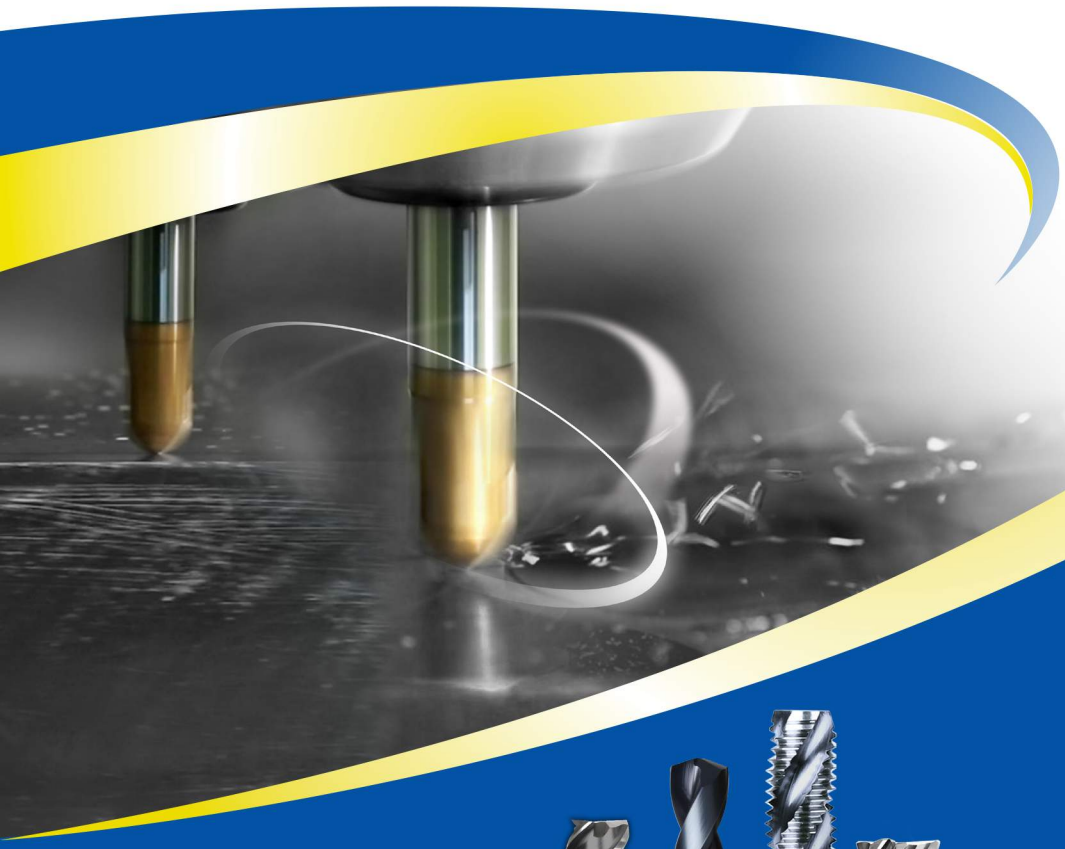
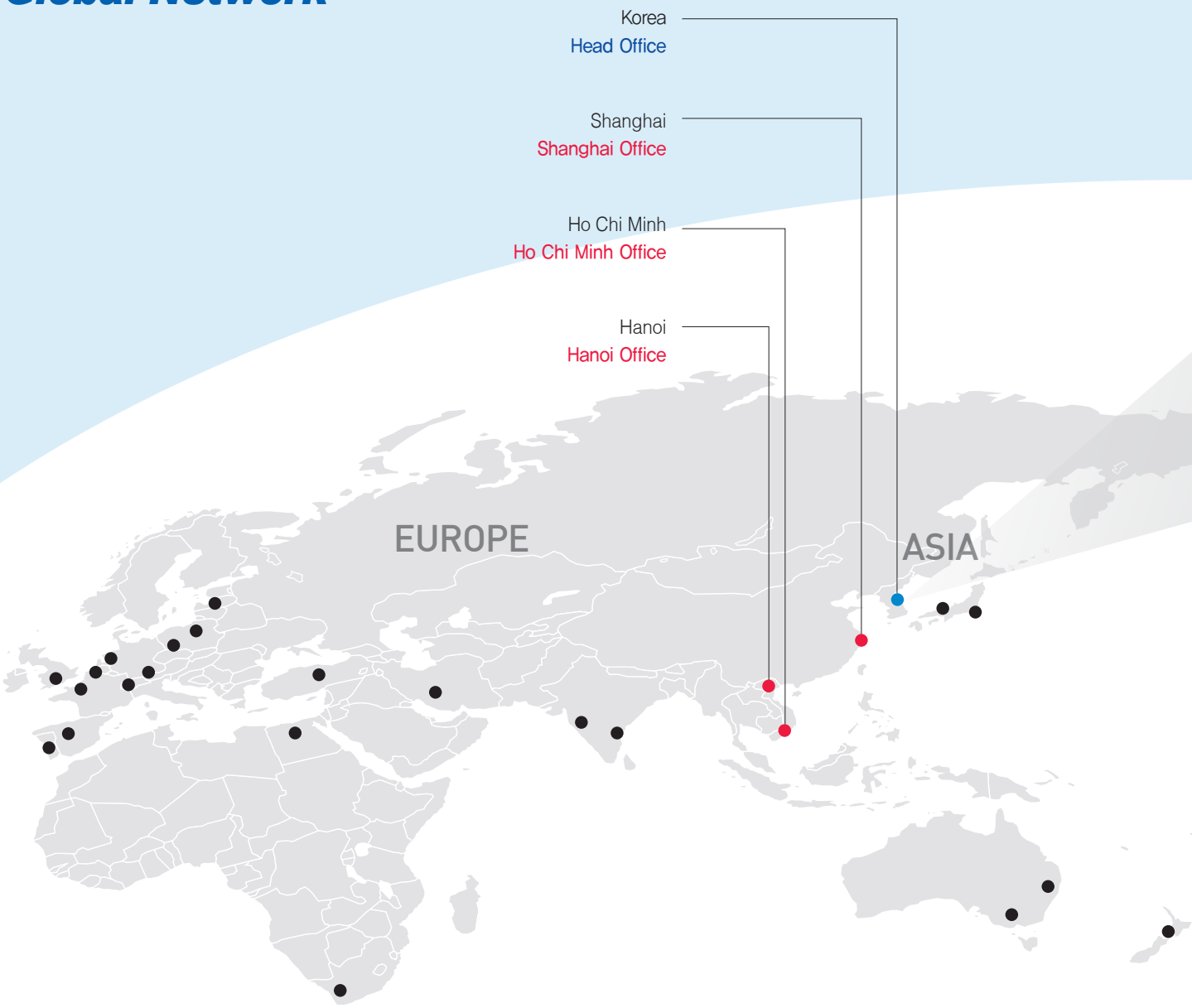
www.iwidin.com

GLOBAL CUTTING TOOLS MANUFACTURER



WIDIN
WIDIN CO.,LTD.

Global Network



WIDIN will continuously expand its business with the whole world as our market.

Our export started in the late of 90's is growing fast by ceaseless activities to find a new market with our high quality products.

50 Countries

4 Overseas Branch Offices

7 Domestic Branch Offices

- Argentina
- Australia
- Austria
- Belgium
- Brazil
- Canada
- China
- Colombia
- Czech
- Denmark
- Egypt
- France
- Germany
- Greece
- Hong Kong
- Hungary
- India
- Indonesia
- Iran
- Italy
- Japan
- Malaysia
- Mexico
- Netherlands
- New Zealand
- Norway
- Philippines
- Poland
- Portugal
- Russia
- Singapore
- Slovenia
- South Africa
- Spain
- Sweden
- Switzerland
- Thailand
- Turkey
- U.S.A
- United Kingdom
- Vietnam

Greetings

Making customer's dreams a reality- The best mechanical solution

Since its establishment in 1988, WIDIN CO.,LTD. has been contributed to pursue the utmost customer satisfaction for the current and potential customers in the globalized market.

With continuously doing development and creativeness of the new technology through the great initiative, we, WIDIN CO.,LTD. is always ready to response of customer needs in customer mind and eye.

To cope with the enormous, various customer demands and satisfaction from popular products to high value added products in the cutting tools industry, WIDIN CO.,LTD. will put its best effort and will play a role of marketing initiator to lead the new 21st era by production and marketing linkage.

Aim to provide the best for money, fine tuned price, utmost quality, excellent customer services based on professionalism, all WIDIN CO.,LTD. will promise to do its best effort at time and where it is.

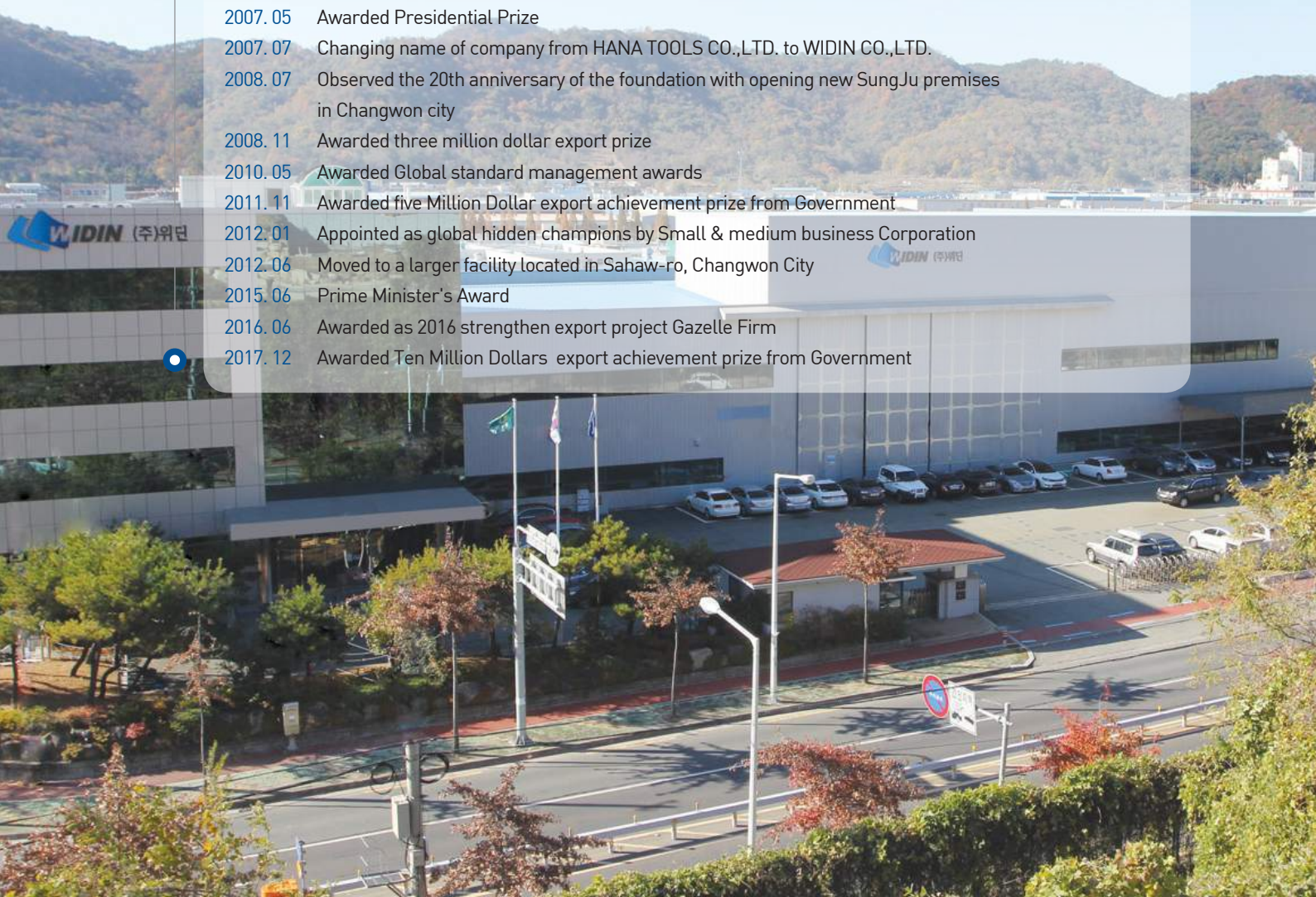
Thank you.

2018. 01

President and CEO **Dong Hyun Kwon** 권동현

History

1988. 07	Established Hana Cutting Tools Co.,Ltd.
1993. 05	Moved to new premises in Changwon City Korea
2000. 03	Opened the Seoul office at Guro Machine and Tool Complex Area
2001. 04	Appointed as the intensive supporting company for export by Gyeongnam Government
2001. 07	Certified in ISO9001 quality management system
2001. 12	Agreed with Machine Tools Technical Research Center in Changwon International University For Machine Tools Consortium
2002. 05	Registered the Utility Model No. 0277126
2002. 05	Registered the Utility Model No. 0350651
2004. 02	Introduced Automated Tool production Network System
2004. 11	Awarded a Bronze Medal of 34th Precision Technology Encouragement Award
2004. 11	Received a letter of recommendation by Ministry of Commerce & Energy Industry
2005. 02	Opened the Shanghai Office in the Gyeongnam Trade office, Shanghai China
2005. 02	Opened the Busan Office in Busan Industry and Tool Complex Area
2005. 08	Opened the Changwon Office in Changwon
2005. 10	Appointed as a professional manufacturing company in machine parts & materials by the Ministry of Commerce, Industry and Energy
2005. 11	Certified in INNO-BIZ(Innovative company)
2006. 11	Nominated for Excellent Quality Product Manufacturer by Korea chamber of commerce & industry on Nov. 29, 2006
2006. 11	Awarded one million dollar prize
2007. 02	HANA TOOLS CO., LTD. has acquired Patent 'Broken Index type End mill'
2007. 05	Awarded Presidential Prize
2007. 07	Changing name of company from HANA TOOLS CO.,LTD. to WIDIN CO.,LTD.
2008. 07	Observed the 20th anniversary of the foundation with opening new SungJu premises in Changwon city
2008. 11	Awarded three million dollar export prize
2010. 05	Awarded Global standard management awards
2011. 11	Awarded five Million Dollar export achievement prize from Government
2012. 01	Appointed as global hidden champions by Small & medium business Corporation
2012. 06	Moved to a larger facility located in Sahaw-ro, Changwon City
2015. 06	Prime Minister's Award
2016. 06	Awarded as 2016 strengthen export project Gazelle Firm
2017. 12	Awarded Ten Million Dollars export achievement prize from Government



Guide Line to Icons

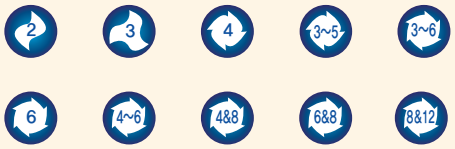
Raw-Material

Ultra fine grade is used in the tool

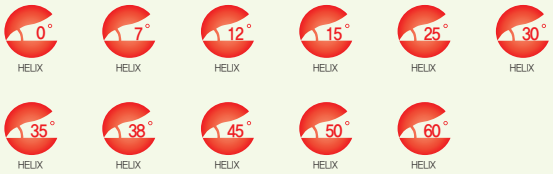
Micro grain grade is used in the tool

K10~K20 grade is used in the tool

Number of Teeth



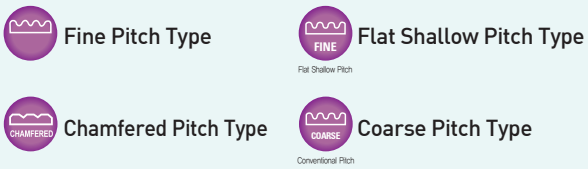
Helix Angle



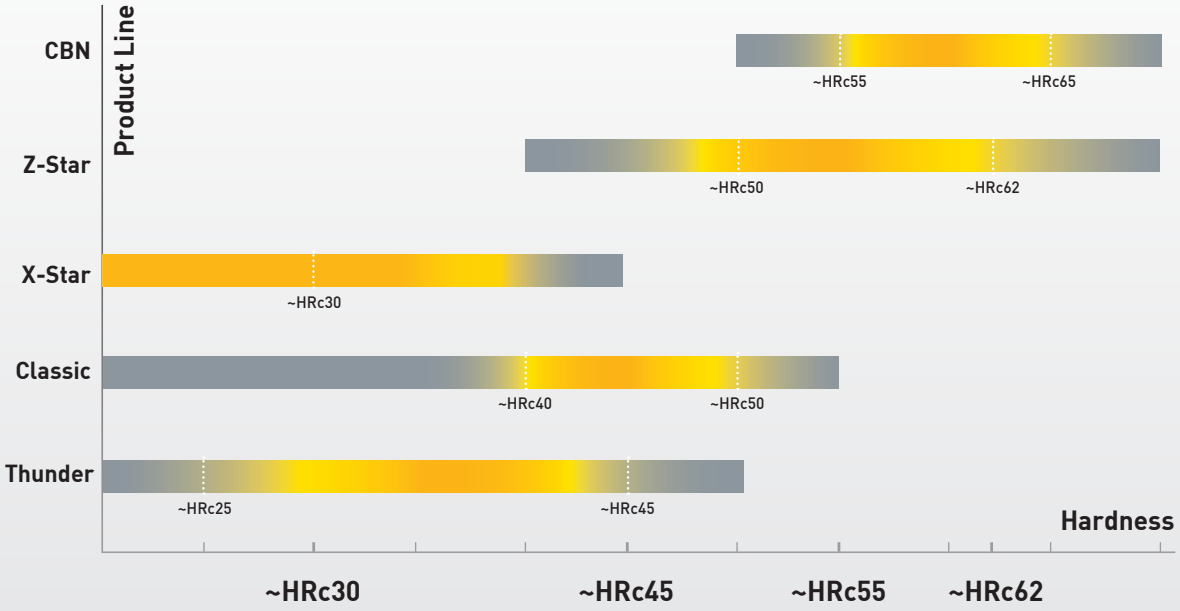
Coating

The Type of End Teeth

The Type of Periphery



Cutting Tools Category Table



Endmills for high hard-ened steel

HRc70

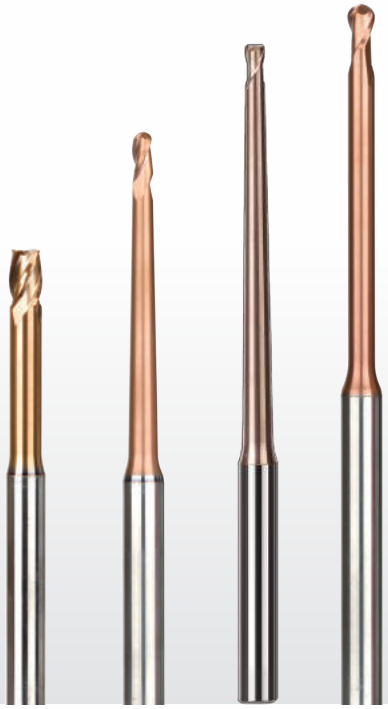
Better performance and quality than Japan Producers

Best for High Speed Machining!

- Endmill for high speed cutting of high hardened steel up to HRc70
- Made of new special raw material and applied new coating technology

RIB Processing

HRc70



Thes best raw material for longer tool life

- Deep hole mahchining with high speed
- Micro size produced from 0.03mm
- Supereminent wear resistance

Aluminum Endmills

- Endmill for Aircraft and Aluminum Machining
- High precision, excellent surface and maximum tool life

Endmills for difficult to cut materials

Excellent Performance for

Stainless Steel, Titanium, Inconel

- Superb Chip ejection
- Suitable for machine tool steel, alloy steel, stainless steel and low hardness materials

Diamond coating Endmills

- Less Heating
- Excellent tool life
- High quality machining surface

Endmills for Mold & Die

Premium Quality of Precise Machining tool

made from the finest raw material

HSSE TAP

Equipped with the world best precision machines and raw materials

Top of the best in high hardness, high speed machining

- STRAIGHT TAP
- SPIRAL ROLL TAP
- ROLL TAP
- SPIRAL TAP
- POINT TAP

Carbide TAP

Supereminent wear resistance

- STRAIGHT TAP
- SPIRAL ROLL TAP
- ROLL TAP
- SPIRAL TAP
- POINT TAP

Drills for high hard-ened steel

For Heat Treated Steel, General Steel, Cast Iron, Stainless Steel

- Various types of products based on each material type
- Differentiated cutting force along with WIDIN's uniques design

Tungsten Carbide Rods & Blanks

Multi-purpose Reamer

Used ultra fine cemented Carbide

Excellent performance for high speed machining

- For prehardened, hardened and machine tool steels and cast iron up to HRc52

Rotating Tool Holder

Axial Rotating Tool Holder

- Special design for Low-noise & High-rigidity
- Use thermal material to minimize variation of accuracy
- Every precision spindle spends long-hours on a special test bench

Radial Totating Tool Holder

- Use special bevel gear for Low-noise & Low-vibration
- Special design of high-rigidity bearing structure
- All of our productions are designed & manufactured by customer demand

Cutter Series

- Cutters for Roughing and Finishing
- Insert Type Cutter
- Insert Tip

Live & Special Center

Live Center for CNC lathe
Live Center for Heavy Duty
Live Center for High Speed Rotation

- Long life
- Run Out 0.003
- Prevent the inflow of cutting oil and foreign substance
- High degree of accuracy of rotation and high durability by using the triplexed bearing structure as high degree of precision

Tool Holder System

TAP SERIES · · · · · · · · · · · · · · · 58~

1

ENDMILL SERIES · · · · · · · · · · 119~

2

DRILL SERIES · · · · · · · · · · · · · 573~

3

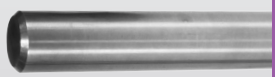
CENTERING TOOLS & REAMERS · · 651~

4

CUTTER SERIES · · · · · · · · · · 672~

5

TUNGSTEN CARBIDE RODS · · 759~

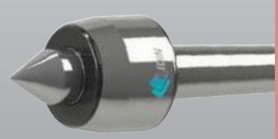


6

TOOL HOLDER SERIES · · · 764~

7

LIVE CENTER SERIES · · · · 897~



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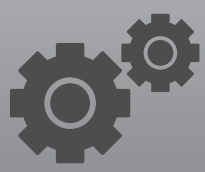
TECHNICAL DATA · · · · · · · · · 926~



9

1 TAP SERIES

※If the following items are not in stock, they will be ordered and produced

Series		EDP. NO	Appearance	Type	Coating	Standard range Min~Max	Page	Stock
CARBIDE TAP SERIES	JIS	WSOM		STRAIGHT TAPS	uncoated	M3~M12	60	•
		WSCM		STRAIGHT TAPS	TiCN	M3~M12	61	•
		WPOM		SPIRAL TAPS	uncoated	M3~M12	62	•
		WPCM		SPIRAL TAPS	TiCN	M3~M12	63	•
		WROM		ROLL TAPS	uncoated	M3~M12	64	•
		WRCM		ROLL TAPS	TiCN	M3~M12	65	•
		WFOM		SPIRAL ROLL TAPS	uncoated	M3~M6	66	•
		WFCM		SPIRAL ROLL TAPS	TiCN	M3~M6	67	•
	DIN	WGOM		STRAIGHT TAPS	uncoated	M3~M24	68	•
		WGCM		STRAIGHT TAPS	TiCN	M3~M24	69	•
		WQOM		SPIRAL TAPS	uncoated	M3~M24	70	•
		WQCM		SPIRAL TAPS	TiCN	M3~M24	71	•
		WMOM		ROLL TAPS	uncoated	M3~M12	72	•
		WMCM		ROLL TAPS	TiCN	M3~M12	73	•
HSSE TAP SERIES	JIS	VSOM		STRAIGHT TAPS	uncoated	M3~M24	74	•
		VSTM		STRAIGHT TAPS	TiN	M3~M24	75	•
		VSCM		STRAIGHT TAPS	TiCN	M3~M24	76	•
		VSHM		STRAIGHT TAPS	HOMO	M3~M24	77	•
		VNOM		POINT TAPS	uncoated	M3~M24	78	•
		VNTM		POINT TAPS	TiN	M3~M24	79	•
		VNCM		POINT TAPS	TiCN	M3~M24	80	•
		VNHM		POINT TAPS	HOMO	M3~M24	81	•
		VPOM		SPIRAL TAPS	uncoated	M3~M24	82	•
		VPTM		SPIRAL TAPS	TiN	M3~M24	83	•
		VPCM		SPIRAL TAPS	TiCN	M3~M24	84	•
		VPHM		SPIRAL TAPS	HOMO	M3~M24	85	•
		VROM		ROLL TAPS	uncoated	M3~M12	86	•
		VRTM		ROLL TAPS	TiN	M3~M12	87	•
		VRCM		ROLL TAPS	TiCN	M3~M12	88	•
		VFOM		SPIRAL ROLL TAPS	uncoated	M3~M6	89	•
		VFTM		SPIRAL ROLL TAPS	TiN	M3~M6	90	•
		VFCM		SPIRAL ROLL TAPS	TiCN	M3~M6	91	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
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NEXT ≫

1 TAP SERIES

※If the following items are not in stock, they will be ordered and produced

Series		EDP. NO	Appearance	Type	Coating	Standard range Min~Max	Page	Stock
HSSE TAP SERIES	DIN	VGOM		STRAIGHT TAPS	uncoated	M3~M24	92	•
		VGTM		STRAIGHT TAPS	TiN	M3~M24	93	•
		VGCM		STRAIGHT TAPS	TiCN	M3~M24	94	•
		VGHM		STRAIGHT TAPS	HOMO	M3~M24	95	•
		VQOM		SPIRAL TAPS	uncoated	M3~M24	96	•
		VQTM		SPIRAL TAPS	TiN	M3~M24	97	•
		VQCM		SPIRAL TAPS	TiCN	M3~M24	98	•
		VQHM		SPIRAL TAPS	HOMO	M3~M24	99	•
		VDOM		POINT TAPS	uncoated	M3~M24	100	•
		VDTM		POINT TAPS	TiN	M3~M24	101	•
		VDCM		POINT TAPS	TiCN	M3~M24	102	•
		VDHM		POINT TAPS	HOMO	M3~M24	103	•
		VMOM		ROLL TAPS	uncoated	M3~M12	104	•
		VMTM		ROLL TAPS	TiN	M3~M12	105	•
		VMCM		ROLL TAPS	TiCN	M3~M12	106	•
PIPE TAP SERIES		VSOPT		STRAIGHT TAPS	uncoated	1/16-28~ 1-11	107	•
		VPOPT		SPIRAL TAPS	uncoated	1/16-28~ 1-11	108	•
		VSONPT		STRAIGHT TAPS	uncoated	1/16-28~1-11	109	•
		VPONPT		SPIRAL TAPS	uncoated	1/16-27~1-11½	110	•
		VSOPS		STRAIGHT TAPS	uncoated	1/8-28~ 1-11	111	•
		VPOPS		SPIRAL TAPS	uncoated	1/8-28~ 1-11	112	•
		VSOPF		STRAIGHT TAPS	uncoated	1/8-28~ 1-11	113	•
		VPOPF		SPIRAL TAPS	uncoated	1/8-28~ 1-11	114	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC				
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NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
① High Hardened Material ~HRc70 ZAMUS STAR SERIES	* Hardened Steels (~HRc70) * High Speed Cutting	DA702		2F	STUB CUT LENGTH with EXTENDED NECK	INCH	1/32~1/2	121	•
		ZB702A		2F	12° STUB CUT LENGTH, BALL NOSE with EXTENDED NECK	INCH	3/16~5/8	122	•
		DA703		3F	STUB CUT LENGTH for FINISHING	INCH	1/16~1/2	123	•
		DA734		4F	BALL NOSE, FINISHING for MOLD & DIE	INCH	1/8~1/2	124	•
		ZS204A		4F	CORNER RADIUS VARIABLE HELIX	INCH	1/8~1/2	125	•
		ZE712A		2F	35° HELIX REGULAR LENGTH	INCH	1/16~1/2	126	•
		ZE714A		4F	45° HELIX REGULAR LENGTH	INCH	1/16~1/2	127	•
		ZE716A		6F	50° HELIX REGULAR LENGTH	INCH	1/4~3/4	128	•
		ZR706A		6F	45° HELIX STUB CUT LENGTH with EXTENDED NECK	INCH	3/16~1/2	129	•
		ZSPM4A		4F	STUB CUT LENGTH with EXTENDED NECK	INCH	1/8~1/2	130	•
		ZSLNS20		2F	LONG NECK	METRIC	0.1~5	131	•
		ZSLNS40		4F	LONG NECK	METRIC	1~5	136	•
		ZSLNB		2F	LONG NECK	METRIC	0.05~5	138	•
		ZSLNR		2F	LONG NECK & BACK DRAFT TYPE	METRIC	0.2~3	142	•
		ZSTNB20		2F	TAPER NECK & BACK DRAFT TYPE	METRIC	0.2~10	146	•
		ZSTNB30		3F	TAPER NECK & BACK DRAFT TYPE	METRIC	1~2.5	150	•
		ZSTNR		2F	TAPER NECK & BACK DRAFT TYPE	METRIC	0.2~3	151	•
		ZS124		4F	LONG LENGTH CUT, VARIABLE FLUTE	METRIC	2~12	153	•
		ZS1(2)04		4F	CORNER RADIUS, VARIABLE HELIX	METRIC	1~12	154	•
		ZS204		4F	CORNER RADIUS, VARIABLE HELIX	METRIC	2~12	155	•
	* High speed & High feed rates	ZSPM4		4F	STUB CUT LENGTH, with EXTENDED NECK	METRIC	3~10	157	•
	* Hardened Steels (~ HRc 70) * High Speed Cutting	DB702		2F	STUB CUT LENGTH, BALL NOSE with EXTENDED NECK	METRIC	0.1~12	158	•
		DB712		2F	REGULAR LENGTH, BALL NOSE	METRIC	1~12	159	•
		DB703		3F	BALL NOSE for FINISHING MOLD & DIE	METRIC	2~12	160	•
		DB734		4F	TAPER NECK for FINISHING MOLD & DIE	METRIC	2~10	161	•
		ZE702		2F	STUB CUT LENGTH, with EXTENDED NECK	METRIC	0.1~20	162	•
		ZE704		4F	STUB CUT LENGTH, with EXTENDED NECK	METRIC	1~20	163	•
		ZE724(6)		4&6F	FINISHING for MOLD & DIE	METRIC	1~12	164	•
		ZR702		2F	STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK	METRIC	1~12	165	•
		ZR732		2F	CORNER RADIUS with LONG SHANK	METRIC	1~12	170	•
		ZR704		4F	STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK	METRIC	1~12	172	•
		ZR714		4F	45° HELIX FINISHING MOLD & DIE	METRIC	3~12	175	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
		○	○	◎	◎	○				

NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
High Hardened Material ~HRc70 ZAMUS STAR SERIES	* Hardened Steels (~ HRc 70) * High Speed Cutting	ZR724		4F	STUB CUT LENGTH, CORNER RADIUS with LONG SHANK	METRIC	6~12	176	•
		ZR734		4F	CORNER RADIUS with LONG SHANK	METRIC	1~12	177	•
		ZR706		6F	45° HELIX STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK	METRIC	6~12	179	•
		ZR736		6F	45° HELIX, LONG SHANK, CORNER RADIUS	METRIC	6~12	180	•
		ZE712		2F	35° HELIX REGULAR LENGTH	METRIC	1~12	181	•
		ZE714		4F	45° HELIX REGULAR LENGTH	METRIC	1~12	182	•
		ZE716		6F	50° HELIX REGULAR LENGTH	METRIC	6~20	183	•
2 for stainless steel ~HRc45 NEO CLASSIC X-STAR	* High performance & High efficiency (~HRc45)	XE504A		4F	REGULAR LENGTH, VARIABLE HELIX	INCH	1/8~1	187	•
		XR404A		4F	SHORT LENGTH, CORNER RADIUS, VARIABLE HELIX	INCH	1/8~3/4	188	•
		XR504A		4F	REGULAR LENGTH, CORNER RADIUS, VARIABLE HELIX	INCH	1/8~1	189	•
		XR514A		4F	REGULAR LENGTH, CORNER RADIUS VARIABLE HELIX	INCH	1/8~1	190	•
		XR524A		4F	LONG REACH, CORNER RADIUS VARIABLE HELIX	INCH	1/4~1	192	•
		XXE504A		4F	REGULAR LENGTH, VARIABLE HELIX	INCH	1/8~1	193	•
		XXE524A		4F	STUB CUT with LONG REACH, VARIABLE HELIX	INCH	1/4~3/4	194	•
		XXE534A		4F	STUB CUT with EXTENDED NECK, VARIABLE HELIX	INCH	1/4~1	195	•
		XXB504A		4F	REGULAR LENGTH, BALL NOSE, VARIABLE HELIX	INCH	1/8~1	196	•
		XXB524A		4F	STUB CUT with LONG REACH, BALL NOSE, VARIABLE HELIX	INCH	1/4~3/4	197	•
		XXR404A		4F	SHORT LENGTH, CORNER RADIUS, VARIABLE HELIX	INCH	1/8~3/4	198	•
		XXR514A		4F	REGULAR LENGTH, CORNER RADIUS, VARIABLE HELIX	INCH	1/8~1	199	•
		XXR524A		4F	STUB CUT with LONG REACH, CORNER RADIUS, VARIABLE HELIX	INCH	1/4~3/4	200	•
		XXR534A		4F	STUB CUT with EXTENDED NECK, CORNER RADIUS, VARIABLE HELIX	INCH	1/4~1	201	•
		XE505A		5F	STUB CUT LENGTH, VARIABLE HELIX	INCH	1/4~1	202	•
		XE515A		5F	REGULAR CUT LENGTH, VARIABLE HELIX	INCH	1/4~1	203	•
		XR505A		5F	STUB CUT LENGTH CORNER RADIUS	INCH	1/4~1	204	•
		XR515A		5F	REGULAR CUT LENGTH CORNER RADIUS , VARIABLE HELIX	INCH	1/4~3/4	205	•
		XR525A		5F	REGULAR CUT LENGTH with EXTENDED NECK, CORNER RADIUS	INCH	1/4~1	206	•
		XR535A		5F	REGULAR CUT LENGTH with LONG EXTENDED NECK, CORNER RADIUS	INCH	3/8~1	207	•
		XE505		5F	REGULAR CUT LENGTH, VARIABLE HELIX	METRIC	6~25	208	•
		XE515		5F	LONG CUT LENGTH	METRIC	6~20	209	•
		XR505		5F	REGULAR CUT LENGTH CORNER RADIUS, VARIABLE HELIX	METRIC	6~25	210	•
		XXB504		4F	REGULAR CUT LENGTH, VARIABLE HELIX	METRIC	4~12	211	•
		XCE504		4F	REGULAR CUT LENGTH, VARIABLE HELIX	METRIC	6~25	212	•
		XE304		4F	REGULAR LENGTH	METRIC	3~20	213	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
		○	○	◎	◎	○				
	◎	◎	○			○				◎

NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
for stainless steel ~HRc45 NEO CLASSIC X-STAR	* High performance & High efficiency (~HRc45)	XM304		4F	ENDMILL FOR COMPLEX AUTOMATIC LATHE - VARIABLE HELIX TYPE	METRIC	3~10	214	•
		XCC504		4F	REGULAR CUT LENGTH, CORNER CHAMFER, VARIABLE HELIX	METRIC	6~25	215	•
		XCR504		4F	REGULAR CUT LENGTH, CORNER RADIUS, VARIABLE HELIX	METRIC	6~25	216	•
		XCE503		3F	REGULAR CUT LENGTH	METRIC	2~25	217	•
		XCC503		3F	REGULAR CUT LENGTH, CORNER CHAMFER	METRIC	2~25	218	•
		XCR503		3F	REGULAR CUT LENGTH, CORNER RADIUS	METRIC	5~25	219	•
		XE504		4F	REGULAR CUT LENGTH, VARIABLE HELIX	METRIC	1~25	220	•
		XR504		4F	REGULAR CUT LENGTH, CORNER RADIUS, VARIABLE HELIX	METRIC	2~25	221	•
		XE514		4F	STUB CUT LENGTH with EXTENDED NECK, VARIABLE HELIX	METRIC	1~20	222	•
		XE524		4F	STUB CUT LENGTH with EXTENDED LONG NECK	METRIC	6~16	223	•
		XR514		4F	REGULAR CUT LENGTH, VARIABLE HELIX	METRIC	2~20	224	•
③ Endmills for high speed & general cutting ~HRc55 ZAMUS CLASSIC	* Hardened Steels (~ HRc 55) * High Speed Cutting * General Speed Cutting	DA412		2F	15°HELIX, REGULAR LENGTH, BALL NOSE	INCH	1/32~1/2	230	•
		DA512		2F	LONG LENGTH, BALL NOSE	INCH	1/32~1	231	•
		DA514		4F	LONG LENGTH, BALL NOSE	INCH	1/16~1	232	•
		DA522		2F	LONG LENGTH, BALL NOSE with EXTENDED NECK	INCH	1/8~1	233	•
		MD502		2F	MINIATURE, BALL NOSE	INCH	0.24~0.62	234	•
		DA542		2F	BALL NOSE with TAPER NECK	INCH	1/16~1/2	235	•
		DA552		2F	BALL NOSE with PENCIL NECK	INCH	3/16~1/2	236	•
		ZA502		2F	REGULAR LENGTH	INCH	1/32~1	237	•
		ZA522		2F	LONG LENGTH	INCH	1/8~1	238	•
		MZ502		2F	MINIATURE	INCH	.016~.062	239	•
		ZA504		4F	REGULAR LENGTH	INCH	1/16~1	240	•
		ZA524		4F	LONG LENGTH	INCH	1/16~1	241	•
		ZA506&8		6&8F	45°HELIX, LONG LENGTH	INCH	1/4~1	242	•
		ZA526&8		6&8F	45°HELIX, EXTRA LONG LENGTH	INCH	1/4~1	243	•
		ZR502A		2F	STUB LENGTH, CORNER RADIUS	INCH	1/16~1/2	244	•
		ZR522A		2F	LONG LENGTH, CORNER RADIUS	INCH	1/16~1/2	245	•
		ZR532A		2F	LONG LENGTH, CORNER RADIUS	INCH	1/4~1/2	246	•
		ZR504A		4F	STUB LENGTH, CORNER RADIUS	INCH	1/16~1/2	247	•
		ZR524A		4F	REGULAR LENGTH, CORNER RADIUS	INCH	1/16~1/2	248	•
		ZR534A		4F	LONG LENGTH, CORNER RADIUS	INCH	1/4~1/2	249	•
		ZR506(8)A		6&8F	50°HELIX, LONG LENGTH, CORNER RADIUS	INCH	1/4~3/4	250	•
		FA50		3&5F	ROUGHING LONG LENGTH	INCH	1/4~1	251	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
	◎	◎	○			○				◎
	○	○	◎	○				○		○

NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
Endmills for high speed & general cutting ~HRc55 ZAMUS CLASSIC	* Hardened Steels (~ HRc 55) * High Speed Cutting * General Speed Cutting	DB402		2F	SHORT LENGTH, BALL NOSE	METRIC	1~20	252	•
		DB412		2F	LONG LENGTH, BALL NOSE	METRIC	1~10	253	•
		DB512		2F	LONG LENGTH, BALL NOSE	METRIC	1~25	254	•
		DB514		4F	LONG LENGTH, BALL NOSE	METRIC	3~25	255	•
		DB502		2F	STUB CUT LENGTH, BALL NOSE with EXTENDED NECK	METRIC	1~12	256	•
		DB522		2F	NECK & LONG SHANK TYPE	METRIC	3~16	257	•
		DB532		2F	MMC - SPHERE TYPE	METRIC	3~16	258	•
		DB534		4F	MMC - SPHERE TYPE	METRIC	5~16	259	•
		DB54(5)2		2F	BALL NOSE with TAPER NECK	METRIC	2~12	260	•
		ZE502		2F	REGULAR LENGTH	METRIC	1~25	261	•
		ZE504		4F	REGULAR LENGTH	METRIC	1~25	262	•
		ZE503		3F	REGULAR LENGTH	METRIC	6~32	263	•
		ZE506		6F	REGULAR & LONG LENGTH	METRIC	6~32	264	•
		ZM502		2F	MEDIUM LENGTH	METRIC	2~25	265	•
		ZM504		4F	MEDIUM LENGTH	METRIC	2~25	266	•
		ZM522		2F	MEDIUM CUT, LONG SHANK TYPE	METRIC	3~20	267	•
		ZM524		4F	MEDIUM CUT, LONG SHANK TYPE	METRIC	3~20	268	•
		ZE522		2F	LONG TYPE	METRIC	3~20	269	•
		ZE524		4F	LONG TYPE	METRIC	3~20	270	•
		ZE534		4F	EXTRA LONG TYPE	METRIC	4~25	271	•
		ZE512		2F	35°HELIX REGULAR LENGTH	METRIC	1~12	272	•
		ZE514		4F	45° HELIX REGULAR LENGTH	METRIC	2~12	273	•
		ZE516		6F	for RIB PROCESSING	METRIC	6~20	274	•
		ZR502		2F	STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK	METRIC	4~12	275	•
		ZR504		4F	STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK	METRIC	4~12	276	•
		ZR512		2F	REGULAR LENGTH, CORNER RADIUS	METRIC	6~20	277	•
		ZR514		4F	REGULAR LENGTH, CORNER RADIUS	METRIC	6~20	278	•
		ZR522		2F	LONG LENGTH, CORNER RADIUS	METRIC	3~12	279	•
		ZR524		4F	LONG LENGTH, CORNER RADIUS	METRIC	3~12	280	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	○				○		○

NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
Endmills for high speed & general cutting ~HRc55 ZAMUS CLASSIC	* Hardened Steels (~HRc55) * High Speed Cutting * General Speed Cutting	TPRB604A-05		4F	30° TAPER RIB BALL, SHORT LENGTH	INCH	0.30~.125	281	•
		TPRB604A-10		4F	1° TAPER RIB BALL, SHORT LENGTH	INCH	0.30~.125	282	•
		TPRB604A-15		4F	1° 30' TAPER RIB BALL, SHORT LENGTH	INCH	0.30~.125	283	•
		TPRB604A-20		4F	2° TAPER RIB BALL, SHORT LENGTH	INCH	0.30~.125	284	•
		TPRB604A-30		4F	3° TAPER RIB BALL, SHORT LENGTH	INCH	0.30~.125	285	•
		TPRB624A-05		4F	30° TAPER RIB BALL, LONG LENGTH	INCH	0.30~.125	286	•
		TPRB624A-10		4F	1° TAPER RIB BALL, LONG LENGTH	INCH	0.30~.125	287	•
		TPRB624A-15		4F	1° 30' TAPER RIB BALL, LONG LENGTH	INCH	0.30~.125	288	•
		TPRB624A-20		4F	2° TAPER RIB BALL, LONG LENGTH	INCH	0.30~.125	289	•
		TPRB624A-30		4F	3° TAPER RIB BALL, LONG LENGTH	INCH	0.30~.125	290	•
		TPRE604A-05		4F	30° TAPER RIB, SHORT LENGTH	INCH	0.30~.125	291	•
		TPRE604A-10		4F	1° TAPER RIB, SHORT LENGTH	INCH	0.30~.125	292	•
		TPRE604A-15		4F	1° 30' TAPER RIB, SHORT LENGTH	INCH	0.30~.125	293	•
		TPRE604A-20		4F	2° TAPER RIB, SHORT LENGTH	INCH	0.30~.125	294	•
		TPRE604A-30		4F	3° TAPER RIB, SHORT LENGTH	INCH	0.30~.125	295	•
		TPRB4-050		4F	30° TAPER BALL, RIB PROCESSING	METRIC	0.6~2.5	296	•
		TPRB4-075		4F	45° TAPER BALL, RIB PROCESSING	METRIC	0.6~2.5	297	•
		TPRB4-100		4F	1° TAPER BALL, RIB PROCESSING	METRIC	0.6~2.5	299	•
		TPRB4-150		4F	1°30' TAPER BALL, RIB PROCESSING	METRIC	0.6~2.5	300	•
		TPRB4-200		4F	2° TAPER BALL, RIB PROCESSING	METRIC	0.6~2.5	302	•
		TPRE4-050		4F	30° TAPER BALL, RIB PROCESSING	METRIC	0.4~2.5	304	•
		TPRE4-075		4F	45° TAPER, RIB PROCESSING	METRIC	0.4~3	306	•
		TPRE4-100		4F	1° TAPER, RIB PROCESSING	METRIC	0.4~3	308	•
		TPRE4-150		4F	1° TAPER, RIB PROCESSING	METRIC	0.4~3	310	•
		TPRE4-200		4F	2° TAPER, RIB PROCESSING	METRIC	0.4~3	312	•
		TPRE4-300		4F	3° TAPER BALL, RIB PROCESSING	METRIC	0.5~3	314	•
		TE503		3F	TAPER END MILL	METRIC	3~10	315	•
		TB503		3F	TAPER BALL END MILL	METRIC	3~12	316	•
		TB504		4F	TAPER BALL END MILL	METRIC	5~12	317	•
		ZF60		3~6F	ROUGHING END MILL	METRIC	4~32	318	•
		ZF61		3~5F	ROUGHING END MILL - FINE PITCH	METRIC	4~25	319	•
		PK503		3F	Z - AXIS ROUGHING END MILL	METRIC	6~20	320	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	○				○		○

NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
4 Endmills for high speed & general cutting ~HRc45 ZAMUS THUNDER	* Hardened Steels (~ HRc 45) * High Speed Cutting * General Speed Cutting	DB312		2F	LONG LENGTH, BALL NOSE	METRIC	1~20	325	•
		DB342		2F	BALL NOSE with TAPER NECK	METRIC	1~12	326	•
		ZE302		2F	REGULAR LENGTH	METRIC	1~20	327	•
		ZE304		4F	REGULAR LENGTH	METRIC	2~20	328	•
		ZE322		2F	LONG & EXTRA LONG LENGTH	METRIC	3~20	329	•
		ZE324		4F	LONG and X-LONG LENGTHS	METRIC	3~20	330	•
		ZR322		2F	CORNER RADIUS LONG LENGTH	METRIC	3~12	331	•
		ZR324		4F	CORNER RADIUS LONG LENGTH	METRIC	3~12	332	•
		ZR304H		4F	45° HELIX STUB CUT LENGTH, CORNER RADIUS, EXTENDED NECK	METRIC	3~12	333	•
		ZR324H		4F	45° HELIX STUB CUT LENGTH, CORNER RADIUS, LONG SHANK	METRIC	6~12	334	•
	* Hardened Steels (~ HRc 45) * High Speed Cutting * General Speed Cutting * Economic Type	TX302		2F	REGULAR LENGTH	METRIC	1~20	335	•
		TS302		2F	REGULAR LENGTH	METRIC	1~20	336	•
		TM302		2F	ENDMILL FOR COMPLEX AUTOMATIC LATHE	METRIC	1~10	337	•
		TX304		4F	REGULAR LENGTH	METRIC	1~20	338	•
		TS304		4F	REGULAR LENGTH	METRIC	2~20	339	•
		TM304		4F	ENDMILL FOR COMPLEX AUTOMATIC LATHE	METRIC	2~10	340	•
		TX304H		4F	45° HELIX, REGULAR LENGTH	METRIC	3~20	341	•
		TXB302		2F	REGULAR LENGTH, BALL NOSE	METRIC	1~20	342	•
		TXB304		4F	REGULAR LENGTH, BALL NOSE	METRIC	1~20	343	•
		TX202		2F	SHORT LENGTH	METRIC	1~20	344	•
		TX222		2F	LONG LENGTH	METRIC	3~20	345	•
		TX204		4F	SHORT LENGTH	METRIC	1~20	346	•
		TX224		4F	LONG LENGTH	METRIC	3~20	347	•
		TXB202		2F	REGULAR LENGTH, BALL NOSE	METRIC	1~20	348	•
		TXB222		2F	LONG LENGTH, BALL NOSE	METRIC	3~22	349	•
		TXB232		2F	LONG REACH, BALL NOSE	METRIC	3~20	350	•
		TXB204		4F	REGULAR LENGTH, BALL NOSE	METRIC	2~20	351	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
	◎	◎	○							

NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
5 Endmills for difficult to cut materials ZAMUS SUS-MATE	* Stainless Steel * Titanium * Inconell	DS502		2F	BALL NOSE REGULAR & LONG LENGTH	METRIC	1~12	354	•
		SM503		3F	REGULAR LENGTH	METRIC	2~20	355	•
		SM504		4F	REGULAR LENGTH, CORNER RADIUS	METRIC	2~20	356	•
		ZF62		4~6F	ROUGHING END MILL	METRIC	6~20	357	•
6 Endmill for non-ferrous metal machining ZAMUS COPPER-MATE	* Copper & non-ferrous material	BC502		2F	STUB CUT with EXTENDED NECK	METRIC	1~12	360	•
		RC502		2F	STUB CUT with EXTENDED NECK	METRIC	2~12	361	•
7 Endmill for Graphite and Non-ferrous ZAMUS GRA-MATE	* Graphite & non-ferrous material	G		2F	DIAMOND COATING BALL NOSE	METRIC	0.5~12	364	•
		GE		2F	DIAMOND COATING END MILL	METRIC	0.5~12	637	•
		WGR502		4F	DIAMOND COATING RADIUS	METRIC	0.2~6	368	•
		WGR504		4F	DIAMOND COATING RADIUS	METRIC	3~20	369	•
		WGB504		4F	DIAMOND COATING, BALL NOSE	METRIC	8~20	370	•
		WGE504		4F	DIAMOND COATING SQUARE	METRIC	2~20	372	•
		WROU		8~12F	ROUTER	METRIC	6~12	373	•
8 Aluminum Endmills ALU-WAVE	* Aluminum * Non-Ferrous Material * Graphite * Plastics	WAE302A		2F	STUB LENGTH, UNCOATED	INCH	1/8~1	377	•
		WAE502A		2F	STUB LENGTH, DLC COATED	INCH	1/8~1	377	•
		WAE312A		2F	REGULAR LENGTH, UNCOATED	INCH	1/8~1	378	•
		WAE512A		2F	REGULAR LENGTH, DLC COATED	INCH	1/8~1	378	•
		WAE322A		2F	LONG LENGTH, UNCOATED	INCH	1/4~1	379	•
		WAE522A		2F	LONG LENGTH, DLC COATED	INCH	1/4~1	379	•
		WAR302A		2F	STUB LENGTH, UNCOATED	INCH	1/8~1	380	•
		WAR502A		2F	STUB LENGTH, DLC COATED	INCH	1/8~1	380	•
		WAR312A		2F	REGULAR LENGTH, UNCOATED	INCH	1/8~1	381	•
		WAR512A		2F	REGULAR LENGTH, DLC COATED	INCH	1/8~1	381	•
		WAR322A		2F	LONG LENGTH, UNCOATED	INCH	1/4~1	382	•
		WAR522A		2F	LONG LENGTH, DLC COATED	INCH	1/4~1	382	•
		WAE303A		3F	STUB LENGTH, UNCOATED	INCH	1/8~1	383	•
		WAE503A		3F	STUB LENGTH, DLC COATED	INCH	1/8~1	383	•
		WAE313A		3F	STUB LENGTH, UNCOATED	INCH	1/8~1	384	•
		WAE513A		3F	STUB LENGTH, DLC COATED	INCH	1/8~1	384	•
		WAE323A		3F	LONG LENGTH, UNCOATED	INCH	1/4~1	385	•
		WAE523A		3F	LONG LENGTH, DLC COATED	INCH	1/4~1	385	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
	○	○	○			○				◎
	○	○				◎			○	
							◎		○	
						○			◎	

NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
Aluminum Endmills ALU-WAVE	* Aluminum * Non-Ferrous Material * Graphite * Plastics	WAR303A		3F	STUB LENGTH, UNCOATED	INCH	1/8~1	386	•
		WAR503A		3F	STUB LENGTH, DLC COATED	INCH	1/8~1	386	•
		WAR313A		3F	REGULAR LENGTH, UNCOATED	INCH	1/8~1	387	•
		WAR513A		3F	REGULAR LENGTH, DLC COATED	INCH	1/8~1	387	•
		WAR323A		3F	LONG TYPE, UNCOATED	INCH	1/4~1	388	•
		WAR523A		3F	LONG TYPE, DLC COATED	INCH	1/4~1	388	•
		WAB312A		2F	STUB BALL NOSE	INCH	1/8~1/2	389	•
		WAF303A		3F	ROUGHING ENDMILL FOR ALUMINNM	INCH	3/8~1	390	•
		WAF313A		3F	ROUGHING ENDMILL FOR ALUMINNM	INCH	3/8~1	391	•
		WAB312		2F	50° HELIX BALL ENDMILL - FOR ALUMINUM	METRIC	6~20	392	•
		WAE301		1F	1 FLUTE-FOR PLASTIC AND NONFERROUS	METRIC	0.2~2.5	393	•
		WAE302		2F	45° HELIX - FOR ALUMINUM	METRIC	1~25	395	•
		WAE30(2)3		3F	45° HELIX LONG & EXTRA LONG LENGTH - FOR ALUMINUM	METRIC	1~25	396	•
		WAR302		2F	45° HELIX CORNER RADIUS - FOR ALUMINUM	METRIC	6~20	400	•
		WAR303		3F	45° HELIX CORNER RADIUS - FOR ALUMINUM	METRIC	6~20	401	•
		WAR502		2F	CORNER RADIUS WITH D.L.C COATED - FOR ALUMINUM & NONFERROUS	METRIC	1~12	402	•
		WAR503		3F	CORNER RADIUS WITH D.L.C COATED - FOR ALUMINUM & NONFERROUS	METRIC	4~20	403	•
		WAF303		3F	38° HELIX ROUGHING ENDMILL - FOR ALUMINUM	METRIC	4~20	404	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
						○			◎	

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
⑨ Endmills for General & Multi–purpose STANDARD END MILL	* General & Multi-purpose	E302		2F	REGULAR LENGTH	METRIC	1~25	408	•
		E304		4F	REGULAR LENGTH	METRIC	2~25	410	•
		B302		2F	BALL NOSE LONG LENGTH	METRIC	1~25	411	•
		BL422		2F	BALL NOSE EXTRA LONG LENGTH	METRIC	3~20	412	•
		B304		4F	BALL NOSE LONG LENGTH	METRIC	3~25	413	•
		E322		2F	LONG LENGTH	METRIC	3~20	414	•
		E324		4F	LONG LENGTH	METRIC	3~20	415	•
		EB302		2F	REGULAR LENGTH - BRAZED TYPE	METRIC	14~50	416	•
		EB304		4F	REGULAR LENGTH - BRAZED TYPE	METRIC	14~50	417	•
		EB306		6F	REGULAR LENGTH - BRAZED TYPE	METRIC	30~50	418	•
		EB322		2F	LONG LENGTH - BRAZED TYPE	METRIC	14~45	419	•
		EB324		4F	LONG LENGTH - BRAZED TYPE	METRIC	14~50	420	•
		BB302		2F	BALL NOSE REGULAR LENGTH -BRAZED TYPE	METRIC	15~32	421	•
		BB342		2F	BALL NOSE REGULAR LENGTH -BRAZED TYPE(ECONOMIC TYPE)	METRIC	15~32	422	•
		EBF304		4F	ROUGHING ENDMILL WITH BRAZED CARBIDE CUTTING	METRIC	16~50	423	•
⑩ Endmills for Mold & Die WINNER SERIES	BALL	WHPB902		2F	APPLIED ULTRA-HIGH PRECISION R TOLERANCE	METRIC	0.1~12	428	•
		WB502---		2F	SHORT LENGTH + REGULAR LENGTH + LONG LENGTH	METRIC	0.1~25	429	•
		WB502---P		2F	HIGH PRECISION	METRIC	0.1~12	433	•
		WB512---		2F	for RIB PROCESSING	METRIC	0.1~12	434	•
		WB512---S6		2F	for RIB PROCESSING(Shank-6)	METRIC	0.5~2	441	•
		WB542---		2F	TAPER NECK	METRIC	0.1~12	444	•
		WB532---		2F	MILLING MACHINE COPY	METRIC	3~12	455	•
		WSB502---		2F	STRAIGHT FLUTE	METRIC	3~20	456	•
		WB503---		3F	HIGH FEED & CENTER MATCH	METRIC	1~12	457	•
		WB504---		4F	HIGH FEED	METRIC	1~12	458	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
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NEXT ≫

2 ENDMILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
Endmills for Mold & Die WINNER SERIES	CORNER RADIUS	WR502---		2F	SHORT LENGTH + REGULAR LENGTH + LONG LENGTH	METRIC	0.2~20	459	•
		WR512---		2F	LONG NECK	METRIC	0.2~20	464	•
		WR542---		2F	TAPER NECK	METRIC	0.2~4	476	•
		WDR503---		3F	DOUBLE CORNER RADIUS	METRIC	6~20	486	•
		WXR504---		4F	SHORT LENGTH+REGULAR LENGTH+LONG SHANK+VARIABLE INDEX GEOMETRY	METRIC	1~20	487	•
		WXR514---		4F	LONG NECK+VARIABLE INDEX GEOMETRY	METRIC	1~20	491	•
		WR544---		4F	TAPER NECK	METRIC	1~4	501	•
		WSPM4---		4F	HIGH FEED	METRIC	1~20	508	•
		WR504---		4F	SHORT LENGTH+REGULAR LENGTH+END TEETH VARIABLE INDEX GEOMETRY	METRIC	3~20	510	•
		WR514---		4F	LONG NECK CORNER RADIUS	METRIC	6~12	512	•
		WR506---		6F	45°CORNER RADIUS	METRIC	6~20	513	•
	SQUARE	WME502---		2F	Ø0.03~	METRIC	0.03~25	514	•
		WE502---S4		2F	Ø0.1 + SHANK 4	METRIC	1~4	516	•
		WE502---S3		2F	SHANK 3	METRIC	0.1~3	517	•
		WE502---		2F	SHORT + REGULAR + LONG LENGTH	METRIC	0.1~20	518	•
		WE522---		2F	LONG	METRIC	1~25	521	•
		WE512---		2F	LONG NECK	METRIC	0.1~12	525	•
		WME504---		4F	VARIABLE INDEX GEOMETRY	METRIC	0.8~25	532	•
		WXE504---		4F	SHORT + REGULAR + LONG LENGTH + VARIABLE INDEX GEOMETRY	METRIC	1~20	534	•
		WE524---		4F	LONG	METRIC	1~25	536	•
		WE514---		4F	LONG NECK	METRIC	1~12	540	•
		WE504---H		4F	45°HELIX + REGULAR + LONG	METRIC	1~20	544	•
		WE506---		6F	45°HELIX + REGULAR + LONG	METRIC	6~20	546	•
	ROUGHING	WF61---		3~5F	ROUGHING ENDMILL	METRIC	3~25	547	•
		WF60---		3~5F	ROUGHING ENDMILL-CORNER R	METRIC	3~25	548	•
	SQUARE TAPER	WTE502---		2F	TAPER	METRIC	0.3~10	549	•
		WTE504---		4F	TAPER	METRIC	3~10	553	•
	SQUARE TAPER RIB	WTE514---		4F	RIB	METRIC	0.8~2.5	555	•
	BALL TAPER	WTB502---		2F	TAPER BALL	METRIC	0.3~2	560	•
	CORNER RADIUS TAPER	WTR504---		4F	TAPER CORNER RADIUS	METRIC	0.8~2.5	562	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
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NEXT ≫

3 DRILL SERIES

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Type	INCH / METRIC	Standard range Min~Max	Page	Stock
1 Drills for high hardened steel POWER MAX DRILL	* High Speed & General Speed Cutting	PF503		2F	3XD	INCH & METRIC	2~20	574	•
		PF505		2F	5XD	INCH & METRIC	3~20	578	•
		SF503		2F	3XD / INTERNAL COOLANT	INCH & METRIC	3~20	582	•
		SF505		2F	5 X D / INTERNAL COOLANT	INCH & METRIC	3.1~20	586	•
		SF510		2F	10 X D / INTERNAL COOLANT, DOUBLE MARGIN	METRIC	3~11.5	590	•
		SF520		2F	20 X D / INTERNAL COOLANT, DOUBLE MARGIN	METRIC	4.1~10	592	•
		HP503		2F	HIGH PRECISION 3 X D, DOUBLE MARGIN	INCH & METRIC	3~16	593	•
		HPI 503		2F	HIGH PRECISION 3 X D INTERNAL COOLANT, DOUBLE MARGIN	INCH & METRIC	3.175~20	596	•
		HPI 505		2F	HIGH PRECISION 5 X D INTERNAL COOLANT, DOUBLE MARGIN	INCH & METRIC	3.175~20	599	•
		HPI 508		2F	HIGH PRECISION 8 X D INTERNAL COOLANT, DOUBLE MARGIN	INCH & METRIC	3.175~20	603	•
		P503A(F)		2F	STUB / DIN 6537K	METRIC	3~20	606	•
		PI503A(F)		2F	STUB INTERNAL COOLANT / DIN 6537K	METRIC	3~20	610	•
		PI505A(F)		2F	MEDIUM INTERNAL COOLANT / DIN 6537L	METRIC	4~20	614	•
2 Drills for General Speed Cutting POWER DRILL	* General Speed Cutting	TDSI		2F	TIPPED DRILL STUB LENGTH -INTERNAL COOLANT TYPE	METRIC	13.5~35	620	•
		TDLI		2F	TIPPED DRILL LONG LENGTH -INTERNAL COOLANT TYPE	METRIC	13.5~35	622	•
		PDS		2F	STUB TYPE - 3 X D	METRIC	1~24	624	•
		PDM		2F	MEDIUM TYPE - 5 X D	METRIC	3~14	626	•
		PDSI		2F	STUB TYPE - 3 x D	METRIC	3~14	628	•
		PDMI		2F	MEDIUM TYPE - 5 x D	METRIC	3.1~14	630	•
		PX503G		2F	POWER DRILL (X-treme)	METRIC	1~20	632	•
		PX505G		2F	POWER DRILL (X-treme)	METRIC	3~20	634	•
		PXI505		2F	POWER DRILL (X-treme)	METRIC	8.4~20	636	•
		CTS		2F	COUNTER BORE SOLID-BOTTOM DRILL	METRIC	3~12	638	•
3 Drills for Multi-purpose SOLID SPIRAL DRILL	* General Purpose	SSD		2F	REGULAR LENGTH	METRIC	1~13	642	•
		SSDL		2F	LONG LENGTH	METRIC	3~10	644	•
		SSTD		2F	REGULAR LENGTH	METRIC	0.5~13	645	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
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NEXT ≫

4 CENTERING TOOLS & REAMERS

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Item	Type	Page	Stock
CENTERING TOOLS	Multi-Purpose	CDS		2F	SOLID CENTER DRILL		652	•
		LDS		2F	NC SPOTTING DRILL		653	•
		LDF		2F	NC SPOTTING DRILL MULTY TYPE		654	•
		LDA		2F	NC SPOTTING DRILL		655	•
		CES302		2F	CENTERING END MILL - SOLID		656	•
		CEM		2F	CENTERING END MILL - BRAZED TYPE		657	•
		CRC		2F	CORNER ROUNDING CUTTER		658	•
		CFT		3F	CHAMFER TOOL		659	•
		BFT		4F	BACK CHAMFER TOOL		660	•
		BFD		2F	BACK CHAMFER TOOL		661	•
		CCT		2F	CHAMFER CUTTER		662	•
		CCF		2F	CHAMFER CUTTER FACE		603	•

※If the following items are not in stock, they will be ordered and produced

Series	Feature	EDP. NO	Appearance	Flutes	Item	Type	Page	Stock
REAMERS	Multi-Purpose	SSR		4&6F	STRAIGHT FLUTE REAMERS	Straight	664	•
		SHR		4&6F	HELICAL FLUTE REAMERS	7° Left Helix	665	•
		SBR		4&6F	BROACH REAMERS	60° Left Helix	666	•
		HRS		4&6F	MACHINE CHUCKING REAMER		667	•

NEXT ≫

[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
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[Applicable Working Material] ○:General Application ◎:The most suitable Application

	Carbon Steel (S45C,S55C...) ~ HB225	Alloy steel (SCM,SK...) HB225~325	Prehardened Steel (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400. 500~	Aluminium	Stainless Steel
				~HRc55 SKD61	~HRc55 SKD11					
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NEXT ≫

5 CUTTER SERIES NEW

※If the following items are not in stock, they will be ordered and produced

Series	Appearance	EDP. NO	Page
Endmill Cutter		ENCC	678
		ENCC	679
		ENCC	680
		AHU	681
Round Insert Cutter		RMCC	682
		RMCC	683
		C-RDT	684
Finishing Endmill Cutter		ASMC	685
		MPMC	685
Round Cutter		RSCC	686
Shell Cutter		SSCC	687

Series	Appearance	EDP. NO	Page
Shell Cutter		SSC	687
Ball Cutter		BMCC	688
		BMCC-MD	689
		BPUX	389
		BPUX	690
		WRMC-T	690
		WRMC-T	690
		TRMC	691
		TRMS	691
		TRMC	692
		TRMS	692

NEXT ≫

※If the following items are not in stock, they will be ordered and produced

Series	Appearance	EDP. NO	Page
Ball Cutter		BWSF	693
		BWSC	693
		SRM	694
		BHSF	694
		GBEC	695
Helical Cutter		HESC	696
		HMCC-BT	697
		HNCC	697
		HMCC-MD	698
		FPCC	698
Shell Mill Cutter		SMCC	699

Series	Appearance	EDP. NO	Page
Shell Mill Cutter		SECC	399
Ball Cutter Finishing		BFCC	700
		C-BFCC	700
		ABPF	701
		C-ABPF	701
		SRFH	702
		C-SRFH	702
		C-RMMC	703
Multi Mill Cutter		AJUL	704
		AJSL	704

NEXT ≫

5 CUTTER SERIES NEW

※If the following items are not in stock, they will be ordered and produced

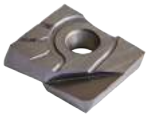
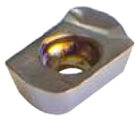
Series	Appearance	EDP. NO	Page
Finishing EndMill Cutter		AQXR	705
		TEBL	706
		SECL	707
		AHJL	707
		ASRL-Pico	708
		ASRL-Pico	709
		BSR	709
		BSR	710
		AJXC	710
		AJXC	711
		SKSC	712

Series	Appearance	EDP. NO	Page
Finishing EndMill Cutter		IHCC	713
Ball Cutter		M-ABPF	714
		M-SRFH	714
		M-BFCC	714
		M-SRM	715
		M-BHSF	715
		M-GBEC	715
Finishing EndMill Cutter		M-AJXC	716
		M-SKSC	716
		M-ASRL	717
		M-ASRL-Pico	717

NEXT ≫

※If the following items are not in stock, they will be ordered and produced

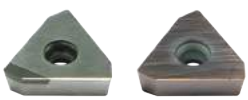
Series	Appearance	EDP. NO	Page
Finishing EndMill Cutter		M-RMCC	718
		M-AQXR	718
		M-SECL	719
Chamfer Mill Cutter		CHCL	720
		CSCC	720
Blades		SD Blade	721
		CTHT	721
Milling Insert		Finishing Ball Insert	722
		Finishing Ball Insert	722
		Finishing Corner Radius Insert	723
		Round Insert	724

Series	Appearance	EDP. NO	Page
Milling Insert		Ball Insert (Indexable Milling)	724
		Corner Radius Insert (Indexable Milling)	725
		Ball Cutter Insert	726
		Helical Cutter Insert	726
		Helical Cutter Insert	726
		Finishing Mill Insert	727
		Finishing Mill Insert	727
		Indexable Milling Insert	728
		Indexable Milling Insert	728
		Indexable Milling Insert	728
		Indexable Milling Insert	729

NEXT ≫

5 CUTTER SERIES NEW

※If the following items are not in stock, they will be ordered and produced

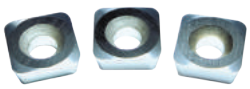
Series	Appearance	EDP. NO	Page
Milling Insert		Indexable Insert	729
		APKT17 (MT, EM, SU) Insert	730
		APKT17 (AL)Insert	730
		APKT09 (MT, SU) Insert	731
		APKT09 (EM)Insert	731
		APKT09 (AL)Insert	731
		Chamfering Mill Insert	732
		Rounding Insert	732
		Finishing Mill Isert (QOMT)	732
		CBN Isert	733
		Round Mill Insert	733

Series	Appearance	EDP. NO	Page
Face Cutter		Face Cutter -75°	734
		Face Cutter -90°	735
		Medium Cutting Cutter	736
		IMCC	736
		CMCC	736
Cylinder Side Cutter		Side Millng Cutter	737
		Circular Face Cutter	737
Key-Home Cutter		Key-Home Cutter	738
		Key-Home Cutter, Outside Cutter	738
		Corner R Holder	738
Relief-Cutter		Relief-Cutter	739

NEXT ≫

※If the following items are not in stock, they will be ordered and produced

Series	Appearance	EDP. NO	Page
Relief-Cutter		U-Home Cutter	739
Post U-Drill		Post U-Drill	740
		T-Cutter	740
Ball Gauge		Ball Gauge	741
		Outside Setting Bar	741
Post Medium Cutting Cutter		Medium Cutter Arbor, SSCC CutterArbor	742
		Medium Boring Cutter	742
Tapping Chuck		Radial Tapping Chuck	743
		Counter Bore	744
		Helix Reamer	744
Post Medium Cutting Cutter Arbor		FPCC-ST Arbor	745
		Extention Arbor	745

Series	Appearance	EDP. NO	Page
Finishing Cutter		Slotting Cutter	746
Arbor		Arbor	746
Multi Mill Cutter		M.S Cutter	747
		M.S Cutter Part	747
		M.S Cutter Insert	747
HMCC-MD Arbor		BT50-WMA	748
Arbor		FPM	749
		FMC	750
Shrink Fit Chuck		Shrink Fit Chuck	753
		Shrink Fit Chuck	753
Block		Setting Block	754
		Setting Block	755

NEXT ≫

6 TUNGSTEN CARBIDE RODS&BLANK

※If the following items are not in stock, they will be ordered and produced

Grades	Series	Feature	Page
WF08	Reaming	Suitable for Grey Cast Iron, Chilled Cast Iron, Hardened Steel, Aluminum Alloy, Plastic	759
WF10	Drilling/Milling	Suitable for Titanium Alloys, Inconel, Heat resisting Steel, Stainless Steel, Grey Cast Iron	759
WF12	Drilling/Milling/Machine tapping	Suitable for Titanium Alloys, Inconel, Stainless Steel, Hardening Steel, Grey Cast Iron, Composite Material, Drill	759
WK10	Drilling/Milling	Suitable for material Hrc45 or more, Stainless Steel, Titanium-Nickel Alloy, Low speed cutting machine, Continuous cutting and Intermitten Cutting	759
WN09	Drilling/Milling/Planing	Suitable for high speed cutting and dry machining to high wear resistance material like Graphite and composite material like CFRP and Industrial Fiber	759
WU08	Drilling/Milling/Planing	Suitable for High Hardened Steel for high speed cutting and dry cutting and high wear resistance for composite material like Aluminum Alloy	759

NEXT ≫

7 TOOL HOLDER SERIES NEW

※If the following items are not in stock, they will be ordered and produced

Series	Appearance	Page
HYDRAULIC CHUCK		774
REDUCTION SLEEVE		786
SHRINK FIT CHUCK		788
MILLING CHUCK		801
DOUBLE BEARING MILLING CHUCK		807
MILLING CHUCK COLLET		811
QUICK CHANGE ARBOR		813
ER COLLET CHUCK		818

Series	Appearance	Page
ER COLLET & ACCESSORIES		826
JSK COLLET CHUCK		830
JSK COLLET & ACCESSORIES		834
DRILL CHUCK		836
JACOBS TAPER ARBOR		838
MORES TAPER ADAPTOR		839
END MILL HOLDER		842
SIDE CUTTER ARBOR		846

NEXT ≫

7 TOOL HOLDER SERIES NEW

※If the following items are not in stock, they will be ordered and produced

Series	Appearance	Page
FACE MILL ARBOR		847
SHELL MILL ARBOR		853
TAPPING CHUCK		856
TAP COLLET		858
OIL HOLE HOLDER		860
MICRO BORING BAR		863
BORING HEAD		871
BASIC HOLDER		880

Series	Appearance	Page
DRILL TAPER CHUCK		884
TOOL SETTING STAND		888
BASE MASTER BOLT		890
PULL STUD BOLT		891
NEW ANGLE HEAD		892
NEW ROTATING TOOL HOLDER		894

NEXT ≫

LIVE CENTER SERIES NEW

※If the following items are not in stock, they will be ordered and produced

Type	Appearance	Page
NC TYPE		898
NCB TYPE		898
NCC TYPE		898
NCBC TYPE		899
NCN TYPE		899
NCBN TYPE		899
NCCN TYPE		900
NCBCN TYPE		900
NCP TYPE		901
NCPB TYPE		901
NCPC TYPE		901
NCPBC TYPE		902
NCPN TYPE		902
NCPBN TYPE		902
NCPCN TYPE		903
NCPBCN TYPE		903
NK TYPE		904
NKB TYPE		904
NKC TYPE		904
NKBC TYPE		905
NKN TYPE		905
NKBN TYPE		905
NKCN TYPE		906
NKBCN TYPE		906
NKD TYPE		907
GR TYPE		907
SM TYPE		908
SMB TYPE		908
SMC TYPE		908
SMBC TYPE		909
SMN TYPE		909
SMBN TYPE		909
SMCN TYPE		910
SMBCN TYPE		910

Type	Appearance	Page
SMP TYPE		911
SMPB TYPE		911
SMPC TYPE		911
SMPBC TYPE		912
SMPN TYPE		912
SMPBN TYPE		912
SMPCN TYPE		913
SMPBCN TYPE		913
D50 TYPE		914
D50B TYPE		914
D50C TYPE		914
D50BC TYPE		915
HD TYPE		916
HDC TYPE		916
HDS TYPE		916
HDSC TYPE		917
HDSTH TYPE		917
PT-60 TYPE		918
PT-80 TYPE		918
LM-A TYPE		919
LM-C TYPE		919
LM-AN TYPE		920
LM-CN TYPE		920
LM-H TYPE		921
LM-HC TYPE		921
LM-HN TYPE		922
LM-HCN TYPE		922
LM-FN TYPE		923
LM-#80 TYPE		923

NEXT ≫

1

TAP SERIES ›

1

Carbide Tap(JIS) Series 60

Carbide Tap(DIN) Series 68

HSSE Tap(JIS) Series 74

HSSE Tap(DIN) Series 92

Pipe Tap Series 107

Tap Series

WIDIN

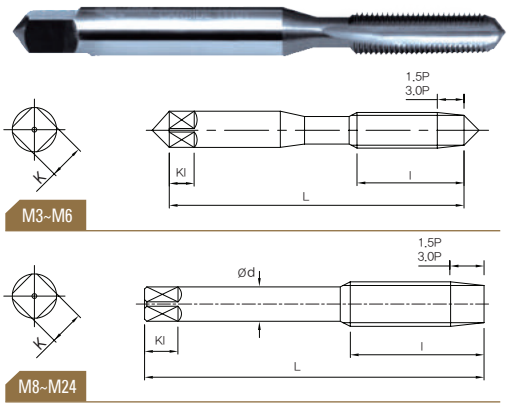
Series		EDP. NO	Appearance	Type	Stock	Page
CARBIDE TAP SERIES	JIS	WSOM ...series		STRAIGHT TAPS(uncoated)	•	60
		WSCM ...series		STRAIGHT TAPS(TiCN)	•	61
		WPOM ...series		SPIRAL TAPS(uncoated)	•	62
		WPCM ...series		SPIRAL TAPS(TiCN)	•	63
		WROM ...series		ROLL TAPS(uncoated)	•	64
		WRCM ...series		ROLL TAPS(TiCN)	•	65
		WFOM ...series		SPIRAL ROLL TAPS(uncoated)	•	66
		WFCM ...series		SPIRAL ROLL TAPS(TiCN)	•	67
	DIN	WGOM ...series		STRAIGHT TAPS(uncoated)	•	68
		WGCM ...series		STRAIGHT TAPS(TiCN)	•	69
		WQOM ...series		SPIRAL TAPS(uncoated)	•	70
		WQCM ...series		SPIRAL TAPS(TiCN)	•	71
		WMOM ...series		ROLL TAPS(uncoated)	•	72
		WMCM ...series		ROLL TAPS(TiCN)	•	73
HSSE TAP SERIES	JIS	VSOM ...series		STRAIGHT TAPS(uncoated)	•	74
		VSTM ...series		STRAIGHT TAPS(TiN)	•	75
		VSCM ...series		STRAIGHT TAPS(TiCN)	•	76
		VSHM ...series		STRAIGHT TAPS(HOMO)	•	77
		VNOM ...series		POINT TAPS(uncoated)	•	78
		VNTM ...series		POINT TAPS(TiN)	•	79
		VNCM ...series		POINT TAPS(TiCN)	•	80
		VNHM ...series		POINT TAPS(HOMO)	•	81
		VPOM ...series		SPIRAL TAPS(uncoated)	•	82
		VPTM ...series		SPIRAL TAPS(TiN)	•	83
		VPCM ...series		SPIRAL TAPS(TiCN)	•	84
		VPHM ...series		SPIRAL TAPS(HOMO)	•	85
		VROM ...series		ROLL TAPS(uncoated)	•	86
		VRTM ...series		ROLL TAPS(TiN)	•	87
		VRCM ...series		ROLL TAPS(TiCN)	•	88
		VFOM ...series		SPIRAL ROLL TAPS(uncoated)	•	89
		VFTM ...series		SPIRAL ROLL TAPS(TiN)	•	90
		VFCM ...series		SPIRAL ROLL TAPS(TiCN)	•	91

Tap Series

WIDIN

Series		EDP. NO	Appearance	Type	Stock	Page
HSSE TAP SERIES	DIN	VGOM ...series		STRAIGHT TAPS(uncoated)	•	92
		VGTM ...series		STRAIGHT TAPS(TiN)	•	93
		VGCM ...series		STRAIGHT TAPS(TiCN)	•	94
		VGHM ...series		STRAIGHT TAPS(HOMO)	•	95
		VQOM ...series		SPIRAL TAPS(uncoated)	•	96
		VQTM ...series		SPIRAL TAPS(TiN)	•	97
		VQCM ...series		SPIRAL TAPS(TiCN)	•	98
		VQHM ...series		SPIRAL TAPS(HOMO)	•	99
		VDOM ...series		POINT TAPS(uncoated)	•	100
		VDTM ...series		POINT TAPS(TiN)	•	101
		VDCM ...series		POINT TAPS(TiCN)	•	102
		VDHM ...series		POINT TAPS(HOMO)	•	103
		VMOM ...series		ROLL TAPS(uncoated)	•	104
		VMTM ...series		ROLL TAPS(TiN)	•	105
		VMCM ...series		ROLL TAPS(TiCN)	•	106
PIPE TAP SERIES		VSOPT ...series		STRAIGHT TAPS(uncoated)	•	107
		VPOPT ...series		SPIRAL TAPS(uncoated)	•	108
		VSONPT ...series		STRAIGHT TAPS(uncoated)	•	109
		VPONPT ...series		SPIRAL TAPS(uncoated)	•	110
		VSOPS ...series		STRAIGHT TAPS(uncoated)	•	111
		VPOPS ...series		SPIRAL TAPS(uncoated)	•	112
		VSOPF ...series		STRAIGHT TAPS(uncoated)	•	113
		VPOPF ...series		SPIRAL TAPS(uncoated)	•	114

CARBIDE TAP(JIS TYPE)



STRAIGHT TAPS

- Designed for high mass producution for general workpieces such as Cast Iron, C.Br, Plastics and so on

WSOM...series

CARBIDE | 3~4 | UNCOATED | 0° HELIX

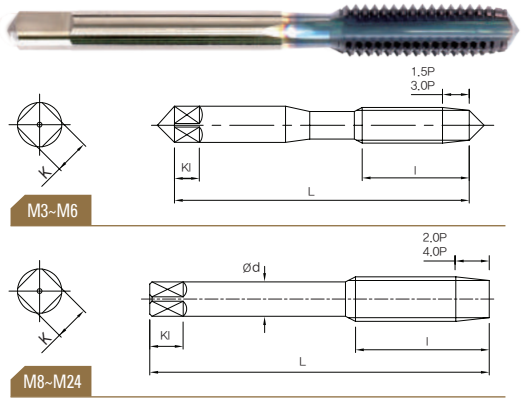
EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes
1.5P	3P								
WSOM0305015	WSOM0305030	M3 X 0.5	WH3	46	11	4	3.2	6	3
WSOM0407015	WSOM0407030	M4 X 0.7	WH3	52	13	5	4	7	3
WSOM0508015	WSOM0508030	M5 X 0.8	WH3	60	16	5.5	4.5	7	3
WSOM0610015	WSOM0610030	M6 X 1.0	WH3	62	19	6	4.5	7	3
WSOM0810015	WSOM0810030	M8 X 1.0	WH3	70	22	6.2	5	8	4
WSOM0812515	WSOM0812530	M8 X 1.25	WH4	70	22	6.2	5	8	4
WSOM1010015	WSOM1010030	M10 X 1.0	WH3	75	24	7	5.5	8	4
WSOM1012515	WSOM1012530	M10 X 1.25	WH4	75	24	7	5.5	8	4
WSOM1015015	WSOM1015030	M10 X 1.5	WH4	75	24	7	5.5	8	4
WSOM1210015	WSOM1210030	M12 X 1.0	WH3	82	29	8.5	6.5	9	4
WSOM1212515	WSOM1212530	M12 X 1.25	WH4	82	29	8.5	6.5	9	4
WSOM1215015	WSOM1215030	M12 X 1.5	WH4	82	29	8.5	6.5	9	4
WSOM1217515	WSOM1217530	M12 X 1.75	WH5	82	29	8.5	6.5	9	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
										◎	○		○	○	◎		○	○	○			◎	

CARBIDE TAP(JIS TYPE)



STRAIGHT TAPS

- Designed for high mass production for general workpieces such as Cast Iron, C.Br, Plastics , and so on
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

WSCM...series

CARBIDE 3~4 TiCN 0° HELIX

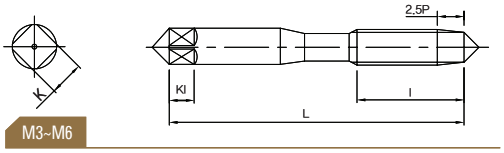
EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes
1.5P	3P								
WSCM0305015	WSCM0305030	M3 X 0.5	WH3	46	11	4	3.2	6	3
WSCM0407015	WSCM0407030	M4 X 0.7	WH3	52	13	5	4	7	3
WSCM0508015	WSCM0508030	M5 X 0.8	WH3	60	16	5.5	4.5	7	3
WSCM0610015	WSCM0610030	M6 X 1.0	WH3	62	19	6	4.5	7	3
WSCM0810015	WSCM0810030	M8 X 1.0	WH3	70	22	6.2	5	8	4
WSCM0812515	WSCM0812530	M8 X 1.25	WH4	70	22	6.2	5	8	4
WSCM1010015	WSCM1010030	M10 X 1.0	WH3	75	24	7	5.5	8	4
WSCM1012515	WSCM1012530	M10 X 1.25	WH4	75	24	7	5.5	8	4
WSCM1015015	WSCM1015030	M10 X 1.5	WH4	75	24	7	5.5	8	4
WSCM1210015	WSCM1210030	M12 X 1.0	WH3	82	29	8.5	6.5	9	4
WSCM1212515	WSCM1212530	M12 X 1.25	WH4	82	29	8.5	6.5	9	4
WSCM1215015	WSCM1215030	M12 X 1.5	WH4	82	29	8.5	6.5	9	4
WSCM1217515	WSCM1217530	M12 X 1.75	WH5	82	29	8.5	6.5	9	4

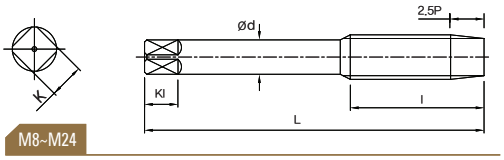
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
										◎	○		○	○	◎		○	○	○			◎	

CARBIDE TAP(JIS TYPE)





SPIRAL TAPS

- Designed for high mass production for general workpieces such as Cast Iron, C.Br, Plastics and so on
- Suitable for tapping of through and blind holes

WPOM...series

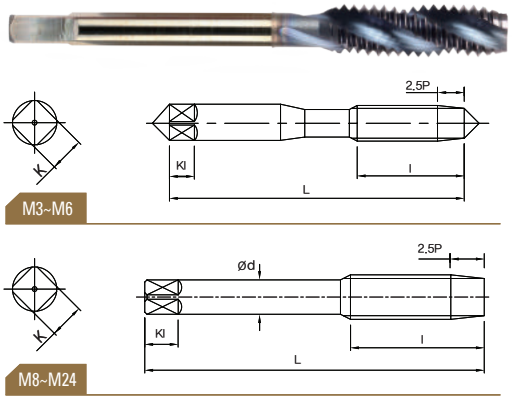
EDP. No. 2.5P	Thread Size	Limits	L	l	d	K	Kl
WPOM0305025	M3 X 0.5	WH3	46	11	4	3.2	6
WPOM0407025	M4 X 0.7	WH3	52	13	5	4	7
WPOM0508025	M5 X 0.8	WH3	60	16	5.5	4.5	7
WPOM0610025	M6 X 1.0	WH3	62	19	6	4.5	7
WPOM0810025	M8 X 1.0	WH3	70	22	6.2	5	8
WPOM0812525	M8 X 1.25	WH4	70	22	6.2	5	8
WPOM1010025	M10 X 1.0	WH3	75	24	7	5.5	8
WPOM1012525	M10 X 1.25	WH4	75	24	7	5.5	8
WPOM1015025	M10 X 1.5	WH4	75	24	7	5.5	8
WPOM1210025	M12 X 1.0	WH3	82	29	8.5	6.5	9
WPOM1212525	M12 X 1.25	WH4	82	29	8.5	6.5	9
WPOM1215025	M12 X 1.5	WH4	82	29	8.5	6.5	9
WPOM1217525	M12 X 1.75	WH5	82	29	8.5	6.5	9

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
										○	◎	◎	◎	◎	○	○	○	○	○				◎

CARBIDE TAP(JIS TYPE)



SPIRAL TAPS

- Designed for high mass producution for general work pieces such as Cast Iron, C.Br, Plastics and so on
- Suitable for tapping of through and blind holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

CARBIDE 3 TiCN 15° HELIX

WPCM...series

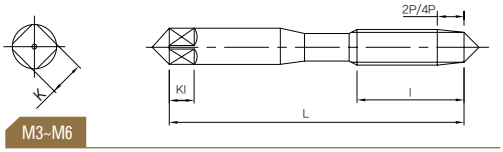
EDP. No. 2.5P	Thread Size	Limits	L	l	d	K	Kl
WPCM0305025	M3 X 0.5	WH3	46	11	4	3.2	6
WPCM0407025	M4 X 0.7	WH3	52	13	5	4	7
WPCM0508025	M5 X 0.8	WH3	60	16	5.5	4.5	7
WPCM0610025	M6 X 1.0	WH3	62	19	6	4.5	7
WPCM0810025	M8 X 1.0	WH3	70	22	6.2	5	8
WPCM0812525	M8 X 1.25	WH4	70	22	6.2	5	8
WPCM1010025	M10 X 1.0	WH3	75	24	7	5.5	8
WPCM1012525	M10 X 1.25	WH4	75	24	7	5.5	8
WPCM1015025	M10 X 1.5	WH4	75	24	7	5.5	8
WPCM1210025	M12 X 1.0	WH3	82	29	8.5	6.5	9
WPCM1212525	M12 X 1.25	WH4	82	29	8.5	6.5	9
WPCM1215025	M12 X 1.5	WH4	82	29	8.5	6.5	9
WPCM1217525	M12 X 1.75	WH5	82	29	8.5	6.5	9

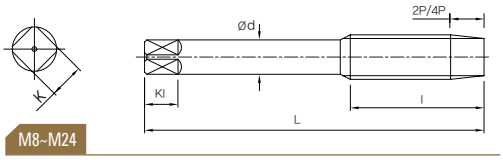
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
										○	◎	◎	◎	◎	○	○	◎	◎	◎			○	◎

CARBIDE TAP(JIS TYPE)





ROLL TAPS

- Designed for high performance of threading Nonferrous metals
- Suitable for tapping of through and blind holes

CARBIDE UNCOATED

WROM...series

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Oil Groove
2P	4P								
WROM0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	1
WROM0305020M	WROM0305040M								4
WROM0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	1
WROM0407020M	WROM0407040M								4
WROM0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	1
WROM0508020M	WROM0508040M								4
WROM0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	1
WROM0610020M	WROM0610040M								4
WROM0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	1
WROM0812520M	WROM0812540M								4
WROM1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	1
WROM1012520M	WROM1012540M								4
WROM1015020S	-	M10 X 1.50	GH7	75	24	7	5.5	8	1
WROM1015020M	WROM1015040M								4
WROM1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	1
WROM1210020M	WROM1210040M								4
WROM1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	1
WROM1212520M	WROM1212540M								4
WROM1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	1
WROM1215020M	WROM1215040M								4
WROM1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	1
WROM1217520M	WROM1217540M								4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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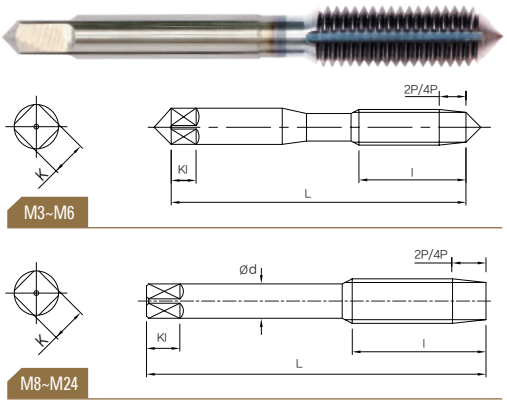
CARBIDE TAP(JIS TYPE)



ROLL TAPS

- It is applicable regardless of steel or Nonferrous alloys
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

CARBIDE TiCN

WRCM...series

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Oil Groove
2P	4P								
WRCM0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	1
WRCM0305020M	WRCM0305040M								4
WRCM0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	1
WRCM0407020M	WRCM0407040M								4
WRCM0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	1
WRCM0508020M	WRCM0508040M								4
WRCM0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	1
WRCM0610020M	WRCM0610040M								4
WRCM0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	1
WRCM0812520M	WRCM0812540M								4
WRCM1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	1
WRCM1012520M	WRCM1025040M								4
WRCM1015020S	-	M10 X 1.50	GH7	75	24	7	5.5	8	1
WRCM1015020M	WRCM1015040M								4
WRCM1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	1
WRCM1210020M	WRCM1210040M								4
WRCM1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	1
WRCM1212520M	WRCM1212540M								4
WRCM1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	1
WRCM1215020M	WRCM1215040M								4
WRCM1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	1
WRCM1217520M	WRCM1217540M								4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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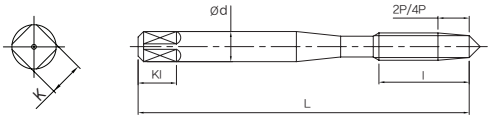
CARBIDE TAP(JIS TYPE)



M3~M6

SPIRAL ROLL TAPS

- Designed for high performance of threading Nonferrous alloys, Aluminum, Magnesium, Zinc and Copper

WFOM...series

CARBIDE UNCOATED

EDP. No.		Thread Size	Limits	L	l	d	K	Kl
2P	4P							
WFOM0305020	WFOM0305040	M3 X 0.5	GH6	46	18	4	3.2	6
WFOM03506020	WFOM03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
WFOM0407020	WFOM0407040	M4 X 0.7	GH7	52	20	5	4	7
WFOM0508020	WFOM0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
WFOM0610020	WFOM0610040	M6 X 1.0	GH7	62	24	6	4.5	7

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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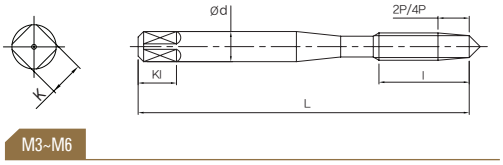
CARBIDE TAP(JIS TYPE)



M3~M6

SPIRAL ROLL TAPS

- Designed for high performance of threading Steel, Nonferrous alloys and Stainless steel
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

WFCM...series

CARBIDE TiCN

EDP. No.		Thread Size	Limits	L	l	d	K	Kl
2P	4P							
WFCM0305020	WFCM0305040	M3 X 0.5	GH6	46	18	4	3.2	6
WFCM03506020	WFCM03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
WFCM0407020	WFCM0407040	M4 X 0.7	GH7	52	20	5	4	7
WFCM0508020	WFCM0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
WFCM0610020	WFCM0610040	M6 X 1.0	GH7	62	24	6	4.5	7

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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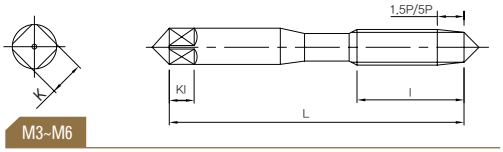
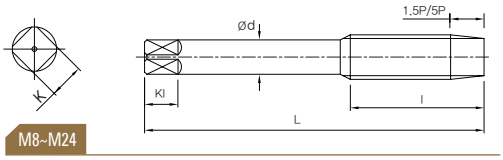
CARBIDE TAP(DIN TYPE)





STRAIGHT TAPS

- Designed for high mass producution for general workpieces such as Cast Iron, C.Br, Plastics and so on

WGOM...series

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
1.5P	5P									
WGOM0305015	WGOM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
WGOM0407015	WGOM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
WGOM0508015	WGOM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
WGOM0610015	WGOM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
WGOM0810015	WGOM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	4	374
WGOM0812515	WGOM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	4	371
WGOM1010015	WGOM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	4	374
WGOM1012515	WGOM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	4	374
WGOM1015015	WGOM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	4	371
WGOM1210015	WGOM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	4	374
WGOM1212515	WGOM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	4	374
WGOM1215015	WGOM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	4	374
WGOM1217515	WGOM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	4	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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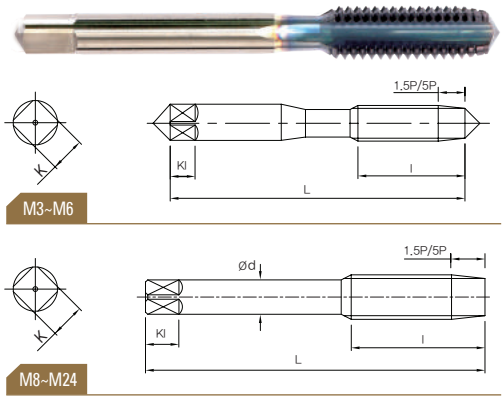
CARBIDE TAP(DIN TYPE)



STRAIGHT TAPS

- Designed for high mass production for general workpieces such as Cast Iron, C.Br, Plastics , and so on
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

DIN 371·374 376 | CARBIDE | 3~4 | TiCN | 0° HELIX

WGCM...series

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
1.5P	5P									
WGCM0305015	WGCM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
WGCM0407015	WGCM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
WGCM0508015	WGCM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
WGCM0610015	WGCM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
WGCM0810015	WGCM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	4	374
WGCM0812515	WGCM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	4	371
WGCM1010015	WGCM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	4	374
WGCM1012515	WGCM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	4	374
WGCM1015015	WGCM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	4	371
WGCM1210015	WGCM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	4	374
WGCM1212515	WGCM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	4	374
WGCM1215015	WGCM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	4	374
WGCM1217515	WGCM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	4	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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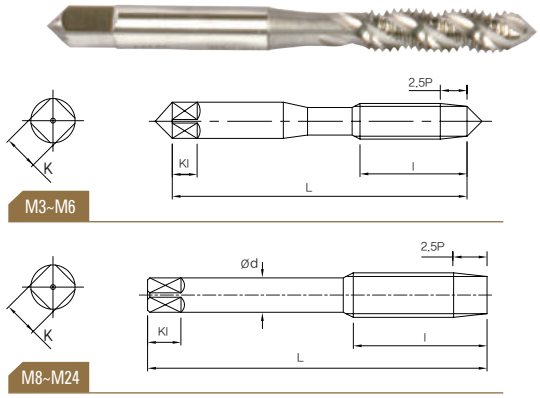
CARBIDE TAP(DIN TYPE)



SPIRAL TAPS

- Designed for high mass production for general workpieces such as Cast Iron, C.Br, Plastics and so on
- Suitable for tapping of through and blind holes

DIN 371·374 376 | CARBIDE | 3 | UNCOATED | 15° HELIX

WQOM...series

EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
WQOM0305025	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
WQOM0407025	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
WQOM0508025	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
WQOM0610025	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
WQOM0810025	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
WQOM0812525	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
WQOM1010025	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
WQOM1012525	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
WQOM1015025	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
WQOM1210025	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
WQOM1212525	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
WQOM1215025	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
WQOM1217525	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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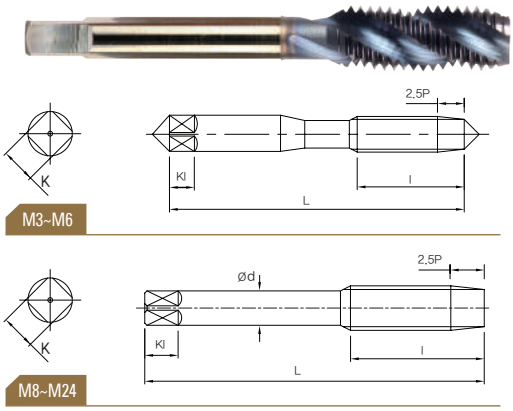
CARBIDE TAP(DIN TYPE)



SPIRAL TAPS

- Designed for high mass producution for general work pieces such as Cast Iron, C.Br, Plastics and so on
- Suitable for tapping of through and blind holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

DIN 371·374 376 | CARBIDE | 3 | TiCN | 15° HELIX

WQCM...series

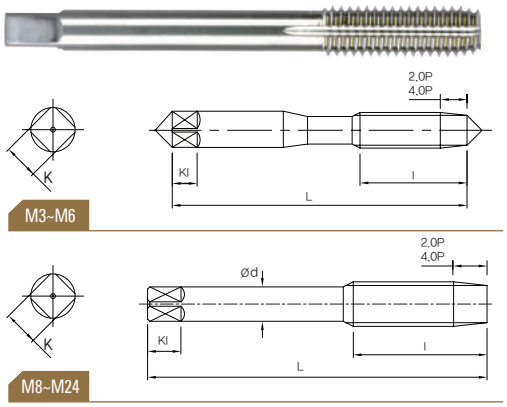
EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
WQCM0305025	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
WQCM0407025	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
WQCM0508025	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
WQCM0610025	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
WQCM0810025	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
WQCM0812525	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
WQCM1010025	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
WQCM1012525	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
WQCM1015025	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
WQCM1210025	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
WQCM1212525	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
WQCM1215025	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
WQCM1217525	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○	○	○				○	○	○		○	○	○	○	○	○	○	○	○	○			○

CARBIDE TAP(DIN TYPE)



ROLL TAPS

- Suitable for tapping of through and blind holes

WMOM...series

CARBIDE UNCOATED

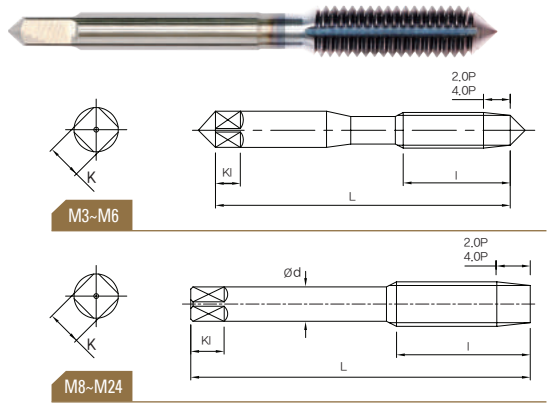
EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Oil Groove
2P	4P								
WMOM0305020S	-	M3x0.5	6HX	56	11.0	3.5	2.7	6	1
WMOM0305020M	WMOM0305040M	M3x0.5	6HX	56	11.0	3.5	2.7	6	4
WMOM0407020S	-	M4x0.7	6HX	63	13.0	4.5	3.4	6	1
WMOM0407020M	WMOM0407040M	M4x0.7	6HX	63	13.0	4.5	3.4	6	4
WMOM0508020S	-	M5x0.8	6HX	70	15.0	6.0	4.9	8	1
WMOM0508020M	WMOM0508040M	M5x0.8	6HX	70	15.0	6.0	4.9	8	4
WMOM0610020S	-	M6x1.0	6HX	80	17.0	6.0	4.9	8	1
WMOM0610020M	WMOM0610040M	M6x1.0	6HX	80	17.0	6.0	4.9	8	4
WMOM0810020S	-	M8x1.0	6HX	90	17.0	6.0	4.9	8	1
WMOM0810020M	WMOM0810040M	M8x1.0	6HX	90	17.0	6.0	4.9	8	4
WMOM0812520S	-	M8x1.25	6HX	90	20.0	8.0	6.2	9	1
WMOM0812520M	WMOM0812540M	M8x1.25	6HX	90	20.0	8.0	6.2	9	4
WMOM1010020S	-	M10x1.0	6HX	90	18.0	7.0	5.5	8	1
WMOM1010020M	WMOM1010040M	M10x1.0	6HX	90	18.0	7.0	5.5	8	4
WMOM1012520S	-	M10x1.25	6HX	100	22.0	7.0	5.5	8	1
WMOM1012520M	WMOM1012540M	M10x1.25	6HX	100	22.0	7.0	5.5	8	4
WMOM1015020S	-	M10x1.5	6HX	100	22.0	10.0	8.0	11	1
WMOM1015020M	WMOM1015040M	M10x1.5	6HX	100	22.0	10.0	8.0	11	4
WMOM1210020S	-	M12x1.0	6HX	100	18.0	9.0	7.0	10	1
WMOM1210020M	WMOM1210040M	M12x1.0	6HX	100	18.0	9.0	7.0	10	4
WMOM1212520S	-	M12x1.25	6HX	100	22.0	9.0	7.0	10	1
WMOM1212520M	WMOM1212540M	M12x1.25	6HX	100	22.0	9.0	7.0	10	4
WMOM1215020S	-	M12x1.5	6HX	100	22.0	9.0	7.0	10	1
WMOM1215020M	WMOM1215040M	M12x1.5	6HX	100	22.0	9.0	7.0	10	4
WMOM1217520S	-	M12x1.75	6HX	110	24.0	9.0	7.0	10	1
WMOM1217520M	WMOM1217540M	M12x1.75	6HX	100	24.0	9.0	7.0	10	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
												◎	◎	◎		◎	◎		◎				

CARBIDE TAP(DIN TYPE)



ROLL TAPS

- Designed for high mass producution for general work pieces such as Cast Iron, C.Br, Plastics and so on
- Suitable for tapping of through and blind holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

WMCM...series

CARBIDE TiCN

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Oil Groove
2P	4P								
WMCM0305020S	-	M3x0.5	6HX	56	11	3.5	2.7	6	1
WMCM0305020M	VMCM0305040M	M3x0.5	6HX	56	11	3.5	2.7	6	4
WMCM0407020S	-	M4x0.7	6HX	63	13	4.5	3.4	6	1
WMCM0407020M	VMCM0407040M	M4x0.7	6HX	63	13	4.5	3.4	6	4
WMCM0508020S	-	M5x0.8	6HX	70	15	6.0	4.9	8	1
WMCM0508020M	VMCM0508040M	M5x0.8	6HX	70	15	6.0	4.9	8	4
WMCM0610020S	-	M6x1.0	6HX	80	17	6.0	4.9	8	1
WMCM0610020M	VMCM0610040M	M6x1.0	6HX	80	17	6.0	4.9	8	4
WMCM0810020S	-	M8x1.0	6HX	90	17	8.0	6.2	9	1
WMCM0810020M	VMCM0810040M	M8x1.0	6HX	90	17	8.0	6.2	9	4
WMCM0812520S	-	M8x1.25	6HX	90	20	8.0	6.2	9	1
WMCM0812520M	VMCM0812540M	M8x1.25	6HX	90	20	8.0	6.2	9	4
WMCM1010020S	-	M10x1.0	6HX	90	18	10.0	8.0	11	1
WMCM1010020M	VMCM1010040M	M10x1.0	6HX	90	18	10.0	8.0	11	4
WMCM1012520S	-	M10x1.25	6HX	100	22	10.0	8.0	11	1
WMCM1012520M	VMCM1012540M	M10x1.25	6HX	100	22	10.0	8.0	11	4
WMCM1015020S	-	M10x1.5	6HX	100	22	10.0	8.0	11	1
WMCM1015020M	VMCM1015040M	M10x1.5	6HX	100	22	10.0	8.0	11	4
WMCM1210020S	-	M12x1.0	6HX	100	18	9.0	7.0	10	1
WMCM1210020M	VMCM1210040M	M12x1.0	6HX	100	18	9.0	7.0	10	4
WMCM1212520S	-	M12x1.25	6HX	100	22	9.0	7.0	10	1
WMCM1212520M	VMCM1212540M	M12x1.25	6HX	100	22	9.0	7.0	10	4
WMCM1215020S	-	M12x1.5	6HX	100	22	9.0	7.0	10	1
WMCM1215020M	VMCM1215040M	M12x1.5	6HX	100	22	9.0	7.0	10	4
WMCM1217520S	-	M12x1.75	6HX	110	24	9.0	7.0	10	1
WMCM1217520M	VMCM1217540M	M12x1.75	6HX	110	24	9.0	7.0	10	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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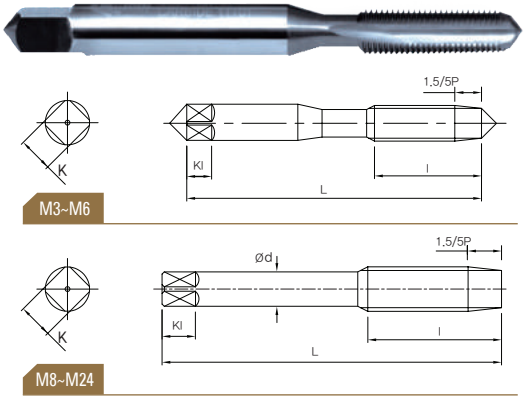
HSSE TAP(JIS TYPE)



STRAIGHT TAPS

- Designed for high performance of threading Cast Iron, Medium Carbon steel, Nonferrous metals and so on

VSOM...series

HSSE | 3~4 | UNCOATED | 0° HELIX

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes
1.5P	5P								
VSOM0305015	VSOM0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VSOM0407015	VSOM0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VSOM04507515	VSOM04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VSOM0508015	VSOM0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VSOM0610015	VSOM0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VSOM0810015	VSOM0810050	M8 X 1.0	WH2	70	22	6.2	5	8	4
VSOM0812515	VSOM0812550	M8 X 1.25	WH2	70	22	6.2	5	8	4
VSOM1012515	VSOM1012550	M10 X 1.25	WH2	75	24	7	5.5	8	4
VSOM1015015	VSOM1015050	M10 X 1.5	WH3	75	24	7	5.5	8	4
VSOM1210015	VSOM1210050	M12 X 1.0	WH2	82	29	8.5	6.5	9	4
VSOM1212515	VSOM1212550	M12 X 1.25	WH2	82	29	8.5	6.5	9	4
VSOM1215015	VSOM1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	4
VSOM1217515	VSOM1217550	M12 X 1.75	WH3	82	29	8.5	6.5	9	4
VSOM1415015	VSOM1415050	M14 X 1.5	WH3	88	30	10.5	8	11	4
VSOM1420015	VSOM1420050	M14 X 2.0	WH3	88	30	10.5	8	11	4
VSOM1615015	VSOM1615050	M16 X 1.5	WH3	95	32	12.5	10	13	4
VSOM1620015	VSOM1620050	M16 X 2.0	WH3	95	32	12.5	10	13	4
VSOM1815015	VSOM1815050	M18 X 1.5	WH3	100	37	14	11	14	4
VSOM1825015	VSOM1825050	M18 X 2.5	WH3	100	37	14	11	14	4
VSOM2015015	VSOM2015050	M20 X 1.5	WH3	105	37	15	12	15	4
VSOM2025015	VSOM2025050	M20 X 2.5	WH3	105	37	15	12	15	4
VSOM2215015	VSOM2215050	M22 X 1.5	WH3	115	38	17	13	16	4
VSOM2225015	VSOM2225050	M22 X 2.5	WH3	115	38	17	13	16	4
VSOM2415015	VSOM2415050	M24 X 1.5	WH3	120	45	19	15	18	4
VSOM2420015	VSOM2420050	M24 X 2.0	WH3	120	45	19	15	18	4
VSOM2430015	VSOM2430050	M24 X 3.0	WH3	120	45	19	15	18	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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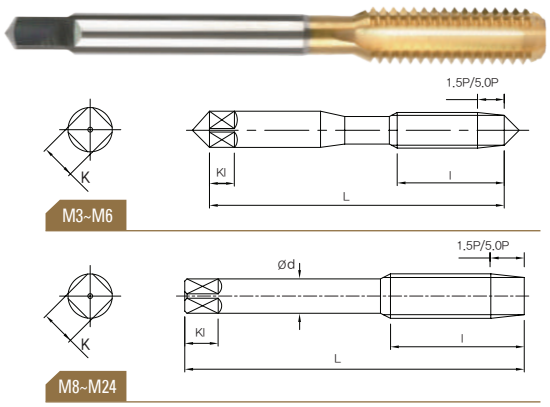
HSSE TAP(JIS TYPE)



STRAIGHT TAPS

- Designed for high mass producution for general work pieces such as Cast Iron, C.Br, Plastics and so on
- Suitable for tapping of through and blind holes
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

VSTM...series

HSSE | 3~4 | TiN | 0° HELIX

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes
1.5P	5P								
VSTM0305015	VSTM0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VSTM0407015	VSTM0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VSTM04507515	VSTM04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VSTM0508015	VSTM0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VSTM0610015	VSTM0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VSTM0810015	VSTM0810050	M8 X 1.0	WH2	70	22	6.2	5	8	4
VSTM0812515	VSTM0812550	M8 X 1.25	WH2	70	22	6.2	5	8	4
VSTM1012515	VSTM1012550	M10 X 1.25	WH2	75	24	7	5.5	8	4
VSTM1015015	VSTM1015050	M10 X 1.5	WH3	75	24	7	5.5	8	4
VSTM1210015	VSTM1210050	M12 X 1.0	WH2	82	29	8.5	6.5	9	4
VSTM1212515	VSTM1212550	M12 X 1.25	WH2	82	29	8.5	6.5	9	4
VSTM1215015	VSTM1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	4
VSTM1217515	VSTM1217550	M12 X 1.75	WH3	82	29	8.5	6.5	9	4
VSTM1415015	VSTM1415050	M14 X 1.5	WH3	88	30	10.5	8	11	4
VSTM1420015	VSTM1420050	M14 X 2.0	WH3	88	30	10.5	8	11	4
VSTM1615015	VSTM1615050	M16 X 1.5	WH3	95	32	12.5	10	13	4
VSTM1620015	VSTM1620050	M16 X 2.0	WH3	95	32	12.5	10	13	4
VSTM1815015	VSTM1815050	M18 X 1.5	WH3	100	37	14	11	14	4
VSTM1825015	VSTM1825050	M18 X 2.5	WH3	100	37	14	11	14	4
VSTM2015015	VSTM2015050	M20 X 1.5	WH3	105	37	15	12	15	4
VSTM2025015	VSTM2025050	M20 X 2.5	WH3	105	37	15	12	15	4
VSTM2215015	VSTM2215050	M22 X 1.5	WH3	115	38	17	13	16	4
VSTM2225015	VSTM2225050	M22 X 2.5	WH3	115	38	17	13	16	4
VSTM2415015	VSTM2415050	M24 X 1.5	WH3	120	45	19	15	18	4
VSTM2420015	VSTM2420050	M24 X 2.0	WH3	120	45	19	15	18	4
VSTM2430015	VSTM2430050	M24 X 3.0	WH3	120	45	19	15	18	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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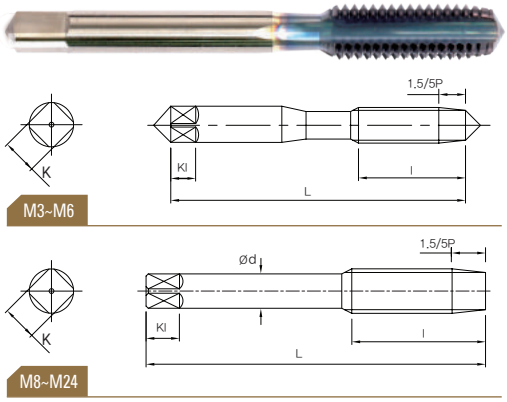
HSSE TAP(JIS TYPE)



STRAIGHT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through and blind holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

HSSE 3~4 TiCN 0° HELIX

VSCM...series

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes
1.5P	5P								
VSCM0305015	VSCM0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VSCM0407015	VSCM0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VSCM04507515	VSCM04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VSCM0508015	VSCM0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VSCM0610015	VSCM0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VSCM0810015	VSCM0810050	M8 X 1.0	WH2	70	22	6.2	5	8	4
VSCM0812515	VSCM0812550	M8 X 1.25	WH2	70	22	6.2	5	8	4
VSCM1012515	VSCM1012550	M10 X 1.25	WH2	75	24	7	5.5	8	4
VSCM1015015	VSCM1015050	M10 X 1.5	WH3	75	24	7	5.5	8	4
VSCM1210015	VSCM1210050	M12 X 1.0	WH2	82	29	8.5	6.5	9	4
VSCM1212515	VSCM1212550	M12 X 1.25	WH2	82	29	8.5	6.5	9	4
VSCM1215015	VSCM1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	4
VSCM1217515	VSCM1217550	M12 X 1.75	WH3	82	29	8.5	6.5	9	4
VSCM1415015	VSCM1415050	M14 X 1.5	WH3	88	30	10.5	8	11	4
VSCM1420015	VSCM1420050	M14 X 2.0	WH3	88	30	10.5	8	11	4
VSCM1615015	VSCM1615050	M16 X 1.5	WH3	95	32	12.5	10	13	4
VSCM1620015	VSCM1620050	M16 X 2.0	WH3	95	32	12.5	10	13	4
VSCM1815015	VSCM1815050	M18 X 1.5	WH3	100	37	14	11	14	4
VSCM1825015	VSCM1825050	M18 X 2.5	WH3	100	37	14	11	14	4
VSCM2015015	VSCM2015050	M20 X 1.5	WH3	105	37	15	12	15	4
VSCM2025015	VSCM2025050	M20 X 2.5	WH3	105	37	15	12	15	4
VSCM2215015	VSCM2215050	M22 X 1.5	WH3	115	38	17	13	16	4
VSCM2225015	VSCM2225050	M22 X 2.5	WH3	115	38	17	13	16	4
VSCM2415015	VSCM2415050	M24 X 1.5	WH3	120	45	19	15	18	4
VSCM2420015	VSCM2420050	M24 X 2.0	WH3	120	45	19	15	18	4
VSCM2430015	VSCM2430050	M24 X 3.0	WH3	120	45	19	15	18	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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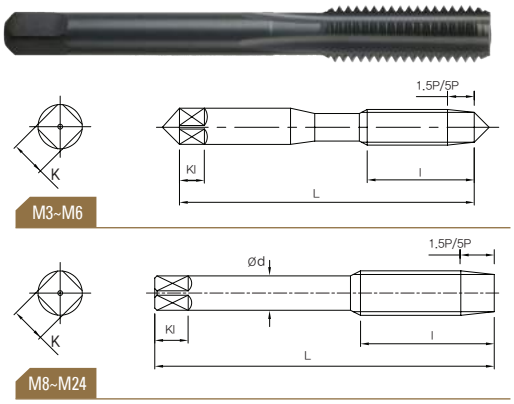
HSSE TAP(JIS TYPE)



STRAIGHT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through and blind holes
- By applying HOMO coating, it provides stable and highly efficient operation due to enhanced durability

HSSE HOMO 3~4 0° HELIX

VSHM...series

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes
1.5P	5P								
VSHM0305015	VSHM0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VSHM0407015	VSHM0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VSHM04507515	VSHM04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VSHM0508015	VSHM0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VSHM0610015	VSHM0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VSHM0810015	VSHM0810050	M8 X 1.0	WH2	70	22	6.2	5	8	4
VSHM0812515	VSHM0812550	M8 X 1.25	WH2	70	22	6.2	5	8	4
VSHM1012515	VSHM1012550	M10 X 1.25	WH2	75	24	7	5.5	8	4
VSHM1015015	VSHM1015050	M10 X 1.5	WH3	75	24	7	5.5	8	4
VSHM1210015	VSHM1210050	M12 X 1.0	WH2	82	29	8.5	6.5	9	4
VSHM1212515	VSHM1212550	M12 X 1.25	WH2	82	29	8.5	6.5	9	4
VSHM1215015	VSHM1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	4
VSHM1217515	VSHM1217550	M12 X 1.75	WH3	82	29	8.5	6.5	9	4
VSHM1415015	VSHM1415050	M14 X 1.5	WH3	88	30	10.5	8	11	4
VSHM1420015	VSHM1420050	M14 X 2.0	WH3	88	30	10.5	8	11	4
VSHM1615015	VSHM1615050	M16 X 1.5	WH3	95	32	12.5	10	13	4
VSHM1620015	VSHM1620050	M16 X 2.0	WH3	95	32	12.5	10	13	4
VSHM1815015	VSHM1815050	M18 X 1.5	WH3	100	37	14	11	14	4
VSHM1825015	VSHM1825050	M18 X 2.5	WH3	100	37	14	11	14	4
VSHM2015015	VSHM2015050	M20 X 1.5	WH3	105	37	15	12	15	4
VSHM2025015	VSHM2025050	M20 X 2.5	WH3	105	37	15	12	15	4
VSHM2215015	VSHM2215050	M22 X 1.5	WH3	115	38	17	13	16	4
VSHM2225015	VSHM2225050	M22 X 2.5	WH3	115	38	17	13	16	4
VSHM2415015	VSHM2415050	M24 X 1.5	WH3	120	45	19	15	18	4
VSHM2420015	VSHM2420050	M24 X 2.0	WH3	120	45	19	15	18	4
VSHM2430015	VSHM2430050	M24 X 3.0	WH3	120	45	19	15	18	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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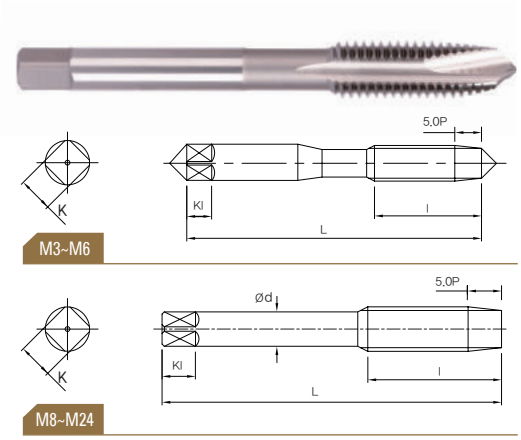
HSSE TAP(JIS TYPE)



POINT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through holes

VNOM...series

HSSE | 3 | UNCOATED | 0° HELIX

EDP. No. 5P	Thread Size	Limits	L	l	d	K	Kl	Flutes
VNOM0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VNOM0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VNOM04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VNOM0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VNOM0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VNOM0810050	M8 X 1.0	WH3	70	22	6.2	5	8	3
VNOM0812550	M8 X 1.25	WH3	70	22	6.2	5	8	3
VNOM1012550	M10 X 1.25	WH3	75	24	7	5.5	8	3
VNOM1015050	M10 X 1.5	WH3	75	24	7	5.5	8	3
VNOM1210050	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
VNOM1212550	M12 X 1.25	WH3	82	29	8.5	6.5	9	3
VNOM1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	3
VNOM1217550	M12 X 1.75	WH4	82	29	8.5	6.5	9	3
VNOM1415050	M14 X 1.5	WH3	88	30	10.5	8	11	3
VNOM1420050	M14 X 2.0	WH4	88	30	10.5	8	11	3
VNOM1615050	M16 X 1.5	WH3	95	32	12.5	10	13	3
VNOM1620050	M16 X 2.0	WH4	95	32	12.5	10	13	3
VNOM1815050	M18 X 1.5	WH4	100	37	14	11	14	3
VNOM1825050	M18 X 2.5	WH4	100	37	14	11	14	3
VNOM2015050	M20 X 1.5	WH4	105	37	15	12	15	3
VNOM2025050	M20 X 2.5	WH4	105	37	15	12	15	3
VNOM2215050	M22 X 1.5	WH4	115	38	17	13	16	3
VNOM2225050	M22 X 2.5	WH4	115	38	17	13	16	3
VNOM2415050	M24 X 1.5	WH4	120	45	19	15	18	3
VNOM2420050	M24 X 2.0	WH4	120	45	19	15	18	3
VNOM2430050	M24 X 3.0	WH4	120	45	19	15	18	3

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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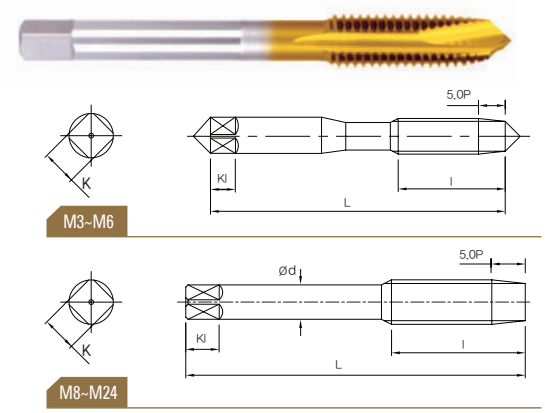
HSSE TAP(JIS TYPE)



POINT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through holes
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

HSSE 3 TiN 0° HELIX

VNTM...series

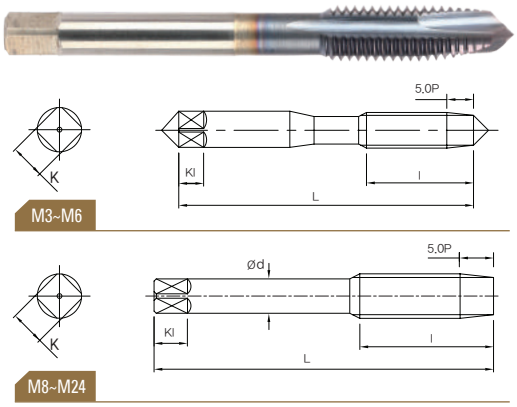
EDP. No. 5P	Thread Size	Limits	L	l	d	K	Kl	Flutes
VNTM0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VNTM0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VNTM04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VNTM0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VNTM0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VNTM0810050	M8 X 1.0	WH3	70	22	6.2	5	8	3
VNTM0812550	M8 X 1.25	WH3	70	22	6.2	5	8	3
VNTM1012550	M10 X 1.25	WH3	75	24	7	5.5	8	3
VNTM1015050	M10 X 1.5	WH3	75	24	7	5.5	8	3
VNTM1210050	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
VNTM1212550	M12 X 1.25	WH3	82	29	8.5	6.5	9	3
VNTM1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	3
VNTM1217550	M12 X 1.75	WH4	82	29	8.5	6.5	9	3
VNTM1415050	M14 X 1.5	WH3	88	30	10.5	8	11	3
VNTM1420050	M14 X 2.0	WH4	88	30	10.5	8	11	3
VNTM1615050	M16 X 1.5	WH3	95	32	12.5	10	13	3
VNTM1620050	M16 X 2.0	WH4	95	32	12.5	10	13	3
VNTM1815050	M18 X 1.5	WH4	100	37	14	11	14	3
VNTM1825050	M18 X 2.5	WH4	100	37	14	11	14	3
VNTM2015050	M20 X 1.5	WH4	105	37	15	12	15	3
VNTM2025050	M20 X 2.5	WH4	105	37	15	12	15	3
VNTM2215050	M22 X 1.5	WH4	115	38	17	13	16	3
VNTM2225050	M22 X 2.5	WH4	115	38	17	13	16	3
VNTM2415050	M24 X 1.5	WH4	120	45	19	15	18	3
VNTM2420050	M24 X 2.0	WH4	120	45	19	15	18	3
VNTM2430050	M24 X 3.0	WH4	120	45	19	15	18	3

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○	○	○				◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○

HSSE TAP(JIS TYPE)



POINT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

HSSE | 3 | TiCN | 0° HELIX

VNCM...series

EDP. No. 5P	Thread Size	Limits	L	l	d	K	Kl	Flutes
VNCM0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VNCM0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VNCM04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VNCM0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VNCM0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VNCM0810050	M8 X 1.0	WH3	70	22	6.2	5	8	3
VNCM0812550	M8 X 1.25	WH3	70	22	6.2	5	8	3
VNCM1012550	M10 X 1.25	WH3	75	24	7	5.5	8	3
VNCM1015050	M10 X 1.5	WH3	75	24	7	5.5	8	3
VNCM1210050	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
VNCM1212550	M12 X 1.25	WH3	82	29	8.5	6.5	9	3
VNCM1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	3
VNCM1217550	M12 X 1.75	WH4	82	29	8.5	6.5	9	3
VNCM1415050	M14 X 1.5	WH3	88	30	10.5	8	11	3
VNCM1420050	M14 X 2.0	WH4	88	30	10.5	8	11	3
VNCM1615050	M16 X 1.5	WH3	95	32	12.5	10	13	3
VNCM1620050	M16 X 2.0	WH4	95	32	12.5	10	13	3
VNCM1815050	M18 X 1.5	WH4	100	37	14	11	14	3
VNCM1825050	M18 X 2.5	WH4	100	37	14	11	14	3
VNCM2015050	M20 X 1.5	WH4	105	37	15	12	15	3
VNCM2025050	M20 X 2.5	WH4	105	37	15	12	15	3
VNCM2215050	M22 X 1.5	WH4	115	38	17	13	16	3
VNCM2225050	M22 X 2.5	WH4	115	38	17	13	16	3
VNCM2415050	M24 X 1.5	WH4	120	45	19	15	18	3
VNCM2420050	M24 X 2.0	WH4	120	45	19	15	18	3
VNCM2430050	M24 X 3.0	WH4	120	45	19	15	18	3

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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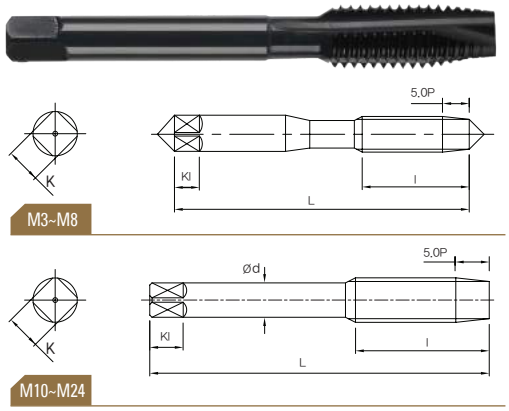
HSSE TAP(JIS TYPE)



POINT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through holes
- By applying HOMO coating, it provides stable and highly efficient operation due to enhanced durability

HSSE HOMO 3 35° HELIX

VNHM...series

EDP. No. 5P	Thread Size	Limits	L	l	d	K	Kl	Flutes
VNHM0305050	M3 X 0.5	WH2	46	11	4	3.2	6	3
VNHM0407050	M4 X 0.7	WH2	52	13	5	4	7	3
VNHM04507550	M4.5 X 0.75	WH2	55	13	5	4	7	3
VNHM0508050	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VNHM0610050	M6 X 1.0	WH2	62	19	6	4.5	7	3
VNHM0810050	M8 X 1.0	WH3	70	22	6.2	5	8	3
VNHM0812550	M8 X 1.25	WH3	70	22	6.2	5	8	3
VNHM1012550	M10 X 1.25	WH3	75	24	7	5.5	8	3
VNHM1015050	M10 X 1.5	WH3	75	24	7	5.5	8	3
VNHM1210050	M12 X 1.0	WH3	82	29	8.5	6.5	9	3
VNHM1212550	M12 X 1.25	WH3	82	29	8.5	6.5	9	3
VNHM1215050	M12 X 1.5	WH3	82	29	8.5	6.5	9	3
VNHM1217550	M12 X 1.75	WH4	82	29	8.5	6.5	9	3
VNHM1415050	M14 X 1.5	WH3	88	30	10.5	8	11	3
VNHM1420050	M14 X 2.0	WH4	88	30	10.5	8	11	3
VNHM1615050	M16 X 1.5	WH3	95	32	12.5	10	13	3
VNHM1620050	M16 X 2.0	WH4	95	32	12.5	10	13	3
VNHM1815050	M18 X 1.5	WH4	100	37	14	11	14	3
VNHM1825050	M18 X 2.5	WH4	100	37	14	11	14	3
VNHM2015050	M20 X 1.5	WH4	105	37	15	12	15	3
VNHM2025050	M20 X 2.5	WH4	105	37	15	12	15	3
VNHM2215050	M22 X 1.5	WH4	115	38	17	13	16	3
VNHM2225050	M22 X 2.5	WH4	115	38	17	13	16	3
VNHM2415050	M24 X 1.5	WH4	120	45	19	15	18	3
VNHM2420050	M24 X 2.0	WH4	120	45	19	15	18	3
VNHM2430050	M24 X 3.0	WH4	120	45	19	15	18	3

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0,25%	C0,25% ~0,45%	C 0,45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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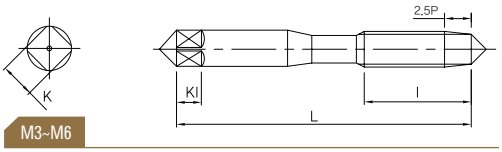
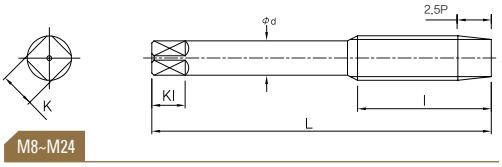
HSSE TAP(JIS TYPE)





SPIRAL TAPS

- Suitable for Carbon steel, Alloy steel and Nonferrous metals and the unique shape of the groove is de signed for high release of chips
- Suitable for tapping of blind holes

HSSE | 3~4 | UNCOATED | 35° HELIX

VPOM...series

EDP. No. 2.5P	Thread Size	Limits	L	l	d	K	Kl	Flutes
VPOM0305025	M3 X 0.5	WH2	46	11	4	3.2	6	3
VPOM0407025	M4 X 0.7	WH2	52	13	5	4	7	3
VPOM04507525	M4.5 X 0.75	WH2	55	13	5	4	7	3
VPOM0508025	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VPOM0610025	M6 X 1.0	WH2	62	19	6	4.5	7	3
VPOM0810025	M8 X 1.0	WH2	70	22	6.2	5	8	3
VPOM0812525	M8 X 1.25	WH2	70	22	6.2	5	8	3
VPOM1012525	M10 X 1.25	WH2	75	24	7	5.5	8	3
VPOM1015025	M10 X 1.5	WH2	75	24	7	5.5	8	3
VPOM1210025	M12 X 1.0	WH2	82	29	8.5	6.5	9	3
VPOM1212525	M12 X 1.25	WH2	82	29	8.5	6.5	9	3
VPOM1215025	M12 X 1.5	WH2	82	29	8.5	6.5	9	3
VPOM1217525	M12 X 1.75	WH2	82	29	8.5	6.5	9	3
VPOM1415025	M14 X 1.5	WH2	88	30	10.5	8	11	3
VPOM1420025	M14 X 2.0	WH2	88	30	10.5	8	11	3
VPOM1615025	M16 X 1.5	WH2	95	32	12.5	10	13	3
VPOM1620025	M16 X 2.0	WH2	95	32	12.5	10	13	3
VPOM1815025	M18 X 1.5	WH2	100	37	14	11	14	4
VPOM1825025	M18 X 2.5	WH3	100	37	14	11	14	4
VPOM2015025	M20 X 1.5	WH3	105	37	15	12	15	4
VPOM2025025	M20 X 2.5	WH3	105	37	15	12	15	4
VPOM2215025	M22 X 1.5	WH3	115	38	17	13	16	4
VPOM2225025	M22 X 2.5	WH3	115	38	17	13	16	4
VPOM2415025	M24 X 1.5	WH3	120	45	19	15	18	4
VPOM2420025	M24 X 2.0	WH3	120	45	19	15	18	4
VPOM2430025	M24 X 3.0	WH4	120	45	19	15	18	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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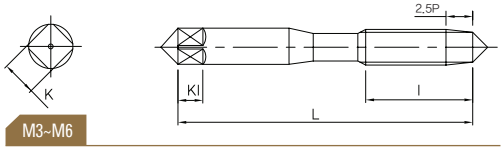
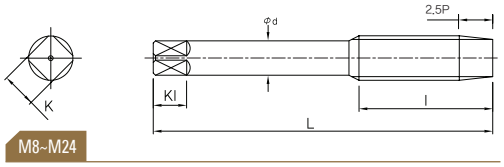
HSSE TAP(JIS TYPE)





SPIRAL TAPS

- Suitable for Carbon steel, Alloy steel and Nonferrous metals and the unique shape of the groove is de signed for high release of chips
- Suitable for tapping of blind holes
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

VPTM...series

HSSE | 3~4 | TiN | 35° HELIX

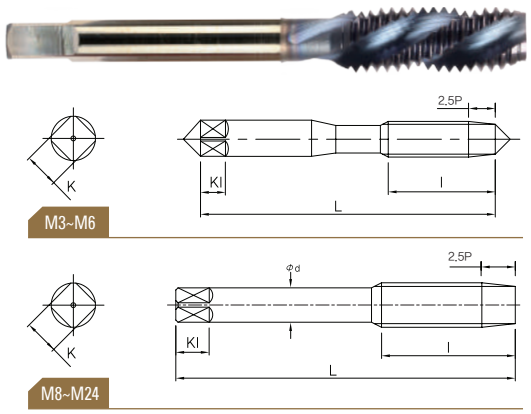
EDP. No. 2.5P	Thread Size	Limits	L	l	d	K	Kl	Flutes
VPTM0305025	M3 X 0.5	WH2	46	11	4	3.2	6	3
VPTM0407025	M4 X 0.7	WH2	52	13	5	4	7	3
VPTM04507525	M4.5 X 0.75	WH2	55	13	5	4	7	3
VPTM0508025	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VPTM0610025	M6 X 1.0	WH2	62	19	6	4.5	7	3
VPTM0810025	M8 X 1.0	WH2	70	22	6.2	5	8	3
VPTM0812525	M8 X 1.25	WH2	70	22	6.2	5	8	3
VPTM1012525	M10 X 1.25	WH2	75	24	7	5.5	8	3
VPTM1015025	M10 X 1.5	WH2	75	24	7	5.5	8	3
VPTM1210025	M12 X 1.0	WH2	82	29	8.5	6.5	9	3
VPTM1212525	M12 X 1.25	WH2	82	29	8.5	6.5	9	3
VPTM1215025	M12 X 1.5	WH2	82	29	8.5	6.5	9	3
VPTM1217525	M12 X 1.75	WH2	82	29	8.5	6.5	9	3
VPTM1415025	M14 X 1.5	WH2	88	30	10.5	8	11	3
VPTM1420025	M14 X 2.0	WH2	88	30	10.5	8	11	3
VPTM1615025	M16 X 1.5	WH2	95	32	12.5	10	13	3
VPTM1620025	M16 X 2.0	WH2	95	32	12.5	10	13	3
VPTM1815025	M18 X 1.5	WH2	100	37	14	11	14	4
VPTM1825025	M18 X 2.5	WH3	100	37	14	11	14	4
VPTM2015025	M20 X 1.5	WH3	105	37	15	12	15	4
VPTM2025025	M20 X 2.5	WH3	105	37	15	12	15	4
VPTM2215025	M22 X 1.5	WH3	115	38	17	13	16	4
VPTM2225025	M22 X 2.5	WH3	115	38	17	13	16	4
VPTM2415025	M24 X 1.5	WH3	120	45	19	15	18	4
VPTM2420025	M24 X 2.0	WH3	120	45	19	15	18	4
VPTM2430025	M24 X 3.0	WH4	120	45	19	15	18	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○	○	○				○	○	○		○	○	○	○	○	○	○	○	○	○			○

HSSE TAP(JIS TYPE)



SPIRAL TAPS

- Suitable for Carbon steel, Alloy steel and Nonferrous metals and the unique shape of the groove is de signed for high release of chips
- Suitable for tapping of blind holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

HSSE 3~4 TiCN 35° HELIX

VPCM...series

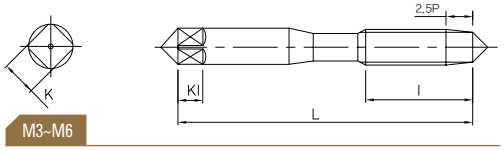
EDP. No. 2.5P	Thread Size	Limits	L	l	d	K	Kl	Flutes
VPCM0305025	M3 X 0.5	WH2	46	11	4	3.2	6	3
VPCM0407025	M4 X 0.7	WH2	52	13	5	4	7	3
VPCM04507525	M4.5 X 0.75	WH2	55	13	5	4	7	3
VPCM0508025	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VPCM0610025	M6 X 1.0	WH2	62	19	6	4.5	7	3
VPCM0810025	M8 X 1.0	WH2	70	22	6.2	5	8	3
VPCM0812525	M8 X 1.25	WH2	70	22	6.2	5	8	3
VPCM1012525	M10 X 1.25	WH2	75	24	7	5.5	8	3
VPCM1015025	M10 X 1.5	WH2	75	24	7	5.5	8	3
VPCM1210025	M12 X 1.0	WH2	82	29	8.5	6.5	9	3
VPCM1212525	M12 X 1.25	WH2	82	29	8.5	6.5	9	3
VPCM1215025	M12 X 1.5	WH2	82	29	8.5	6.5	9	3
VPCM1217525	M12 X 1.75	WH2	82	29	8.5	6.5	9	3
VPCM1415025	M14 X 1.5	WH2	88	30	10.5	8	11	3
VPCM1420025	M14 X 2.0	WH2	88	30	10.5	8	11	3
VPCM1615025	M16 X 1.5	WH2	95	32	12.5	10	13	3
VPCM1620025	M16 X 2.0	WH2	95	32	12.5	10	13	3
VPCM1815025	M18 X 1.5	WH2	100	37	14	11	14	4
VPCM1825025	M18 X 2.5	WH3	100	37	14	11	14	4
VPCM2015025	M20 X 1.5	WH3	105	37	15	12	15	4
VPCM2025025	M20 X 2.5	WH3	105	37	15	12	15	4
VPCM2215025	M22 X 1.5	WH3	115	38	17	13	16	4
VPCM2225025	M22 X 2.5	WH3	115	38	17	13	16	4
VPCM2415025	M24 X 1.5	WH3	120	45	19	15	18	4
VPCM2420025	M24 X 2.0	WH3	120	45	19	15	18	4
VPCM2430025	M24 X 3.0	WH4	120	45	19	15	18	4

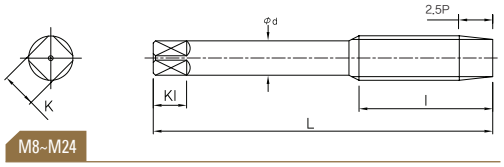
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	◎	◎	○				○	○	○		○	○	○	○	○	○	◎	○	○	○	○		○

HSSE TAP(JIS TYPE)





SPIRAL TAPS

- Suitable for Carbon steel, Alloy steel and Nonferrous metals and the unique shape of the groove is de signed for high release of chips

VPHM...series

HSSE · 3~4 · HOMO · 35° HELIX

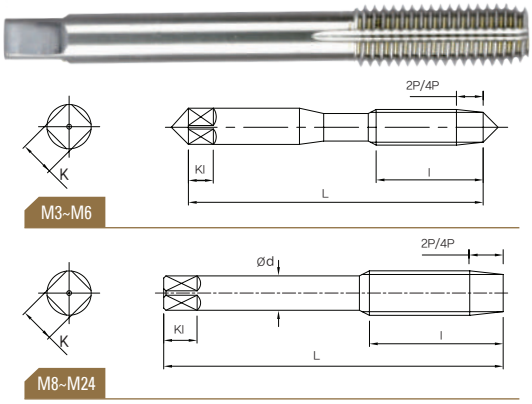
EDP. No. 2.5P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VPHM0305025	M3 X 0.5	WH2	46	11	4	3.2	6	3
VPHM0407025	M4 X 0.7	WH2	52	13	5	4	7	3
VPHM04507525	M4.5 X 0.75	WH2	55	13	5	4	7	3
VPHM0508025	M5 X 0.8	WH2	60	16	5.5	4.5	7	3
VPHM0610025	M6 X 1.0	WH2	62	19	6	4.5	7	3
VPHM0810025	M8 X 1.0	WH2	70	22	6.2	5	8	3
VPHM0812525	M8 X 1.25	WH2	70	22	6.2	5	8	3
VPHM1012525	M10 X 1.25	WH2	75	24	7	5.5	8	3
VPHM1015025	M10 X 1.5	WH2	75	24	7	5.5	8	3
VPHM1210025	M12 X 1.0	WH2	82	29	8.5	6.5	9	3
VPHM1212525	M12 X 1.25	WH2	82	29	8.5	6.5	9	3
VPHM1215025	M12 X 1.5	WH2	82	29	8.5	6.5	9	3
VPHM1217525	M12 X 1.75	WH2	82	29	8.5	6.5	9	3
VPHM1415025	M14 X 1.5	WH2	88	30	10.5	8	11	3
VPHM1420025	M14 X 2.0	WH2	88	30	10.5	8	11	3
VPHM1615025	M16 X 1.5	WH2	95	32	12.5	10	13	3
VPHM1620025	M16 X 2.0	WH2	95	32	12.5	10	13	3
VPHM1815025	M18 X 1.5	WH2	100	37	14	11	14	4
VPHM1825025	M18 X 2.5	WH3	100	37	14	11	14	4
VPHM2015025	M20 X 1.5	WH3	105	37	15	12	15	4
VPHM2025025	M20 X 2.5	WH3	105	37	15	12	15	4
VPHM2215025	M22 X 1.5	WH3	115	38	17	13	16	4
VPHM2225025	M22 X 2.5	WH3	115	38	17	13	16	4
VPHM2415025	M24 X 1.5	WH3	120	45	19	15	18	4
VPHM2420025	M24 X 2.0	WH3	120	45	19	15	18	4
VPHM2430025	M24 X 3.0	WH4	120	45	19	15	18	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○								○														○

HSSE TAP(JIS TYPE)



ROLL TAPS

- Designed for high performance of threading
  Aluminum, Zinc, Copper and other Nonferrous alloys

VROM...series

HSSE UNCOATED

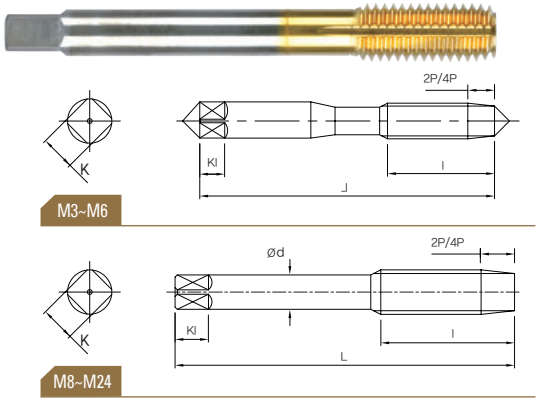
EDP. No. 2P	EDP. No. 4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VROM0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	1
VROM0305020M	VROM0305040M								4
VROM0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	1
VROM0407020M	VROM0407040M								4
VROM0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	1
VROM0508020M	VROM0508040M								4
VROM0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	1
VROM0610020M	VROM0610040M								4
VROM0810020S	-	M8 X 1.0	GH7	70	22	6.2	5	8	1
VROM0810040S	VROM0810040M								4
VROM0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	1
VROM0812520M	VROM0812540M								4
VROM1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	1
VROM1012520M	VROM1012540M								4
VROM1015020S	-	M10 X 1.50	GH7	75	24	7	5.5	8	1
VROM1015020M	VROM1015040M								4
VROM1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	1
VROM1210020M	VROM1210040M								4
VROM1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	1
VROM1212520M	VROM1212540M								4
VROM1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	1
VROM1215020M	VROM1215040M								4
VROM1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	1
VROM1217520M	VROM1217540M								4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
												○	○	○	○	○	○		◎				

HSSE TAP(JIS TYPE)



ROLL TAPS

- It is applicable regardless of steel or Nonferrous alloys
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

HSSE TiN

VRTM...series

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Oil Groove
2P	4P								
VRTM0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	1
VRTM0305020M	VRTM0305040M								4
VRTM0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	1
VRTM0407020M	VRTM0407040M								4
VRTM0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	1
VRTM0508020M	VRTM0508040M								4
VRTM0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	1
VRTM0610020M	VRTM0610040M								4
VRTM0810020S	-	M8 X 1.0	GH7	70	22	6.2	5	8	1
VRTM0810040S	VRTM0810040M								4
VRTM0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	1
VRTM0812520M	VRTM0812540M								4
VRTM1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	1
VRTM1012520M	VRTM1012540M								4
VRTM1015020S	-	M10 X 1.50	GH7	75	24	7	5.5	8	1
VRTM1015020M	VRTM1015040M								4
VRTM1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	1
VRTM1210020M	VRTM1210040M								4
VRTM1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	1
VRTM1212520M	VRTM1212540M								4
VRTM1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	1
VRTM1215020M	VRTM1215040M								4
VRTM1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	1
VRTM1217520M	VRTM1217540M								4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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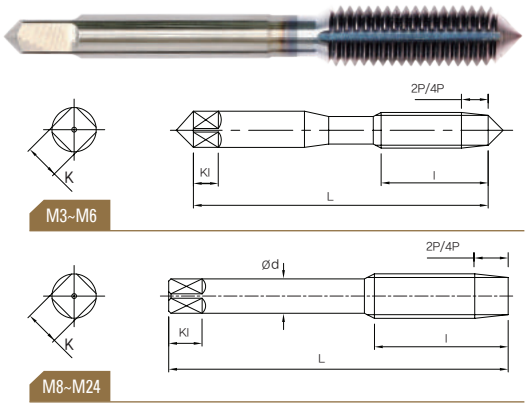
HSSE TAP(JIS TYPE)



ROLL TAPS

- It is applicable regardless of steel or Nonferrous alloys
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

HSSE TiCN

VRCM...series

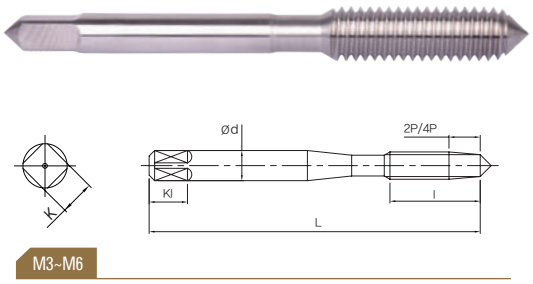
EDP. No. 2P	EDP. No. 4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VRCM0305020S	-	M3 X 0.5	GH5	46	11	4	3.2	6	1
VRCM0305020M	VRCM0305040M								4
VRCM0407020S	-	M4 X 0.7	GH6	52	13	5	4	7	1
VRCM0407020M	VRCM0407040M								4
VRCM0508020S	-	M5 X 0.8	GH6	60	16	5.5	4.5	7	1
VRCM0508020M	VRCM0508040M								4
VRCM0610020S	-	M6 X 1.0	GH7	62	19	6	4.5	7	1
VRCM0610020M	VRCM0610040M								4
VRCM0810020S	-	M8 X 1.0	GH7	70	22	6.2	5	8	1
VRCM0810040S	VRCM0810040M								4
VRCM0812520S	-	M8 X 1.25	GH7	70	22	6.2	5	8	1
VRCM0812520M	VRCM0812540M								4
VRCM1012520S	-	M10 X 1.25	GH7	75	24	7	5.5	8	1
VRCM1012520M	VRCM1012540M								4
VRCM1015020S	-	M10 X 1.50	GH7	75	24	7	5.5	8	1
VRCM1015020M	VRCM1015040M								4
VRCM1210020S	-	M12 X 1.0	GH7	82	29	8.5	6.5	9	1
VRCM1210020M	VRCM1210040M								4
VRCM1212520S	-	M12 X 1.25	GH7	82	29	8.5	6.5	9	1
VRCM1212520M	VRCM1212540M								4
VRCM1215020S	-	M12 X 1.5	GH7	82	29	8.5	6.5	9	1
VRCM1215020M	VRCM1215040M								4
VRCM1217520S	-	M12 X 1.75	GH8	82	29	8.5	6.5	9	1
VRCM1217520M	VRCM1217540M								4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

HSSE TAP(JIS TYPE)



SPIRAL ROLL TAPS

- Designed for high performance of threading Aluminum, Zinc, Magnesiume, Copper and other Nonferrous alloys

VFOM...series

HSSE UNCOATED 15° HELIX

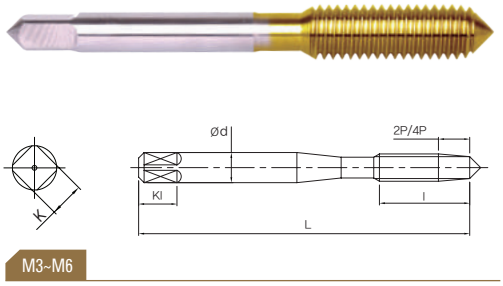
EDP. No.		Thread Size	Limits	L	l	d	K	Kl
2P	4P							
VFOM0305020	VFOM0305040	M3 X 0.5	GH6	46	18	4	3.2	6
VFOM03506020	VFOM03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
VFOM0407020	VFOM0407040	M4 X 0.7	GH7	52	20	5	4	7
VFOM0508020	VFOM0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
VFOM0610020	VFOM0610040	M6 X 1.0	GH7	62	24	6	4.5	7

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
												○	○	○	○	○	○		◎				

HSSE TAP(JIS TYPE)



SPIRAL ROLL TAPS

- Designed for high performance of threading Nonferrous alloys, Steel, and Stainless steel
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

VFTM...series

HSSE TiN 15° HELIX

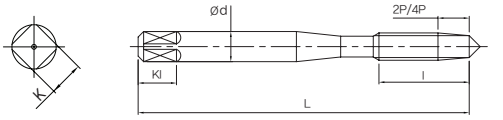
EDP. No.		Thread Size	Limits	L	l	d	K	Kl
2P	4P							
VFTM0305020	VFTM0305040	M3 X 0.5	GH6	46	18	4	3.2	6
VFTM03506020	VFTM03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
VFTM0407020	VFTM0407040	M4 X 0.7	GH7	52	20	5	4	7
VFTM0508020	VFTM0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
VFTM0610020	VFTM0610040	M6 X 1.0	GH7	62	24	6	4.5	7

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○	○	○				◎	○	○		○	○	○	○									

HSSE TAP(JIS TYPE)



M3~M6

SPIRAL ROLL TAPS

- Designed for high performance of threading Nonferrous alloys, Steel, and Stainless steel
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

VFCM...series

HSSE TiCN 15° HELIX

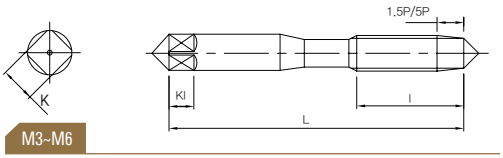
EDP. No.		Thread Size	Limits	L	l	d	K	Kl
2P	4P							
VFCM0305020	VFCM0305040	M3 X 0.5	GH6	46	18	4	3.2	6
VFCM03506020	VFCM03506040	M3.5 X 0.6	GH6	46	18	4	3.2	6
VFCM0407020	VFCM0407040	M4 X 0.7	GH7	52	20	5	4	7
VFCM0508020	VFCM0508040	M5 X 0.8	GH7	60	22	5.5	4.5	7
VFCM0610020	VFCM0610040	M6 X 1.0	GH7	62	24	6	4.5	7

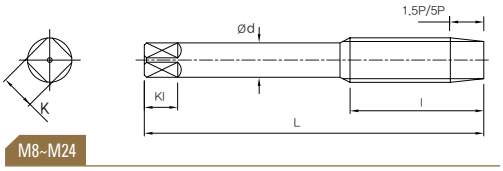
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

HSSE TAP(DIN TYPE)





STRAIGHT TAPS

- Designed for high mass producution for general workpieces such as Cast Iron, C.Br, Plastics and so on

VGOM...series

DIN 371·374 376 | HSSE | 3~4 | UNCOATED | 0° HELIX

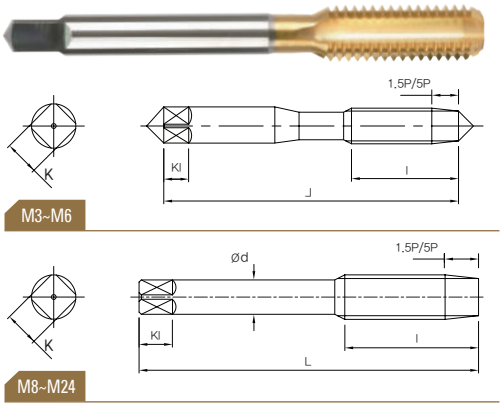
EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
1.5P	5P									
VGOM0305015	VGOM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VGOM0407015	VGOM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VGOM0508015	VGOM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VGOM0610015	VGOM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VGOM0810015	VGOM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	4	374
VGOM0812515	VGOM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	4	371
VGOM1010015	VGOM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	4	374
VGOM1012515	VGOM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	4	374
VGOM1015015	VGOM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	4	371
VGOM1210015	VGOM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	4	374
VGOM1212515	VGOM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	4	374
VGOM1215015	VGOM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	4	374
VGOM1217515	VGOM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	4	376
VGOM1415015	VGOM1415050	M14X1.5	6H	100	22.0	11.0	9.0	12	4	374
VGOM1420015	VGOM1420050	M14X2.0	6H	110	26.0	11.0	9.0	12	4	376
VGOM1615015	VGOM1615050	M16X1.5	6H	100	22.0	12.0	9.0	12	4	374
VGOM1620015	VGOM1620050	M16X2.0	6H	110	27.0	12.0	9.0	12	4	376
VGOM1815015	VGOM1815050	M18X1.5	6H	110	25.0	14.0	11.0	14	4	374
VGOM1825015	VGOM1825050	M18X2.5	6H	125	30.0	14.0	11.0	14	4	376
VGOM2015015	VGOM2015050	M20X1.5	6H	125	25.0	16.0	12.0	15	4	374
VGOM2025015	VGOM2025050	M20X2.5	6H	140	32.0	16.0	12.0	15	4	376
VGOM2215015	VGOM2215050	M22X1.5	6H	125	25.0	18.0	14.5	17	4	374
VGOM2225015	VGOM2225050	M22X2.5	6H	140	32.0	18.0	14.5	17	4	376
VGOM2415015	VGOM2415050	M24X1.5	6H	140	27.0	18.0	14.5	17	4	374
VGOM2420015	VGOM2420050	M24X2.0	6H	140	27.0	18.0	14.5	17	4	374
VGOM2430015	VGOM2430050	M24X3.0	6H	160	34.0	18.0	14.5	17	4	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
										◎	○		○	○	◎		○	○	○			○	

HSSE TAP(DIN TYPE)



STRAIGHT TAPS

- Suitable for Carbon steel, Alloy steel and Nonferrous metals and the unique shape of the groove is de signed for high release of chips
- Suitable for tapping of blind holes
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

VGTM...series

DIN 371·374 376 | HSSE | 3~4 | TiN | 0° HELIX

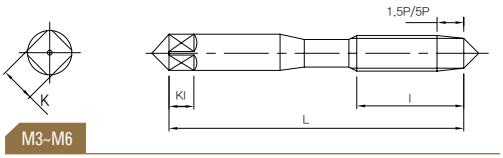
EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
1.5P	5P									
VGTM0305015	VGTM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VGTM0407015	VGTM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VGTM0508015	VGTM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VGTM0610015	VGTM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VGTM0810015	VGTM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	4	374
VGTM0812515	VGTM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	4	371
VGTM1010015	VGTM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	4	374
VGTM1012515	VGTM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	4	374
VGTM1015015	VGTM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	4	371
VGTM1210015	VGTM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	4	374
VGTM1212515	VGTM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	4	374
VGTM1215015	VGTM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	4	374
VGTM1217515	VGTM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	4	376
VGTM1415015	VGTM1415050	M14X1.5	6H	100	22.0	11.0	9.0	12	4	374
VGTM1420015	VGTM1420050	M14X2.0	6H	110	26.0	11.0	9.0	12	4	376
VGTM1615015	VGTM1615050	M16X1.5	6H	100	22.0	12.0	9.0	12	4	374
VGTM1620015	VGTM1620050	M16X2.0	6H	110	27.0	12.0	9.0	12	4	376
VGTM1815015	VGTM1815050	M18X1.5	6H	110	25.0	14.0	11.0	14	4	374
VGTM1825015	VGTM1825050	M18X2.5	6H	125	30.0	14.0	11.0	14	4	376
VGTM2015015	VGTM2015050	M20X1.5	6H	125	25.0	16.0	12.0	15	4	374
VGTM2025015	VGTM2025050	M20X2.5	6H	140	32.0	16.0	12.0	15	4	376
VGTM2215015	VGTM2215050	M22X1.5	6H	125	25.0	18.0	14.5	17	4	374
VGTM2225015	VGTM2225050	M22X2.5	6H	140	32.0	18.0	14.5	17	4	376
VGTM2415015	VGTM2415050	M24X1.5	6H	140	27.0	18.0	14.5	17	4	374
VGTM2420015	VGTM2420050	M24X2.0	6H	140	27.0	18.0	14.5	17	4	374
VGTM2430015	VGTM2430050	M24X3.0	6H	160	34.0	18.0	14.5	17	4	376

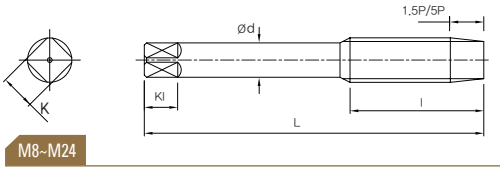
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○																						

HSSE TAP(DIN TYPE)





STRAIGHT TAPS

- Designed for high mass production for general workpieces such as Cast Iron, C.Br, Plastics , and so on
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

VGCM...series

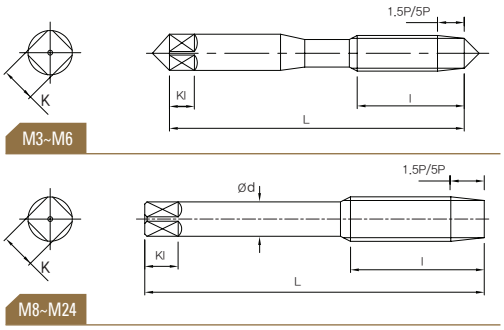
EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
1.5P	5P									
VGCM0305015	VGCM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VGCM0407015	VGCM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VGCM0508015	VGCM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VGCM0610015	VGCM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VGCM0810015	VGCM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	4	374
VGCM0812515	VGCM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	4	371
VGCM1010015	VGCM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	4	374
VGCM1012515	VGCM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	4	374
VGCM1015015	VGCM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	4	371
VGCM1210015	VGCM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	4	374
VGCM1212515	VGCM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	4	374
VGCM1215015	VGCM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	4	374
VGCM1217515	VGCM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	4	376
VGCM1415015	VGCM1415050	M14X1.5	6H	100	22.0	11.0	9.0	12	4	374
VGCM1420015	VGCM1420050	M14X2.0	6H	110	26.0	11.0	9.0	12	4	376
VGCM1615015	VGCM1615050	M16X1.5	6H	100	22.0	12.0	9.0	12	4	374
VGCM1620015	VGCM1620050	M16X2.0	6H	110	27.0	12.0	9.0	12	4	376
VGCM1815015	VGCM1815050	M18X1.5	6H	110	25.0	14.0	11.0	14	4	374
VGCM1825015	VGCM1825050	M18X2.5	6H	125	30.0	14.0	11.0	14	4	376
VGCM2015015	VGCM2015050	M20X1.5	6H	125	25.0	16.0	12.0	15	4	374
VGCM2025015	VGCM2025050	M20X2.5	6H	140	32.0	16.0	12.0	15	4	376
VGCM2215015	VGCM2215050	M22X1.5	6H	125	25.0	18.0	14.5	17	4	374
VGCM2225015	VGCM2225050	M22X2.5	6H	140	32.0	18.0	14.5	17	4	376
VGCM2415015	VGCM2415050	M24X1.5	6H	140	27.0	18.0	14.5	17	4	374
VGCM2420015	VGCM2420050	M24X2.0	6H	140	27.0	18.0	14.5	17	4	374
VGCM2430015	VGCM2430050	M24X3.0	6H	160	34.0	18.0	14.5	17	4	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
										◎	○		○	○	◎		○	○	○			◎	

HSSE TAP(DIN TYPE)



STRAIGHT TAPS

- Suitable for Carbon steel, Alloy steel and Nonferrous metals and the unique shape of the groove is de signed for high release of chips
- Suitable for tapping of blind holes
- By applying HOMO coating, it provides stable and highly efficient operation due to enhanced durability

VGHM...series

DIN 371·374 376 | HSSE | 3~4 | HOMO | 0° HELIX

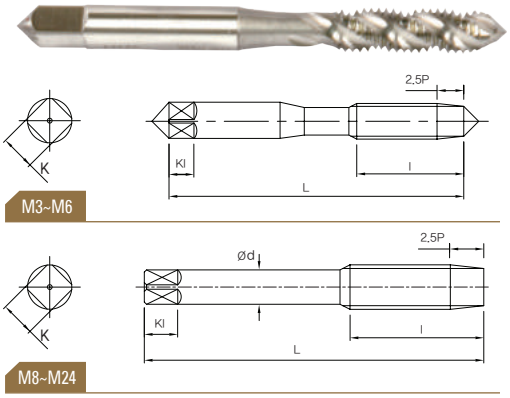
EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
1.5P	5P									
VGHM0305015	VGHM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VGHM0407015	VGHM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VGHM0508015	VGHM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VGHM0610015	VGHM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VGHM0810015	VGHM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	4	374
VGHM0812515	VGHM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	4	371
VGHM1010015	VGHM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	4	374
VGHM1012515	VGHM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	4	374
VGHM1015015	VGHM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	4	371
VGHM1210015	VGHM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	4	374
VGHM1212515	VGHM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	4	374
VGHM1215015	VGHM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	4	374
VGHM1217515	VGHM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	4	376
VGHM1415015	VGHM1415050	M14X1.5	6H	100	22.0	11.0	9.0	12	4	374
VGHM1420015	VGHM1420050	M14X2.0	6H	110	26.0	11.0	9.0	12	4	376
VGHM1615015	VGHM1615050	M16X1.5	6H	100	22.0	12.0	9.0	12	4	374
VGHM1620015	VGHM1620050	M16X2.0	6H	110	27.0	12.0	9.0	12	4	376
VGHM1815015	VGHM1815050	M18X1.5	6H	110	25.0	14.0	11.0	14	4	374
VGHM1825015	VGHM1825050	M18X2.5	6H	125	30.0	14.0	11.0	14	4	376
VGHM2015015	VGHM2015050	M20X1.5	6H	125	25.0	16.0	12.0	15	4	374
VGHM2025015	VGHM2025050	M20X2.5	6H	140	32.0	16.0	12.0	15	4	376
VGHM2215015	VGHM2215050	M22X1.5	6H	125	25.0	18.0	14.5	17	4	374
VGHM2225015	VGHM2225050	M22X2.5	6H	140	32.0	18.0	14.5	17	4	376
VGHM2415015	VGHM2415050	M24X1.5	6H	140	27.0	18.0	14.5	17	4	374
VGHM2420015	VGHM2420050	M24X2.0	6H	140	27.0	18.0	14.5	17	4	374
VGHM2430015	VGHM2430050	M24X3.0	6H	160	34.0	18.0	14.5	17	4	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○			○						○														

HSSE TAP(DIN TYPE)



SPIRAL TAPS

- Designed for high mass producution for general work pieces such as Cast Iron, C.Br, Plastics and so on

VQOM...series

DIN 371·374 376 | HSSE | 3~4 | UNCOATED | 15° HELIX

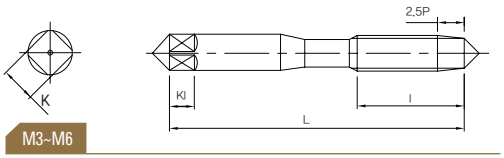
EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
VQOM0305025	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VQOM0407025	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VQOM0508025	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VQOM0610025	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VQOM0810025	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
VQOM0812525	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
VQOM1010025	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
VQOM1012525	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
VQOM1015025	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
VQOM1210025	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
VQOM1212525	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
VQOM1215025	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
VQOM1217525	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376
VQOM1415025	M14X1.5	6H	100	22.0	11.0	9.0	12	4	374
VQOM1420025	M14X2.0	6H	110	26.0	11.0	9.0	12	4	376
VQOM1615025	M16X1.5	6H	100	22.0	12.0	9.0	12	4	374
VQOM1620025	M16X2.0	6H	110	27.0	12.0	9.0	12	4	376
VQOM1815025	M18X1.5	6H	110	25.0	14.0	11.0	14	4	374
VQOM1825025	M18X2.5	6H	125	30.0	14.0	11.0	14	4	376
VQOM2015025	M20X1.5	6H	125	25.0	16.0	12.0	15	4	374
VQOM2025025	M20X2.5	6H	140	32.0	16.0	12.0	15	4	376
VQOM2215025	M22X1.5	6H	125	25.0	18.0	14.5	17	4	374
VQOM2225025	M22X2.5	6H	140	32.0	18.0	14.5	17	4	376
VQOM2415025	M24X1.5	6H	140	27.0	18.0	14.5	17	4	374
VQOM2420025	M24X2.0	6H	140	27.0	18.0	14.5	17	4	374
VQOM2430025	M24X3.0	6H	160	34.0	18.0	14.5	17	4	376

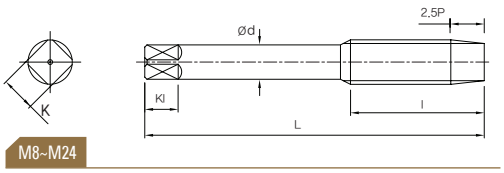
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
	○		◎								○	○	○	○	○	○	○	○	○				○

HSSE TAP(DIN TYPE)





SPIRAL TAPS

- Suitable for Carbon steel, Alloy steel and Nonferrous metals and the unique shape of the groove is de signed for high release of chips
- Suitable for tapping of blind holes
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

VQTM...series

DIN 371·374 376 | HSSE | 3~4 | TiN | 135° HELIX

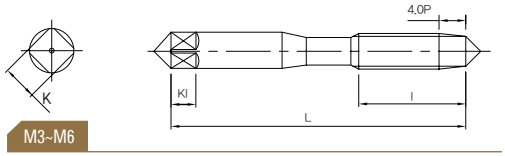
EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
VQTM0305025	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VQTM0407025	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VQTM0508025	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VQTM0610025	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VQTM0810025	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
VQTM0812525	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
VQTM1010025	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
VQTM1012525	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
VQTM1015025	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
VQTM1210025	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
VQTM1212525	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
VQTM1215025	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
VQTM1217525	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376
VQTM1415025	M14X1.5	6H	100	22.0	11.0	9.0	12	3	374
VQTM1420025	M14X2.0	6H	110	26.0	11.0	9.0	12	3	376
VQTM1615025	M16X1.5	6H	100	22.0	12.0	9.0	12	3	374
VQTM1620025	M16X2.0	6H	110	27.0	12.0	9.0	12	3	376
VQTM1815025	M18X1.5	6H	110	25.0	14.0	11.0	14	4	374
VQTM1825025	M18X2.5	6H	125	30.0	14.0	11.0	14	4	376
VQTM2015025	M20X1.5	6H	125	25.0	16.0	12.0	15	4	374
VQTM2025025	M20X2.5	6H	140	32.0	16.0	12.0	15	4	376
VQTM2215025	M22X1.5	6H	125	25.0	18.0	14.5	17	4	374
VQTM2225025	M22X2.5	6H	140	32.0	18.0	14.5	17	4	376
VQTM2415025	M24X1.5	6H	140	27.0	18.0	14.5	17	4	374
VQTM2420025	M24X2.0	6H	140	27.0	18.0	14.5	17	4	374
VQTM2430025	M24X3.0	6H	160	34.0	18.0	14.5	17	4	376

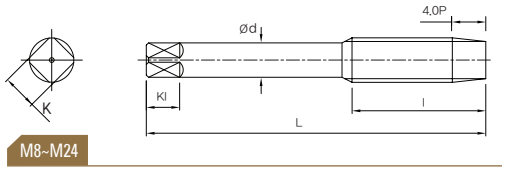
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○	○	○				○	○	○		○	○	○	○	○	○	○	○	○				○

HSSE TAP(DIN TYPE)





SPIRAL TAPS

- Designed for high mass producution for general work pieces such as Cast Iron, C.Br, Plastics and so on
- Suitable for tapping of through and blind holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

VQCM...series

DIN 371·374 376 | HSSE | 3~4 | TiCN | 15° HELIX

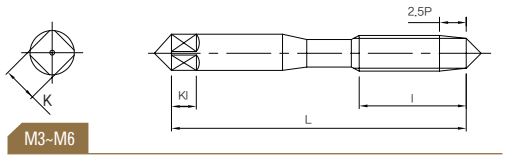
EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
VQCM0305025	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VQCM0407025	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VQCM0508025	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VQCM0610025	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VQCM0810025	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
VQCM0812525	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
VQCM1010025	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
VQCM1012525	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
VQCM1015025	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
VQCM1210025	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
VQCM1212525	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
VQCM1215025	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
VQCM1217525	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376
VQCM1415025	M14X1.5	6H	100	22.0	11.0	9.0	12	4	374
VQCM1420025	M14X2.0	6H	110	26.0	11.0	9.0	12	4	376
VQCM1615025	M16X1.5	6H	100	22.0	12.0	9.0	12	4	374
VQCM1620025	M16X2.0	6H	110	27.0	12.0	9.0	12	4	376
VQCM1815025	M18X1.5	6H	110	25.0	14.0	11.0	14	4	374
VQCM1825025	M18X2.5	6H	125	30.0	14.0	11.0	14	4	376
VQCM2015025	M20X1.5	6H	125	25.0	16.0	12.0	15	4	374
VQCM2025025	M20X2.5	6H	140	32.0	16.0	12.0	15	4	376
VQCM2215025	M22X1.5	6H	125	25.0	18.0	14.5	17	4	374
VQCM2225025	M22X2.5	6H	140	32.0	18.0	14.5	17	4	376
VQCM2415025	M24X1.5	6H	140	27.0	18.0	14.5	17	4	374
VQCM2420025	M24X2.0	6H	140	27.0	18.0	14.5	17	4	374
VQCM2430025	M24X3.0	6H	160	34.0	18.0	14.5	17	4	376

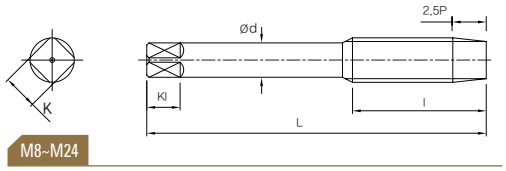
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○	○	○				○	○	○		○	○	○	○	○	○	○	○	○	○			○

HSSE TAP(DIN TYPE)





SPIRAL TAPS

- Suitable for Carbon steel, Alloy steel and Nonferrous metals and the unique shape of the groove is de signed for high release of chips

VQHM...series

DIN 371·374 376 | HSSE | 3~4 | HOMO | 35° HELIX

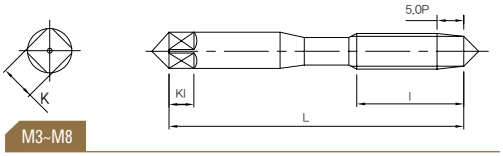
EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
VQHM0305025	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VQHM0407025	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VQHM0508025	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VQHM0610025	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VQHM0810025	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
VQHM0812525	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
VQHM1010025	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
VQHM1012525	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
VQHM1015025	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
VQHM1210025	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
VQHM1212525	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
VQHM1215025	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
VQHM1217525	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376
VQHM1415025	M14X1.5	6H	100	22.0	11.0	9.0	12	3	374
VQHM1420025	M14X2.0	6H	110	26.0	11.0	9.0	12	3	376
VQHM1615025	M16X1.5	6H	100	22.0	12.0	9.0	12	3	374
VQHM1620025	M16X2.0	6H	110	27.0	12.0	9.0	12	3	376
VQHM1815025	M18X1.5	6H	110	25.0	14.0	11.0	14	4	374
VQHM1825025	M18X2.5	6H	125	30.0	14.0	11.0	14	4	376
VQHM2015025	M20X1.5	6H	125	25.0	16.0	12.0	15	4	374
VQHM2025025	M20X2.5	6H	140	32.0	16.0	12.0	15	4	376
VQHM2215025	M22X1.5	6H	125	25.0	18.0	14.5	17	4	374
VQHM2225025	M22X2.5	6H	140	32.0	18.0	14.5	17	4	376
VQHM2415025	M24X1.5	6H	140	27.0	18.0	14.5	17	4	374
VQHM2420025	M24X2.0	6H	140	27.0	18.0	14.5	17	4	374
VQHM2430025	M24X3.0	6H	160	34.0	18.0	14.5	17	4	376

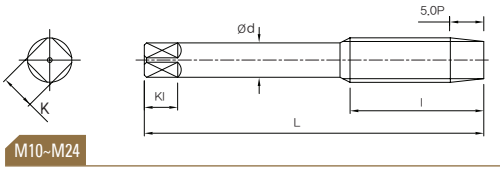
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○								○														○

HSSE TAP(DIN TYPE)





POINT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals

VDOM...series

DIN 371·374 376 | HSSE | 3 | UNCOATED | 0° HELIX

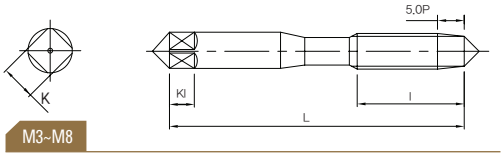
EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
VDOM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VDOM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VDOM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VDOM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VDOM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
VDOM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
VDOM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
VDOM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
VDOM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
VDOM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
VDOM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
VDOM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
VDOM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376
VDOM1415050	M14X1.5	6H	100	22.0	11.0	9.0	12	3	374
VDOM1420050	M14X2.0	6H	110	26.0	11.0	9.0	12	3	376
VDOM1615050	M16X1.5	6H	100	22.0	12.0	9.0	12	3	374
VDOM1620050	M16X2.0	6H	110	27.0	12.0	9.0	12	3	376
VDOM1815050	M18X1.5	6H	110	25.0	14.0	11.0	14	3	374
VDOM1825050	M18X2.5	6H	125	30.0	14.0	11.0	14	3	376
VDOM2015050	M20X1.5	6H	125	25.0	16.0	12.0	15	3	374
VDOM2025050	M20X2.5	6H	140	32.0	16.0	12.0	15	3	376
VDOM2215050	M22X1.5	6H	125	25.0	18.0	14.5	17	3	374
VDOM2225050	M22X2.5	6H	140	32.0	18.0	14.5	17	3	376
VDOM2415050	M24X1.5	6H	140	27.0	18.0	14.5	17	3	374
VDOM2420050	M24X2.0	6H	140	27.0	18.0	14.5	17	3	374
VDOM2430050	M24X3.0	6H	160	34.0	18.0	14.5	17	3	376

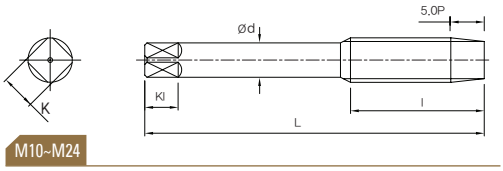
■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0,25%	C0,25% ~0,45%	C 0,45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
	○	○	◎							○	○	○	○	○	○	◎	○	○	○				○

HSSE TAP(DIN TYPE)





POINT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through holes
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

VDTM...series

DIN 371·374 376 | HSSE | 3 | TiN | 0° HELIX

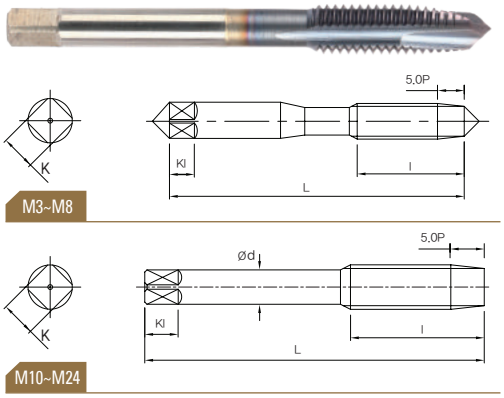
EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
VDTM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VDTM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VDTM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VDTM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VDTM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
VDTM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
VDTM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
VDTM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
VDTM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
VDTM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
VDTM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
VDTM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
VDTM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376
VDTM1415050	M14X1.5	6H	100	22.0	11.0	9.0	12	3	374
VDTM1420050	M14X2.0	6H	110	26.0	11.0	9.0	12	3	376
VDTM1615050	M16X1.5	6H	100	22.0	12.0	9.0	12	3	374
VDTM1620050	M16X2.0	6H	110	27.0	12.0	9.0	12	3	376
VDTM1815050	M18X1.5	6H	110	25.0	14.0	11.0	14	3	374
VDTM1825050	M18X2.5	6H	125	30.0	14.0	11.0	14	3	376
VDTM2015050	M20X1.5	6H	125	25.0	16.0	12.0	15	3	374
VDTM2025050	M20X2.5	6H	140	32.0	16.0	12.0	15	3	376
VDTM2215050	M22X1.5	6H	125	25.0	18.0	14.5	17	3	374
VDTM2225050	M22X2.5	6H	140	32.0	18.0	14.5	17	3	376
VDTM2415050	M24X1.5	6H	140	27.0	18.0	14.5	17	3	374
VDTM2420050	M24X2.0	6H	140	27.0	18.0	14.5	17	3	374
VDTM2430050	M24X3.0	6H	160	34.0	18.0	14.5	17	3	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0,25%	C0,25% ~0,45%	C 0,45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
○	○	○	○				◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○

HSSE TAP(DIN TYPE)



POINT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

DIN 371·374 376 | HSSE | 3 | TiCN | 0° HELIX

VDCM...series

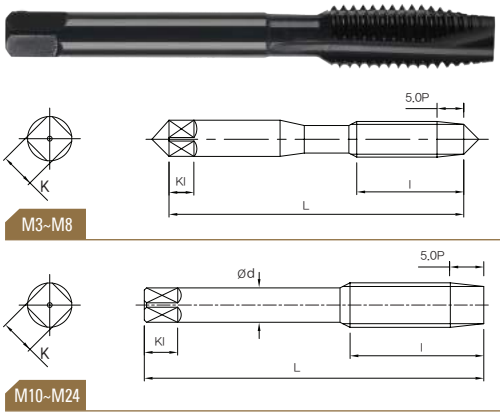
EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
VDCM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VDCM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VDCM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VDCM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VDCM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
VDCM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
VDCM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
VDCM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
VDCM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
VDCM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
VDCM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
VDCM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
VDCM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376
VDCM1415050	M14X1.5	6H	100	22.0	11.0	9.0	12	3	374
VDCM1420050	M14X2.0	6H	110	26.0	11.0	9.0	12	3	376
VDCM1615050	M16X1.5	6H	100	22.0	12.0	9.0	12	3	374
VDCM1620050	M16X2.0	6H	110	27.0	12.0	9.0	12	3	376
VDCM1815050	M18X1.5	6H	110	25.0	14.0	11.0	14	3	374
VDCM1825050	M18X2.5	6H	125	30.0	14.0	11.0	14	3	376
VDCM2015050	M20X1.5	6H	125	25.0	16.0	12.0	15	3	374
VDCM2025050	M20X2.5	6H	140	32.0	16.0	12.0	15	3	376
VDCM2215050	M22X1.5	6H	125	25.0	18.0	14.5	17	3	374
VDCM2225050	M22X2.5	6H	140	32.0	18.0	14.5	17	3	376
VDCM2415050	M24X1.5	6H	140	27.0	18.0	14.5	17	3	374
VDCM2420050	M24X2.0	6H	140	27.0	18.0	14.5	17	3	374
VDCM2430050	M24X3.0	6H	160	34.0	18.0	14.5	17	3	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
◎	◎	◎	○				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○

HSSE TAP(DIN TYPE)



POINT TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals
- Suitable for tapping of through holes
- By applying HOMO coating, it provides stable and highly efficient operation due to enhanced durability

VDHM...series

DIN 371·374 376 | HSSE | 3 | HOMO | 0° HELIX

EDP. No.	Thread Size	Limits	L	l	d	K	Kl	Flutes	DiN Type
VDHM0305050	M3X0.5	6H	56	11.0	3.5	2.7	6	3	371
VDHM0407050	M4X0.7	6H	63	13.0	4.5	3.4	6	3	371
VDHM0508050	M5X0.8	6H	70	15.0	6.0	4.9	8	3	371
VDHM0610050	M6X1.0	6H	80	17.0	6.0	4.9	8	3	371
VDHM0810050	M8X1.0	6H	90	17.0	6.0	4.9	8	3	374
VDHM0812550	M8X1.25	6H	90	20.0	8.0	6.2	9	3	371
VDHM1010050	M10X1.0	6H	90	18.0	7.0	5.5	8	3	374
VDHM1012550	M10X1.25	6H	100	22.0	7.0	5.5	8	3	374
VDHM1015050	M10X1.5	6H	100	22.0	10.0	8.0	11	3	371
VDHM1210050	M12X1.0	6H	100	18.0	9.0	7.0	10	3	374
VDHM1212550	M12X1.25	6H	100	22.0	9.0	7.0	10	3	374
VDHM1215050	M12X1.5	6H	100	22.0	9.0	7.0	10	3	374
VDHM1217550	M12X1.75	6H	110	24.0	9.0	7.0	10	3	376
VDHM1415050	M14X1.5	6H	100	22.0	11.0	9.0	12	3	374
VDHM1420050	M14X2.0	6H	110	26.0	11.0	9.0	12	3	376
VDHM1615050	M16X1.5	6H	100	22.0	12.0	9.0	12	3	374
VDHM1620050	M16X2.0	6H	110	27.0	12.0	9.0	12	3	376
VDHM1815050	M18X1.5	6H	110	25.0	14.0	11.0	14	3	374
VDHM1825050	M18X2.5	6H	125	30.0	14.0	11.0	14	3	376
VDHM2015050	M20X1.5	6H	125	25.0	16.0	12.0	15	3	374
VDHM2025050	M20X2.5	6H	140	32.0	16.0	12.0	15	3	376
VDHM2215050	M22X1.5	6H	125	25.0	18.0	14.5	17	3	374
VDHM2225050	M22X2.5	6H	140	32.0	18.0	14.5	17	3	376
VDHM2415050	M24X1.5	6H	140	27.0	18.0	14.5	17	3	374
VDHM2420050	M24X2.0	6H	140	27.0	18.0	14.5	17	3	374
VDHM2430050	M24X3.0	6H	160	34.0	18.0	14.5	17	3	376

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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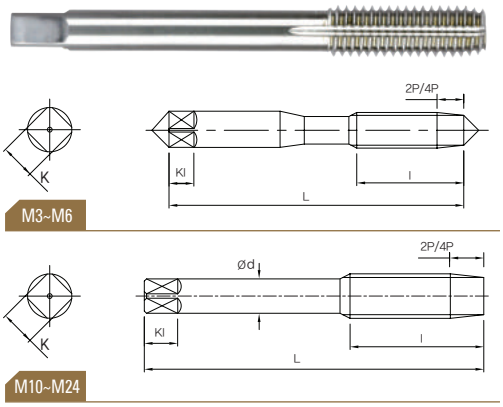
HSSE TAP(DIN TYPE)



ROLL TAPS

- Designed for high performance of threading Carbon steel, Alloy steel and Nonferrous metals

VMOM...series

HSSE UNCOATED

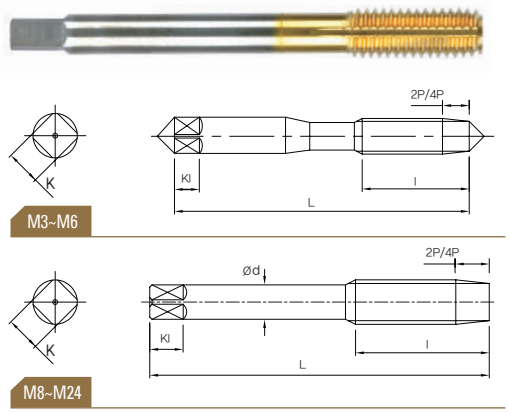
EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Oil Groove
2P	4P								
VMOM0305020S	-	M3x0.5	6HX	56	11.0	3.5	2.7	6	1
VMOM0305020M	VMOM0305040M	M3x0.5	6HX	56	11.0	3.5	2.7	6	4
VMOM0407020S	-	M4x0.7	6HX	63	13.0	4.5	3.4	6	1
VMOM0407020M	VMOM0407040M	M4x0.7	6HX	63	13.0	4.5	3.4	6	4
VMOM0508020S	-	M5x0.8	6HX	70	15.0	6.0	4.9	8	1
VMOM0508020M	VMOM0508040M	M5x0.8	6HX	70	15.0	6.0	4.9	8	4
VMOM0610020S	-	M6x1.0	6HX	80	17.0	6.0	4.9	8	1
VMOM0610020M	VMOM0610040M	M6x1.0	6HX	80	17.0	6.0	4.9	8	4
VMOM0810020S	-	M8x1.0	6HX	90	17.0	6.0	4.9	8	1
VMOM0810020M	VMOM0810040M	M8x1.0	6HX	90	17.0	6.0	4.9	8	4
VMOM0812520S	-	M8x1.25	6HX	90	20.0	8.0	6.2	9	1
VMOM0812520M	VMOM0812540M	M8x1.25	6HX	90	20.0	8.0	6.2	9	4
VMOM1010020S	-	M10x1.0	6HX	90	18.0	7.0	5.5	8	1
VMOM1010020M	VMOM1010040M	M10x1.0	6HX	90	18.0	7.0	5.5	8	4
VMOM1012520S	-	M10x1.25	6HX	100	22.0	7.0	5.5	8	1
VMOM1012520M	VMOM1012540M	M10x1.25	6HX	100	22.0	7.0	5.5	8	4
VMOM1015020S	-	M10x1.5	6HX	100	22.0	10.0	8.0	11	1
VMOM1015020M	VMOM1015040M	M10x1.5	6HX	100	22.0	10.0	8.0	11	4
VMOM1210020S	-	M12x1.0	6HX	100	18.0	9.0	7.0	10	1
VMOM1210020M	VMOM1210040M	M12x1.0	6HX	100	18.0	9.0	7.0	10	4
VMOM1212520S	-	M12x1.25	6HX	100	22.0	9.0	7.0	10	1
VMOM1212520M	VMOM1212540M	M12x1.25	6HX	100	22.0	9.0	7.0	10	4
VMOM1215020S	-	M12x1.5	6HX	100	22.0	9.0	7.0	10	1
VMOM1215020M	VMOM1215040M	M12x1.5	6HX	100	22.0	9.0	7.0	10	4
VMOM1217520S	-	M12x1.75	6HX	110	24.0	9.0	7.0	10	1
VMOM1217520M	VMOM1217540M	M12x1.75	6HX	100	24.0	9.0	7.0	10	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
												◎	◎	◎		◎	◎		◎				

HSSE TAP(DIN TYPE)



ROLL TAPS

- It is applicable regardless of steel or Nonferrous alloys
- By applying TiN coating, it provides stable and highly efficient operation due to enhanced durability

HSSE TiN

VMTM...series

EDP. No. 2P	EDP. No. 4P	Thread Size	Limits	L	l	d	K	Kl	Oil Groove
VMTM0305020S	-	M3x0.5	6HX	56	11	3.5	2.7	6	1
VMTM0305020M	VMTM0305040M	M3x0.5	6HX	56	11	3.5	2.7	6	4
VMTM0407020S	-	M4x0.7	6HX	63	13	4.5	3.4	6	1
VMTM0407020M	VMTM0407040M	M4x0.7	6HX	63	13	4.5	3.4	6	4
VMTM0508020S	-	M5x0.8	6HX	70	15	6.0	4.9	8	1
VMTM0508020M	VMTM0508040M	M5x0.8	6HX	70	15	6.0	4.9	8	4
VMTM0610020S	-	M6x1.0	6HX	80	17	6.0	4.9	8	1
VMTM0610020M	VMTM0610040M	M6x1.0	6HX	80	17	6.0	4.9	8	4
VMTM0810020S	-	M8x1.0	6HX	90	17	8.0	6.2	9	1
VMTM0810020M	VMTM0810040M	M8x1.0	6HX	90	17	8.0	6.2	9	4
VMTM0812520S	-	M8x1.25	6HX	90	20	8.0	6.2	9	1
VMTM0812520M	VMTM0812540M	M8x1.25	6HX	90	20	8.0	6.2	9	4
VMTM1010020S	-	M10x1.0	6HX	90	18	10.0	8.0	11	1
VMTM1010020M	VMTM1010040M	M10x1.0	6HX	90	18	10.0	8.0	11	4
VMTM1012520S	-	M10x1.25	6HX	100	22	10.0	8.0	11	1
VMTM1012520M	VMTM1012540M	M10x1.25	6HX	100	22	10.0	8.0	11	4
VMTM1015020S	-	M10x1.5	6HX	100	22	10.0	8.0	11	1
VMTM1015020M	VMTM1015040M	M10x1.5	6HX	100	22	10.0	8.0	11	4
VMTM1210020S	-	M12x1.0	6HX	100	18	9.0	7.0	10	1
VMTM1210020M	VMTM1210040M	M12x1.0	6HX	100	18	9.0	7.0	10	4
VMTM1212520S	-	M12x1.25	6HX	100	22	9.0	7.0	10	1
VMTM1212520M	VMTM1212540M	M12x1.25	6HX	100	22	9.0	7.0	10	4
VMTM1215020S	-	M12x1.5	6HX	100	22	9.0	7.0	10	1
VMTM1215020M	VMTM1215040M	M12x1.5	6HX	100	22	9.0	7.0	10	4
VMTM1217520S	-	M12x1.75	6HX	110	24	9.0	7.0	10	1
VMTM1217520M	VMTM1217540M	M12x1.75	6HX	110	24	9.0	7.0	10	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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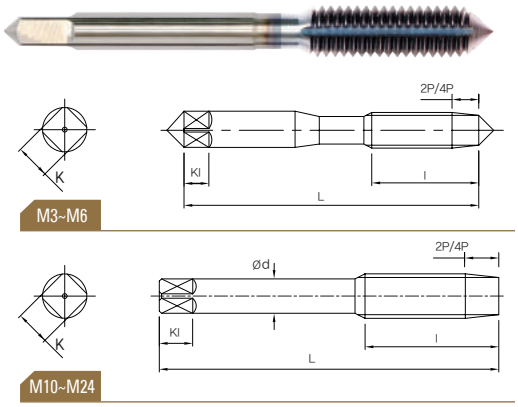
HSSE TAP(DIN TYPE)



ROLL TAPS

- Designed for high mass producution for general work pieces such as Cast Iron, C.Br, Plastics and so on
- Suitable for tapping of through and blind holes
- By applying TiCN coating, it provides stable and highly efficient operation due to enhanced durability

HSSE TiCN

VMCM...series

EDP. No.		Thread Size	Limits	L	l	d	K	Kl	Oil Groove
2P	4P								
VMCM0305020S	-	M3x0.5	6HX	56	11	3.5	2.7	6	1
VMCM0305020M	VMCM0305040M	M3x0.5	6HX	56	11	3.5	2.7	6	4
VMCM0407020S	-	M4x0.7	6HX	63	13	4.5	3.4	6	1
VMCM0407020M	VMCM0407040M	M4x0.7	6HX	63	13	4.5	3.4	6	4
VMCM0508020S	-	M5x0.8	6HX	70	15	6.0	4.9	8	1
VMCM0508020M	VMCM0508040M	M5x0.8	6HX	70	15	6.0	4.9	8	4
VMCM0610020S	-	M6x1.0	6HX	80	17	6.0	4.9	8	1
VMCM0610020M	VMCM0610040M	M6x1.0	6HX	80	17	6.0	4.9	8	4
VMCM0810020S	-	M8x1.0	6HX	90	17	8.0	6.2	9	1
VMCM0810020M	VMCM0810040M	M8x1.0	6HX	90	17	8.0	6.2	9	4
VMCM0812520S	-	M8x1.25	6HX	90	20	8.0	6.2	9	1
VMCM0812520M	VMCM0812540M	M8x1.25	6HX	90	20	8.0	6.2	9	4
VMCM1010020S	-	M10x1.0	6HX	90	18	10.0	8.0	11	1
VMCM1010020M	VMCM1010040M	M10x1.0	6HX	90	18	10.0	8.0	11	4
VMCM1012520S	-	M10x1.25	6HX	100	22	10.0	8.0	11	1
VMCM1012520M	VMCM1012540M	M10x1.25	6HX	100	22	10.0	8.0	11	4
VMCM1015020S	-	M10x1.5	6HX	100	22	10.0	8.0	11	1
VMCM1015020M	VMCM1015040M	M10x1.5	6HX	100	22	10.0	8.0	11	4
VMCM1210020S	-	M12x1.0	6HX	100	18	9.0	7.0	10	1
VMCM1210020M	VMCM1210040M	M12x1.0	6HX	100	18	9.0	7.0	10	4
VMCM1212520S	-	M12x1.25	6HX	100	22	9.0	7.0	10	1
VMCM1212520M	VMCM1212540M	M12x1.25	6HX	100	22	9.0	7.0	10	4
VMCM1215020S	-	M12x1.5	6HX	100	22	9.0	7.0	10	1
VMCM1215020M	VMCM1215040M	M12x1.5	6HX	100	22	9.0	7.0	10	4
VMCM1217520S	-	M12x1.75	6HX	110	24	9.0	7.0	10	1
VMCM1217520M	VMCM1217540M	M12x1.75	6HX	110	24	9.0	7.0	10	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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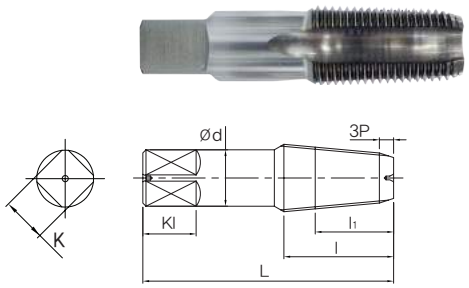
PIPE TAP(PT TYPE)



PT PIPE TAPS

VSOPT...series

4 UNCOATED

EDP. No.	Thread Size	Tap Limit	Basic Major Dia(mm)	L	l	l_1	d	K	Kl	Flutes
VSOPT1/16	1/16-28	JIS II	7.723	55	19	13.00	8	6	9	4
VSOPT1/8	1/8-28	JIS II	9.728	55	19	13.00	8	6	9	4
VSOPT1/4	1/4-19	JIS II	13.157	62	28	21.00	11	9	12	4
VSOPT3/8	3/8-19	JIS II	16.662	65	28	21.00	14	11	14	4
VSOPT1/2	1/2-14	JIS II	20.955	80	35	25.00	18	14	17	4
VSOPT3/4	3/4-14	JIS II	26.441	85	35	25.00	23	17	20	4
VSOPT1	1-11	JIS II	33.249	95	45	32.00	26	21	24	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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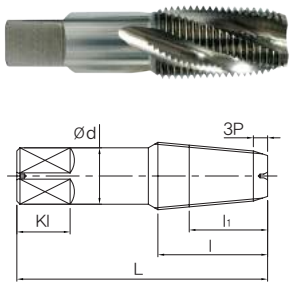
PIPE TAP(PT TYPE)



PT SPIRAL PIPE TAPS

VPOPT...series

EDP. No.	Thread Size	Tap Limit	Basic Major Dia(mm)	L	l	L_1	d	K	Kl	Flutes
VPOPT1/16	1/16-28	JIS II	7.723	55	19	13.00	8	6	9	3
VPOPT1/8	1/8-28	JIS II	9.728	55	19	13.00	8	6	9	3
VPOPT1/4	1/4-19	JIS II	13.157	62	28	21.00	11	9	12	3
VPOPT3/8	3/8-19	JIS II	16.662	65	28	21.00	14	11	14	3
VPOPT1/2	1/2-14	JIS II	20.955	80	35	25.00	18	14	17	4
VPOPT3/4	3/4-14	JIS II	26.441	85	35	25.00	23	17	20	4
VPOPT1	1-11	JIS II	33.249	95	45	32.00	26	21	24	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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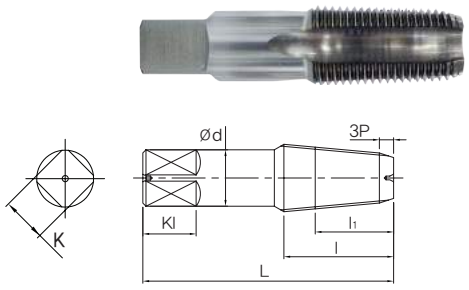
PIPE TAP(NPT TYPE)



NPT PIPE TAPS

VSONPT...series

4 UNCOATED

EDP. No.	Thread Size	Tap Limit	Basic Major Dia(mm)	L	l	l1	d	K	Kl	Flutes
VSONPT1/16	1/16-27	ANSI G	7.770	55	19	12.00	8	6	9	4
VSONPT1/8	1/8-27	ANSI G	10.117	55	19	12.05	8	6	9	4
VSONPT1/4	1/4-18	ANSI G	13.426	62	28	17.45	11	9	12	4
VSONPT3/8	3/8-18	ANSI G	16.866	65	28	17.65	14	11	14	4
VSONPT1/2	1/2-14	ANSI G	20.980	80	35	22.85	18	14	17	4
VSONPT3/4	3/4-14	ANSI G	26.325	85	35	22.95	23	17	20	4
VSONPT1	1-11½	ANSI G	32.934	95	45	27.40	26	21	24	4

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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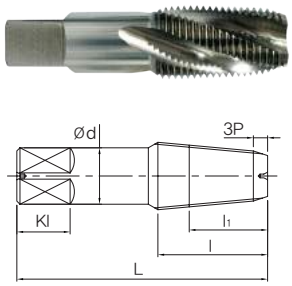
PIPE TAP(NPT TYPE)



NPT SPIRAL PIPE TAPS

VPONPT...series

EDP. No.	Thread Size	Tap Limit	Basic Major Dia(mm)	L	l	L_1	d	K	Kl	Flutes
VPONPT1/16	1/16-27	ANSI G	7.770	55	19	12.00	8	6	9	3
VPONPT1/8	1/8-27	ANSI G	10.117	55	19	12.05	8	6	9	3
VPONPT1/4	1/4-18	ANSI G	13.426	62	28	17.45	11	9	12	3
VPONPT3/8	3/8-18	ANSI G	16.866	65	28	17.65	14	11	14	3
VPONPT1/2	1/2-14	ANSI G	20.980	80	35	22.85	18	14	17	4
VPONPT3/4	3/4-14	ANSI G	26.325	85	35	22.95	23	17	20	4
VPONPT1	1-11½	ANSI G	32.934	95	45	27.40	26	21	24	4

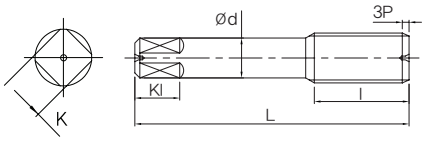
※Production other than the above requirement is possible when requested separately

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
	○		○						○									◎					

PIPE TAP(PS TYPE)



PS PIPE TAPS

VSOPS...series

4 UNCOATED

EDP. No.	Thread Size	Tap Limit	Basic Major Dia(mm)	L	l	d	K	Kl	Flutes
VSOPS1/8	1/8-28	JIS II	9.728	55	19	8	6	9	4
VSOPS1/4	1/4-19	JIS II	13.157	62	28	11	9	12	4
VSOPS3/8	3/8-19	JIS II	16.662	65	28	14	11	14	4
VSOPS1/2	1/2-14	JIS II	20.955	80	35	18	14	17	4
VSOPS3/4	3/4-14	JIS II	26.441	85	35	23	17	20	4
VSOPS1	1-11	JIS II	33.249	95	45	26	21	24	4

※Production other than the above requirement is possible when requested separately

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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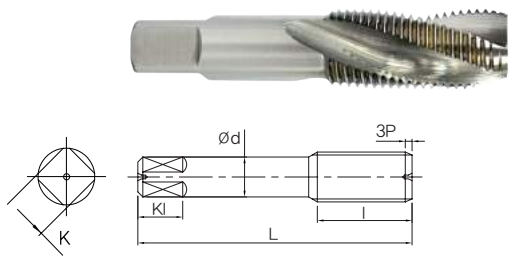
PIPE TAP(PS TYPE)



PS SPIRAL PIPE TAPS

VPOPS...series

EDP. No.	Thread Size	Tap Limit	Basic Major Dia(mm)	L	l	d	K	Kl	Flutes
VPOPS1/8	1/8-28	JIS II	9.728	55	19	8	6	9	3
VPOPS1/4	1/4-19	JIS II	13.157	62	28	11	9	12	3
VPOPS3/8	3/8-19	JIS II	16.662	65	28	14	11	14	3
VPOPS1/2	1/2-14	JIS II	20.955	80	35	18	14	17	4
VPOPS3/4	3/4-14	JIS II	26.441	85	35	23	17	20	4
VPOPS1	1-11	JIS II	33.249	95	45	26	21	24	4

※Production other than the above requirement is possible when requested separately

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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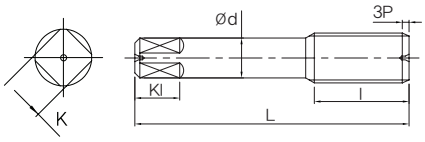
PIPE TAP(PF TYPE)



PF PIPE TAPS

VSOPF...series

4 UNCOATED

EDP. No.	Thread Size	Tap Limit	Basic Major Dia(mm)	L	l	d	K	Kl	Flutes
VSOPF1/8	1/8-28	JIS II	9.728	55	19	8	6	9	4
VSOPF1/4	1/4-19	JIS II	13.157	62	28	11	9	12	4
VSOPF3/8	3/8-19	JIS II	16.662	65	28	14	11	14	4
VSOPF1/2	1/2-14	JIS II	20.955	80	35	18	14	17	4
VSOPF3/4	3/4-14	JIS II	26.441	85	35	23	17	20	4
VSOPF1	1-11	JIS II	33.249	95	45	26	21	24	4

※Production other than the above requirement is possible when requested separately

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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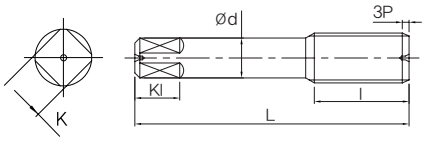
PIPE TAP(PF TYPE)



PF SPIRAL PIPE TAPS

VPOPF...series

EDP. No.	Thread Size	Tap Limit	Basic Major Dia(mm)	L	l	d	K	Kl	Flutes
VPOPF1/8	1/8-28	JIS II	9.728	55	19	8	6	9	3
VPOPF1/4	1/4-19	JIS II	13.157	62	28	11	9	12	3
VPOPF3/8	3/8-19	JIS II	16.662	65	28	14	11	14	3
VPOPF1/2	1/2-14	JIS II	20.955	80	35	18	14	17	4
VPOPF3/4	3/4-14	JIS II	26.441	85	35	23	17	20	4
VPOPF1	1-11	JIS II	33.249	95	45	26	21	24	4

※Production other than the above requirement is possible when requested separately

■ Applicable Working Material

○:General Application ◎:The most suitable Application

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Stainless Steels	Tool Steels	Cast Steels	Cast Iron	Ductile Cast Iron	Copper	Brass	Brass Casting	Bronze	Aluminum Pressed Material	Aluminum Alloy Casting	Magnesium Alloy Casting	Zinc Alloy Casting	Titanium Alloyes	Ni based Alloy	Thermo-sclerosis Plastic	Thermo Plastic
C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRc	45~55 HRc	50~60 HRc	SUS	SKD	SC	FC	FCD	Cu	Bs	BsC	PB	AL	AC,ADC	MC	ZDC				
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MEMO

2

ENDMILL SERIES >

WIDIN®

2

Endmills for high hardened steel
(Zamus Star Series) 119

Endmills for Stainless Steel
(Neo Classic X-STAR Series) 185

Endmills for hardened steel
(Zamus Classic Series) 227

Endmills for general steel
(Zamus Thunder Series) 323

Endmills for difficult to cut materials
(Sus-wave Series) 353

Endmills for copper
(Zamus Copper-Mate Series) 359

Endmills for Diamond and Composite Material
(Zamus Gra-Mate Series) 363

Endmills for Aluminum
(Alu-Wave Series) 375

Standard EndMills
(Standard EndMill Series) 407

Endmills for Mold & Die
(Winner Series) 426

Endmills for high hardened steel

ZAMUS STAR SERIES

ENDMILL SERIES

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
DA702 ...series		STUB CUT LENGTH with EXTENDED NECK	INCH	•	121
ZB702A ...series		12° STUB CUT LENGTH, BALL NOSE with EXTENDED NECK	INCH	•	122
DA703 ...series		STUB CUT LENGTH for FINISHING	INCH	•	123
DA734 ...series		BALL NOSE, FINISHING for MOLD & DIE	INCH	•	124
ZS204A ...series		CORNER RADIUS VARIABLE HELIX	INCH	•	125
ZE712A ...series		35° HELIX REGULAR LENGTH	INCH	•	126
ZE714A ...series		45° HELIX REGULAR LENGTH	INCH	•	127
ZE716A ...series		50° HELIX REGULAR LENGTH	INCH	•	128
ZR706A ...series		45° HELIX STUB CUT LENGTH with EXTENDED NECK	INCH	•	129
ZSPM4A ...series		STUB CUT LENGTH with EXTENDED NECK	INCH	•	130
ZSLNS20 ...series		LONG NECK	METRIC	•	131
ZSLNS40 ...series		LONG NECK	METRIC	•	136
ZSLNB ...series		LONG NECK	METRIC	•	138
ZSLNR ...series		LONG NECK & BACK DRAFT TYPE	METRIC	•	142
ZSTNB20 ...series		TAPER NECK & BACK DRAFT TYPE	METRIC	•	146
ZSTNB30 ...series		TAPER NECK & BACK DRAFT TYPE	METRIC	•	150
ZSTNR ...series		TAPER NECK & BACK DRAFT TYPE	METRIC	•	151
ZS124 ...series		LONG LENGTH CUT, VARIABLE FLUTE	METRIC	•	153
ZS1(2)04 ...series		CORNER RADIUS, VARIABLE HELIX	METRIC	•	154
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NEXT ≫

Endmills for high hardened steel _ ZAMUS STAR SERIES

WIDIN

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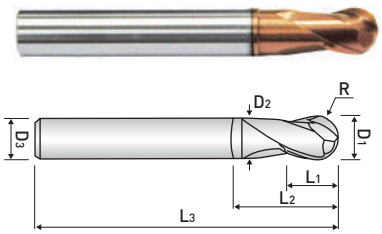
Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed to machine high hardened materials up to HRc70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating
- Excellent workpiece finishes

DA702 ...series

ULTRA FINE | HELIX | R1/64~R1/8 | R5/32~R1/4 | p.933

EDP. No.	D1	R	L1	L2	L3	D2	D3
DA702001	1/32	1/64	1/32	1/16	2	.029	1/4
DA702002	1/16	1/32	1/16	1/8	2	.059	1/4
DA702003	3/32	3/64	3/32	3/16	2	.090	1/4
DA702004	1/8	1/16	1/8	1/4	2-1/2	.121	1/4
DA702006	3/16	3/32	3/16	3/8	3	.184	1/4
DA702008	1/4	1/8	1/4	1/2	3-1/2	.246	1/4
DA702010	5/16	5/32	5/16	5/8	4	.309	5/16
DA702012	3/8	3/16	3/8	3/4	4	.371	3/8
DA702016	1/2	1/4	1/2	1	4-1/2	.496	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

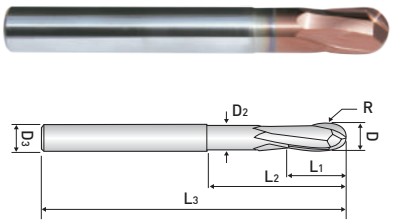
○:General Application ◎:The most suitable Application

■ Tolerance

Diameter	Tolerance(Inch)	Shank Dia.
up to 1/4	±0.002	h6
over 1/4	±0.004	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, 12° HELIX STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed for high hardened materials up to HRc70
- Suitable for high speed machining

ZB702A ...series

ULTRA FINE | HELIX | R3/32~R1/8 | R3/16~R5/16 | p.933

EDP. No.	D1	R	L1	L2	L3	D2	D3
ZB702A012093	3/16	3/32	.265	.650	2	.184	3/16
ZB702A012093L	3/16	3/32	.265	1.3	4	.184	3/16
ZB702A016125	1/4	1/8	.350	.800	3	.245	1/4
ZB702A016125L	1/4	1/8	.350	1.6	6	.245	1/4
ZB702A024187	3/8	3/16	.460	1.27	3	.368	3/8
ZB702A024187L	3/8	3/16	.460	2.1	6	.368	3/8
ZB702A032250	1/2	1/4	.625	1.39	4	.490	1/2
ZB702A032250L	1/2	1/4	.625	2.3	6	.490	1/2
ZB702A040312	5/8	5/16	.750	1.66	4	.610	5/8
ZB702A040312L	5/8	5/16	.750	2.6	6	.610	5/8

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

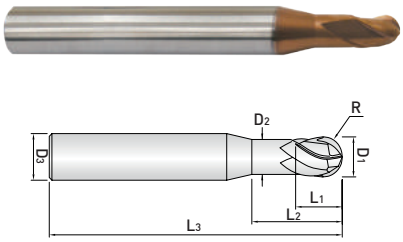
○:General Application ◎:The most suitable Application

■ Tolerance

Diameter	Radius(Inch)	Shank Dia.
up to 1/4	±0.002	h6
over 1/4	±0.004	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



3 FLUTE, STUB CUT LENGTH, BALL NOSE, for FINISHING

- Designed to machine high hardened materials up to HRc70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating
- Excellent workpiece finishes

DA703 ...series

ULTRA FINE | HELIX | R1/64~R1/8 | R5/32~R1/4 | p.933

EDP. No.	D1	R	L1	L2	L3	D2	D3
DA703002	1/16	1/32	1/16	1/8	2	.059	1/4
DA703003	3/32	3/64	3/32	3/16	2	.090	1/4
DA703004	1/8	1/16	1/8	1/4	2	.121	1/4
DA703006	3/16	3/32	3/16	3/8	2	.184	1/4
DA703008	1/4	1/8	1/4	1/2	2-1/4	.246	1/4
DA703010	5/16	5/32	5/16	5/8	2-1/2	.309	5/16
DA703012	3/8	3/16	3/8	3/4	3	.371	3/8
DA703016	1/2	1/4	1/2	1	3	.496	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

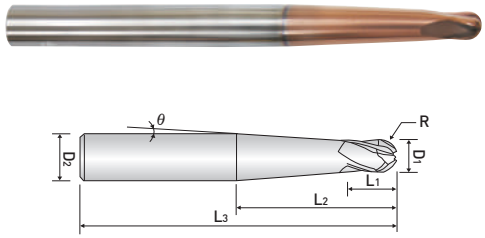
○:General Application ◎:The most suitable Application

■ Tolerance

Diameter	Radius(Inch)	Shank Dia.
up to 1/4	±0.002	h6
over 1/4	±0.004	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, BALL NOSE, FINISHING for DIE & MOLD

- Designed to machine high hardened materials up to HRc70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finishes

DA734 ...series

ULTRA FINE | HELIX | p.933

EDP. No.	D_1	R	L_1	L_2	L_3	θ	D_2
DA734004	1/8	1/16	1/8	1.57	3	2.5	1/4
DA734005	5/32	5/64	5/32	1.25	3	2.5	1/4
DA734006	3/16	3/32	3/16	.92	3	2.5	1/4
DA734008	1/4	1/8	1/4	1.70	4	2.5	3/8
DA734010	5/16	5/32	5/16	1.04	4	2.5	3/8
DA734012	3/8	3/16	3/8	1.82	5	2.5	1/2
DA734016	1/2	1/4	1/2	1.95	5	-	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

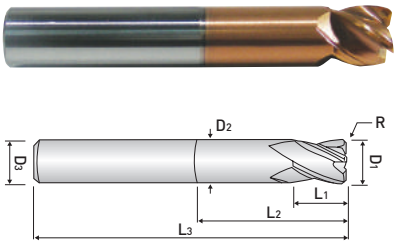
○:General Application ◎:The most suitable Application

■ Tolerance

Radius(Inch)	Shank Dia.
±0.004	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, CORNER RADIUS VARIABLE HELIX

- The impacting debut of new type endmill for high hardened steels up to HRc70 and high speed machining up to 200m/min
- High precision and excellent surface due to each 4F variable helix geometry
- Longer tool life over 50% as reducing chatter and resonance

ZS204A ...series

ULTRA FINE | 4 | 38° HELIX | R ±0.0004 Φ1/8~Φ1/4 | R ±0.0006 Φ5/16~Φ1/2 | AlTiN HH | DATA p.951

EDP. No.	D1	R	L1	L2	L3	D2	D3
ZS204A008010	1/8	.010	5/32	3/4	1-1/2	.115	1/8
ZS204A008015	1/8	.015	5/32	3/4	1-1/2	.115	1/8
ZS204A012010	3/16	.010	1/4	1	2	.175	3/16
ZS204A012015	3/16	.015	1/4	1	2	.175	3/16
ZS204A016020	1/4	.020	5/16	1	2-1/2	.230	1/4
ZS204A016060	1/4	.060	5/16	1	2-1/2	.230	1/4
ZS204A016060L	1/4	.060	5/16	1-1/2	3	.230	1/4
ZS204A020020	5/16	.020	3/8	1	2-1/2	.288	5/16
ZS204A020060	5/16	.060	3/8	1	2-1/2	.288	5/16
ZS204A024030	3/8	.030	7/16	1	2-1/2	.345	3/8
ZS204A024080	3/8	.080	7/16	1	2-1/2	.345	3/8
ZS204A024080L	3/8	.080	7/16	2	3-1/2	.345	3/8
ZS204A028030	7/16	.030	1/2	1-1/8	3	.403	7/16
ZS204A028080	7/16	.080	1/2	1-1/8	3	.403	7/16
ZS204A032030	1/2	.030	9/16	1-1/4	3	.460	1/2
ZS204A032060	1/2	.060	9/16	1-1/4	3	.460	1/2
ZS204A032090	1/2	.090	9/16	1-1/4	3	.460	1/2
ZS204A032090L	1/2	.090	9/16	2-1/4	4	.460	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

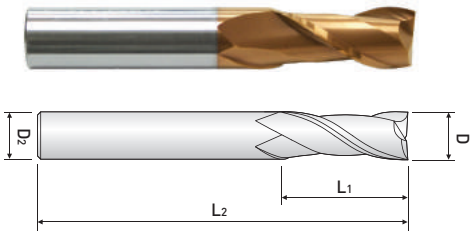
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia.(inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, 35° HELIX, REGULAR LENGTH

- Designed to machine high hardened materials up to HRc70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZE712A ....series

ULTRA FINE | HELIX | p.950

EDP. No.	D	C.L	OAL	SH.Dia.
ZE712A004	1/16	3/16	1-1/2	1/8
ZE712A008	1/8	1/2	1-1/2	1/8
ZE712A012	3/16	5/8	2	3/16
ZE712A016	1/4	3/4	2-1/2	1/4
ZE712A020	5/16	13/16	2-1/2	5/16
ZE712A024	3/8	1	2-1/2	3/8
ZE712A032	1/2	1	3	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

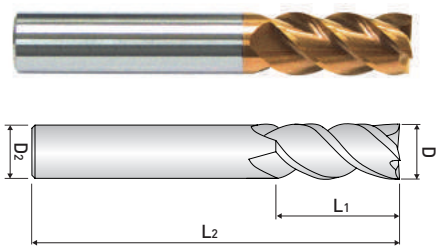
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, 45° HELIX, REGULAR LENGTH

- Designed to machine high hardened materials up to HRc70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZE714A ....series

ULTRA FINE | HELIX | p.951

EDP. No.	D	C.L	OAL	SH.Dia.
ZE714A004	1/16	3/16	1-1/2	1/8
ZE714A008	1/8	1/2	1-1/2	1/8
ZE714A012	3/16	5/8	2	3/16
ZE714A016	1/4	3/4	2-1/2	1/4
ZE714A020	5/16	13/16	2-1/2	5/16
ZE714A024	3/8	1	2-1/2	3/8
ZE714A032	1/2	1	3	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

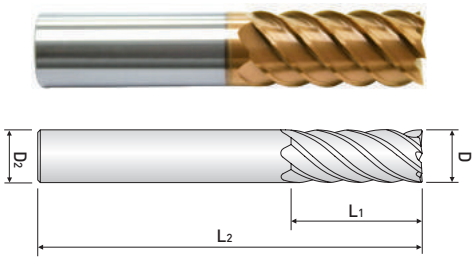
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



6 FLUTE, 50° HELIX REGULAR LENGTH

- Designed to machine high hardened materials up to HRc70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZE716A ....series

ULTRA FINE | HELIX | p.949

EDP. No.	D	C.L	OAL	SH.Dia.
ZE716A016	1/4	1/2	2-1/4	1/4
ZE716A020	5/16	3/4	2-1/2	5/16
ZE716A024	3/8	7/8	2-7/8	3/8
ZE716A032	1/2	1	3-1/4	1/2
ZE716A040	5/8	1-1/4	3-5/8	5/8
ZE716A048	3/4	1-1/2	4-1/8	3/4

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

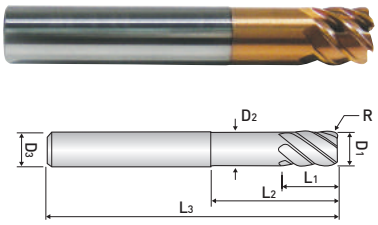
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



6 FLUTE, 45° HELIX STUB CUT LENGT, CORNER RADIUS with EXTENDED NECK

- Applied various corner "R" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR706A .....series

ULTRA FINE | HELIX | Φ1/8~Φ1/4 | Φ5/16~Φ1/2 | p.949

EDP. No.	D1	R	L1	L2	L3	D2	D3
ZR706A01220	3/16	.020	.265	.650	2	.184	1/4
ZR706A01230	3/16	.030	.265	.650	2	.184	1/4
ZR706A01220L	3/16	.020	.265	1.3	4	.184	1/4
ZR706A01230L	3/16	.030	.265	1.3	4	.184	1/4
ZR706A01620	1/4	.020	.350	.800	3	.245	1/4
ZR706A01630	1/4	.030	.350	.800	3	.245	1/4
ZR706A01620L	1/4	.020	.350	1.6	6	.245	1/4
ZR706A01630L	1/4	.030	.350	1.6	6	.245	1/4
ZR706A02020	5/16	.020	.400	1.130	3	.306	5/16
ZR706A02020	5/16	.030	.400	1.130	3	.306	5/16
ZR706A02030L	5/16	.020	.400	1.8	6	.306	5/16
ZR706A02030L	5/16	.030	.400	1.8	6	.306	5/16
ZR706A02420	3/8	.020	.460	1.270	3	.368	3/8
ZR706A02430	3/8	.030	.460	1.270	3	.368	3/8
ZR706A02420L	3/8	.020	.460	2.1	6	.368	3/8
ZR706A02430L	3/8	.030	.460	2.1	6	.368	3/8
ZR706A03230S**	1/2	.030	.625	1.390	3	.490	1/2
ZR706A03230	1/2	.030	.625	1.390	4	.490	1/2
ZR706A03260	1/2	.060	.625	1.390	4	.490	1/2
ZR706A03230L	1/2	.030	.625	2.3	6	.490	1/2
ZR706A03260L	1/2	.060	.625	2.3	6	.490	1/2

** : Available while supplies last

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
	○	○	◎	◎	○				

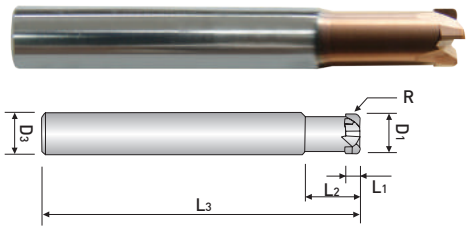
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
±.0004	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, STUB CUT LENGTH, with EXTENDED NECK

- Designed to machine high hardened material by using newly developed raw-material and new coating
- Applying straight flute design on the tool to minimize the corner radius breakage
- Applying backdraft type on the tool to maximize the reducing chatter and preventing deflection

ZSPM4A ...series

ULTRA FINE HELIX

EDP. No.	D_1	R	L_1	L_2	L_3	D_3
ZSPM4A008	1/8	1/32	.063	3/8	2-1/4	1/4
ZSPM4A012	3/16	1/16	.094	9/16	2-1/4	1/4
ZSPM4A016	1/4	1/16	.10	1/2	2-1/4	1/4
ZSPM4A016L	1/4	1/16	.10	1	3	1/4
ZSPM4A020	5/16	3/32	.13	5/8	2-1/2	5/16
ZSPM4A020L	5/16	3/32	.13	1-1/4	3	5/16
ZSPM4A024	3/8	3/32	.15	3/4	3	3/8
ZSPM4A024L	3/8	3/32	.15	1-1/2	4	3/8
ZSPM4A032	1/2	1/8	.20	1	3	1/2
ZSPM4A032L	1/2	1/8	.20	2	5	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

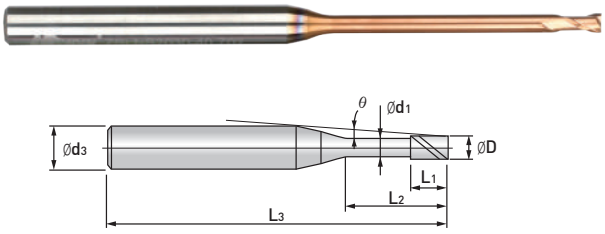
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

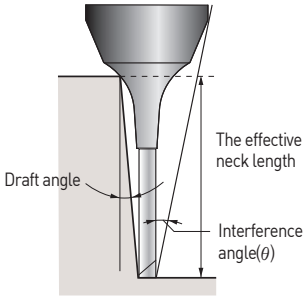
ZSLNS20....-.. series

ULTRA FINE HELIX p.968

EDP. No.	Dimension(mm)							Effective Neck Length				
	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNS2001-0.3	0.1	0.3	0.15	0.08	45	4	11.6	0.4	0.4	0.5	0.5	0.5
ZSLNS2001-0.5		0.5					11.4	0.6	0.7	0.7	0.7	0.8
ZSLNS2001-1		1					10.9	1.2	1.2	1.2	1.3	1.4
ZSLNS2002-0.5	0.2	0.5	0.3	0.17	50	4	11.3	1.2	1.3	1.5	1.7	2.0
ZSLNS2002-1		1					10.8	1.7	1.9	2.2	2.4	2.7
ZSLNS2002-1.5		1.5					10.3	2.3	2.5	2.8	3.0	3.4
ZSLNS2003-1	0.3	1	0.45	0.27	50	4	10.8	1.7	1.9	2.2	2.4	2.7
ZSLNS2003-1.5		1.5					10.3	2.3	2.5	2.8	3.0	3.4
ZSLNS2003-2		2					9.8	2.8	3.1	3.4	3.6	4.1
ZSLNS2003-2.5		2.5					9.4	3.4	3.7	4.0	4.3	4.7
ZSLNS2003-3		3					9.0	3.9	4.3	4.6	4.9	5.4
ZSLNS2004-1	0.4	1	0.6	0.37	50	4	10.7	1.7	1.9	2.2	2.4	2.7
ZSLNS2004-1.5		1.5					10.2	2.3	2.5	2.8	3.0	3.4
ZSLNS2004-2		2					9.7	2.8	3.1	3.4	3.6	4.1
ZSLNS2004-2.5		2.5					9.3	3.4	3.7	4.0	4.3	4.7
ZSLNS2004-3		3					8.9	3.9	4.3	4.6	4.9	5.4
ZSLNS2004-3.5		3.5					8.6	4.5	4.9	5.2	5.5	6.0
ZSLNS2004-4		4					8.2	5.0	5.4	5.8	6.1	6.6
ZSLNS2004-5		5					7.6	6.1	6.6	6.9	7.3	7.8
ZSLNS2004-6		6					7.1	7.2	7.7	8.1	8.4	9.0
ZSLNS2005-1	0.5	1	0.75	0.47	50	4	10.7	1.7	1.9	2.2	2.4	2.7
ZSLNS2005-1.5		1.5					10.2	2.3	2.5	2.8	3.0	3.4
ZSLNS2005-2		2					9.7	2.8	3.1	3.4	3.6	4.1
ZSLNS2005-2.5		2.5					9.3	3.4	3.7	4.0	4.3	4.7
ZSLNS2005-3		3					8.9	3.9	4.3	4.6	4.9	5.4
ZSLNS2005-4		4					8.1	5.0	5.4	5.8	6.1	6.6
ZSLNS2005-5		5					7.5	6.1	6.6	6.9	7.3	7.8
ZSLNS2005-6		6					7.0	7.2	7.7	8.1	8.4	9.0
ZSLNS2005-8		8					6.2	9.3	9.9	10.3	10.7	11.4
ZSLNS2006-2	0.6	2	0.9	0.57	50	4	9.6	2.8	3.1	3.4	3.6	4.1
ZSLNS2006-4		4					8.1	5.0	5.4	5.8	6.1	6.6
ZSLNS2006-6		6					6.9	7.2	7.7	8.1	8.4	9.0
ZSLNS2006-8		8					6.1	9.3	9.9	10.3	10.7	11.4
ZSLNS2006-10		10					5.4	11.5	12.1	12.6	13.0	13.7

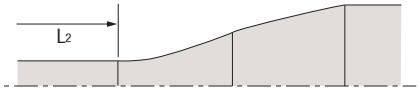
NEXT

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

- If the workpiece has draft angle, the interference length will be longer than the L2.
- Please refer to the effective neck length for the various draft angles
- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2," and should also be referred to



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ULTRA FINE HELIX p.968

ZSLNS20....-.. series

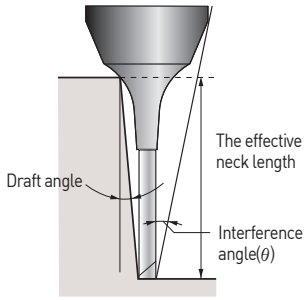
EDP. No.	Dimension(mm)							Effective Neck Length				
	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNS2007-2	0.7	2	1.05	0.67	50	4	9.6	2.8	3.1	3.4	3.6	4.1
ZSLNS2007-4		4					8.0	5.0	5.4	5.8	6.1	6.6
ZSLNS2007-6		6					6.9	7.2	7.7	8.1	8.4	9.0
ZSLNS2007-8		8					6.0	9.3	9.9	10.3	10.7	11.4
ZSLNS2007-10		10					5.3	11.5	12.1	12.6	13.0	13.7
ZSLNS2008-4	0.8	4	1.2	0.77	50	4	7.9	5.0	5.4	5.8	6.1	6.6
ZSLNS2008-6		6					6.8	7.2	7.7	8.1	8.4	9.0
ZSLNS2008-8		8					5.9	9.3	9.9	10.3	10.7	11.4
ZSLNS2008-10		10					5.2	11.5	12.1	12.6	13.0	13.7
ZSLNS2008-12		12			55		4.7	13.6	14.2	14.8	15.2	16.0
ZSLNS2009-6	0.9	6	1.35	0.86	50	4	6.7	7.2	7.7	8.1	8.4	9.1
ZSLNS2009-8		8					5.8	9.4	9.9	10.4	10.7	11.4
ZSLNS2009-10		10					5.1	11.5	12.1	12.6	13.0	13.7
ZSLNS2009-12		12			55		4.6	13.6	14.3	14.8	15.2	16.0
ZSLNS2010-2	1	2	1.5	0.96	50	4	9.4	2.9	3.2	3.4	3.7	4.1
ZSLNS2010-4		4					7.7	5.1	5.5	5.8	6.1	6.6
ZSLNS2010-6		6					6.6	7.2	7.7	8.1	8.4	9.1
ZSLNS2010-8		8					5.7	9.4	9.9	10.4	10.7	11.4
ZSLNS2010-10		10					5.0	11.5	12.1	12.6	13.0	13.7
ZSLNS2010-12		12			55		4.5	13.6	14.3	14.8	15.2	16.0
ZSLNS2010-14		14					4.1	15.7	16.4	17.0	17.4	18.7
ZSLNS2010-16		16			60		3.8	17.8	18.6	19.1	19.6	21.3
ZSLNS2010-20		20					3.2	22.0	22.8	23.5	24.0	26.6
ZSLNS2012-6	1.2	6	1.8	1.15	50	4	6.3	7.3	7.7	8.1	8.5	9.1
ZSLNS2012-8		8					5.5	9.4	9.9	10.4	10.8	11.4
ZSLNS2012-10		10					4.8	11.5	12.1	12.6	13.0	13.7
ZSLNS2012-12		12			55		4.3	13.6	14.3	14.8	15.2	16.0
ZSLNS2012-16		16					3.6	17.8	18.6	19.2	19.7	21.3
ZSLNS2014-6	1.4	6	2.1	1.34	50	4	6.1	7.3	7.8	8.1	8.5	9.1
ZSLNS2014-8		8					5.3	9.4	10.0	10.4	10.8	11.5
ZSLNS2014-10		10					4.6	11.6	12.1	12.6	13.0	13.8
ZSLNS2014-12		12			55		4.1	13.7	14.3	14.8	15.3	16.1
ZSLNS2014-14		14					3.7	15.8	16.5	17.0	17.5	18.7
ZSLNS2014-16		16					3.4	17.9	18.6	19.2	19.7	21.4

X No application
– No interference

※ These tools are manufactured based on order received

NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

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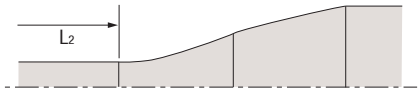

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ULTRA FINE HELIX p.968

ZSLNS20....-.. series

EDP. No.	Dimension(mm)							Effective Neck Length				
	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNS2015-4	1.5	4	2.25	1.44	50	4	7.2	5.2	5.5	5.9	6.2	6.7
ZSLNS2015-6		6					6.0	7.3	7.8	8.1	8.5	9.1
ZSLNS2015-8		8					5.1	9.4	10.0	10.4	10.8	11.5
ZSLNS2015-10		10					4.5	11.6	12.1	12.6	13.0	13.8
ZSLNS2015-12		12			55		4.0	13.7	14.3	14.8	15.3	16.1
ZSLNS2015-14		14					3.6	15.8	16.5	17.0	17.5	18.7
ZSLNS2015-16		16					3.3	17.9	18.6	19.2	19.7	-
ZSLNS2015-18		18			60		3.0	20.0	20.7	21.3	21.9	-
ZSLNS2015-20		20					2.8	22.0	22.9	23.5	24.1	-
ZSLNS2015-25		25			65		2.4	27.3	28.1	28.8	30.0	-
ZSLNS2016-6	1.6	6	2.4	1.54	50	4	5.9	7.3	7.8	8.1	8.5	9.1
ZSLNS2016-8		8					5.0	9.4	10.0	10.4	10.8	11.5
ZSLNS2016-10		10					4.4	11.6	12.1	12.6	13.0	13.8
ZSLNS2016-12		12			55		3.9	13.7	14.3	14.8	15.3	16.1
ZSLNS2016-14		14					3.5	15.8	16.5	17.0	17.5	18.7
ZSLNS2016-16		16					3.2	17.9	18.6	19.2	19.7	21.4
ZSLNS2016-18		18			60		2.9	20.0	20.7	21.3	21.9	-
ZSLNS2016-20		20					2.7	22.0	22.9	23.5	24.1	-
ZSLNS2018-6	1.8	6	2.7	1.73	50	4	5.6	7.4	7.8	8.2	8.5	9.1
ZSLNS2018-8		8					4.8	9.5	10.0	10.4	10.8	11.5
ZSLNS2018-10		10					4.2	11.6	12.2	12.6	13.0	13.8
ZSLNS2018-12		12			55		3.7	13.7	14.3	14.8	15.3	16.1
ZSLNS2018-14		14					3.3	15.8	16.5	17.0	17.5	18.8
ZSLNS2018-16		16					3.0	17.9	18.6	19.2	19.7	-
ZSLNS2018-18		18			60		2.7	20.0	20.7	21.3	21.9	-
ZSLNS2018-20		20					2.5	22.1	22.9	23.5	24.1	-
ZSLNS2020-4	2	4	3	1.92	50	4	6.5	5.3	5.6	5.9	6.2	6.7
ZSLNS2020-6		6					5.3	7.4	7.8	8.2	8.5	9.1
ZSLNS2020-8		8					4.5	9.5	10.0	10.4	10.8	11.5
ZSLNS2020-10		10					3.9	11.6	12.2	12.7	13.1	13.8
ZSLNS2020-12		12			55		3.4	13.7	14.3	14.9	15.3	16.1
ZSLNS2020-14		14					3.1	15.8	16.5	17.0	17.5	18.8

X No application
– No interference

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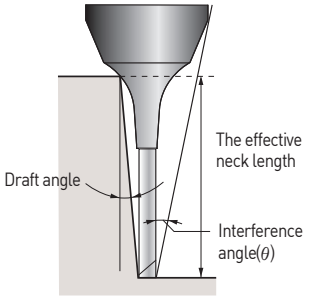
NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

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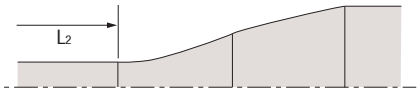

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ULTRA FINE HELIX p.968

ZSLNS20....-.. series

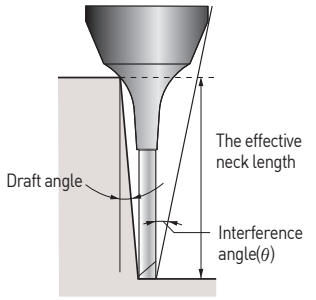
EDP. No.	Dimension(mm)							Effective Neck Length				
	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNS2020-16	2	16	3	1.92	55	4	2.8	17.9	18.6	19.2	19.7	-
ZSLNS2020-18		18			60		2.6	20.0	20.8	21.4	21.9	-
ZSLNS2020-20		20					2.4	22.1	22.9	23.5	24.1	-
ZSLNS2020-25		25			65		2.0	27.3	28.2	28.9	-	-
ZSLNS2020-30		30			70		1.7	32.5	33.4	34.4	-	-
ZSLNS2025-8	2.5	8	3.75	2.4	50	4	3.7	9.6	10.1	10.5	10.9	11.5
ZSLNS2025-10		10					3.1	11.7	12.2	12.7	13.1	13.8
ZSLNS2025-12		12			55		2.7	13.8	14.4	14.9	15.3	-
ZSLNS2025-14		14					2.4	15.9	16.5	17.1	17.5	-
ZSLNS2025-16		16					2.2	18.0	18.7	19.2	19.7	-
ZSLNS2025-18		18			60		2.0	20.1	20.8	21.4	-	-
ZSLNS2025-20		20					1.8	22.1	22.9	23.5	-	-
ZSLNS2025-25		25			65		1.5	27.3	28.2	-	-	-
ZSLNS2025-30		30			70		1.3	32.6	33.5	-	-	-
ZSLNS2030-8	3	8	4.5	2.88	55	6	5.6	9.6	10.1	10.5	10.9	11.5
ZSLNS2030-10		10					5.0	11.7	12.3	12.7	13.1	13.8
ZSLNS2030-12		12			60		4.5	13.8	14.4	14.9	15.4	16.3
ZSLNS2030-14		14					4.1	15.9	16.6	17.1	17.6	18.9
ZSLNS2030-16		16					3.7	18.0	18.7	19.3	19.8	21.6
ZSLNS2030-18		18					3.4	20.1	20.8	21.4	21.9	24.2
ZSLNS2030-20		20			65		3.2	22.2	23.0	23.6	24.2	26.9
ZSLNS2030-25		25			70		2.7	27.4	28.2	28.9	30.2	-
ZSLNS2030-30		30			75		2.4	32.6	33.5	34.5	36.2	-
ZSLNS2030-35		35			80		2.1	37.7	38.7	40.2	42.2	-
ZSLNS2030-40		40			90		1.9	42.9	43.9	45.9	-	-

X No application
– No interference

※ These tools are manufactured based on order received

NEXT >>

Endmills for high hardened steel *Zamus Star Series*



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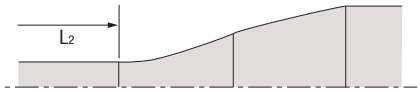

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ULTRA FINE HELIX p.968

ZSLNS20....-.. series

EDP. No.	Dimension(mm)							Effective Neck Length				
	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNS2040-12	4	12	6	3.85	60	6	3.4	13.9	14.5	15.0	15.4	16.3
ZSLNS2040-16		16					2.8	18.1	18.8	19.3	19.8	-
ZSLNS2040-20		20			70		2.3	22.3	23.0	23.6	24.3	-
ZSLNS2040-25		25					2.0	27.4	28.3	28.9	-	-
ZSLNS2040-30		30			80		1.7	32.6	33.5	34.6	-	-
ZSLNS2040-35		35					1.5	37.8	38.8	-	-	-
ZSLNS2040-40		40			90		1.3	42.9	44.0	-	-	-
ZSLNS2040-45		45					1.2	48.1	49.4	-	-	-
ZSLNS2040-50		50			100		1.1	53.2	54.8	-	-	-
ZSLNS2050-16	5	16	7.5	4.85	60	6	1.5	18.1	18.8	-	-	-
ZSLNS2050-20		20					1.3	22.3	23.0	-	-	-
ZSLNS2050-25		25			70		1.1	27.4	28.3	-	-	-
ZSLNS2050-30		30					0.9	32.6	-	-	-	-
ZSLNS2050-35		35			80		0.8	37.8	-	-	-	-
ZSLNS2050-40		40			90		0.7	42.9	-	-	-	-
ZSLNS2050-50		50			100		0.6	53.2	-	-	-	-

X No application
– No interference

※ These tools are manufactured based on order received

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

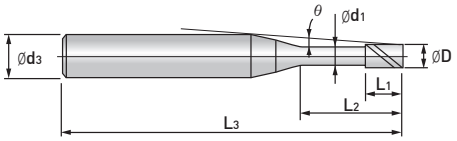
○:General Application ◎:The most suitable Application

■ Tolerance

Diameter	Mill Dia.(mm)	Shank Dia.
0.1 ~ 0.5	0 ~ -0.012	h5
0.6 ~ 4	0 ~ -0.015	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

ZSLNS40....-.. series

ULTRA FINE HELIX p.968

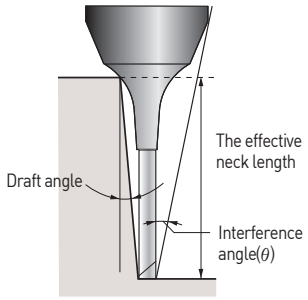
EDP. No.	Dimension(mm)							Effective Neck Length				
	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNS4010-4	1	4	1.5	0.96	50	4	7.7	5.1	5.5	5.8	6.1	6.6
ZSLNS4010-6		6					6.6	7.2	7.7	8.1	8.4	9.1
ZSLNS4010-8		8					5.7	9.4	9.9	10.4	10.7	11.4
ZSLNS4010-10		10					5.0	11.5	12.1	12.6	13.0	13.7
ZSLNS4015-4	1.5	4	2.25	1.44	50	4	7.2	5.2	5.5	5.9	6.2	6.7
ZSLNS4015-6		6					6.0	7.3	7.8	8.1	8.5	9.1
ZSLNS4015-8		8					5.1	9.4	10.0	10.4	10.8	11.5
ZSLNS4015-10		10					4.5	11.6	12.1	12.6	13.0	13.8
ZSLNS4015-12		12			55		4.0	13.7	14.3	14.8	15.3	16.1
ZSLNS4015-14		14					3.6	15.8	16.5	17.0	17.5	18.7
ZSLNS4015-16		16					3.3	17.9	18.6	19.2	19.7	-
ZSLNS4015-18		18			60		3.0	20.0	20.7	21.3	21.9	-
ZSLNS4015-20		20					2.8	22.0	22.9	23.5	24.1	-
ZSLNS4015-25		25			65		2.4	27.3	28.1	28.8	30.0	-
ZSLNS4020-4	2	4	3	1.92	50	4	6.5	5.3	5.6	5.9	6.2	6.7
ZSLNS4020-6		6					5.3	7.4	7.8	8.2	8.5	9.1
ZSLNS4020-8		8					4.5	9.5	10.0	10.4	10.8	11.5
ZSLNS4020-10		10					3.9	11.6	12.2	12.7	13.1	13.8
ZSLNS4020-12		12			55		3.4	13.7	14.3	14.9	15.3	16.1
ZSLNS4020-14		14					3.1	15.8	16.5	17.0	17.5	18.8
ZSLNS4020-16		16					2.8	17.9	18.6	19.2	19.7	-
ZSLNS4020-18		18			60		2.6	20.0	20.8	21.4	21.9	-
ZSLNS4020-20		20					2.4	22.1	22.9	23.5	24.1	-
ZSLNS4020-25		25			6 5		2.0	27.3	28.2	28.9	-	-
ZSLNS4020-30		30			70		1.7	32.5	33.4	34.4	-	-
ZSLNS4025-8	2.5	8	3.75	2.4	50	4	3.7	9.6	10.1	10.5	10.9	11.5
ZSLNS4025-10		10					3.1	11.7	12.2	12.7	13.1	13.8
ZSLNS4025-12		12			55		2.7	13.8	14.4	14.9	15.3	-
ZSLNS4025-14		14					2.4	15.9	16.5	17.1	17.5	-
ZSLNS4025-16		16					2.2	18.0	18.7	19.2	19.7	-
ZSLNS4025-18		18			60		2.0	20.1	20.8	21.4	-	-
ZSLNS4025-20		20					1.8	22.1	22.9	23.5	-	-
ZSLNS4025-25		25			65		1.5	27.3	28.2	-	-	-
ZSLNS4025-30		30			70		1.3	32.6	33.5	-	-	-

X No application
– No interference

※ These tools are manufactured based on order received

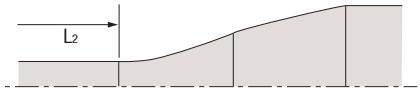
NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, LONG NECK

- If the workpiece has draft angle, the interference length will be longer than the L2.
- Please refer to the effective neck length for the various draft angles
- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2," and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

ULTRA FINE HELIX p.968

ZSLNS40....-.. series

EDP. No.	Dimension(mm)							Effective Neck Length				
	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNS4030-8	3	8	4.5	2.88	55	6	5.6	9.6	10.1	10.5	10.9	11.5
ZSLNS4030-10		10					5.0	11.7	12.3	12.7	13.1	13.8
ZSLNS4030-12		12			60		4.5	13.8	14.4	14.9	15.4	16.3
ZSLNS4030-14		14					4.1	15.9	16.6	17.1	17.6	18.9
ZSLNS4030-16		16					3.7	18.0	18.7	19.3	19.8	21.6
ZSLNS4030-18		18					3.4	20.1	20.8	21.4	21.9	24.2
ZSLNS4030-20		20			65		3.2	22.2	23.0	23.6	24.2	26.9
ZSLNS4030-25		25			70		2.7	27.4	28.2	28.9	30.2	-
ZSLNS4030-30		30			75		2.4	32.6	33.5	34.5	36.2	-
ZSLNS4030-35		35			80		2.1	37.7	38.7	40.2	42.2	-
ZSLNS4030-40		40			90		1.9	42.9	43.9	45.9	-	-
ZSLNS4040-12	4	12	6	3.85	60	6	3.4	13.9	14.5	15.0	15.4	16.3
ZSLNS4040-16		16					2.8	18.1	18.8	19.3	19.8	-
ZSLNS4040-20		20			70		2.3	22.3	23.0	23.6	24.3	-
ZSLNS4040-25		25					2.0	27.4	28.3	28.9	-	-
ZSLNS4040-30		30			80		1.7	32.6	33.5	34.6	-	-
ZSLNS4040-35		35					1.5	37.8	38.8	-	-	-
ZSLNS4040-40		40			90		1.3	42.9	44.0	-	-	-
ZSLNS4040-45		45					1.2	48.1	49.4	-	-	-
ZSLNS4040-50		50			100		1.1	53.2	54.8	-	-	-
ZSLNS4050-16	5	16	7.5	4.85	60	6	1.5	18.1	18.8	-	-	-
ZSLNS4050-20		20					1.3	22.3	23.0	-	-	-
ZSLNS4050-25		25			70		1.1	27.4	28.3	-	-	-
ZSLNS4050-30		30					0.9	32.6	-	-	-	-
ZSLNS4050-35		35			80		0.8	37.8	-	-	-	-
ZSLNS4050-40		40			90		0.7	42.9	-	-	-	-
ZSLNS4050-50		50			100		0.6	53.2	-	-	-	-

X No application
– No interference

※ These tools are manufactured based on order received

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

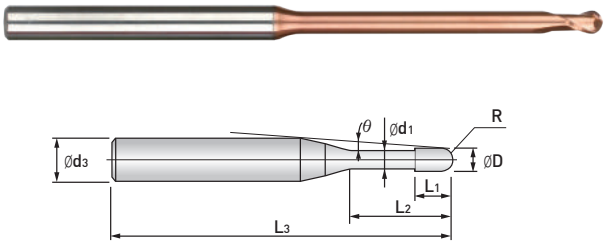
○:General Application ◎:The most suitable Application

■ Tolerance

Diameter	Mill Dia.(mm)	Shank Dia.
0.1 ~ 0.5	0 ~ -0.012	h5
0.6 ~ 4	0 ~ -0.015	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

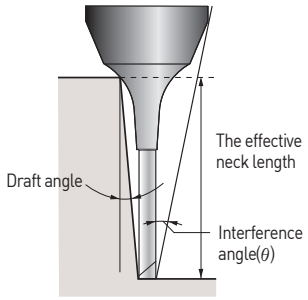
ZSLNB....-..-. series

ULTRA FINE HELIX p.967

EDP. No.	Dimension(mm)								Effective Neck Length				
	R	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNB2001-0.2	0.05	0.1	0.2	0.08	0.08	45	4	11.8	0.3	0.3	0.3	0.4	0.4
ZSLNB2001-0.3			0.3					11.7	0.4	0.4	0.5	0.5	0.5
ZSLNB2001-0.5			0.5					11.4	0.6	0.7	0.7	0.7	0.8
ZSLNB2002-0.5	0.1	0.2	0.5	0.15	0.17	50	4	11.5	1.2	1.3	1.5	1.6	2.0
ZSLNB2002-1			1					10.9	1.7	1.9	2.1	2.3	2.7
ZSLNB2002-1.5			1.5					10.4	2.3	2.5	2.8	3.0	3.4
ZSLNB2002-2			2					9.9	2.8	3.1	3.4	3.6	4.1
ZSLNB2002-2.5			2.5					9.5	3.4	3.7	4.0	4.2	4.7
ZSLNB2002-3.0			3					9.1	3.9	4.3	4.6	4.9	5.4
ZSLNB2003-1	0.15	0.3	1	0.25	0.27	50	4	10.9	1.7	1.9	2.1	2.3	2.7
ZSLNB2003-1.5			1.5					10.4	2.3	2.5	2.7	3.0	3.4
ZSLNB2003-2			2					9.9	2.8	3.1	3.4	3.6	4.0
ZSLNB2003-2.5			2.5					9.5	3.4	3.7	4.0	4.2	4.7
ZSLNB2003-3			3					9.1	3.9	4.3	4.6	4.8	5.3
ZSLNB2004-1	0.2	0.4	1	0.3	0.37	50	4	11.0	1.7	1.9	2.1	2.3	2.7
ZSLNB2004-1.5			1.5					10.4	2.3	2.5	2.7	2.9	3.4
ZSLNB2004-2			2					9.9	2.8	3.1	3.4	3.6	4.0
ZSLNB2004-2.5			2.5					9.5	3.4	3.7	4.0	4.2	4.7
ZSLNB2004-3			3					9.1	3.9	4.3	4.6	4.8	5.3
ZSLNB2004-3.5			3.5					8.7	4.5	4.8	5.2	5.4	6.0
ZSLNB2004-4			4					8.3	5.0	5.4	5.7	6.0	6.6
ZSLNB2004-4.5			4.5					8.0	5.6	6.0	6.3	6.6	7.2
ZSLNB2005-1	0.25	0.5	1	0.35	0.47	50	4	11.0	1.7	1.9	2.1	2.3	2.6
ZSLNB2005-2			2					9.9	2.8	3.1	3.3	3.6	4.0
ZSLNB2005-3			3					9.0	3.9	4.3	4.6	4.8	5.3
ZSLNB2005-4			4					8.3	5.0	5.4	5.7	6.0	6.6
ZSLNB2005-5			5					7.7	6.1	6.5	6.9	7.2	7.8
ZSLNB2005-6			6					7.1	7.2	7.6	8.0	8.4	9.0
ZSLNB2005-8			8					6.3	9.3	9.9	10.3	10.7	11.4

NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

- If the workpiece has draft angle, the interference length will be longer than the L2
- Please refer to the effective neck length for the various draft angles
- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2," and should also be referred to

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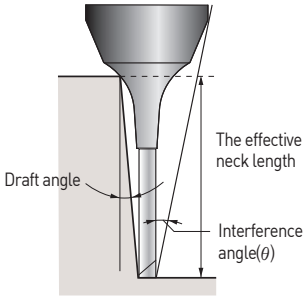
ULTRA FINE HELIX p.967

ZSLNB....-..-. series

EDP. No.	Dimension(mm)								Effective Neck Length				
	R	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNB2006-1	0.3	0.6	1	0.4	0.57	50	4	11.0	1.7	1.9	2.1	2.3	2.6
ZSLNB2006-2			2					9.9	2.8	3.1	3.3	3.6	4.0
ZSLNB2006-3			3					9.0	3.9	4.3	4.5	4.8	5.3
ZSLNB2006-4			4					8.3	5.0	5.4	5.7	6.0	6.6
ZSLNB2006-5			5					7.6	6.1	6.5	6.9	7.2	7.8
ZSLNB2006-6			6					7.1	7.2	7.6	8.0	8.4	9.0
ZSLNB2006-7			7					6.6	8.3	8.8	9.2	9.5	10.2
ZSLNB2006-8			8					6.2	9.3	9.9	10.3	10.7	11.4
ZSLNB2006-9			9					5.8	10.4	10.9	11.4	11.8	12.5
ZSLNB2006-10			10					5.5	11.4	12.0	12.5	12.9	13.7
ZSLNB2006-12			12					5.0	13.6	14.2	14.7	15.2	16.0
ZSLNB2008-2	0.4	0.8	2	0.5	0.77	50	4	9.9	2.8	3.1	3.3	3.5	4.0
ZSLNB2008-4			4					8.2	5.0	5.4	5.7	6.0	6.5
ZSLNB2008-5			5					7.5	6.1	6.5	6.9	7.2	7.8
ZSLNB2008-6			6					7.0	7.2	7.6	8.0	8.4	9.0
ZSLNB2008-8			8					6.1	9.3	9.8	10.3	10.7	11.3
ZSLNB2008-10			10					5.4	11.4	12.0	12.5	12.9	13.7
ZSLNB2010-2	0.5	1	2	0.8	0.96	50	4	9.9	2.9	3.1	3.3	3.5	4.0
ZSLNB2010-3			3					8.9	4.0	4.3	4.5	4.8	5.3
ZSLNB2010-4			4					8.1	5.0	5.4	5.7	6.0	6.5
ZSLNB2010-5			5					7.4	6.1	6.5	6.9	7.2	7.8
ZSLNB2010-6			6					6.8	7.2	7.7	8.0	8.4	9.0
ZSLNB2010-7			7					6.3	8.3	8.8	9.2	9.5	10.2
ZSLNB2010-8			8					5.9	9.3	9.9	10.3	10.7	11.3
ZSLNB2010-9			9					5.5	10.4	11.0	11.4	11.8	12.5
ZSLNB2010-10			10					5.2	11.5	12.0	12.5	12.9	13.7
ZSLNB2010-12			12			55		4.6	13.6	14.2	14.7	15.2	15.9
ZSLNB2010-14			14					4.2	15.7	16.4	16.9	17.4	18.5
ZSLNB2010-16			16					3.8	17.8	18.5	19.1	19.6	21.2
ZSLNB2010-18			18			60		3.5	19.9	20.7	21.3	21.8	23.8
ZSLNB2010-20			20					3.3	22.0	22.8	23.4	24.0	26.5
ZSLNB2012-4	0.6	1.2	4	1.1	1.15	50	4	7.9	5.1	5.4	5.7	6.0	6.5
ZSLNB2012-6			6					6.6	7.2	7.7	8.0	8.4	9.0
ZSLNB2012-8			8					5.7	9.4	9.9	10.3	10.7	11.3
ZSLNB2012-10			10					5.0	11.5	12.1	12.5	12.9	13.7
ZSLNB2012-12			12			55		4.5	13.6	14.2	14.7	15.2	15.9

NEXT ≫≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

- If the workpiece has draft angle, the interference length will be longer than the L2
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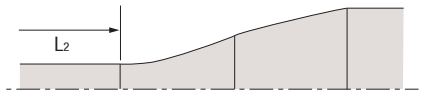
- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2," and should also be referred to



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ULTRA FINE HELIX p.967

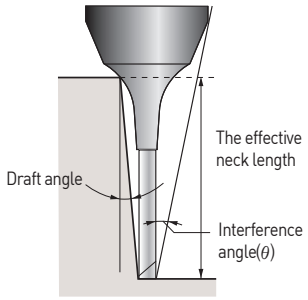
ZSLNB....-..-. series

EDP. No.	Dimension(mm)								Effective Neck Length				
	R	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNB2014-8	0.7	1.4	8	1.3	1.34	50	4	5.5	9.4	9.9	10.3	10.7	11.3
ZSLNB2014-12			12			55		4.3	13.6	14.2	14.7	15.2	15.9
ZSLNB2014-16			16					3.5	17.8	18.5	19.1	19.6	21.2
ZSLNB2015-4	0.75	1.5	4	1.35	1.44	50	4	7.7	5.1	5.4	5.7	6.0	6.5
ZSLNB2015-6			6					6.4	7.3	7.7	8.0	8.4	9.0
ZSLNB2015-8			8					5.4	9.4	9.9	10.3	10.7	11.3
ZSLNB2015-10			10					4.7	11.5	12.1	12.5	12.9	13.7
ZSLNB2015-12			12			55		4.2	13.6	14.2	14.7	15.2	15.9
ZSLNB2015-14			14					3.8	15.7	16.4	16.9	17.4	18.5
ZSLNB2015-16			16					3.4	17.8	18.5	19.1	19.6	21.1
ZSLNB2015-20			20			60		2.9	22.0	22.8	23.4	24.0	-
ZSLNB2016-8	0.8	1.6	8	1.4	1.54	50	4	5.3	9.4	9.9	10.3	10.7	11.3
ZSLNB2016-10			10					4.6	11.5	12.1	12.5	12.9	13.7
ZSLNB2016-12			12			55		4.1	13.6	14.2	14.7	15.2	15.9
ZSLNB2016-16			16					3.3	17.8	18.5	19.1	19.6	21.1
ZSLNB2016-20			20			60		2.8	22.0	22.8	23.4	24.0	-
ZSLNB2018-8	0.9	1.8	8	1.6	1.73	50	4	5.1	9.4	9.9	10.3	10.7	11.3
ZSLNB2018-12			12			55		3.9	13.7	14.3	14.7	15.2	15.9
ZSLNB2018-16			16					3.1	17.9	18.6	19.1	19.6	21.1
ZSLNB2018-20			20			60		2.6	22.0	22.8	23.4	24.0	-
ZSLNB2020-3	1	2	3	1.7	1.92	50	4	8.3	4.1	4.4	4.6	4.8	5.2
ZSLNB2020-4			4	3				7.3	5.2	5.5	5.8	6.0	6.5
ZSLNB2020-6			6					5.8	7.3	7.7	8.1	8.4	9.0
ZSLNB2020-8			8					4.9	9.5	9.9	10.3	10.7	11.3
ZSLNB2020-10			10					4.2	11.6	12.1	12.6	12.9	13.6
ZSLNB2020-12			12			55		3.7	13.7	14.3	14.8	15.2	15.9
ZSLNB2020-14			14					3.2	15.8	16.4	16.9	17.4	18.5
ZSLNB2020-16			16					2.9	17.9	18.6	19.1	19.6	-
ZSLNB2020-18			18			60		2.7	20.0	20.7	21.3	21.8	-
ZSLNB2020-20			20					2.4	22.1	22.8	23.4	24.0	-
ZSLNB2020-22			22					2.3	24.1	24.9	25.6	26.3	-
ZSLNB2020-25			25			65		2.0	27.3	28.1	28.8	-	-
ZSLNB2020-30			30			70		1.7	32.4	33.4	34.2	-	-

X No application
– No interference

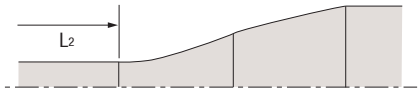
NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

- If the workpiece has draft angle, the interference length will be longer than the L2.
- Please refer to the effective neck length for the various draft angles
- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2"and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

ULTRA FINE HELIX p.967

ZSLNB....-..-. series

EDP. No.	Dimension(mm)								Effective Neck Length				
	R	D	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNB2020-35	1	2	35	3	1.92	75	4	1.5	37.6	38.6	-	-	-
ZSLNB2020-40			40			80		1.4	42.8	43.8	-	-	-
ZSLNB2025-10	1.25	2.5	10	4	2.4	50	4	3.4	11.6	12.1	12.6	13	13.6
ZSLNB2025-16			16			55		2.3	17.9	18.6	19.1	19.6	-
ZSLNB2025-20			20			60		1.9	22.1	22.8	23.5	-	-
ZSLNB2030-8	1.5	3	8	4	2.88	55	6	6.2	9.6	10.0	10.4	10.7	11.3
ZSLNB2030-10			10					5.5	11.7	12.2	12.6	13.0	13.6
ZSLNB2030-13			13			60		4.6	14.8	15.4	15.9	16.3	17.1
ZSLNB2030-16			16					4.0	18.0	18.6	19.1	19.6	21.1
ZSLNB2030-18			18					3.6	20.0	20.7	21.3	21.8	23.7
ZSLNB2030-20			20			65		3.4	22.1	22.9	23.5	24.0	26.4
ZSLNB2030-25			25			70		2.8	27.3	28.2	28.8	29.9	-
ZSLNB2030-30			30			75		2.5	32.5	33.4	34.3	35.9	-
ZSLNB2030-35			35			80		2.2	37.7	38.7	40.0	41.9	-
ZSLNB2040-10	2	4	10	5	3.9	55	6	4.5	11.6	12.1	12.5	12.9	13.5
ZSLNB2040-13			13			60		3.6	14.7	15.3	15.8	16.2	17.0
ZSLNB2040-16			16					3.1	17.9	18.5	19.1	19.5	20.9
ZSLNB2040-20			20			65		2.5	22.1	22.8	23.4	23.9	-
ZSLNB2040-25			25			70		2.1	27.3	28.1	28.8	29.8	-
ZSLNB2040-30			30			75		1.8	32.4	33.4	34.2	-	-
ZSLNB2040-35			35			80		1.6	37.6	38.6	39.9	-	-
ZSLNB2040-40			40					1.4	42.8	43.8	-	-	-
ZSLNB2040-45			45			90		1.2	47.9	49.1	-	-	-
ZSLNB2040-50			50			100		1.1	53.1	54.5	-	-	-
ZSLNB2050-20	2.5	5	20	6	4.9	65	6	1.4	22.0	22.8	-	-	-
ZSLNB2050-25			25			70		1.2	27.2	28.1	-	-	-
ZSLNB2050-30			30			75		1.0	32.4	-	-	-	-
ZSLNB2050-35			35			80		0.8	42.8	-	-	-	-
ZSLNB2050-40			40			90		0.7	42.8	-	-	-	-

– No interference

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

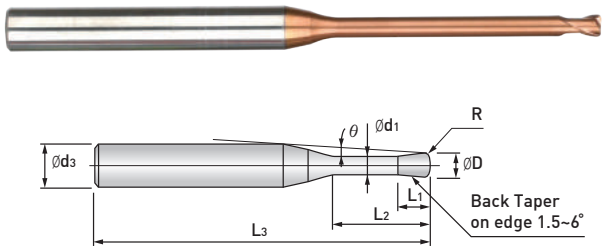
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)	Shank Dia.
±0.005	h5

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

ZSLNR....-..-. series

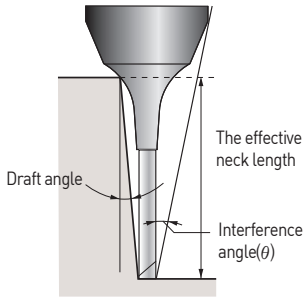
ULTRA FINE HELIX

p.958~960

EDP. No.	Dimension(mm)								Effective Neck Length				
	D	R	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNR2002-0.5-005	0.2	0.05	0.5	0.15	0.17	50	4	11.4	0.9	1.0	1.0	1.1	1.2
ZSLNR2002-1-005			1					10.9	1.6	1.7	1.9	2.0	2.3
ZSLNR2002-1.5-005			1.5					10.3	2.1	2.3	2.5	2.7	3.0
ZSLNR2002-2-005			2					9.9	2.8	3.1	3.4	3.6	4.1
ZSLNR2003-1-005	0.3	0.05	1	0.25	0.27	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ZSLNR2003-1.5-005			1.5					10.3	2.1	2.3	2.5	2.7	3.0
ZSLNR2003-2-005			2					9.8	2.7	2.9	3.1	3.3	3.6
ZSLNR2003-2.5-005			2.5					9.4	3.2	3.5	3.7	3.9	4.3
ZSLNR2003-3-005			3					9.0	3.9	4.3	4.6	4.9	5.4
ZSLNR2004-1-005	0.4	0.05	1	0.3	0.37	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ZSLNR2004-1.5-005			1.5					10.3	2.0	2.1	2.2	2.3	2.5
ZSLNR2004-2-005			2					9.8	2.7	2.9	3.1	3.3	3.6
ZSLNR2004-2.5-005			2.5					9.4	3.2	3.5	3.7	3.9	4.3
ZSLNR2004-3-005			3					9.0	3.8	4.0	4.3	4.5	4.9
ZSLNR2004-3.5-005			3.5					8.6	4.3	4.6	4.9	5.1	5.5
ZSLNR2004-4-005			4					8.3	5.0	5.4	5.8	6.1	6.6
ZSLNR2004-2-01		0.1	2					9.8	2.7	2.9	3.1	3.3	3.6
ZSLNR2004-3-01			3					9.0	3.8	4.0	4.3	4.5	4.9
ZSLNR2004-4-01			4					8.3	5.0	5.4	5.8	6.1	6.6
ZSLNR2005-1-005	0.5	0.05	1	0.35	0.47	50	4	10.8	1.4	1.5	1.6	1.7	1.9
ZSLNR2005-2-005			2					9.7	2.5	2.6	2.8	2.9	3.1
ZSLNR2005-3-005			3					8.9	3.8	4.0	4.3	4.5	4.9
ZSLNR2005-4-005			4					8.2	4.8	5.2	5.4	5.7	6.1
ZSLNR2005-5-005			5					7.6	6.1	6.6	6.9	7.3	7.8
ZSLNR2005-6-005			6					7.0	7.2	7.7	8.1	8.4	9.0
ZSLNR2005-1-01		0.1	1					10.8	1.4	1.5	1.6	1.7	1.9
ZSLNR2005-2-01			2					9.8	2.5	2.6	2.8	2.9	3.1
ZSLNR2005-3-01			3					8.9	3.8	4.0	4.3	4.5	4.9

NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

- If the workpiece has draft angle, the interference length will be longer than the L2.
- Please refer to the effective neck length for the various draft angles
- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2"and should also be referred to

※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

ZSLNR....-..-. series

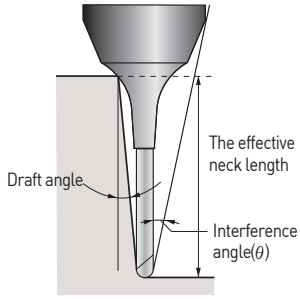
ULTRA FINE HELIX

p.958~960

EDP. No.	Dimension(mm)								Effective Neck Length				
	D	R	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNR2005-4-01	0.5	0.1	4	0.35	0.47	50	4	8.2	4.8	5.2	5.4	5.7	6.1
ZSLNR2005-5-01			5					7.6	6.1	6.5	6.9	7.2	7.8
ZSLNR2005-6-01			6					7.1	7.2	7.7	8.1	8.4	9.0
ZSLNR2006-2-01	0.6	0.1	2	0.4	0.57	50	4	9.7	2.5	2.6	2.8	2.9	3.1
ZSLNR2006-4-01			4					8.1	4.8	5.2	5.4	5.7	6.1
ZSLNR2006-6-01			6					7.0	7.2	7.7	8.1	8.4	9.0
ZSLNR2006-8-01			8					6.1	9.3	9.9	10.3	10.7	11.4
ZSLNR2006-10-01			10					5.5	11.5	12.1	12.5	13.0	13.7
ZSLNR2008-4-01	0.8	0.1	4	0.5	0.77	50	4	8.0	4.8	5.2	5.4	5.7	6.1
ZSLNR2008-6-01			6					6.8	7.0	7.4	7.7	7.9	8.4
ZSLNR2008-8-01			8					5.9	9.3	9.9	10.3	10.7	11.4
ZSLNR2008-12-01			12			55		4.7	13.6	14.2	14.7	15.2	16.0
ZSLNR2008-4-02		0.2	4			50		8.0	4.8	5.1	5.4	5.6	6.1
ZSLNR2008-6-02			6					6.9	7.0	7.3	7.7	7.9	8.4
ZSLNR2010-4-01	1	0.1	4	0.8	0.94	50	4	7.7	4.7	4.9	5.1	5.2	5.5
ZSLNR2010-6-01			6					6.6	7.1	7.4	7.7	8.0	8.5
ZSLNR2010-8-01			8					5.7	9.2	9.6	9.9	10.2	10.8
ZSLNR2010-10-01			10					5.1	11.6	12.1	12.6	13.0	13.7
ZSLNR2010-12-01			12			55		4.5	13.7	14.3	14.8	15.3	16.0
ZSLNR2010-16-01			16			60		3.8	17.9	18.6	19.2	19.7	21.3
ZSLNR2010-20-01			20					3.2	22.0	22.8	23.5	24.0	26.7
ZSLNR2010-4-02		0.2	4			50		7.8	4.7	4.9	5.1	5.2	5.5
ZSLNR2010-6-02			6					6.6	7.1	7.4	7.7	8.0	8.5
ZSLNR2010-8-02			8					5.8	9.2	9.6	9.9	10.2	10.8
ZSLNR2010-10-02			10					5.1	11.6	12.1	12.6	13.0	13.7
ZSLNR2010-12-02			12			55		4.6	13.7	14.3	14.8	15.2	16.0
ZSLNR2010-16-02			16			60		3.8	17.9	18.6	19.2	19.7	21.3
ZSLNR2010-20-02			20					3.2	22.0	22.8	23.5	24.0	26.6

NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

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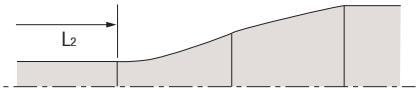

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ULTRA FINE HELIX p.958~960

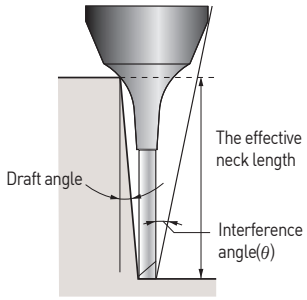
ZSLNR....-..-. series

EDP. No.	Dimension(mm)								Effective Neck Length				
	D	R	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNR2010-6-03	1	0.3	6	0.8	0.94	50	4	6.7	7.1	7.4	7.7	8.0	8.4
ZSLNR2010-10-03			10					5.1	11.5	12.1	12.6	13.0	13.7
ZSLNR2010-16-03			16			60		3.8	17.9	18.6	19.1	19.6	21.3
ZSLNR2010-20-03			20					3.2	22.0	22.8	23.5	24.0	26.6
ZSLNR2015-4-01	1.5	0.1	4	1.35	1.42	50	4	7.2	4.8	4.9	5.1	5.3	5.5
ZSLNR2015-8-01			8					5.2	9.2	9.6	10.0	10.3	10.8
ZSLNR2015-12-01			12			55		4.0	13.4	13.9	14.3	14.7	16.1
ZSLNR2015-15-01			15					3.5	16.9	17.6	18.1	18.6	20.1
ZSLNR2015-20-01			20			60		2.8	22.1	22.9	23.5	24.1	-
ZSLNR2015-4-02		0.2	4			50		7.3	4.7	4.9	5.1	5.3	5.5
ZSLNR2015-8-02			8					5.2	9.2	9.6	10.0	10.3	10.8
ZSLNR2015-12-02			12			55		4.1	13.4	13.9	14.3	14.7	16.1
ZSLNR2015-15-02			15					3.5	16.9	17.5	18.1	18.6	20.0
ZSLNR2015-20-02			20			60		2.8	22.1	22.9	23.5	24.1	-
ZSLNR2015-8-03		0.3	8			50		5.2	9.2	9.6	10.0	10.3	10.8
ZSLNR2015-15-03			15			55		3.5	16.9	17.5	18.1	18.6	20.0
ZSLNR2015-20-03			20			60		2.8	22.1	22.9	23.5	24.0	-
ZSLNR2020-6-02	2	0.2	6	1.7	1.92	50	4	5.4	6.8	7.1	7.3	7.5	8.1
ZSLNR2020-8-02			8					4.6	8.9	9.2	9.4	9.7	10.8
ZSLNR2020-12-02			12			55		3.5	13.4	13.9	14.3	14.7	16.1
ZSLNR2020-16-02			16					2.8	17.6	18.1	18.6	19.3	-
ZSLNR2020-20-02			20			60		2.4	22.1	22.9	23.5	24.1	-
ZSLNR2020-25-02			25			65		2.0	27.3	28.2	28.8	-	-
ZSLNR2020-30-02			30			70		1.7	32.5	33.4	34.4	-	-
ZSLNR2020-8-03		0.3	8			50		4.6	8.9	9.2	9.4	9.7	10.7
ZSLNR2020-16-03			16			55		2.8	17.6	18.1	18.6	19.3	-
ZSLNR2020-20-03			20			60		2.4	22.1	22.9	23.5	24.0	-
ZSLNR2020-6-05		0.5	6			50		5.5	6.8	7.1	7.3	7.4	8.0
ZSLNR2020-8-05			8					4.7	8.9	9.2	9.4	9.6	10.7

– No interference

NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG NECK

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ULTRA FINE HELIX

p.958~960

ZSLNR....-..-. series

EDP. No.	Dimension(mm)								Effective Neck Length				
	D	R	L_2	L_1	d_1	L_3	d_3	θ	0.5°	1°	1.5°	2°	3°
ZSLNR2020-12-05	2	0.5	12	1.7	1.92	55	4	3.5	13.4	13.9	14.3	14.6	16.0
ZSLNR2020-16-05			16					2.9	17.6	18.1	18.6	19.2	-
ZSLNR2020-20-05			20			60		2.4	22.1	22.9	23.5	24.0	-
ZSLNR2020-25-05			25			65		2.0	27.3	28.1	28.8	-	-
ZSLNR2020-30-05			30			70		1.7	32.5	33.4	34.3	-	-
ZSLNR2020-8-08		0.8	8			50		4.8	8.9	9.2	9.4	9.6	10.6
ZSLNR2020-16-08			16			55		2.9	17.6	18.1	18.6	19.2	-
ZSLNR2020-20-08			20			60		2.4	22.1	22.8	23.5	24.0	-
ZSLNR2030-8-02	3	0.2	8	2.5	2.86	55	6	5.7	9.0	9.3	9.5	9.9	10.9
ZSLNR2030-12-02			12			60		4.5	13.1	13.5	14.0	14.7	16.2
ZSLNR2030-16-02			16					3.8	17.7	18.2	18.7	19.5	21.6
ZSLNR2030-20-02			20			65		3.2	21.8	22.4	23.1	24.2	26.9
ZSLNR2030-30-02			30			75		2.4	32.6	33.5	34.5	36.2	-
ZSLNR2030-35-02			35			80		2.1	37.7	38.7	40.2	42.2	-
ZSLNR2030-8-03		0.3	8			55		5.7	9.0	9.3	9.5	9.9	10.9
ZSLNR2030-16-03			16			60		3.8	17.7	18.2	18.7	19.4	21.5
ZSLNR2030-20-03			20			65		3.2	21.8	22.4	23.1	24.2	26.8
ZSLNR2030-30-03			30			75		2.4	32.6	33.5	34.5	36.2	-
ZSLNR2030-8-05		0.5	8			55		5.8	9.0	9.3	9.5	9.8	10.8
ZSLNR2030-12-05			12			60		4.6	13.1	13.5	13.9	14.6	16.2
ZSLNR2030-16-05			16					3.8	17.7	18.2	18.7	19.4	21.5
ZSLNR2030-20-05			20			65		3.2	21.8	22.4	23.1	24.2	26.8
ZSLNR2030-30-05			30			75		2.4	32.6	33.5	34.5	36.1	-
ZSLNR2030-35-05			35			80		2.1	37.7	38.7	40.2	42.1	-

– No interference

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

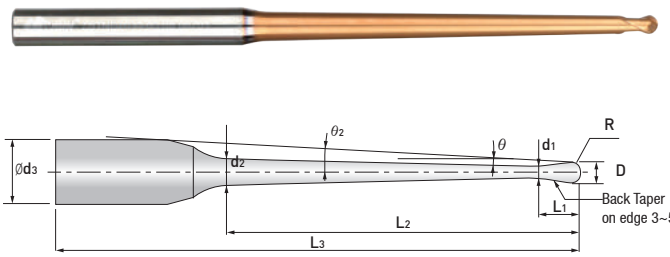
○:General Application ◎:The most suitable Application

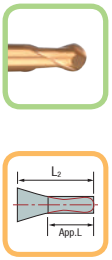
■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.015	h5

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*





The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

※R2 or higher is not applied to Back draft type.

ZSTNB20..-..-. series

ULTRA FINE | HELIX | up to R3 | over R3 | p.952~955

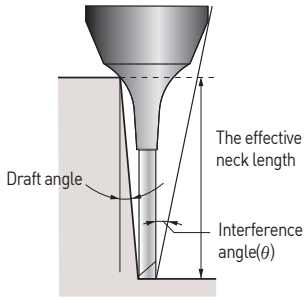
EDP. No.	Dimension(mm)											Effective Neck Length				
	R	D	L_2	θ	L_1	d_1	d_2	L_3	d_3	App.L	θ_2	0.5°	1°	1.5°	2°	3°
ZSTNB2002-1-04	0.1	0.2	1	0.4	0.15	0.17	0.18	50	4	1.35	10.9	1.5	1.7	1.8	2.0	2.3
ZSTNB2002-1.5-04			1.5	0.4			0.19			1.77	10.4	2.0	2.2	2.4	2.6	2.9
ZSTNB2002-2-09			2	0.9			0.23			1.10	10.1	x	2.8	3.1	3.4	3.9
ZSTNB2002-2.5-09			2.5	0.9			0.24			1.10	9.6	x	3.3	3.7	4.0	4.5
ZSTNB2003-2-04	0.15	0.3	2	0.4	0.25	0.28	0.29	50	4	2.19	10.0	2.5	2.8	3.0	3.2	3.5
ZSTNB2003-3-09			3	0.9			0.36			1.20	9.3	x	3.8	4.2	4.5	5.1
ZSTNB2003-4-09			4	0.9			0.39			1.20	8.6	x	4.8	5.3	5.7	6.3
ZSTNB2004-2-04	0.2	0.4	2	0.4	0.3	0.37	0.39	50	4	2.20	10.0	2.5	2.8	3.0	3.2	3.5
ZSTNB2004-3-04			3	0.4			0.41			2.44	9.1	3.6	3.9	4.1	4.4	4.8
ZSTNB2004-4-04			4	0.4			0.42			2.44	8.4	4.7	5.2	5.6	5.9	6.5
ZSTNB2004-4-09			4	0.9			0.49			1.25	8.5	x	4.8	5.3	5.7	6.3
ZSTNB2004-5-04			5	0.4			0.44			2.44	7.8	5.7	6.3	6.7	7.1	7.7
ZSTNB2004-5-09			5	0.9			0.52			1.25	7.9	x	5.9	6.4	6.8	7.5
ZSTNB2005-4-04	0.25	0.5	4	0.4	0.35	0.47	0.52	50	4	2.49	8.4	4.6	5.0	5.3	5.5	5.9
ZSTNB2005-8-09			8	0.9			0.71			1.30	6.5	x	8.9	9.6	10.1	10.9
ZSTNB2005-12-09			12				0.84			1.30	5.3	x	13.0	13.9	14.5	15.4
ZSTNB20054-2-04	0.27	0.54	2	0.4	0.37	0.52	0.54	50	4	1.80	10.0	2.3	2.5	2.7	2.8	3.0
ZSTNB20054-4-04			4				0.57			1.80	8.4	4.5	4.9	5.2	5.5	5.9
ZSTNB20054-5-04			5				0.59			1.80	7.8	5.5	6.0	6.3	6.6	7.1
ZSTNB20054-6-04			6				0.60			1.80	7.2	6.7	7.3	7.8	8.2	8.8
ZSTNB20054-6.5-04			6.5				0.61			1.80	7.0	7.2	7.9	8.3	8.7	9.4
ZSTNB20054-7-04			7				0.61			1.80	6.8	7.7	8.4	8.9	9.3	10.0
ZSTNB2006-2-04	0.3	0.6	2	0.4	0.4	0.57	0.59	50	4	2.17	10.0	2.4	2.5	2.7	2.8	3.0
ZSTNB2006-4-04			4				0.62			2.54	8.4	4.6	5.0	5.2	5.5	5.9
ZSTNB2006-6-04			6				0.65			2.54	7.2	6.8	7.4	7.8	8.2	8.8
ZSTNB2006-6-09			6	0.9			0.75			1.35	7.3	x	6.9	7.5	7.9	8.6
ZSTNB2006-8-09			8				0.81			1.35	6.4	x	8.9	9.6	10.1	10.9
ZSTNB2006-10-04			10	0.4			0.70			2.54	5.6	10.8	11.7	12.2	12.7	13.5
ZSTNB2006-10-09			10	0.9			0.87			1.35	5.7	x	11.0	11.8	12.3	13.2
ZSTNB2006-12-09			12				0.93	55		1.35	5.2	x	13.0	13.9	14.5	15.4
ZSTNB2006-15-04			15	0.4			0.77			2.54	4.4	15.9	17.0	17.6	18.2	19.2
ZSTNB2006-15-09			15	0.9			1.03			1.35	4.5	x	16.1	17.1	17.7	18.8

X No application
– No interference

NEXT

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, TAPER NECK BACK DRAFT TYPE

- If the workpiece has draft angle, the interference length will be longer than the L2.
- Please refer to the effective neck length for the various draft angles
- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2"and should also be referred to

※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

ZSTNB20..-..-. series

ULTRA FINE | HELIX | up to R3 | over R3 | p.952~955

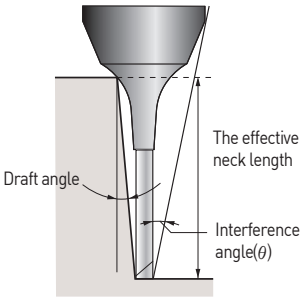
EDP. No.	Dimension(mm)											Effective Neck Length				
	R	D	L_2	θ	L_1	d_1	d_2	L_3	d_3	App. L	θ_2	0.5°	1°	1.5°	2°	3°
ZSTNB2008-4-04	0.4	0.8	4	0.4	0.5	0.77	0.82	50	4	2.64	8.3	4.6	4.9	5.2	5.5	5.9
ZSTNB2008-6-04			6				0.85			2.64	7.1	6.6	7.1	7.5	7.7	8.3
ZSTNB2008-8-09			8	0.9			1.01			1.45	6.3	x	8.9	9.6	10.1	10.9
ZSTNB2008-12-09			12				1.13	55		1.45	5.0	x	13.0	13.9	14.5	15.4
ZSTNB2008-16-09			16				1.26			1.45	4.2	x	17.1	18.1	18.8	19.9
ZSTNB2009-4-04	0.45	0.9	4	0.4	0.6	0.86	0.91	50	4	3.46	8.2	4.5	4.7	4.9	5.1	5.4
ZSTNB2009-8-04			8				0.96	55		3.46	6.1	8.7	9.3	9.7	10.0	10.6
ZSTNB2009-12-04			12				1.02			3.46	4.8	12.9	13.8	14.4	14.9	15.7
ZSTNB2009-16-04			16				1.08	60		3.46	4.0	17.0	18.0	18.7	19.3	20.5
ZSTNB2009-18-04			18				1.10	65		3.46	3.7	19.1	20.1	20.9	21.5	23.1
ZSTNB2009-20-04			20				1.13			3.46	3.4	21.1	22.2	23.0	23.6	25.6
ZSTNB2009-22-04			22				1.16			3.46	3.2	23.1	24.3	25.1	25.8	28.2
ZSTNB2009-24-04			24				1.19	70		3.46	3.0	25.2	26.4	27.2	27.9	-
ZSTNB2010-6-04	0.5	1	6	0.4	0.8	0.94	1.01	50	6	5.09	8.3	6.8	7.2	7.5	7.8	8.3
ZSTNB2010-8-04			8				1.04	55		5.09	7.5	8.8	9.3	9.7	10.0	10.6
ZSTNB2010-10-04			10				1.07			5.09	6.8	11.0	11.7	12.3	12.7	13.5
ZSTNB2010-10-09			10	0.9			1.23			2.70	6.9	x	11.2	11.9	12.4	13.2
ZSTNB2010-15-09			15				1.39	60		2.70	5.7	x	16.2	17.1	17.8	18.8
ZSTNB2010-20-04			20	0.4			1.21	65		5.09	4.7	21.2	22.3	23.0	23.6	25.7
ZSTNB2010-20-09			20	0.9			1.54			2.70	4.8	x	21.3	22.4	23.1	24.6
ZSTNB2010-25-09			25				1.70	70		2.70	4.2	x	26.4	27.6	28.4	30.8
ZSTNB2010-30-04			30	0.4			1.35	75		5.09	3.6	31.3	32.7	33.6	34.8	38.5
ZSTNB2010-30-09			30	0.9			1.86			2.70	3.7	x	31.4	32.8	33.7	36.9
ZSTNB2010-35-09			35				2.02	80		2.70	3.3	x	36.5	38.0	39.0	43.1
ZSTNB2010-40-09			40				2.17	85		2.70	3.0	x	41.6	43.2	44.4	-
ZSTNB2010-50-09			50				2.49	95		2.70	2.5	x	51.7	53.5	55.5	-
ZSTNB2010-60-09			60				2.80	105		2.70	2.2	x	61.8	63.8	66.6	-
ZSTNB2010-70-09			70				3.11	115		2.70	1.9	x	71.9	74.0	-	-
ZSTNB2015-8-04	0.75	1.5	8	0.4	1.35	1.42	1.51	55	6	7.07	7.3	8.9	9.4	9.7	10.0	10.6
ZSTNB2015-10-04			10				1.54			7.07	6.6	10.9	11.5	11.9	12.2	12.9

X No application
– No interference

NEXT ≫

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, TAPER NECK BACK DRAFT TYPE

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- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2"and should also be referred to

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ZSTNB20..-..-. series

ULTRA FINE | HELIX | up to R3 | over R3 | p.952~955

EDP. No.	Dimension(mm)											Effective Neck Length				
	R	D	L_2	θ	L_1	d_1	d_2	L_3	d_3	App.L	θ_2	0.5°	1°	1.5°	2°	3°
ZSTNB2015-12-04	0.75	1.5	12	0.4	1.35	1.42	1.57	55	6	7.07	6.0	13.0	13.6	14.0	14.4	15.4
ZSTNB2015-15-09			15	0.9			1.85	60		3.89	5.4	x	16.4	17.2	17.8	18.8
ZSTNB2015-20-09			20				2.01	65		3.89	4.5	x	21.4	22.4	23.2	24.7
ZSTNB2015-30-09			30				2.32	75		3.89	3.4	x	31.5	32.9	33.7	37.0
ZSTNB2018-4-04	0.9	1.8	4	0.4	1.6	1.73	1.76	50	6	4.38	9.2	4.6	4.8	4.9	5.1	5.4
ZSTNB2018-8-04			8				1.82			6.61	7.1	8.6	9.0	9.2	9.4	10.2
ZSTNB2018-12-04			12				1.88	55		6.61	5.8	12.9	13.5	14.0	14.4	15.4
ZSTNB2018-16-04			16				1.93	60		6.61	4.9	17.0	17.7	18.3	18.7	20.5
ZSTNB2018-20-04			20				1.99	65		6.61	4.3	21.2	22.3	23.0	23.6	25.6
ZSTNB2018-24-04			24				2.04			6.61	3.8	25.3	26.5	27.3	27.9	30.8
ZSTNB2018-28-04			28				2.10	70		6.61	3.4	29.4	30.6	31.5	32.4	35.9
ZSTNB2018-32-04			32				2.15			6.61	3.0	33.4	34.8	35.7	37.1	-
ZSTNB2018-36-04			36				2.21	75		6.61	2.8	37.5	38.9	39.9	41.7	-
ZSTNB2018-38-04			38				2.24	80		6.61	2.7	39.5	41.0	42.0	44.0	-
ZSTNB2018-40-04			40				2.27			6.61	2.6	41.5	43.1	44.2	46.3	-
ZSTNB2020-8-04	1	2	8	0.4	1.7	1.92	2.01	50	6	7.42	7.0	8.7	9.0	9.2	9.5	10.2
ZSTNB2020-12-04			12				2.06	55		7.42	5.7	13.0	13.6	14.0	14.4	15.4
ZSTNB2020-16-04			16				2.12	60		7.42	4.8	17.0	17.7	18.3	18.7	20.5
ZSTNB2020-20-04			20				2.18	65		7.42	4.1	21.3	22.3	23.0	23.6	25.6
ZSTNB2020-20-09			20	0.9			2.50			4.24	4.2	x	21.4	22.4	23.2	24.6
ZSTNB2020-25-09			25				2.65			4.24	3.6	x	26.5	27.7	28.5	30.8
ZSTNB2020-30-04			30	0.4			2.32	70		7.42	3.1	31.4	32.7	33.6	34.8	38.5
ZSTNB2020-30-09			30	0.9			2.81			4.24	3.2	x	31.6	32.9	33.7	36.9
ZSTNB2020-35-09			35				2.97	75		4.24	2.8	x	36.6	38.0	39.0	-
ZSTNB2020-40-04			40	0.4			2.46	80		7.42	2.5	41.5	43.1	44.2	46.3	-
ZSTNB2020-40-09			40	0.9			3.12			4.24	2.6	x	41.7	43.2	44.5	-
ZSTNB2020-50-09			50				3.44	90		4.24	2.1	x	51.8	53.5	55.5	-
ZSTNB2020-60-09			60				3.75	100		4.24	1.8	x	61.9	63.8	-	-
ZSTNB2020-70-09			70				4.07	110		4.24	1.6	x	72.0	74.1	-	-
ZSTNB2030-8-04	1.5	3	8	0.4	2.5	2.86	2.94	50	6	8.50	6.3	8.8	9.1	9.3	9.5	10.3
ZSTNB2030-16-04			16				3.05	55		12.52	4.1	17.2	17.8	18.3	18.7	20.6

X No application
– No interference

NEXT ≫

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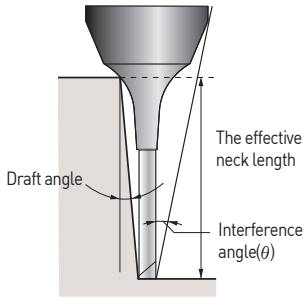
Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, TAPER NECK BACK DRAFT TYPE

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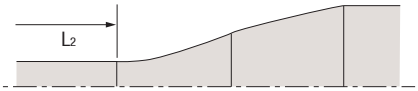

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ULTRA FINE | HELIX | up to R3 | over R3 | p.952~955

ZSTNB20..-..-. series

EDP. No.	Dimension(mm)											Effective Neck Length				
	R	D	L_2	θ	L_1	d_1	d_2	L_3	d_3	App. L	θ_2	0.5°	1°	1.5°	2°	3°
ZSTNB2030-20-04	1.5	3	20	0.4	2.5	2.86	3.10	60	6	12.52	3.4	21.2	22.0	22.6	23.3	25.7
ZSTNB2030-30-04			30				3.24	70		12.52	2.5	31.6	32.8	33.7	34.9	-
ZSTNB2030-30-09			30	0.9			3.72			6.95	2.6	x	31.8	33.0	33.8	-
ZSTNB2030-40-04			40	0.4			3.38	80		12.52	2.0	41.7	43.2	44.3	-	-
ZSTNB2030-40-09			40	0.9			4.04			6.95	2.0	x	41.9	43.3	-	-
ZSTNB2030-50-09			50				4.35	90		6.95	1.7	x	52.0	53.6	-	-
ZSTNB2030-60-09			60				4.67	100		6.95	1.4	x	62.1	-	-	-
ZSTNB2030-70-09			70				4.98	110		6.95	1.2	x	72.1	-	-	-
ZSTNB2040-20-10	2	4	20	1	8	3.86	4.28	70	8	12.01	5.0	20.5	21.6	22.3	22.8	23.5
ZSTNB2040-30-10			30				4.63	80		12.01	3.51	22.0	31.6	32.5	33.2	34.16
ZSTNB2040-40-10			40				4.98	90		12.01	2.7	22.0	42.0	43.4	44.3	-
ZSTNB2040-50-10			50				5.33	100		12.01	2.2	22.0	52.0	53.6	54.7	-
ZSTNB2040-60-10			60				5.68	110		12.01	1.9	22.0	62.0	63.8	-	-
ZSTNB2050-30-10	2.5	5	30	1	10	4.86	5.56	80	8	14.01	2.8	25.5	31.7	32.6	33.2	-
ZSTNB2050-40-10			40				5.91	90		14.01	2.1	25.5	41.7	42.8	43.5	-
ZSTNB2050-60-10			60				6.61	110		14.01	1.5	25.5	62.1	-	-	-
ZSTNB2060-30-10	3	6	30	1	12	5.86	6.49	80	8	16.01	1.9	29.0	31.8	32.6	-	-
ZSTNB2060-40-10			40				6.84	90		16.01	1.5	29.0	41.8	-	-	-
ZSTNB2060-50-10			50				7.19	100		16.01	1.2	29.0	51.8	-	-	-
ZSTNB2060-60-10			60				7.54	110	10	16.01	1.9	29.0	62.2	63.9	-	-
ZSTNB2060-70-10			70				7.89	120		16.01	1.7	29.0	72.2	74.1	-	-
ZSTNB2060-80-10			80				8.23	130		16.01	1.5	29.0	82.2	-	-	-
ZSTNB2080-50-10	4	8	50	1	14	7.86	9.12	110	10	18.01	1.2	32.0	51.9	-	-	-
ZSTNB2080-60-10			60				9.47	120		18.01	1.0	32.0	-	-	-	-
ZSTNB2080-70-10			70				9.82	130		18.01	0.9	32.0	-	-	-	-
ZSTNB2080-80-10			80				10.16	140	12	18.01	1.5	32.0	82.3	-	-	-
ZSTNB2100-60-10	5	10	60	1	18	9.86	11.33	130	12	22.01	1.1	39.0	62.1	-	-	-
ZSTNB2100-75-10			75				11.85	140		22.01	0.9	39.0	-	-	-	-

X No application
– No interference

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

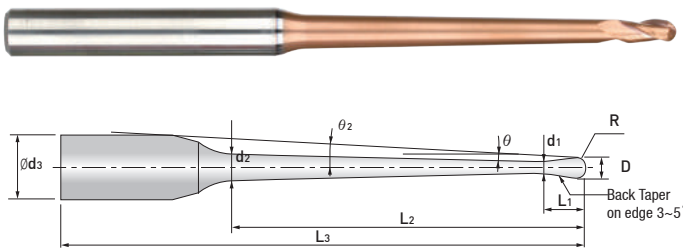
○:General Application ◎:The most suitable Application

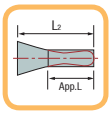
■ Tolerance

Diameter	Radius	Shank Dia.
up to 6	±0.005	h6
over 6	±0.01	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*





The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

※R2 or higher is not applied to Back draft type.

ZSTNB30..-..-.. series

ULTRA FINE | HELIX | up to R3 | over R3

p.952~955

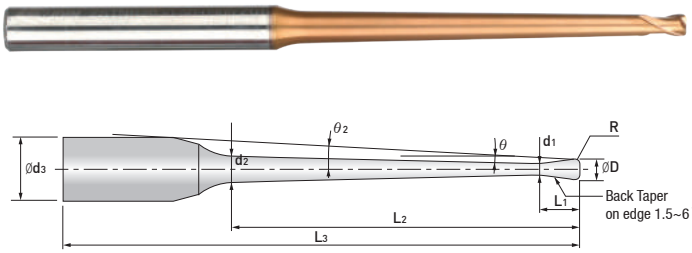
EDP. No.	Dimension(mm)											Effective Neck Length				
	R	D	L_2	θ	L_1	d_1	d_2	L_3	d_3	App.L	θ_2	0.5°	1°	1.5°	2°	3°
ZSTNB3020-8-04	1	2	8	0.4	1.7	1.92	2.01	50	6	7.42	7.0	8.7	9.0	9.2	9.5	10.2
ZSTNB3020-12-04			12				2.06	55		7.42	5.7	13.0	13.6	14.0	14.4	15.4
ZSTNB3020-16-04			16				2.12	60		7.42	4.8	17.0	17.7	18.3	18.7	20.5
ZSTNB3020-20-04			20				2.18	65		7.42	4.1	21.3	22.3	23.0	23.6	25.6
ZSTNB3020-20-09			20	0.9			2.50			4.24	4.2	x	21.4	22.4	23.2	24.6
ZSTNB3020-25-09			25				2.65			4.24	3.6	x	26.5	27.7	28.5	30.8
ZSTNB3020-30-04			30	0.4			2.32	70		7.42	3.1	31.4	32.7	33.6	34.8	38.5
ZSTNB3020-30-09			30	0.9			2.81			4.24	3.2	x	31.6	32.9	33.7	36.9
ZSTNB3020-35-09			35				2.97	75		4.24	2.8	x	36.6	38.0	39.0	-
ZSTNB3020-40-04			40	0.4			2.46	80		7.42	2.5	41.5	43.1	44.2	46.3	-
ZSTNB3020-40-09			40	0.9			3.12	80		4.24	2.6	x	41.7	43.2	44.5	-
ZSTNB3020-50-09			50				3.44	90		4.24	2.1	x	51.8	53.5	55.5	-
ZSTNB3020-60-09			60				3.75	100		4.24	1.8	x	61.9	63.8	-	-
ZSTNB3020-70-09			70				4.07	110		4.24	1.6	x	72.0	74.1	-	-
ZSTNB3030-8-04	1.5	3	8	0.4	2.5	2.86	2.94	50	6	8.50	6.3	8.8	9.1	9.3	9.5	10.3
ZSTNB3030-16-04			16				3.05	55		12.52	4.1	17.2	17.8	18.3	18.7	20.6
ZSTNB3030-20-04			20				3.10	60		12.52	3.4	21.2	22.0	22.6	23.3	25.7
ZSTNB3030-30-04			30				3.24	70		12.52	2.5	31.6	32.8	33.7	34.9	-
ZSTNB3030-30-09			30	0.9			3.72			6.95	2.6	x	31.8	33.0	33.8	-
ZSTNB3030-40-04			40	0.4			3.38	80		12.52	2.0	41.7	43.2	44.3	-	-
ZSTNB3030-40-09			40	0.9			4.04			6.95	2.0	x	41.9	43.3	-	-
ZSTNB3030-50-09			50				4.35	90		6.95	1.7	x	52.0	53.6	-	-
ZSTNB3030-60-09			60				4.67	100		6.95	1.4	x	62.1	-	-	-
ZSTNB3030-70-09			70				4.98	110		6.95	1.2	x	72.1	-	-	-
ZSTNB3040-20-10	2	4	20	1	8	3.86	4.28	70	8	12.01	5.0	20.5	21.6	22.3	22.8	23.5
ZSTNB3040-30-10			30				4.63	80		12.01	3.6	22.0	31.6	32.5	33.2	34.1
ZSTNB3040-40-10			40				4.98	90		12.01	2.7	22.0	42.0	43.4	44.3	-
ZSTNB3040-50-10			50				5.33	100		12.01	2.2	22.0	52.0	53.6	54.7	-
ZSTNB3040-60-10			60				5.68	110		12.01	1.9	22.0	62.0	63.8	-	-
ZSTNB3050-30-10	2.5	5	30	1	10	4.86	5.56	80	8	14.01	2.8	25.5	31.7	32.6	33.2	-
ZSTNB3050-40-10			40				5.91	90		14.01	2.1	25.5	41.7	42.8	43.5	-
ZSTNB3050-60-10			60				6.61	110		12.52	1.5	25.5	62.1	-	-	-

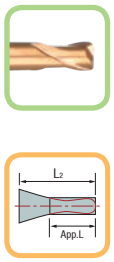
X No application
– No interference

NEXT ≫

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*





The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length

※R2 or higher is not applied to Back draft type.

ZSTNR....-..-. series

ULTRA FINE HELIX

p.956~957

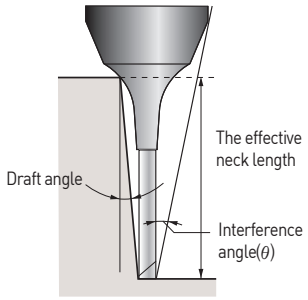
EDP. No.	Dimension(mm)											Effective Neck Length				
	D	R	L_2	θ	L_1	d_1	d_2	L_3	d_3	App.L	θ_2	0.5°	1°	1.5°	2°	3°
ZSTNR2002-2-09005	0.2	0.05	2	0.9	0.15	0.17	0.23	50	4	1.10	10.0	x	2.8	3.1	3.4	3.9
ZSTNR2004-4-09005	0.4	0.05	4	0.9	0.3	0.37	0.49	50	4	1.25	8.4	x	4.9	5.3	5.7	6.3
ZSTNR2004-5-09005			5	0.9			0.52			1.25	7.8	x	5.9	6.4	6.8	7.5
ZSTNR2004-4-0901		0.1	4	0.9			0.49			1.25	8.5	x	4.9	5.3	5.7	6.3
ZSTNR2004-5-0901			5	0.9			0.52			1.25	7.9	x	5.9	6.4	6.8	7.5
ZSTNR2005-5-0901	0.5	0.1	5	0.9	0.35	0.47	0.62	50	4	1.30	7.8	x	5.9	6.4	6.8	7.5
ZSTNR2005-8-0901			8	0.9			0.71			1.30	6.4	x	9.0	9.7	10.2	11.0
ZSTNR2005-10-0901			10	0.9			0.77	55		1.30	5.8	x	11.0	11.8	12.4	13.2
ZSTNR2006-12-0901	0.6	0.1	12	0.9	0.4	0.57	0.93	55	4	1.35	5.1	x	13.0	13.9	14.5	15.5
ZSTNR2006-15-0901			15	0.9			1.03			1.35	4.5	x	16.1	17.1	17.8	18.8
ZSTNR2008-6-0402	0.8	0.2	6	0.4	0.5	0.77	0.85	50	4	2.64	7.0	6.6	7.1	7.5	7.8	8.3
ZSTNR2008-12-0902			12	0.9			1.13	55		1.45	5.0	x	13.0	13.9	14.5	15.5
ZSTNR2010-8-0402	1	0.2	8	0.4	0.8	0.94	1.04	55	6	5.09	7.4	8.8	9.3	9.7	10.1	10.6
ZSTNR2010-10-0902			10	0.9			1.23			5.09	6.8	x	11.2	11.9	12.4	13.3
ZSTNR2010-15-0902			15	0.9			1.39	60		2.70	5.6	x	16.3	17.2	17.8	18.8
ZSTNR2010-20-0902			20	0.9			1.54	65		2.70	4.8	x	21.3	22.4	23.2	24.7
ZSTNR2010-25-0902			25	0.9			1.70	70		2.70	4.1	x	26.4	27.6	28.5	30.9
ZSTNR2010-30-0902			30	0.9			1.86	75		2.70	3.7	x	31.5	32.8	33.7	37.0
ZSTNR2010-35-0902			35	0.9			2.02	80		2.70	3.3	x	36.5	38.0	39.0	43.2
ZSTNR2010-8-0403		0.3	8	0.4			1.04	55		2.70	7.4	8.8	9.3	9.7	10.0	10.6
ZSTNR2010-15-0903			15	0.9			1.39	60		2.70	5.6	x	16.3	17.2	17.8	18.8
ZSTNR2010-25-0903			25	0.9			1.70	70		2.70	4.2	x	26.4	27.6	28.5	30.8
ZSTNR2010-30-0903			30	0.9			1.86	75		2.70	3.7	x	31.5	32.8	33.7	37.0
ZSTNR2015-10-0402	1.5	0.2	10	0.4	1.35	1.42	1.54	55	6	7.07	6.4	11.0	11.5	11.9	12.3	13.0
ZSTNR2015-15-0902			15	0.9			1.85	60		7.07	5.3	x	16.4	17.3	17.9	18.9
ZSTNR2015-20-0902			20	0.9			2.01	65		3.89	4.5	x	21.5	22.5	23.2	24.9
ZSTNR2015-25-0902			25	0.9			2.16	70		3.89	3.9	x	26.6	27.7	28.5	31.0
ZSTNR2015-30-0902			30	0.9			2.32	75		3.89	3.4	x	31.6	32.9	33.8	37.1
ZSTNR2015-10-0403		0.3	10	0.4			1.54	55		3.89	6.4	11.0	11.5	11.9	12.3	13.0

X No application
– No interference

NEXT ≫

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, TAPER NECK BACK DRAFT TYPE

- If the workpiece has draft angle, the interference length will be longer than the L2.
- Please refer to the effective neck length for the various draft angles
- In addition, the angle at which the tool will interfere with the workpiece is shown as the"interference angle θ_2"and should also be referred to

※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

UWC ULTRA FINE | 2 | 30° HELIX | R ±0.01 | AlTiN HH | DATA

p.956~957

ZSTNR....-..-. series

EDP. No.	Dimension(mm)											Effective Neck Length				
	D	R	L_2	θ	L_1	d_1	d_2	L_3	d_3	App. L	θ_2	0.5°	1°	1.5°	2°	3°
ZSTNR2015-20-0903	1.5	0.3	20	0.9	1.35	1.42	2.01	65	6	3.89	4.5	x	21.5	22.5	23.2	24.8
ZSTNR2015-25-0903			25				2.16	70			3.9	x	26.5	27.7	28.5	31.0
ZSTNR2015-30-0903			30				2.32	75			3.4	x	31.6	32.9	33.8	37.1
ZSTNR2020-30-0902	2	0.2	30	0.9	1.7	1.92	2.81	70	6	7.42	3.1	x	31.6	32.9	33.8	37.2
ZSTNR2020-40-0902			40				3.12	80			2.5	x	41.8	43.3	44.6	-
ZSTNR2020-50-0902			50				3.44	90			2.1	x	51.9	53.6	55.7	-
ZSTNR2020-12-0403		0.3	12	0.4			2.06	55			5.5	13.0	13.6	14.1	14.5	15.6
ZSTNR2020-20-0903			20	0.9			2.50	65		4.24	4.1	x	21.5	22.5	23.2	24.9
ZSTNR2020-30-0903			30				2.81	70			3.1	x	31.6	32.9	33.8	37.1
ZSTNR2020-40-0903			40				3.12	80			2.5	x	41.7	43.3	44.6	-
ZSTNR2020-50-0903			50				3.44	90			2.1	x	51.8	53.6	55.7	-
ZSTNR2020-8-0405		0.5	8	0.4			2.01	50			6.8	8.7	9.0	9.3	9.5	10.4
ZSTNR2020-12-0405			12				2.06	55			5.6	13.0	13.6	14.1	14.4	15.5
ZSTNR2020-16-0405			16				2.12	60			4.7	17.0	17.8	18.3	18.7	20.7
ZSTNR2020-20-0905			20	0.9			2.50	65			4.2	x	21.5	22.5	23.2	24.8
ZSTNR2020-25-0905			25				2.65	65			3.6	x	26.6	27.7	28.5	30.9
ZSTNR2020-30-0905			30				2.81	70			3.1	x	31.6	32.9	33.8	37.1
ZSTNR2020-40-0905			40				3.12	80			2.5	x	41.7	43.2	44.6	-
ZSTNR2020-50-0905			50				3.44	90			2.1	x	51.8	53.6	55.6	-
ZSTNR2030-40-0902	3	0.2	40	0.9	2.5	2.86	4.04	80	6	6.95	2.0	x	42.0	43.4	-	-
ZSTNR2030-50-0902			50				4.35	90			1.6	x	52.1	53.7	-	-
ZSTNR2030-60-0902			60				4.67	100			1.4	x	62.2	-	-	-
ZSTNR2030-40-0903		0.3	40				4.04	80			2.0	x	42.0	43.4	-	-
ZSTNR2030-50-0903			50				4.35	90			1.7	x	52.1	53.7	-	-
ZSTNR2030-60-0903			60				4.67	100			1.4	x	62.2	-	-	-
ZSTNR2030-40-0905		0.5	40				4.04	80			2.0	x	42.0	43.4	-	-
ZSTNR2030-50-0905			50				4.35	90			1.7	x	52.1	53.7	-	-
ZSTNR2030-60-0905			60				4.67	100			1.4	x	62.1	-	-	-

※ These tools are manufactured based on order received.

X No application
– No interference

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
	○	○	◎	◎	○				

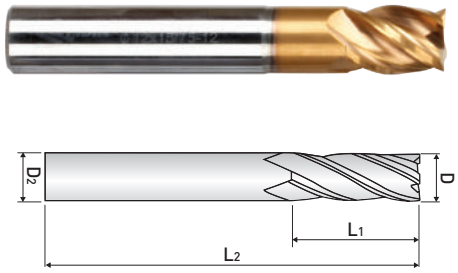
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.015	h5

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, LONG CUT LENGTH BROKEN INDEX

- High precision and excellent surface due to each 4F unequal index geometry
- Longer tool life over 50% as reducing chatter and resonance

ZS124 ...series

UWC ULTRA FINE | 4 ULTRA FINE | 38° HELIX | AlTiN HH | DATA p.961

EDP. No.	D	L_1	L_2	D_2
ZS124 020	2	5	45	4
ZS124 030	3	8	45	6
ZS124 040	4	10	45	6
ZS124 060	6	16	50	6
ZS124 080	8	20	60	8
ZS124 100	10	25	75	10
ZS124 120	12	35	85	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

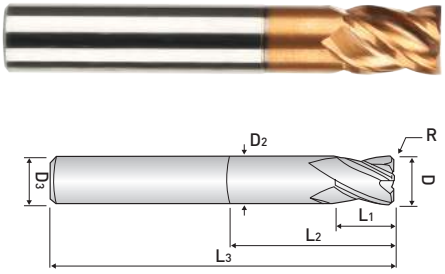
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, CORNER RADIUS BROKEN INDEX

- The impacting debut of new type endmill for high hardened steels up to HRc70 and high speed machining up to 200m/min
- High precision and excellent surface due to each 4F unequal index geometry
- Longer tool life over 50% as reducing chatter and resonance

ZS1(2)04 ...series

ULTRA FINE HELIX p.961

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZS104010	1	-	1.5	4	45	0.9	4
ZS204010		0.05					
ZS104020	2	-	3	6	45	1.9	4
ZS204020		0.05					
ZS104030	3	-	4	7	45	2.9	6
ZS204030		0.1					
ZS104040	4	-	5	9	45	3.8	6
ZS204040		0.1					
ZS104060	6	-	7	14	50	5.8	6
ZS204060		0.2					
ZS104080	8	-	9	18	60	7.8	8
ZS204080		0.2					
ZS104100	10	-	12	25	75	9.7	10
ZS204100		0.2					
ZS104120	12	-	15	30	75	11.7	12
ZS204120		0.3					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

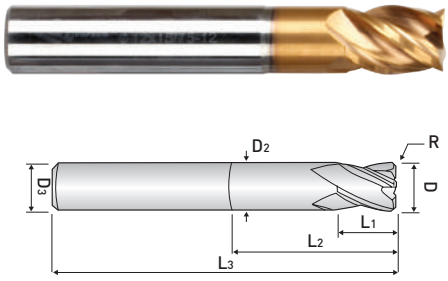
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, CORNER RADIUS BROKEN INDEX

- The impacting debut of new type endmill for high hardened steels up to HRc70 and high speed machining up to 200m/min
- High precision and excellent surface due to each 4F unequal index geometry
- Longer tool life over 50% as reducing chatter and resonance

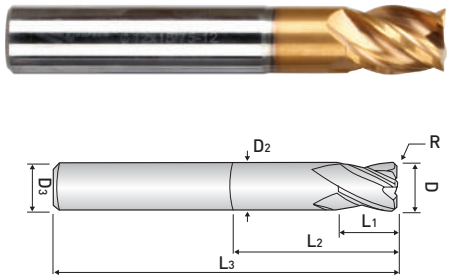
ZS204 .....series

ULTRA FINE | HELIX | up to 6 | over 6 | p.961

EDP. No.	D	R	L1	L2	L3	D2	D3
ZS20402000507	2	0.05	2.5	7	50	1.9	4
ZS2040200107		0.1					
ZS2040300109	3	0.1	4	9	55	2.9	6
ZS2040300209		0.2					
ZS2040300309		0.3					
ZS2040300312				12			
ZS2040300316				16			
ZS2040400212	4	0.2	5	12	55	3.8	6
ZS2040400312		0.3					
ZS2040400316				16			
ZS2040400320				20			
ZS2040400512		0.5		12			
ZS2040400516				16			
ZS2040400520				20			
ZS2040401012		1		12			
ZS2040500116	5	0.1	6	16	60	4.8	6
ZS2040500216		0.2					
ZS2040500316		0.3					
ZS2040500516		0.5					
ZS2040501016		1					
ZS2040600120	6	0.1	7	20	60	5.8	6
ZS2040600220		0.2					
ZS2040600320		0.3					
ZS2040600520		0.5					
ZS2040601020		1					
ZS2040601520		1.5					

NEXT >>

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, CORNER RADIUS BROKEN INDEX

- The impacting debut of new type endmill for high hardened steels up to HRc70 and high speed machining up to 200m/min
- High precision and excellent surface due to each 4F unequal index geometry
- Longer tool life over 50% as reducing chatter and resonance

ZS204 .....series

UWC ULTRA FINE | 4 | 38° HELIX | R ±0.01 up to 6 | R ±0.015 over 6 | AlTiN HH | DATA p.961

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZS2040800125	8	0.1	9	25	60	7.8	8
ZS2040800225		0.2					
ZS2040800325		0.3					
ZS2040800525		0.5					
ZS2040801025		1					
ZS2040801525		1.5					
ZS2040802025		2					
ZS2041000232	10	0.2	11	32	75	9.7	10
ZS2041000332		0.3					
ZS2041000532		0.5					
ZS2041001032		1					
ZS2041001532		1.5					
ZS2041002032		2					
ZS2041200238	12	0.2	12	38	75	11.7	12
ZS2041200338		0.3					
ZS2041200538		0.5					
ZS2041201038		1					
ZS2041201538		1.5					
ZS2041202038		2					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

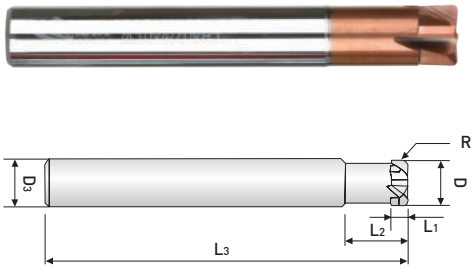
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, STUB CUT LENGTH, with EXTENDED NECK

- Designed to machine high hardened material by using newly developed raw-material and new coating
- Applying straight flute design on the tool to minimize the corner radius breakage
- Applying back draft type on the tool to maximize the reducing chatter and preventing deflection

ZSPM4...-.. series

ULTRA FINE HELIX

p.961~962

EDP. No.	D	R	L_1	L_2	L_3	D_3
ZSPM4030-05	3	0.5	1.2	8	50	6
ZSPM4040-05	4	0.5	1.5	10	50	6
ZSPM4060-05	6	0.5	2.5	12	60	6
ZSPM4060-10		1				
ZSPM4060-15		1.5				
ZSPM4060-15L					90	
ZSPM4080-10	8	1	3.5	16	60	8
ZSPM4080-20		2				
ZSPM4080-20L					100	
ZSPM4100-10	10	1	4	20	70	10
ZSPM4100-20		2				
ZSPM4100-20L					100	
ZSPM4120-20	12	2	5	25	80	12
ZSPM4120-30		3				
ZSPM4120-30L					110	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

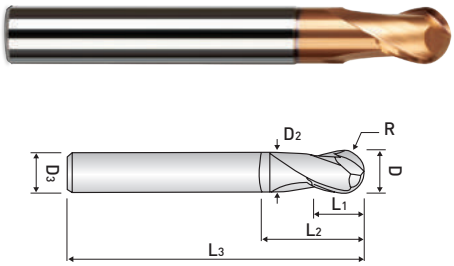
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed to machine high hardened materials up to HRc 70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating
- Excellent workpiece finishes

DB702 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | p.962

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
DB702001	0.1	0.05	0.15	-	40	-	4
DB702002	0.2	0.1	0.3	-	40	-	4
DB702003	0.3	0.15	0.5	-	40	-	4
DB702004	0.4	0.2	0.6	-	40	-	4
DB702005	0.5	0.25	0.7	-	40	-	4
DB702006	0.6	0.3	0.9	-	40	-	4
DB702007	0.7	0.35	1.1	-	40	-	4
DB702008	0.8	0.4	1.2	-	40	-	4
DB702009	0.9	0.45	1.4	-	40	-	4
DB702010S4	1	0.5	1.5	-	45	-	4
DB702010				3	50	0.95	6
DB702015S4	1.5	0.75	2	-	45	-	4
DB702015	1.5	0.75	2	4	50	1.45	6
DB702020S4	2	1	2.5	-	45	-	4
DB702020				5	50	1.9	6
DB702025	2.5	1.25	3	7	50	2.45	6
DB702030S4	3	1.5	4	-	45	-	4
DB702030S				10	50	2.9	6
DB702030					60		
DB702031					70		
DB702040S4	4	2	5	-	45	-	4
DB702040S				10	50	3.9	6
DB702040					60		
DB702041					70		
DB702050	5	2.5	6	12	60	4.9	6
DB702060	6	3	7	12	60	5.9	6
DB702061					90		
DB702080	8	4	9	15	70	7.9	8
DB702081					100		
DB702100	10	5	11	25	75	9.9	10
DB702101					100		
DB702120	12	6	12	25	80	11.9	12
DB702121					110		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

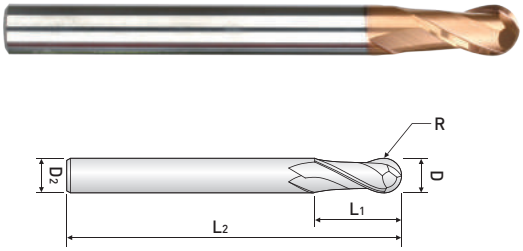
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)		Shank Dia.
up to R3	±0.005	h6
over R3	±0.01	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, REGULAR LENGTH, BALL NOSE

- Designed to machine high hardened material up to HRc 70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating
- Excellent workpiece finishes

DB712 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | p.962

EDP. No.	D	R	L_1	L_2	D_2
DB712010S	1	0.5	1.5	40	6
DB712010S4			2.5	50	4
DB712010					6
DB712012	1.2	0.6	3	50	6
DB712015S	1.5	0.75	2.5	40	6
DB712015S4			4	50	4
DB712015					6
DB712020S	2	1	3	40	6
DB712020S4			5	50	4
DB712020					6
DB712025	2.5	1.25	7	60	6
DB712030S	3	1.5	4.5	50	6
DB712030S4			8	60	4
DB712030					6
DB712040S	4	2	6	50	6
DB712040			8	70	
DB712050S	5	2.5	7.5	50	6
DB712050			10	80	
DB712060S	6	3	9	50	6
DB712060			12	90	
DB712080S	8	4	12	50	8
DB712081			14	100	
DB712100S	10	5	15	60	10
DB712100			18	100	
DB712120S	12	6	18	60	12
DB712120			22	110	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

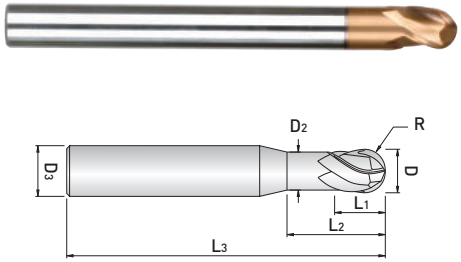
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)		Shank Dia.
up to R3	±0.005	h6
over R3	±0.01	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



3 FLUTE, BALL NOSE for FINISHING MOLD & DIE

- Designed to machine high hardened materials up to HRc 70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating
- Excellent workpiece finishes

DB703 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | p.963

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
DB703020	2	1	2.5	5	50	1.9	6
DB703025	2.5	1.25	3	7	50	2.4	6
DB703030S	3	1.5	4	10	50	2.9	6
DB703030					60		
DB703031					70		
DB703040S	4	2	5	10	50	3.7	6
DB703040					60		
DB703041					70		
DB703050	5	2.5	6	12	60	4.7	6
DB703060	6	3	7	12	60	5.6	6
DB703061					90	5.9	
DB703080	8	4	9	15	70	7.4	8
DB703081					100	7.9	
DB703100	10	5	11	25	75	9.4	10
DB703101					100	9.9	
DB703120	12	6	12	25	80	11.4	12
DB703121					110	11.9	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

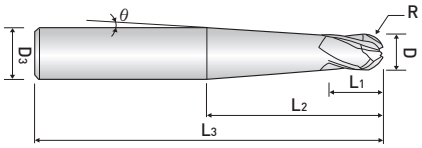
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)		Shank Dia.
up to R3	±0.005	h6
over R3	±0.01	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, TAPER NECK, FINISHING MOLD & DIE

- Designed to machine high hardened material up to HRc 70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating
- Excellent workpiece finishes

DB734 ...series

ULTRA FINE HELIX

p.963

EDP. No.	D	R	L_1	L_2	L_3	θ	D_3
DB734020-2.5	2	1	2	25	60	2.5	4
DB734020-3.5				18		3.5	
DB734025-2.5	2.5	1.25	3	20	60	2.5	4
DB734025-3.0				17		3	
DB734030-2.0	3	1.5	3	46	70	2	6
DB734030-2.5				37		2.5	
DB734040-2.0	4	2.0	4	33	70	2	6
DB734040-2.5				27		2.5	
DB734050-2.5	5	2.5	5	16	70	2.5	6
DB734060-1.5	6	3.0	6	44	100	1.5	8
DB734060-2.5				29		2.5	
DB734080-1.5	8	4.0	8	46	100	1.5	10
DB734080-2.5				31		2.5	
DB734100-1.5	10	5.0	10	48	110	1.5	12
DB734100-2.5				33		2.5	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

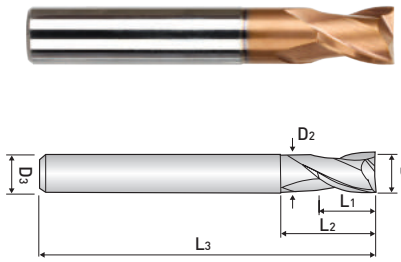
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)	Shank Dia.
±0.01	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, STUB CUT LENGTH, with EXTENDED NECK

- Designed to machine high hardened materials up to HRc 70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZE702 ...series

ULTRA FINE HELIX p.964

EDP. No.	D	L_1	L_2	L_3	D_2	D_3
ZE702001	0.1	0.2	-	40	-	4
ZE702002	0.2	0.4	-	40	-	4
ZE702003	0.3	0.5	-	40	-	4
ZE702004	0.4	0.7	-	40	-	4
ZE702005	0.5	1	-	40	-	4
ZE702006	0.6	1.2	-	40	-	4
ZE702007	0.7	1.4	-	40	-	4
ZE702008	0.8	1.6	-	40	-	4
ZE702009	0.9	2	-	40	-	4
ZE702010S4	1	1.5	-	40	-	4
ZE702010						6
ZE702015	1.5	2.2	-	40	-	6
ZE702020S4	2	3	6	40	1.9	4
ZE702020						6
ZE702025	2.5	4	6	40	2.4	6
ZE702030	3	4	7	45	2.9	6
ZE702035	3.5	6	9	45	3.3	6
ZE702040	4	6	9	45	3.8	6
ZE702045	4.5	6	10	45	4.3	6
ZE702050	5	6	11	50	4.8	6
ZE702060	6	7	14	50	5.8	6
ZE702080	8	9	18	60	7.8	8
ZE702100	10	12	25	75	9.7	10
ZE702120	12	15	30	75	11.7	12
ZE702160	16	18	38	90	15.7	16
ZE702200	20	24	45	100	19.7	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

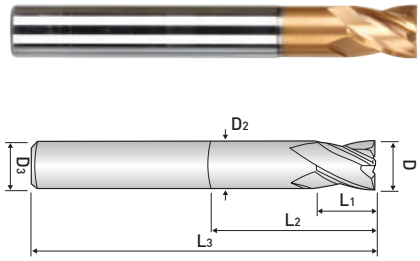
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, STUB CUT LENGTH, with EXTENDED NECK

- Designed to machine high hardened materials up to HRc 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZE704 ...series

ULTRA FINE | HELIX | p.964

EDP. No.	D	L_1	L_2	L_3	D_2	D_3
ZE704010S4	1	1.5	-	40	-	4
ZE704010						6
ZE704015	1.5	2.2	-	40	-	6
ZE704020S4	2	3	6	40	1.9	4
ZE704020						6
ZE704025	2.5	4	6	40	2.4	6
ZE704030	3	4	7	45	2.9	6
ZE704035	3.5	5	9	45	3.3	6
ZE704040	4	5	9	45	3.8	6
ZE704045	4.5	6	10	45	4.3	6
ZE704050	5	6	11	50	4.8	6
ZE704060	6	7	14	50	5.8	6
ZE704080	8	9	18	60	7.8	8
ZE704100	10	12	25	75	9.7	10
ZE704120	12	15	30	75	11.7	12
ZE704160	16	18	38	90	15.7	16
ZE704200	20	24	45	100	19.7	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

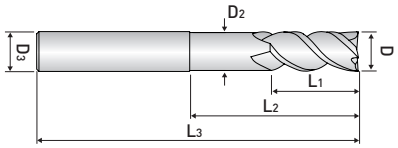
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



4 & 6 FLUTE, FINISHING for MOLD & DIE

- Designed to machine high hardened materials up to HRc 70.
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating.
- Corner radius(below 0.05) against chipping in high speed machining.

ZE724(6) ...series

ULTRA FINE | HELIX | HELIX | p.965

EDP. No.	D	L_1	L_2	L_3	D_2	D_3	Z
ZE724010	1	1.5	5	45	0.95	6	4
ZE724015	1.5	2.2	6	45	1.45	6	4
ZE724020	2	3	8	45	1.9	6	4
ZE724030	3	4	9	50	2.9	6	4
ZE724040	4	5	12	50	3.8	6	4
ZE724050	5	6	15	50	4.8	6	4
ZE726060	6	7	20	60	5.8	6	6
ZE726080	8	9	25	70	7.8	8	6
ZE726100	10	12	32	75	9.7	10	6
ZE726120	12	15	38	80	11.7	12	6

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

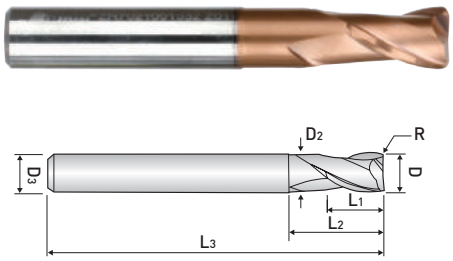
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.015	h6
over 6	0 ~ -0.002	

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

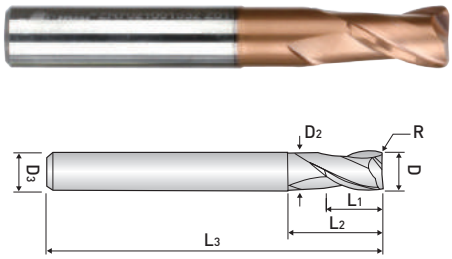
ZR702 .....series

UWC ULTRA FINE | 2 | 30° HELIX | R ±0,01 up to Φ6 | R ±0,015 over Φ6 | AlTiN HH | DATA p.965~966

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZR702 010 005 03 S4	1	0.05	1.5	3	50	0.95	4
ZR702 010 005 04 S4				4			
ZR702 010 005 06 S4				6			
ZR702 010 005 08 S4				8			
ZR702 010 005 10 S4				10			
ZR702 010 01 03 S4		0.1		3			
ZR702 010 01 04 S4				4			
ZR702 010 01 06 S4				6			
ZR702 010 01 08 S4				8			
ZR702 010 01 10 S4				10			
ZR702 010 02 03 S4		0.2		3			
ZR702 010 02 04 S4				4			
ZR702 010 02 06 S4				6			
ZR702 010 02 08 S4				8			
ZR702 010 02 10 S4				10			
ZR702 010 03 03 S4		0.3		3			
ZR702 010 03 04 S4				4			
ZR702 010 03 06 S4				6			
ZR702 010 03 08 S4				8			
ZR702 010 03 10 S4				10			
ZR702 010 01 04	1	0.1	1.5	4	50	0.95	6
ZR702 010 01 06				6			
ZR702 010 02 04		0.2		4			
ZR702 010 02 06				6			
ZR702 010 02 10				10			
ZR702 010 02 12				12			
ZR702 012 02 08	1.2	0.2	2	8	50	1.15	6
ZR702 012 02 12				12			
ZR702 015 005 04 S4	1.5	0.05	2.5	4	50	1.45	4
ZR702 015 005 06 S4				6			
ZR702 015 005 08 S4				8			
ZR702 015 005 10 S4				10			
ZR702 015 005 12 S4				12			
ZR702 015 01 04 S4		0.1		4			
ZR702 015 01 06 S4				6			
ZR702 015 01 08 S4				8			
ZR702 015 01 10 S4				10			
ZR702 015 01 12 S4				12			

NEXT >>

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

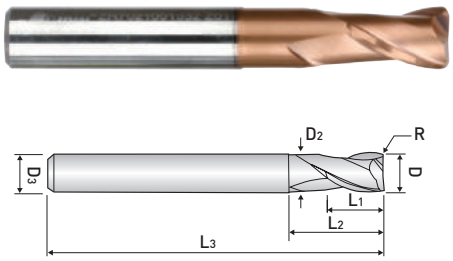
ZR702 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.965~966

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZR702 015 02 04 S4	1.5	0.2	2.5	4	50	1.45	4
ZR702 015 02 06 S4				6			
ZR702 015 02 08 S4				8			
ZR702 015 02 10 S4				10			
ZR702 015 02 12 S4				12			
ZR702 015 03 04 S4		0.3		4			
ZR702 015 03 06 S4				6			
ZR702 015 03 08 S4				8			
ZR702 015 03 10 S4				10			
ZR702 015 03 12 S4				12			
ZR702 015 05 04 S4		0.5		4			
ZR702 015 05 06 S4				6			
ZR702 015 05 08 S4				8			
ZR702 015 05 10 S4				10			
ZR702 015 05 12 S4				12			
ZR702 015 02 04	1.5	0.2	2.5	4	50	1.45	6
ZR702 015 02 06				6			
ZR702 015 02 08				8			
ZR702 015 02 10				10			
ZR702 015 02 15				15			
ZR702 020 01 06 S4	2	0.1	3	6	50	1.9	4
ZR702 020 01 08 S4				8			
ZR702 020 01 10 S4				10			
ZR702 020 01 12 S4				12			
ZR702 020 01 16 S4				16			
ZR702 020 01 20 S4				20			
ZR702 020 02 06 S4		0.2		6			
ZR702 020 02 08 S4				8			
ZR702 020 02 10 S4				10			
ZR702 020 02 12 S4				12			
ZR702 020 02 16 S4				16			
ZR702 020 02 20 S4				20			
ZR702 020 03 06 S4		0.3		6			
ZR702 020 03 08 S4				8			
ZR702 020 03 10 S4				10			
ZR702 020 03 12 S4				12			
ZR702 020 03 16 S4				16			
ZR702 020 03 20 S4				20			

NEXT ≫

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR702 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.965~966

EDP. No.	D	R	L1	L2	L3	D2	D3
ZR702 020 05 06 S4	2	0.5	3	6	50	1.9	4
ZR702 020 05 08 S4				8			
ZR702 020 05 10 S4				10			
ZR702 020 05 12 S4				12			
ZR702 020 05 16 S4				16			
ZR702 020 05 20 S4				20			
ZR702 020 01 08	2	0.1	3	8	50	1.9	6
ZR702 020 01 12				12			
ZR702 020 02 06		0.2		6			
ZR702 020 02 09				9			
ZR702 020 02 16				16			
ZR702 020 03 06		0.3		6			
ZR702 020 05 06		0.5		6			
ZR702 020 05 09				9			
ZR702 020 05 12				12			
ZR702 020 05 16				16			
ZR702 025 02 08 S4	2.5	0.2	3.5	8	50	2.4	4
ZR702 025 02 10 S4				10			
ZR702 025 02 12 S4				12			
ZR702 025 02 16 S4				16			
ZR702 025 03 08 S4		0.3		8			
ZR702 025 03 10 S4				10			
ZR702 025 03 12 S4				12			
ZR702 025 03 16 S4				16			
ZR702 025 05 08 S4		0.5		8			
ZR702 025 05 10 S4				10			
ZR702 025 05 12 S4				12			
ZR702 025 05 16 S4				16			
ZR702 030 01 08	3	0.1	4.5	8	55	2.9	6
ZR702 030 01 10				10			
ZR702 030 01 12				12			
ZR702 030 01 16				16			
ZR702 030 01 20				20	60		
ZR702 030 02 08		0.2		8	55		
ZR702 030 02 09				9			
ZR702 030 02 10				10			

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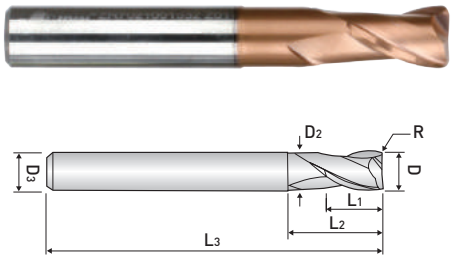
Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

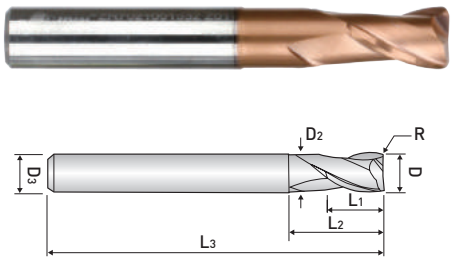
ZR702 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.965~966

EDP. No.	D	R	L1	L2	L3	D2	D3
ZR702 030 02 12	3	0.2	4.5	12	55	2.9	6
ZR702 030 02 16				16			
ZR702 030 02 20				20	60		
ZR702 030 03 08		0.3		8	55		
ZR702 030 03 09				9			
ZR702 030 03 10				10			
ZR702 030 03 12				12			
ZR702 030 03 14				14			
ZR702 030 03 16				16			
ZR702 030 03 20				20	60		
ZR702 030 05 08		0.5		8	55		
ZR702 030 05 09				9			
ZR702 030 05 10				10			
ZR702 030 05 12				12			
ZR702 030 05 16				16			
ZR702 030 05 20				20	60		
ZR702 030 10 08		1.0		8	55		
ZR702 030 10 10				10			
ZR702 030 10 12				12			
ZR702 030 10 16				16			
ZR702 030 10 20				20	60		
ZR702 030 10 25				25			
ZR702 040 01 10	4	0.1	6	10	55	3.8	6
ZR702 040 01 12				12			
ZR702 040 01 16				16			
ZR702 040 01 20				20	60		
ZR702 040 01 25				25			
ZR702 040 02 10		0.2		10	55		
ZR702 040 02 12				12			
ZR702 040 02 16				16			
ZR702 040 02 20				20	60		
ZR702 040 02 25				25			
ZR702 040 03 10		0.3		10	55		
ZR702 040 03 12				12			
ZR702 040 03 16				16			
ZR702 040 03 20				20	60		
ZR702 040 03 25				25			

NEXT

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR702 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.965~966

EDP. No.	D	R	L1	L2	L3	D2	D3
ZR702 040 05 10	4	0.5	6	10	55	3.8	6
ZR702 040 05 12				12			
ZR702 040 05 16				16			
ZR702 040 05 20				20	60		
ZR702 040 05 25				25			
ZR702 040 05 30				30	70		
ZR702 040 10 10		1.0		10	55		
ZR702 040 10 12				12			
ZR702 040 10 16				16			
ZR702 040 10 20				20	60		
ZR702 040 10 25				25			
ZR702 040 10 30				30	70		
ZR702 050 03 18	5	0.3	8	18	60	4.8	6
ZR702 060 02 20	6	0.2	9	20	60	5.8	6
ZR702 060 03 20		0.3					
ZR702 060 05 20		0.5					
ZR702 060 10 20		1.0					
ZR702 060 15 20		1.5					
ZR702 060 20 20		2.0					
ZR702 080 02 25	8	0.2	12	25	60	7.8	8
ZR702 080 03 25		0.3					
ZR702 080 05 25		0.5					
ZR702 080 10 25		1.0					
ZR702 080 15 25		1.5					
ZR702 100 02 32	10	0.2	15	32	70	9.7	10
ZR702 100 03 32		0.3					
ZR702 100 05 32		0.5					
ZR702 100 10 32		1.0					
ZR702 100 15 32		1.5					
ZR702 100 20 32		2.0					
ZR702 120 03 38	12	0.3	18	38	80	11.7	12
ZR702 120 05 38		0.5					
ZR702 120 10 38		1.0					
ZR702 120 15 38		1.5					
ZR702 120 20 38		2.0					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

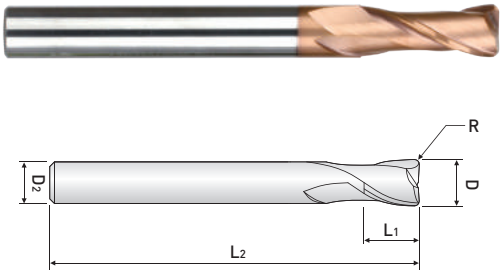
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG SHANK, CORNER RADIUS

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

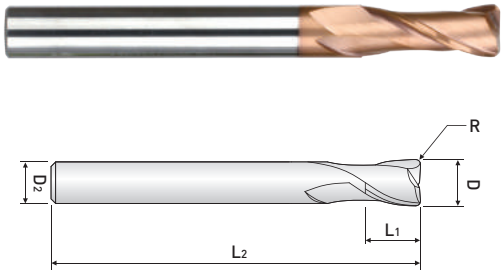
ZR732 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.965~966

EDP. No.	D	R	L_1	L_2	D_2
ZR732 010 01	1	0.1	2	50	6
ZR732 010 02		0.2			
ZR732 010 03		0.3			
ZR732 015 01	1.5	0.1	3	50	6
ZR732 015 02		0.2			
ZR732 015 03		0.3			
ZR732 015 05		0.5			
ZR732 020 01	2	0.1	5	50	6
ZR732 020 02		0.2			
ZR732 020 03		0.3			
ZR732 020 05		0.5			
ZR732 025 01	2.5	0.1	7	60	6
ZR732 025 02		0.2			
ZR732 025 03		0.3			
ZR732 025 05		0.5			
ZR732 030 01	3	0.1	8	60	6
ZR732 030 02		0.2			
ZR732 030 03		0.3			
ZR732 030 05		0.5			
ZR732 040 01	4	0.1	10	70	6
ZR732 040 02		0.2			
ZR732 040 03		0.3			
ZR732 040 05		0.5			
ZR732 040 10		1.0			

NEXT

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, LONG SHANK, CORNER RADIUS

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR732 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.965~966

EDP. No.	D	R	L_1	L_2	D_2
ZR732 050 01	5	0.1	13	80	6
ZR732 050 02		0.2			
ZR732 050 03		0.3			
ZR732 050 05		0.5			
ZR732 050 10		1.0			
ZR732 060 01	6	0.1	15	90	6
ZR732 060 02		0.2			
ZR732 060 03		0.3			
ZR732 060 05		0.5			
ZR732 060 10		1.0			
ZR732 080 01	8	0.1	20	100	8
ZR732 080 02		0.2			
ZR732 080 03		0.3			
ZR732 080 05		0.5			
ZR732 080 10		1.0			
ZR732 080 20		2.0			
ZR732 100 02	10	0.2	25	100	10
ZR732 100 03		0.3			
ZR732 100 05		0.5			
ZR732 100 10		1.0			
ZR732 100 20		2.0			
ZR732 120 02	12	0.2	30	110	12
ZR732 120 03		0.3			
ZR732 120 05		0.5			
ZR732 120 10		1.0			
ZR732 120 20		2.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

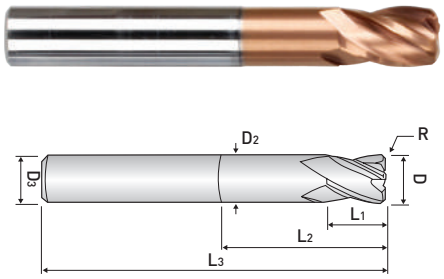
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

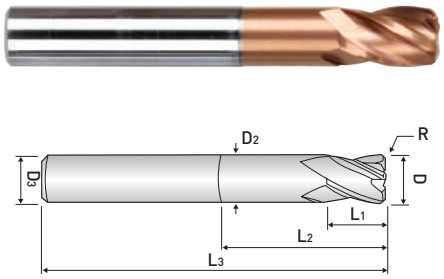
ZR704 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.966

EDP. No.	D	R	L1	L2	L3	D2	D3
ZR704 010 01 03 S4	1	0.1	2	3	50	0.95	4
ZR704 010 01 04 S4				4			
ZR704 010 01 06 S4				6			
ZR704 010 02 03 S4		0.2		3			
ZR704 010 02 04 S4				4			
ZR704 010 02 06 S4				6			
ZR704 010 03 03 S4		0.3		3			
ZR704 010 03 04 S4				4			
ZR704 010 03 06 S4				6			
ZR704 015 01 04 S4	1.5	0.1	2.5	4	50	1.45	4
ZR704 015 01 06 S4				6			
ZR704 015 02 04 S4		0.2		4			
ZR704 015 02 06 S4				6			
ZR704 015 03 04 S4		0.3		4			
ZR704 015 03 06 S4				6			
ZR704 020 01 06 S4	2	0.1	3	6	50	1.9	4
ZR704 020 01 08 S4				8			
ZR704 020 02 06 S4		0.2		6			
ZR704 020 02 08 S4				8			
ZR704 020 03 06 S4		0.3		6			
ZR704 020 03 08 S4				8			
ZR704 020 05 06 S4		0.5		6			
ZR704 020 05 08 S4				8			
ZR704 020 02 08	2	0.2	3	8	50	1.9	6
ZR704 020 02 10				10			
ZR704 020 02 12				12			
ZR704 025 01 06 S4	2.5	0.1	3.5	6	50	2.4	4
ZR704 030 01 08	3	0.1	4	8	55	2.9	6
ZR704 030 01 10				10			
ZR704 030 01 12				12			
ZR704 030 01 16				16			
ZR704 030 01 20				20	60		
ZR704 030 02 08		0.2		8	55		
ZR704 030 02 10				10			
ZR704 030 02 12				12			
ZR704 030 02 16				16			
ZR704 030 02 20				20	60		

NEXT

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

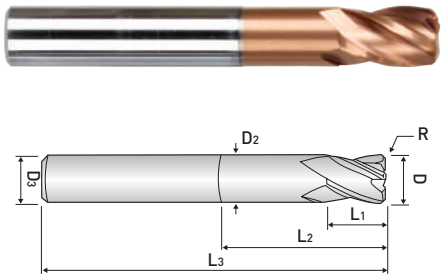
ZR704 .....series

ULTRA FINE | 4 | HELIX | up to Φ6 | over Φ6 | p.966

EDP. No.	D	R	L1	L2	L3	D2	D3
ZR704 030 03 08	3	0.3	4	8	55	2.9	6
ZR704 030 03 09				9			
ZR704 030 03 10				10			
ZR704 030 03 12				12			
ZR704 030 03 16				16			
ZR704 030 03 20				20	60		
ZR704 030 05 08		0.5		8	55		
ZR704 030 05 09				9			
ZR704 030 05 10				10			
ZR704 030 05 12				12			
ZR704 030 05 16				16			
ZR704 030 05 20				20	60		
ZR704 030 10 08		1.0		8	55		
ZR704 030 10 10				10			
ZR704 030 10 12				12			
ZR704 030 10 16				16			
ZR704 030 10 20				20	60		
ZR704 040 01 10	4	0.1	6	10	55	3.8	6
ZR704 040 01 12				12			
ZR704 040 01 16				16			
ZR704 040 01 20				20	60		
ZR704 040 01 25				25			
ZR704 040 02 10		0.2		10	55		
ZR704 040 02 12				12			
ZR704 040 02 16				16			
ZR704 040 02 20				20	60		
ZR704 040 02 25				25			
ZR704 040 03 10		0.3		10	55		
ZR704 040 03 12				12			
ZR704 040 03 16				16			
ZR704 040 03 20				20	60		
ZR704 040 03 25				25			
ZR704 040 05 10		0.5		10	55		
ZR704 040 05 12				12			
ZR704 040 05 16				16			
ZR704 040 05 20				20	60		
ZR704 040 05 25				25			

NEXT

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR704 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.966

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZR704 040 10 10	4	1.0	6	10	55	3.8	6
ZR704 040 10 12				12			
ZR704 040 10 16				16			
ZR704 040 10 20				20	60		
ZR704 040 10 25				25			
ZR704 060 02 20	6	0.2	9	20	60	5.8	6
ZR704 060 03 20		0.3					
ZR704 060 05 20		0.5					
ZR704 060 10 20		1.0					
ZR704 060 15 20		1.5					
ZR704 060 20 20		2.0					
ZR704 080 02 25	8	0.2	12	25	60	7.8	8
ZR704 080 03 25		0.3					
ZR704 080 05 25		0.5					
ZR704 080 10 25		1.0					
ZR704 080 15 25		1.5					
ZR704 080 20 25		2.0					
ZR704 100 02 32	10	0.2	15	32	70	9.7	10
ZR704 100 03 32		0.3					
ZR704 100 05 32		0.5					
ZR704 100 10 32		1.0					
ZR704 100 15 32		1.5					
ZR704 100 20 32		2.0					
ZR704 120 03 38	12	0.3	18	38	80	11.7	12
ZR704 120 05 38		0.5					
ZR704 120 10 38		1.0					
ZR704 120 15 38		1.5					
ZR704 120 20 38		2.0					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

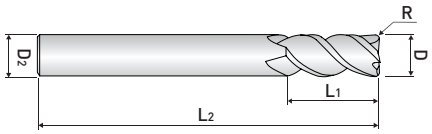
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up tp 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, 45°HELIX FINISHING MOLD & DIE

- Designed to machine high hardened material up to HRc 70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating
- Possible to reduce machining cycle time by 2 x D finishing performance

ZR714....-..-. series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.966

EDP. No.	D	R	L_1	L_2	D_2
ZR7140303	3	0.3	8	50	6
ZR7140305		0.5			
ZR7140403	4	0.3	11	50	6
ZR7140405		0.5			
ZR7140410		1.0			
ZR7140603	6	0.3	15	60	6
ZR7140605		0.5			
ZR7140610		1.0			
ZR7140803	8	0.3	20	60	8
ZR7140805		0.5			
ZR7140810		1.0			
ZR7140815		1.5			
ZR7140820		2.0			
ZR7141003	10	0.3	25	70	10
ZR7141005		0.5			
ZR7141010		1.0			
ZR7141015		1.5			
ZR7141020		2.0			
ZR7141025		2.5			
ZR7141030		3.0			
ZR7141203	12	0.3	30	80	12
ZR7141205		0.5			
ZR7141210		1.0			
ZR7141215		1.5			
ZR7141220		2.0			
ZR7141225		2.5			
ZR7141230		3.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

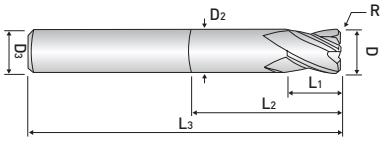
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up tp 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, STUB CUT LENGTH, CORNER RADIUS with LONG SHANK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR724 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.966

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZR7240600520	6	0.5	9	20	90	5.8	6
ZR7240601020		1.0					
ZR7240800525	8	0.5	12	25	100	7.7	8
ZR7240801025		1.0					
ZR7241000532	10	0.5	15	32	100	9.7	10
ZR7241001032		1.0					
ZR7241002032		2.0					
ZR7241200538	12	0.5	18	38	110	11.7	12
ZR7241201038		1.0					
ZR7241202038		2.0					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

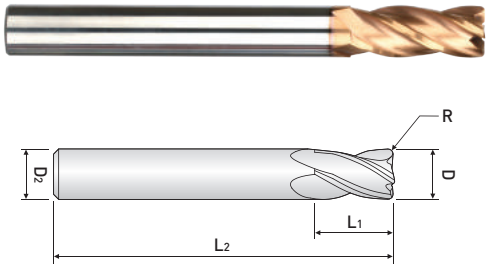
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, LONG SHANK, CORNER RADIUS

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

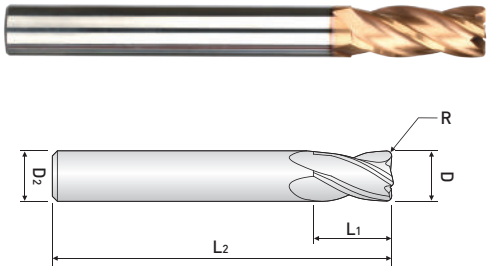
ZR734....-..-. series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.966

EDP. No.	D	R	L_1	L_2	D_2
ZR734 010 01	1	0.1	2	50	6
ZR734 010 02		0.2			
ZR734 010 03		0.3			
ZR734 015 01	1.5	0.1	3	50	6
ZR734 015 02		0.2			
ZR734 015 03		0.3			
ZR734 015 05		0.5			
ZR734 020 01	2	0.1	5	50	6
ZR734 020 02		0.2			
ZR734 020 03		0.3			
ZR734 020 05		0.5			
ZR734 025 01	2.5	0.1	7	60	6
ZR734 025 02		0.2			
ZR734 025 03		0.3			
ZR734 025 05		0.5			
ZR734 030 01	3	0.1	8	60	6
ZR734 030 02		0.2			
ZR734 030 03		0.3			
ZR734 030 05		0.5			
ZR734 040 01	4	0.1	10	70	6
ZR734 040 02		0.2			
ZR734 040 03		0.3			
ZR734 040 05		0.5			
ZR734 040 10		1.0			

NEXT

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, LONG SHANK, CORNER RADIUS

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR734....-..-. series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.966

EDP. No.	D	R	L_1	L_2	D_2
ZR734 050 01	5	0.1	13	80	6
ZR734 050 02		0.2			
ZR734 050 03		0.3			
ZR734 050 05		0.5			
ZR734 050 10		1.0			
ZR734 060 01	6	0.1	15	90	6
ZR734 060 02		0.2			
ZR734 060 03		0.3			
ZR734 060 05		0.5			
ZR734 060 10		1.0			
ZR734 080 01	8	0.1	20	100	8
ZR734 080 02		0.2			
ZR734 080 03		0.3			
ZR734 080 05		0.5			
ZR734 080 10		1.0			
ZR734 080 20		2.0			
ZR734 100 02	10	0.2	25	100	10
ZR734 100 03		0.3			
ZR734 100 05		0.5			
ZR734 100 10		1.0			
ZR734 100 20		2.0			
ZR734 120 02	12	0.2	30	110	12
ZR734 120 03		0.3			
ZR734 120 05		0.5			
ZR734 120 10		1.0			
ZR734 120 20		2.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

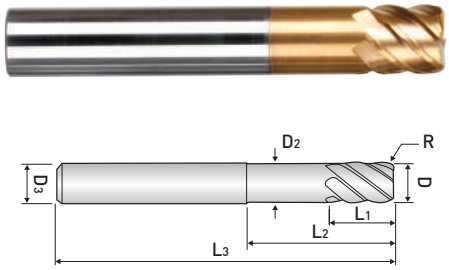
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



6 FLUTE, 45°HELIX STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR706 .....series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.967

EDP. No.	D	R	L1	L2	L3	D2	D3
ZR7060600314	6	0.3	6	14	50	5.8	6
ZR7060600514		0.5					
ZR7060800524	8	0.5	8	24	60	7.8	8
ZR7060801024		1.0					
ZR7061000530	10	0.5	10	30	70	9.8	10
ZR7061001030		1.0					
ZR7061200530	12	0.5	12	30	75	11.8	12
ZR7061201030		1.0					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

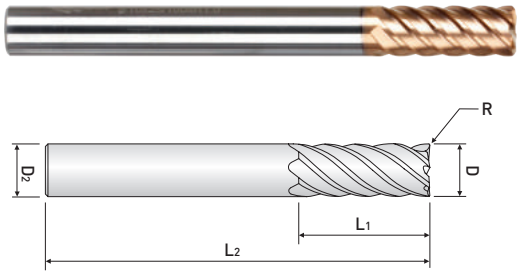
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



6 FLUTE, 45°HELIX, LONG SHANK, CORNER RADIUS

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZR736 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | p.967

EDP. No.	D	R	L_1	L_2	D_2
ZR736 060 05	6	0.5	15	90	6
ZR736 060 10		1.0			
ZR736 080 05	8	0.5	20	100	8
ZR736 080 10		1.0			
ZR736 100 05	10	0.5	25	100	10
ZR736 100 10		1.0			
ZR736 120 05	12	0.5	30	110	12
ZR736 120 10		1.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

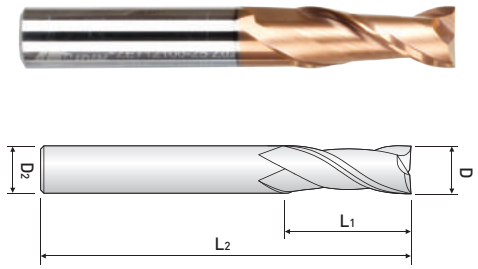
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



2 FLUTE, 35°HELIX REGULAR LENGTH

- Applied various corner "Radius" and effected length
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZE712 ...series

ULTRA FINE HELIX p.964

EDP. No.	D	L_1	L_2	D_2
ZE712010-02	1.0	2	40	6
ZE712010		3		
ZE712010-04		4		
ZE712012	1.2	3	40	6
ZE712015	1.5	4	40	6
ZE712015-06		6		
ZE712015-08		8		
ZE712020	2.0	5	40	6
ZE712020-08		8		
ZE712020-10		10	50	
ZE712025	2.5	6	40	6
ZE712030	3.0	8	45	6
ZE712030-10		10	50	
ZE712030-12		12		
ZE712035	3.5	10	45	6
ZE712040	4.0	10	45	6
ZE712040-12		12	50	
ZE712040-16		16	60	
ZE712045	4.5	11	45	6
ZE712050	5.0	13	50	6
ZE712055	5.5	13	50	6
ZE712060	6.0	13	50	6
ZE712060-15		15	60	
ZE712065	6.5	16	60	8
ZE712070	7.0	18	60	8
ZE712080	8.0	19	60	8
ZE712100	10.0	22	70	10
ZE712100-25		25		
ZE712120	12.0	26	75	12
ZE712120-30		30	80	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

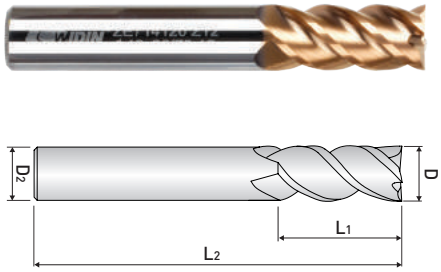
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for high hardened steel *Zamus Star Series*



4 FLUTE, 45°HELIX, REGULAR LENGTH

- Designed to machine high hardened materials up to HRc 70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZE714 ...series

ULTRA FINE | HELIX | p.965

EDP. No.	D	L_1	L_2	D_2
ZE714010	1.0	2.5	40	6
ZE714012	1.2	3	40	6
ZE714015	1.5	4	40	6
ZE714020	2.0	5	40	6
ZE714025	2.5	6	40	6
ZE714030	3.0	8	45	6
ZE714035	3.5	9	45	6
ZE714040	4.0	10	45	6
ZE714050	5.0	13	50	6
ZE714060	6.0	13	50	6
ZE714060-15		15	60	
ZE714080	8.0	19	60	8
ZE714100	10.0	22	70	10
ZE714100-25		25		
ZE714120	12.0	26	75	12
ZE714120-30		30	80	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

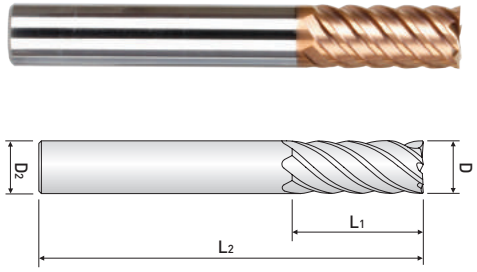
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high hardened steel *Zamus Star Series*



6 FLUTE, 50° HELIX REGULAR LENGTH

- Designed to machine high hardened materials up to HRc 70
- Suitable for dry cutting & high speed cutting due to newly developed raw-material and new coating

ZE716 ...series

ULTRA FINE HELIX p.967

EDP. No.	D	L_1	L_2	D_2
ZE716060	6	13	50	6
ZE716080	8	18	60	8
ZE716100	10	22	70	10
ZE716120	12	26	75	12
ZE716160	16	35	90	16
ZE716200	20	44	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○	○	◎	◎	○				

○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for Stainless Steel

NEO CLASSIC X-STAR SERIES(~HRc45)

ENDMILL SERIES

Endmills for stainless steel_ Neo Classic X-STAR Series

WIDIN

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XR404A ... series		SHORT LENGTH, CORNER RADIUS, VARIABLE HELIX	INCH	•	188
XR504A ... series		REGULAR LENGTH, CORNER RADIUS, VARIABLE HELIX	INCH	•	189
XR514A ... series		REGULAR LENGTH, CORNER RADIUS VARIABLE HELIX	INCH	•	190
XR524A ... series		LONG REACH, CORNER RADIUS VARIABLE HELIX	INCH	•	192
XXE504A ... series		REGULAR LENGTH, VARIABLE HELIX	INCH	•	193
XXE524A ... series		STUB CUT with LONG REACH, VARIABLE HELIX	INCH	•	194
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XXR524A ... series		STUB CUT with LONG REACH, CORNER RADIUS, VARIABLE HELIX	INCH	•	200
XXR534A ... series		STUB CUT with EXTENDED NECK, CORNER RADIUS, VARIABLE HELIX	INCH	•	201
XE505A ... series		STUB CUT LENGTH, VARIABLE HELIX	INCH	•	202
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NEXT ≫≫

Endmills for stainless steel_ Neo Classic X-STAR Series

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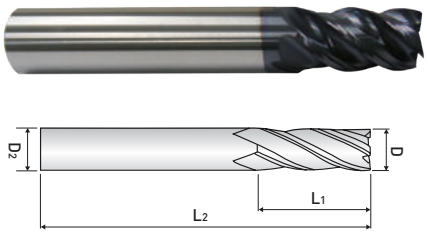
Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent perfor mance on mild mold steel and stainless steel

XE504A ...series

ULTRA FINE | HELIX | HELIX | p.947~949

EDP. No.	D	L_1	L_2	D_2
XE504A008	1/8	3/8	1-1/2	1/8
XE504A010	5/32	7/16	2	3/16
XE504A012	3/16	7/16	2	3/16
XE504A014	7/32	7/16	2-1/2	1/4
XE504A016	1/4	1/2	2-1/2	1/4
XE504A017	1/4	3/4	2-1/2	1/4
XE504A018	9/32	5/8	2-1/2	5/16
XE504A020	5/16	13/16	2-1/2	5/16
XE504A022	11/32	13/16	2-1/2	3/8
XE504A024	3/8	7/8	2-1/2	3/8
XE504A026	13/32	15/16	2-3/4	7/16
XE504A028	7/16	1	2-3/4	7/16
XE504A030	15/32	1	3	1/2
XE504A032	1/2	1	3	1/2
XE504A033	1/2	1-1/4	3-1/4	1/2
XE504A036	9/16	1-1/8	3-1/2	9/16
XE504A040	5/8	1-1/4	3-1/2	5/8
XE504A048	3/4	1-1/2	4	3/4
XE504A064	1	1-1/2	4	1

※ Flat shank is available upon request
ex) XE504A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

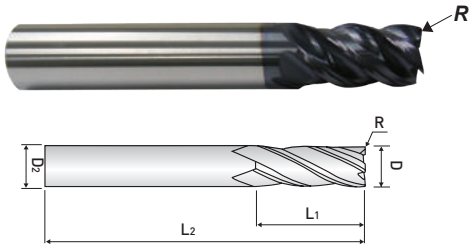
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
from 1/4 to 3/8	0 ~ -0.0016	
from 3/8 to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



**4 FLUTE, SHORT LENGTH,
CORNER RADIUS, VARIABLE HELIX**

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel

XR404A ...series

ULTRA FINE | HELIX | HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XR404A008	1/8	.015	1/4	1-1/2	1/8
XR404A010	5/32	.015	5/16	2	3/16
XR404A012	3/16	.015	3/8	2	3/16
XR404A014	7/32	.020	3/8	2	1/4
XR404A016	1/4	.020	7/16	2	1/4
XR404A020	5/16	.020	1/2	2	5/16
XR404A024	3/8	.020	5/8	2	3/8
XR404A028	7/16	.020	5/8	2-1/2	7/16
XR404A032	1/2	.030	5/8	2-1/2	1/2
XR404A040	5/8	.040	3/4	3	5/8
XR404A048	3/4	.040	1	3	3/4

※ Flat shank is available upon request
ex) XR404A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

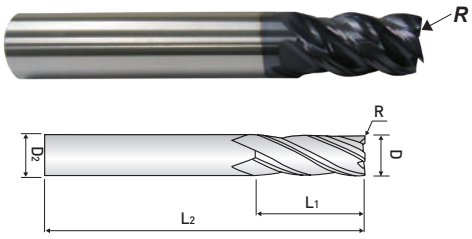
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel

XR504A ...series

ULTRA FINE | HELIX | HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XR504A008	1/8	.015	3/8	1-1/2	1/8
XR504A012	3/16	.015	7/16	2	3/16
XR504A016	1/4	.020	1/2	2-1/2	1/4
XR504A017	1/4	.020	3/4	2-1/2	1/4
XR504A020	5/16	.020	13/16	2-1/2	5/16
XR504A024	3/8	.020	7/8	2-1/2	3/8
XR504A028	7/16	.020	1	2-3/4	7/16
XR504A032	1/2	.030	1	3	1/2
XR504A033	1/2	.030	1-1/4	3-1/4	1/2
XR504A036	9/16	.030	1-1/8	3-1/2	9/16
XR504A040	5/8	.040	1-1/4	3-1/2	5/
XR504A048	3/4	.040	1-1/2	4	3/4
XR504A064	1	.040	1-1/2	4	1

※ Flat shank is available upon request
ex) XR504A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

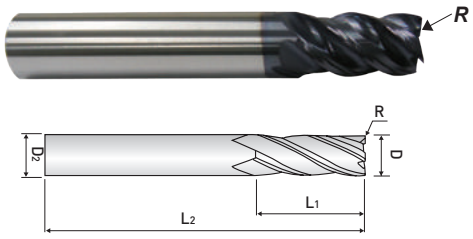
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, SHORT LENGTH, CORNER RADIUS, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel

XR514A ... series

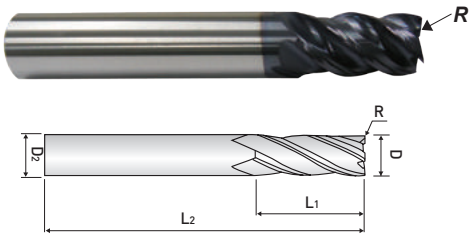
ULTRA FINE | HELIX | HELIX

p.947~949

EDP. No.	D	R	L1	L2	D2
XR514A008010	1/8	.010	3/8	2-1/2	1/8
XR514A008015		.015			
XR514A012010	3/16	.010	7/16	2	3/16
XR514A012015		.015			
XR514A012030		.030			
XR514A016010	1/4	.010	1/2	2-1/2	1/4
XR514A016015		.015			
XR514A016030		.030			
XR514A017010		.010	3/4		
XR514A017015		.015			
XR514A017030		.030			
XR514A020015	5/16	.015	13/16	2-1/2	5/16
XR514A020030		.030			
XR514A024010	3/8	.010	7/8	2-1/2	3/8
XR514A024015		.015			
XR514A024030		.030			
XR514A024045		.045			
XR514A024060		.060			
XR514A028015	7/16	.015	1	2-3/4	7/16
XR514A028030		.030			
XR514A032010	1/2	.010	1	3	12
XR514A032015		.015			
XR514A032030		.030			
XR514A032045		.045			
XR514A032060		.060			
XR514A032090		.090			
XR514A032125		.125			

NEXT

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, SHORT LENGTH,
CORNER RADIUS, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel

XR514A ... series

ULTRA FINE | HELIX | HELIX

p.947~949

EDP. No.	D	R	L1	L2	D2
XR514A033010	1/2	.010	1-1/4	3-1/4	1/2
XR514A033015		.015			
XR514A033030		.030			
XR514A033045		.045			
XR514A033060		.060			
XR514A033090		.090			
XR514A033125		.125			
XR514A036030	9/16	.030	1-1/8	3-1/2	9/16
XR514A040030	5/8	.030	1-1/4	3-1/2	5/8
XR514A040045		.045			
XR514A040060		.060			
XR514A040090		.090			
XR514A040125		.125			
XR514A048030	3/4	.030	1-1/2	4	3/4
XR514A048045		.045			
XR514A048060		.060			
XR514A048090		.090			
XR514A048125		.125			
XR514A064030	1	.030	1-1/2	4	1
XR514A064045		.045			
XR514A064060		.060			
XR514A064090		.090			
XR514A064125		.125			

※ Flat shank is available upon request
ex) XR514A032010F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

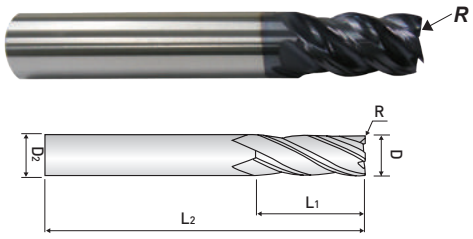
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



**4 FLUTE, LONG REACH,
CORNER RADIUS, VARIABLE HELIX**

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel

XR524A ...series

ULTRA FINE | HELIX | HELIX | p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XR524A016	1/4	.020	1/2	4	1/4
XR524A020	5/16	.020	13/16	4	5/16
XR524A024	3/8	.020	7/8	5	3/8
XR524A028	7/16	.020	1	6	7/16
XR524A032	1/2	.030	1	6	1/2
XR524A036	9/16	.030	1-1/8	6	9/16
XR524A040	5/8	.040	1-1/4	6	5/8
XR524A048	3/4	.040	1-1/2	6	3/4
XR524A064	1	.040	1-1/2	6	1

※ Flat shank is available upon request
ex) XR524A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

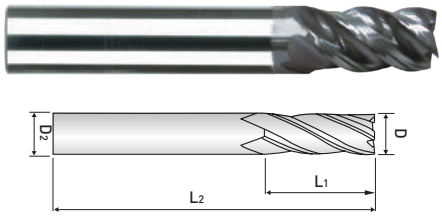
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel

XXE504A ...series

ULTRA FINE | HELIX | HELIX | p.947~949

EDP. No.	D	L_1	L_2	D_2
XXE504A008	1/8	3/8	1-1/2	1/8
XXE504A010	5/32	7/16	2	3/16
XXE504A012	3/16	7/16	2	3/16
XXE504A016	1/4	1/2	2-1/2	1/4
XXE504A017	1/4	3/4	2-1/2	1/4
XXE504A020	5/16	13/16	2-1/2	5/16
XXE504A024	3/8	7/8	2-1/2	3/8
XXE504A028	7/16	1	2-3/4	7/16
XXE504A032	1/2	1	3	1/2
XXE504A033	1/2	1-1/4	3-1/4	1/2
XXE504A036	9/16	1-1/8	3-1/2	9/16
XXE504A040	5/8	1-1/4	3-1/2	5/8
XXE504A048	3/4	1-1/2	4	3/4
XXE504A064	1	1-1/2	4	1

※ Flat shank is available upon request
ex) XXE504A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

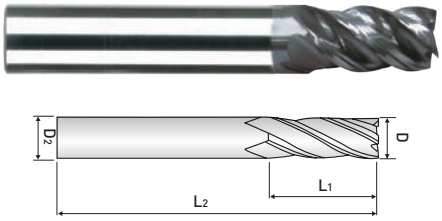
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -.0016	
over 3/8 up to 1	0 ~ -.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, STUB CUT with LONG REACH, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high L2 tensile stainless steel, inconel and titanium

XXE524A ...series

ULTRA FINE | HELIX | HELIX

p.947~949

EDP. No.	D	L_1	L_2	D_2
XXE524A016	1/4	3/8	4	1/4
XXE524A024	3/8	1/2	4	3/8
XXE524A032	1/2	5/8	5	1/2
XXE524A033	1/2	5/8	6	1/2
XXE524A040	5/8	3/4	5	5/8
XXE524A041	5/8	3/4	6	5/8
XXE524A048	3/4	1	5	3/4
XXE524A049	3/4	1	6	3/4

※ Flat shank is available upon request
ex) XXE524A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

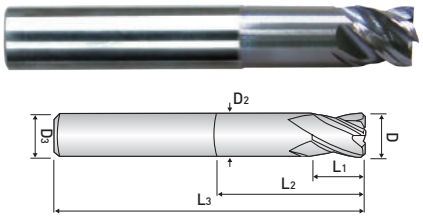
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -.0016	
over 3/8 up to 1	0 ~ -.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, STUB CUT LENGTH
with EXTENDED NECK, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XXE534A ...series

ULTRA FINE | 4 | 38° HELIX | 40° HELIX | TiAlN SH | DATA p.947~949

EDP. No.	D	L_1	L_2	L_3	D_2	D_3
XXE534A016	1/4	3/8	1-1/4	4	.240	1/4
XXE534A024	3/8	1/2	1-7/8	4	.365	3/8
XXE534A032	1/2	5/8	2-1/4	4	.490	1/2
XXE534A040	5/8	3/4	2-1/4	4-1/8	.615	5/8
XXE534A048	3/4	1	2-1/4	4-1/4	.740	3/4
XXE534A064	1	1-1/8	2-1/4	4-1/2	.990	1

※ Flat shank is available upon request
ex) XXE534A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

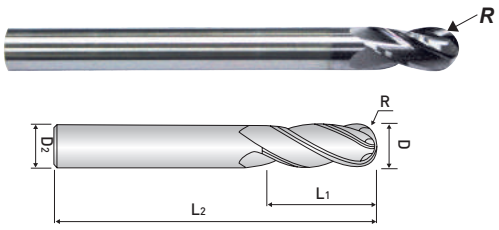
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -.0016	
over 3/8 up to 1	0 ~ -.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, BALL NOSE VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XXB504A ...series

ULTRA FINE | HELIX | HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XXB504A008	1/8	1/16	1/2	2	1/8
XXB504A012	3/16	3/32	5/8	2-1/4	3/16
XXB504A016	1/4	1/8	3/4	2-1/2	1/4
XXB504A020	5/16	5/32	3/4	2-1/2	5/16
XXB504A024	3/8	3/16	7/8	2-1/2	3/8
XXB504A032	1/2	1/4	1	3	1/2
XXB504A033	1/2	1/4	1-1/4	3-1/4	1/2
XXB504A040	5/8	5/16	1-1/4	3-1/2	5/8
XXB504A048	3/4	3/8	1-1/2	4	3/4
XXB504A064	1	1/2	1-1/2	4	1

※ Flat shank is available upon request

ex) XXB504A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

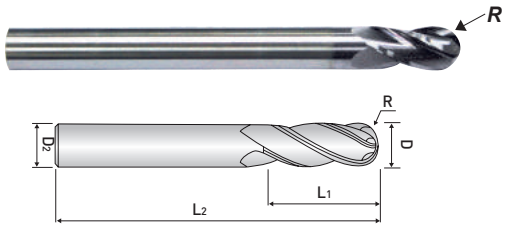
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, STUB CUT with LONG REACH, BALL NOSE VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XXB524A ...series

ULTRA FINE | HELIX | HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XXB524A016	1/4	1/8	3/8	4	1/4
XXB524A024	3/8	3/16	1/2	4	3/8
XXB524A032	1/2	1/4	5/8	5	1/2
XXB524A041	5/8	5/16	3/4	6	5/8
XXB524A049	3/4	3/8	1	6	3/4

※ Flat shank is available upon request
ex) XXB524A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

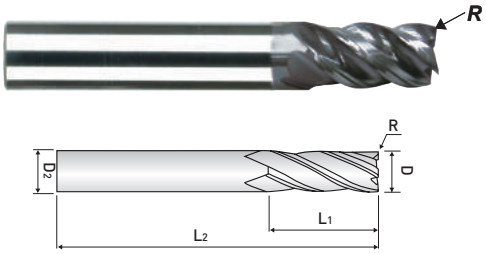
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -.0016	
over 3/8 up to 1	0 ~ -.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, SHORT LENGTH, CORNER RADIUS, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XXR404A ...series

ULTRA FINE | HELIX | HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XXR404A008	1/8	.015	1/4	1-1/2	1/8
XXR404A010	5/32	.015	5/16	2	3/16
XXR404A012	3/16	.015	3/8	2	3/16
XXR404A016	1/4	.020	7/16	2	1/4
XXR404A020	5/16	.020	1/2	2	5/16
XXR404A024	3/8	.020	5/8	2	3/8
XXR404A032	1/2	.030	5/8	2-1/2	1/2
XXR404A040	5/8	.030	3/4	3	5/8
XXR404A048	3/4	.030	1	3	3/4

※ Flat shank is available upon request
ex) XXR404A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

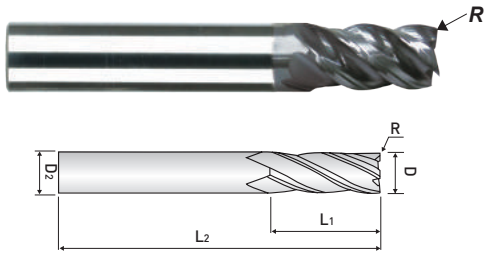
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, CORNER RADIUS, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XXR514A .....series

ULTRA FINE HELIX HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XXR514A008015	1/8	.015	3/8	1-1/2	1/8
XXR514A012015	3/16	.015	7/16	2	3/16
XXR514A016015	1/4	.015	1/2	2-1/2	1/4
XXR514A016030		.030			
XXR514A017015		.015	3/4		
XXR514A017030		.030			
XXR514A020015	5/16	.015	13/16	2-1/2	5/16
XXR514A024015	3/8	.015	7/8	2-1/2	3/8
XXR514A024030		.030			
XXR514A032030	1/2	.030	1	3	1/2
XXR514A032045		.045			
XXR514A032060		.060			
XXR514A032125		.125			
XXR514A033015	1/2	.015	1-1/4	3-1/14	1/2
XXR514A033030		.030			
XXR514A033045		.045			
XXR514A033060		.060			
XXR514A033125		.125			
XXR514A040030	5/8	.030	1-1/4	3-1/12	5/8
XXR514A040060		.060			
XXR514A048030	3/4	.030	1-1/12	4	3/4
XXR514A048060		.060			
XXR514A064030	1	.030	1-1/12	4	1
XXR514A064060		.060			

※ Flat shank is available upon request
ex) XXR514A032030F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

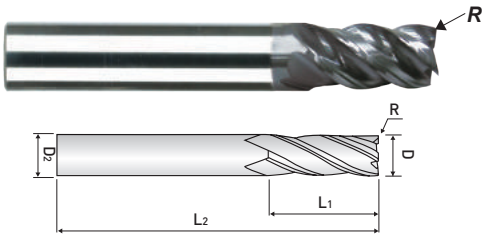
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, STUB CUT with LONG REACH, CORNER RADIUS, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XXR524A ...series

ULTRA FINE HELIX HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XXR524A016	1/4	.015	3/8	4	1/4
XXR524A024	3/8	.020	1/2	4	3/8
XXR524A032	1/2	.030	5/8	5	1/2
XXR524A033	1/2	.030	5/8	6	1/2
XXR524A040	5/8	.030	3/4	5	5/8
XXR524A041	5/8	.030	3/4	6	5/8
XXR524A048	3/4	.030	1	5	3/4
XXR524A049	3/4	.030	1	6	3/4

※ Flat shank is available upon request

ex) XXR524A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

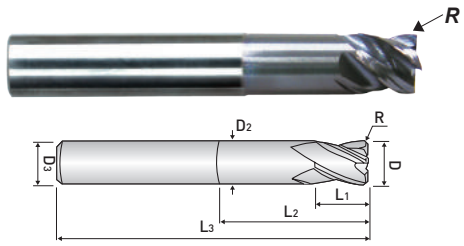
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -.0016	
over 3/8 up to 1	0 ~ -.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, STUB CUT with EXTENDED NECK, CORNER RADIUS, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XXR534A ...series

ULTRA FINE HELIX HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
XXR534A016	1/4	.015	3/8	1-1/4	4	.240	1/4
XXR534A024	3/8	.020	1/2	1-7/8	4	.365	3/8
XXR534A032	1/2	.020	5/8	2-1/4	4	.490	1/2
XXR534A040	5/8	.030	3/4	2-1/4	4-1/8	.615	5/8
XXR534A048	3/4	.030	1	2-1/4	4-1/4	.740	3/4
XXR534A064	1	.030	1-1/8	2-1/4	4-1/2	.990	1

※ Flat shank is available upon request
ex) XXR534A032F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

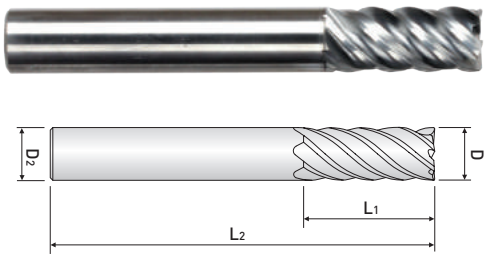
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -.0016	
over 3/8 up to 1	0 ~ -.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTES, STUB CUT LENGTH, VARIABLE HELIX

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity Reduced Vibration Harmonics

XE505A ... series

ULTRA FINE | HELIX | HELIX | HELIX

p.947~949

EDP. No.	D	L_1	L_2	D_2
XE505 A 016	1/4	3/8	2	1/4
XE505 A 020	5/16	7/16	2	5/16
XE505 A 024	3/8	1/2	2	3/8
XE505 A 028	7/16	9/16	2-1/2	7/16
XE505 A 032	1/2	5/8	2-1/2	1/2
XE505 A 040	5/8	3/4	3	5/8
XE505 A 048	3/4	1	3	3/4
XE505 A 064	1	1	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

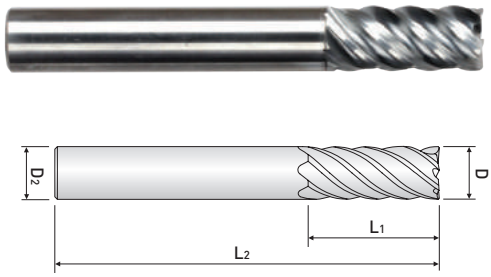
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -.0016	
over 3/8 up to 1	0 ~ -.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTES, REGULAR CUT LENGTH, VARIABLE HELIX

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity Reduced Vibration Harmonics

XE515A ... series

UWC ULTRA FINE | 5 | 44° HELIX | 45° HELIX | 46° HELIX | TiAlN SH | DATA p.947~949

EDP. No.	D	L_1	L_2	D_2
XE515 A 016	1/4	5/8	2-1/2	1/4
XE515 A 018	9/32	5/8	2-1/2	5/16
XE515 A 020	5/16	13/16	2-1/2	5/16
XE515 A 022	11/32	13/16	2-1/2	3/8
XE515 A 024	3/8	7/8	2-1/2	3/8
XE515 A 026	13/32	7/8	2-3/4	7/16
XE515 A 028	7/16	1	2-3/4	7/16
XE515 A 030	15/32	1	3	1/2
XE515 A 032	1/2	1-1/4	3	1/2
XE515 A 036	9/16	1-1/4	3-1/2	9/16
XE515 A 040	5/8	1-1/4	3-1/2	5/8
XE515 A 048	3/4	1-1/2	4	3/4
XE515 A 064	1	1-1/2	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

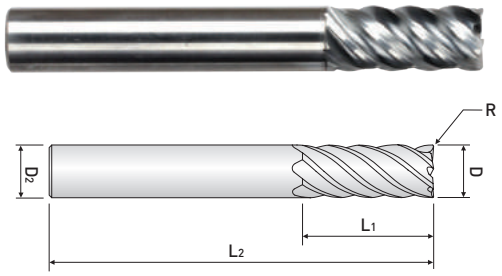
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTES, STUB CUT LENGTH
CORNER RADIUS, VARIABLE HELIX

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity. Reduced Vibration Harmonics

XR505A ... series

ULTRA FINE | HELIX | HELIX | HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XR505 A 016 015	1/4	.015	3/8	2	1/4
XR505 A 016 030		.030			
XR505 A 020 015	5/16	.015	7/16	2	5/16
XR505 A 020 030		.030			
XR505 A 024 015	3/8	.015	1/2	2	3/8
XR505 A 024 030		.030			
XR505 A 028 015	7/16	.015	9/16	2-1/2	7/16
XR505 A 028 030		.030			
XR505 A 032 015	1/2	.015	5/8	2-1/2	1/2
XR505 A 032 030		.030			
XR505 A 040 015	5/8	.015	3/4	3	5/8
XR505 A 040 030		.030			
XR505 A 040 045		.045			
XR505 A 048 015	3/4	.015	1	3	3/4
XR505 A 048 030		.030			
XR505 A 048 045		.045			
XR505 A 064 015	1	.015	1-1/2	4	1
XR505 A 064 030		.030			
XR505 A 064 045		.045			
XR505 A 064 060		.060			
XR505 A 064 090		.090			
XR505 A 064 125		. 125			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

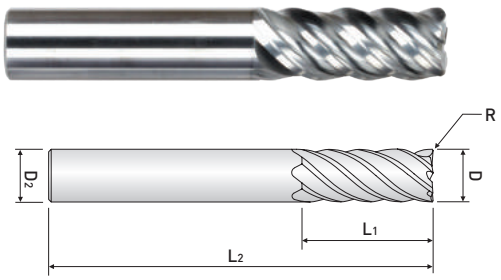
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -.0016	
over 3/8 up to 1	0 ~ -.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTES, REGULAR CUT LENGTH
CORNER RADIUS, VARIABLE HELIX

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity. Reduced Vibration Harmonics

XR515A ... series

ULTRA FINE | HELIX | HELIX | HELIX

p.947~949

EDP. No.	D	R	L_1	L_2	D_2
XR515 A 016 015	1/4	.015	5/8	2-1/2	1/4
XR515 A 016 030		.030			
XR515 A 018 015	9/32	.015	5/8	2-1/2	5/16
XR515 A 018 030		.030			
XR515 A 020 015	5/16	.015	13/16	2-1/2	5/16
XR515 A 020 030		.030			
XR515 A 022 015	11/32	.015	13/16	2-1/2	3/8
XR515 A 022 030		.030			
XR515 A 024 015	3/8	.015	7/8	2-1/2	3/8
XR515 A 024 030		.030			
XR515 A 026 015	13/32	.015	7/8	2-3/4	7/16
XR515 A 026 030		.030			
XR515 A 028 015	7/16	.015	1	2-3/4	7/16
XR515 A 028 030		.030			
XR515 A 030 015	15/32	.015	1	3	1/2
XR515 A 030 030		.030			
XR515 A 032 015	1/2	.015	1-1/4	3	1/2
XR515 A 032 030		.030			
XR515 A 032 045		.045			
XR515 A 032 060		. 060			
XR515 A 032 090		.090			
XR515 A 032 125		.125			
XR515 A 036 015	9/16	.015	1-1/4	3-1/2	9/16
XR515 A 036 030		.030			
XR515 A 040 015	5/8	.015	1-1/4	3-1/2	5/8
XR515 A 040 030		.030			
XR515 A 040 045		.045			
XR515 A 040 060		.060			
XR515 A 040 090		.090			
XR515 A 040 125		.125			
XR515 A 048 015	3/4	.015	1-1/2	4	3/4
XR515 A 048 030		.030			
XR515 A 048 045		.045			
XR515 A 048 060		.060			
XR515 A 048 060		.090			
XR515 A 048 125		.125			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

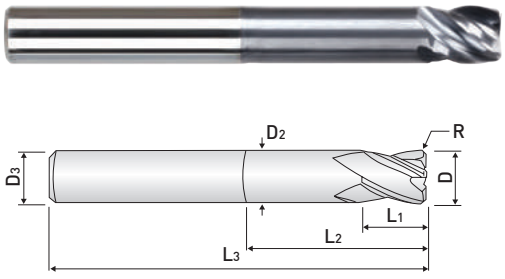
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTES, REGULAR CUT LENGTH WITH EXTENDED NECK

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity Reduced Vibration Harmonics

XR525A ... series

ULTRA FINE HELIX

p.947~949

EDP. No.	D	R	L1	L2	L3	D2	D3
XR525 A 016 015	1/4	.015	3 / 4	2-1/8	4	.242	1/4
XR525 A 016 030		.030					
XR525 A 020 015	5/16	.015	1	2-1/8	4	.305	5/16
XR525 A 020 030		.030					
XR525 A 024 015	3/8	.015	1	2-1/8	4	.367	3/8
XR525 A 024 030		.030					
XR525 A 028 015	7/16	.015	1-1/4	2-1/8	4	.430	7/16
XR525 A 028 030		.030					
XR525 A 032 015	1/2	.015	1-1/4	2-1/8	4	.492	1/2
XR525 A 032 030		.030					
XR525 A 032 015L		.015	1-3/8	3-1/8	5		
XR525 A 032 030L		.030					
XR525 A 040 015	5/8	.015	1-1/2	2-1/8	4	.617	5/8
XR525 A 040 030		.030					
XR525 A 040 045		.045					
XR525 A 040 015L		.015	1-3/4	3-1/8	5		
XR525 A 040 030L		. 030					
XR525 A 040 045L		.045					
XR525 A 048 015	3/4	.015	1-7/8	3	5	.742	3/4
XR525 A 048 030		.030					
XR525 A 048 045		.045					
XR525 A 064 015	1	.015	2-1/4	3	5	.992	1
XR525 A 064 030		.030					
XR525 A 064 045		.045					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

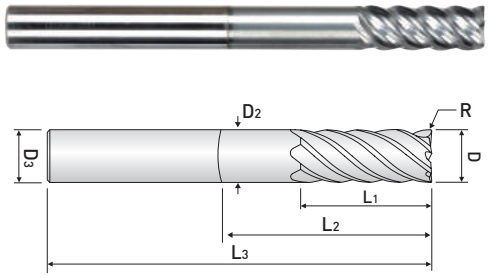
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTE, REGULAR CUT LENGTH WITH LONG EXTENDED NECK, CORNER RADIUS

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity. Reduced Vibration Harmonics.

XR535A ...series

ULTRA FINE HELIX

p.947~949

EDP. No.	D	R	L1	L2	L3	D2	D3
XR535 A 024 015	3/8	.015	1-1/4	3-3/8	6	.367	3/8
XR535 A 024 030		.030					
XR535 A 028 015	7/16	.015	1-1/2	3-3/8	6	.430	7/16
XR535 A 028 030		.030					
XR535 A 032 015	1/2	.015	1-1/2	4-1/8	6	.492	1/2
XR535 A 032 030		.030					
XR535 A 040 015	5/8	.015	2	4	6	.617	5/8
XR535 A 040 030		.030					
XR535 A 040 045		.045					
XR535 A 048 015	3/4	.015	2-1/4	4	6	.742	3/4
XR535 A 048 030		.030					
XR535 A 048 045		.045					
XR535 A 064 015	1	.015	3	4	6	.992	1
XR535 A 064 030		.030					
XR535 A 064 045		.045					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

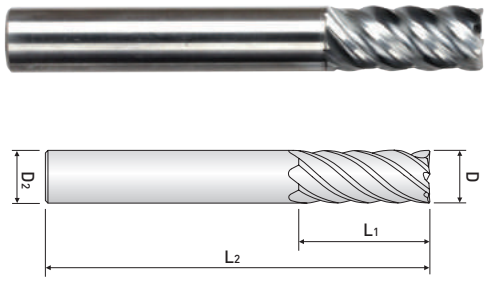
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)		Shank Dia.
from 1/8 up to 1/4	0 ~ -0.0012	-.0001 ~ -.0003
over 1/4 up to 3/8	0 ~ -0.0016	
over 3/8 up to 1	0 ~ -0.002	-.0001 ~ -.0004

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTE, REGULAR CUT LENGTH, VARIABLE HELIX

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity Reduced Vibration Harmonics

XE505 ... series

UWC ULTRA FINE | 5 | 44° HELIX | 45° HELIX | 46° HELIX | TiAlN SH | DATA p.969~971

EDP. No.	D	L_1	L_2	D_2
XE505 060	6	13	57	6
XE505 080	8	19	63	8
XE505 100	10	22	72	10
XE505 120	12	26	83	12
XE505 140	14	26	83	14
XE505 160	16	32	92	16
XE505 180	18	32	92	18
XE505 200	20	38	104	20
XE505 250	25	38	104	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

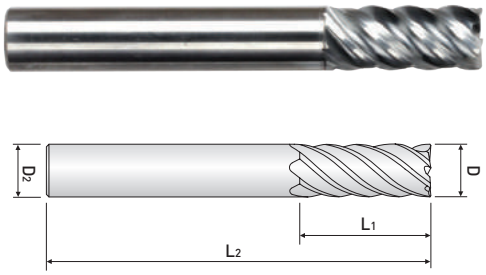
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 8	0 ~ -0.04	h6
over 8	0 ~ -0.05	

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTES, LONG CUT LENGTH

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity Reduced Vibration Harmonics

XE515 ... series

UWC ULTRA FINE | 5 | 45° HELIX | TiAlN SH | DATA p.969~971

EDP. No.	D	L_1	L_2	D_2
XE515 060	6	25	75	6
XE515 080	8	30	75	8
XE515 100	10	45	100	10
XE515 120	12	75	150	12
XE515 160	16	75	150	16
XE515 200	20	75	150	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

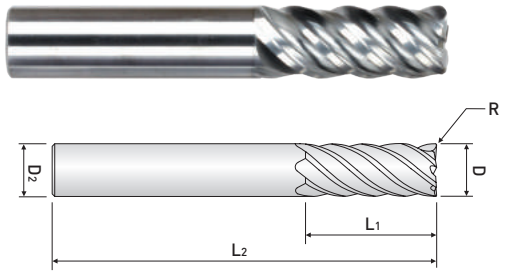
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 8	0 ~ -0.04	h6
over 8	0 ~ -0.05	

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



5 FLUTES, REGULAR CUT LENGTH
CORNER RADIUS, VARIABLE HELIX

- Maintains Cutting Edge Strength & Sharpness for Improved Tool Life
- Strong Cutting Edges Allowing for Increased depths of cut at Elevated Cutting Speeds & Feeds
- Higher Feeds and Speeds for increased Productivity Reduced Vibration Harmonics

XR505 ... series

ULTRA FINE | HELIX | HELIX | HELIX

p.969~971

EDP. No.	D	R	L_1	L_2	D_2
XR505 06 050	6	0.5	13	57	6
XR505 08 050	8	0.5	19	63	8
XR505 10 050	10	0.5	22	72	10
XR505 12 075	12	0.75	26	83	12
XR505 14 075	14	0.75	26	83	14
XR505 14 075 S16				92	16
XR505 16 100	16	1.0	32	92	16
XR505 18 100	18	1.0	32	92	18
XR505 18 100 S20				104	20
XR505 20 100	20	1.0	38	104	20
XR505 25 100	25	1.0	38	104	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

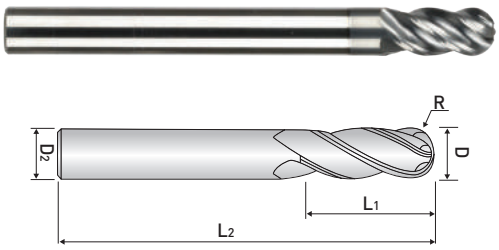
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 8	0 ~ -0.04	h6
over 8	0 ~ -0.05	

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, BALL NOSE, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XXB504 ...series

ULTRA FINE | HELIX | HELIX

p.969~971

EDP. No.	D	R	L_1	L_2	D_2
XXB504040	4	2	8	70	4
XXB504060	6	3	12	90	6
XXB504080	8	4	15	100	8
XXB504100	10	5	20	100	10
XXB504120	12	6	25	110	12

※ Flat shank is available upon request
ex) XXB504100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○			○				◎

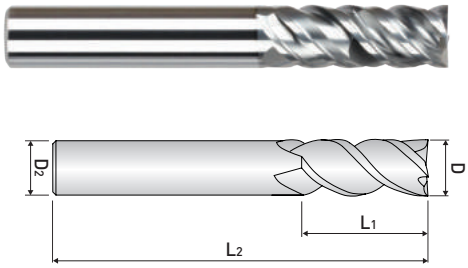
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, VARIABLE HELIX - DOUBLE CORE

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Reinforced bending moment because of double core geometry

XCE504 ...series

ULTRA FINE | HELIX | HELIX

p.969~971

EDP. No.	D	L_1	L_2	D_2
XCE504060	6	15	50	6
XCE504080	8	20	60	8
XCE504100	10	25	70	10
XCE504120	12	30	75	12
XCE504160	16	40	90	16
XCE504200	20	45	100	20
XCE504250	25	50	120	25

※ Flat shank is available upon request
ex) XCE504100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

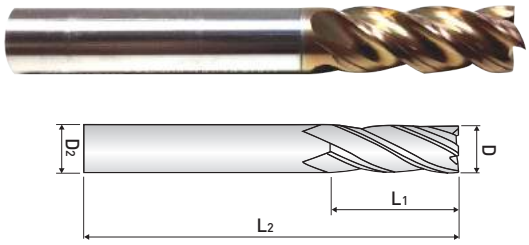
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance
- Strengthened cutting edge geometry designed for excellent performance on high-temp alloys, high tensile stainless steel, inconel and titanium

XE304 ...series

MG FINE GRAIN | 4 | 38° HELIX | 40° HELIX | AlTiN W | DATA p.969~971

EDP. No.	D	C.L	OAL	SH. Dia.
XE304 030	3	10	50	6
XE304 040	4	12	50	6
XE304 050	5	15	50	6
XE304 060	6	15	57	6
XE304 070	7	20	63	8
XE304 080	8	20	63	8
XE304 090	9	25	72	10
XE304 100	10	25	72	10
XE304 110	11	30	80	12
XE304 120	12	30	80	12
XE304 130	13	35	80	12
XE304 140	14	35	80	12
XE304 160	16	42	100	16
XE304 180	18	45	100	16
XE304 200	20	48	105	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

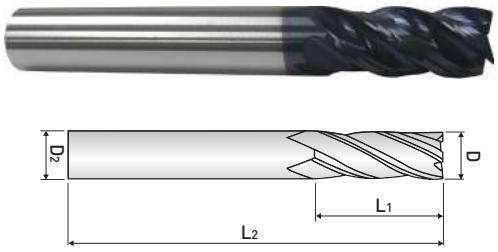
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTES, VARIABLE HELIX ENDMILL FOR A COMPLEX AUTOMATIC LATHE (X-STAR MINI)

- Minimize resonance phenomenon with Variable helix
- Suitable for a low hardness machine(automatic lathe) with unique design

XM304 ...series

MG FINE GRAIN | 4 | 38° HELIX | 40° HELIX | AlTiN SH | DATA p.969~971

EDP. No.	D	C.L	OAL	SH. Dia.
XM304 030	3	5	35	3
XM304 040	4	6	40	4
XM304 050	5	8	40	5
XM304 060	6	10	45	6
XM304 070	7	12	45	7
XM304 080	8	12	45	8
XM304 090	9	15	50	9
XM304 100	10	15	50	10

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

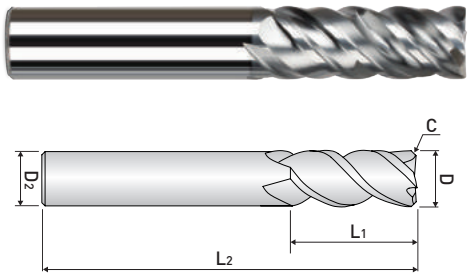
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Reinforced bending moment because of double core geometry
  * corner chamfer type

XCC504 ...series

ULTRA FINE | HELIX | HELIX

p.969~971

EDP. No.	D	C	L_1	L_2	D_2
XCC504060	6	0.075	15	50	6
XCC504080	8	0.1	20	60	8
XCC504100	10	0.125	25	70	10
XCC504120	12	0.15	30	75	12
XCC504160	16	0.2	40	90	16
XCC504200	20	0.3	45	100	20
XCC504250	25	0.3	50	120	25

※ Flat shank is available upon request
ex) XCC504100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
◎	◎	○	◎	◎	○				◎

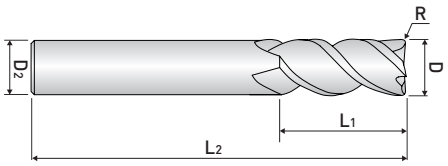
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, CORNER RADIUS VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Reinforced bending moment because of double core geometry

XCR504 ...series

ULTRA FINE | HELIX | HELIX

p.969~971

EDP. No.	D	R	L_1	L_2	D_2
XCR5040602	6	0.2	15	50	6
XCR5040605		0.5			
XCR5040610		1			
XCR5040805	8	0.5	20	60	8
XCR5040810		1			
XCR5041005	10	0.5	25	70	10
XCR5041010		1			
XCR5041205	12	0.5	30	75	12
XCR5041210		1			
XCR5041605	16	0.5	40	90	16
XCR5041610		1			
XCR5042005	20	0.5	45	100	20
XCR5042010		1			
XCR5042505	25	0.5	50	120	25
XCR5042510		1			

※ Flat shank is available upon request
ex) XCR5041005F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

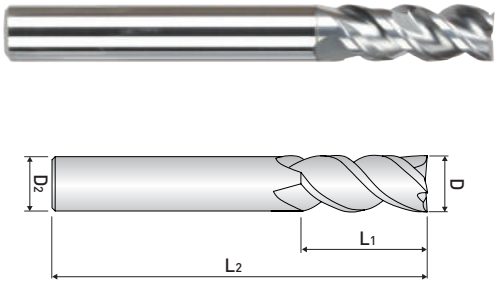
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



3 FLUTE, REGULAR LENGTH, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Reinforced bending moment because of double core geometry

XCE503 ...series

ULTRA FINE HELIX p.969~971

EDP. No.	D	L_1	L_2	D_2
XCE503020	2	6	50	6
XCE503025	2.5	8	50	6
XCE503030	3	10	50	6
XCE503035	3.5	10	50	6
XCE503040	4	12	50	6
XCE503045	4.5	14	50	6
XCE503050	5	15	50	6
XCE503055	5.5	15	50	6
XCE503060	6	15	50	6
XCE503080	8	20	60	8
XCE503100	10	25	70	10
XCE503120	12	30	75	12
XCE503160	16	40	90	16
XCE503200	20	45	100	20
XCE503250	25	50	120	25

※ Flat shank is available upon request
ex) XCE503100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

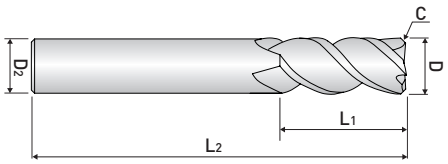
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



3 FLUTE, REGULAR LENGTH

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Reinforced bending moment because of double core geometry
  * corner chamfer type

XCC503 ...series

ULTRA FINE HELIX p.969~971

EDP. No.	D	C	L_1	L_2	D_2
XCC503020	2	0.025	6	50	6
XCC503025	2.5	0.025	8	50	6
XCC503030	3	0.035	10	50	6
XCC503035	3.5	0.035	10	50	6
XCC503040	4	0.045	12	50	6
XCC503045	4.5	0.045	14	50	6
XCC503050	5	0.055	15	50	6
XCC503055	5.5	0.055	15	50	6
XCC503060	6	0.075	15	50	6
XCC503080	8	0.1	20	60	8
XCC503100	10	0.125	25	70	10
XCC503120	12	0.150	30	75	12
XCC503160	16	0.200	40	90	16
XCC503200	20	0.250	45	100	20
XCC503250	25	0.300	50	120	25

※ Flat shank is available upon request
ex) XCC503100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

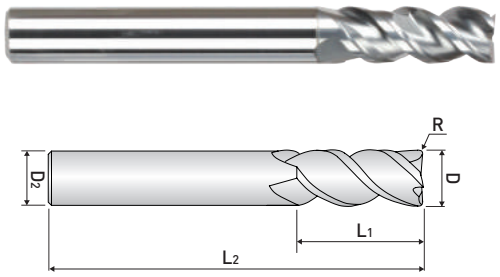
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



3 FLUTE, REGULAR LENGTH
CORNER RADIUS, DOUBLE CORE

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Reinforced bending moment because of double core geometry

XCR503 ...series

ULTRA FINE HELIX

p.969~971

EDP. No.	D	R	L_1	L_2	D_2
XCR5030502	5	0.2	15	50	6
XCR5030602	6	0.2	15	50	6
XCR5030605		0.5			
XCR5030610		1			
XCR5030805	8	0.5	20	60	8
XCR5030810		1			
XCR5031005	10	0.5	25	70	10
XCR5031010		1			
XCR5031205	12	0.5	30	75	12
XCR5031210		1			
XCR5031605	16	0.5	40	90	16
XCR5031610		1			
XCR5032005	20	0.5	45	100	20
XCR5032010		1			
XCR5032505	25	0.5	50	120	25
XCR5032510		1			

※ Flat shank is available upon request
ex) XCR5031010F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

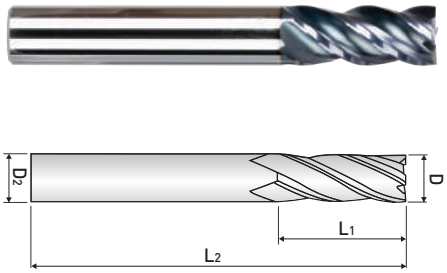
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel

XE504 ...series

UWC ULTRA FINE | 4 | 38° HELIX | 40° HELIX | ALTiN H | DATA p.969~971

EDP. No.	D	L_1	L_2	D_2
XE504010	1	2.5	45	4
XE504020	2	5	45	4
XE504030	3	8	50	6
XE504040	4	11	50	6
XE504050	5	13	50	6
XE504060	6	13	50	6
XE504070	7	16	60	8
XE504080	8	19	60	8
XE504090	9	19	70	10
XE504100	10	22	70	10
XE504110	11	22	75	12
XE504120	12	26	75	12
XE504130	13	26	80	12
XE504140	14	26	80	14
XE504160	16	32	90	16
XE504180	18	32	100	18
XE504200	20	38	100	20
XE504250	25	45	120	25

※ Flat shank is available upon request
ex) XE504100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

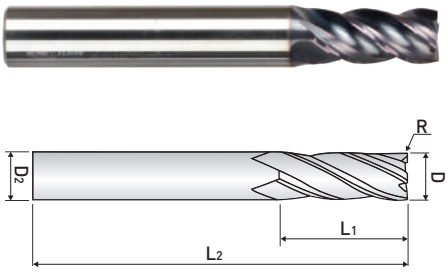
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 12	0 ~ -0.02	h6
over 12	0 ~ -0.03	

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH, CORNER RADIUS VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent per formance on mild mold steel and stainless steel

XR504 ...series

ULTRA FINE | HELIX | HELIX

p.969~971

EDP. No.	D	R	L_1	L_2	D_2
XR504020	2	0.1	5	45	4
XR504030	3	0.1	8	50	6
XR504040	4	0.2	11	50	6
XR504050	5	0.2	13	50	6
XR504060	6	0.2	13	50	6
XR504070	7	0.2	16	60	8
XR504080	8	0.2	19	60	8
XR504090	9	0.2	19	70	10
XR504100	10	0.3	22	70	10
XR504110	11	0.3	22	75	12
XR504120	12	0.3	26	75	12
XR504130	13	0.3	26	80	12
XR504140	14	0.3	26	80	14
XR504160	16	0.3	32	90	16
XR504180	18	0.3	32	100	18
XR504200	20	0.3	38	100	20
XR504250	25	0.3	45	120	25

※ Flat shank is available upon request
ex) XR504100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

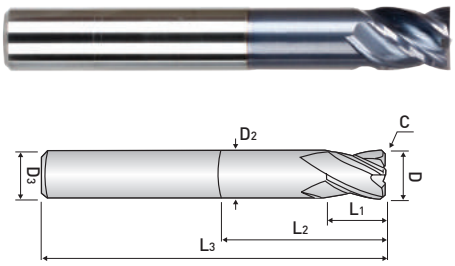
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 12	0 ~ -0.02	h6
over 12	0 ~ -0.03	

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, STUB CUT LENGTH
with EXTENDED NECK, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel
  * corner chamfer type

XE514 ...series

ULTRA FINE | HELIX | HELIX

p.969~971

EDP. No.	D	L_1	L_2	L_3	D_2	D_3
XE514010	1	2	10	45	0.8	4
XE514020	2	3	12	45	1.8	4
XE514030	3	4	14	50	2.8	6
XE514040	4	5	16	50	3.8	6
XE514050	5	6	18	50	4.8	6
XE514060	6	7	20	50	5.8	6
XE514080	8	9	26	60	7.8	8
XE514100	10	11	31	70	9.8	10
XE514120	12	13	37	75	11.8	12
XE514160	16	17	43	90	15.8	16
XE514200	20	21	53	100	19.8	20

※ Flat shank is available upon request
ex) XE514100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

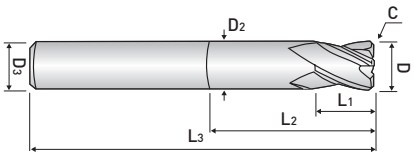
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 12	0 ~ -0.02	h6
over 12	0 ~ -0.03	

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, STUB CUT LENGTH with EXTENDED LONG NECK

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel
  * corner chamfer type

XE524 ...series

ULTRA FINE | HELIX | HELIX

p.969~971

EDP. No.	D	L_1	L_2	L_3	D_2	D_3
XE524060	6	7	33	70	5.8	6
XE524080	8	9	43	80	7.8	8
XE524100	10	11	43	84	9.8	10
XE524120	12	13	51	97	11.8	12
XE524160	16	17	66	115	15.8	16

※ Flat shank is available upon request
ex) XE524100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

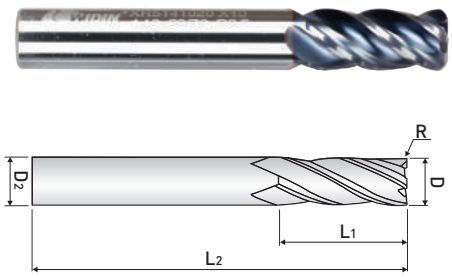
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 12	0 ~ -0.02	h6
over 12	0 ~ -0.03	

※ These tools are manufactured based on order received.

Endmills for stainless steel *Neo Classic X-STAR Series*



4 FLUTE, REGULAR LENGTH CORNER RADIUS, VARIABLE HELIX

- High precision and excellent surface due to each 4F variable helix geometry
- The unique patented design decrease chatter and resonance, can achieve an Axial Depth 1XD
- Applied various corner radius.
- Sharp cutting edge geometry designed for excellent performance on mild mold steel and stainless steel

XR514 ...series

ULTRA FINE | HELIX | HELIX

p.969~971

EDP. No.	D	R	L_1	L_2	D_2
XR5140201	2	0.1	5	45	4
XR5140202		0.2			
XR5140302	3	0.2	8	50	6
XR5140303		0.3			
XR5140305		0.5			
XR5140403	4	0.3	10	50	6
XR5140405		0.5			
XR5140410		1.0			
XR5140505	5	0.5	13	50	6
XR5140510		1.0			
XR5140605	6	0.5	13	50	6
XR5140610		1.0			
XR5140615		1.5			
XR5140805	8	0.5	19	60	8
XR5140810		1.0			
XR5140815		1.5			
XR5140820		2.0			
XR5141005	10	0.5	22	70	10
XR5141010		1.0			
XR5141015		1.5			
XR5141020		2.0			
XR5141205	12	0.5	26	75	12
XR5141210		1.0			
XR5141215		1.5			
XR5141220		2.0			
XR5141230		3.0			
XR5141615	16	1.5	32	90	16
XR5141620		2.0			
XR5141630		3.0			
XR5142030	20	3.0	38	100	20
XR5142040		4.0			
XR5142050		5.0			

※ Flat shank is available upon request

ex) XR5141010 : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	◎	◎	○				◎

○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 12	0 ~ -0.02	h6
over 12	0 ~ -0.03	

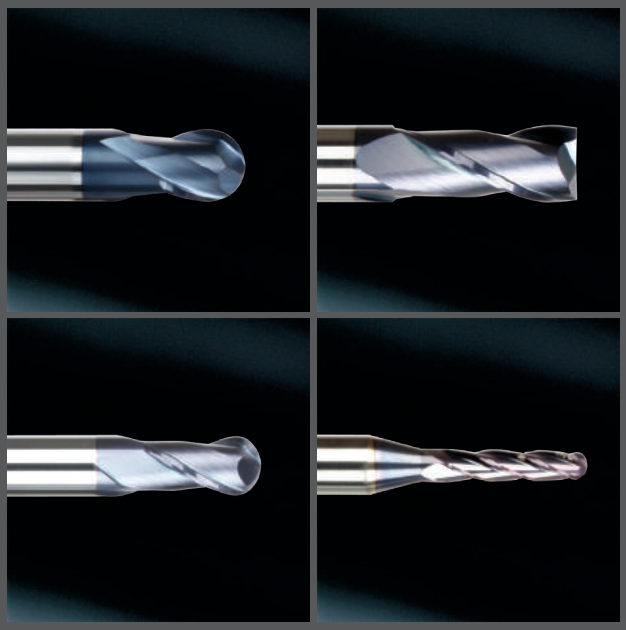
※ These tools are manufactured based on order received.

MEMO

Endmills for high speed & general cutting

ZAMUS CLASSIC SERIES(~HRc55)

ENDMILL SERIES



Endmills for high speed & general cutting _ ZAMUS CLASSIC SERIES

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
DA412 ...series		15°HELIX STUB CUT LENGTH with EXTENDED NECK	INCH	•	230
DA512 ...series		LONG LENGTH, BALL NOSE	INCH	•	231
DA514 ...series		LONG LENGTH, BALL NOSE	INCH	•	232
DA522 ...series		LONG LENGTH, BALL NOSE with EXTENDED NECK	INCH	•	233
MD502 ...series		MINIATURE, BALL NOSE	INCH	•	234
DA542 ...series		BALL NOSE with TAPER NECK	INCH	•	235
DA552 ...series		BALL NOSE with PENCIL NECK	INCH	•	236
ZA502 ...series		REGULAR LENGTH	INCH	•	237
ZA522 ...series		LONG LENGTH	INCH	•	238
MZ502 ...series		MINIATURE	INCH	•	239
ZA504 ...series		REGULAR LENGTH	INCH	•	240
ZA524 ...series		LONG LENGTH	INCH	•	241
ZA506&8 ...series		45°HELIX, LONG LENGTH	INCH	•	242
ZA526&8 ...series		45°HELIX, EXTRA LONG LENGTH	INCH	•	243
ZR502A ...series		STUB LENGTH, CORNER RADIUS	INCH	•	244
ZR522A ...series		LONG LENGTH, CORNER RADIUS	INCH	•	245
ZR532A ...series		LONG LENGTH, CORNER RADIUS	INCH	•	246
ZR504A ...series		STUB LENGTH, CORNER RADIUS	INCH	•	247
ZR524A ...series		REGULAR LENGTH, CORNER RADIUS	INCH	•	248
ZR534A ...series		LONG LENGTH, CORNER RADIUS	INCH	•	249
ZR506(8)A ...series		50°HELIX, LONG LENGTH, CORNER RADIUS	INCH	•	250
FA50 ...series		ROUGHING LONG LENGTH	INCH	•	251
DB402 ...series		SHORT LENGTH, BALL NOSE	METRIC	•	252
DB412 ...series		15°HELIX STUB CUT LENGTH, BALL NOSE with EXTENDED NECK	METRIC	•	253
DB512 ...series		LONG LENGTH, BALL NOSE	METRIC	•	254
DB514 ...series		LONG LENGTH, BALL NOSE	METRIC	•	255

NEXT ≫

Endmills for high speed & general cutting _ ZAMUS CLASSIC SERIES

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
DB502 ...series		STUB CUT LENGTH, BALL NOSE with EXTENDED NECK	METRIC	•	256
DB522 ...series		EXTENDED NECK-LONG SHANK	METRIC	•	257
DB532 ...series		MMC-SPHERE TYPE	METRIC	•	258
DB534 ...series		MMC-SPHERE TYPE	METRIC	•	259
DB54(5)2 ...series		BALL NOSE with TAPER NECK	METRIC	•	260
ZE502 ...series		REGULAR LENGTH	METRIC	•	261
ZE504 ...series		REGULAR LENGTH	METRIC	•	262
ZE503 ...series		REGULAR LENGTH	METRIC	•	263
ZE506 ...series		REGULAR & LONG LENGTH	METRIC	•	264
ZM502 ...series		MEDIUM LENGTH	METRIC	•	265
ZM504 ...series		MEDIUM LENGTH	METRIC	•	266
ZM522 ...series		MEDIUM CUT, LONG SHANK TYPE	METRIC	•	267
ZM524 ...series		MEDIUM CUT, LONG SHANK TYPE	METRIC	•	268
ZE522 ...series		LONG LENGTH	METRIC	•	269
ZE524 ...series		LONG LENGTH	METRIC	•	270
ZE534 ...series		EXTRA LONG LENGTH	METRIC	•	271
ZE512 ...series		35° HELIX REGULAR LENGTH	METRIC	•	272
ZE514 ...series		45° HELIX REGULAR LENGTH	METRIC	•	273
ZE516 ...series		50° HELIX REGULAR LENGTH	METRIC	•	274
ZR502 ...series		STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK	METRIC	•	275
ZR504 ...series		STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK	METRIC	•	276
ZR512 ...series		REGULAR LENGTH, CORNER RADIUS	METRIC	•	277
ZR514 ...series		REGULAR LENGTH, CORNER RADIUS	METRIC	•	278
ZR522 ...series		LONG LENGTH, CORNER RADIUS	METRIC	•	279
ZR524 ...series		LONG LENGTH, CORNER RADIUS	METRIC	•	280
TPRB604A-05 ...series		30' TAPER RIB BALL, SHORT LENGTH	INCH	•	281
TPRB604A-10 ...series		1° TAPER RIB BALL, SHORT LENGTH	INCH	•	282
TPRB604A-15 ...series		1° 30'TAPER RIB BALL, SHORT LENGTH	INCH	•	283
TPRB604A-20 ...series		2° TAPER RIB BALL, SHORT LENGTH	INCH	•	284
TPRB604A-30 ...series		3° TAPER RIB BALL, SHORT LENGTH	INCH	•	285
TPRB624A-05 ...series		30' TAPER RIB BALL, LONG LENGTH	INCH	•	286
TPRB624A-10 ...series		1° TAPER RIB BALL, LONG LENGTH	INCH	•	287

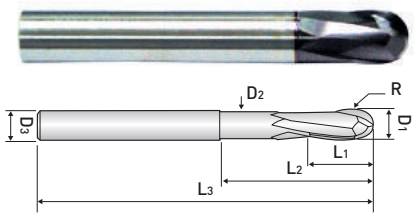
NEXT ≫

Endmills for high speed & general cutting _ ZAMUS CLASSIC SERIES

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
TPRB624A-15 ...series		1° 30' TAPER RIB BALL, LONG LENGTH	INCH	•	288
TPRB624A-20 ...series		2° TAPER RIB BALL, LONG LENGTH	INCH	•	289
TPRB624A-30 ...series		3° TAPER RIB BALL, LONG LENGTH	INCH	•	290
TPRE604A-05 ...series		30' TAPER RIB, SHORT LENGTH	INCH	•	291
TPRE604A-10 ...series		1° TAPER RIB, SHORT LENGTH	INCH	•	292
TPRE604A-15 ...series		1° 30' TAPER RIB, SHORT LENGTH	INCH	•	293
TPRE604A-20 ...series		2° TAPER RIB, SHORT LENGTH	INCH	•	294
TPRE604A-30 ...series		3° TAPER RIB, SHORT LENGTH	INCH	•	295
TPRB4 ...-..-050 series		30' TAPER BALL, RIB PROCESSING	METRIC	•	296
TPRB4 ...-..-075 series		45' TAPER BALL, RIB PROCESSING	METRIC	•	297
TPRB4 ...-..-100 series		1° TAPER BALL, RIB PROCESSING	METRIC	•	299
TPRB4 ...-..-150 series		1°30' TAPER BALL, RIB PROCESSING	METRIC	•	300
TPRB4 ...-..-200 series		2° TAPER BALL, RIB PROCESSING	METRIC	•	302
TPRE4 ...-..-050 series		30' TAPER BALL, RIB PROCESSING	METRIC	•	304
TPRE4 ...-..-075 series		45' TAPER, RIB PROCESSING	METRIC	•	306
TPRE4 ...-..-100 series		1° TAPER, RIB PROCESSING	METRIC	•	308
TPRE4 ...-..-150 series		1°30' TAPER, RIB PROCESSING	METRIC	•	310
TPRE4 ...-..-200 series		2° TAPER, RIB PROCESSING	METRIC	•	312
TPRE4 ...-..-300 series		3° TAPER BALL, RIB PROCESSING	METRIC	•	314
TE503 .....series		TAPER END MILL	METRIC	•	315
TB503 ...series		TAPER BALL END MILL	METRIC	•	316
TB504 ...series		TAPER BALL END MILL	METRIC	•	317
ZF60 ....series		ROUGHING END MILL	METRIC	•	318
ZF61 ...series		ROUGHING END MILL - FINE PITCH	METRIC	•	319
PK503 ...series		Z - AXIS ROUGHING END MILL	METRIC	•	320

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, 15° HELIX STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed for high hardened materials up to HRc62
- Suitable for high speed machining

DA412 ...series

ULTRA FINE HELIX

p.933~934

EDP. No.	D_1	R	L_1	L_2	L_3	D_2	D_3
DA412001	1/32	1/64	1/32	1/16	2	.029	1/4
DA412002	1/16	1/32	1/16	1/8	2	.059	1/4
DA412003	3/32	3/64	3/32	3/16	2	.090	1/4
DA412004	1/8	1/16	1/8	1/4	2-1/2	.121	1/4
DA412006	3/16	3/32	3/16	3/8	3	.184	1/4
DA412008	1/4	1/8	1/4	1/2	3-1/2	.246	1/4
DA412010	5/16	5/32	5/16	5/8	4	.309	5/16
DA412012	3/8	3/16	3/8	3/4	4	.371	3/8
DA412012L	3/8	3/16	1	1-3/8	6	.371	3/8
DA412016	1/2	1/4	1/2	1	4-1/2	.496	1/2
DA412016L	1/2	1/4	1	1-1/2	6	.496	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

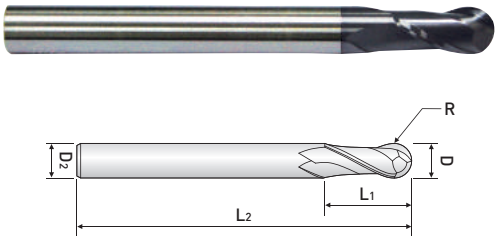
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling

DA512 ...series

ULTRA FINE HELIX p.934~935

EDP. No.	D	R	C.L	OAL	SH.Dia.
DA512001	1/32	1/64	1/32	2-1/2	1/4
DA512002	1/16	1/32	1/16	2-1/2	1/4
DA512003	3/32	3/64	3/32	2-1/2	1/4
DA512004	1/8	1/16	5/16	2-3/8	1/8
DA512006	3/16	3/32	3/8	3-1/8	3/16
DA512008	1/4	1/8	1/2	3-1/2	1/4
DA512010	5/16	5/32	9/16	4	5/16
DA512012	3/8	3/16	3/4	4	3/8
DA512016	1/2	1/4	7/8	4-1/4	1/2
DA512020	5/8	5/16	1-1/4	5-1/2	5/8
DA512024	3/4	3/8	1-1/2	6-1/4	3/4
DA512032	1	1/2	2	7-1/8	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

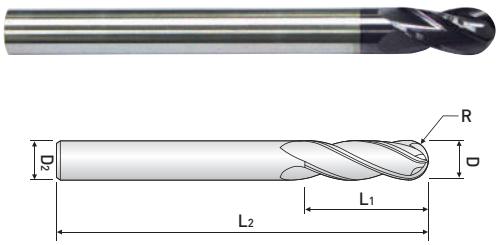
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

DA514 ...series

ULTRA FINE HELIX

p.935~936

EDP. No.	D	R	C.L	OAL	SH.Dia.
DA514002	1/16	1/32	1/16	2-1/2	1/4
DA514003	3/32	3/64	3/32	2-1/2	1/4
DA514004	1/8	1/16	5/16	2-3/8	1/8
DA514006	3/16	3/32	3/8	3-1/8	3/16
DA514008	1/4	1/8	1/2	3-1/2	1/4
DA514010	5/16	5/32	9/16	4	5/16
DA514012	3/8	3/16	3/4	4	3/8
DA514016	1/2	1/4	7/8	4-1/4	1/2
DA514020	5/8	5/16	1-1/4	5-1/2	5/8
DA514024	3/4	3/8	1-1/2	6-1/4	3/4
DA514032	1	1/2	2	7-1/8	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

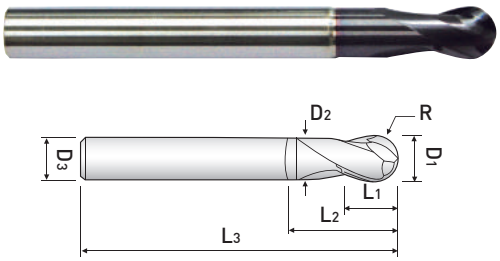
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, LONG LENGTH,
BALL NOSE with EXTENDED NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling
- Suitable for deep copy milling with long neck type

DA522 ...series

ULTRA FINE HELIX

p.936~937

EDP. No.	D1	R	L1	L2	L3	D2	D3
DA522004	1/8	1/16	5/16	-	2-3/4	-	1/4
DA522006	3/16	3/32	1/2	-	3-1/8	-	1/4
DA522008	1/4	1/8	1/2	7/8	3-1/8	.242	1/4
DA522010	5/16	5/32	9/16	1-1/16	3-1/2	.305	5/16
DA522012	3/8	3/16	3/4	1-1/4	4	.367	3/8
DA522016	1/2	1/4	7/8	1-3/8	4-1/4	.492	1/2
DA522020	5/8	5/16	1-1/4	2	5-1/2	.617	5/8
DA522024	3/4	3/8	1-1/2	2-1/4	6-1/4	.742	3/4
DA522032	1	1/2	2-1/8	3	7	.992	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

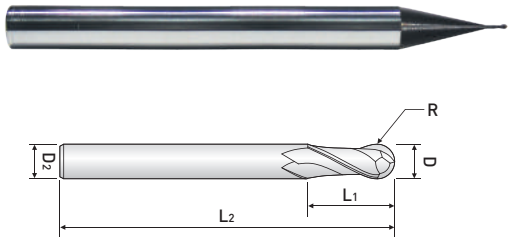
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, MINIATURE, BALL NOSE

- High precision milling in medical, optical, electronics and aerospace industrials
- Excellent performance at dry cutting conditon
- Excellent performance on high hardened steel

MD502 ...series

ULTRA FINE HELIX

p.937

EDP. No.	D	R	C.L	OAL	SH.Dia.
MD502024	.024	.012	.043	1-1/2	1/8
MD502028	.028	.014	.060	1-1/2	1/8
MD502031	.031	.0155	.080	1-1/2	1/8
MD502035	.035	.0175	.087	1-1/2	1/8
MD502040	.040	.020	.100	1-1/2	1/8
MD502043	.043	.0215	.118	1-1/2	1/8
MD502047	.047	.0235	.118	1-1/2	1/8
MD502052	.052	.026	.138	1-1/2	1/8
MD502055	.055	.0275	.138	1-1/2	1/8
MD502062	.062	.031	.157	1-1/2	1/8

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

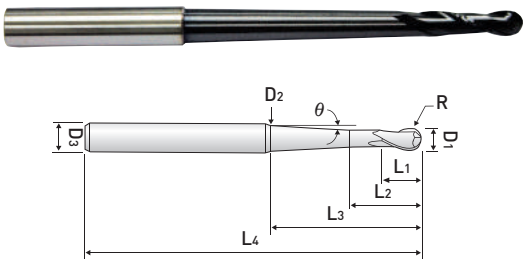
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, BALL NOSE with TAPER NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling
- Suitable for deep copy milling with taper long neck type

DA542 ...series

ULTRA FINE HELIX

p.938

EDP. No.	D_1	R	L_1	L_2	L_3	D_2	D_3	L_4	θ
DA542001	1/16	1/32	5/32	15/64	7/8	.096	1/4	2-3/8	1°30′
DA542002	1/16	1/32	5/32	15/64	1-5/8	.208	1/4	3-1/8	3°
DA542004	1/8	1/16	1/4	21/64	2-1/16	.216	1/4	3-5/8	1°30′
DA542006	3/16	3/32	3/8	29/64	2-3/8	.288	3/8	4-3/8	1°30′
DA542008	1/4	1/8	1/2	5/8	2-1/16	.325	3/8	4-3/8	1°30′
DA542010	5/16	5/32	9/16	11/16	2-1/16	.385	1/2	4-3/4	1°30′
DA542012	3/8	3/16	11/16	13/16	2-3/8	.458	1/2	5-1/16	1°30′
DA542016	1/2	1/4	7/8	1	3-1/4	.618	3/4	6-3/8	1°30′

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

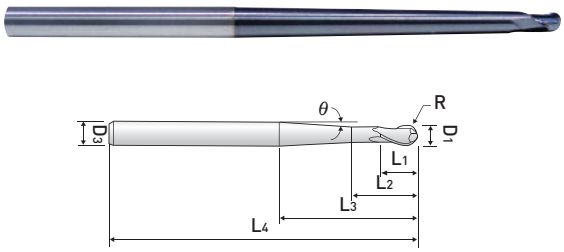
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



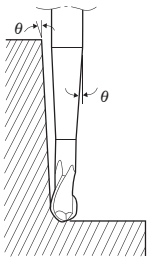
2 FLUTE, BALL NOSE with PENCIL NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling
- Suitable for deep copy milling with taper long neck type

DA552 ...series

ULTRA FINE HELIX p.939

EDP. No.	D_1	R	L_1	L_2	L_3	D_3	L_4	θ
DA552006	3/16	3/32	9/16	.659	3-11/32	3/8	7-3/4	2°
DA552007	3/16	3/32	9/16	.666	2-13/16	3/8	6	2°30′
DA552008	1/4	1/8	3/4	.859	4-7/16	1/2	7-3/4	2°
DA552009	1/4	1/8	3/4	.856	3-23/32	1/2	6	2°30′
DA552010	5/16	5/32	3/4	.868	4-29/32	1/2	7-3/4	1°20′
DA552011	5/16	5/32	3/4	.870	3-15/16	1/2	6	1°45′
DA552012	3/8	3/16	1-3/16	1.326	4-29/32	5/8	7-3/4	2°
DA552013	3/8	3/16	1-3/16	1.325	4-3/16	5/8	6	2°30′
DA552016	1/2	1/4	1-3/16	1.309	4	5/8	7-3/4	1°20′
DA552017	1/2	1/4	1-3/16	1.329	3-3/8	5/8	6	1°45′



MILLING ON TAPERED WALL

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

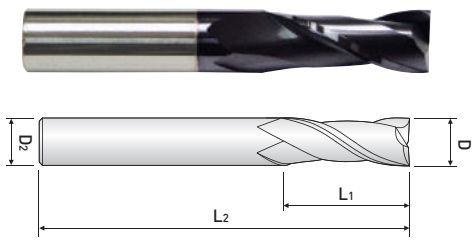
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZA502 ...series

ULTRA FINE | HELIX | p.940

EDP. No.	D	C.L	OAL	SH.Dia.
ZA502002	1/32	1/8	1-1/2	1/8
ZA502004	1/16	3/16	1-1/2	1/8
ZA502006	3/32	5/16	1-1/2	1/8
ZA502008	1/8	1/2	1-1/2	1/8
ZA502010	5/32	9/16	2	3/16
ZA502012	3/16	5/8	2	3/16
ZA502014	7/32	5/8	2-1/2	1/4
ZA502016	1/4	3/4	2-1/2	1/4
ZA502018	9/32	3/4	2-1/2	5/16
ZA502020	5/16	13/16	2-1/2	5/16
ZA502024	3/8	1	2-1/2	3/8
ZA502026	13/32	1	2-3/4	7/16
ZA502028	7/16	1	2-3/4	7/16
ZA502032	1/2	1	3	1/2
ZA502036	9/16	1-1/8	3-1/2	9/16
ZA502040	5/8	1-1/4	3-1/2	5/8
ZA502048	3/4	1-1/2	4	3/4
ZA502064	1	1-1/2	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

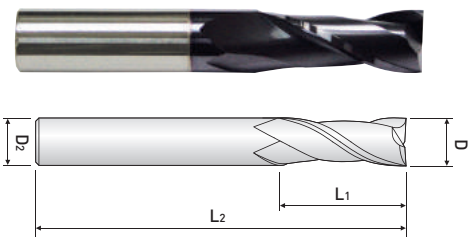
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZA522 ...series

ULTRA FINE | HELIX | p.940

EDP. No.	D	C.L	OAL	SH.Dia.
ZA522008	1/8	3/4	2-1/4	1/8
ZA522012	3/16	3/4	2-1/2	3/16
ZA522016	1/4	1-1/8	3	1/4
ZA522020	5/16	1-1/8	3	5/16
ZA522024	3/8	1-1/8	3	3/8
ZA522032	1/2	2	4	1/2
ZA522040	5/8	2-1/4	5	5/8
ZA522048	3/4	2-1/4	5	3/4
ZA522064	1	2-1/4	5	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

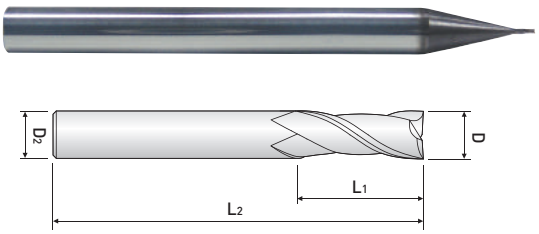
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, MINIATURE

- High precision milling in medical, optical, electronics and aero space industries
- Excellent preformance on high hardened steel

MZ502 ...series

ULTRA FINE HELIX p.941

EDP. No.	D	C.L	OAL	SH.Dia.
MZ502016	.016	.031	1-1/2	1/8
MZ502020	.020	.040	1-1/2	1/8
MZ502024	.024	.047	1-1/2	1/8
MZ502028	.028	.055	1-1/2	1/8
MZ502031	.031	.063	1-1/2	1/8
MZ502035	.035	.080	1-1/2	1/8
MZ502040	.040	.100	1-1/2	1/8
MZ502043	.043	.100	1-1/2	1/8
MZ502047	.047	.157	1-1/2	1/8
MZ502052	.052	.157	1-1/2	1/8
MZ502055	.055	.157	1-1/2	1/8
MZ502062	.062	.157	1-1/2	1/8

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

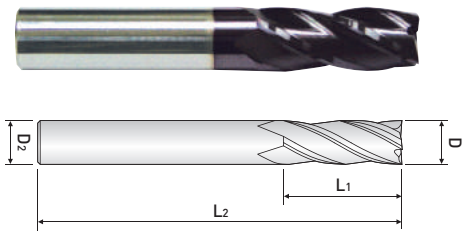
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.001	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZA504 ...series

ULTRA FINE | HELIX | p.941

EDP. No.	D	C.L	OAL	SH.Dia.
ZA504004	1/16	3/16	1-1/2	1/8
ZA504008	1/8	1/2	1-1/2	1/8
ZA504012	3/16	5/8	2	3/16
ZA504016	1/4	3/4	2-1/2	1/4
ZA504020	5/16	13/16	2-1/2	5/16
ZA504024	3/8	1	2-1/2	3/8
ZA504028	7/16	1	2-3/4	7/16
ZA504032	1/2	1	3	1/2
ZA504040	5/8	1-1/4	3-1/2	5/8
ZA504048	3/4	1-1/2	4	3/4
ZA504064	1	1-1/2	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

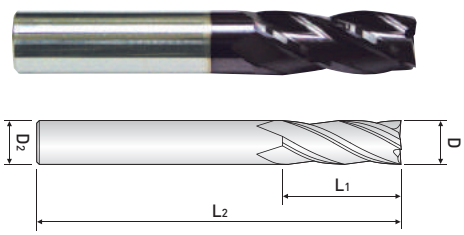
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZA524 ...series

ULTRA FINE HELIX p.942

EDP. No.	D	C.L	OAL	SH.Dia.
ZA524004	1/16	1/4	1-1/2	1/8
ZA524008	1/8	3/4	2-1/4	1/8
ZA524012	3/16	3/4	2-1/2	3/16
ZA524016	1/4	1-1/8	3	1/4
ZA524020	5/16	1-1/8	3	5/16
ZA504022	11/32	7/8	2-1/2	3/8
ZA524024	3/8	1-1/8	3	3/8
ZA524032	1/2	2	4	1/2
ZA524040	5/8	2-1/4	5	5/8
ZA524048	3/4	2-1/4	5	3/4
ZA524064	1	2-1/4	5	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

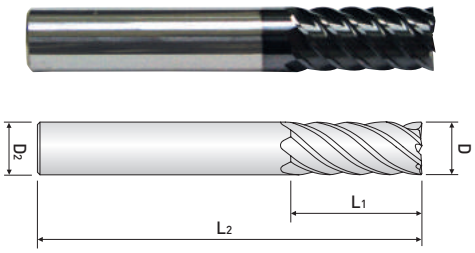
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



6&8 FLUTE, 45°HELIX LONG LENGTH

- Designed to machine tool steel, hardened materials
- High speed cutting and finish milling with high feed rate
- Superior workpiece finishes
- Superior wear resistant

ZA506&8 ...series

ULTRA FINE HELIX

p.942~943

EDP. No.	D	C.L	OAL	SH.Dia.	NO. OF FLUTE
ZA506016	1/4	1/2	2-1/4	1/4	6
ZA506020	5/16	3/4	2-1/2	5/16	6
ZA506024	3/8	7/8	2-7/8	3/8	6
ZA506032	1/2	1	3-1/4	1/2	6
ZA506040	5/8	1-1/4	3-5/8	5/8	6
ZA508048	3/4	1-1/2	4-1/8	3/4	8
ZA508064	1	1-3/4	4-1/4	1	8

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

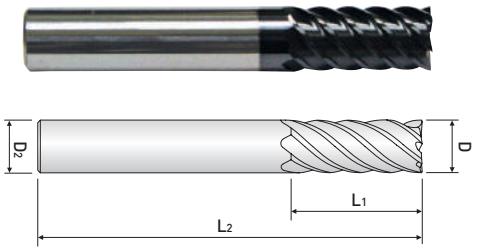
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



6&8 FLUTE, 45°HELIX EXTRA LONG LENGTH

- Designed to machine tool steel, hardened materials
- High speed cutting and finish milling with high feed rate
- Superior workpiece finishes
- Superior wear resistant

ZA526&8 ...series

ULTRA FINE HELIX p.943

EDP. No.	D	C.L	OAL	SH.Dia.	NO. OF FLUTE
ZA526016	1/4	1	2-3/4	1/4	6
ZA526020	5/16	1-1/2	3-5/8	5/16	6
ZA526024	3/8	1-3/4	4	3/8	6
ZA526032	1/2	2-3/16	4-3/8	1/2	6
ZA526040	5/8	2-5/8	5-1/8	5/8	6
ZA528048	3/4	2-1/4	5	3/4	8
ZA528049	3/4	3-1/4	6	3/4	8
ZA528050	3/4	4-1/8	7	3/4	8
ZA528064	1	4-1/8	7	1	8

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

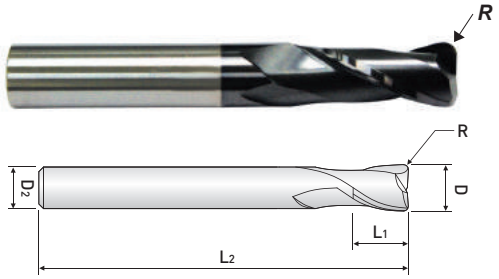
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, STUB LENGTH, CORNER RADIUS

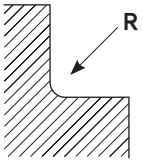
- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZR502A .....series

ULTRA FINE HELIX

p.944

EDP. No.	D	R	C.L	OAL	SH.Dia.
ZR502A00408	1/16	.008	1/8	2-1/4	1/4
ZR502A00810	1/8	.010	1/4	2-1/4	1/4
ZR502A00820		.020			
ZR502A00830		.030			
ZR502A01210	3/16	.010	3/8	2-1/2	1/4
ZR502A01220		.020			
ZR502A01230		.030			
ZR502A01610	1/4	.010	1/2	3	1/4
ZR502A01620		.020			
ZR502A01630		.030			
ZR502A01660		.040			
ZR502A02020	5/16	.020	1/2	3	5/16
ZR502A02030		.030			
ZR502A02060		.060			
ZR502A02090		.090			
ZR502A02420	3/8	.020	5/8	3	3/8
ZR502A02430		.030			
ZR502A02460		.060			
ZR502A02490		.090			
ZR502A03220	1/2	.020	5/8	4	1/2
ZR502A03230		.030			
ZR502A03260		.060			
ZR502A03290		.090			



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

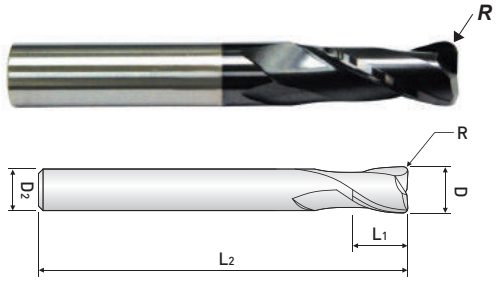
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



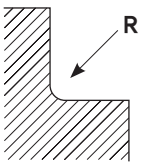
2 FLUTE, REGULAR LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZR522A ...series

ULTRA FINE HELIX p.944

EDP. No.	D	R	C.L	OAL	SH.Dia.
ZR522A00408	1/16	.008	3/16	2-1/4	1/4
ZR522A00810	1/8	.010	1/2	2-1/4	1/4
ZR522A00820		.020			
ZR522A00830		.030			
ZR522A01210	3/16	.010	5/8	2-1/2	1/4
ZR522A01220		.020			
ZR522A01230		.030			
ZR522A01610	1/4	.010	3/4	3	1/4
ZR522A01620		.020			
ZR522A01630		.030			
ZR522A01660		.060			
ZR522A02020	5/16	.020	13/16	3	5/16
ZR522A02030		.030			
ZR522A02060		.060			
ZR522A02090		.090			
ZR522A02420	3/8	.020	1	3	3/8
ZR522A02430		.030			
ZR522A02460		.060			
ZR522A02490		.090			
ZR522A02820	7/16	.020	1	4	7/16
ZR522A02830		.030			
ZR522A02860		.060			
ZR522A02890		.090			
ZR522A03220	1/2	.020	1	4	1/2
ZR522A03230		.030			
ZR522A03260		.060			
ZR522A03290		.090			



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

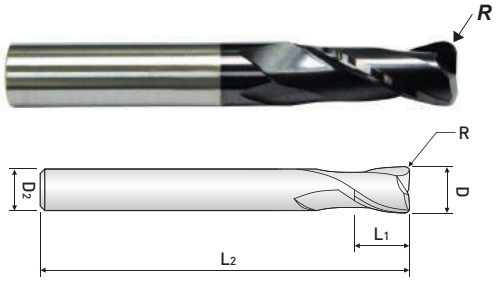
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



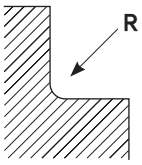
2 FLUTE, LONG LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZR532A .....series

ULTRA FINE HELIX p.944

EDP. No.	D	R	C.L	OAL	SH.Dia.
ZR532A01620	1/4	.020	1-1/8	3	1/4
ZR532A01630		.030			
ZR532A01660		.060			
ZR532A02020	5/16	.020	1-1/8	3	5/16
ZR532A02030		.030			
ZR532A02060		.060			
ZR532A02090		.090			
ZR532A02420	3/8	.020	1-1/8	3	3/8
ZR532A02430		.030			
ZR532A02460		.060			
ZR532A02490		.090			
ZR532A03220	1/2	.020	2	4	1/2
ZR532A03230		.030			
ZR532A03260		.060			
ZR532A03290		.090			



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

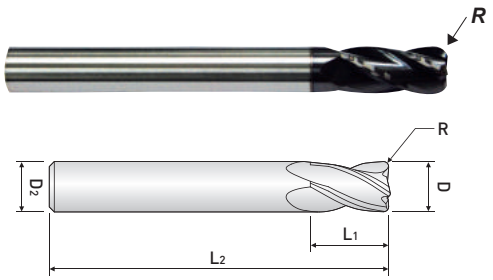
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, STUB LENGTH, CORNER RADIUS

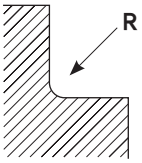
- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZR504A .....series

ULTRA FINE HELIX

p.944

EDP. No.	D	R	C.L	OAL	SH.Dia.
ZR504A00408	1/16	.008	1/8	2-1/4	1/4
ZR504A00810	1/8	.010	1/4	2-1/4	1/4
ZR504A00820		.020			
ZR504A00830		.030			
ZR504A01210	3/16	.010	3/8	2-1/2	1/4
ZR504A01220		.020			
ZR504A01230		.030			
ZR504A01610	1/4	.010	1/2	3	1/4
ZR504A01620		.020			
ZR504A01630		.030			
ZR504A01660		.060			
ZR504A02020	5/16	.020	1/2	3	5/16
ZR504A02030		.030			
ZR504A02060		.060			
ZR504A02090		.090			
ZR504A02420	3/8	.020	5/8	3	3/8
ZR504A02430		.030			
ZR504A02460		.060			
ZR504A02490		.090			
ZR504A03220	1/2	.020	5/8	4	1/2
ZR504A03230		.030			
ZR504A03260		.060			
ZR504A03290		.090			



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

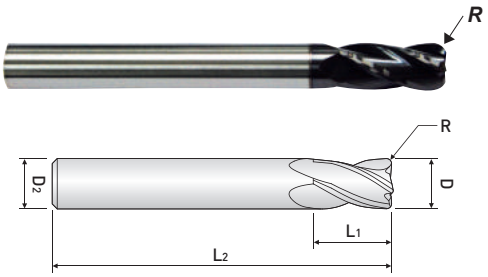
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, REGULAR LENGTH, CORNER RADIUS

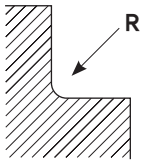
- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZR524A .....series

ULTRA FINE HELIX

p.944

EDP. No.	D	R	C.L	OAL	SH.Dia.
ZR524A00408	1/16	.008	3/16	2-1/4	1/4
ZR524A00810	1/8	.010	1/2	2-1/4	1/4
ZR524A00820		.020			
ZR524A00830		.030			
ZR524A01210	3/16	.010	5/8	2-1/2	1/4
ZR524A01220		.020			
ZR524A01230		.030			
ZR524A01610	1/4	.010	3/4	3	1/4
ZR524A01620		.020			
ZR524A01630		.030			
ZR524A01660		.060			
ZR524A02020	5/16	.020	13/16	3	5/16
ZR524A02030		.030			
ZR524A02060		.060			
ZR524A02090		.090			
ZR524A02420	3/8	.020	1	3	3/8
ZR524A02430		.030			
ZR524A02460		.060			
ZR524A02490		.090			
ZR524A02820	7/16	.020	1	4	7/16
ZR524A02830		.030			
ZR524A02860		.060			
ZR524A02890		.090			
ZR524A03220	1/2	.020	1	4	1/2
ZR524A03230		.030			
ZR524A03260		.060			
ZR524A03290		.090			



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

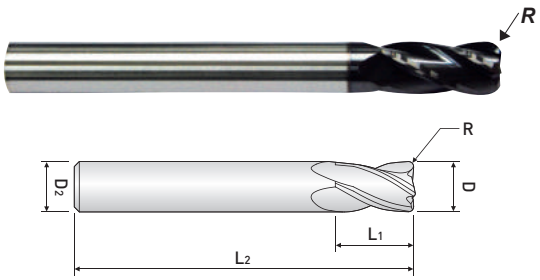
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, LONG LENGTH, CORNER RADIUS

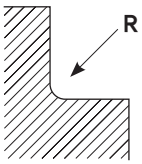
- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZR534A .....series

ULTRA FINE HELIX

p.944

EDP. No.	D	R	C.L	OAL	SH.Dia.
ZR534A01620	1/4	.020	1-1/8	3	1/4
ZR534A01630		.030			
ZR534A01660		.060			
ZR534A02020	5/16	.020	1-1/8	3	5/16
ZR534A02030		.030			
ZR534A02060		.060			
ZR534A02090		.090			
ZR534A02420	3/8	.020	1-1/8	3	3/8
ZR534A02430		.030			
ZR534A02460		.060			
ZR534A02490		.090			
ZR534A03220	1/2	.020	2	4	1/2
ZR534A03230		.030			
ZR534A03260		.060			
ZR534A03290		.090			



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

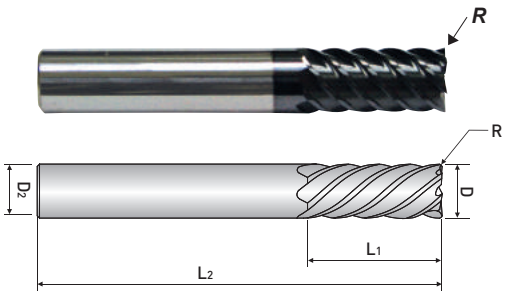
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



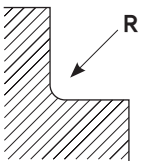
6&8 FLUTE, 45°HELIX, LONG LENGTH, CORNER RADIUS

- Designed to machine tool steel, hardened materials
- High speed cutting and finish milling with high feed rates
- Superior workpiece finishes

ZR506(8)A .....series

ULTRA FINE HELIX p.945

EDP. No.	D	R	C.L	OAL	SH.Dia.	Z
ZR506A01620	1/4	.020	1/2	2-1/4	1/4	6
ZR506A02020	5/16	.020	3/4	2-1/2	5/16	6
ZR506A02420	3/8	.020	7/8	2-7/8	3/8	6
ZR506A02430		.030				
ZR506A03220	1/2	.020	1	3-1/4	1/2	6
ZR506A03230		.030				
ZR506A04030	5/8	.030	1-1/4	3-5/8	5/8	6
ZR506A04060		.060				
ZR508A04830	3/4	.030	1-1/2	4-1/8	3/4	8
ZR508A04860		.060				
ZR508A04890		.090				



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

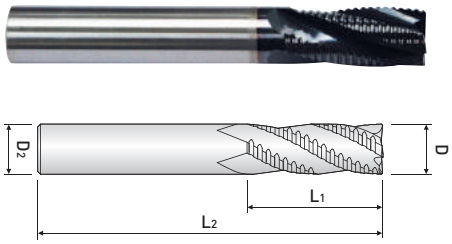
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



ROUGHING END MILL - LONG LENGTH

- Designed for machine tool steel, alloy steel, mold steel and other highly hardened materials
- High velocity milling of hardened steels
- For dry and wet milling
- Fast chip ejection

FA50 ....series

ULTRA FINE HELIX p.945

EDP. No.	Dia.	C.L	OAL	SH.Dia.	Z
FA503016	1/4	3/4	2-1/2	1/4	3
FA503020	5/16	3/4	2-1/2	5/16	3
FA503024	3/8	7/8	2-1/2	3/8	3
FA504032	1/2	1	3	1/2	4
FA504040	5/8	1-1/4	3-1/2	5/8	4
FA504048	3/4	1-5/8	4	3/4	4
FA505064	1	1-3/4	4	1	5

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

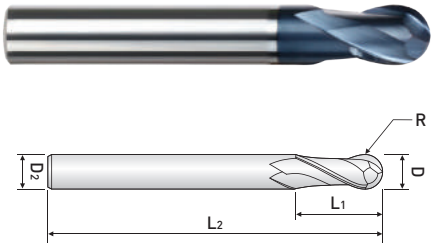
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	1/4 ~ 3/8	1/2 ~ 5/8	3/4 ~ 1
Tolerance of Mill Dia.	0 ~ -.0022	0 ~ -.0027	0 ~ -.0033

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, SHORT LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling

DB402 ...series

ULTRA FINE HELIX

p.972

EDP. No.	D	R	L_1	L_2	D_2
DB402010	1	0.5	3	38	4
DB402012	1.2	0.6	3	38	4
DB402015	1.5	0.75	3	42	4
DB402020	2	1	3	42	6
DB402025	2.5	1.25	3	42	6
DB402030	3	1.5	4	50	6
DB402035	3.5	1.75	4	50	6
DB402040	4	2	5	50	6
DB402045	4.5	2.25	5	50	6
DB402050	5	2.5	6	50	6
DB402055	5.5	2.75	6	50	6
DB402060	6	3	7	50	6
DB402070	7	3.5	8	60	8
DB402080	8	4	9	60	8
DB402090	9	4.5	10	70	10
DB402100	10	5	11	70	10
DB402120	12	6	12	75	12
DB402140	14	7	14	80	14
DB402160	16	8	16	82	16
DB402200	20	10	20	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

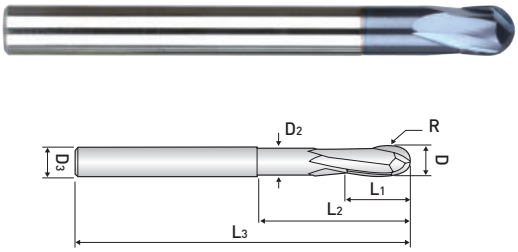
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, 15°HELIX STUB CUT LENGTH, BALL NOSE with EXTENDED NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Suitable for copy milling.

DB412 ...series

ULTRA FINE HELIX p.968

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
DB412010	1	0.5	1	3	50	0.95	4
DB412015	1.5	0.75	2	5	50	1.4	4
DB412020	2	1	3	6	50	1.9	6
DB412030S	3	1.5	4	8	50	2.9	4
DB412030							6
DB412030L					75		
DB412040S	4	2	5	10	50	3.9	4
DB412040							6
DB412040L					75		
DB412050	5	2.5	5	10	50	4.9	6
DB412060S	6	3	6	12	50	5.9	6
DB412060					75		
DB412060L				16	100		
DB412080	8	4	8	16	60	7.9	8
DB412080L				25	100		
DB412100	10	5	10	20	70	9.9	10
DB412100L				30	100		

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

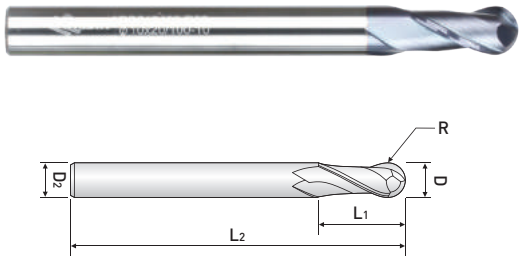
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling

DB512 ...series

ULTRA FINE HELIX p.972

EDP. No.	D	R	L_1	L_2	D_2
DB512010S4	1	0.5	3	50	4
DB512010					6
DB512015	1.5	0.75	4	50	6
DB512020S4	2	1	5	60	4
DB512020					6
DB512025	2.5	1.25	6	60	6
DB512030S4	3	1.5	8	70	4
DB512030					6
DB512035	3.5	1.75	8	70	6
DB512040S4	4	2	8	70	4
DB512040					6
DB512045	4.5	2.25	10	70	6
DB512050	5	2.5	12	80	6
DB512055	5.5	2.75	12	80	6
DB512060	6	3	12	90	6
DB512065	6.5	3.25	12	90	8
DB512070	7	3.5	15	90	8
DB512080	8	4	15	100	8
DB512090	9	4.5	20	100	10
DB512100	10	5	20	100	10
DB512101			25	150	
DB512110	11	5.5	25	110	12
DB512120	12	6	25	110	12
DB512121			30	150	
DB512122			35	200	
DB512130	13	6.5	30	110	14
DB512140	14	7	30	110	14
DB512150	15	7.5	35	140	16
DB512160	16	8	35	140	16
DB512161			40	200	
DB512162			45	250	
DB512180	18	9	40	150	18
DB512200	20	10	40	160	20
DB512201			45	200	
DB512202			50	250	
DB512250	25	12.5	50	180	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

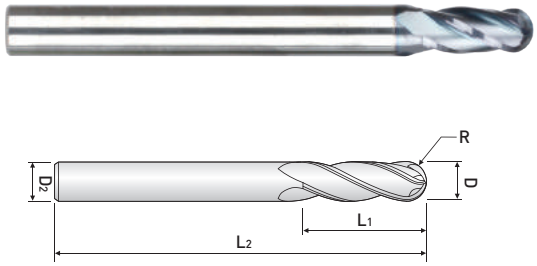
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling

DB514 ...series

ULTRA FINE | HELIX | p.973

EDP. No.	D	R	L_1	L_2	D_2
DB514030	3	1.5	8	70	6
DB514040	4	2	8	70	6
DB514050	5	2.5	10	80	6
DB514060	6	3	12	90	6
DB514070	7	3.5	15	90	8
DB514080	8	4	15	100	8
DB514090	9	4.5	20	100	10
DB514100	10	5	20	100	10
DB514110	11	5.5	25	110	12
DB514120	12	6	25	110	12
DB514130	13	6.5	30	110	14
DB514140	14	7	30	110	14
DB514150	15	7.5	35	140	16
DB514160	16	8	35	140	16
DB514180	18	9	40	150	18
DB514200	20	10	40	160	20
DB514250	25	12.5	50	180	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

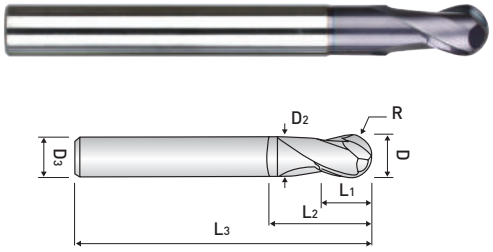
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, STUB CUT LENGTH,
BALL NOSE with EXTENDED NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling
- Designed to high strength

DB502 ...series

ULTRA FINE HELIX p.972

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
DB502010	1	0.5	1	3	50	0.95	6
DB502015	1.5	0.75	1.5	4	50	1.45	6
DB502020	2	1	2	6	60	1.9	6
DB502030	3	1.5	4	9	70	2.85	6
DB502040	4	2	5	12	70	3.85	6
DB502050	5	2.5	6	15	80	4.7	6
DB502060	6	3	7	18	90	5.7	6
DB502080	8	4	10	24	90	7.7	8
DB502100	10	5	12	30	100	9.5	10
DB502120	12	6	14	36	110	11.5	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

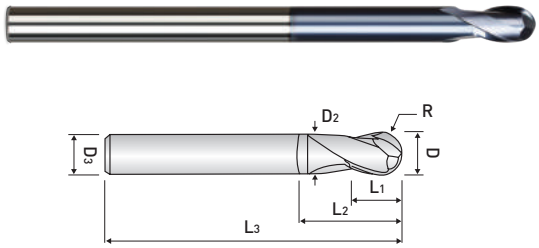
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, EXTENDED NECK-LONG SHANK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling
- Suitable for deep copy milling with long neck type

DB522 ...series

ULTRA FINE | HELIX | p.972

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
DB522030	3	1.5	4	35	100	2.9	6
DB522040	4	2	6	35	100	3.9	6
DB522050	5	2.5	7	40	115	4.9	6
DB522060	6	3	8	45	115	5.9	6
DB522061							8
DB522070	7	3.5	10	45	125	6.9	8
DB522080	8	4	12	55	125	7.9	8
DB522081							10
DB522090	9	4.5	15	65	140	8.9	10
DB522100	10	5	15	65	140	9.9	10
DB522120	12	6	18	75	150	11.9	12
DB522140	14	7	23	75	155	13.9	14
DB522160	16	8	30	75	155	15.9	16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

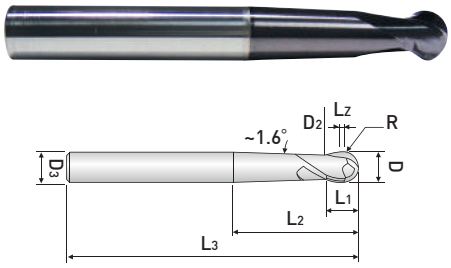
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, MMC-SPHERE TYPE

- For copy milling & steep sloped machining in mold & die
- AlTiN coated for high wear resistance

DB532 ...series

ULTRA FINE HELIX

p.974

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3	L_z
DB532030	3	1.5	4	30	80	2.5	6	1.5
DB532031			2.3					-
DB532040	4	2	5	30	80	3.3	6	1.5
DB532041			3.1					-
DB532050	5	2.5	6	43	80	4.1	6	2
DB532051			3.9	38				-
DB532060	6	3	7	30	100	4.7	6	2
DB532061			4.9	28				-
DB532080	8	4	9	36	100	6.5	8	3
DB532081			6.3	33				-
DB532100	10	5	11	43	100	8.2	10	3
DB532101			7.9	40				-
DB532120	12	6	13	52	100	9.8	12	3
DB532121			9.5	49				-
DB532160	16	8	15	61	150	13.4	16	3
DB532161			12.4	59				-

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

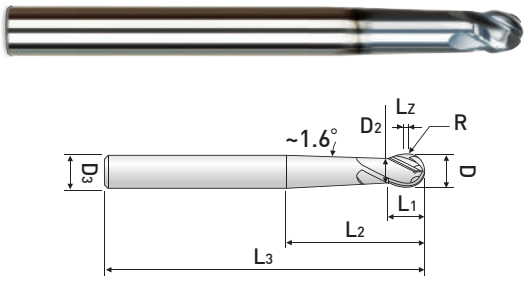
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, MMC-SPHERE TYPE

- For copy milling & Steep sloped machining in Mold & Die
- AlTiN coated for high wear resistance

DB534 ...series

ULTRA FINE HELIX p.975

EDP. No.	D	R	L1	L2	L3	D2	D3	Lz
DB534050	5	2.5	6	43	80	4.1	6	2
DB534051			3.9	38				-
DB534060	6	3	7	30	100	4.7	6	2
DB534061			4.9	28				-
DB534080	8	4	9	36	100	6.5	8	3
DB534081			6.3	33				-
DB534100	10	5	11	43	100	8.2	10	3
DB534101			7.9	40				-
DB534120	12	6	13	52	100	9.8	12	3
DB534121			9.5	49				-
DB534160	16	8	15	61	150	13.4	16	3
DB534161			12.4	59				-

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

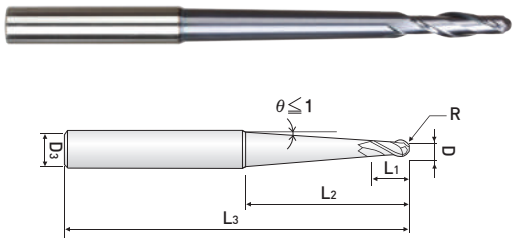
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, BALL NOSE with TAPER NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Suitable for copy milling
- Suitable for deep copy milling with taper long neck type

DB54(5)2 ...series

ULTRA FINE HELIX

p.972

EDP. No.	D	R	L_1	L_2	L_3	D_3
DB542020	2	1.0	3	63	110	6
DB552020			5	85	155	
DB542030	3	1.5	5	65	110	6
DB552030			7	87	155	
DB542040	4	2.0	7	67	110	6
DB552040			10	90	155	8
DB542050	5	2.5	10	70	110	6
DB552050			15	95	155	8
DB542060	6	3.0	18	78	155	10
DB552060			20	110	200	
DB542080	8	4.0	30	100	155	12
DB552080				120	200	
DB542100	10	5.0	40	100	155	12
DB552100				120	200	
DB542120	12	6.0	50	110	155	16
DB552120				130	200	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

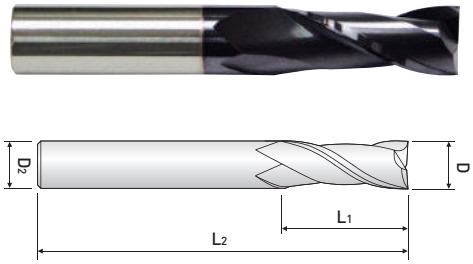
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZE502 ...series

ULTRA FINE HELIX p.976

EDP. No.	D	L_1	L_2	D_2
ZE502010S4	1	3	42	4
ZE502010				6
ZE502015	1.5	4	42	6
ZE502020S4	2	6	42	4
ZE502020				6
ZE502025	2.5	8	42	6
ZE502030S4	3	10	50	4
ZE502030				6
ZE502035	3.5	10	50	6
ZE502040S4	4	12	50	4
ZE502040				6
ZE502045	4.5	14	50	6
ZE502050	5	15	50	6
ZE502055	5.5	15	50	6
ZE502060	6	15	50	6
ZE502065	6.5	18	60	8
ZE502070	7	20	60	8
ZE502075	7.5	20	60	8
ZE502080	8	20	60	8
ZE502085	8.5	23	70	10
ZE502090	9	25	70	10
ZE502095	9.5	25	70	10
ZE502100	10	25	70	10
ZE502105	10.5	28	75	12
ZE502110	11	30	75	12
ZE502115	11.5	30	75	12
ZE502120	12	30	75	12
ZE502125S12	12.5	30	80	12
ZE502130S12	13	30	80	12
ZE502130		35	85	14
ZE502130S16			90	16
ZE502140	14	35	85	14
ZE502140S16			90	16
ZE502150	15	40	90	16
ZE502160	16	40	90	16
ZE502170	17	40	100	16
ZE502180	18	45	100	18
ZE502190	19	45	100	20
ZE502200	20	45	100	20
ZE502220	22	45	100	20
ZE502240	24	50	120	25
ZE502250	25	50	120	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

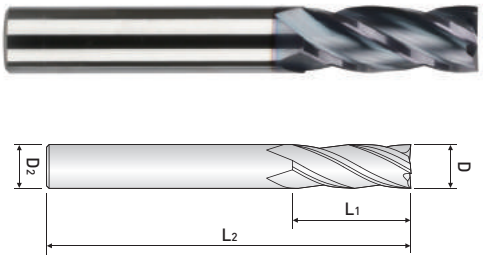
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZE504 ...series

ULTRA FINE | HELIX | 7832

EDP. No.	D	L_1	L_2	D_2
ZE504010	1	2.5	42	6
ZE504015	1.5	4	42	6
ZE504020S4	2	6	42	4
ZE504020				6
ZE504025	2.5	8	42	6
ZE504030S4	3	10	50	4
ZE504030				6
ZE504035	3.5	10	50	6
ZE504040S4	4	12	50	4
ZE504040				6
ZE504045	4.5	14	50	6
ZE504050	5	15	50	6
ZE504055	5.5	15	50	6
ZE504060	6	15	50	6
ZE504065	6.5	18	60	8
ZE504070	7	20	60	8
ZE504075	7.5	20	60	8
ZE504080	8	20	60	8
ZE504085	8.5	23	70	10
ZE504090	9	25	70	10
ZE504095	9.5	25	70	10
ZE504100	10	25	70	10
ZE504105	10.5	28	75	12
ZE504110	11	30	75	12
ZE504115	11.5	30	75	12
ZE504120	12	30	75	12
ZE504125S12	12.5	30	80	12
ZE504130S12	13	30	80	12
ZE504130		35	85	14
ZE504130S16			90	16
ZE504140	14	35	85	14
ZE504140S16			90	16
ZE504150	15	40	90	16
ZE504160	16	40	90	16
ZE504170	17	40	100	16
ZE504180	18	45	100	18
ZE504190	19	45	100	20
ZE504200	20	45	100	20
ZE504220	22	45	100	20
ZE504240	24	50	120	25
ZE504250	25	50	120	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
○	○	◎	○				○		○

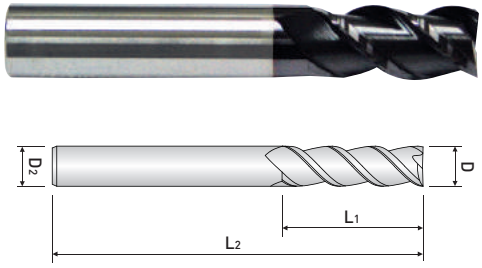
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



3 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZE503 ...series

ULTRA FINE | HELIX | p.977

EDP. No.	D	L_1	L_2	D_2
ZE503060	6	15	50	6
ZE503070	7	18	60	8
ZE503080	8	18	60	8
ZE503090	9	22	70	10
ZE503100	10	22	70	10
ZE503110	11	26	75	12
ZE503120	12	26	75	12
ZE503130	13	32	85	14
ZE503140	14	32	85	14
ZE503150	15	35	90	16
ZE503160	16	35	90	16
ZE503180	18	40	100	18
ZE503200	20	40	100	20
ZE503250	25	50	120	25
ZE503320	32	70	150	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

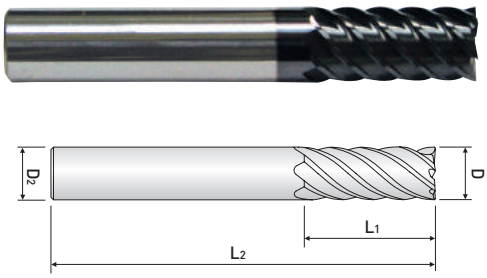
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



6 FLUTE, REGULAR & LONG LENGTH

- Designed for highly hardened materials up to HRc 55
- Suitable for high speed & finishing machining

ZE506 ...series

ULTRA FINE | HELIX | p.981

EDP. No.	D	L_1	L_2	D_2
ZE506060	6	15	50	6
ZE506061		26	70	
ZE506070	7	18	60	8
ZE506080	8	18	60	8
ZE506081		36	90	
ZE506090	9	22	70	10
ZE506100	10	22	70	10
ZE506101		46	100	
ZE506110	11	26	75	12
ZE506120	12	26	75	12
ZE506121		56	110	
ZE506130	13	32	85	14
ZE506140	14	32	85	14
ZE506150	15	35	90	16
ZE506160	16	35	90	16
ZE506161		66	130	
ZE506180	18	44	100	18
ZE506200	20	44	100	20
ZE506201		76	150	
ZE506250	25	50	120	25
ZE506251		92	180	
ZE506320	32	70	150	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

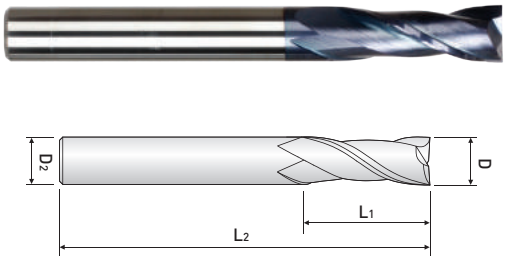
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, MEDIUM LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZM502 ...series

ULTRA FINE HELIX

p.982

EDP. No.	D	L_1	L_2	D_2
ZM502020	2	8	40	4
ZM502030	3	12	50	6
ZM502040	4	15	50	6
ZM502050	5	20	60	6
ZM502060	6	20	60	6
ZM502080	8	25	70	8
ZM502100	10	30	90	10
ZM502120	12	30	90	12
ZM502140	14	40	110	16
ZM502160	16	50	110	16
ZM502180	18	50	110	20
ZM502200	20	55	110	20
ZM502250	25	75	140	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

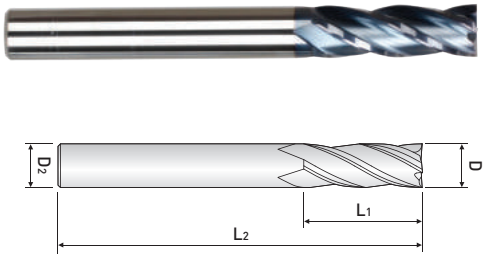
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, MEDIUM LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZM504 ...series

ULTRA FINE HELIX

p.942

EDP. No.	D	L_1	L_2	D_2
ZM504020	2	8	40	4
ZM504030	3	12	50	6
ZM504040	4	15	50	6
ZM504050	5	20	60	6
ZM504060	6	20	60	6
ZM504080	8	25	70	8
ZM504100	10	30	90	10
ZM504120	12	30	90	12
ZM504140	14	40	110	16
ZM504160	16	50	110	16
ZM504180	18	50	110	20
ZM504200	20	55	110	20
ZM504250	25	75	140	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

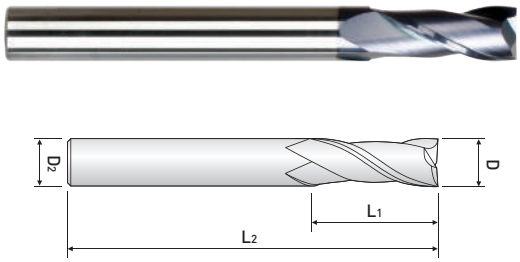
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, MEDIUM CUT LONG SHANK TYPE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZM522 ...series

ULTRA FINE | HELIX | p.982

EDP. No.	D	L_1	L_2	D_2
ZM522030	3	10	70	6
ZM522040	4	12	70	6
ZM522050	5	15	80	6
ZM522060	6	15	80	6
ZM522080	8	20	100	8
ZM522100	10	25	100	10
ZM522120	12	30	110	12
ZM522160	16	40	125	16
ZM522200	20	45	150	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

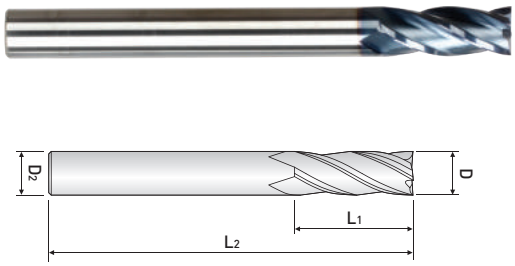
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, MEDIUM CUT LONG SHANK TYPE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZM524 ...series

ULTRA FINE | HELIX | p.982

EDP. No.	D	L_1	L_2	D_2
ZM524030	3	10	70	6
ZM524040	4	12	70	6
ZM524050	5	15	80	6
ZM524060	6	15	80	6
ZM524080	8	20	100	8
ZM524100	10	25	100	10
ZM524120	12	30	110	12
ZM524160	16	40	125	16
ZM524200	20	45	150	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

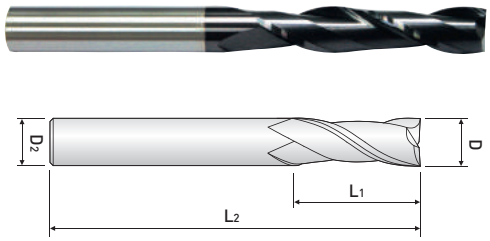
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZE522 ...series

ULTRA FINE HELIX p.976

EDP. No.	D	L_1	L_2	D_2
ZE522030	3	25	75	6
ZE522040	4	25	75	6
ZE522050	5	30	80	6
ZE522060	6	30	80	6
ZE522070	7	35	85	8
ZE522080	8	35	85	8
ZE522090	9	45	100	10
ZE522100	10	45	100	10
ZE522101		60	155	
ZE522110	11	50	110	12
ZE522120	12	55	120	12
ZE522121		65	155	
ZE522140	14	60	120	14
ZE522160	16	60	120	16
ZE522161		75	165	
ZE522180	18	60	120	18
ZE522200	20	60	120	20
ZE522201		75	165	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

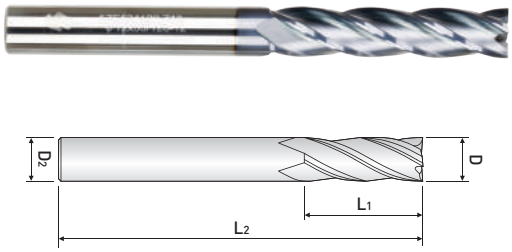
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZE524 ...series

ULTRA FINE | HELIX | p.978

EDP. No.	D	L_1	L_2	D_2
ZE524030	3	25	75	6
ZE524040	4	25	75	6
ZE524050	5	30	80	6
ZE524060	6	30	80	6
ZE524070	7	35	85	8
ZE524080	8	35	85	8
ZE524090	9	45	100	10
ZE524100	10	45	100	10
ZE524110	11	50	110	12
ZE524120	12	55	120	12
ZE524140	14	60	120	14
ZE524160	16	60	120	16
ZE524180	18	60	120	18
ZE524200	20	60	120	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

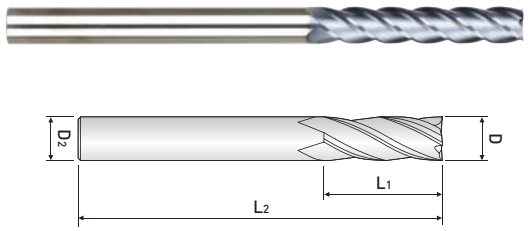
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, EXTRA LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes

ZE534 ...series

ULTRA FINE | HELIX | p.978

EDP. No.	D	L_1	L_2	D_2
ZE534040	4	30	130	6
ZE534050	5	35	130	6
ZE534060	6	40	130	6
ZE534061		50	155	
ZE534081	8	60	155	8
ZE534082		80	200	
ZE534101	10	60	155	10
ZE534102		80	200	
ZE534121	12	60	155	12
ZE534122		80	200	
ZE534161	16	80	155	16
ZE534162		100	200	
ZE534163		120	250	
ZE534201	20	80	165	20
ZE534202		100	200	
ZE534203		130	250	
ZE534252	25	100	200	25
ZE534253		150	250	

※ Please reduce cutting speed around 20~30% from the above table for ZE534 series.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

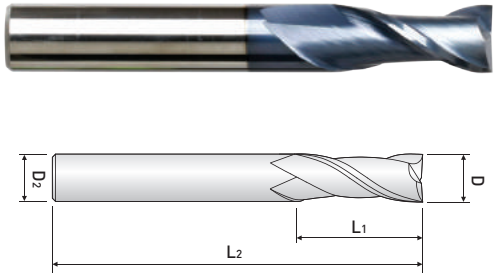
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, 35° HELIX REGULAR LENGTH

- Designed for high hardened materials up to HRc 62
- Suitable for high speed machining

ZE512 ...series

ULTRA FINE | HELIX | p.976

EDP. No.	D	L_1	L_2	D_2
ZE512010	1	3	40	6
ZE512015	1.5	4	40	6
ZE512020	2	5	40	6
ZE512025	2.5	6	40	6
ZE512030	3	8	45	6
ZE512035	3.5	10	45	6
ZE512040	4	10	45	6
ZE512045	4.5	11	45	6
ZE512050	5	13	50	6
ZE512055	5.5	13	50	6
ZE512060	6	13	50	6
ZE512065	6.5	16	60	8
ZE512070	7	18	60	8
ZE512080	8	19	60	8
ZE512100	10	22	70	10
ZE512120	12	26	75	12

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

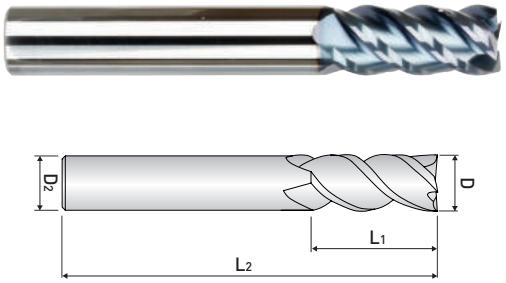
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, 45°HELIX REGULAR LENGTH

- Designed for high hardened materials up to HRc 62
- Suitable for high speed machining

ZE514 ...series

ULTRA FINE | HELIX | p.978

EDP. No.	D	L_1	L_2	D_2
ZE514020	2	5	40	6
ZE514025	2.5	6	40	6
ZE514030	3	8	45	6
ZE514040	4	10	45	6
ZE514050	5	13	50	6
ZE514060	6	13	50	6
ZE514080	8	19	60	8
ZE514100	10	22	70	10
ZE514120	12	26	75	12

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

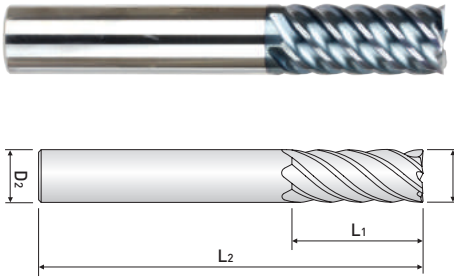
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



6 FLUTE, 50° HELIX REGULAR LENGTH

- Designed for high hardened materials up to HRc 62
- Suitable for high speed machining

ZE516 ...series

ULTRA FINE | HELIX | p.981

EDP. No.	D	L_1	L_2	D_2
ZE516060	6	13	50	6
ZE516080	8	18	60	8
ZE516100	10	22	70	10
ZE516120	12	26	75	12
ZE516160	16	35	90	16
ZE516200	20	44	100	20

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

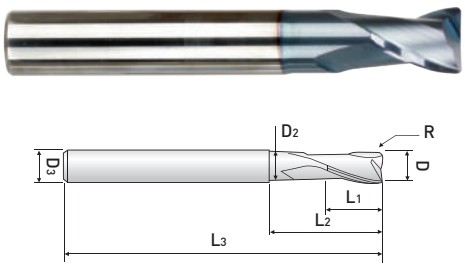
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes
- Increased feed rate

ZR502 ...series

ULTRA FINE HELIX

p.983

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZR5020405	4	0.5	6	10	55	3.7	6
ZR5020410		1					
ZR5020605	6	0.5	8	15	55	5.7	6
ZR5020610		1					
ZR5020805	8	0.5	10	20	65	7.7	8
ZR5020810		1					
ZR5020815		1.5					
ZR5020820		2					
ZR5021005	10	0.5	12	28	80	9.5	10
ZR5021010		1					
ZR5021015		1.5					
ZR5021020		2					
ZR5021205	12	0.5	15	30	82	11.5	12
ZR5021210		1					
ZR5021215		1.5					
ZR5021220		2					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

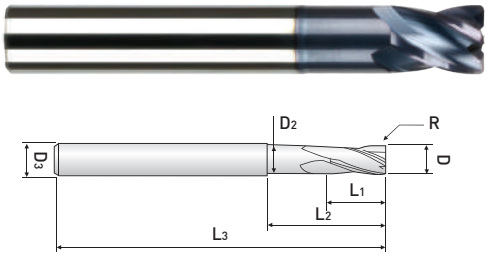
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, STUB CUT LENGTH,
CORNER RADIUS with EXTENDED NECK

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes
- Increased feed rate

ZR504 ...series

ULTRA FINE | HELIX | p.984

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZR5040405	4	0.5	6	10	55	3.7	6
ZR5040410		1					
ZR5040605	6	0.5	8	15	55	5.7	6
ZR5040610		1					
ZR5040805	8	0.5	10	20	65	7.7	8
ZR5040810		1					
ZR5040815		1.5					
ZR5040820		2					
ZR5041005	10	0.5	12	28	80	9.7	10
ZR5041010		1					
ZR5041015		1.5					
ZR5041020		2					
ZR5041205	12	0.5	15	30	82	11.7	12
ZR5041210		1					
ZR5041215		1.5					
ZR5041220		2					

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

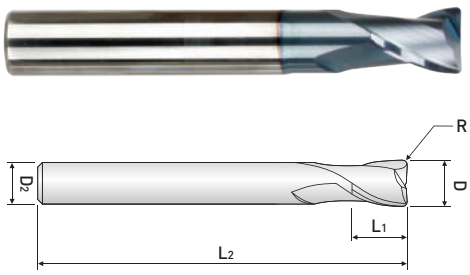
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, REGULAR LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes
- Increased feed rate

ZR512 ...series

ULTRA FINE HELIX

p.983

EDP. No.	D	R	L_1	L_2	D_2
ZR5120605	6	0.5	15	55	6
ZR5120610		1			
ZR5120805	8	0.5	20	65	8
ZR5120810		1			
ZR5120815		1.5			
ZR5120820		2			
ZR5121005	10	0.5	25	80	10
ZR5121010		1			
ZR5121015		1.5			
ZR5121020		2			
ZR5121025		2.5			
ZR5121030		3			
ZR5121205	12	0.5	30	82	12
ZR5121210		1			
ZR5121215		1.5			
ZR5121220		2			
ZR5121225		2.5			
ZR5121230		3			
ZR5121605	16	0.5	40	100	16
ZR5121610		1			
ZR5121615		1.5			
ZR5121620		2			
ZR5121630		3			
ZR5122005	20	0.5	45	110	20
ZR5122010		1			
ZR5122015		1.5			
ZR5122020		2			
ZR5122030		3			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

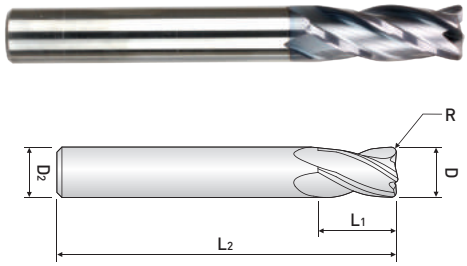
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, REGULAR LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes
- Increased feed rate

ZR514 ...series

ULTRA FINE HELIX

p.984

EDP. No.	D	R	L_1	L_2	D_2
ZR5140605	6	0.5	15	55	6
ZR5140610		1			
ZR5140805	8	0.5	20	65	8
ZR5140810		1			
ZR5140815		1.5			
ZR5140820		2			
ZR5141005	10	0.5	25	80	10
ZR5141010		1			
ZR5141015		1.5			
ZR5141020		2			
ZR5141025		2.5			
ZR5141030		3			
ZR5141205	12	0.5	30	82	12
ZR5141210		1			
ZR5141215		1.5			
ZR5141220		2			
ZR5141225		2.5			
ZR5141230		3			
ZR5141605	16	0.5	40	100	16
ZR5141610		1			
ZR5141615		1.5			
ZR5141620		2			
ZR5141630		3			
ZR5142005	20	0.5	45	110	20
ZR5142010		1			
ZR5142015		1.5			
ZR5142020		2			
ZR5142030		3			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

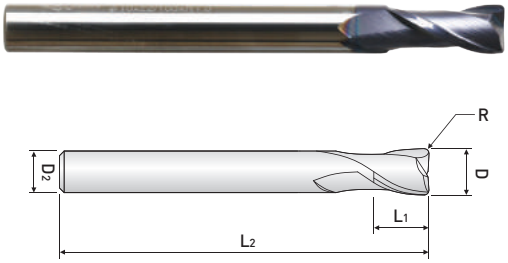
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



2 FLUTE, LONG LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes
- Increased feed rate

ZR522 ...series

ULTRA FINE HELIX

p.983

EDP. No.	D	R	L1	L2	D2
ZR5220302S4	3	0.2	8	60	4
ZR5220302					6
ZR5220305S4		0.5			4
ZR5220305					6
ZR5220402S4	4	0.2	11	70	4
ZR5220402		0.2			6
ZR5220405S4		0.5			4
ZR5220405		0.5			6
ZR5220410S4		1			4
ZR5220410		1			6
ZR5220502	5	0.2	13	80	6
ZR5220505		0.5			
ZR5220510		1			
ZR5220602	6	0.2	13	90	6
ZR5220605		0.5			
ZR5220610		1			
ZR5220805	8	0.5	19	100	8
ZR5220810		1			
ZR5220815		1.5			
ZR5220820		2			
ZR5221005	10	0.5	22	100	10
ZR5221010		1			
ZR5221015		1.5			
ZR5221020		2			
ZR5221025		2.5			
ZR5221205	12	0.5	26	110	12
ZR5221210		1			
ZR5221215		1.5			
ZR5221220		2			
ZR5221225		2.5			
ZR5221230		3			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

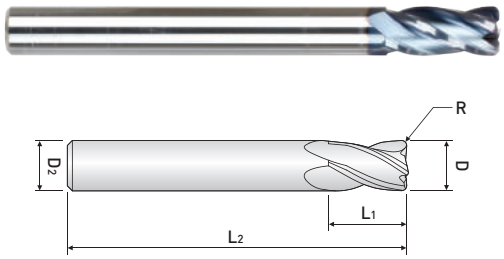
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, LONG LENGTH, CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Superior workpiece finishes
- Increased feed rate

ZR524 ...series

ULTRA FINE | HELIX | p.984

EDP. No.	D	R	L1	L2	D2
ZR5240302S4	3	0.2	8	60	4
ZR5240302					6
ZR5240305S4		0.5			4
ZR5240305					6
ZR5240402S4	4	0.2	11	70	4
ZR5240402					6
ZR5240405S4		0.5			4
ZR5240405					6
ZR5240410S4		1			4
ZR5240410					6
ZR5240502	5	0.2	13	80	6
ZR5240505		0.5			
ZR5240510		1			
ZR5240602	6	0.2	13	90	6
ZR5240605		0.5			
ZR5240610		1			
ZR5240805	8	0.5	19	100	8
ZR5240810		1			
ZR5240815		1.5			
ZR5240820		2			
ZR5241005	10	0.5	22	100	10
ZR5241010		1			
ZR5241015		1.5			
ZR5241020		2			
ZR5241025		2.5			
ZR5241205	12	0.5	26	110	12
ZR5241210		1			
ZR5241215		1.5			
ZR5241220		2			
ZR5241225		2.5			
ZR5241230		3			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

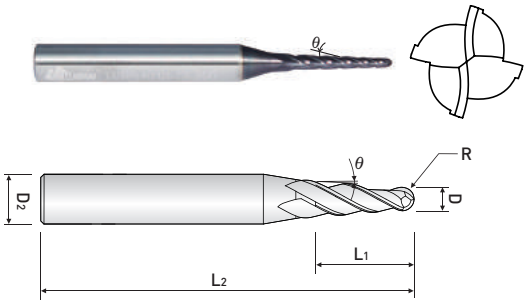
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※Items can be changed for quality improvement without notice.

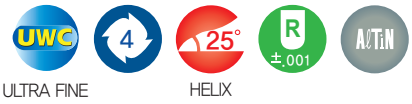
Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB604A 05series



ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB604A-0030-05	.030	.015	30'	.210	3	3/16
TPRB604A-0040-05	.040	.020	30'	.280	3	3/16
TPRB604A-0050-05	.050	.025	30'	.350	3	3/16
TPRB604A-0060-05	.060	.030	30'	.420	3	3/16
TPRB604A-0070-05	.070	.035	30'	.490	3	3/16
TPRB604A-0080-05	.080	.040	30'	.560	3	3/16
TPRB604A-0090-05	.090	.045	30'	.630	3	3/16
TPRB604A-0100-05	.100	.050	30'	.700	3	3/16
TPRB604A-0125-05	.125	.0625	30'	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

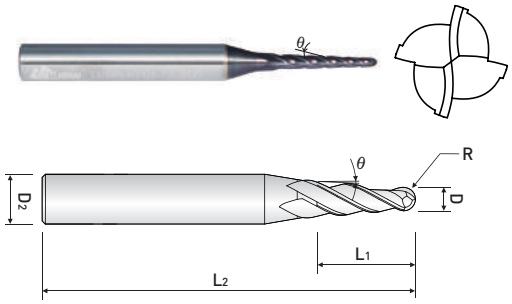
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB604A 10series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB604A-0030-10	.030	.015	1°	.210	3	3/16
TPRB604A-0040-10	.040	.020	1°	.280	3	3/16
TPRB604A-0050-10	.050	.025	1°	.350	3	3/16
TPRB604A-0060-10	.060	.030	1°	.420	3	3/16
TPRB604A-0070-10	.070	.035	1°	.490	3	3/16
TPRB604A-0080-10	.080	.040	1°	.560	3	3/16
TPRB604A-0090-10	.090	.045	1°	.630	3	3/16
TPRB604A-0100-10	.100	.050	1°	.700	3	3/16
TPRB604A-0125-10	.125	.0625	1°	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

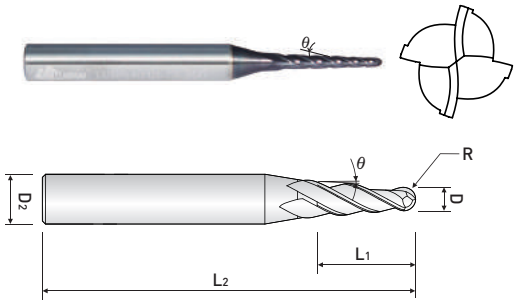
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB604A 15series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB604A-0030-05	.030	.015	1° 30'	.210	3	3/16
TPRB604A-0040-05	.040	.020	1° 30'	.280	3	3/16
TPRB604A-0050-05	.050	.025	1° 30'	.350	3	3/16
TPRB604A-0060-05	.060	.030	1° 30'	.420	3	3/16
TPRB604A-0070-05	.070	.035	1° 30'	.490	3	3/16
TPRB604A-0080-05	.080	.040	1° 30'	.560	3	3/16
TPRB604A-0090-05	.090	.045	1° 30'	.630	3	3/16
TPRB604A-0100-05	.100	.050	1° 30'	.700	3	3/16
TPRB604A-0125-05	.125	.0625	1° 30'	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

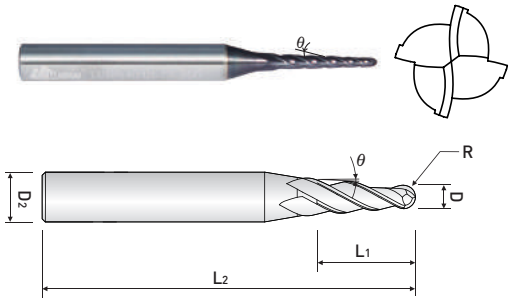
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB604A 20series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB604A-0030-20	.030	.015	2°	.210	3	3/16
TPRB604A-0040-20	.040	.020	2°	.280	3	3/16
TPRB604A-0050-20	.050	.025	2°	.350	3	3/16
TPRB604A-0060-20	.060	.030	2°	.420	3	3/16
TPRB604A-0070-20	.070	.035	2°	.490	3	3/16
TPRB604A-0080-20	.080	.040	2°	.560	3	3/16
TPRB604A-0090-20	.090	.045	2°	.630	3	3/16
TPRB604A-0100-20	.100	.050	2°	.700	3	3/16
TPRB604A-0125-20	.125	.0625	2°	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

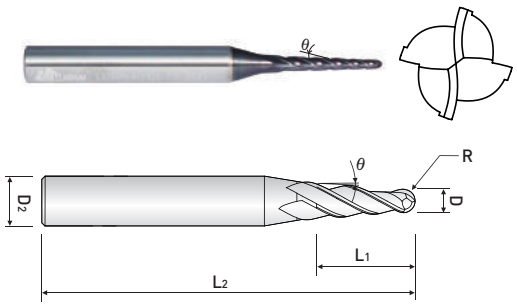
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB604A 30series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB604A-0030-30	.030	.015	3°	.210	3	3/16
TPRB604A-0040-30	.040	.020	3°	.280	3	3/16
TPRB604A-0050-30	.050	.025	3°	.350	3	3/16
TPRB604A-0060-30	.060	.030	3°	.420	3	3/16
TPRB604A-0070-30	.070	.035	3°	.490	3	3/16
TPRB604A-0080-30	.080	.040	3°	.560	3	3/16
TPRB604A-0090-30	.090	.045	3°	.630	3	3/16
TPRB604A-0100-30	.100	.050	3°	.700	3	3/16
TPRB604A-0125-30	.125	.0625	3°	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

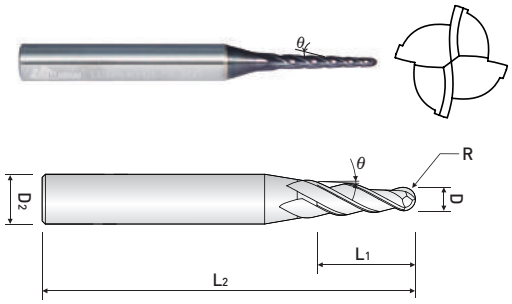
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB624A 05series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB624A-0030-05	.030	.015	30'	.420	3	3/16
TPRB624A-0040-05	.040	.020	30'	.260	3	3/16
TPRB624A-0050-05	.050	.025	30'	.700	3	3/16
TPRB624A-0060-05	.060	.030	30'	.840	3	3/16
TPRB624A-0070-05	.070	.035	30'	.980	3	3/16
TPRB624A-0080-05	.080	.040	30'	1.120	3	3/16
TPRB624A-0090-05	.090	.045	30'	1.260	3	3/16
TPRB624A-0100-05	.100	.050	30'	1.400	3	3/16
TPRB624A-0125-05	.125	.0625	30'	1.750	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

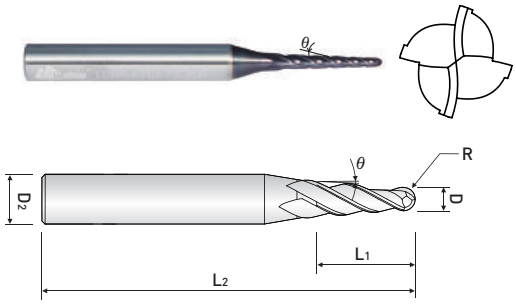
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB624A 10series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB624A-0030-10	.030	.015	1°	.420	3	3/16
TPRB624A-0040-10	.040	.020	1°	.560	3	3/16
TPRB624A-0050-10	.050	.025	1°	.700	3	3/16
TPRB624A-0060-10	.060	.030	1°	.840	3	3/16
TPRB624A-0070-10	.070	.035	1°	.980	3	3/16
TPRB624A-0080-10	.080	.040	1°	1.120	3	3/16
TPRB624A-0090-10	.090	.045	1°	1.260	3	3/16
TPRB624A-0100-10	.100	.050	1°	1.400	3	3/16
TPRB624A-0125-10	.125	.0625	1°	1.750	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

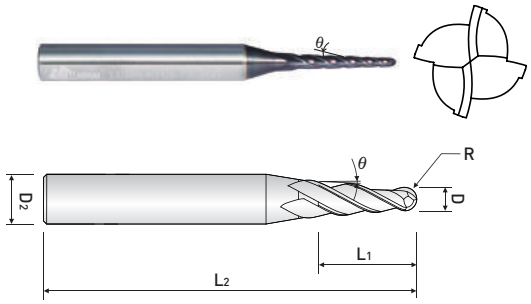
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB624A 15series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB624A-0030-15	.030	.015	1°30'	.420	3	3/16
TPRB624A-0040-15	.040	.020	1°30'	.260	3	3/16
TPRB624A-0050-15	.050	.025	1°30'	.700	3	3/16
TPRB624A-0060-15	.060	.030	1°30'	.840	3	3/16
TPRB624A-0070-15	.070	.035	1°30'	.980	3	3/16
TPRB624A-0080-15	.080	.040	1°30'	1.120	3	3/16
TPRB624A-0090-15	.090	.045	1°30'	1.260	3	3/16
TPRB624A-0100-15	.100	.050	1°30'	1.400	3	3/16
TPRB624A-0125-15	.125	.0625	1°30'	1.750	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

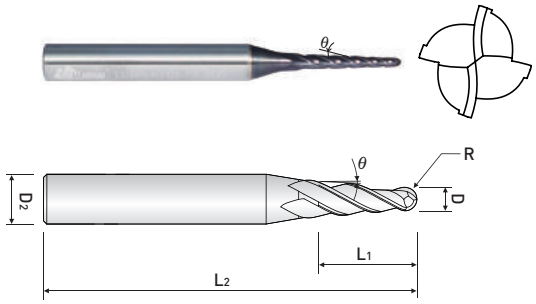
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB624A 20series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB624A-0030-20	.030	.015	2°	.420	3	3/16
TPRB624A-0040-20	.040	.020	2°	.260	3	3/16
TPRB624A-0050-20	.050	.025	2°	.700	3	3/16
TPRB624A-0060-20	.060	.030	2°	.840	3	3/16
TPRB624A-0070-20	.070	.035	2°	.980	3	3/16
TPRB624A-0080-20	.080	.040	2°	1.120	3	3/16
TPRB624A-0090-20	.090	.045	2°	1.260	3	3/16
TPRB624A-0100-20	.100	.050	2°	1.400	3	3/16
TPRB624A-0125-20	.125	.0625	2°	1.750	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

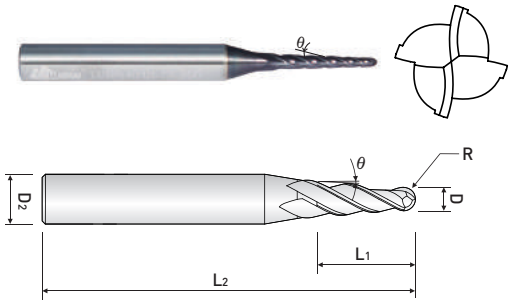
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER RIB BALL, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TPRB624A 30series

ULTRA FINE HELIX

EDP. No.	D	R	θ	C.L	OAL	SH.Dia.
TPRB624A-0030-30	.030	.015	3°	.420	3	3/16
TPRB624A-0040-30	.040	.020	3°	.260	3	3/16
TPRB624A-0050-30	.050	.025	3°	.700	3	3/16
TPRB624A-0060-30	.060	.030	3°	.840	3	3/16
TPRB624A-0070-30	.070	.035	3°	.980	3	3/16
TPRB624A-0080-30	.080	.040	3°	1.120	3	3/16
TPRB624A-0090-30	.090	.045	3°	1.260	3	3/16
TPRB624A-0100-30	.100	.050	3°	1.400	3	3/16
TPRB624A-0125-30	.125	.0625	3°	1.750	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

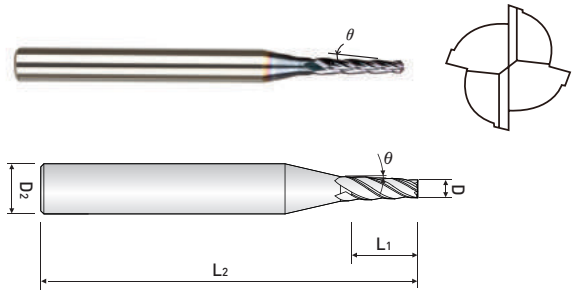
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER ENDMILLS

- Rigid taper end mill for highly productive rib processing

TPRE604A 05series

ULTRA FINE HELIX

EDP. No.	D	θ	C.L	OAL	SH.Dia.
TPRE4A604-0030-05	.030	30'	.210	3	3/16
TPRE4A604-0040-05	.040	30'	.280	3	3/16
TPRE4A604-0050-05	.050	30'	.350	3	3/16
TPRE4A604-0060-05	.060	30'	.420	3	3/16
TPRE4A604-0070-05	.070	30'	.490	3	3/16
TPRE4A604-0080-05	.080	30'	.560	3	3/16
TPRE4A604-0090-05	.090	30'	.630	3	3/16
TPRE4A604-0100-05	.100	30'	.700	3	3/16
TPRE4A604-0125-05	.125	30'	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

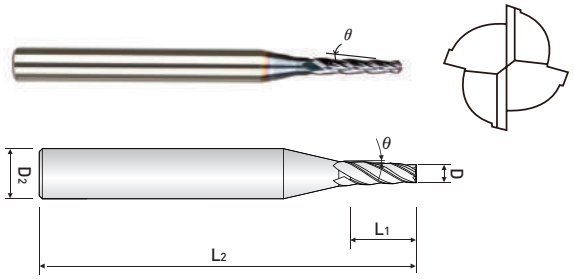
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER ENDMILLS

- Rigid taper end mill for highly productive rib processing

TPRE604A 10series

ULTRA FINE HELIX

EDP. No.	D	θ	C.L	OAL	SH.Dia.
TPRE4A604-0030-10	.030	1°	.210	3	3/16
TPRE4A604-0040-10	.040	1°	.280	3	3/16
TPRE4A604-0050-10	.050	1°	.350	3	3/16
TPRE4A604-0060-10	.060	1°	.420	3	3/16
TPRE4A604-0070-10	.070	1°	.490	3	3/16
TPRE4A604-0080-10	.080	1°	.560	3	3/16
TPRE4A604-0090-10	.090	1°	.630	3	3/16
TPRE4A604-0100-10	.100	1°	.700	3	3/16
TPRE4A604-0125-10	.125	1°	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

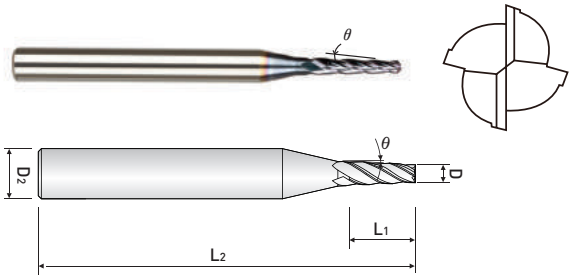
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER ENDMILLS

- Rigid taper end mill for highly productive rib processing

TPRE604A 15series

ULTRA FINE HELIX

EDP. No.	D	θ	C.L	OAL	SH.Dia.
TPRE4A604-0030-15	.030	1°30'	.210	3	3/16
TPRE4A604-0040-15	.040	1°30'	.280	3	3/16
TPRE4A604-0050-15	.050	1°30'	.350	3	3/16
TPRE4A604-0060-15	.060	1°30'	.420	3	3/16
TPRE4A604-0070-15	.070	1°30'	.490	3	3/16
TPRE4A604-0080-15	.080	1°30'	.560	3	3/16
TPRE4A604-0090-15	.090	1°30'	.630	3	3/16
TPRE4A604-0100-15	.100	1°30'	.700	3	3/16
TPRE4A604-0125-15	.125	1°30'	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

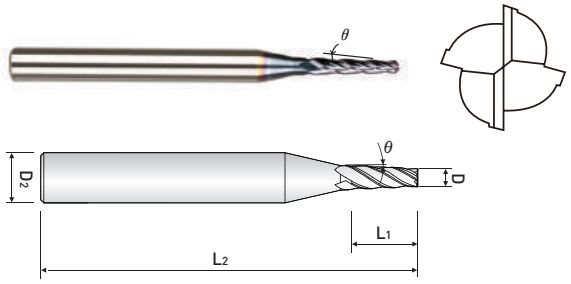
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER ENDMILLS

- Rigid taper end mill for highly productive rib processing

TPRE604A 20series

ULTRA FINE HELIX

EDP. No.	D	θ	C.L	OAL	SH.Dia.
TPRE4A604-0030-20	.030	2°	.210	3	3/16
TPRE4A604-0040-20	.040	2°	.280	3	3/16
TPRE4A604-0050-20	.050	2°	.350	3	3/16
TPRE4A604-0060-20	.060	2°	.420	3	3/16
TPRE4A604-0070-20	.070	2°	.490	3	3/16
TPRE4A604-0080-20	.080	2°	.560	3	3/16
TPRE4A604-0090-20	.090	2°	.630	3	3/16
TPRE4A604-0100-20	.100	2°	.700	3	3/16
TPRE4A604-0125-20	.125	2°	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

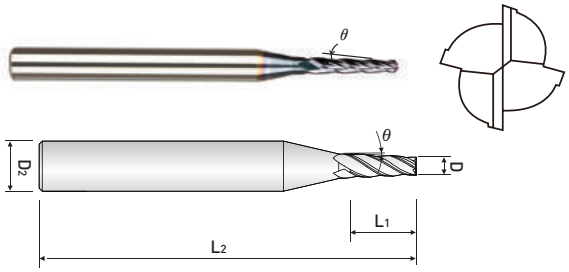
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE TAPER ENDMILLS

- Rigid taper end mill for highly productive rib processing

TPRE604A 30series

ULTRA FINE HELIX

EDP. No.	D	θ	C.L	OAL	SH.Dia.
TPRE4A604-0030-30	.030	3°	.210	3	3/16
TPRE4A604-0040-30	.040	3°	.280	3	3/16
TPRE4A604-0050-30	.050	3°	.350	3	3/16
TPRE4A604-0060-30	.060	3°	.420	3	3/16
TPRE4A604-0070-30	.070	3°	.490	3	3/16
TPRE4A604-0080-30	.080	3°	.560	3	3/16
TPRE4A604-0090-30	.090	3°	.630	3	3/16
TPRE4A604-0100-30	.100	3°	.700	3	3/16
TPRE4A604-0125-30	.125	3°	.875	3	3/16

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

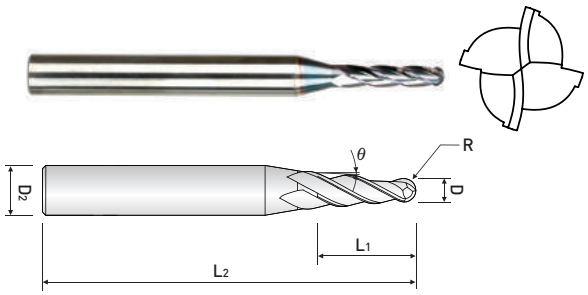
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -.0012	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRB4...-..-050 series

ULTRA FINE HELIX p.979

EDP. No.	R	θ	L1	L2	D2
TPRB4006-04-050	0.3	30′	4	40	4
TPRB4006-06-050			6		
TPRB4008-06-050	0.4	30′	6	45	4
TPRB4008-08-050			8		
TPRB4008-10-050			10		
TPRB4010-06-050	0.5	30′	6	45	4
TPRB4010-08-050			8		
TPRB4010-10-050			10		
TPRB4010-12-050			12		
TPRB4010-16-050			16	50	
TPRB4012-06-050	0.6	30′	6	45	4
TPRB4012-08-050			8		
TPRB4012-10-050			10		
TPRB4012-12-050			12		
TPRB4012-16-050			16	50	
TPRB4015-08-050	0.75	30′	8	45	4
TPRB4015-10-050			10		
TPRB4015-12-050			12		
TPRB4015-16-050			16	50	
TPRB4015-20-050			20	55	
TPRB4016-08-050	0.8	30′	8	45	4
TPRB4016-10-050			10		
TPRB4016-12-050			12		
TPRB4016-16-050			16	50	
TPRB4016-20-050			20	55	
TPRB4018-08-050	0.9	30′	8	45	4
TPRB4018-10-050			10		
TPRB4018-12-050			12		
TPRB4018-16-050			16	50	
TPRB4018-20-050			20	55	
TPRB4020-10-050	1.0	30′	10	45	4
TPRB4020-12-050			12		
TPRB4020-16-050			16	50	
TPRB4020-20-050			20	55	
TPRB4020-25-050			25		
TPRB4025-10-050	1.25	30′	10	45	4
TPRB4025-12-050			12		
TPRB4025-16-050			16	50	
TPRB4025-20-050			20	55	
TPRB4025-25-050			25		

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
○	○	◎	○				○		○

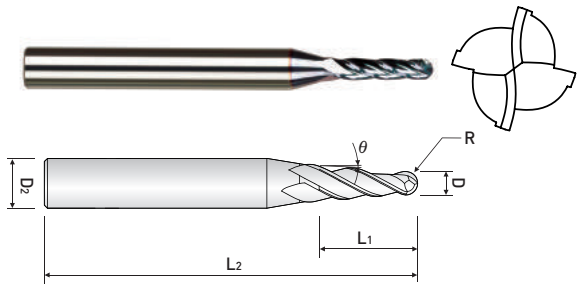
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)	Shank Dia.
±0.01	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRB4...-..-075 series

ULTRA FINE HELIX p.979

EDP. No.	R	θ	L1	L2	D2
TPRB4006-04-075	0.3	45′	4	40	4
TPRB4006-06-075			6		
TPRB4008-06-075	0.4	45′	6	45	4
TPRB4008-08-075			8		
TPRB4008-10-075			10		
TPRB4010-08-075	0.5	45′	8	45	4
TPRB4010-10-075			10		
TPRB4010-12-075			12		
TPRB4012-08-075	0.6	45′	8	45	4
TPRB4012-10-075			10		
TPRB4012-12-075			12		
TPRB4012-16-075			16	50	
TPRB4015-08-075	0.75	45′	8	45	4
TPRB4015-10-075			10		
TPRB4015-12-075			12		
TPRB4015-16-075			16	50	
TPRB4015-20-075			20	55	
TPRB4016-08-075	0.8	45′	8	45	4
TPRB4016-10-075			10		
TPRB4016-12-075			12		
TPRB4016-16-075			16	50	
TPRB4016-20-075			20	55	
TPRB4018-08-075	0.9	45′	8	45	4
TPRB4018-10-075			10		
TPRB4018-12-075			12		
TPRB4018-16-075			16	50	
TPRB4018-20-075			20	55	
TPRB4020-10-075	1.0	45′	10	45	4
TPRB4020-12-075			12		
TPRB4020-16-075			16	50	
TPRB4020-20-075			20	55	
TPRB4020-25-075			25		
TPRB4025-10-075	1.25	45′	10	45	4
TPRB4025-12-075			12		
TPRB4025-16-075			16	50	
TPRB4025-20-075			20	55	
TPRB4025-25-075			25		

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
○	○	◎	○				○		○

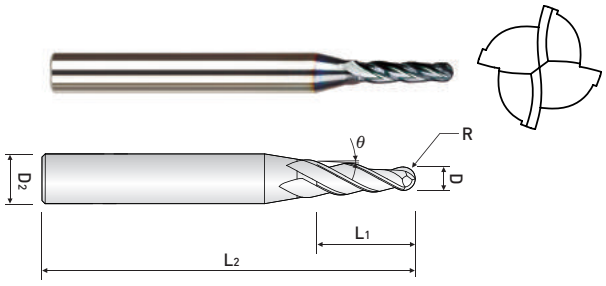
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)	Shank Dia.
±0.01	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRB4...-..-100 series

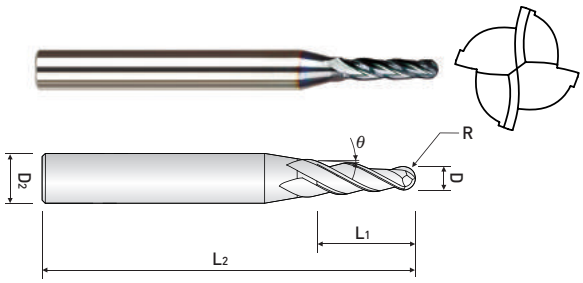
ULTRA FINE HELIX p.979

EDP. No.	R	θ	L1	L2	D2
TPRB4006-04-100	0.3	1°00′	4	40	4
TPRB4006-06-100			6		
TPRB4008-06-100	0.4	1°00′	6	45	4
TPRB4008-08-100			8		
TPRB4008-10-100			10		
TPRB4010-06-100	0.5	1°00′	6	45	4
TPRB4010-08-100			8		
TPRB4010-10-100			10		
TPRB4010-12-100			12		
TPRB4010-16-100			16	50	
TPRB4012-06-100	0.6	1°00′	6	45	4
TPRB4012-08-100			8		
TPRB4012-10-100			10		
TPRB4012-12-100			12		
TPRB4012-16-100			16	50	
TPRB4015-08-100	0.75	1°00′	8	45	4
TPRB4015-10-100			10		
TPRB4015-12-100			12		
TPRB4015-16-100			16	50	
TPRB4015-20-100			20	55	
TPRB4016-08-100	0.8	1°00′	8	45	4
TPRB4016-10-100			10		
TPRB4016-12-100			12		
TPRB4016-16-100			16	50	
TPRB4016-20-100			20	55	
TPRB4018-08-100	0.9	1°00′	8	45	4
TPRB4018-10-100			10		
TPRB4018-12-100			12		
TPRB4018-16-100			16	50	
TPRB4018-20-100			20	55	

※ These tools are manufactured based on order received.

NEXT ≫

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRB4...-..-100 series

ULTRA FINE HELIX

p.979

EDP. No.	R	θ	L1	L2	D2
TPRB4020-10-100	1.0	1°00′	10	45	4
TPRB4020-12-100			12		
TPRB4020-16-100			16	50	
TPRB4020-20-100			20	55	
TPRB4020-25-100			25		
TPRB4025-10-100	1.25	1°00′	10	45	4
TPRB4025-12-100			12		
TPRB4025-16-100			16	50	
TPRB4025-20-100			20	55	
TPRB4025-25-100			25		

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

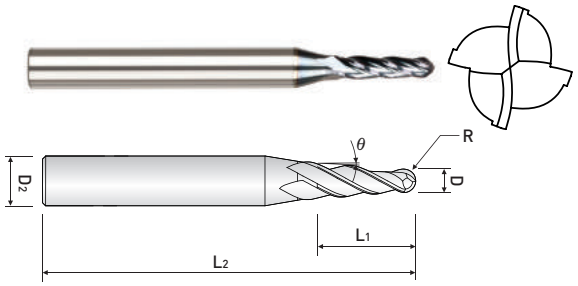
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)	Shank Dia.
±0.01	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

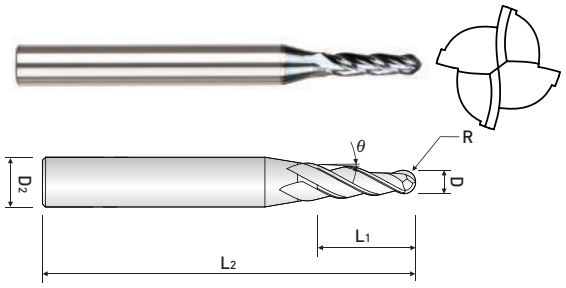
TPRB4...-..-150 series

ULTRA FINE HELIX p.979

EDP. No.	R	θ	L1	L2	D2
TPRB4006-04-150	0.3	1°30′	4	40	4
TPRB4006-06-150			6		
TPRB4008-06-150	0.4	1°30′	6	45	4
TPRB4008-08-150			8		
TPRB4008-10-150			10		
TPRB4010-06-150	0.5	1°30′	6	45	4
TPRB4010-08-150			8		
TPRB4010-10-150			10		
TPRB4010-12-150			12		
TPRB4010-16-150			16	50	
TPRB4012-06-150	0.6	1°30′	6	45	4
TPRB4012-08-150			8		
TPRB4012-10-150			10		
TPRB4012-12-150			12		
TPRB4012-16-150			16	50	
TPRB4015-08-150	0.75	1°30′	8	45	4
TPRB4015-10-150			10		
TPRB4015-12-150			12		
TPRB4015-16-150			16	50	
TPRB4015-20-150			20	55	
TPRB4016-08-150	0.8	1°30′	8	45	4
TPRB4016-10-150			10		
TPRB4016-12-150			12		
TPRB4016-16-150			16	50	
TPRB4016-20-150			20	55	
TPRB4018-08-150	0.9	1°30′	8	45	4
TPRB4018-10-150			10		
TPRB4018-12-150			12		
TPRB4018-16-150			16	50	
TPRB4018-20-150			20	55	

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRB4...-..-150 series

ULTRA FINE HELIX

p.979

EDP. No.	R	θ	L1	L2	D2
TPRB4020-10-150	1.0	1°30′	10	45	4
TPRB4020-12-150			12		
TPRB4020-16-150			16	50	
TPRB4020-20-150			20	55	
TPRB4020-25-150			25		
TPRB4020-30-150			30	60	
TPRB4025-10-150	1.25	1°30′	10	45	4
TPRB4025-12-150			12		
TPRB4025-16-150			16	50	
TPRB4025-20-150			20	55	
TPRB4025-25-150			25		
TPRB4025-30-150			30	60	6

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

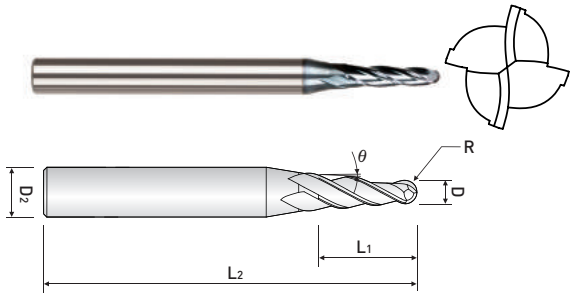
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)	Shank Dia.
±0.01	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

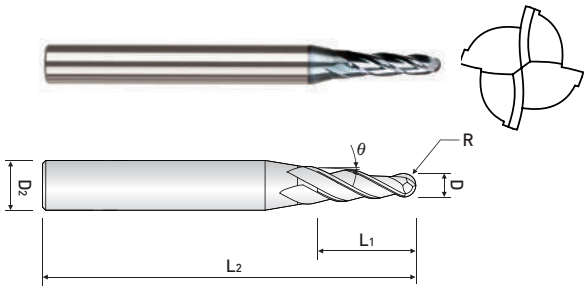
TPRB4...-..-200 series

ULTRA FINE HELIX p.979

EDP. No.	R	θ	L1	L2	D2
TPRB4006-04-200	0.3	2°00′	4	40	4
TPRB4006-06-200			6		
TPRB4008-06-200	0.4	2°00′	6	45	4
TPRB4008-08-200			8		
TPRB4008-10-200			10		
TPRB4010-06-200	0.5	2°00′	6	45	4
TPRB4010-08-200			8		
TPRB4010-10-200			10		
TPRB4010-12-200			12		
TPRB4010-16-200			16	50	
TPRB4012-06-200	0.6	2°00′	6	45	4
TPRB4012-08-200			8		
TPRB4012-10-200			10		
TPRB4012-12-200			12		
TPRB4012-16-200			16	50	
TPRB4015-08-200	0.75	2°00′	8	45	4
TPRB4015-10-200			10		
TPRB4015-12-200			12		
TPRB4015-16-200			16	50	
TPRB4015-20-200			20	55	
TPRB4016-08-200	0.8	2°00′	8	45	4
TPRB4016-10-200			10		
TPRB4016-12-200			12		
TPRB4016-16-200			16	50	
TPRB4016-20-200			20	55	
TPRB4018-08-200	0.9	2°00′	8	45	4
TPRB4018-10-200			10		
TPRB4018-12-200			12		
TPRB4018-16-200			16	50	
TPRB4018-20-200			20	55	

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRB4...-..-200 series

ULTRA FINE HELIX p.979

EDP. No.	R	θ	L1	L2	D2
TPRB4020-10-200	1.0	2°00′	10	45	4
TPRB4020-12-200			12		
TPRB4020-16-200			16	50	
TPRB4020-20-200			20	55	
TPRB4020-25-200			25		
TPRB4020-30-200			30	60	6
TPRB4025-10-200	1.25	2°00′	10	45	4
TPRB4025-12-200			12		
TPRB4025-16-200			16	50	
TPRB4025-20-200			20	55	
TPRB4025-25-200			25		
TPRB4025-30-200			30	60	6

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

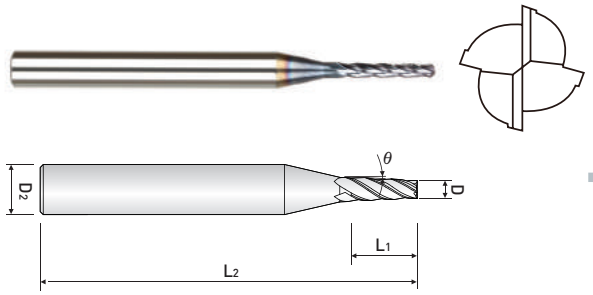
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)	Shank Dia.
±0.01	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

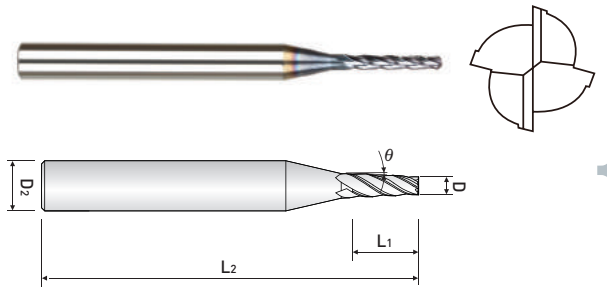
TPRE4...-..-050 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4004-02-050	0.4	30′	2	40	4
TPRE4004-03-050			3		
TPRE4004-04-050			4		
TPRE4005-02-050	0.5	30′	2	40	4
TPRE4005-04-050			4		
TPRE4005-06-050			6		
TPRE4006-04-050	0.6	30′	4	40	4
TPRE4006-06-050			6		
TPRE4007-06-050	0.7	30′	6	40	4
TPRE4007-08-050			8		
TPRE4008-06-050	0.8	30′	6	45	4
TPRE4008-08-050			8		
TPRE4008-10-050			10		
TPRE4009-06-050	0.9	30′	6	45	4
TPRE4009-08-050			8		
TPRE4009-10-050			10		
TPRE4010-06-050	1.0	30′	6	45	4
TPRE4010-08-050			8		
TPRE4010-10-050			10		
TPRE4010-12-050			12		
TPRE4010-16-050			16	50	
TPRE4012-06-050	1.2	30′	6	45	4
TPRE4012-08-050			8		
TPRE4012-10-050			10		
TPRE4012-12-050			12		
TPRE4012-16-050			16	50	
TPRE4014-08-050	1.4	30′	8	45	4
TPRE4014-12-050			12		
TPRE4014-16-050			16	50	

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRE4...-...-050 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4015-08-050	1.5	30′	8	45	4
TPRE4015-10-050			10		
TPRE4015-12-050			12		
TPRE4015-16-050			16	50	
TPRE4015-20-050			20	55	
TPRE4016-08-050	1.6	30′	8	45	4
TPRE4016-10-050			10		
TPRE4016-12-050			12		
TPRE4016-16-050			16	50	
TPRE4016-20-050			20	55	
TPRE4018-08-050	1.8	30′	8	45	4
TPRE4018-10-050			10		
TPRE4018-12-050			12		
TPRE4018-16-050			16	50	
TPRE4018-20-050			20	55	
TPRE4020-10-050	2.0	30′	10	45	4
TPRE4020-12-050			12		
TPRE4020-16-050			16	50	
TPRE4020-20-050			20	55	
TPRE4020-25-050			25		
TPRE4025-10-050	2.5	30′	10	45	4
TPRE4025-12-050			12		
TPRE4025-16-050			16	50	
TPRE4025-20-050			20	55	
TPRE4025-25-050			25		
TPRE4025-30-050			30	60	

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

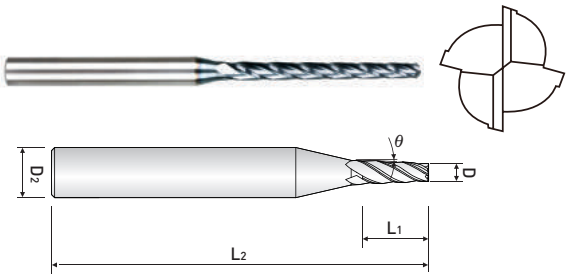
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

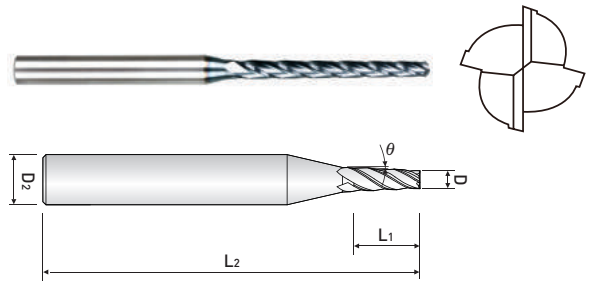
TPRE4...-..-075 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4004-02-075	0.4	45′	2	40	4
TPRE4004-03-075			3		
TPRE4004-04-075			4		
TPRE4005-04-075	0.5	45′	4	40	4
TPRE4005-06-075			6		
TPRE4006-04-075	0.6	45′	4	40	4
TPRE4006-06-075			6		
TPRE4007-06-075	0.7	45′	6	40	4
TPRE4007-08-075			8		
TPRE4008-06-075	0.8	45′	6	45	4
TPRE4008-08-075			8		
TPRE4008-10-075			10		
TPRE4009-06-075	0.9	45′	6	45	4
TPRE4009-08-075			8		
TPRE4009-10-075			10		
TPRE4010-08-075	1.0	45′	8	45	4
TPRE4010-10-075			10		
TPRE4010-12-075			12		
TPRE4012-08-075	1.2	45′	8	45	4
TPRE4012-10-075			10		
TPRE4012-12-075			12		
TPRE4012-16-075			16	50	
TPRE4015-08-075	1.5	45′	8	45	4
TPRE4015-10-075			10		
TPRE4015-12-075			12		
TPRE4015-16-075			16	50	
TPRE4015-20-075			20	55	

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRE4...-..-075 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4016-08-075	1.6	45′	8	45	4
TPRE4016-10-075			10		
TPRE4016-12-075			12		
TPRE4016-16-075			16	50	
TPRE4016-20-075			20	55	
TPRE4018-08-075	1.8	45′	8	45	4
TPRE4018-10-075			10		
TPRE4018-12-075			12		
TPRE4018-16-075			16	50	
TPRE4018-20-075			20	55	
TPRE4020-10-075	2.0	45′	10	45	4
TPRE4020-12-075			12		
TPRE4020-16-075			16	50	
TPRE4020-20-075			20	55	
TPRE4020-25-075			25		
TPRE4025-10-075	2.5	45′	10	45	4
TPRE4025-12-075			12		
TPRE4025-16-075			16	50	
TPRE4025-20-075			20	55	
TPRE4025-25-075			25		
TPRE4025-30-075			30	60	
TPRE4030-25-075	3.0	45′	25	55	4
TPRE4030-40-075			40	80	6

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
○	○	◎	○				○		○

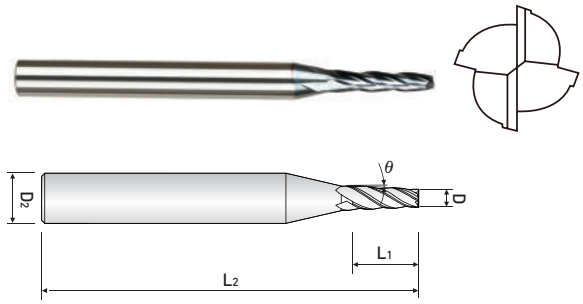
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRE4...-..-100 series

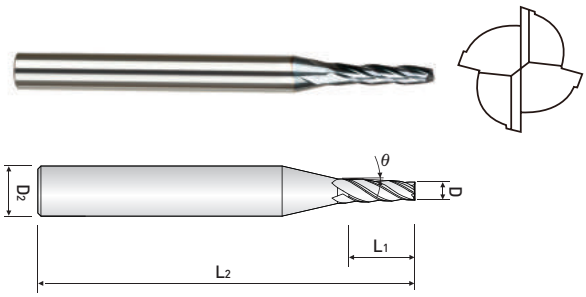
ULTRA FINE | HELIX | p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4004-02-100	0.4	1°00′	2	40	4
TPRE4004-03-100			3		
TPRE4004-04-100			4		
TPRE4005-02-100	0.5	1°00′	2	40	4
TPRE4005-04-100			4		
TPRE4005-06-100			6		
TPRE4006-04-100	0.6	1°00′	4	40	4
TPRE4006-06-100			6		
TPRE4007-06-100	0.7	1°00′	6	40	4
TPRE4007-08-100			8		
TPRE4008-06-100	0.8	1°00′	6	45	4
TPRE4008-08-100			8		
TPRE4008-10-100			10		
TPRE4009-06-100	0.9	1°00′	6	45	4
TPRE4009-08-100			8		
TPRE4009-10-100			10		
TPRE4010-06-100	1.0	1°00′	6	45	4
TPRE4010-08-100			8		
TPRE4010-10-100			10		
TPRE4010-12-100			12		
TPRE4010-16-100			16	50	
TPRE4012-06-100	1.2	1°00′	6	45	4
TPRE4012-08-100			8		
TPRE4012-10-100			10		
TPRE4012-12-100			12		
TPRE4012-16-100			16	50	
TPRE4014-08-100	1.4	1°00′	8	45	4
TPRE4014-12-100			12		
TPRE4014-16-100			16	50	

※ These tools are manufactured based on order received.

NEXT ≫

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRE4...-..-100 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4015-08-100	1.5	1°00′	8	45	4
TPRE4015-10-100			10		
TPRE4015-12-100			12		
TPRE4015-16-100			16	50	
TPRE4015-20-100			20	55	
TPRE4016-08-100	1.6	1°00′	8	45	4
TPRE4016-10-100			10		
TPRE4016-12-100			12		
TPRE4016-16-100			16	50	
TPRE4016-20-100			20	55	
TPRE4018-08-100	1.8	1°00′	8	45	4
TPRE4018-10-100			10		
TPRE4018-12-100			12		
TPRE4018-16-100			16	50	
TPRE4018-20-100			20	55	
TPRE4020-10-100	2.0	1°00′	10	45	4
TPRE4020-12-100			12		
TPRE4020-16-100			16	50	
TPRE4020-20-100			20	55	
TPRE4020-25-100			25		
TPRE4025-10-100	2.5	1°00′	10	45	4
TPRE4025-12-100			12		
TPRE4025-16-100			16	50	
TPRE4025-20-100			20	55	
TPRE4025-25-100			25		
TPRE4025-30-100			30	60	
TPRE4030-25-100	3.0	1°00′	25	55	4
TPRE4030-40-100			40	80	6

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

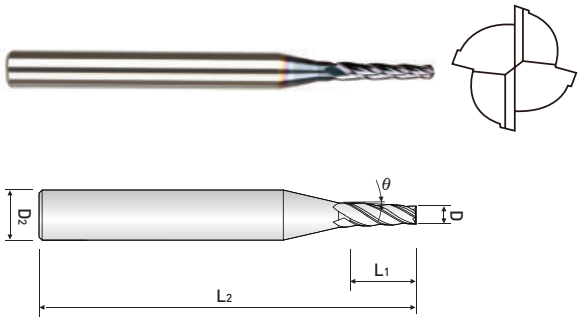
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

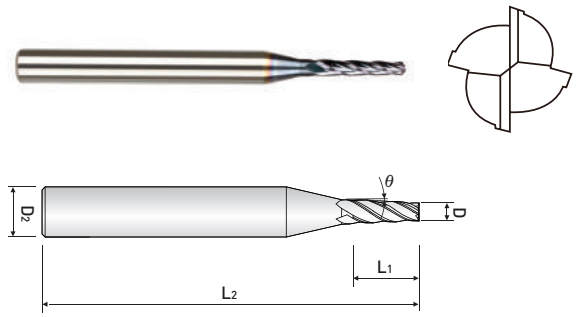
TPRE4...-..-150 series

ULTRA FINE | HELIX | p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4004-02-150	0.4	1°30′	2	40	4
TPRE4004-03-150			3		
TPRE4004-04-150			4		
TPRE4005-04-150	0.5	1°30′	4	40	4
TPRE4005-06-150			6		
TPRE4006-04-150	0.6	1°30′	4	40	4
TPRE4006-06-150			6		
TPRE4007-06-150	0.7	1°30′	6	40	4
TPRE4007-08-150			8		
TPRE4008-06-150	0.8	1°30′	6	45	4
TPRE4008-08-150			8		
TPRE4008-10-150			10		
TPRE4009-06-150	0.9	1°30′	6	45	4
TPRE4009-08-150			8		
TPRE4009-10-150			10		
TPRE4010-06-150	1.0	1°30′	6	45	4
TPRE4010-08-150			8		
TPRE4010-10-150			10		
TPRE4010-12-150			12		
TPRE4010-16-150			16	50	
TPRE4012-06-150	1.2	1°30′	6	45	4
TPRE4012-08-150			8		
TPRE4012-10-150			10		
TPRE4012-12-150			12		
TPRE4012-16-150			16	50	
TPRE4014-08-150	1.4	1°30′	8	45	4
TPRE4014-12-150			12		
TPRE4014-16-150			16	50	

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRE4...-..-150 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4015-08-150	1.5	1°30′	8	45	4
TPRE4015-10-150			10		
TPRE4015-12-150			12		
TPRE4015-16-150			16	50	
TPRE4015-20-150			20	55	
TPRE4016-08-150	1.6	1°30′	8	45	4
TPRE4016-10-150			10		
TPRE4016-12-150			12		
TPRE4016-16-150			16	50	
TPRE4016-20-150			20	55	
TPRE4018-08-150	1.8	1°30′	8	45	4
TPRE4018-10-150			10		
TPRE4018-12-150			12		
TPRE4018-16-150			16	50	
TPRE4018-20-150			20	55	
TPRE4020-10-150	2.0	1°30′	10	45	4
TPRE4020-12-150			12		
TPRE4020-16-150			16	50	
TPRE4020-20-150			20	55	
TPRE4020-25-150			25		
TPRE4025-10-150	2.5	1°30′	10	45	4
TPRE4025-12-150			12		
TPRE4025-16-150			16	50	
TPRE4025-20-150			20	55	
TPRE4025-25-150			25		
TPRE4025-30-150			30	65	6
TPRE4030-25-150	3.0	1°30′	25	60	6
TPRE4030-40-150			40	80	

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

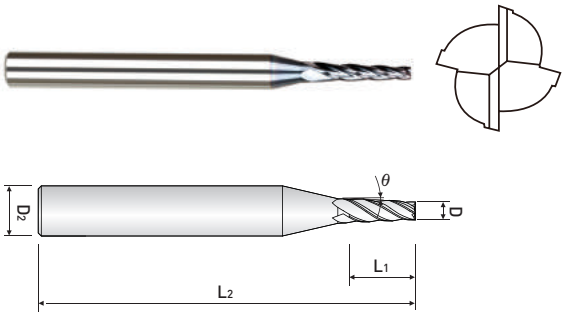
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

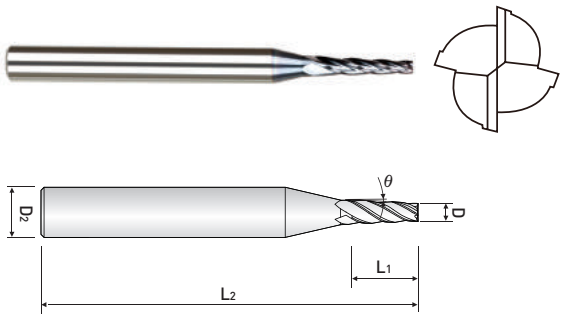
TPRE4...-..-200 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4004-02-200	0.4	2°00′	2	40	4
TPRE4004-03-200			3		
TPRE4004-04-200			4		
TPRE4005-04-200	0.5	2°00′	4	40	4
TPRE4005-06-200			6		
TPRE4006-04-200	0.6	2°00′	4	40	4
TPRE4006-06-200			6		
TPRE4007-06-200	0.7	2°00′	6	40	4
TPRE4007-08-200			8		
TPRE4008-06-200	0.8	2°00′	6	45	4
TPRE4008-08-200			8		
TPRE4008-10-200			10		
TPRE4009-06-200	0.9	2°00′	6	45	4
TPRE4009-08-200			8		
TPRE4009-10-200			10		
TPRE4010-06-200	1.0	2°00′	6	45	4
TPRE4010-08-200			8		
TPRE4010-10-200			10		
TPRE4010-12-200			12		
TPRE4010-16-200			16	50	
TPRE4012-06-200	1.2	2°00′	6	45	4
TPRE4012-08-200			8		
TPRE4012-10-200			10		
TPRE4012-12-200			12		
TPRE4012-16-200			16	50	
TPRE4014-08-200	1.4	2°00′	8	45	4
TPRE4014-12-200			12		
TPRE4014-16-200			16	50	

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRE4...-..-200 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4015-08-200	1.5	2°00′	8	45	4
TPRE4015-10-200			10		
TPRE4015-12-200			12		
TPRE4015-16-200			16	50	
TPRE4015-20-200			20	55	
TPRE4016-08-200	1.6	2°00′	8	45	4
TPRE4016-10-200			10		
TPRE4016-12-200			12		
TPRE4016-16-200			16	50	
TPRE4016-20-200			20	55	
TPRE4018-08-200	1.8	2°00′	8	45	4
TPRE4018-10-200			10		
TPRE4018-12-200			12		
TPRE4018-16-200			16	50	
TPRE4018-20-200			20	55	
TPRE4020-10-200	2.0	2°00′	10	45	4
TPRE4020-12-200			12		
TPRE4020-16-200			16	50	
TPRE4020-20-200			20	55	
TPRE4020-25-200			25		
TPRE4025-10-200	2.5	2°00′	10	45	4
TPRE4025-12-200			12		
TPRE4025-16-200			16	50	
TPRE4025-20-200			20	55	
TPRE4025-25-200			25	60	6
TPRE4025-30-200			30	65	
TPRE4030-25-200	3.0	2°00′	25	60	6
TPRE4030-40-200			40	80	

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

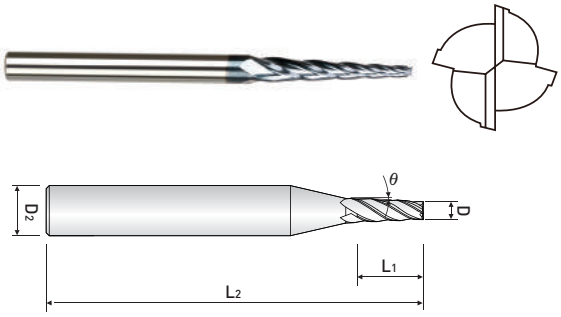
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



MULTIPLE FLUTES – TAPER BALL ENDMILLS for RIB PROCESSING

- Applying high hardened taper angle on the tool leads to highly efficient Rib processing
- Suitable to do machining performance on the inclined workpiece for electricity and electronic precise mold

■ Taper Tolerance : ±10′

TPRE4...-..-300 series

ULTRA FINE HELIX p.979

EDP. No.	D	θ	L1	L2	D2
TPRE4005-04-300	0.5	3°00′	4	40	4
TPRE4006-04-300	0.6	3°00′	4	40	4
TPRE4007-06-300	0.7	3°00′	6	40	4
TPRE4008-06-300	0.8	3°00′	6	45	4
TPRE4008-10-300			10		
TPRE4009-08-300	0.9	3°00′	8	45	4
TPRE4010-08-300	1.0	3°00′	8	45	4
TPRE4010-12-300			12		
TPRE4012-10-300	1.2	3°00′	10	45	4
TPRE4012-16-300			16	50	
TPRE4015-12-300	1.5	3°00′	12	45	4
TPRE4015-20-300			20	55	
TPRE4016-12-300	1.6	3°00′	12	45	4
TPRE4016-20-300			20	55	
TPRE4018-12-300	1.8	3°00′	12	45	4
TPRE4018-20-300			20	55	
TPRE4020-16-300	2.0	3°00′	16	50	4
TPRE4020-25-300			25	60	6
TPRE4025-20-300	2.5	3°00′	20	60	6
TPRE4025-30-300			30	65	
TPRE4030-25-300	3.0	3°00′	25	60	6
TPRE4030-40-300			40	80	8

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

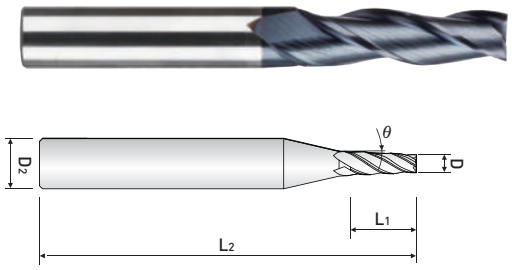
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



3 FLUTE, TAPER END MILL

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- AlTiN coated for high wear resistance

TE503 .....series

ULTRA FINE HELIX p.980

EDP. No.	D	θ	L1	N.D	L2	D2
TE50303106	3	1°	10	3.4	50	6
TE50303206		2°		3.7		
TE50303306		3°		4		
TE50303506		5°		4.8		
TE50304106	4	1°	15	4.5	50	6
TE50304206		2°		5		
TE50304306		3°		5.6		
TE50304508		5°		6.6		8
TE50305106	5	1°	20 (17.1)	5.7	60	6
TE50305208		2°		6.4		8
TE50305308		3°		7.1		
TE50305508		5°		8.5		
TE50306108	6	1°	20	6.7	60	8
TE50306208		2°		7.4		
TE50306308		3°		8.1		
TE50306510		5°		9.5	70	10
TE50308110	8	1°	25 (22.8)	8.9	70	10
TE50308210		2°		9.8		
TE50308312		3°		10.6	75	12
TE50308512		5°		12.4		
TE50310112	10	1°	35	11.2	90	12
TE50310212		2°	28	12.4		
TE50310314		3°	35 (34.3)	13.7		14
TE50310516		5°		16.1		16

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
○	○	◎	○				○		○

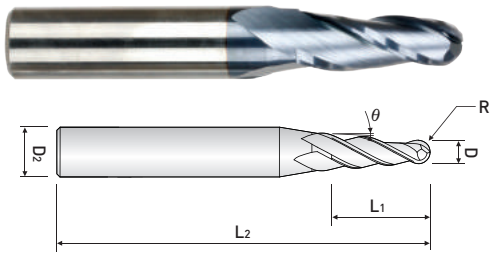
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.02	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



3 FLUTE, TAPER BALL END MILL

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- AlTiN coated for high wear resistance

TB503 ...series

ULTRA FINE HELIX p.980

EDP. No.	D	R	θ	L1	L2	D2
TB50315306	3	1.5	3°	12	60	6
TB50320306	4	2		15	60	6
TB50325308	5	2.5		18	60	8
TB50330310	6	3		22	70	10
TB50340312	8	4		26	75	12
TB50350312	10	5		19	75	12
TB50360316	12	6		36	90	16
TB50315506	3	1.5	5°	12	60	6
TB50320508	4	2		15	60	8
TB50325510	5	2.5		18	70	10
TB50330510	6	3		22	70	10
TB50340512	8	4		26	75	12
TB50350516	10	5		30	90	16
TB50360520	12	6		36	100	20
TB50315706	3	1.5	7°	12	60	6
TB50320708	4	2		15	60	8
TB50325710	5	2.5		18	70	10
TB50330712	6	3		22	75	12
TB50340716	8	4		26	90	16
TB50350716	10	5		30	90	16
TB50360720	12	6		36	100	20

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

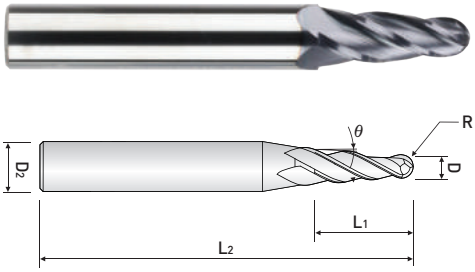
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.05	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



4 FLUTE, TAPER BALL END MILL

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- AlTiN coated for high wear resistance

TB504 ...series

ULTRA FINE HELIX p.980

EDP. No.	D	R	θ	L1	L2	D2
TB50425308	5	2.5	3°	18	60	8
TB50430310	6	3		22	70	10
TB50440312	8	4		26	75	12
TB50450312	10	5		19	75	12
TB50460316	12	6		36	90	16
TB50425510	5	2.5	5°	18	70	10
TB50430510	6	3		22	70	10
TB50440512	8	4		26	75	12
TB50450516	10	5		30	90	16
TB50460520	12	6		36	100	20
TB50425710	5	2.5	7°	18	70	10
TB50430712	6	3		22	75	12
TB50440716	8	4		26	90	16
TB50450716	10	5		30	90	16
TB50460720	12	6		36	100	20

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

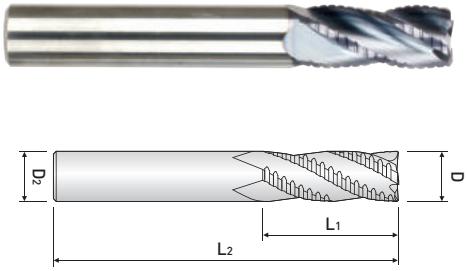
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.05	h6

※Items can be changed for quality improvement without notice.

Endmills for high speed & general cutting ZAMUS CLASSIC Series



3~6 FLUTE, ROUGHING & FINISHING END MILL

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- AlTiN coated for high wear resistance

ZF60 ....series

ULTRA FINE HELIX

p.985

EDP. No.	D	L_1	L_2	D_2
ZF603040	4	10	50	6
ZF603050	5	13	50	6
ZF603060	6	15	50	6
ZF603070	7	18	60	8
ZF603080	8	18	60	8
ZF604090	9	22	70	10
ZF604100	10	22	70	10
ZF604110	11	26	75	12
ZF604120	12	26	75	12
ZF604130	13	32	85	14
ZF604140	14	32	85	14
ZF604150	15	35	90	16
ZF604160	16	35	90	16
ZF604180	18	44	100	18
ZF604200	20	44	100	20
ZF605250	25	50	120	25
ZF606320	32	70	150	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

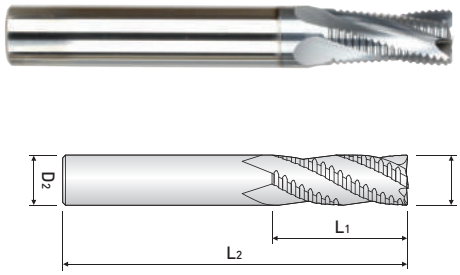
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS CLASSIC Series



3~5 FLUTE, ROUGHING END MILL - FINE Pitch
DIN6527L / DIN6535-HA, DIN6535-HB

- Designed for machine tool steel, alloy steel, mold steel and other highly hardened materials
- High velocity milling of hardened steels
- For dry and wet milling
- Fast chip ejection

ZF61 ....series

ULTRA FINE | HELIX | Conventional Pitch

p.985

EDP. No.		D	L_1	L_2	D_2
PLAIN SHANK	FLAT SHANK				
ZF613040	ZF613040F	4	10	50	6
ZF613050	ZF613050F	5	13	50	6
ZF613060	ZF613060F	6	16	57	6
ZF613070	ZF613070F	7	16	63	8
ZF613080	ZF613080F	8	16	63	8
ZF614090	ZF614090F	9	19	72	10
ZF614100	ZF614100F	10	22	72	10
ZF614120	ZF614120F	12	26	83	12
ZF614140	ZF614140F	14	32	83	14
ZF614160	ZF614160F	16	35	92	16
ZF614180	ZF614180F	18	40	100	18
ZF614200	ZF614200F	20	44	104	20
ZF615250	ZF615250F	25	50	120	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

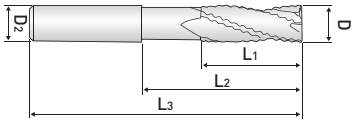
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS CLASSIC Series



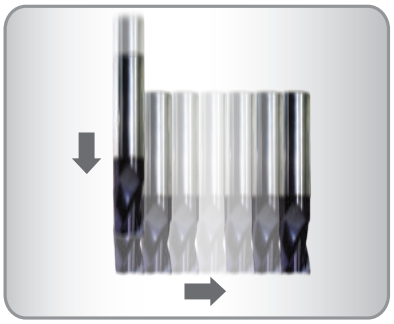
3 FLUTE, Z - AXIS ROUGHING END MILL

- Reducing cycle time by 1 pass operating from Z-axis to slotting
- Preventing the working interruption as Neck type

PK503 ...series

ULTRA FINE | HELIX | Conventional Pitch | p.986

EDP. No.	D	L_1	L_2	L_3	D_2	Z
PK503060	6	9	15	57	6	
PK503080	8	12	20	63	8	
PK503100	10	15	25	72	10	
PK503120	12	18	30	83	12	3
PK503140	14	21	35	83	14	
PK503160	16	24	40	92	16	
PK503200	20	30	50	104	20	



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

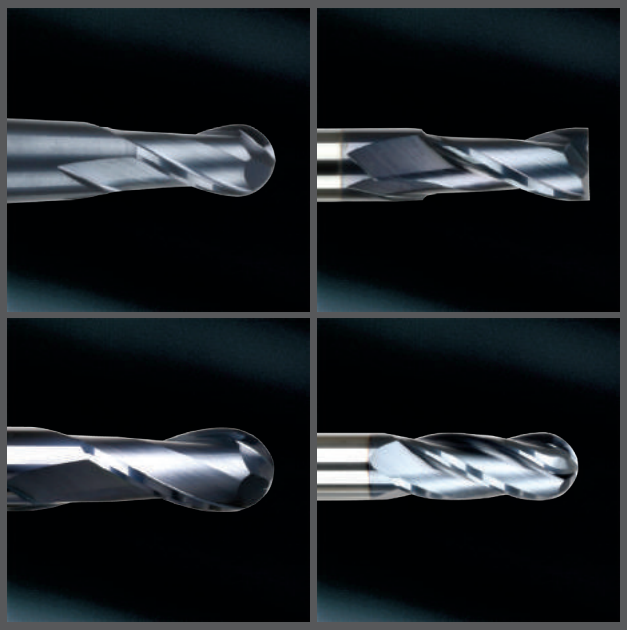
Tolerance \ Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(d11)	-20 -85	-30 -105	-40 -150	-50 -180	-65 -225
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

MEMO

Endmills for high speed & general cutting

ZAMUS THUNDER SERIES

ENDMILL SERIES



Endmills for high speed & general cutting ZAMUS THUNDER Series

Endmills for high speed & general cutting _ ZAMUS THUNDER Series WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
DB312 ... series		LONG LENGTH, BALL NOSE	METRIC	•	325
DB342 ... series		BALL NOSE with TAPER NECK	METRIC	•	326
ZE302 ... series		REGULAR LENGTH	METRIC	•	327
ZE304 ... series		REGULAR LENGTH	METRIC	•	328
ZE322 ... series		LONG & EXTRA LONG LENGTH	METRIC	•	329
ZE324 ... series		LONG and EXTRA LONG LENGTH	METRIC	•	330
ZR322 ... series		CORNER RADIUS LONG LENGTH	METRIC	•	331
ZR324 ... series		CORNER RADIUS with LONG SHANK	METRIC	•	332
ZR304H ... series		45°HELIX STUB CUT LENGTH, CORNER RADIUS, EXTENDED NECK	METRIC	•	333
ZR324H ... series		45° HELIX STUB CUT LENGTH, CORNER RADIUS, LONG SHANK	METRIC	•	334
TX302 ... series		REGULAR LENGTH	METRIC	•	335
TS302 ... series		REGULAR LENGTH	METRIC	•	336
TM302 ... series		ENDMILL FOR COMPLEX AUTOMATIC LATHE	METRIC	•	337
TX304 ... series		REGULAR LENGTH	METRIC	•	338

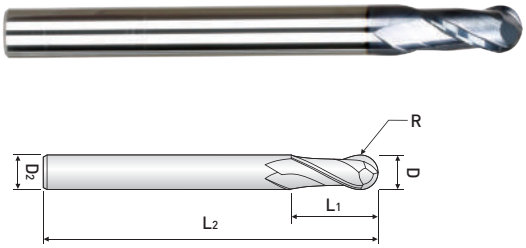
NEXT ≫≫

Endmills for high speed & general cutting ZAMUS THUNDER Series

Endmills for high speed & general cutting _ ZAMUS THUNDER Series WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
TS304 ... series		REGULAR LENGTH	METRIC	•	339
TM304 ... series		ENDMILL FOR COMPLEX AUTOMATIC LATHE	METRIC	•	340
TX304H ... series		45° HELIX REGULAR LENGTH	METRIC	•	341
TXB302 ... series		REGULAR LENGTH, BALL NOSE	METRIC	•	342
TXB304 ... series		REGULAR LENGTH, BALL NOSE	METRIC	•	343
TX202 ... series		SHORT LENGTH	METRIC	•	344
TX222 ... series		LONG LENGTH	METRIC	•	345
TX204 ... series		SHORT LENGTH	METRIC	•	346
TX224 ... series		LONG LENGTH	METRIC	•	347
TXB202 ... series		REGULAR LENGTH, BALL NOSE	METRIC	•	348
TXB222 ... series		LONG LENGTH, BALL NOSE	METRIC	•	349
TXB232 ... series		LONG REACH, BALL NOSE	METRIC	•	350
TXB204 ... series		REGULAR LENGTH, BALL NOSE	METRIC	•	351

Endmills for high speed & general cutting *ZAMUS THUNDER Series*



2 FLUTE, LONG LENGTH, BALL NOSE

- Suitable for deep slotting machining performance as long size shape with taper neck.

DB312 ...series

FINE GRAIN HELIX p.972

EDP. No.	D	R	L_1	L_2	D_2
DB312010S4	1	0.5	2.5	50	4
DB312010					6
DB312012	1.2	0.6	3	50	6
DB312015	1.5	0.75	4	50	6
DB312020S4	2	1	5	50	4
DB312020					6
DB312025	2.5	1.25	6	60	6
DB312030S3	3	1.5	8	60	3
DB312030S4					4
DB312030					6
DB312035	3.5	1.75	8	70	6
DB312040S4	4	2	8	70	4
DB312040					6
DB312045	4.5	2.25	8	70	6
DB312050	5	2.5	10	80	6
DB312055	5.5	2.75	10	80	6
DB312060S	6	3	12	60	6
DB312060				90	
DB312065	6.5	3.25	12	90	8
DB312070	7	3.5	14	90	8
DB312080S	8	4	14	60	8
DB312080				100	
DB312090	9	4.5	18	100	10
DB312100S	10	5	18	60	10
DB312100				100	
DB312120	12	6	22	110	12
DB312140	14	7	26	110	14
DB312160	16	8	30	140	16
DB312180	18	9	34	140	18
DB312200	20	10	38	160	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

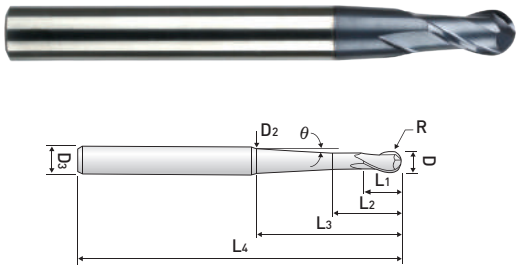
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (inch)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, BALL NOSE with TAPER NECK

- Suitable for deep slotting machining performance as long size shape with taper neck

DB342 .....series

FINE GRAIN HELIX p.972

EDP. No.	D	R	L1	L2	L3	L4	D2	D3	θ
DB34201015	1	0.5	2	4	23	60	2	6	1°30´
DB34201050							4.3		5°
DB34201030					42	80	5		3°
DB34202015	2	1	4	6	23	60	2.9	6	1°30´
DB34202050							5		5°
DB34202030					41	80	5.7		3°
DB34203030	3	1.5	6	8	32	70	5.6	6	3°
DB34203015					52	90	5.3		1°30´
DB34204030	4	2	8	10	28	70	6	6	3°
DB34204015					49	90			1°30´
DB34205030	5	2.5	10	12	41	90	8	8	3°
DB34205015					61	110	7.6		1°30´
DB34206030	6	3	12	15	34	90	8	8	3°
DB34206015					53	110			1°30´
DB34208030	8	4	14	17	36	100	10	10	3°
DB34208015					55	120			1°30´
DB34210030	10	5	18	21	40	110	12	12	3°
DB34210015					59	130			1°30´
DB34212030	12	6	22	25	63	140	16	16	3°
DB34212015					83	160	15		1°30´

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

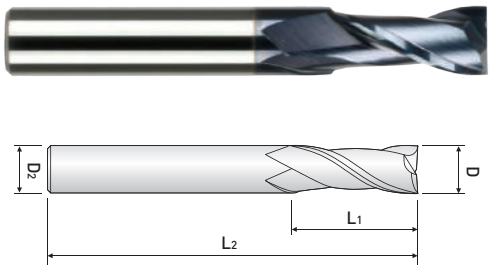
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials

ZE302 ...series

MG FINE GRAIN | 2 | 30° HELIX | TiAlN | DATA p.976

EDP. No.	D	L_1	L_2	D_2
ZE302010	1	2.5	40	6
ZE302015	1.5	4	40	6
ZE302020	2	6	40	6
ZE302025	2.5	8	40	6
ZE302030	3	8	45	6
ZE302035	3.5	10	45	6
ZE302040	4	11	45	6
ZE302045	4.5	11	45	6
ZE302050	5	13	50	6
ZE302055	5.5	13	50	6
ZE302060	6	13	50	6
ZE302065	6.5	16	60	8
ZE302070	7	16	60	8
ZE302075	7.5	16	60	8
ZE302080	8	19	60	8
ZE302085	8.5	19	70	10
ZE302090	9	19	70	10
ZE302095	9.5	19	70	10
ZE302100	10	22	70	10
ZE302105	10.5	22	75	12
ZE302110	11	22	75	12
ZE302115	11.5	22	75	12
ZE302120	12	26	75	12
ZE302130	13	26	80	12
ZE302140	14	26	80	14
ZE302150	15	32	90	16
ZE302160	16	32	90	16
ZE302180	18	32	100	18
ZE302200	20	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

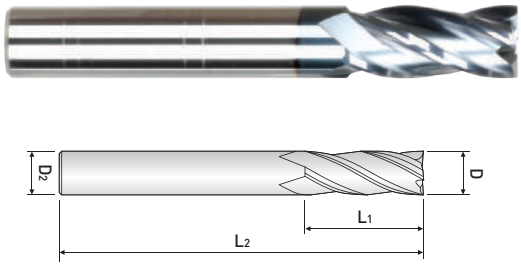
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials

ZE304 ...series

MG FINE GRAIN | 4 | 30° HELIX | TiAlN | DATA p.978

EDP. No.	D	L_1	L_2	D_2
ZE304020	2	6	40	6
ZE304025	2.5	8	40	6
ZE304030	3	8	45	6
ZE304035	3.5	10	45	6
ZE304040	4	11	45	6
ZE304045	4.5	11	45	6
ZE304050	5	13	50	6
ZE304055	5.5	13	50	6
ZE304060	6	13	50	6
ZE304065	6.5	16	60	8
ZE304070	7	16	60	8
ZE304075	7.5	16	60	8
ZE304080	8	19	60	8
ZE304085	8.5	19	70	10
ZE304090	9	19	70	10
ZE304095	9.5	19	70	10
ZE304100	10	22	70	10
ZE304105	10.5	22	75	12
ZE304110	11	22	75	12
ZE304115	11.5	22	75	12
ZE304120	12	26	75	12
ZE304130	13	26	80	12
ZE304140	14	26	80	14
ZE304150	15	32	90	16
ZE304160	16	32	90	16
ZE304180	18	32	100	18
ZE304200	20	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

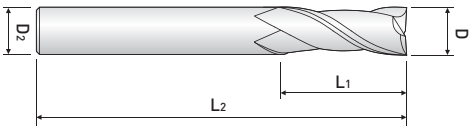
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting *ZAMUS THUNDER Series*



2 FLUTE, LONG & EXTRA LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials

ZE322 ...series

MG FINE GRAIN | 2 | 30° HELIX | TiAlN | DATA p.976

EDP. No.	D	L_1	L_2	D_2
ZE322030	3	15	60	6
ZE322031		20	70	
ZE322030S			100	3
ZE322040	4	15	60	6
ZE322041		20	70	
ZE322040S			100	4
ZE322050	5	20	60	6
ZE322051			80	
ZE322052		25	100	
ZE322060	6	20	80	6
ZE322061		30	100	
ZE322062		40	150	
ZE322080	8	30	90	8
ZE322081		35	100	
ZE322082		40	150	
ZE322100	10	30	90	10
ZE322101		35	100	
ZE322102		45	150	
ZE322103		55	180	
ZE322120	12	30	90	12
ZE322121		40	110	
ZE322122		50	150	
ZE322123		60	200	
ZE322140	14	40	120	14
ZE322141		60	150	
ZE322160	16	50	140	16
ZE322161		70	160	
ZE322162		80	200	
ZE322180	18	50	140	18
ZE322200	20	60	150	20
ZE322201		100	200	
ZE322202		130	250	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

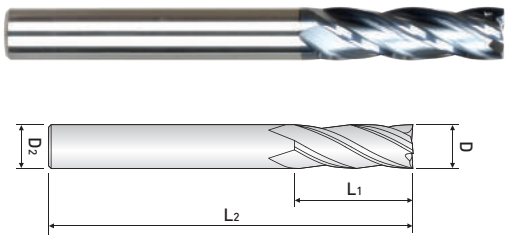
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, LONG & EXTRA LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials

ZE324 ...series

MG FINE GRAIN | 4 | 30° HELIX | TiAlN | DATA p.978

EDP. No.	D	L_1	L_2	D_2
ZE324030	3	15	60	6
ZE324031		20	70	
ZE324030S			100	3
ZE324040	4	15	60	6
ZE324041		20	70	
ZE324040S			100	4
ZE324050	5	20	60	6
ZE324051			80	
ZE324052		25	100	
ZE324060	6	20	80	6
ZE324061		30	100	
ZE324062		40	150	
ZE324080	8	30	90	8
ZE324081		35	100	
ZE324082		40	150	
ZE324100	10	30	90	10
ZE324101		35	100	
ZE324102		45	150	
ZE324103		55	180	
ZE324120	12	30	90	12
ZE324121		40	110	
ZE324122		50	150	
ZE324123		60	200	
ZE324140	14	40	120	14
ZE324141		60	150	
ZE324160	16	50	140	16
ZE324161		70	160	
ZE324162		80	200	
ZE324180	18	50	140	18
ZE324200	20	60	150	20
ZE324201		100	200	
ZE324202		130	250	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

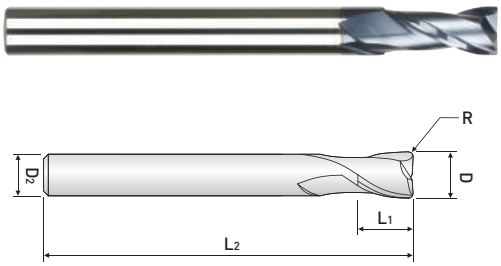
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting *ZAMUS THUNDER Series*



2 FLUTE, CORNER RADIUS LONG LENGTH

- Designed to machine tool steel, alloy steel mold steel and other high hardened materials
- TiALN coated for high wear resistance

ZR322 ....series

MG FINE GRAIN | 2 | 30° HELIX | R ±0.02 | TiALN | DATA p.983

EDP. No.	D	R	L1	L2	D2
ZR3220302S4	3	0.2	8	60	4
ZR3220302					6
ZR3220303		0.3			6
ZR3220305S4		0.5			4
ZR3220305					6
ZR3220402S4	4	0.2	11	70	4
ZR3220402					6
ZR3220403		0.3			6
ZR3220405S4		0.5			4
ZR3220405					6
ZR3220410S4		1.0			4
ZR3220410					6
ZR3220502	5	0.2	13	80	6
ZR3220503		0.3			
ZR3220505		0.5			
ZR3220510		1.0			
ZR3220602	6	0.2	13	90	6
ZR3220603		0.3			
ZR3220605		0.5			
ZR3220610		1.0			
ZR3220803	8	0.3	19	100	8
ZR3220805		0.5			
ZR3220810		1.0			
ZR3220815		1.5			
ZR3220820		2.0			
ZR3221003	10	0.3	22	100	10
ZR3221005		0.5			
ZR3221010		1.0			
ZR3221015		1.5			
ZR3221020		2.0			
ZR3221025		2.5			
ZR3221205	12	0.5	26	110	12
ZR3221210		1.0			
ZR3221215		1.5			
ZR3221220		2.0			
ZR3221225		2.5			
ZR3221230		3.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

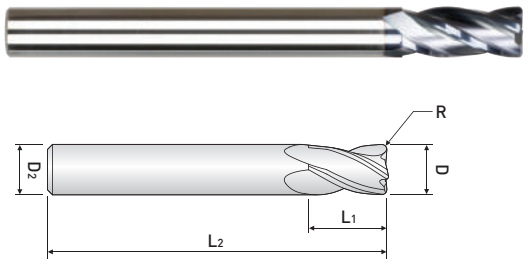
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, CORNER RADIUS LONG LENGTH

- Designed to machine tool steel, alloy steel mold steel and other high hardened materials
- TiALN coated for high wear resistance

ZR324 ....series

MG FINE GRAIN | 4 | 30° HELIX | R ±0.02 | TiALN | DATA p.984

EDP. No.	D	R	L1	L2	D2
ZR3240302S4	3	0.2	8	60	4
ZR3240302					6
ZR3240303		0.3			6
ZR3240305S4		0.5			4
ZR3240305					6
ZR3240402S4	4	0.2	11	70	4
ZR3240402					6
ZR3240403		0.3			6
ZR3240405S4		0.5			4
ZR3240405					6
ZR3240410S4		1.0			4
ZR3240410					6
ZR3240502	5	0.2	13	80	6
ZR3240503		0.3			
ZR3240505		0.5			
ZR3240510		1.0			
ZR3240602	6	0.2	13	90	6
ZR3240603		0.3			
ZR3240605		0.5			
ZR3240610		1.0			
ZR3240803	8	0.3	19	100	8
ZR3240805		0.5			
ZR3240810		1.0			
ZR3240815		1.5			
ZR3240820		2.0			
ZR3241003	10	0.3	22	100	10
ZR3241005		0.5			
ZR3241010		1.0			
ZR3241015		1.5			
ZR3241020		2.0			
ZR3241025		2.5			
ZR3241205	12	0.5	26	110	12
ZR3241210		1.0			
ZR3241215		1.5			
ZR3241220		2.0			
ZR3241225		2.5			
ZR3241230		3.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
◎	◎	○							

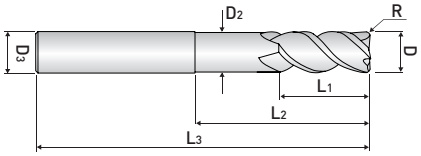
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, 45° HELIX STUB CUT LENGTH, CORNER RADIUS with EXTENDED NECK

- Designed for high hardened materials up to HRc 45
- Suitable for high speed machining

ZR304H ...series

MG FINE GRAIN | 4 | 45° HELIX | R ±0.02 | TiAlN | DATA p.984

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZR304H0303	3	0.3	4	12	55	2.8	6
ZR304H0305		0.5					
ZR304H0403	4	0.3	5	16	55	3.8	6
ZR304H0405		0.5					
ZR304H0605	6	0.5	7	20	60	5.8	6
ZR304H0610		1.0					
ZR304H0805	8	0.5	10	25	65	7.8	8
ZR304H0810		1.0					
ZR304H1005	10	0.5	12	30	70	9.8	10
ZR304H1010		1.0					
ZR304H1015		1.5					
ZR304H1020		2.0					
ZR304H1205	12	0.5	15	30	80	11.8	12
ZR304H1210		1.0					
ZR304H1215		1.5					
ZR304H1220		2.0					

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
◎	◎	○							

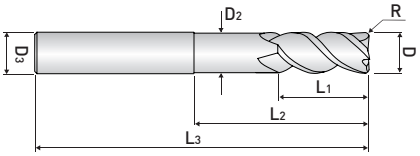
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, 45° HELIX STUB CUT LENGTH, CORNER RADIUS LONG SHANK

- Designed for high hardened materials up to HRc 45
- Suitable for high speed machining

ZR324H ...series

FINE GRAIN HELIX p.984

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
ZR324H0605	6	0.5	9	20	90	5.8	6
ZR324H0610		1.0					
ZR324H0805	8	0.5	12	25	100	7.8	8
ZR324H0810		1.0					
ZR324H1005	10	0.5	15	32	100	9.8	10
ZR324H1010		1.0					
ZR324H1015		1.5					
ZR324H1020		2.0					
ZR324H1205	12	0.5	18	38	110	11.8	12
ZR324H1210		1.0					
ZR324H1215		1.5					
ZR324H1220		2.0					

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

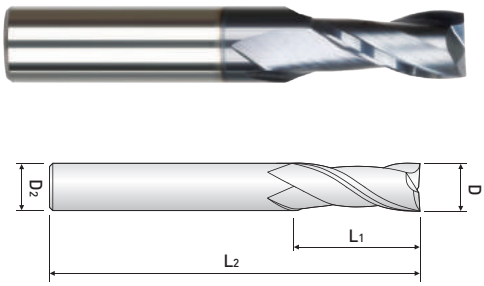
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Excellent high-performance Endmills

TX302...series

MG FINE GRAIN | 2 | 30° HELIX | TiAlN | DATA p.987

EDP. No.	D	L_1	L_2	D_2
TX302010	1	3	50	4
TX302015	1.5	4	50	4
TX302020	2	6	50	4
TX302025	2.5	8	50	4
TX302030	3	9	50	4
TX302040	4	11	50	4
TX302050	5	13	50	6
TX302060	6	16	50	6
TX302070	7	16	60	8
TX302080	8	19	60	8
TX302090	9	19	60	10
TX302100	10	25	75	10
TX302120	12	30	75	12
TX302140	14	32	75	14
TX302160	16	32	100	16
TX302180	18	32	100	18
TX302200	20	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

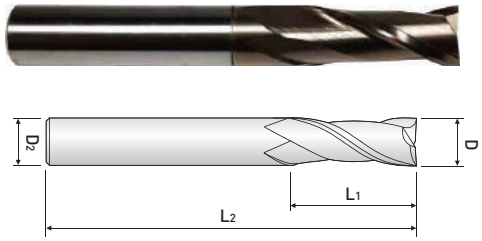
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(e8)	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, REGULAR LENGTH

TS302 ...series

MG FINE GRAIN | 2 | 30° HELIX | AlTiN W

EDP. No.	D	C.L	OAL	SH.Dia.
TS302 010	1	3	45	6
TS302 015	1.5	4	45	6
TS302 020	2	6	45	6
TS302 025	2.5	8	45	6
TS302 030	3	10	50	6
TS302 035	3.5	10	50	6
TS302 040	4	12	50	6
TS302 045	4.5	14	50	6
TS302 050	5	15	50	6
TS302 055	5.5	15	50	6
TS302 060	6	15	57	6
TS302 065	6.5	18	63	8
TS302 070	7	20	63	8
TS302 075	7.5	20	63	8
TS302 080	8	20	63	8
TS302 085	8.5	23	72	10
TS302 090	9	25	72	10
TS302 095	9.5	25	72	10
TS302 100	10	25	72	10
TS302 105	10.5	28	80	12
TS302 110	11	30	80	12
TS302 115	11.5	30	80	12
TS302 120	12	30	80	12
TS302 125	12.5	35	80	12
TS302 130	13	35	80	12
TS302 140	14	35	80	12
TS302 150	15	42	100	16
TS302 160	16	42	100	16
TS302 170	17	42	100	16
TS302 180	18	45	100	16
TS302 190	19	48	105	20
TS302 200	20	48	105	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

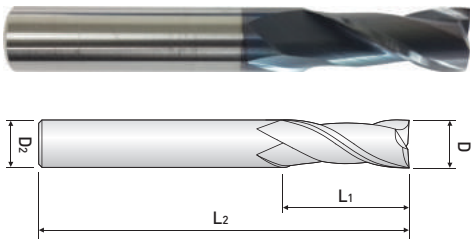
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTES, VARIABLE HELIX ENDMILL FOR A COMPLEX AUTOMATIC LATHES (THUNDER MINI)

- Suitable for low hardness machine(automatic lathe) with unique design

TM302...series

FINE GRAIN HELIX

EDP. No.	D	C.L	OAL	SH.Dia.
TM302 010	1	2	35	3
TM302 015	1.5	3	35	3
TM302 020	2	4	35	3
TM302 025	2.5	4	35	3
TM302 030	3	5	35	3
TM302 040	4	6	40	4
TM302 050	5	8	40	5
TM302 060	6	10	45	6
TM302 070	7	12	45	7
TM302 080	8	12	45	8
TM302 090	9	15	50	9
TM302 100	10	15	50	10

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

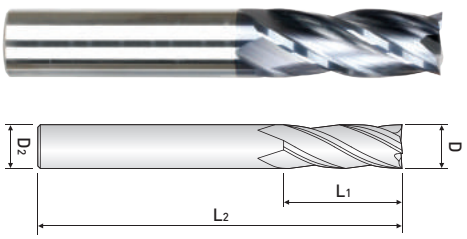
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Excellent high-performance Endmills

TX304...series

MG FINE GRAIN | 4 | 30° HELIX | TiAlN | DATA p.988

EDP. No.	D	L_1	L_2	D_2
TX304010	1	3	50	4
TX304015	1.5	4	50	4
TX304020	2	6	50	4
TX304025	2.5	8	50	4
TX304030	3	9	50	4
TX304040	4	11	50	4
TX304050	5	13	50	6
TX304060	6	16	50	6
TX304070	7	16	60	8
TX304080	8	19	60	8
TX304090	9	19	60	10
TX304100	10	25	75	10
TX304120	12	30	75	12
TX304140	14	32	75	14
TX304160	16	32	100	16
TX304180	18	32	100	18
TX304200	20	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

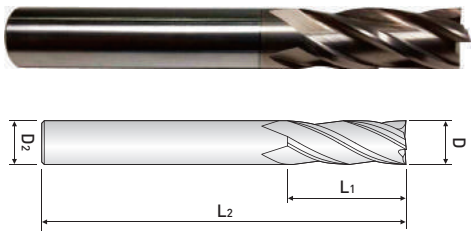
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(e8)	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, REGULAR LENGTH

TS304...series

MG FINE GRAIN | 4 | 30° HELIX | AlTiN W

EDP. No.	D	C.L	OAL	SH.Dia
TS304 020	2	6	45	6
TS304 025	2.5	8	45	6
TS304 030	3	10	50	6
TS304 035	3.5	10	50	6
TS304 040	4	12	50	6
TS304 045	4.5	14	50	6
TS304 050	5	15	50	6
TS304 055	5.5	15	50	6
TS304 060	6	15	57	6
TS304 065	6.5	18	63	8
TS304 070	7	20	63	8
TS304 075	7.5	20	63	8
TS304 080	8	20	63	8
TS304 085	8.5	23	72	10
TS304 090	9	25	72	10
TS304 095	9.5	25	72	10
TS304 100	10	25	72	10
TS304 105	10.5	28	80	12
TS304 110	11	30	80	12
TS304 115	11.5	30	80	12
TS304 120	12	30	80	12
TS304 125	12.5	35	80	12
TS304 130	13	35	80	12
TS304 140	14	35	80	12
TS304 150	15	42	100	16
TS304 160	16	42	100	16
TS304 170	17	42	100	16
TS304 180	18	45	100	16
TS304 190	19	48	105	20
TS304 200	20	48	105	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

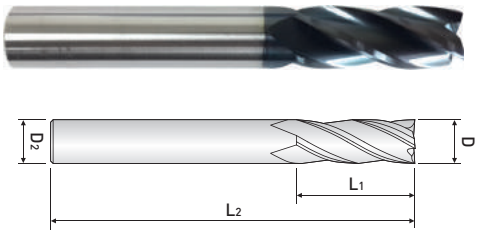
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTES, VARIABLE HELIX ENDMILL FOR COMPLEX AUTOMATIC LATHES

- Suitable for low hardness machine(automatic lathe) with unique design

TM304...series

FINE GRAIN HELIX

EDP. No.	D	C.L	OAL	SH.Dia
TM304 020	2	4	35	3
TM304 025	2.5	4	35	3
TM304 030	3	5	35	3
TM304 040	4	6	40	4
TM304 050	5	8	40	5
TM304 060	6	10	45	6
TM304 070	7	12	45	7
TM304 080	8	12	45	8
TM304 090	9	15	50	9
TM304 100	10	15	50	10

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

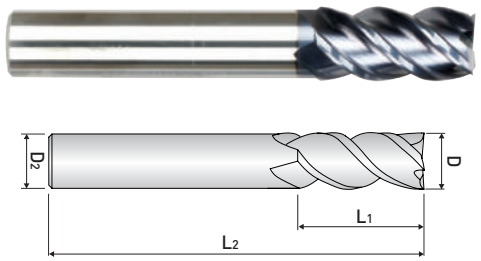
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting *ZAMUS THUNDER Series*



4 FLUTE, 45° HELIX, REGULAR LENGTH

TX304H ...series

MG FINE GRAIN | 4 | 45° HELIX | TiAlN

EDP. No.	D	L_1	L_2	D_2
TX304H030	3	8	50	6
TX304H040	4	11	50	6
TX304H050	5	13	50	6
TX304H060	6	13	50	6
TX304H080	8	19	60	8
TX304H100	10	22	70	10
TX304H120	12	26	75	12
TX304H130	13	26	80	12
TX304H140	14	26	80	14
TX304H160	16	32	90	16
TX304H180	18	32	100	18
TX304H200	20	38	100	20

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

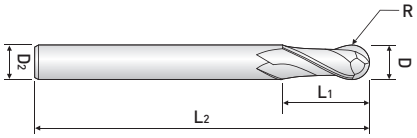
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(e8)	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, REGULAR LENGTH, BALL NOSE

- Designed to machine tool steel, alloy, mold steel and other high hardened material
- Suitable to profile processing

TXB302...series

FINE GRAIN HELIX p.989

EDP. No.	D	R	L_1	L_2	D_2
TXB302010	1	0.5	2	50	4
TXB302015	1.5	0.75	3	50	4
TXB302020	2	1	4	50	4
TXB302025	2.5	1.25	6	50	4
TXB302030	3	1.5	6	50	4
TXB302040	4	2	8	50	4
TXB302050	5	2.5	10	50	6
TXB302060	6	3	12	50	6
TXB302080	8	4	14	60	8
TXB302100	10	5	18	75	10
TXB302120	12	6	22	75	12
TXB302140	14	7	32	75	14
TXB302160	16	8	32	100	16
TXB302180	18	9	32	100	18
TXB302200	20	10	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

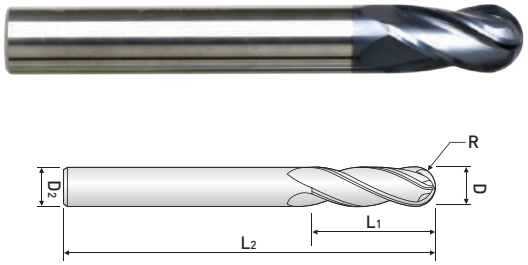
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.04	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting *ZAMUS THUNDER Series*



4 FLUTE, REGULAR LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Excellent workpiece finishes

TXB304...series

MG FINE GRAIN | 4 | 30° HELIX | R ±0,02 | TiAlN | DATA p.989

EDP. No.	D	R	L_1	L_2	D_2
TXB304010	1	0.5	2	50	4
TXB304015	1.5	0.75	3	50	4
TXB304020	2	1	4	50	4
TXB304030	3	1.5	6	50	4
TXB304040	4	2	8	50	4
TXB304050	5	2.5	10	50	6
TXB304060	6	3	12	50	6
TXB304080	8	4	14	60	8
TXB304100	10	5	18	75	10
TXB304120	12	6	22	75	12
TXB304140	14	7	32	75	14
TXB304160	16	8	32	100	16
TXB304180	18	9	32	100	18
TXB304200	20	10	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

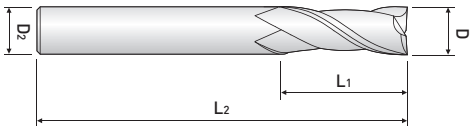
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.04	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Excellent workpiece finishes

TX202...series

MG FINE GRAIN | 2 | 30° HELIX | TiAlN | DATA p.987

EDP. No.	D	L_1	L_2	D_2
TX202010	1	3	39	3
TX202015	1.5	5	39	3
TX202020	2	7	39	3
TX202025	2.5	8	39	3
TX202030	3	10	39	3
TX202040	4	14	51	4
TX202050	5	16	51	5
TX202060	6	19	64	6
TX202080	8	21	64	8
TX202100	10	25	70	10
TX202120	12	25	76	12
TX202160	16	32	89	16
TX202200	20	38	102	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

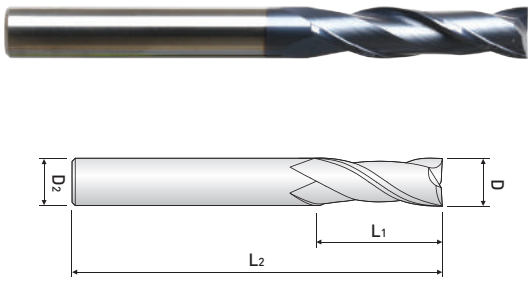
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(e8)	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Excellent workpiece finishes

TX222...series

MG FINE GRAIN | 2 | 30° HELIX | TiAlN | DATA p.987

EDP. No.	D	L_1	L_2	D_2
TX222030	3	20	60	3
TX222040	4	20	60	4
TX222050	5	25	75	5
TX222060	6	30	75	6
TX222080	8	30	75	8
TX222100	10	40	100	10
TX222120	12	45	100	12
TX222140	14	45	100	14
TX222160	16	45	100	16
TX222180	18	45	100	18
TX222200	20	45	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

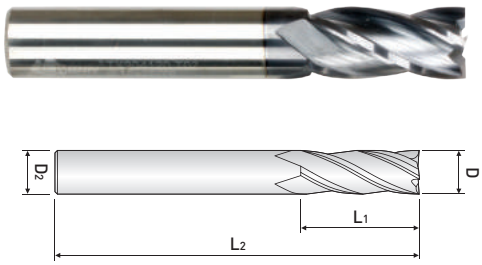
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(e8)	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, SHORT LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Excellent workpiece finishes

TX204...series

MG FINE GRAIN | 4 | 30° HELIX | TiAlN | DATA p.988

EDP. No.	D	L_1	L_2	D_2
TX204010	1	3	39	3
TX204015	1.5	5	39	3
TX204020	2	7	39	3
TX204025	2.5	8	39	3
TX204030	3	10	39	3
TX204040	4	14	51	4
TX204050	5	16	51	5
TX204060	6	19	64	6
TX204080	8	21	64	8
TX204100	10	25	70	10
TX204120	12	25	76	12
TX204160	16	32	89	16
TX204200	20	38	102	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

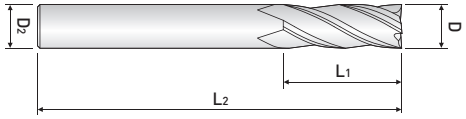
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(e8)	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Excellent workpiece finishes

TX224...series

MG FINE GRAIN | 4 | 30° HELIX | TiAlN | DATA p.988

EDP. No.	D	L_1	L_2	D_2
TX224030	3	20	60	3
TX224040	4	20	60	4
TX224050	5	25	75	5
TX224060	6	30	75	6
TX224080	8	30	75	8
TX224100	10	40	100	10
TX224120	12	45	100	12
TX224140	14	45	100	14
TX224160	16	45	100	16
TX224180	18	45	100	18
TX224200	20	45	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

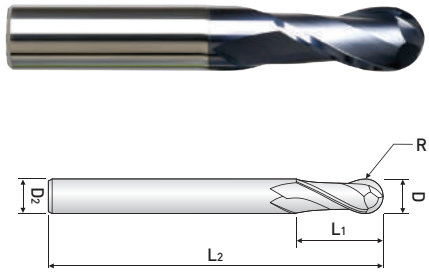
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(e8)	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, REGULAR LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TXB202...series

FINE GRAIN HELIX p.989

EDP. No.	D	R	L_1	L_2	D_2
TXB202010	1	0.5	3	39	3
TXB202015	1.5	0.75	5	39	3
TXB202020	2	1	7	39	3
TXB202025	2.5	1.25	8	39	3
TXB202030	3	1.5	10	39	3
TXB202040	4	2	14	51	4
TXB202050	5	2.5	16	51	5
TXB202060	6	3	19	64	6
TXB202080	8	4	21	64	8
TXB202100	10	5	25	70	10
TXB202120	12	6	25	76	12
TXB202160	16	8	32	89	16
TXB202200	20	10	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

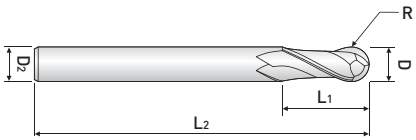
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.04	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, LONG LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Excellent workpiece finishes

TXB222...series

FINE GRAIN HELIX p.989

EDP. No.	D	R	L_1	L_2	D_2
TXB222030	3	1.5	20	60	3
TXB222040	4	2	20	60	4
TXB222050	5	2.5	25	75	5
TXB222060	6	3	30	75	6
TXB222080	8	4	30	100	8
TXB222100	10	5	40	100	10
TXB222120	12	6	45	100	12
TXB222140	14	7	45	100	14
TXB222160	16	8	45	100	16
TXB222180	18	9	45	100	18
TXB222200	20	10	45	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

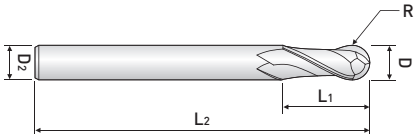
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.04	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



2 FLUTE, LONG REACH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

TXB232...series

p.989

EDP. No.	D	R	L_1	L_2	D_2
TXB232030	3	1.5	5	75	3
TXB232040	4	2	8	75	4
TXB232050	5	2.5	9	75	5
TXB232060	6	3	10	100	6
TXB232080	8	4	12	100	8
TXB232100	10	5	14	100	10
TXB232120	12	6	16	100	12
TXB232140	14	7	18	100	14
TXB232160	16	8	22	150	16
TXB232200	20	10	26	150	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

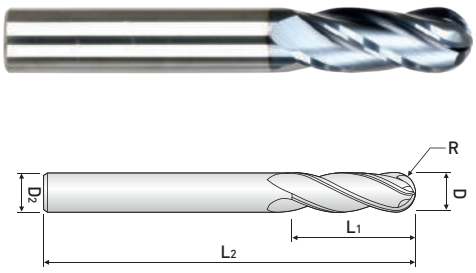
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.04	h6

※ These tools are manufactured based on order received.

Endmills for high speed & general cutting ZAMUS THUNDER Series



4 FLUTE, REGULAR LENGTH, BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- Excellent workpiece finishes

TXB204...series

MG FINE GRAIN | 4 | 30° HELIX | R ±0,02 | TiAlN | DATA p.989

EDP. No.	D	R	L_1	L_2	D_2
TXB204020	2	1	7	39	3
TXB204030	3	1.5	10	39	3
TXB204040	4	2	14	51	4
TXB204050	5	2.5	16	51	5
TXB204060	6	3	19	64	6
TXB204080	8	4	21	64	8
TXB204100	10	5	25	70	10
TXB204120	12	6	25	76	12
TXB204160	16	8	32	89	16
TXB204200	20	10	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○							

○:General Application ◎:The most suitable Application

■ Tolerance

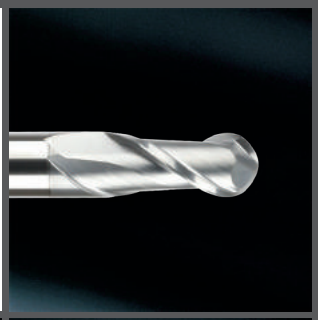
Mill Dia. (mm)	Shank Dia.
0 ~ -0.04	h6

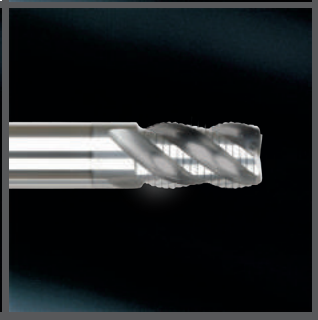
※ These tools are manufactured based on order received.

Endmills for difficult to cut Materials

SUS WAVE SERIES

ENDMILL SERIES



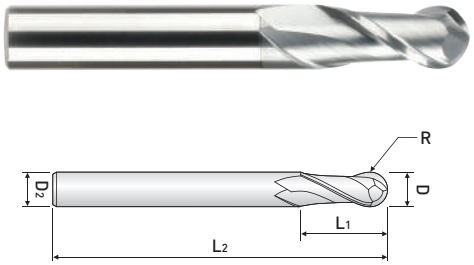


Endmills for difficult to cut materials _ SUS WAVE SERIES

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
DS502 ...series		BALL NOSE REGULAR & LONG LENGTH	METRIC	•	354
SM503 ...series		REGULAR LENGTH	METRIC	•	355
SM504 ...series		REGULAR LENGTH, CORNER RADIUS	METRIC	•	356
ZF62 ...series		ROUGHING END MILL	METRIC	•	357

Endmills for difficult to cut materials SUS WAVE Series



2 FLUTE, BALL NOSE REGULAR & LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
- For copy-milling machines

DS502 ...series

ULTRA FINE HELIX

p.990

EDP. No.	D	R	L_1	L_2	D_2
DS502010	1	0.5	3	50	6
DS502020	2	1	6	50	6
DS502030	3	1.5	8	50	6
DS502031				70	
DS502040	4	2	10	50	6
DS502041				70	
DS502050	5	2.5	13	50	6
DS502051				80	
DS502060	6	3	13	50	6
DS502061				90	
DS502080	8	4	19	60	8
DS502081				100	
DS502100	10	5	22	70	10
DS502101				100	
DS502120	12	6	26	75	12
DS502121				110	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○				◎

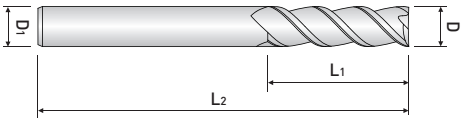
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.02	h6

※ These tools are manufactured based on order received.

Endmills for difficult to cut materials SUS WAVE Series



3 FLUTE, REGULAR LENGTH

- Suitable for Stainless steel, Titanium, Inconel

SM503 ...series

ULTRA FINE | HELIX | HELIX | HELIX | p.991

EDP. No.	D	L_1	L_2	D_2
SM503010	1	2	45	4
SM503015	1.5	3	45	4
SM503020	2	4	50	6
SM503030	3	6	50	6
SM503040	4	8	50	6
SM503050	5	10	50	6
SM503060	6	13	60	6
SM503080	8	19	70	8
SM503100	10	22	80	10
SM503120	12	26	90	12
SM503140	14	26	90	12
SM503160	16	30	110	16
SM503180	18	32	110	18
SM503200	20	32	140	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○				◎

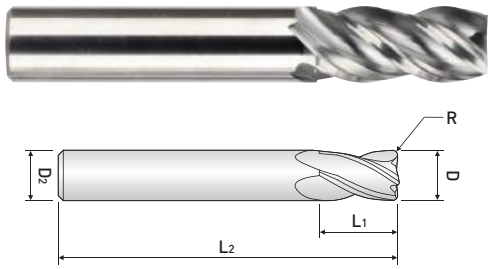
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.02	h6

※ These tools are manufactured based on order received.

Endmills for difficult to cut materials SUS WAVE Series



4 FLUTE, REGULAR LENGTH

- Suitable for Stainless steel, Titanium, Inconel
- Variable helix Type
- High performance by applying corner radius to prevent chipping
  (Not suitable a work which requires R shape)

SM504 ...series

ULTRA FINE | HELIX | HELIX

p.992

EDP. No.	D	R	L_1	L_2	D_2
SM504020	2	0.1	6	45	6
SM504030	3	0.1	10	45	6
SM504040	4	0.2	12	50	6
SM504050	5	0.2	13	50	6
SM504060	6	0.2	13	50	6
SM504070	7	0.2	16	60	8
SM504080	8	0.2	16	60	8
SM504090	9	0.2	19	70	10
SM504100	10	0.3	22	70	10
SM504120	12	0.3	26	75	12
SM504140	14	0.3	26	82	14
SM504160	16	0.3	32	90	16
SM504180	18	0.3	32	100	18
SM504200	20	0.3	38	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○				◎

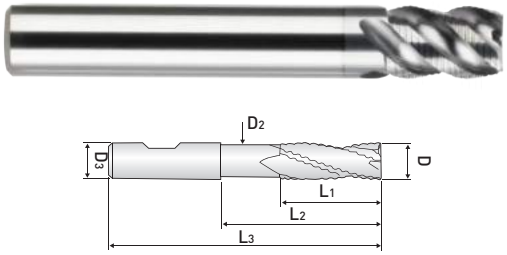
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 12	0 ~ -0.02	h6
over 12	0 ~ -0.03	

※ These tools are manufactured based on order received.

Endmills for difficult to cut materials SUS WAVE Series



4~6 FLUTE, ROUGHING END MILL
DIN6527 / DIN6535-HA, DIN6535-HB

- Designed to machine tool steel, alloy steel, stainless steel and other low hardness materials
- Fast chip ejection

ZF62 ....series

ULTRA FINE | HELIX | Conventional Pitch

p.993

EDP. No.		D	L1	L2	D2	L3	D3	Z
PLAIN SHANK	FLAT SHANK							
ZF624060	ZF624060F	6	7	-	-	54	6	4
ZF624061	ZF624061F		16	-	-	57		
ZF624062	ZF624062F			20	5.5			
ZF624080	ZF624080F	8	9	-	-	58	8	4
ZF624081	ZF624081F		16	-	-	63		
ZF624082	ZF624082F			26	7.5			
ZF624100	ZF624100F	10	14	-	-	66	10	4
ZF624101	ZF624101F		22	-	-	72		
ZF624102	ZF624102F			31	9.5			
ZF624120	ZF624120F	12	16	-	-	73	12	4
ZF624121	ZF624121F		26	-	-	83		
ZF624122	ZF624122F			37	11.5			
ZF625160	ZF625160F	16	22	-	-	82	16	5
ZF625161	ZF625161F		32	-	-	92		
ZF625162	ZF625162F			51	15.5	100		
ZF626200	ZF626200F	20	26	-	-	92	20	6
ZF626201	ZF626201F		38	-	-	104		
ZF626202	ZF626202F			59	19.2	110		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○				◎

○:General Application ◎:The most suitable Application

■ Tolerance

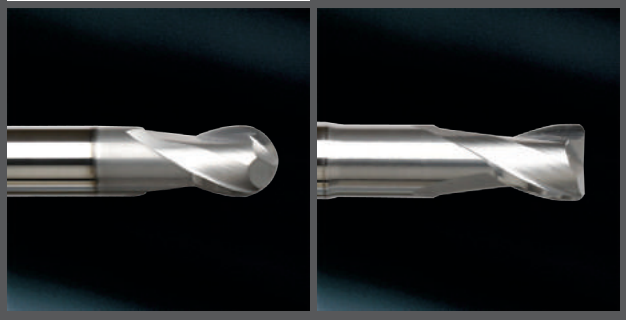
㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmill for non-ferrous Metal Machining

ZAMUS COPPER MATE SERIES

ENDMILL SERIES

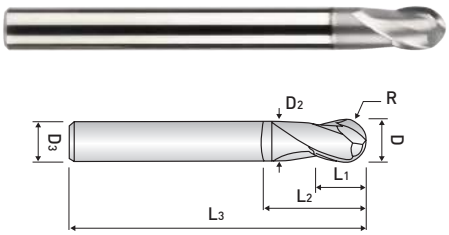


Endmill for non-ferrous metal machining _ ZAMUS COPPER MATE SERIES

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
BC502 .....series		STUB CUT with EXTENDED NECK	METRIC	•	360
RC502.....series		STUB CUT with EXTENDED NECK	METRIC	•	361

Endmill for non-ferrous metal machining ZAMUS COPPER MATE Series



2 FLUTE, STUB CUT LENGTH,
BALL NOSE with EXTENDED NECK

- Suitable for copper & non-ferrous material

BC502 ...series

ULTRA FINE HELIX

p.992

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
BC502010	1	0.5	1.5	3	50	0.8	6
BC502015	1.5	0.75	2	4	50	1.3	6
BC502020	2	1	2.5	5	50	1.8	6
BC502025	2.5	1.25	3	7	50	2.3	6
BC502030	3	1.5	4	10	60	2.8	6
BC502040	4	2	5	10	60	3.8	6
BC502050	5	2.5	6	12	60	4.8	6
BC502060	6	3	7	12	60	5.8	6
BC502061					90		
BC502080	8	4	9	15	70	7.8	8
BC502081				16	100		
BC502100	10	5	11	25	75	9.8	10
BC502101					100		
BC502120	12	6	12	25	80	11.8	12
BC502121					110		

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○				◎			○	

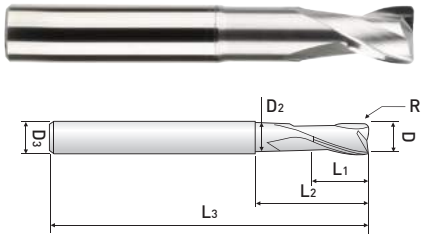
○:General Application ◎:The most suitable Application

■ Tolerance

Radius (mm)	Shank Dia.
±0.01	h6

※ These tools are manufactured based on order received.

Endmill for non-ferrous metal machining ZAMUS COPPER MATE Series



2 FLUTE, STUB CUT LENGTH,
CORNER RADIUS with EXTENDED NECK

- Suitable for copper & non-ferrous material

RC502 .....series

ULTRA FINE | HELIX | up to φ6 | over 6 | p.994

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
RC5020200509	2	0.5	3	9	55	1.8	6
RC5020300509	3	0.5	4	9	55	2.8	6
RC5020300516				16			
RC5020300520				20			
RC5020400512	4	0.5	5	12	55	3.7	6
RC5020400516				16			
RC5020400520				20			
RC5020600520	6	0.5	7	20	60	5.5	6
RC5020601020		1					
RC5020800525	8	0.5	9	25	60	7.4	8
RC5020801025		1					
RC5021000532	10	0.5	11	32	70	9.2	10
RC5021001032		1					
RC5021200538	12	0.5	12	38	80	11	12
RC5021201038		1					

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○				◎			○	

○:General Application ◎:The most suitable Application

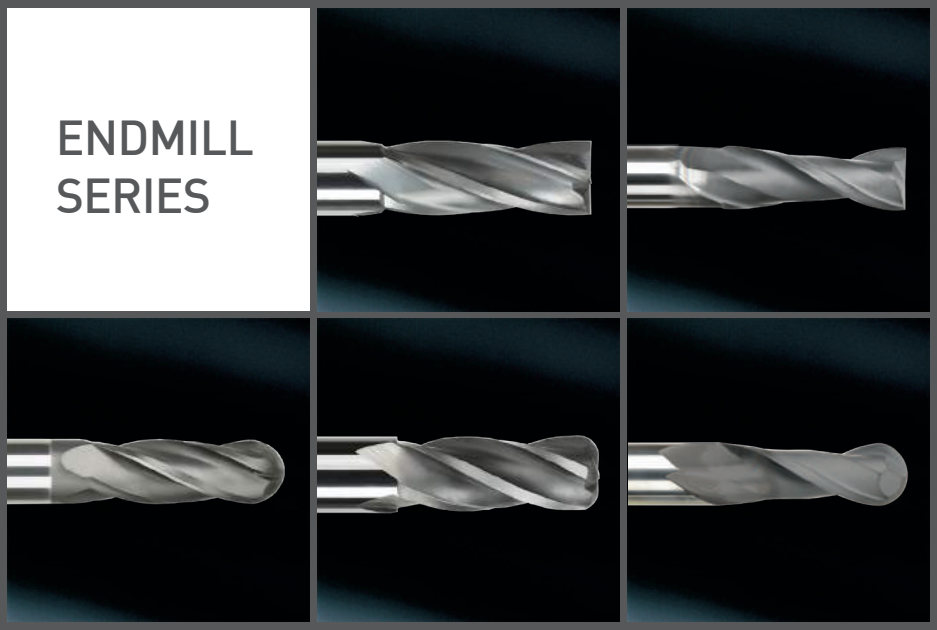
■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmill for Graphite and Non-ferrous

ZAMUS GRA MATE SERIES

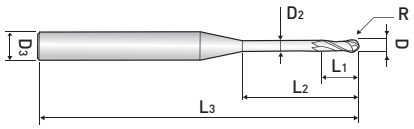


Endmill for Graphite and Non-ferrous _ ZAMUS GRA MATE SERIES

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
G .....series		DIAMOND COATING BALL NOSE	METRIC	•	364
GE .....series		DIAMOND COATING END MILL	METRIC	•	637
WGR502 ....series		2 FLUTE, DIAMOND COATING RADIUS	METRIC	•	368
WGR504 ....series		4 FLUTE, DIAMOND COATING RADIUS	METRIC	•	369
WGB504 ....series		4 FLUTE, DIAMOND COATING, BALL NOSE	METRIC	•	370
WGE504 ....series		4 FLUTE, DIAMOND COATING SQUARE	METRIC	•	372
WROU ....series		8~12FLUTE, ROUTER	METRIC	•	373

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



2 FLUTE, DIAMOND COATING BALL NOSE

- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc

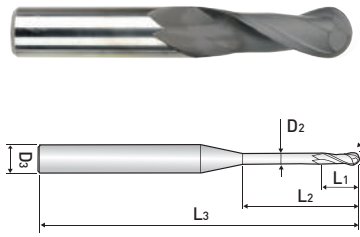
G .....series

HELIX DIAMOND p.994

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
G00501003	0.5	0.25	1	3	50	0.45	4
G00501006				6			
G00501010				10			
G00601203	0.6	0.3	1.2	3	50	0.55	4
G00601206				6			
G00601208				8			
G00601210				10			
G00601212				12			
G0080164	0.8	0.4	1.6	4	50	0.75	4
G0080166				6			
G0080168				8			
G0100306	1	0.5	3	6	60	0.95	4
G0100308				8			
G0100310				10			
G0100312				12			
G0100314				14			
G0100316				16			
G0100318				18			
G0100320				20			
G0120410	1.2	0.6	4	10	70	1.15	4
G0150510	1.5	0.75	5	10	60	1.45	4
G0150512				12			
G0150516				16			
G0150520				20			
G0150525				25	70		
G0150530				30			

NEXT

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



2 FLUTE, DIAMOND COATING BALL NOSE

- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc

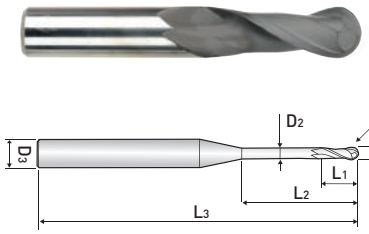
G .....series

WC | 2 | R ±0.015 | 30° HELIX | DIAMOND | DATA p.994

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
G0200812	2	1	8	12	60	1.95	4
G0200816				16			
G0200820				20			
G0200825				25	70		
G0200830				30			
G0200835				35	80		
G0200840				40			
G0201020			10	20	80		
G0201020L					100		
G0251020	2.5	1.25	10	20	80	2.43	4
G0301216	3	1.5	12	16	60	2.9	6
G0301220				20	70		
G0301225				25			
G0301230				30	80		
G0301235				35			
G0301240				40	90		
G0301245				45			
G0301525			15	25	80		4
G04015S	4	2	15	-	50	-	4
G04015M				-	80	-	
G04015L				-	120	-	
G0401520				20	60	3.9	6
G0401525				25	70		
G0401530				30	80		
G0401535				35			
G0401540				40	90		
G0401545				45			
G0401550				50	100		
G0402030			20	30	80		4

NEXT >>

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



2 FLUTE, DIAMOND COATING BALL NOSE

- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc

G .....series

HELIX DIAMOND p.994

EDP. No.	D	R	L1	L2	L3	D2	D3
G0503050	5	2.5	30	50	100	4.8	6
G0503050L					150		
G06020S	6	3	20	-	70	-	6
G06020M				-	100	-	
G06020L				-	150	-	
G0603050			30	50	100	5.8	
G0603050L					150		
G08025S	8	4	25	-	70	-	8
G08025M				-	110	-	
G08025L				-	160	-	
G0804060			40	60	110	7.8	
G0804060L					200		
G10030S	10	5	30	-	80	-	10
G10030M				-	120	-	
G10030L				-	170	-	
G1005070			50	70	120	9.7	
G1005070L					200		
G12035S	12	6	35	-	80	-	12
G12035M				-	130	-	
G12035L				-	180	-	
G1205575			55	75	130	11.7	
G1205575L					200		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
						◎		○	

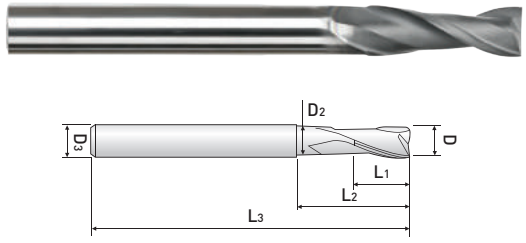
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



2 FLUTE, DIAMOND COATING BALL NOSE

- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc

GE .....series

WC 2 30° HELIX DIAMOND DATA p.995

EDP. No.	D	L_1	L_2	L_3	D_2	D_3
GE00501006	0.5	1	6	50	0.45	4
GE00601206	0.6	1.2	6	50	0.55	4
GE00601210			10			
GE00701506	0.7	1.5	6	50	0.65	4
GE00802006	0.8	2	6	50	0.75	4
GE0100308	1	3	8	60	0.95	4
GE0100310			10			
GE0100312			12			
GE0150412	1.5	4	12	60	1.45	4
GE0200612	2	6	12	60	1.95	4
GE0200612S6						6
GE0250812	2.5	8	12	60	2.43	4
GE0301012	3	10	12	60	2.9	4
GE0301016			16			
GE0301012S6			12			6
GE0301016S6			16			
GE04012S	4	12	-	60	-	6
GE0401216			16		3.9	
GE0401220			20			
GE0501520	5	15	20	60	4.8	6
GE06020S	6	20	-	60	-	6
GE0602030			30	80	5.8	
GE0603050		30	50	150		
GE08025S	8	25	-	70	-	8
GE0802540			40	100	7.8	
GE0804070		40	70	150		
GE10030S	10	30	-	80	-	10
GE1003050			50	100	9.7	
GE1004580		45	80	160		
GE12030S	12	30	-	80	-	12
GE1203050			50	110	11.7	
GE1205080		50	80	160		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
						◎		○	

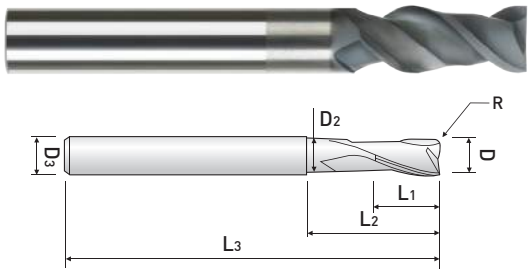
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



2 FLUTE, DIAMOND COATING RADIUS ENDMILLS

- High performance on Graphite and Non-ferrous material
- Applicable various Shape machining by applying Variable Corner Radius

WGR502 .....series

WC | 2 | 30° HELIX | R AGAINST CHIPPING | DIAMOND | DATA p.995

EDP No.	D	R	L1	L2	L3	D2	D3
WGR502 002	0.2	-	0.3	-	40	-	3
WGR502 003	0.3	-	0.5	-	40	-	3
WGR502 004	0.4	-	0.6	-	40	-	3
WGR502 005 025	0.5	0.05	0.7	2.5	40	0.45	3
WGR502 005 040				4			
WGR502 006 030	0.6	0.05	0.9	3	40	0.55	3
WGR502 006 050				5			
WGR502 008 040	0.8	0.05	1.2	4	40	0.75	3
WGR502 008 070				7			
WGR502 010 050	1	0.1	1.5	5	40	0.95	3
WGR502 010 085				8.5			
WGR502 010 120				12			
WGR502 012 060	1.2	0.1	1.8	6	50	1.15	3
WGR502 012 100				10			
WGR502 015 075	1.5	0.15	2.2	7.5	50	1.4	3
WGR502 015 120				12			
WGR502 015 180				18			
WGR502 020 100	2	0.15	2.2	10	60	1.9	3
WGR502 020 160				16			
WGR502 020 250				25			
WGR502 030 100	3	0.2	3	10	65	2.9	4
WGR502 030 150				15			
WGR502 030 200				20			
WGR502 030 250				25	75		
WGR502 030 300				30			
WGR502 040 200	4	0.2	4	20	65	3.9	6
WGR502 040 300				30	75		
WGR502 040 400				40	90		
WGR502 050 200	5	0.3	5	20	75	4.9	6
WGR502 050 300				30			
WGR502 050 400				40	90		
WGR502 050 500				50			
WGR502 060 300	6	0.3	6	30	75	5.9	6
WGR502 060 400				40	90		
WGR502 060 500				50			
WGR502 060 600				60	100		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
						◎		○	

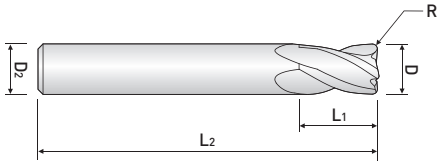
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Dia.	Tolerance	
All size	0 ~ -0.020	h6

※ These tools are manufactured based on order received.

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



4 FLUTE, DIAMOND COATING RADIUS ENDMILLS

- Improve coating stability by applying high-end Diamond Coating
- Applicable non-ferrous material such as Graphite and CFRP

WGR504 .....series

WC | 4 | 30° HELIX | R ±0.010 D≤12 | R ±0.015 D>12 | DIAMOND | DATA p.996

EDP No.	D	R	L1	L2	D2
WGR504 030 02 080	3.0	0.2	8	80	4
WGR504 030 03 080		0.3			
WGR504 030 05 080		0.5			
WGR504 040 03 100	4.0	0.3	10	100	4
WGR504 040 05 100		0.5			
WGR504 040 10 100		1.0			
WGR504 060 03 110	6.0	0.3	15	110	6
WGR504 060 05 110		0.5			
WGR504 060 10 110		1.0			
WGR504 080 05 110	8.0	0.5	20	110	8
WGR504 080 10 110		1.0			
WGR504 080 05 130		0.5		130	
WGR504 080 10 130		1.0			
WGR504 100 05 130	10.0	0.5	25	130	10
WGR504 100 10 130		1.0			
WGR504 100 05 150		0.5		150	
WGR504 100 10 150		1.0			
WGR504 120 05 130	12.0	0.5	30	130	12
WGR504 120 10 130		1.0			
WGR504 120 05 150		0.5		150	
WGR504 120 10 150		1.0			
WGR504 160 05 200	16.0	0.5	32	200	16
WGR504 160 10 200		1.0			
WGR504 200 05 200	20.0	0.5	40	200	20
WGR504 200 10 200		1.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
						◎		○	

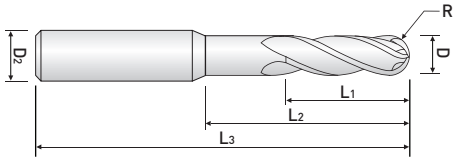
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Dia.	Tolerance	
up to 12	0 ~ -0.020	h6
over 12	0 ~ -0.030	

※ These tools are manufactured based on order received.

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



4 FLUTE, DIAMOND COATING, BALL NOSE ENDMILLS

- High performance on Graphite and Non-ferrous material

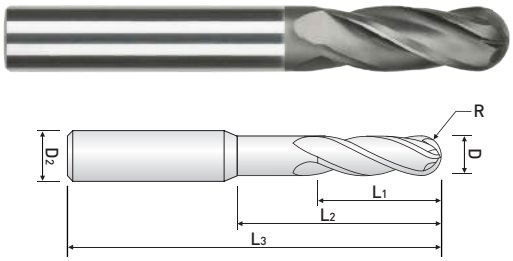
WGB504 .....series

WC | 4 | 30° HELIX | R ±0.010 ALL SIZE | DIAMOND | DATA p.996

EDP. No.	D	R	L_1	L_2	L_3	D_2
WGB504 010	1.0	0.5	3	-	60	4
WGB504 010 10				10		
WGB504 010 15				15		
WGB504 010 20				20		
WGB504 010 25				25	80	
WGB504 010 30				30		
WGB504 015	1.5	0.75	4	-	60	4
WGB504 015 10				10	80	
WGB504 015 15				15		
WGB504 015 20				20		
WGB504 015 25				25		
WGB504 015 30				30		
WGB504 020	2.0	1.0	6	-	60	4
WGB504 020 10				10	80	
WGB504 020 15				15		
WGB504 020 20				20		
WGB504 020 25				25		
WGB504 020 30				30		
WGB504 020 40				40	100	
WGB504 030	3.0	1.5	9	-	60	4
WGB504 030 15				15	100	
WGB504 030 20				20		
WGB504 030 25				25		
WGB504 030 30				30		
WGB504 030 40				40		
WGB504 030 50				50		
WGB504 040 060	4.0	2.0	12	-	60	4
WGB504 040 080					80	
WGB504 040 110					110	
WGB504 040 130					130	
WGB504 040 150					150	
WGB504 050 080	5.0	2.5	15	25	80	6
WGB504 050 110					110	
WGB504 060 090	6.0	3.0	20	-	90	6
WGB504 060 110					110	
WGB504 060 130					130	
WGB504 060 150					150	
WGB504 060 180					180	

NEXT >>

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



4 FLUTE, DIAMOND COATING, BALL NOSE ENDMILLS

- High performance on Graphite and Non-ferrous material

WGB504 .....series

WC | 4 | 30° HELIX | R ±0.010 ALL SIZE | DIAMOND | DATA p.996

EDP No.	D	R	L1	L2	L3	D2
WGB504 080 110	8.0	4.0	25	-	110	8
WGB504 080 130					130	
WGB504 080 150					150	
WGB504 080 200					200	
WGB504 100 110	10.0	5.0	30	-	110	10
WGB504 100 130					130	
WGB504 100 150					150	
WGB504 100 180					180	
WGB504 100 200					200	
WGB504 120 110	12.0	6.0	35	-	110	12
WGB504 120 130					130	
WGB504 120 150					150	
WGB504 120 180					180	
WGB504 120 200					200	
WGB504 160 150	16.0	8.0	50	-	150	16
WGB504 160 200					200	
WGB504 200 150	20.0	10.0	60	-	150	20
WGB504 200 200					200	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
						◎		○	

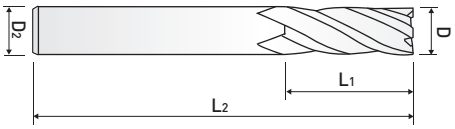
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Dia.	Tolerance	
up to 12	0 ~ -0.020	h6
over 12	0 ~ -0.030	

※ These tools are manufactured based on order received.

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



4 FLUTE, DIAMOND COATING, BALL NOSE ENDMILLS

- High performance on Graphite, Reinforced plastic and Non-ferrous material

WGE504 .....series

WC | 4 | 30° HELIX | DIAMOND | DATA p.998

EDP No.	D	L_1	L_2	D_2
WGE504 020	2.0	6	50	4
WGE504 020 08		8		
WGE504 020 10		10		
WGE504 025	2.5	8	50	4
WGE504 030	3.0	8	50	6
WGE504 030 10		10		
WGE504 030 12		12		
WGE504 030 16		16	60	
WGE504 030 20		20		
WGE504 040	4.0	10	50	6
WGE504 040 12		12		
WGE504 040 16		16	60	
WGE504 040 20		20		
WGE504 040 25		25		
WGE504 050	5.0	15	60	6
WGE504 060	6.0	15	60	6
WGE504 060 20		20	110	
WGE504 060 30		30	150	
WGE504 080	8.0	20	70	8
WGE504 080 30		30	110	
WGE504 080 40		40	150	
WGE504 100	10.0	25	75	10
WGE504 100 40		40	110	
WGE504 100 50		50	150	
WGE504 120	12.0	30	80	12
WGE504 120 50		50	120	
WGE504 120 60		60	160	
WGE504 160	16.0	50	110	16
WGE504 160 70		70	160	
WGE504 160 90		90	160	
WGE504 160 100		100	200	
WGE504 200	20.0	70	160	20
WGE504 200 90		90	160	
WGE504 200 100		100	200	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
						◎		○	

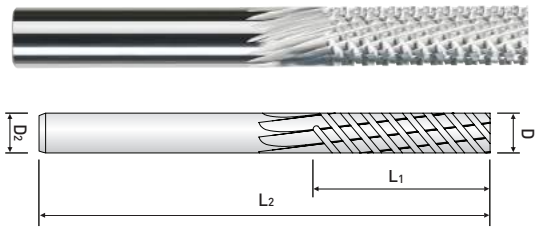
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Dia.	Tolerance	
All Size	0 ~ -0.030	h6

※ These tools are manufactured based on order received.

Endmill for Graphite and Non-ferrous ZAMUS GRA MATE Series



WINNER ROUTER SERIES

- Suitable for Ceramic machining such as Graphite and Non-ferrous material
- Suitable for composite material machining such as CFRP, AFRP and GFRP

WROU .....series

WC | 8&12 | 15° HELIX | 50° HELIX | DIAMOND | DATA p.997

EDP. No.	D	L_1	L_2	D_2	No.OF FLUTE	END STYLE	COATING
WROU060XN	6	25	63	6	8	X	X
WROU060YN						0	X
WROU060XC	6	25	63	6	8	X	0
WROU060YC						0	0
WROU080XN	8	25	63	8	10	X	X
WROU080YN						0	X
WROU080XC	8	25	63	8	10	X	0
WROU080YC						0	0
WROU100XN	10	28	63	10	12	X	X
WROU100YN						0	X
WROU100XC	10	28	63	10	12	X	0
WROU100YC						0	0
WROU120XN	12	38	89	12	12	X	X
WROU120YN						0	X
WROU120XC	12	38	89	12	12	X	0
WROU120YC						0	0

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
						◎		○	

○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Dia.	Tolerance	
All Size	0 ~ -0.05	h6

※ These tools are manufactured based on order received.

Aluminum Endmills

ALU WAVE SERIES

ENDMILL
SERIES

Aluminum Endmills _ ALU WAVE SERIES

WIDIN

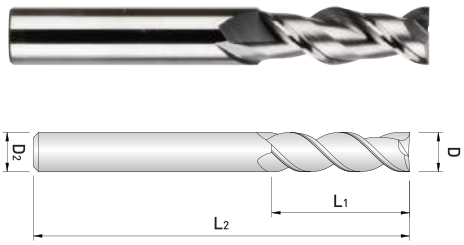
EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
WAE302A ...series		STUB LENGTH, UNCOATED	INCH	•	377
WAE502A ...series		STUB LENGTH, DLC COATED	INCH	•	377
WAE312A ...series		REGULAR LENGTH, UNCOATED	INCH	•	378
WAE512A ...series		REGULAR LENGTH, DLC COATED	INCH	•	378
WAE322A ...series		LONG LENGTH, UNCOATED	INCH	•	379
WAE522A ...series		LONG LENGTH, DLC COATED	INCH	•	379
WAR302A ...series		STUB LENGTH, UNCOATED	INCH	•	380
WAR502A ...series		STUB LENGTH, DLC COATED	INCH	•	380
WAR312A ...series		REGULAR LENGTH, UNCOATED	INCH	•	381
WAR512A ...series		REGULAR LENGTH, DLC COATED	INCH	•	381
WAR322A ...series		LONG LENGTH, UNCOATED	INCH	•	382
WAR522A ...series		LONG LENGTH, DLC COATED	INCH	•	382
WAE303A ...series		STUB LENGTH, UNCOATED	INCH	•	383
WAE503A ...series		STUB LENGTH, DLC COATED	INCH	•	383
WAE313A ...series		STUB LENGTH, UNCOATED	INCH	•	384
WAE513A ...series		REGULAR LENGTH, DLC COATED	INCH	•	384
WAE323A ...series		LONG LENGTH, UNCOATED	INCH	•	385
WAE523A ...series		LONG LENGTH, DLC COATED	INCH	•	385
WAR303A ...series		STUB LENGTH, UNCOATED	INCH	•	386
WAR503A ...series		STUB LENGTH, DLC COATED	INCH	•	386

Aluminum Endmills _ ALU WAVE SERIES

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
WAR313A ...series		REGULAR LENGTH, UNCOATED	INCH	•	387
WAR513A ...series		REGULAR LENGTH, DLC COATED	INCH	•	387
WAR323A ...series		LONG LENGTH, UNCOATED	INCH	•	388
WAR523A ...series		LONG LENGTH, DLC COATED	INCH	•	388
WAB312A ...series		LONG LENGTH, BALL NOSE	INCH	•	389
WAF303A ...series		ROUGHING ENDMILL FOR ALUMINNM	INCH	•	390
WAF313A ...series		ROUGHING ENDMILL FOR ALUMINNM	INCH	•	391
WAB312 ...series		2 FLUTE, 50 HELIX BALL ENDMILL FOR ALUMINNM	METRIC	•	392
WAE301 ...series		1 FLUTE, SQUARE ENDMILL, REGULAR LENGTH	METRIC	•	393
WAE302 ...series		2 FLUTE, SQUARE ENDMILL, REGULAR LENGTH	METRIC	•	395
WAE30(2)3 ...series		3 FLUTE, SQUARE ENDMILL, REGULAR & LONG LENGTH	METRIC	•	396
WAR302 ...series		2 FLUTE, CORNER RADIUS ENDMILL, REGULAR LENGTH	METRIC	•	400
WAR303 ...series		3 FLUTE, CORNER RADIUS ENDMILL, REGULAR LENGTH	METRIC	•	401
WAR502 ...series		2 FLUTE, CORNER RADIUS ENDMILL, DLC COATED, REGULAR LENGTH	METRIC	•	402
WAR503 ...series		3 FLUTE, CORNER RADIUS ENDMILL, DLC COATED, REGULAR LENGTH	METRIC	•	403
WAF303 ...series		3 FLUTE, ROUGHER ENDMILL, REGULAR & LONG LENGTH	METRIC	•	404

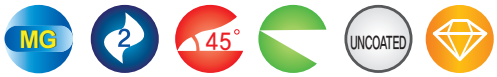
Aluminum Endmills *ALU WAVE Series*



2 FLUTE, STUB LENGTH, SQUARE
- for Aluminum

- High performance geometry and polished flutes on Aluminum, Non-Ferrous Materials, Graphite & Plastics.
- Available both Uncoated and Diamond Like Coated for more performance options.

WAE302A .....series



FINE GRAIN | HELIX | SHARP EDGE | D.L.C.

EDP. No.		Dimension (Inch)			
NON-Coated	D.L.C.Coated	D	C.L	OAL	SH.Dia
WAE302A008	WAE502A008	1/8	1/4	1-1/2	1/8
WAE302A012	WAE502A012	3/16	5/16	2	3/16
WAE302A016	WAE502A016	1/4	3/8	2-1/2	1/4
WAE302A020	WAE502A020	5/16	7/16	2-1/2	5/16
WAE302A024	WAE502A024	3/8	1/2	2-1/2	3/8
WAE302A028	WAE502A028	7/16	9/16	2-3/4	7/16
WAE302A032	WAE502A032	1/2	3/4	3	1/2
WAE302A040	WAE502A040	5/8	7/8	3-1/2	5/8
WAE302A048	WAE502A048	3/4	1	4	3/4
WAE302A064	WAE502A064	1	1-1/2	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

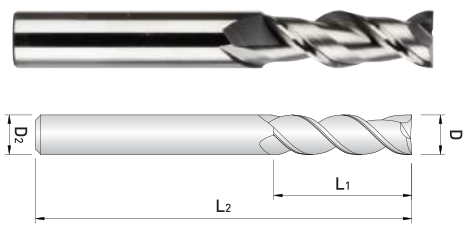
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

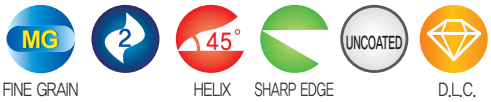
Aluminum Endmills ALU WAVE Series



2 FLUTE, REGULAR CUT LENGTH, SQUARE - for Aluminum

- High performance geometry and polished flutes
- Optimized design for effective chip evacuation
- Great workpiece finish
- Excellent for Aluminum, Other Non-Ferrous Metals, Graphite & Plastics

WAE312A .....series



FINE GRAIN HELIX SHARP EDGE D.L.C.

EDP. No.		Dimension (Inch)			
NON-Coated	D.L.C.Coated	D	C.L	OAL	SH.Dia
WAE312A008	WAE512A008	1/8	3/8	1-1/2	1/8
WAE312A012	WAE512A012	3/16	9/16	2	3/16
WAE312A016	WAE512A016	1/4	3/4	2-1/2	1/4
WAE312A020	WAE512A020	5/16	13/16	2-1/2	5/16
WAE312A024	WAE512A024	3/8	1	2-1/2	3/8
WAE312A028	WAE512A028	7/16	1	2-3/4	7/16
WAE312A032	WAE512A032	1/2	1-1/4	3	1/2
WAE312A040	WAE512A040	5/8	1-5/8	3-1/2	5/8
WAE312A048	WAE512A048	3/4	1-5/8	4	3/4
WAE312A064	WAE512A064	1	2	5	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

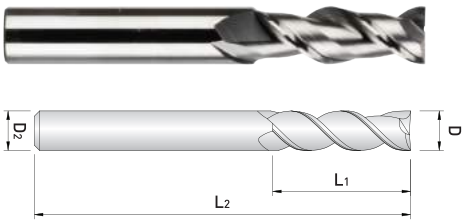
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

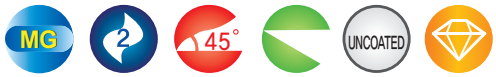
Aluminum Endmills ALU WAVE Series



2 FLUTE, LONG CUT LENGTH, SQUARE
- for Aluminum

- High performance geometry and polished flutes
- Optimized design for effective chip evacuation
- Great workpiece finish
- Excellent for Aluminum, Other Non-Ferrous Metals, Graphite & Plastics

WAE322A .....series



FINE GRAIN HELIX SHARP EDGE D.L.C.

EDP. No.		Dimension (Inch)			
NON-Coated	D.L.C.Coated	D	C.L	OAL	SH.Dia
WAE322A016	WAE522A016	1/4	1-1/2	4	1/4
WAE322A020	WAE522A020	5/16	1-1/2	4	5/16
WAE322A024	WAE522A024	3/8	1-1/2	4	3/8
WAE322A032	WAE522A032	1/2	2	4	1/2
WAE322A040	WAE522A040	5/8	2-1/2	5	5/8
WAE322A048	WAE522A048	3/4	2-1/2	5	3/4
WAE322A064	WAE522A064	1	3-1/4	6	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

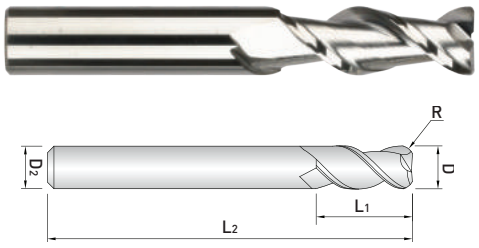
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills *ALU WAVE Series*



2 FLUTE, REGULAR CUT LENGTH, CORNER RADIUS - for Aluminum

- High performance geometry and polished flutes
- Optimized design for effective chip evacuation
- Great workpiece finish
- Excellent for Aluminum, Other Non-Ferrous Metals, Graphite & Plastics

WAR302A .....series

FINE GRAIN HELIX D.L.C.

EDP. No.		Dimension (Inch)				
NON-Coated	D.L.C.Coated	D	R	C.L	OAL	SH.Dia
WAR302A008010	WAR502A008010	1/8	.010	1/4	1-1/2	1/8
WAR302A012010	WAR502A012010	3/16	.010	5/16	2	3/16
WAR302A016010	WAR502A016010	1/4	.010	3/8	2-1/2	1/4
WAR302A020020	WAR502A020020	5/16	.020	7/16	2-1/2	5/16
WAR302A024020	WAR502A024020	3/8	.020	1/2	2-1/2	3/8
WAR302A028020	WAR502A028020	7/16	.020	9/16	2-3/4	7/16
WAR302A032020	WAR502A032020	1/2	.020	3/4	3	1/2
WAR302A040030	WAR502A040030	5/8	.030	7/8	3-1/2	5/8
WAR302A048030	WAR502A048030	3/4	.030	1	4	3/4
WAR302A064030	WAR502A064030	1	.030	1-1/2	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

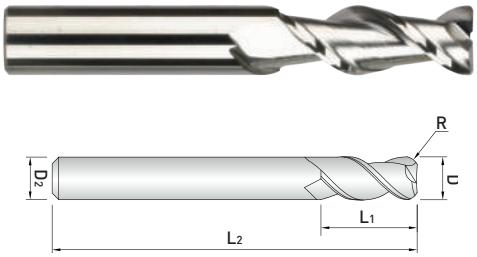
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills *ALU WAVE Series*



2 FLUTE, REGULAR CUT LENGTH, CORNER RADIUS - for Aluminum

- High performance geometry and polished flutes
- Optimized design for effective chip evacuation
- Great workpiece finish
- Excellent for Aluminum, Other Non-Ferrous Metals, Graphite & Plastics

WAR312A .....series

FINE GRAIN HELIX D.L.C.

EDP. No.		Dimension (Inch)				
NON-Coated	D.L.C.Coated	D	R	C.L	OAL	SH.Dia
WAR312A008010	WAR512A008010	1/8	.010	3/8	1-1/2	1/8
WAR312A012010	WAR512A012010	3/16	.010	9/16	2	3/16
WAR312A016010	WAR512A016010	1/4	.010	3/4	2-1/2	1/4
WAR312A020020	WAR512A020020	5/16	.020	13/16	2-1/2	5/16
WAR312A024020	WAR512A024020	3/8	.020	1	2-1/2	3/8
WAR312A028020	WAR512A028020	7/16	.020	1	2-3/4	7/16
WAR312A032020	WAR512A032020	1/2	.020	1-1/4	3	1/2
WAR312A040030	WAR512A040030	5/8	.030	1-5/8	3-1/2	5/8
WAR312A048030	WAR512A048030	3/4	.030	1-5/8	4	3/4
WAR312A064030	WAR512A064030	1	.030	2	5	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

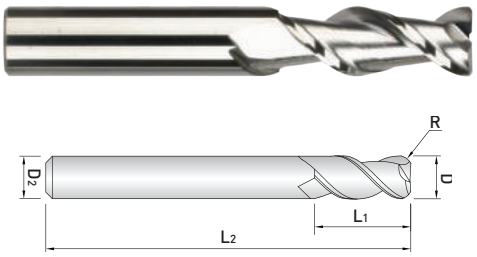
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



2 FLUTE, LONG CUT LENGTH, CORNER RADIUS - for Aluminum

- High performance geometry and polished flutes
- Optimized design for effective chip evacuation
- Great workpiece finish
- Excellent for Aluminum, Other Non-Ferrous Metals, Graphite & Plastics

WAR322A .....series

FINE GRAIN HELIX D.L.C.

EDP. No.		Dimension (Inch)				
NON-Coated	D.L.C.Coated	D	R	C.L	OAL	SH.Dia
WAR322A016010	WAR522A016010	1/4	.010	1-1/2	4	1/4
WAR322A020020	WAR522A020020	5/16	.020	1-1/2	4	5/16
WAR322A024020	WAR522A024020	3/8	.020	1-1/2	4	3/8
WAR322A032020	WAR522A032020	1/2	.020	2	4	1/2
WAR322A040030	WAR522A040030	5/8	.030	2-1/2	5	5/8
WAR322A048030	WAR522A048030	3/4	.030	2-1/2	5	3/4
WAR322A064030	WAR522A064030	1	.030	3-1/4	6	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

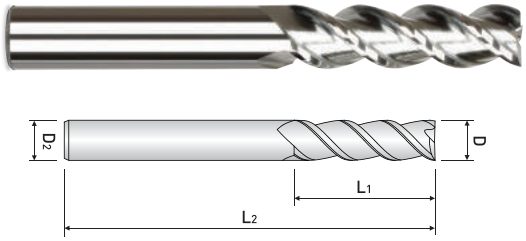
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



3 FLUTE, STUB LENGTH, SQUARE
- for Aluminum

- High performance geometry and polished flutes
- Designed for high speed cutting with excellent workpiece finish
- Optimized design for reducing cutting load and effective chip evacuation
- Excellent for Aluminum, Aluminum Alloys, Copper and Other Non-Ferrous Metals

WAE303A .....series

MG FINE GRAIN | 3 | 45° HELIX | SHARP EDGE | UNCOATED | D.L.C. | DATA p.000

EDP. No.		Dimension (Inch)			
NON-Coated	D.L.C.Coated	D	C.L	OAL	SH.Dia
WAE303A008	WAE503A008	1/8	1/4	1-1/2	1/8
WAE303A012	WAE503A012	3/16	5/16	2	3/16
WAE303A016	WAE503A016	1/4	3/8	2-1/2	1/4
WAE303A020	WAE503A020	5/16	7/16	2-1/2	5/16
WAE303A024	WAE503A024	3/8	1/2	2-1/2	3/8
WAE303A028	WAE503A028	7/16	9/16	2-3/4	7/16
WAE303A032	WAE503A032	1/2	5/8	3	1/2
WAE303A040	WAE503A040	5/8	3/4	3-1/2	5/8
WAE303A048	WAE503A048	3/4	1	4	3/4
WAE303A064	WAE503A064	1	1-1/4	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

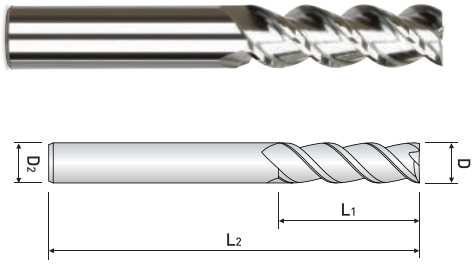
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



3 FLUTE, REGULAR LENGTH, SQUARE
- for Aluminum

- High performance geometry and polished flutes
- Designed for high speed cutting with excellent workpiece finish
- Optimized design for reducing cutting load and effective chip evacuation
- Excellent for Aluminum, Aluminum Alloys, Copper and Other Non-Ferrous Metals

WAE313A .....series

FINE GRAIN | HELIX | SHARP EDGE | D.L.C.

EDP. No.		Dimension (Inch)			
NON-Coated	D.L.C.Coated	D	C.L	OAL	SH.Dia
WAE313A008	WAE513A008	1/8	3/8	1-1/2	1/8
WAE313A012	WAE513A012	3/16	9/16	2	3/16
WAE313A016	WAE513A016	1/4	3/4	2-1/2	1/4
WAE313A020	WAE513A020	5/16	13/16	2-1/2	5/16
WAE313A024	WAE513A024	3/8	1	2-1/2	3/8
WAE313A028	WAE513A028	7/16	1-1/4	2-3/4	7/16
WAE313A032	WAE513A032	1/2	1-1/4	3	1/2
WAE313A040	WAE513A040	5/8	1-5/8	3-1/2	5/8
WAE313A048	WAE513A048	3/4	1-5/8	4	3/4
WAE313A064	WAE513A064	1	2	5	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

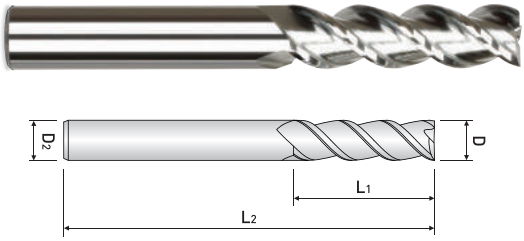
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

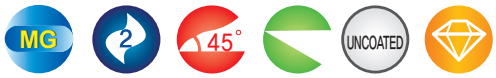
Aluminum Endmills *ALU WAVE Series*



2 FLUTE, REGULAR CUT LENGTH, SQUARE
- for Aluminum

- High performance geometry and polished flutes
- Designed for high speed cutting with excellent workpiece finish
- Optimized design for reducing cutting load and effective chip evacuation
- Excellent for Aluminum, Aluminum Alloys, Copper and Other Non-Ferrous Metals

WAE323A .....series



FINE GRAIN HELIX SHARP EDGE D.L.C.

EDP. No.		Dimension (Inch)			
NON-Coated	D.L.C.Coated	D	C.L	OAL	SH.Dia
WAE323A016	WAE523A016	1/4	1-1/2	4	1/4
WAE323A020	WAE523A020	5/16	1-1/2	4	5/16
WAE323A024	WAE523A024	3/8	1-1/2	4	3/8
WAE323A032	WAE523A032	1/2	2	4	1/2
WAE323A040	WAE523A040	5/8	2-1/2	5	5/8
WAE323A048	WAE523A048	3/4	2-1/2	5	3/4
WAE323A064	WAE523A064	1	3-1/4	6	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

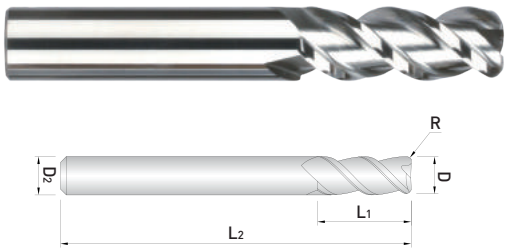
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills *ALU WAVE Series*



3 FLUTE, STUB LENGTH, CORNER RADIUS
- for Aluminum

- High performance geometry and polished flutes
- Designed for high speed cutting with excellent workpiece finish
- Optimized design for reducing cutting load and effective chip evacuation
- Excellent for Aluminum, Aluminum Alloys, Copper and Other Non-Ferrous Metals

WAR303A .....series

FINE GRAIN HELIX D.L.C.

EDP. No.		Dimension (Inch)				
NON-Coated	D.L.C.Coated	D	R	C.L	OAL	SH.Dia
WAR303A008010	WAR503A008010	1/8	.010	1/4	1-1/2	1/8
WAR303A012010	WAR503A012010	3/16	.010	5/16	2	3/16
WAR303A012020	WAR503A012020	3/16	.020	5/16	2	3/16
WAR303A016010	WAR503A016010	1/4	.010	3/8	2-1/2	1/4
WAR303A016020	WAR503A016020	1/4	.020	3/8	2-1/2	1/4
WAR303A016030	WAR503A016030	1/4	.030	3/8	2-1/2	1/4
WAR303A016060	WAR503A016060	1/4	.060	3/8	2-1/2	1/4
WAR303A020020	WAR503A020020	5/16	.020	7/16	2-1/2	5/16
WAR303A020030	WAR503A020030	5/16	.030	7/16	2-1/2	5/16
WAR303A024020	WAR503A024020	3/8	.020	1/2	2-1/2	3/8
WAR303A024030	WAR503A024030	3/8	.030	1/2	2-1/2	3/8
WAR303A024060	WAR503A024060	3/8	.060	1/2	2-1/2	3/8
WAR303A028020	WAR503A028020	7/16	.020	9/16	2-3/4	7/16
WAR303A032020	WAR503A032020	1/2	.020	5/8	3	1/2
WAR303A032030	WAR503A032030	1/2	.030	5/8	3	1/2
WAR303A032060	WAR503A032060	1/2	.060	5/8	3	1/2
WAR303A040030	WAR503A040030	5/8	.030	3/4	3-1/2	5/8
WAR303A040060	WAR503A040060	5/8	.060	3/4	3-1/2	5/8
WAR303A040090	WAR503A040090	5/8	.090	3/4	3-1/2	5/8
WAR303A048060	WAR503A048060	3/4	.060	1	4	3/4
WAR303A048090	WAR503A048090	3/4	.090	1	4	3/4
WAR303A048120	WAR503A048120	3/4	.120	1	4	3/4
WAR303A064060	WAR503A064060	1	.060	1-1/4	4	1
WAR303A064090	WAR503A064090	1	.090	1-1/4	4	1
WAR303A064120	WAR503A064120	1	.120	1-1/4	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

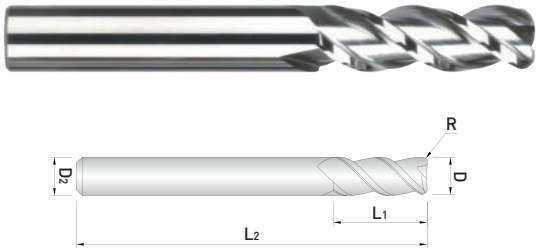
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills *ALU WAVE Series*



3 FLUTE, STUB LENGTH, CORNER RADIUS
- for Aluminum

- High performance geometry and polished flutes
- Designed for high speed cutting with excellent workpiece finish
- Optimized design for reducing cutting load and effective chip evacuation
- Excellent for Aluminum, Aluminum Alloys, Copper and Other Non-Ferrous Metals

WAR313A .....series

FINE GRAIN HELIX D.L.C.

EDP. No.		Dimension (Inch)				
NON-Coated	D.L.C.Coated	D	R	C.L	OAL	SH.Dia
WAR313A008010	WAR513A008010	1/8	.010	3/8	1-1/2	1/8
WAR313A012010	WAR513A012010	3/16	.010	9/16	2	3/16
WAR313A012020	WAR513A012020	3/16	3/16	9/16	2	3/16
WAR313A016010	WAR513A016010	1/4	.010	5/8	2-1/2	1/4
WAR313A016020	WAR513A016020	1/4	.020	5/8	2-1/2	1/4
WAR313A016030	WAR513A016030	1/4	.030	5/8	2-1/2	1/4
WAR313A016060	WAR513A016060	1/4	.060	5/8	2-1/2	1/4
WAR313A020020	WAR513A020020	5/16	.020	13/16	2-1/2	5/16
WAR313A020030	WAR513A020030	5/16	.030	13/16	2-1/2	5/16
WAR313A024020	WAR513A024020	3/8	.020	1	2-1/2	3/8
WAR313A024030	WAR513A024030	3/8	.030	1	2-1/2	3/8
WAR313A024060	WAR513A024060	3/8	.060	1	2-1/2	3/8
WAR313A028020	WAR513A028020	7/16	.020	1-1/4	2-3/4	7/16
WAR313A032020	WAR513A032020	1/2	.020	1-1/4	3	1/2
WAR313A032030	WAR513A032030	1/2	.030	1-1/4	3	1/2
WAR313A032060	WAR513A032060	1/2	.060	1-1/4	3	1/2
WAR313A040030	WAR513A040030	5/8	.030	1-5/8	3-1/2	5/8
WAR313A040060	WAR513A040060	5/8	.060	1-5/8	3-1/2	5/8
WAR313A040090	WAR513A040090	5/8	.090	1-5/8	3-1/2	5/8
WAR313A048060	WAR513A048060	3/4	.060	1-5/8	4	3/4
WAR313A048090	WAR513A048090	3/4	.090	1-5/8	4	3/4
WAR313A048120	WAR513A048120	3/4	.120	1-5/8	4	3/4
WAR313A064060	WAR513A064060	1	.060	2	5	1
WAR313A064090	WAR513A064090	1	.090	2	5	1
WAR313A064120	WAR513A064120	1	.120	2	5	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

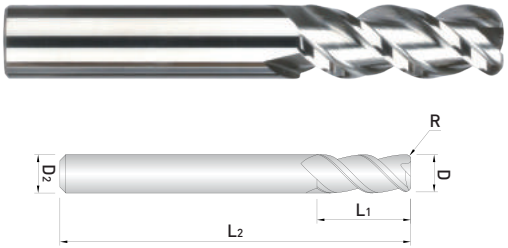
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



3 FLUTE, LONG LENGTH, CORNER RADIUS ENDMILL - for Aluminum

- High performance geometry and polished flutes
- Designed for high speed cutting with excellent workpiece finish
- Optimized design for reducing cutting load and effective chip evacuation
- Excellent for Aluminum, Aluminum Alloys, Copper and Other Non-Ferrous Metals

WAR323A .....series

FINE GRAIN HELIX D.L.C.

EDP. No.		Dimension (Inch)				
NON-Coated	D.L.C.Coated	D	R	C.L	OAL	SH.Dia
WAR323A016010	WAR523A016010	1/4	.010	1-1/2	4	1/4
WAR323A016020	WAR523A016020	1/4	1/4	1-1/2	4	1/4
WAR323A016030	WAR523A016030	1/4	1/4	1-1/2	4	1/4
WAR323A016060	WAR523A016060	1/4	1/4	1-1/2	4	1/4
WAR323A020020	WAR523A020020	5/16	5/16	1-1/2	4	5/16
WAR323A020030	WAR523A020030	5/16	5/16	1-1/2	4	5/16
WAR323A024020	WAR523A024020	3/8	3/8	1-1/2	4	3/8
WAR323A024030	WAR523A024030	3/8	3/8	1-1/2	4	3/8
WAR323A024060	WAR523A024060	3/8	3/8	1-1/2	4	3/8
WAR323A032020	WAR523A032020	1/2	1/2	2	4	1/2
WAR323A032030	WAR523A032030	1/2	1/2	2	4	1/2
WAR323A032060	WAR523A032060	1/2	1/2	2	4	1/2
WAR323A040030	WAR523A040030	5/8	5/8	2-1/2	5	5/8
WAR323A040060	WAR523A040060	5/8	5/8	2-1/2	5	5/8
WAR323A040090	WAR523A040090	5/8	5/8	2-1/2	5	5/8
WAR323A048060	WAR523A048060	3/4	3/4	2-1/2	5	3/4
WAR323A048090	WAR523A048090	3/4	3/4	2-1/2	5	3/4
WAR323A048120	WAR523A048120	3/4	3/4	2-1/2	5	3/4
WAR323A064060	WAR523A064060	1	1	3-1/4	6	1
WAR323A064090	WAR523A064090	1	1	3-1/4	6	1
WAR323A064120	WAR523A064120	1	1	3-1/4	6	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

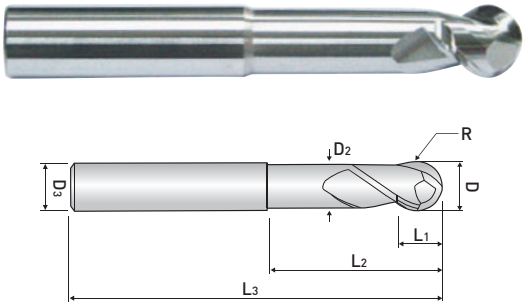
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
0 ~ .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



2 FLUTE, REGULAR LENGTH, STUB BALL NOSE ENDMILL - for Aluminum

- High performance geometry and polished flutes on Aluminum, Non-Ferrous Materials, Graphite & Plastics
- Available both Uncoated and Diamond Like Coated for more performance options

WAB312A .....series

FINE GRAIN HELIX D.L.C.

EDP. No.	Dimension(Inch)						
	D	R	L_1	L_2	L_3	D_2	SH.Dia
WAB312A008	1/8	R1/16	1/8	3/8	3	.115	1/8
WAB312A012	3/16	R3/32	3/16	9/16	3	.175	3/16
WAB312A016	1/4	R1/8	1/4	2	3	.230	1/4
WAB312A024	3/8	R3/16	3/8	2-1/4	3-1/2	.345	3/8
WAB312A032	1/2	R1/4	1/2	2-1/2	4	.460	1/2

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

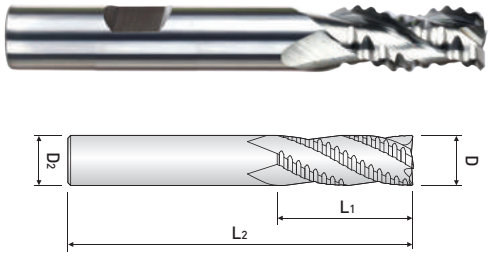
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	Shank Dia.
± .0008	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



3 FLUTE, ROUGHER ENDMILL, REGULAR & LONG LENGTH - for Aluminum

DIN6527L / DIN6535-HA,DIN6535-HB

- Suitable for Aluminum, Aluminum Alloy, Copper &Non-Ferrous material
- High performance geometry and coarse pitch combined for excellent tool life
- Regular and Long lengths
- Uncoated only
- Excellent for Aluminum, Aluminum Alloys, Non-Ferrous Metals, Graphite and Plastics

WAF303A .....series

FINE GRAIN | HELIX | Conventional Pitch

EDP. No.	Dimension (Inch)			
	D	C.L	OAL	SH.Dia
WAF303A024	3/8	1	3	3/8
WAF303A024L	3/8	1-1/2	3-1/2	3/8
WAF303A032	1/2	1-1/4	3-1/4	1/2
WAF303A032L	1/2	2	4	1/2
WAF303A040	5/8	1-1/4	3-1/2	5/8
WAF303A040L	5/8	2-1/2	5	5/8
WAF303A048	3/4	1-1/2	4	3/4
WAF303A048L	3/4	2-1/2	5	3/4
WAF303A064	1	1-1/2	4	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

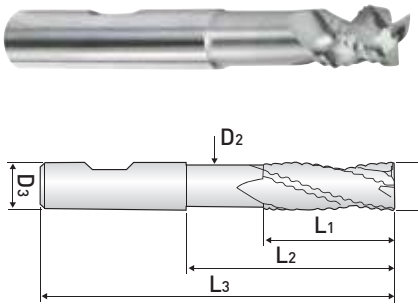
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	1/4 ~ 3/8	1/2 ~ 5/8	3/4 ~ 1
Tolerance	0 ~ -.0022	0 ~ -.0027	0 ~ -.0033

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



3 FLUTE, ROUGHER ENDMILL,
LONG REACH & STUB CUT
- for Aluminum

- High performance geometry and coarse pitch combined for excellent tool life
- Extra-long OAL with long necked reach and stub flute length
- Uncoated only
- Excellent for Aluminum, Aluminum Alloys, Non-Ferrous Metals, Graphite and Plastics

WAF313A .....series

EDP. No.	Dimension (Inch)					
	D	C.L	Neck Length	OAL	Neck Dia.	SH.Dia
WAF313A024	3/8	7/16	2-1/4	3-1/2	0.345	3/8
WAF313A032	1/2	9/16	2-1/2	4	0.460	1/2
WAF313A040	5/8	3/4	3	5	0.575	5/8
WAF313A048	3/4	13/16	4	6	0.710	3/4
WAF313A064	1	15/16	4	6	0.960	1

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

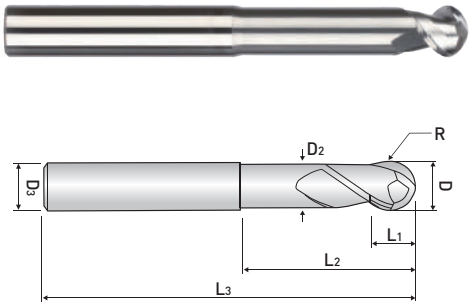
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (Inch)	1/4 ~ 3/8	1/2 ~ 5/8	3/4 ~ 1
Tolerance	0 ~ -.0022	0 ~ -.0027	0 ~ -.0033

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



2 FLUTE, STUB CUT BALL NOSE
- for Aluminum

- Excellent cutting quality on aluminum & copper
- high polished flute face improving chip evacuation and Lubricity

WAB312 ...series

FINE GRAIN | HELIX | p.998

EDP. No.	D	R	L_1	L_2	L_3	D_2	D_3
WAB312 060	6	3	5.5	25	55	5.4	6
WAB312 061	6	3	5.5	40	90	5.4	6
WAB312 080	8	4	7	30	65	7.2	8
WAB312 081	8	4	7	50	100	7.2	8
WAB312 100	10	5	8.5	35	75	9	10
WAB312 101	10	5	10	50	100	9	10
WAB312 102	10	5	10	60	150	9	10
WAB312 120	12	6	10.5	40	75	11	12
WAB312 121	12	6	12	50	110	11	12
WAB312 122	12	6	12	60	150	11	12
WAB312 160	16	8	14	50	90	14.5	16
WAB312 161	16	8	16	70	150	14.5	16
WAB312 162	16	8	16	90	200	14.5	16
WAB312 200	20	10	17	50	100	18	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
					○			◎	

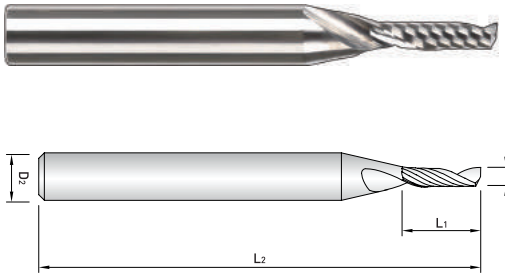
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.02	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



1 FLUTE, SQUARE ENDMILL, REGULAR LENGTH
- for Aluminum

- Excellent cutting quality on aluminum & copper
- high polished flute face improving chip evacuation and Lubricity

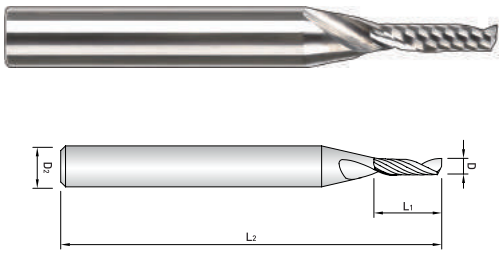
WAE301 ...series

MG FINE GRAIN | 1 | 30° HELIX | UNCOATED | DATA p.999

EDP. No.	D	L_1	L_2	D_2
WAE301 002	0.2	0.3	40	4
WAE301 003	0.3	0.9	40	4
WAE301 004	0.4	1.2	40	4
WAE301 005	0.5	1.5	40	4
WAE301 006	0.6	1.8	40	4
WAE301 007	0.7	2.1	40	4
WAE301 008	0.8	2.4	40	4
WAE301 009	0.9	2.7	40	4
WAE301 010	1	3	45	6
WAE301 010-4.5	1	4.5	45	6
WAE301 010-6	1	6	50	6
WAE301 012	1.2	3	45	6
WAE301 012-5	1.2	5	45	6
WAE301 012-6	1.2	6	50	6
WAE301 015	1.5	4	45	6
WAE301 015-6	1.5	6	50	6
WAE301 015-8	1.5	8	50	6
WAE301 020	2	6	50	6
WAE301 020-8	2	8	50	6
WAE301 020-10	2	10	50	6
WAE301 025	2.5	7	50	6

NEXT >>

Aluminum Endmills ALU WAVE Series



1 FLUTE, SQUARE ENDMILL, REGULAR LENGTH
- for Aluminum

- Excellent cutting quality on aluminum & copper
- high polished flute face improving chip evacuation and Lubricity

WAE301 ...series

MG FINE GRAIN | 1 | 30° HELIX | UNCOATED | DATA p.999

EDP. No.	D	L_1	L_2	D_2
WAE301 025-8	2.5	8	50	6
WAE301 025-10	2.5	10	50	6
WAE301 025-12	2.5	12	50	6
WAE301 030	3	8	50	6
WAE301 030-12	3	12	50	6
WAE301 030-15	3	15	50	6
WAE301 040	4	10	50	6
WAE301 040-15	4	15	50	6
WAE301 040-20	4	20	60	6
WAE301 050	5	13	60	6
WAE301 050-20	5	20	60	6
WAE301 050-25	5	25	60	6
WAE301 060	6	15	60	6
WAE301 060-20	6	20	60	6
WAE301 060-25	6	25	60	6
WAE301 080	8	20	70	8
WAE301 080-25	8	25	75	8
WAE301 100	10	22	75	10
WAE301 100-30	10	30	80	10
WAE301 120	12	26	75	12
WAE301 120-35	12	35	90	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
					○			◎	

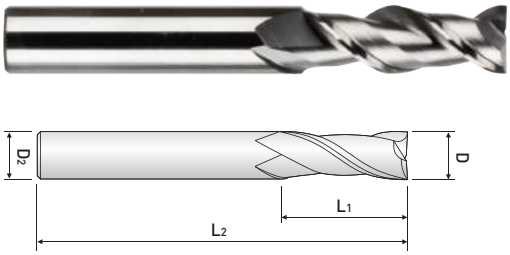
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 5	0 ~ -0.02	h6
over 5	0 ~ -0.03	

※ These tools are manufactured based on order received.

Aluminum Endmills *ALU WAVE Series*



2 FLUTE, SQUARE ENDMILL, REGULAR LENGTH
- for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-ferrous material
- high polished flute face improving chip evacuation and Lubricity

WAE302 ...series

MG FINE GRAIN | 2 | 45° HELIX | SHARP EDGE | UNCOATED | DATA p.999

EDP. No.	D	L_1	L_2	D_2
WAE302 010	1	3	50	4
WAE302 010-6	1	6	60	6
WAE302 012	1.2	4	50	6
WAE302 015	1.5	6	50	6
WAE302 015-8	1.5	8	60	6
WAE302 020 S4	2	6	50	4
WAE302 020	2	6	50	6
WAE302 020-10	2	10	60	6
WAE302 025	2.5	12	55	6
WAE302 030	3	12	55	6
WAE302 030-15	3	15	65	6
WAE302 035	3.5	14	57	6
WAE302 040	4	14	55	6
WAE302 040-16	4	16	65	6
WAE302 050	5	17	55	6
WAE302 050-22	5	22	60	6
WAE302 060	6	17	60	6
WAE302 060-22	6	22	60	6
WAE302 070	7	20	63	8
WAE302 080	8	23	70	8
WAE302 080-31	8	31	80	8
WAE302 090	9	25	72	10
WAE302 100	10	28	75	10
WAE302 100-36	10	36	90	10
WAE302 110	11	30	80	12
WAE302 120	12	33	80	12
WAE302 120-41	12	41	95	12
WAE302 122	12	45	100	12
WAE302 130	13	35	85	14
WAE302 140	14	38	90	14
WAE302 150	15	40	90	16
WAE302 160	16	45	100	16
WAE302 160-53	16	53	110	16
WAE302 180	18	49	100	18
WAE302 200	20	50	100	20
WAE302 200-55	20	55	110	20
WAE302 250	25	50	120	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

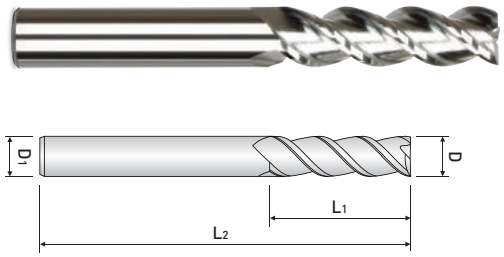
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



3 FLUTE, SQUARE ENDMILL, REGULAR & LONG LENGTH - for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-ferrous material
- Suitable for high speed cutting
- Optimized design for reducing cutting load and maxi mizing chip evacuation

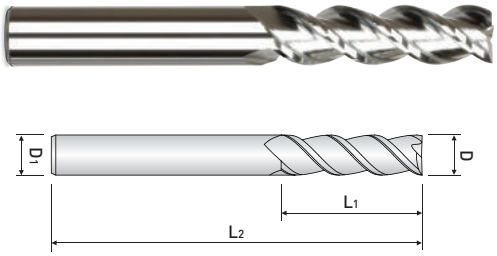
WAE30(2)3 ...series

MG FINE GRAIN | 3 | 45° HELIX | SHARP EDGE | UNCOATED | DATA p.1000

EDP. No.	D	L_1	L_2	D_2
WAE303 010-02	1	2	40	6
WAE303 010-025	1	2.5	40	6
WAE303 010	1	3	50	6
WAE303 010-04	1	4	60	6
WAE303 010-06	1	6	60	6
WAE303 012	1.2	4	50	6
WAE303 015-03	1.5	3	40	6
WAE303 015	1.5	5	50	6
WAE303 015-06	1.5	6	60	6
WAE303 015-08	1.5	8	60	6
WAE303 015-10	1.5	10	60	6
WAE303 020-03	2	3	40	6
WAE303 020	2	6	50	6
WAE303 020-08	2	8	60	6
WAE303 020-10	2	10	60	6
WAE303 020-12	2	12	60	6
WAE303 025	2.5	8	40	6
WAE303 025-10	2.5	10	55	6
WAE303 025-12	2.5	12	60	6
WAE303 030-04	3	4	45	6
WAE303 030-08	3	8	45	6
WAE303 030	3	12	55	6
WAE303 031	3	15	65	6
WAE323 030	3	20	70	6
WAE323 031	3	25	75	6
WAE323 032	3	30	80	6
WAE303 035	3.5	12	55	6
WAE303 040-05	4	5	45	6
WAE303 040-08	4	8	45	6
WAE303 040-11	4	11	45	6
WAE303 040	4	14	55	6
WAE303 040-16	4	16	65	6
WAE303 041	4	20	70	6
WAE323 040	4	26	75	6
WAE323 041	4	30	80	6
WAE303 045	4.5	15	55	6

NEXT ≫

Aluminum Endmills ALU WAVE Series



3 FLUTE, SQUARE ENDMILL, REGULAR & LONG LENGTH - for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-ferrous material
- Suitable for high speed cutting
- Optimized design for reducing cutting load and maxi mizing chip evacuation

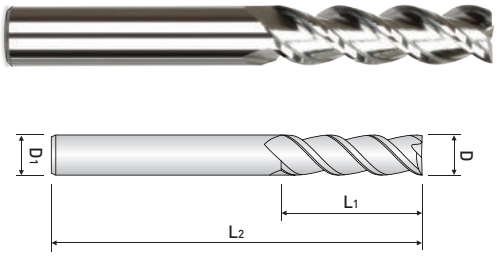
WAE30(2)3 ...series

MG FINE GRAIN | 3 | 45° HELIX | SHARP EDGE | UNCOATED | DATA p.1000

EDP. No.	D	L_1	L_2	D_2
WAE303 050-06	5	6	45	6
WAE303 050	5	17	55	6
WAE303 051	5	22	60	6
WAE303 052	5	26	70	6
WAE323 050	5	31	75	6
WAE323 051	5	36	80	6
WAE323 052	5	41	85	6
WAE323 053	5	46	90	6
WAE303 055	5.5	17	55	6
WAE303 060-07	6	7	50	6
WAE303 060-13	6	13	50	6
WAE303 060	6	17	60	6
WAE303 061	6	22	60	6
WAE303 062	6	26	70	6
WAE303 063	6	31	75	6
WAE323 060	6	36	80	6
WAE323 061	6	43	90	6
WAE323 062	6	51	100	6
WAE303 070	7	23	65	8
WAE303 080-10	8	10	60	8
WAE303 080-20	8	20	60	8
WAE303 080	8	23	70	8
WAE303 080-29	8	29	80	8
WAE303 081	8	31	80	8
WAE303 082	8	36	85	8
WAE323 080	8	41	90	8
WAE323 081	8	46	95	8
WAE323 082	8	51	100	8
WAE323 083	8	56	105	8
WAE323 084	8	66	110	8
WAE303 090	9	28	70	10
WAE303 100-12	10	12	65	10
WAE303 100-23	10	23	65	10
WAE303 100	10	28	75	10

NEXT >>

Aluminum Endmills ALU WAVE Series



3 FLUTE, SQUARE ENDMILL, REGULAR & LONG LENGTH - for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-ferrous material
- Suitable for high speed cutting
- Optimized design for reducing cutting load and maximizing chip evacuation

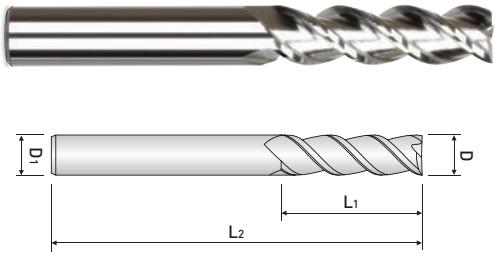
WAE30(2)3 ...series

MG FINE GRAIN | 3 | 45° HELIX | SHARP EDGE | UNCOATED | DATA p.1000

EDP. No.	D	L_1	L_2	D_2
WAE303 100-33	10	33	90	10
WAE303 101	10	36	90	10
WAE303 100-41	10	41	90	10
WAE303 102	10	46	100	10
WAE303 103	10	51	100	10
WAE323 100	10	56	110	10
WAE323 100-61	10	61	110	10
WAE323 101	10	66	120	10
WAE303 110	11	30	80	12
WAE303 120-14	12	14	70	12
WAE303 120-27	12	27	70	12
WAE303 120	12	33	80	12
WAE303 121	12	41	95	12
WAE303 122	12	46	100	12
WAE303 122-51	12	51	100	12
WAE303 123	12	56	110	12
WAE303 124-61	12	61	110	12
WAE323 120	12	66	120	12
WAE323 120-71	12	71	120	12
WAE323 121	12	76	135	12
WAE303 130	13	35	85	14
WAE303 140	14	38	90	14
WAE303 150	15	40	90	16
WAE303 160-19	16	19	90	16
WAE303 160-33	16	33	90	16
WAE303 160	16	45	100	16
WAE303 160-53	16	53	105	16
WAE303 161	16	56	110	16
WAE303 162	16	66	130	16
WAE303 163	16	76	150	16
WAE323 160	16	86	160	16
WAE323 161	16	96	180	16
WAE323 162	16	106	190	16
WAE323 163	16	116	200	16

NEXT >>

Aluminum Endmills ALU WAVE Series



3 FLUTE, SQUARE ENDMILL, REGULAR & LONG LENGTH
- for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-ferrous material
- Suitable for high speed cutting
- Optimized design for reducing cutting load and maximizing chip evacuation

WAE30(2)3 ...series

MG FINE GRAIN | 3 | 45° HELIX | SHARP EDGE | UNCOATED | DATA p.1000

EDP. No.	D	L_1	L_2	D_2
WAE303 180	18	49	100	18
WAE303 200-23	20	23	90	20
WAE303 200-39	20	39	90	20
WAE303 200	20	50	100	20
WAE303 201	20	60	110	20
WAE303 202	20	70	130	20
WAE303 203	20	76	150	20
WAE323 200	20	86	160	20
WAE323 201	20	96	180	20
WAE323 202	20	106	190	20
WAE323 203	20	116	200	20
WAE323 204	20	126	220	20
WAE303 250	25	50	120	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

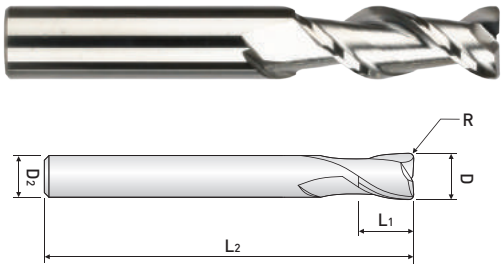
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



2 FLUTE, CORNER RADIUS ENDMILL, REGULAR LENGTH
- for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-Ferrous Material

WAR302 ...series

MG FINE GRAIN | 2 | R ±0.015 | 45° HELIX | UNCOATED | DATA p.1001

EDP. No.	D	R	L_1	L_2	D_2
WAR302 06 05	6	0.5	15	50	6
WAR302 06 10		1			
WAR302 06 15		1.5			
WAR302 06 20		2			
WAR302 08 05	8	0.5	20	60	8
WAR302 08 10		1			
WAR302 08 15		1.5			
WAR302 08 20		2			
WAR302 08 30		3			
WAR302 10 05	10	0.5	25	70	10
WAR302 10 10		1			
WAR302 10 15		1.5			
WAR302 10 20		2			
WAR302 10 30		3			
WAR302 10 40		4			
WAR302 12 10	12	1	30	75	12
WAR302 12 20		2			
WAR302 12 30		3			
WAR302 12 40		4			
WAR302 14 10	14	1	35	80	14
WAR302 14 20		2			
WAR302 14 30		3			
WAR302 14 40		4			
WAR302 14 50		5			
WAR302 16 10	16	1	40	90	16
WAR302 16 20		2			
WAR302 16 30		3			
WAR302 16 40		4			
WAR302 16 50		5			
WAR302 20 10	20	1	45	100	20
WAR302 20 20		2			
WAR302 20 30		3			
WAR302 20 40		4			
WAR302 20 50		5			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
					○			◎	

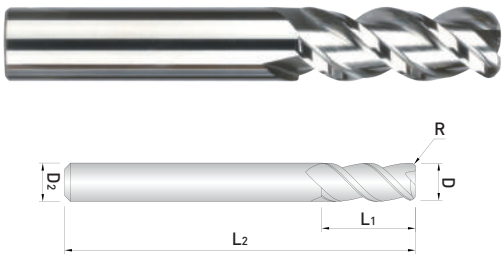
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Aluminum Endmills *ALU WAVE Series*



3 FLUTE, REGULAR LENGTH, CORNER RADIUS
- for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-Ferrous Material
- Suitable for High Speed Cutting
- Optimized design for reducing cutting load and effective chip evacuation

WAR303 ...series

ULTRA FINE HELIX p.1000

EDP. No.	D	R	L_1	L_2	D_2
WAR303 06 05	6	0.5	15	50	6
WAR303 06 10		1			
WAR303 06 15		1.5			
WAR303 06 20		2			
WAR303 08 05	8	0.5	20	60	8
WAR303 08 10		1			
WAR303 08 15		1.5			
WAR303 08 20		2			
WAR303 10 05	10	0.5	25	70	10
WAR303 10 10		1			
WAR303 10 15		1.5			
WAR303 10 20		2			
WAR303 10 30		3			
WAR303 10 40		4			
WAR303 12 10	12	1	30	75	12
WAR303 12 20		2			
WAR303 12 30		3			
WAR303 12 40		4			
WAR303 14 10	14	1	35	80	14
WAR303 14 20		2			
WAR303 14 30		3			
WAR303 14 40		4			
WAR303 14 50		5			
WAR303 16 10	16	1	40	90	16
WAR303 16 20		2			
WAR303 16 30		3			
WAR303 16 40		4			
WAR303 16 50		5			
WAR303 20 10	20	1	45	100	20
WAR303 20 20		2			
WAR303 20 30		3			
WAR303 20 40		4			
WAR303 20 50		5			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

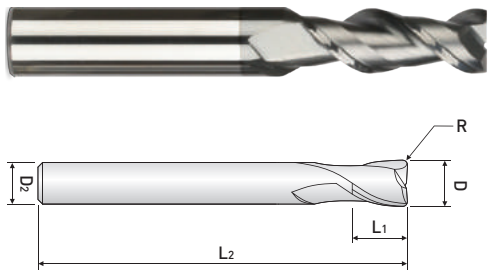
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



2 FLUTE, CORNER RADIUS ENDMILL with DLC COATING, REGULAR LENGTH
- for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-Ferrous Material
- Adjust Corner Radius to prevent chipping (Not applicable for R Shape machining)
- Diamond Film Coating maximizes the tool life
- DLC Coated to improve chip evacuation and prolong tool life

WAR502 ...series

FINE GRAIN | HELIX | D.L.C. | p.1002

EDP. No.	D	R	L_1	L_2	D_2
WAR502 010	1	0.05	3	40	6
WAR502 015	1.5	0.05	5	40	6
WAR502 020	2	0.1	6	40	6
WAR502 021		0.1	12	50	
WAR502 030	3	0.1	10	50	6
WAR502 031		0.1	20	60	
WAR502 040	4	0.1	12	50	6
WAR502 041		0.1	20	60	
WAR502 050	5	0.1	15	57	6
WAR502 060	6	0.1	15	57	6
WAR502 061		0.1	22	65	
WAR502 070	7	0.1	20	63	8
WAR502 080	8	0.1	20	63	8
WAR502 081		0.1	28	70	
WAR502 090	9	0.1	25	72	10
WAR502 100	10	0.2	28	72	10
WAR502 101		0.2	32	80	
WAR502 110	11	0.2	30	80	12
WAR502 120	12	0.2	32	80	12
WAR502 121		0.2	40	100	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
					○			◎	

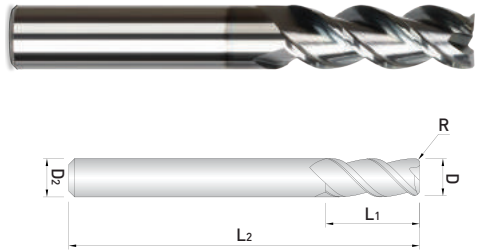
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.02	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



3 FLUTE, CORNER RADIUS ENDMILL with DLC COATING, REGULAR LENGTH
- for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-Ferrous Material
- Diamond Film Coating maximizes the tool life
- DLC Coated to improve chip evacuation and prolong tool life

WAR503 ...series

MG FINE GRAIN | 3 | 45° HELIX | R ±0.015 | D.L.C. | DATA p.1003

EDP. No.	D	R	L_1	L_2	D_2
WAR503 040	4	0.5	14	57	6
WAR503 041		1	25	62	
WAR503 060	6	0.5	16	57	6
WAR503 061		1	25	62	
WAR503 080	8	0.5	22	63	8
WAR503 081		1	35	80	
WAR503 100	10	0.5	28	72	10
WAR503 101		1	45	100	
WAR503 120	12	0.5	32	80	12
WAR503 121		1	45	100	
WAR503 160	16	0.5	45	90	16
WAR503 161		1	65	125	
WAR503 200	20	0.5	50	100	20
WAR503 201		1	70	130	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

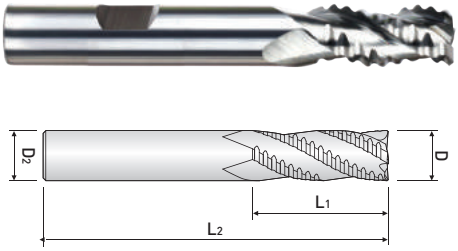
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Aluminum Endmills ALU WAVE Series



3 FLUTE, ROUGHER ENDMILL, REGULAR & LONG LENGTH - for Aluminum

- Suitable for Aluminum, Aluminum Alloy, Copper & Non-Ferrous Material
- High performance geometry and coarse pitch combined for excellent tool life
- Regular and Long lengths
- Uncoated only
- Excellent for Aluminum, Aluminum Alloys, Non-Ferrous Metals, Graphite and Plastics

WAF303 ...series

MG FINE GRAIN | 3 | 38° HELIX | COARSE Conventional Pitch | DIN 6535HA | DIN 6535HB | UNCOATED | DATA

p.1005

EDP. No.	D	L_1	L_2	D_2
WAF303 040	4	10	55	6
WAF303 050	5	15	55	6
WAF303 060	6	16	60	6
WAF303 061	6	25	80	6
WAF303 070	7	16	63	8
WAF303 080	8	20	65	8
WAF303 081	8	30	90	8
WAF303 090	9	19	72	10
WAF303 100	10	25	75	10
WAF303 101	10	40	100	10
WAF303 120	12	30	80	12
WAF303 121	12	50	110	12
WAF303 140	14	35	90	14
WAF303 160	16	42	100	16
WAF303 161	16	52	150	16
WAF303 162	16	65	125	16
WAF303 180	18	32	92	18
WAF303 200	20	38	104	20
WAF303 201	20	55	160	20

※ Flat Shank is available upon request
ex) WAF303100F : Flat shank

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
	○				○			◎	

○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

MEMO

Endmills for General & Multi-purpose

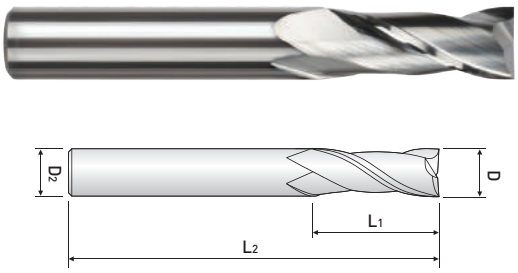
STANDARD ENDMILL SERIES

Endmills for General & Multi-purpose _ STANDARD END MILL SERIES

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
E302 ...series		REGULAR LENGTH	METRIC	•	408
E304 ...series		REGULAR LENGTH	METRIC	•	410
B302 ...series		BALL NOSE LONG LENGTH	METRIC	•	411
BL422 ...series		BALL NOSE EXTRA LONG LENGTH	METRIC	•	412
B304 ...series		BALL NOSE LONG LENGTH	METRIC	•	413
E322 ...series		LONG LENGTH	METRIC	•	414
E324 ...series		LONG LENGTH	METRIC	•	415
EB302 ...series		REGULAR LENGTH - BRAZED TYPE	METRIC	•	416
EB304 ...series		REGULAR LENGTH - BRAZED TYPE	METRIC	•	417
EB306 ...series		REGULAR LENGTH - BRAZED TYPE	METRIC	•	418
EB322 ...series		LONG LENGTH - BRAZED TYPE	METRIC	•	419
EB324 ...series		LONG LENGTH - BRAZED TYPE	METRIC	•	420
BB302 ...series		BALL NOSE REGULAR LENGTH - BRAZED TYPE	METRIC	•	421
BB342 ...series		BALL NOSE REGULAR LENGTH - BRAZED TYPE(ECONOMIC TYPE)	METRIC	•	422
EBF304 ...series		ROUGHING ENDMILL WITH BRAZED CARBIDE CUTTING	METRIC	•	423

Endmills for General & Multi-purpose STANDARD END MILL Series



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials

E302 ...series

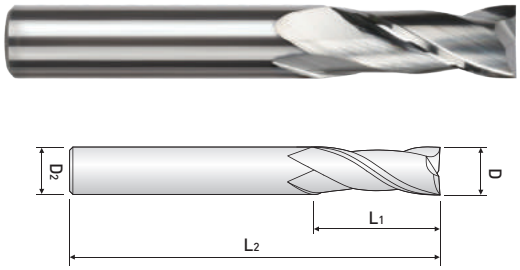
MG FINE GRAIN | 2 | 30° HELIX | DATA p.1006

EDP. No.	D	L_1	L_2	D_2
E302010S4	1	3	42	4
E302010				6
E302015S4	1.5	4	42	4
E302015				6
E302020S4	2	6	42	4
E302020				6
E302025S4	2.5	8	42	4
E302025				6
E302030	3	10	50	6
E302035	3.5	10	50	6
E302040	4	12	50	6
E302045	4.5	14	50	6
E302050	5	15	50	6
E302055	5.5	15	50	6
E302060	6	15	50	6
E302065	6.5	18	60	8
E302070	7	20	60	8
E302075	7.5	20	60	8
E302080	8	20	60	8
E302085	8.5	23	70	10
E302090	9	25	70	10
E302095	9.5	25	70	10
E302100	10	25	70	10
E302105	10.5	28	75	12
E302110	11	30	75	12

※ Please reduce cutting speed around 20~30%

NEXT ≫

Endmills for General & Multi-purpose STANDARD END MILL Series



2 FLUTE, REGULAR LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials

E302 ...series

MG FINE GRAIN

DATA p.1006

EDP. No.	D	L_1	L_2	D_2
E302115	11.5	30	75	12
E302120	12	30	75	12
E302130	13	35	85	14
E302130S16			90	16
E302140	14	35	85	14
E302140S16			90	16
E302150	15	40	90	16
E302160	16	40	90	16
E302180	18	45	100	18
E302200	20	45	100	20
E302250	25	50	120	25

※ Please reduce cutting speed around 20~30%

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

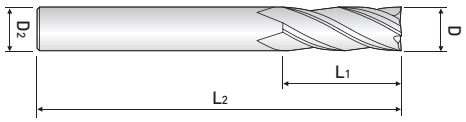
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for General & Multi-purpose STANDARD END MILL Series



4 FLUTE, REGULAR LENGTH

E304 ...series

MG FINE GRAIN | 4 | 30° HELIX | DATA p.1006

EDP. No.	D	L_1	L_2	D_2
E304020S4	2	6	42	4
E304020				6
E304025	2.5	8	42	6
E304030	3	10	50	6
E304035	3.5	10	50	6
E304040	4	12	50	6
E304045	4.5	14	50	6
E304050	5	15	50	6
E304055	5.5	15	50	6
E304060	6	15	50	6
E304065	6.5	18	60	8
E304070	7	20	60	8
E304075	7.5	20	60	8
E304080	8	20	60	8
E304085	8.5	23	70	10
E304090	9	25	70	10
E304095	9.5	25	70	10
E304100	10	25	70	10
E304105	10.5	28	75	12
E304110	11	30	75	12
E304115	11.5	30	75	12
E304120	12	30	75	12
E304130	13	35	85	14
E304130S16			90	16
E304140	14	35	85	14
E304140S16			90	16
E304150	15	40	90	16
E304160	16	40	90	16
E304180	18	45	100	18
E304200	20	45	100	20
E304250	25	50	120	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

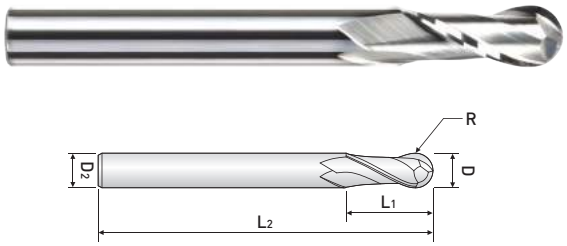
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for General & Multi-purpose STANDARD END MILL Series



2 FLUTE, BALL NOSE LONG LENGTH

B302 ...series

FINE GRAIN | HELIX | p.1007

EDP. No.	D	R	L_1	L_2	D_2
B302010	1	0.5	3	50	6
B302015	1.5	0.75	4	50	6
B302020	2	1	6	60	6
B302025	2.5	1.25	6	60	6
B302030	3	1.5	8	70	6
B302035	3.5	1.75	8	70	6
B302040	4	2	8	70	6
B302045	4.5	2.25	10	70	6
B302050	5	2.5	12	80	6
B302055	5.5	2.75	12	80	6
B302060	6	3	12	90	6
B302065	6.5	3.25	12	90	8
B302070	7	3.5	20	90	8
B302080	8	4	20	100	8
B302090	9	4.5	25	100	10
B302100	10	5	25	100	10
B302110	11	5.5	30	110	12
B302120	12	6	30	110	12
B302130	13	6.5	35	120	14
B302140	14	7	35	120	14
B302150	15	7.5	40	140	16
B302160	16	8	40	140	16
B302180	18	9	45	150	18
B302200	20	10	45	160	20
B302250	25	12.5	50	180	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

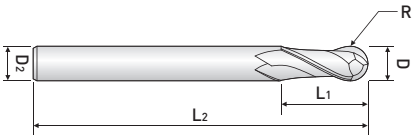
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for General & Multi-purpose STANDARD END MILL Series



2 FLUTE, BALL NOSE EXTRA LONG LENGTH

BL422 ...series

MG FINE GRAIN | 2 | 30° HELIX | R ±0,02 | DATA p.1007

EDP. No.	D	R	L_1	L_2	D_2
BL422030	3	1.5	30	75	3
BL422040	4	2	30	75	4
BL422050	5	2.5	40	100	5
BL422060	6	3	50	150	6
BL422080	8	4	50	150	8
BL422100	10	5	60	150	10
BL422120	12	6	75	150	12
BL422140	14	7	75	150	14
BL422160	16	8	75	150	16
BL422180	18	9	75	150	18
BL422200	20	10	75	150	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

○:General Application ◎:The most suitable Application

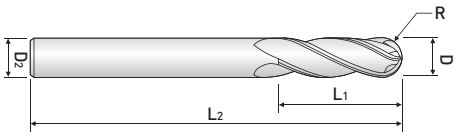
■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for General & Multi-purpose STANDARD END MILL Series

4 FLUTE, BALL NOSE LONG LENGTH



B304 ...series

MG FINE GRAIN | 4 | 30° HELIX | R ±0,02 | DATA p.1007

EDP. No.	D	R	L_1	L_2	D_2
B304030	3	1.5	8	70	6
B304040	4	2	8	70	6
B304050	5	2.5	12	80	6
B304060	6	3	12	90	6
B304070	7	3.5	20	90	8
B304080	8	4	20	100	8
B304090	9	4.5	25	100	10
B304100	10	5	25	100	10
B304110	11	5.5	30	110	12
B304120	12	6	30	110	12
B304130	13	6.5	35	120	14
B304140	14	7	35	120	14
B304150	15	7.5	40	140	16
B304160	16	8	40	140	16
B304180	18	9	45	150	18
B304200	20	10	45	160	20
B304250	25	12.5	50	180	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

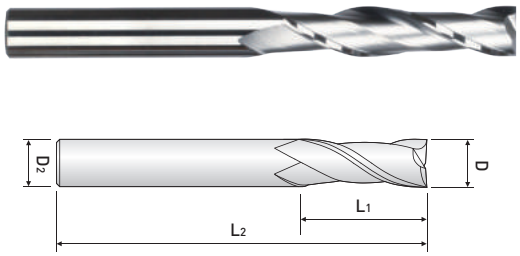
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for General & Multi-purpose STANDARD END MILL Series



2 FLUTE, LONG LENGTH

E322 ...series

MG FINE GRAIN | 2 | 30° HELIX | DATA p.1006

EDP. No.	D	L_1	L_2	D_2
E322030	3	25	75	6
E322040	4	25	75	6
E322050	5	30	85	6
E322060	6	30	85	6
E322070	7	35	85	8
E322080	8	35	85	8
E322090	9	45	100	10
E322100	10	45	100	10
E322101		60	155	
E322120	12	55	120	12
E322121		65	155	
E322140	14	60	120	14
E322160	16	60	120	16
E322161		75	165	
E322180	18	60	120	18
E322200	20	60	120	20
E322201		75	165	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

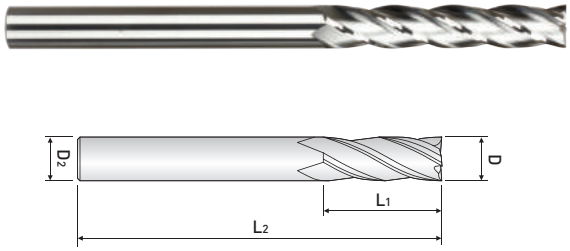
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for General & Multi-purpose STANDARD END MILL Series



4 FLUTE, LONG LENGTH

E324 ...series

MG FINE GRAIN | 4 | 30° HELIX | DATA p.1006

EDP. No.	D	L_1	L_2	D_2
E324030	3	25	75	6
E324040	4	25	75	6
E324050	5	30	85	6
E324060	6	30	85	6
E324070	7	35	85	8
E324080	8	35	85	8
E324090	9	45	100	10
E324100	10	45	100	10
E324101		60	155	
E324120	12	55	120	12
E324121		65	155	
E324140	14	60	120	14
E324160	16	60	120	16
E324161		75	165	
E324180	18	60	120	18
E324200	20	60	120	20
E324201		75	165	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

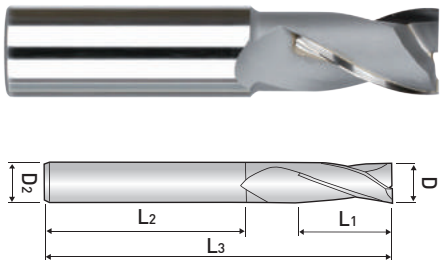
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Dia.	ø1~ø3	ø3~ø6	ø6~ø10	ø10~ø18	ø18~ø30
Cutting Edge(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Endmills for General & Multi-purpose STANDARD END MILL Series



2 FLUTE, REGULAR LENGTH
- BRAZED TYPE

EB302 ...series

MG FINE GRAIN
2
30° HELIX

EDP. No.	D	L_1	L_2	L_3	D_2
EB302140	14	28	60	98	16
EB302150	15	28	60	98	16
EB302160	16	28	60	98	16
EB302170	17	32	70	115	20
EB302180	18	32	70	115	20
EB302190	19	32	70	115	20
EB302200	20	32	70	115	20
EB302210	21	32	70	115	20
EB302220	22	32	70	115	20
EB302230	23	40	85	140	25
EB302240	24	40	85	140	25
EB302250	25	40	85	140	25
EB302260	26	40	85	140	25
EB302270	27	40	85	140	25
EB302280	28	40	85	140	25
EB302290	29	50	85	150	32
EB302300	30	50	85	150	32
EB302310	31	50	85	150	32
EB302320	32	50	85	150	32
EB302350	35	50	85	150	32
EB302360	36	50	85	150	32
EB302380	38	55	85	155	32
EB302400	40	55	85	155	32
EB302420	42	55	85	155	32
EB302450	45	63	85	160	32
EB302500	50	63	85	160	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

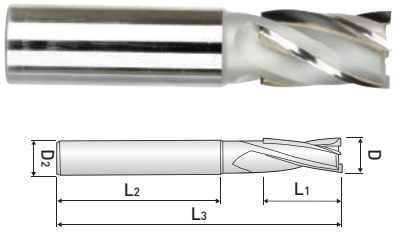
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.05	h7

※Items can be changed for quality improvement without notice.

Endmills for General & Multi-purpose STANDARD END MILL Series



4 FLUTE, REGULAR LENGTH
- BRAZED TYPE

EB304 ...series

MG FINE GRAIN | 4 | 30° HELIX

EDP. No.	D	L_1	L_2	L_3	D_2
EB304140	14	28	60	98	16
EB304150	15	28	60	98	16
EB304160	16	28	60	98	16
EB304170	17	32	70	115	20
EB304180	18	32	70	115	20
EB304190	19	32	70	115	20
EB304200	20	32	70	115	20
EB304210	21	32	70	115	20
EB304220	22	32	70	115	20
EB304230	23	40	85	140	25
EB304240	24	40	85	140	25
EB304250	25	40	85	140	25
EB304260	26	40	85	140	25
EB304270	27	40	85	140	25
EB304280	28	40	85	140	25
EB304290	29	50	85	150	32
EB304300	30	50	85	150	32
EB304310	31	50	85	150	32
EB304320	32	50	85	150	32
EB304350	35	50	85	150	32
EB304360	36	50	85	150	32
EB304380	38	55	85	155	32
EB304400	40	55	85	155	32
EB304420	42	55	85	155	32
EB304450	45	63	85	160	32
EB304500	50	63	85	160	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

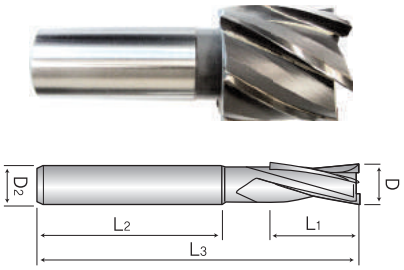
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.05	h7

※Items can be changed for quality improvement without notice.

Endmills for General & Multi-purpose STANDARD END MILL Series



6 FLUTE, REGULAR LENGTH
- BRAZED TYPE

EB306 ...series

MG FINE GRAIN | 6 | 30° HELIX

EDP. No.	D	L_1	L_2	L_3	D_2
EB306 300	30	50	85	150	32
EB306 320	32	50	85	150	32
EB306 350	35	50	85	150	32
EB306 380	38	55	85	155	32
EB306 380 S42	38	55	85	155	42
EB306 400	40	55	85	155	32
EB306 400 S42	40	55	85	155	42
EB306 420	42	55	85	155	32
EB306 420 S42	42	55	85	155	42
EB306 450	45	63	85	160	32
EB306 450 S42	45	63	85	160	42
EB306 500	50	63	85	160	32
EB306 500 S42	50	63	85	160	42

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

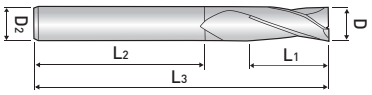
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.05	h7

※Items can be changed for quality improvement without notice.

Endmills for General & Multi-purpose STANDARD END MILL Series



2 FLUTE, LONG LENGTH
- BRAZED TYPE

EB322 ...series

FINE GRAIN HELIX

EDP. No.	D	L_1	L_2	L_3	D_2
EB322140	14	50	60	130	16
EB322150	15	50	60	130	16
EB322160	16	50	60	130	16
EB322180	18	60	60	140	20
EB322200	20	60	60	140	20
EB322220	22	60	60	140	20
EB322240	24	70	60	150	25
EB322250	25	70	60	150	25
EB322260	26	70	60	150	25
EB322280	28	70	60	150	25
EB322300	30	80	70	180	32
EB322320	32	90	70	190	32
EB322350	35	100	70	200	32
EB322380	38	100	70	220	32
EB322400	40	100	70	220	32
EB322450	45	120	80	230	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

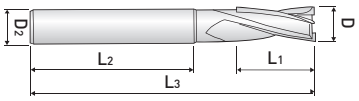
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.05	h7

※Items can be changed for quality improvement without notice.

Endmills for General & Multi-purpose STANDARD END MILL Series



4 FLUTE, LONG LENGTH
- BRAZED TYPE

EB324 ...series

FINE GRAIN HELIX

EDP. No.	D	L_1	L_2	L_3	D_2
EB324140	14	50	60	130	16
EB324150	15	50	60	130	16
EB324160	16	50	60	130	16
EB324180	18	60	60	140	20
EB324200	20	60	60	140	20
EB324220	22	60	60	140	20
EB324240	24	70	60	150	25
EB324250	25	70	60	150	25
EB324260	26	70	60	150	25
EB324280	28	70	60	150	25
EB324300	30	80	70	180	32
EB324320	32	90	70	190	32
EB324350	35	100	70	200	32
EB324380	38	100	70	220	32
EB324400	40	100	70	220	32
EB324450	45	120	80	230	32
EB324500	50	140	80	240	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

○:General Application ◎:The most suitable Application

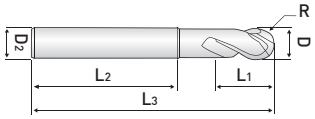
■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.05	h7

※Items can be changed for quality improvement without notice.

Endmills for General & Multi-purpose STANDARD END MILL Series

2 FLUTE, BALL NOSE REGULAR LENGTH
- BRAZED TYPE



BB302 ...series

MG FINE GRAIN
2
30° HELIX

EDP. No.	D	R	L_1	L_2	L_3	D_2
BB302150	15	7.5	28	55	100	16
BB302160	16	8	28	55	100	16
BB302180	18	9	29	55	110	20
BB302200	20	10	29	55	110	20
BB302220	22	11	36	60	110	25
BB302240	24	12	37	60	110	25
BB302250	25	12.5	38	60	120	25
BB302280	28	14	40	65	120	32
BB302300	30	15	46	65	130	32
BB302320	32	16	47	65	140	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

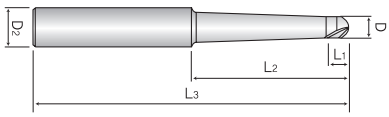
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.05	h7

※Items can be changed for quality improvement without notice.

Endmills for General & Multi-purpose STANDARD END MILL Series



2 FLUTE, BALL NOSE ECONOMIC
- BRAZED TYPE

BB342 ...series

FINE GRAIN HELIX

EDP. No.	D	R	L_1	L_2	L_3	D_2
BB342 150	15	7.5	15	40	100	20
BB342 160	16	8	15	40	100	20
BB342 170	17	8.5	16	45	110	25
BB342 180	18	9	16	45	110	25
BB342 190	19	9.5	17	45	110	25
BB342 200	20	10	17	45	110	25
BB342 210	21	10.5	17	45	110	25
BB342 220	22	11	17	45	110	25
BB342 240	24	12	20	55	120	32
BB342 250	25	12.5	20	55	120	32
BB342 280	28	14	22	65	130	32
BB342 300	30	15	25	65	130	32
BB342 320	32	16	25	75	140	32

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

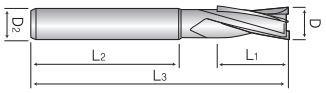
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.05	h7

※Items can be changed for quality improvement without notice.

Endmills for General & Multi-purpose STANDARD END MILL Series



4 FLUTE, ROUGHING ENDMILL
- BRAZED TYPE

EBF304 ...series

MG FINE GRAIN | 4 | 30° HELIX | CHAMFERED Chamfered Pitch Type

EDP. No.	D	L_1	L_2	L_3	D_2
EBF304 160	16	28	60	98	16
EBF304 180	18	32	70	115	20
EBF304 200	20	32	70	115	20
EBF304 250	25	40	85	140	25
EBF304 300	30	50	85	150	32
EBF304 320	32	50	85	150	32
EBF304 350	35	50	85	150	32
EBF304 400	40	55	85	155	42
EBF304 420	42	55	85	155	42
EBF304 450	45	63	85	160	42
EBF304 500	50	63	85	160	42

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○								

○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.05	h7

※Items can be changed for quality improvement without notice.

MEMO

Endmills for Mold & Die

WINNER SERIES

ENDMILL SERIES

Endmills for Mold & Die _ WINNER SERIES

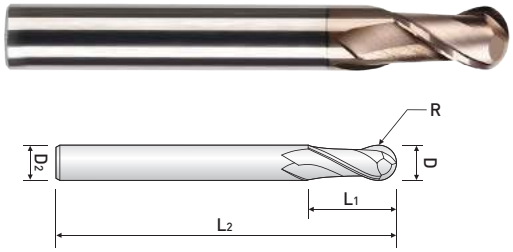
WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
WHPB902 ... series		APPLIED UTRA-HIGH PRECISION R TOLERANCE	METRIC	•	428
WB502 ... series		SHORT LENGTH + REGULAR LENGTH + LONG LENGTH	METRIC	•	429
WB502---P ... series		HIGH PRECISION	METRIC	•	433
WB512 ... series		for RIB PROCESSING	METRIC	•	434
WB512---S6 ... series		for RIB PROCESSING (Shank-6)	METRIC	•	441
WB542... series		TAPER NECK	METRIC	•	444
WB532... series		MILLING MACHINE COPY	METRIC	•	455
WSB502... series		STRAIGHT FLUTE	METRIC	•	456
WB503... series		HIGH FEED & CENTER MATCH	METRIC	•	457
WB504... series		HIGH FEED	METRIC	•	458
WR502 ... series		SHORT LENGTH + REGULAR LENGTH + LONG LENGTH	METRIC	•	459
WR512 ... series		LONG NECK	METRIC	•	464
WR542 ... series		TAPER NECK	METRIC	•	476
WDR503 ... series		DOUBLE CORNER RADIUS	METRIC	•	486
WXR504 ... series		SHORT LENGTH+REGULAR LENGTH +LONG SHANK+VARIABLE INDEX GEOMETRY	METRIC	•	487
WXR514 ... series		LONG NECK +VARIABLE INDEX GEOMETRY	METRIC	•	491
WR544 ... series		TAPER NECK	METRIC	•	501
WSPM4 ... series		HIGH FEED	METRIC	•	508
WR504 ... series		SHORT LENGTH+REGULAR LENGTH +END TEETH VARIABLE INDEX GEOMETRY	METRIC	•	510
WR514 ... series		LONG NECK CORNER RADIUS	METRIC	•	512
WR506 ... series		45°CORNER RADIUS	METRIC	•	513

Endmills for Mold & Die _ WINNER SERIES

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
WME502 ... series		Ø0.03~	METRIC	•	514
WE502---S4 ... series		Ø0.1 + SHANK 4	METRIC	•	516
WE502---S3 ... series		SHANK 3	METRIC	•	517
WE502 ... series		SHORT + REGULAR + LONG LENGTH	METRIC	•	518
WE522 ... series		LONG	METRIC	•	521
WE512 ... series		LONG NECK	METRIC	•	525
WME504 ... series		VARIABLE INDEX GEOMETRY	METRIC	•	532
WXE504... series		SHORT + REGULAR + LONG LENGTH + VARIABLE INDEX GEOMETRY	METRIC	•	534
WE524 ... series		LONG	METRIC	•	536
WE514 ... series		LONG NECK	METRIC	•	540
WE504---H ... series		45°HELIX + REGULAR + LONG	METRIC	•	544
WE506 ... series		45°HELIX + REGULAR + LONG	METRIC	•	546
WF61 ... series		ROUGHING ENDMILL	METRIC	•	547
WF60 ... series		ROUGHING ENDMILL-CORNER R	METRIC	•	548
WTE502 ... series		TAPER	METRIC	•	549
WTE504 ... series		TAPER	METRIC	•	553
WTE514 ... series		RIB	METRIC	•	555
WTB502 ... series		TAPER BALL	METRIC	•	560
WTR504 ... series		TAPER CORNER RADIUS	METRIC	•	562

Endmills for Mold & Die(Ball) WINNER Series



ULTRA HIGH PRECISION BALL ENDMILLS

- Longer tool life and improvement on stable machining by the newest W Coating
- Actualization of high precision by applying the world's first Ultra precision Tolerance

WHPB902 .....series

ULTRA FINE | HELIX | R≤1.5 | 1.5<R≤3 | R>3 | W Coating | p.1008

EDP. No.	D	R	L_1	L_2	D_2
WHPB902 001	0.1	0.05	0.2	40	4
WHPB902 0015	0.15	0.075	0.3	40	4
WHPB902 002	0.2	0.1	0.4	40	4
WHPB902 003	0.3	0.15	0.6	40	4
WHPB902 004	0.4	0.2	0.8	40	4
WHPB902 005	0.5	0.25	1.0	40	4
WHPB902 006	0.6	0.3	1.2	40	4
WHPB902 007	0.7	0.35	1.4	40	4
WHPB902 008	0.8	0.4	1.6	40	4
WHPB902 009	0.9	0.45	1.8	40	4
WHPB902 010	1.0	0.5	2.5	50	6
WHPB902 012	1.2	0.6	3.0	50	6
WHPB902 015	1.5	0.75	4.0	50	6
WHPB902 020	2.0	1	5.0	50	6
WHPB902 025	2.5	1.25	6.0	60	6
WHPB902 030	3.0	1.5	6.0	60	6
WHPB902 040	4.0	2	8.0	70	6
WHPB902 050	5.0	2.5	10.0	80	6
WHPB902 060	6.0	3	12.0	90	6
WHPB902 080	8.0	4	14.0	100	8
WHPB902 100	10.0	5	18.0	100	10
WHPB902 120	12.0	6	24.0	110	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
						◎		○	

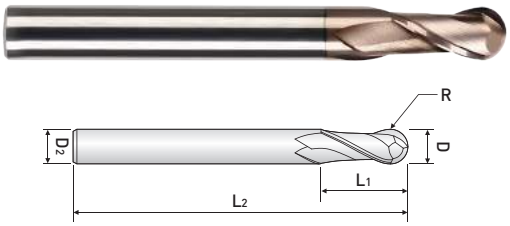
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE BALL,
SHORT LENGTH + REGULAR LENGTH + LONG LENGTH

- Better wear resistance and machining with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

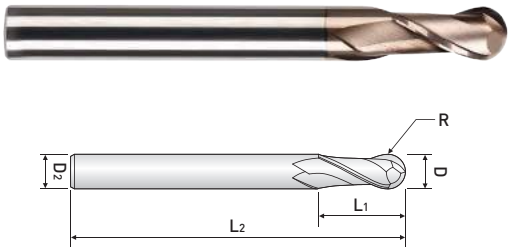
WB502 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1008

EDP. No.	D	R	L_1	L_2	D_2
WB502 001S	0.1	0.05	0.1	40	4
WB502 001			0.2	40	4
WB502 001 S3			0.2	40	3
WB502 0015S	0.15	0.075	0.15	40	4
WB502 0015			0.3	40	4
WB502 0015 S3			0.3	40	3
WB502 002S	0.2	0.1	0.2	40	4
WB502 002			0.4	40	4
WB502 002 S3			0.4	40	3
WB502 003S	0.3	0.15	0.3	40	4
WB502 003			0.6	40	4
WB502 003 S3			0.6	40	3
WB502 004S	0.4	0.2	0.4	40	4
WB502 004			0.8	40	4
WB502 004 S3			0.8	40	3
WB502 005S	0.5	0.25	0.5	40	4
WB502 005			1.0	40	4
WB502 005 S3			1.0	40	3
WB502 006S	0.6	0.3	0.6	40	4
WB502 006			1.2	40	4
WB502 006 S3			1.2	40	3
WB502 007S	0.7	0.35	0.7	40	4
WB502 007			1.4	40	4
WB502 007 S3			1.4	40	3
WB502 008S	0.8	0.4	0.8	40	4
WB502 008			1.6	40	4
WB502 008 S3			1.6	40	3
WB502 009S	0.9	0.45	0.9	40	4
WB502 009			1.8	40	4
WB502 009 S3			1.8	40	3
WB502 010S	1.0	0.5	1.5	40	6
WB502 010 S3			2.5	50	3
WB502 010 S4			2.5	50	4
WB502 010			2.5	50	6
WB502 010 070			2.5	70	6
WB502 010 100			2.5	100	6

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE BALL,
SHORT LENGTH + REGULAR LENGTH + LONG LENGTH

- Better wear resistance and machining with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

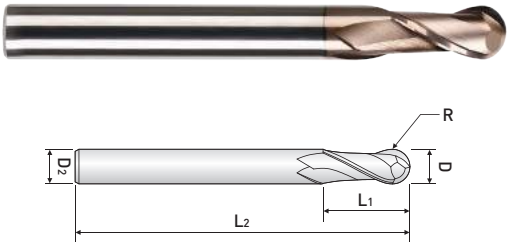
WB502 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1008

EDP. No.	D	R	L_1	L_2	D_2
WB502 0120S	1.2	0.6	2.0	40	6
WB502 012 S3			3.0	50	3
WB502 012 S4			3.0	50	4
WB502 012			3.0	50	6
WB502 012 070			3.0	70	6
WB502 012 100			3.0	100	6
WB502 015S	1.5	0.75	2.5	40	6
WB502 015 S3			4.0	50	3
WB502 015 S4			4.0	50	4
WB502 015			4.0	50	6
WB502 015 070			4.0	70	6
WB502 015 100			4.0	100	6
WB502 020S	2.0	1	3.0	40	6
WB502 020 S3			5.0	50	3
WB502 020 S4			5.0	50	4
WB502 020			5.0	50	6
WB502 020 080			5.0	80	6
WB502 020 100			5.0	100	6
WB502 025S	2.5	1.25	4.0	40	6
WB502 025 S3			6.0	60	3
WB502 025 S4			6.0	60	4
WB502 025			6.0	60	6
WB502 025 080			6.0	80	6
WB502 025 100			6.0	100	6
WB502 030S	3.0	1.5	4.5	40	6
WB502 030 S3			6.0	60	3
WB502 030 S4			6.0	60	4
WB502 030			6.0	60	6
WB502 030 080			6.0	80	6
WB502 030 100			6.0	100	6
WB502 035	3.5	1.75	8.0	70	6
WB502 040S	4.0	2	6.0	50	6
WB502 040 S4			8.0	70	4
WB502 040			8.0	70	6
WB502 040 100 S4			8.0	100	4
WB502 040 120 S4			8.0	120	4
WB502 040 100			8.0	100	6
WB502 040 120			8.0	120	6

NEXT >>

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE BALL,
SHORT LENGTH + REGULAR LENGTH + LONG LENGTH

- Better wear resistance and machining with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

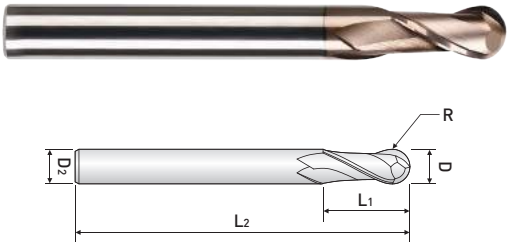
WB502 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1008

EDP. No.	D	R	L_1	L_2	D_2
WB502 045	4.5	2.25	9.0	80	6
WB502 050S	5.0	2.5	7.5	60	6
WB502 050			10.0	80	6
WB502 050 S5			10.0	80	5
WB502 055	5.5	2.75	11.0	90	6
WB502 060S	6.0	3	9.0	50	6
WB502 060 060			9.0	60	6
WB502 060 080			9.0	80	6
WB502 060			12.0	90	6
WB502 060 110			12.0	110	6
WB502 060 130			12.0	130	6
WB502 060 150			12.0	150	6
WB502 065	6.5	3.25	13.0	90	8
WB502 070	7.0	3.5	14.0	90	8
WB502 080S	8.0	4	12.0	50	8
WB502 080 060			12.0	60	8
WB502 080 080			12.0	80	8
WB502 080 090			12.0	90	8
WB502 080			14.0	100	8
WB502 080 130			14.0	130	8
WB502 080 150			14.0	150	8
WB502 085	8.5	4.25	16.0	100	10
WB502 090	9.0	4.5	18.0	100	10
WB502 100S	10.0	5	15.0	50	10
WB502 100 060			15.0	60	10
WB502 100 080			15.0	80	10
WB502 100 090			15.0	90	10
WB502 100			18.0	100	10
WB502 100 130			18.0	130	10
WB502 100 150			18.0	150	10
WB502 100 180			18.0	180	10
WB502 100 200			18.0	200	10
WB502 110	11.0	5.5	20.0	100	12
WB502 120S	12.0	6	18.0	60	12
WB502 120 080			18.0	80	12
WB502 120 090			18.0	90	12
WB502 120 100			18.0	100	12
WB502 120			24.0	110	12

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE BALL,
SHORT LENGTH + REGULAR LENGTH + LONG LENGTH

- Better wear resistance and machining with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

WB502 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1008

EDP. No.	D	R	L_1	L_2	D_2
WB502 120 130	12.0	6	24.0	130	12
WB502 120 150			24.0	150	12
WB502 120 180			24.0	180	12
WB502 120 200			24.0	200	12
WB502 130	13.0	6.5	24.0	100	12
WB502 140 S12	14.0	7	26.0	100	12
WB502 140			26.0	100	14
WB502 140 S16			26.0	100	16
WB502 150	15.0	7.5	28.0	140	16
WB502 160 100	16.0	8	24.0	100	16
WB502 160 130			24.0	130	16
WB502 160			30.0	150	16
WB502 160 180			30.0	180	16
WB502 160 200			30.0	200	16
WB502 180 S16	18.0	9	34.0	150	16
WB502 180			34.0	150	18
WB502 200 100	20.0	10	30.0	100	20
WB502 200 130			30.0	130	20
WB502 200			38.0	150	20
WB502 200 200			38.0	200	20
WB502 250 120	25.0	12.5	50.0	120	25
WB502 250			50.0	180	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

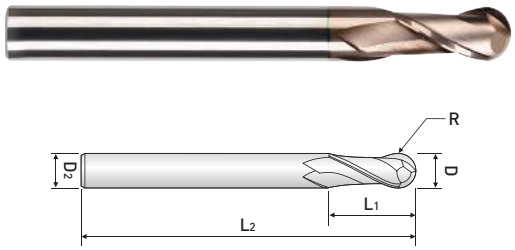
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



High PRECISION BALL

- High precise performance with R tolerance below 3 micron
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WB502...P ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating

EDP. No.	D	R	L_1	L_2	D_2
WB502 001P	0.1	0.05	0.2	40	4
WB502 0015P	0.15	0.075	0.3	40	4
WB502 002P	0.2	0.1	0.4	40	4
WB502 003P	0.3	0.15	0.6	40	4
WB502 004P	0.4	0.2	0.8	40	4
WB502 005P	0.5	0.25	1.0	40	4
WB502 006P	0.6	0.3	1.2	40	4
WB502 007P	0.7	0.35	1.4	40	4
WB502 008P	0.8	0.4	1.6	40	4
WB502 009P	0.9	0.45	1.8	40	4
WB502 010P	1.0	0.5	2.5	50	6
WB502 012P	1.2	0.6	3.0	50	6
WB502 015P	1.5	0.75	4.0	50	6
WB502 020P	2.0	1	5.0	50	6
WB502 025P	2.5	1.25	6.0	60	6
WB502 030P	3.0	1.5	6.0	60	6
WB502 040P	4.0	2	8.0	70	6
WB502 050P	5.0	2.5	10.0	80	6
WB502 060P	6.0	3	12.0	90	6
WB502 080P	8.0	4	14.0	100	8
WB502 100P	10.0	5	18.0	100	10
WB502 120P	12.0	6	24.0	110	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

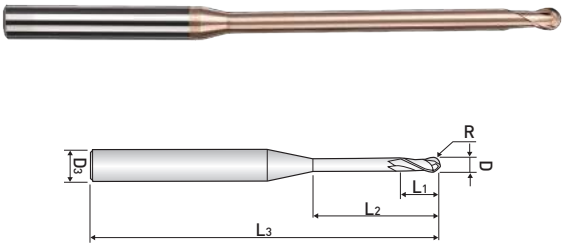
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0 ~ -0.012	h6
over 6	0 ~ -0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING

- Excellent effect in preventing breakage with a shape of neck without notch
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

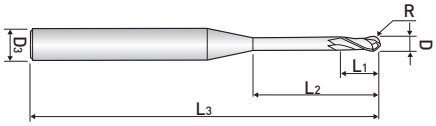
WB512 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating p.1009~1012

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 001 002	0.1	0.05	0.1	0.2	40	4
WB512 001 003				0.3		
WB512 001 005				0.5		
WB512 001 01				1.0		
WB512 002 005	0.2	0.1	0.2	0.5	40	4
WB512 002 01				1.0		
WB512 002 015				1.5		
WB512 002 02				2.0		
WB512 002 03				3.0		
WB512 003 01	0.3	0.15	0.3	1.0	40	4
WB512 003 015				1.5		
WB512 003 02				2.0		
WB512 003 025				2.5		
WB512 003 03				3.0		
WB512 003 04				4.0		
WB512 003 05				5.0		
WB512 004 01	0.4	0.2	0.4	1.0	40	4
WB512 004 015				1.5		
WB512 004 02				2.0		
WB512 004 025				2.5		
WB512 004 03				3.0		
WB512 004 04				4.0		
WB512 004 05				5.0		
WB512 004 06				6.0		
WB512 004 08				8.0		
WB512 004 10				10.0		
WB512 005 01	0.5	0.25	0.5	1.0	45	4
WB512 005 015				1.5		
WB512 005 02				2.0		
WB512 005 025				2.5		
WB512 005 03				3.0		
WB512 005 04				4.0		
WB512 005 05				5.0		
WB512 005 06				6.0		
WB512 005 08				8.0		
WB512 005 10				10.0		

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING

- Excellent effect in preventing breakage with a shape of neck without notch
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

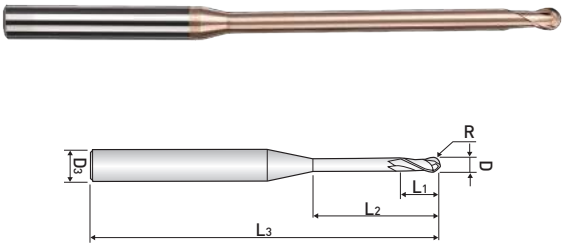
WB512 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating p.1009~1012

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 005 12	0.5	0.25	0.5	12.0	45	4
WB512 005 14				14.0		
WB512 005 16				16.0		
WB512 006 01	0.6	0.3	0.6	1.0	45	4
WB512 006 02				2.0		
WB512 006 03				3.0		
WB512 006 04				4.0		
WB512 006 05				5.0		
WB512 006 06				6.0		
WB512 006 08				8.0		
WB512 006 10				10.0		
WB512 006 12				12.0		
WB512 006 14				14.0	50	
WB512 006 16				16.0		
WB512 007 02	0.7	0.35	0.7	2.0	45	4
WB512 007 04				4.0		
WB512 007 06				6.0		
WB512 007 08				8.0		
WB512 007 10				10.0		
WB512 007 12				12.0		
WB512 008 01	0.8	0.4	0.8	1.0	45	4
WB512 008 02				2.0		
WB512 008 03				3.0		
WB512 008 04				4.0		
WB512 008 05				5.0		
WB512 008 06				6.0		
WB512 008 08				8.0		
WB512 008 10				10.0		
WB512 008 12				12.0		
WB512 008 14				14.0	50	
WB512 008 16				16.0		
WB512 008 20				20.0	55	
WB512 009 04	0.9	0.45	0.9	4.0	45	4
WB512 009 06				6.0		
WB512 009 08				8.0		
WB512 009 10				10.0		

NEXT ≫≫

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING

- Excellent effect in preventing breakage with a shape of neck without notch
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

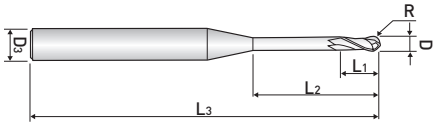
WB512 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating p.1009~1012

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 010 02	1.0	0.5	1.0	2.0	50	4
WB512 010 03				3.0		
WB512 010 04				4.0		
WB512 010 05				5.0		
WB512 010 06				6.0		
WB512 010 07				7.0		
WB512 010 08				8.0		
WB512 010 09				9.0		
WB512 010 10				10.0		
WB512 010 12				12.0		
WB512 010 14				14.0		
WB512 010 16				16.0		
WB512 010 18				18.0		
WB512 010 20				20.0	55	
WB512 010 22				22.0	60	
WB512 010 26				26.0		
WB512 010 30				30.0	70	
WB512 010 40				40.0	80	
WB512 010 50				50.0	100	
WB512 012 04	1.2	0.6	1.2	4.0	50	4
WB512 012 06				6.0		
WB512 012 08				8.0		
WB512 012 10				10.0		
WB512 012 12				12.0		
WB512 012 16				16.0		
WB512 012 20				20.0	55	
WB512 012 26				26.0	60	
WB512 014 06	1.4	0.7	1.4	6.0	50	4
WB512 014 08				8.0		
WB512 014 10				10.0		
WB512 014 12				12.0		
WB512 014 16				16.0		

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING

- Excellent effect in preventing breakage with a shape of neck without notch
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

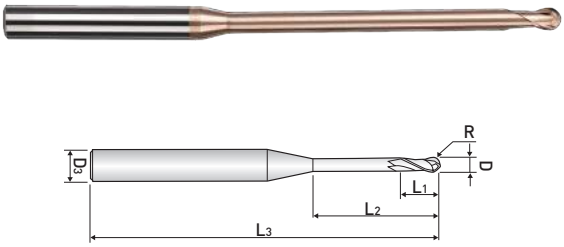
WB512 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating p.1009~1012

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 015 03	1.5	0.75	1.5	3.0	50	4
WB512 015 04				4.0		
WB512 015 05				5.0		
WB512 015 06				6.0		
WB512 015 07				7.0		
WB512 015 08				8.0		
WB512 015 10				10.0		
WB512 015 12				12.0		
WB512 015 14				14.0		
WB512 015 16				16.0		
WB512 015 18				18.0		
WB512 015 20				20.0	55	
WB512 015 22				22.0	60	
WB512 015 26				26.0		
WB512 015 30				30.0	70	
WB512 015 35				35.0		
WB512 015 40				40.0	80	
WB512 016 04	1.6	0.8	1.6	4.0	50	4
WB512 016 06				6.0		
WB512 016 08				8.0		
WB512 016 10				10.0		
WB512 016 12				12.0		
WB512 016 16				16.0		
WB512 016 20				20.0	55	
WB512 018 04	1.8	0.9	1.8	4.0	50	4
WB512 018 06				6.0		
WB512 018 08				8.0		
WB512 018 10				10.0		
WB512 018 12				12.0		
WB512 018 16				16.0		
WB512 018 20				20.0	55	
WB512 020 04	2.0	1	2.0	4.0	50	4
WB512 020 06				6.0		
WB512 020 08				8.0		
WB512 020 10				10.0		
WB512 020 12				12.0		

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING

- Excellent effect in preventing breakage with a shape of neck without notch
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

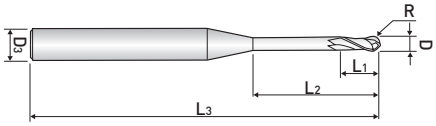
WB512 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating p.1009~1012

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 020 14	2.0	1	2.0	14.0	50	4
WB512 020 16				16.0		
WB512 020 18				18.0	55	
WB512 020 20				20.0		
WB512 020 22				22.0	60	
WB512 020 26				26.0		
WB512 020 30				30.0	70	
WB512 020 35				35.0		
WB512 020 40				40.0	80	
WB512 020 45				45.0	90	
WB512 020 50				50.0	100	
WB512 020 60				60.0	110	
WB512 025 08	2.5	1.25	2.5	8.0	50	4
WB512 025 10				10.0		
WB512 025 12				12.0		
WB512 025 16				16.0		
WB512 025 20				20.0		
WB512 025 22				22.0	60	
WB512 025 26				26.0		
WB512 025 30				30.0	70	
WB512 025 35				35.0		
WB512 025 40				40.0	80	
WB512 025 45				45.0	90	
WB512 025 50				50.0	100	
WB512 030 06	3.0	1.5	3.0	6.0	50	6
WB512 030 08				8.0		
WB512 030 10				10.0		
WB512 030 12				12.0		
WB512 030 14				14.0	60	
WB512 030 16				16.0		
WB512 030 18				18.0		
WB512 030 20				20.0		
WB512 030 22				22.0	65	
WB512 030 26				26.0		
WB512 030 30				30.0	70	
WB512 030 35				35.0		
WB512 030 40				40.0	80	
WB512 030 45				45.0	90	

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING

- Excellent effect in preventing breakage with a shape of neck without notch
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

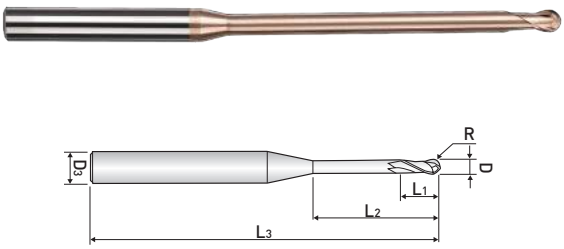
WB512 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating p.1009~1012

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 030 50	3.0	1.5	3.0	50.0	100	6
WB512 030 60				60.0		
WB512 040 08	4.0	2	4.0	8.0	50	6
WB512 040 10				10.0		
WB512 040 12				12.0		
WB512 040 14				14.0	60	
WB512 040 16				16.0		
WB512 040 18				18.0		
WB512 040 20				20.0		
WB512 040 22				22.0	65	
WB512 040 26				26.0		
WB512 040 30				30.0	70	
WB512 040 35				35.0		
WB512 040 40				40.0	80	
WB512 040 45				45.0	90	
WB512 040 50				50.0	100	
WB512 040 55				55.0		
WB512 040 60				60.0		
WB512 050 15	5.0	2.5	6.0	15.0	60	6
WB512 050 20				20.0		
WB512 050 26				26.0	65	
WB512 050 30				30.0	70	
WB512 050 35				35.0		
WB512 050 40				40.0	80	
WB512 050 45				45.0	90	
WB512 050 50				50.0	100	
WB512 050 55				55.0		
WB512 050 60				60.0		
WB512 060 20	6.0	3	8.0	20.0	60	6
WB512 060 30				30.0		
WB512 060 20 90			12.0	20.0	90	
WB512 060 30 90				30.0		

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING

- Excellent effect in preventing breakage with a shape of neck without notch
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel Alloy Steel, Carbon Steel

WB512 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating p.1009~1012

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 080 25	8.0	4	10.0	25.0	70	8
WB512 080 35				35.0		
WB512 080 25 100			14.0	25.0	100	
WB512 080 35 100				35.0		
WB512 100 30	10.0	5	12.0	30.0	75	10
WB512 100 40				40.0		
WB512 100 30 100			18.0	30.0	100	
WB512 100 40 100				40.0		
WB512 120 32	12.0	6	14.0	32.0	80	12
WB512 120 45				45.0		
WB512 120 32 110			22.0	32.0	110	
WB512 120 45 110				45.0		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

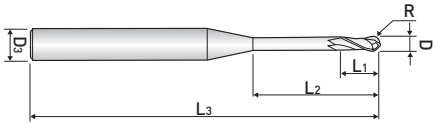
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING(Shank-6)

- High precise performance through increasing chucking power from 6mm Shank
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

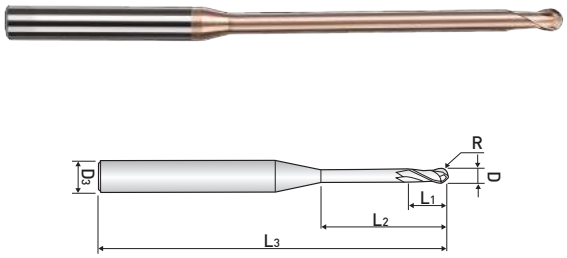
WB512...S6 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 005 01 S6	0.5	0.25	0.5	1.0	45	6
WB512 005 02 S6				2.0		
WB512 005 04 S6				4.0		
WB512 006 01 S6	0.6	0.3	0.6	1.0	45	6
WB512 006 02 S6				2.0		
WB512 006 03 S6				3.0		
WB512 006 04 S6				4.0		
WB512 006 05 S6				5.0		
WB512 006 06 S6				6.0		
WB512 006 08 S6				8.0		
WB512 006 10 S6				10.0		
WB512 006 12 S6				12.0		
WB512 006 14 S6				14.0	50	
WB512 006 16 S6				16.0		
WB512 008 01 S6	0.8	0.4	0.8	1.0	45	6
WB512 008 02 S6				2.0		
WB512 008 03 S6				3.0		
WB512 008 04 S6				4.0		
WB512 008 05 S6				5.0		
WB512 008 06 S6				6.0		
WB512 008 08 S6				8.0		
WB512 008 10 S6				10.0		
WB512 008 12 S6				12.0		
WB512 008 14 S6				14.0	50	
WB512 008 16 S6				16.0		
WB512 008 20 S6				20.0	55	
WB512 010 02 S6	1.0	0.5	1.0	2.0	50	6
WB512 010 03 S6				3.0		
WB512 010 04 S6				4.0		
WB512 010 05 S6				5.0		
WB512 010 06 S6				6.0		
WB512 010 07 S6				7.0		
WB512 010 08 S6				8.0		
WB512 010 09 S6				9.0		
WB512 010 10 S6				10.0		
WB512 010 12 S6				12.0		
WB512 010 14 S6				14.0		
WB512 010 16 S6				16.0		

NEXT ≫

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, for RIB PROCESSING(Shank-6)

- High precise performance through increasing chucking power from 6mm Shank
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

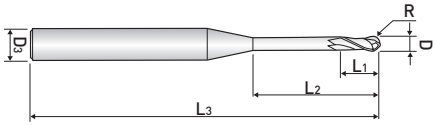
WB512...S6 ...series

ULTRA FINE | 2 | 30° HELIX | R ±0.005 up to R3 | R ±0.01 over R3 | W Coating

EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 010 18 S6	1.0	0.5	1.0	18.0	50	6
WB512 010 20 S6				20.0	55	
WB512 010 22 S6				22.0	60	
WB512 010 26 S6				26.0		
WB512 010 30 S6				30.0	70	
WB512 015 03 S6	1.5	0.75	1.5	3.0	50	6
WB512 015 04 S6				4.0		
WB512 015 06 S6				6.0		
WB512 015 08 S6				8.0		
WB512 015 10 S6				10.0		
WB512 015 12 S6				12.0		
WB512 015 14 S6				14.0		
WB512 015 16 S6				16.0		
WB512 015 18 S6				18.0		
WB512 015 20 S6				20.0	55	
WB512 015 22 S6				22.0	60	
WB512 015 26 S6				26.0		
WB512 015 30 S6				30.0	70	
WB512 015 35 S6				35.0		
WB512 015 40 S6				40.0	80	
WB512 020 04 S6	2.0	1	2.0	4.0	50	6
WB512 020 06 S6				6.0		
WB512 020 08 S6				8.0		
WB512 020 10 S6				10.0		
WB512 020 12 S6				12.0		
WB512 020 14 S6				14.0		
WB512 020 16 S6				16.0		
WB512 020 18 S6				18.0	55	
WB512 020 20 S6				20.0		
WB512 020 22 S6				22.0	60	
WB512 020 26 S6				26.0		

NEXT

Endmills for Mold & Die(Ball) WINNER Series



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WB512...S6 ...series

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EDP. No.	D	R	L_1	L_2	L_3	D_3
WB512 020 30 S6	2.0	1	2.0	30.0	70	6
WB512 020 35 S6				35.0		
WB512 020 40 S6				40.0	80	
WB512 020 45 S6				45.0	90	
WB512 020 50 S6				50.0	100	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

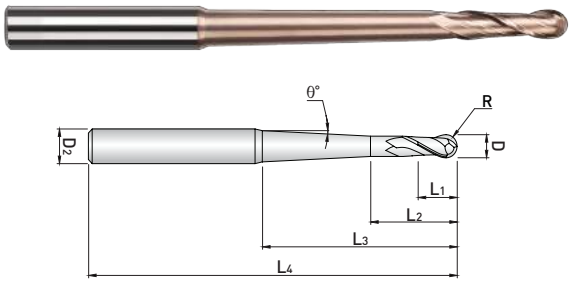
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



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  Pre-hardened Steel, Alloy Steel, Carbon Steel

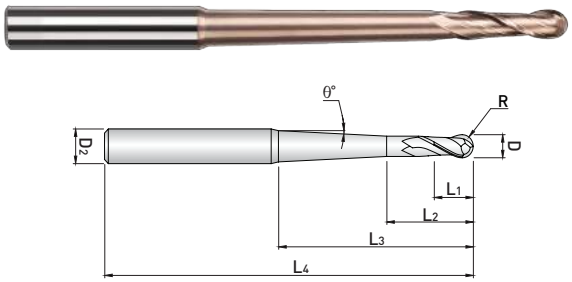
WB542 ...series

ULTRA FINE | 2 | 30° HELIX | R ±0.005 up to R3 | R ±0.01 over R3 | W Coating | DATA p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 001 05 005	0.1	0.05	30`	0.1	-	0.5	40	4
WB542 001 05 01						1.0		
WB542 001 10 005			1°			0.5		
WB542 001 10 01						1.0		
WB542 001 15 005			1°30`			0.5		
WB542 001 15 01						1.0		
WB542 001 20 005			2°			0.5		
WB542 001 20 01						1.0		
WB542 001 30 005			3°			0.5		
WB542 001 30 01						1.0		
WB542 002 05 01	0.2	0.1	30`	0.2	0.4	1.0	40	4
WB542 002 05 02						2.0		
WB542 002 05 03						3.0		
WB542 002 10 01			1°			1.0		
WB542 002 10 02						2.0		
WB542 002 10 03						3.0		
WB542 002 15 01			1°30`			1.0		
WB542 002 15 02						2.0		
WB542 002 15 03						3.0		
WB542 002 20 01			2°			1.0		
WB542 002 20 02						2.0		
WB542 002 20 03						3.0		
WB542 002 30 01			3°			1.0		
WB542 002 30 02						2.0		
WB542 002 30 03						3.0		
WB542 002 50 02			5°			2.0		
WB542 002 50 03						3.0		
WB542 003 05 02	0.3	0.15	30`	0.3	0.6	2.0	40	4
WB542 003 05 03						3.0		
WB542 003 05 04						4.0		
WB542 003 05 05						5.0		
WB542 003 10 02			1°			2.0		
WB542 003 10 03						3.0		
WB542 003 10 04						4.0		
WB542 003 10 05						5.0		
WB542 003 15 02			1°30′			2.0		
WB542 003 15 03						3.0		
WB542 003 15 04						4.0		

NEXT ≫

Endmills for Mold & Die(Ball) WINNER Series



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- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

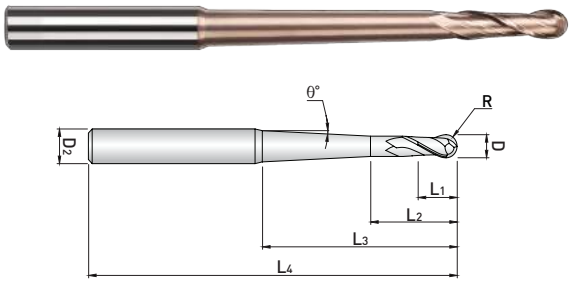
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 003 15 05	0.3	0.15	1°30′	0.3	0.6	5.0	40	4
WB542 003 20 02			2°			2.0		
WB542 003 20 03						3.0		
WB542 003 20 04						4.0		
WB542 003 20 05						5.0		
WB542 003 30 02			3°			2.0		
WB542 003 30 03						3.0		
WB542 003 30 04						4.0		
WB542 003 30 05						5.0		
WB542 003 50 05			5°			5.0		
WB542 004 05 02	0.4	0.2	30`	0.4	0.8	2.0	50	4
WB542 004 05 03						3.0		
WB542 004 05 04						4.0		
WB542 004 05 05						5.0		
WB542 004 05 06						6.0		
WB542 004 10 02			1°			2.0		
WB542 004 10 03						3.0		
WB542 004 10 04						4.0		
WB542 004 10 05						5.0		
WB542 004 10 06						6.0		
WB542 004 15 02			1°30`			2.0		
WB542 004 15 03						3.0		
WB542 004 15 04						4.0		
WB542 004 15 05						5.0		
WB542 004 15 06						6.0		
WB542 004 20 02			2°			2.0		
WB542 004 20 03						3.0		
WB542 004 20 04						4.0		
WB542 004 20 05						5.0		
WB542 004 20 06						6.0		
WB542 004 30 02			3°			2.0		
WB542 004 30 03						3.0		
WB542 004 30 04						4.0		
WB542 004 30 05						5.0		
WB542 004 30 06						6.0		
WB542 004 50 04			5°			4.0		
WB542 004 50 06						6.0		

NEXT ≫

Endmills for Mold & Die(Ball) WINNER Series



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  Pre-hardened Steel, Alloy Steel, Carbon Steel

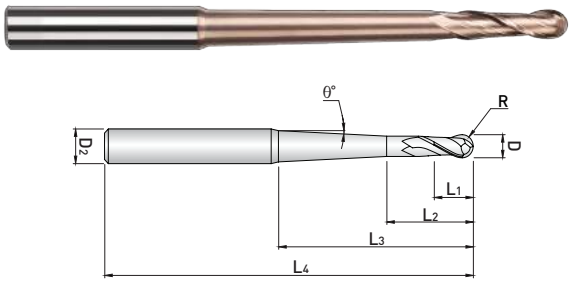
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 005 05 04	0.5	0.25	30`	0.5	1.0	4.0	50	4
WB542 005 05 06						6.0		
WB542 005 05 08						8.0		
WB542 005 05 10						10.0		
WB542 005 10 04			1°			4.0		
WB542 005 10 06						6.0		
WB542 005 10 08						8.0		
WB542 005 10 10						10.0		
WB542 005 15 04			1°30`			4.0		
WB542 005 15 06						6.0		
WB542 005 15 08						8.0		
WB542 005 15 10						10.0		
WB542 005 20 04			2°			4.0		
WB542 005 20 06						6.0		
WB542 005 20 08						8.0		
WB542 005 20 10						10.0		
WB542 005 30 04			3°			4.0		
WB542 005 30 06						6.0		
WB542 005 30 08						8.0		
WB542 005 30 10						10.0		
WB542 006 05 04	0.6	0.3	30`	0.6	1.2	4.0	50	4.0
WB542 006 05 06						6.0		
WB542 006 05 08						8.0		
WB542 006 05 10						10.0		
WB542 006 05 12						12.0		
WB542 006 10 04			1°			4.0		
WB542 006 10 06						6.0		
WB542 006 10 08						8.0		
WB542 006 10 10						10.0		
WB542 006 10 12						12.0		
WB542 006 15 04			1°30`			4.0		
WB542 006 15 06						6.0		
WB542 006 15 08						8.0		
WB542 006 15 10						10.0		
WB542 006 15 12						12.0		
WB542 006 20 04			2°			4.0		
WB542 006 20 06						6.0		
WB542 006 20 08						8.0		

NEXT

Endmills for Mold & Die(Ball) WINNER Series



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  Pre-hardened Steel, Alloy Steel, Carbon Steel

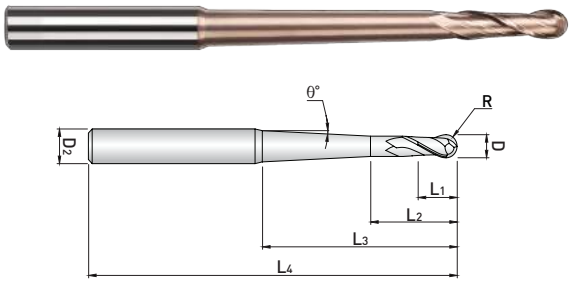
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 006 20 10	0.6	0.3	2°	0.6	1.2	10.0	50	4.0
WB542 006 20 12						12.0		
WB542 006 30 04			3°			4.0		
WB542 006 30 06						6.0		
WB542 006 30 08						8.0		
WB542 006 30 10						10.0		
WB542 006 30 12						12.0		
WB542 008 05 04	0.8	0.4	30`	0.8	1.6	4.0	50	4
WB542 008 05 06						6.0		
WB542 008 05 08						8.0		
WB542 008 05 10						10.0		
WB542 008 05 12						12.0		
WB542 008 05 16						16.0		
WB542 008 10 04			1°			4.0		
WB542 008 10 06						6.0		
WB542 008 10 08						8.0		
WB542 008 10 10						10.0		
WB542 008 10 12						12.0		
WB542 008 10 16						16.0		
WB542 008 15 04			1°30`			4.0		
WB542 008 15 06						6.0		
WB542 008 15 08						8.0		
WB542 008 15 10						10.0		
WB542 008 15 12						12.0		
WB542 008 15 16						16.0		
WB542 008 20 04			2°			4.0		
WB542 008 20 06						6.0		
WB542 008 20 08						8.0		
WB542 008 20 10						10.0		
WB542 008 20 12						12.0		
WB542 008 20 16						16.0		
WB542 008 30 04			3°			4.0		
WB542 008 30 06						6.0		
WB542 008 30 08						8.0		
WB542 008 30 10						10.0		
WB542 008 30 12						12.0		
WB542 008 30 16						16.0		

NEXT

Endmills for Mold & Die(Ball) WINNER Series



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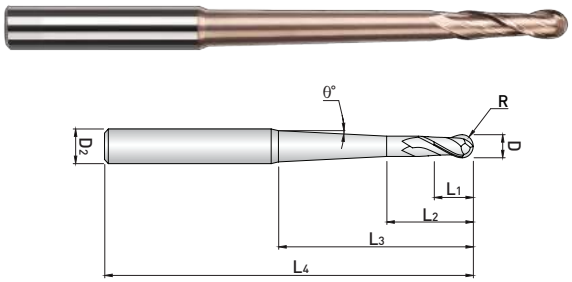
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 010 05 06	1.0	0.5	30`	1.0	2.5	6.0	50	4
WB542 010 05 08						8.0		
WB542 010 05 10						10.0		
WB542 010 05 12						12.0		
WB542 010 05 16						16.0		
WB542 010 05 20						20.0		
WB542 010 05 25						25.0	60	
WB542 010 05 30						30.0	70	
WB542 010 05 40						40.0	80	
WB542 010 05 50						50.0	90	
WB542 010 10 06			1°			6.0	50	
WB542 010 10 08						8.0		
WB542 010 10 10						10.0		
WB542 010 10 12						12.0		
WB542 010 10 16						16.0		
WB542 010 10 20						20.0		
WB542 010 10 25						25.0	60	
WB542 010 10 30						30.0	70	
WB542 010 10 40						40.0	80	
WB542 010 10 50						50.0	90	
WB542 010 15 06			1°30`			6.0	50	
WB542 010 15 08						8.0		
WB542 010 15 10						10.0		
WB542 010 15 12						12.0		
WB542 010 15 16						16.0		
WB542 010 15 20						20.0		
WB542 010 15 25						25.0	60	
WB542 010 15 30						30.0	70	
WB542 010 15 40						40.0	80	
WB542 010 15 50						50.0	90	
WB542 010 20 06			2°			6.0	50	
WB542 010 20 08						8.0		
WB542 010 20 10						10.0		
WB542 010 20 12						12.0		
WB542 010 20 16						16.0		
WB542 010 20 20						20.0		
WB542 010 20 25						25.0	60	
WB542 010 20 30						30.0	70	

NEXT ≫

Endmills for Mold & Die(Ball) WINNER Series



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  Pre-hardened Steel, Alloy Steel, Carbon Steel

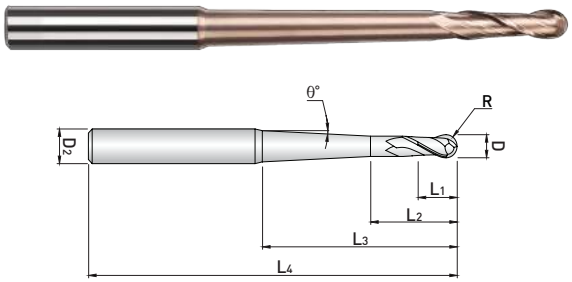
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 010 20 40	1.0	0.5	2°	1.0	2.5	40.0	80	4
WB542 010 20 50						50.0	90	6
WB542 010 30 06			3°			6.0	50	4
WB542 010 30 08						8.0		
WB542 010 30 10						10.0		
WB542 010 30 12						12.0		
WB542 010 30 16						16.0		
WB542 010 30 20						20.0		
WB542 010 30 25						25.0	60	
WB542 010 30 30						30.0	70	6
WB542 010 30 40						40.0	80	
WB542 010 30 50						50.0	90	
WB542 010 50 30			5°			30.0	70	
WB542 012 05 08	1.2	0.6	30`	1.2	3.0	8.0	50	4
WB542 012 05 12						12.0		
WB542 012 05 16						16.0		
WB542 012 05 20						20.0		
WB542 012 05 25						25.0	60	
WB542 012 05 30						30.0	70	
WB542 012 10 08			1°			8.0	50	
WB542 012 10 12						12.0		
WB542 012 10 16						16.0		
WB542 012 10 20						20.0		
WB542 012 10 25						25.0	60	
WB542 012 10 30						30.0	70	
WB542 012 15 08			1°30`			8.0	50	
WB542 012 15 12						12.0		
WB542 012 15 16						16.0		
WB542 012 15 20						20.0		
WB542 012 15 25						25.0	60	
WB542 012 15 30						30.0	70	
WB542 012 20 08			2°			8.0	50	
WB542 012 20 12						12.0		
WB542 012 20 16						16.0		
WB542 012 20 20						20.0		
WB542 012 20 25						25.0	60	
WB542 012 20 30						30.0	70	
WB542 012 30 08			3°			8.0	50	
WB542 012 30 12						12.0		

NEXT

Endmills for Mold & Die(Ball) WINNER Series



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  Pre-hardened Steel, Alloy Steel, Carbon Steel

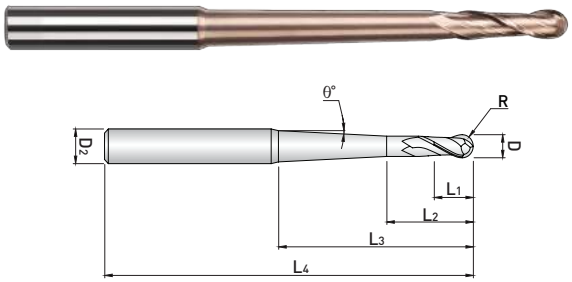
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 012 30 16	1.2	0.6	3°	1.2	3.0	16.0	50	4
WB542 012 30 20						20.0		
WB542 012 30 25						25.0	60	
WB542 012 30 30						30.0	70	6
WB542 015 05 08	1.5	0.75	30`	1.5	4.0	8.0	50	4
WB542 015 05 10						10.0		
WB542 015 05 12						12.0		
WB542 015 05 16						16.0		
WB542 015 05 20						20.0		
WB542 015 05 25						25.0	60	
WB542 015 05 30						30.0	70	
WB542 015 05 40						40.0	80	
WB542 015 05 50						50.0	90	
WB542 015 10 08			1°			8.0	50	
WB542 015 10 10						10.0		
WB542 015 10 12						12.0		
WB542 015 10 16						16.0		
WB542 015 10 20						20.0		
WB542 015 10 25						25.0	60	
WB542 015 10 30						30.0	70	
WB542 015 10 40						40.0	80	
WB542 015 10 50						50.0	90	
WB542 015 15 08			1°30`			8.0	50	
WB542 015 15 10						10.0		
WB542 015 15 12						12.0		
WB542 015 15 16						16.0		
WB542 015 15 20						20.0		
WB542 015 15 25						25.0	60	
WB542 015 15 30						30.0	70	
WB542 015 15 40						40.0	80	
WB542 015 15 50						50.0	90	
WB542 015 20 08			2°			8.0	50	
WB542 015 20 10						10.0		
WB542 015 20 12						12.0		
WB542 015 20 16						16.0		
WB542 015 20 20						20.0		
WB542 015 20 25						25.0	60	
WB542 015 20 30						30.0	70	
WB542 015 20 40						40.0	80	6

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, TAPER NECK

- Strenghten the hardness of neck by applying Taper neck
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

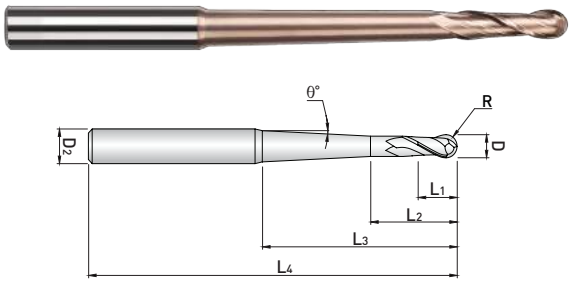
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 015 20 50	1.5	0.75	2°	1.5	4.0	50.0	90	6
WB542 015 30 20			3°			20.0	50	
WB542 015 30 30						30.0	70	
WB542 015 30 40						40.0	80	
WB542 015 30 50						50.0	90	8
WB542 015 50 30			5°			30.0	70	
WB542 020 05 10	2.0	1	30`	2.0	5.0	10.0	50	4
WB542 020 05 12						12.0		
WB542 020 05 16						16.0		
WB542 020 05 20						20.0		
WB542 020 05 25						25.0	60	
WB542 020 05 30						30.0	70	
WB542 020 05 40						40.0	80	
WB542 020 05 50						50.0	100	6
WB542 020 05 60						60.0		
WB542 020 05 80						80.0	140	
WB542 020 10 10			1°			10.0	50	4
WB542 020 10 12						12.0		
WB542 020 10 16						16.0		
WB542 020 10 20						20.0		
WB542 020 10 25						25.0	60	
WB542 020 10 30						30.0	70	
WB542 020 10 40						40.0	80	6
WB542 020 10 50						50.0	100	
WB542 020 10 60						60.0		
WB542 020 10 80						80.0	140	
WB542 020 15 10			1°30`			10.0	50	4
WB542 020 15 12						12.0		
WB542 020 15 16						16.0		
WB542 020 15 20						20.0		
WB542 020 15 25						25.0	60	
WB542 020 15 30						30.0	70	6
WB542 020 15 40						40.0	80	
WB542 020 15 50						50.0	100	
WB542 020 15 60						60.0		
WB542 020 15 80						80.0	140	
WB542 020 20 10			2°			10.0	50	4
WB542 020 20 12						12.0		
WB542 020 20 16						16.0		

NEXT ≫

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, TAPER NECK

- Strenghten the hardness of neck by applying Taper neck
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

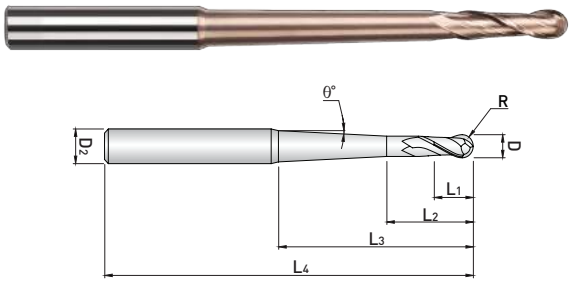
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 020 20 20	2.0	1	2°	2.0	5.0	20.0	55	4
WB542 020 20 25						25.0	60	
WB542 020 20 30						30.0	70	
WB542 020 20 40						40.0	80	6
WB542 020 20 50						50.0	90	
WB542 020 20 60						60.0	100	
WB542 020 20 80						80.0	140	8
WB542 020 30 30			3°			30.0	70	6
WB542 020 30 40						40.0	80	
WB542 020 30 50						50.0	90	8
WB542 020 30 60						60.0	100	
WB542 020 30 80						80.0	140	10
WB542 020 50 30			5°			30.0	70	8
WB542 020 50 40						40.0	90	10
WB542 030 05 16	3.0	1.5	30`	4.5	6.0	16.0	60	6
WB542 030 05 20						20.0	65	
WB542 030 05 30						30.0	70	
WB542 030 05 40						40.0	80	
WB542 030 05 50						50.0	90	
WB542 030 05 60						60.0	100	
WB542 030 10 16			1°			16.0	60	
WB542 030 10 20						20.0	65	
WB542 030 10 30						30.0	70	
WB542 030 10 40						40.0	80	
WB542 030 10 50						50.0	90	
WB542 030 10 60						60.0	100	
WB542 030 10 70						70.0	120	
WB542 030 15 16			1°30`			16.0	60	
WB542 030 15 20						20.0	65	
WB542 030 15 30						30.0	70	
WB542 030 15 40						40.0	80	
WB542 030 15 50						50.0	90	
WB542 030 15 60						60.0	100	
WB542 030 20 16			2°			16.0	60	
WB542 030 20 20						20.0	65	
WB542 030 20 30						30.0	70	
WB542 030 20 40						40.0	80	
WB542 030 20 50						50.0	90	8
WB542 030 30 30			3°			30.0	70	6

NEXT

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, TAPER NECK

- Strenghten the hardness of neck by applying Taper neck
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

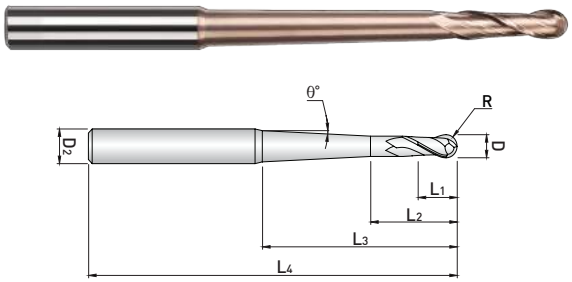
WB542 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 030 30 40	3.0	1.5	3°	4.5	6.0	40.0	90	8
WB542 030 50 30			5°			30.0	70	8
WB542 030 50 40						40.0	90	10
WB542 040 05 40	4.0	2	30`	6.0	8.0	40.0	90	6
WB542 040 05 50						50.0	100	
WB542 040 05 60						60.0	110	
WB542 040 05 70						70.0	120	
WB542 040 10 40			1°			40.0	90	
WB542 040 10 50						50.0	100	
WB542 040 10 60						60.0	110	8
WB542 040 10 70						70.0	120	
WB542 040 15 40			1°30`			40.0	90	6
WB542 040 15 50						50.0	100	8
WB542 040 15 60						60.0	110	
WB542 040 15 70						70.0	120	
WB542 040 30 50			3°			50.0	100	10
WB542 040 50 50			5°			50.0	100	12
WB542 050 10 60	5.0	2.5	1°	10.0	13.0	60.0	120	8
WB542 050 15 60			1°30`			60.0		
WB542 050 30 40			3°			40.0		
WB542 060 10 60	6.0	3	1°	12.0	15.0	60.0	120	8
WB542 060 10 90						90.0	150	10
WB542 060 15 60			1°30`			60.0	120	
WB542 060 15 90						90.0	150	
WB542 060 20 60			2°			60.0	120	
WB542 060 20 90						90.0	150	12
WB542 060 30 60			3°			60.0	120	
WB542 060 30 90						90.0	150	14
WB542 080 10 70	8.0	4	1°	14.0	18.0	70.0	130	10
WB542 080 10 100						100.0	150	12
WB542 080 15 70			1°30`			70.0	130	
WB542 080 15 100						100.0	150	14
WB542 080 20 70			2°			70.0	130	12
WB542 080 20 100						100.0	150	14
WB542 080 30 70			3°			70.0	130	
WB542 080 30 100						100.0	150	18

NEXT ≫

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE, TAPER NECK

- Strenghten the hardness of neck by applying Taper neck
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

WB542 ...series

ULTRA FINE | 2 | 30° HELIX | R ±0.005 up to R3 | R ±0.01 over R3 | W Coating | DATA p.1013~1014

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WB542 100 10 70	10.0	5	1°	18.0	22.0	70.0	130	12
WB542 100 10 80						80.0	150	14
WB542 100 10 100						100.0	200	
WB542 100 15 70			1°30`			70.0	130	
WB542 100 15 80						80.0	150	
WB542 100 15 100						100.0	200	16
WB542 100 20 70			2°			70.0	130	14
WB542 100 20 80						80.0	150	16
WB542 100 20 100						100.0	200	
WB542 100 30 70			3°			70.0	130	
WB542 100 30 80						80.0	150	18
WB542 100 30 100						100.0	200	20
WB542 120 10 60	12.0	6	1°	22.0	25.0	60.0	130	14
WB542 120 10 80						80.0	150	
WB542 120 10 90						90.0	180	16
WB542 120 10 100						100.0	200	
WB542 120 15 60			1°30`			60.0	130	14
WB542 120 15 80						80.0	150	16
WB542 120 15 90						90.0	180	
WB542 120 15 100						100.0	200	
WB542 120 20 60			2°			60.0	130	
WB542 120 20 80						80.0	150	
WB542 120 20 90						90.0	180	18
WB542 120 20 100						100.0	200	
WB542 120 30 60			3°			60.0	130	16
WB542 120 30 80						80.0	150	18
WB542 120 30 90						90.0	180	20
WB542 120 30 100						100.0	200	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

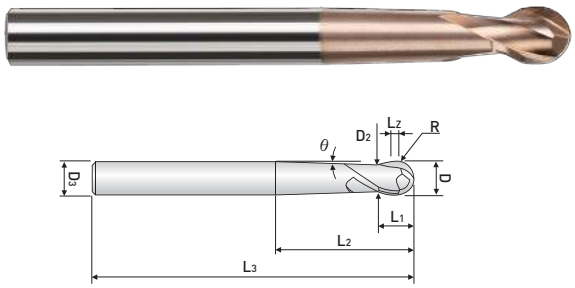
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



MILLING MACHINE COPY

- A rounded cutting line enable to machining a various curved shape
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

WB532 ...series

ULTRA FINE | HELIX | All Sizes | W Coating | p.1015

EDP. No.	D	R	θ	L1	L2	L3	D2	D3
WB532 030	3.0	1.5	1°30`	2.3	16.0	80	2.5	6
WB532 040	4.0	2	1°30`	3.1	20.0	80	3.3	6
WB532 050	5.0	2.5	1°30`	3.9	25.0	80	4.1	6
WB532 060	6.0	3	1°30`	4.9	30.0	100	4.7	6
WB532 080	8.0	4	1°30`	6.3	35.0	100	6.5	8
WB532 100	10.0	5	1°30`	7.9	40.0	100	8.2	10
WB532 120	12.0	6	1°30`	9.5	50.0	100	9.8	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

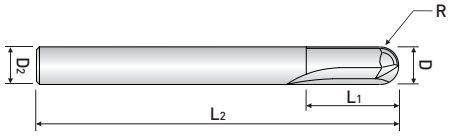
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



2 FLUTE STRAIGHT BALL

- Strenghten the hardness of neck by applying Taper neck
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

WSB502 ...series

ULTRA FINE | 2 | HELIX | R ±0.005 up to R3 | R ±0.01 over R3 | W Coating | DATA p.1016

EDP. No.	D	R	L_1	L_2	D_2
WSB502 030	3.0	1.5	10.0	70	6
WSB502 040	4.0	2	12.0	70	6
WSB502 050	5.0	2.5	18.0	90	6
WSB502 060	6.0	3	20.0	90	6
WSB502 080	8.0	4	25.0	100	8
WSB502 100	10.0	5	30.0	100	10
WSB502 120	12.0	6	32.0	110	12
WSB502 160	16.0	8	35.0	150	16
WSB502 200	20.0	10	40.0	150	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

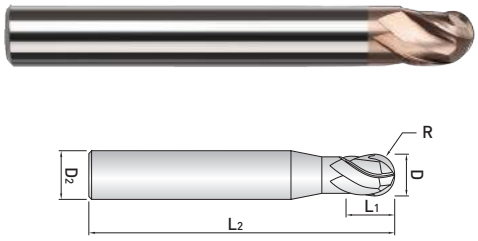
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



3 FLUTE BALL

- Increased tool life and excellent surface roughness with a ball type in the shape of 3 flute center match
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WB503 ...series

ULTRA FINE | HELIX | up to R3 | over R3 | W Coating | p.1016

EDP. No.	D	R	L_1	L_2	D_2
WB503 010	1.0	0.5	1.0	50	6
WB503 015	1.5	0.75	1.5	50	6
WB503 020	2.0	1	2.0	50	6
WB503 030	3.0	1.5	3.0	60	6
WB503 040	4.0	2	4.0	70	6
WB503 050	5.0	2.5	5.0	80	6
WB503 060	6.0	3	6.0	90	6
WB503 080	8.0	4	8.0	100	8
WB503 100	10.0	5	10.0	100	10
WB503 120	12.0	6	12.0	110	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

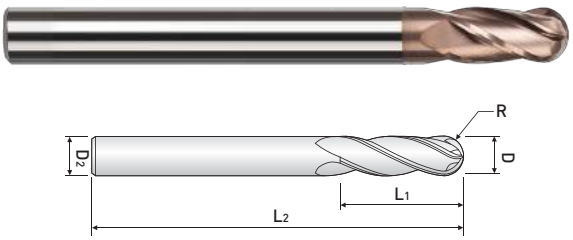
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Ball) WINNER Series



4 FLUTE BALL

- Increased tool life and excellent surface roughness with a ball type in the shape of 4 flute center match
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

WB504 ...series

ULTRA FINE | 4 | 30° HELIX | R ±0.005 up to R3 | R ±0.01 over R3 | W Coating | DATA p.1017

EDP. No.	D	R	L_1	L_2	D_2
WB504 010	1.0	0.5	1.0	50	6
WB504 015	1.5	0.75	1.5	50	6
WB504 020	2.0	1	2.0	50	6
WB504 030	3.0	1.5	3.0	60	6
WB504 040	4.0	2	4.0	70	6
WB504 050	5.0	2.5	5.0	80	6
WB504 060	6.0	3	6.0	90	6
WB504 080	8.0	4	8.0	100	8
WB504 100	10.0	5	10.0	100	10
WB504 120	12.0	6	12.0	110	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

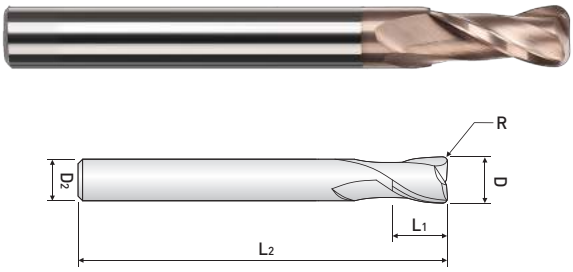
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.02	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE CORNER RADIUS
SHORT LENGTH + REGULAR LENGTH + LONG LENGTH

- A variety of sizes on 2 flute corner R radius
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

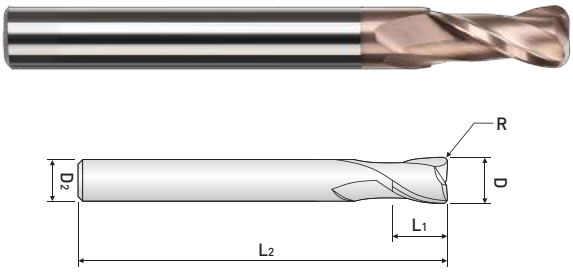
WR502 ...series

ULTRA FINE | HELIX | up to R3 | over Φ6 | W Coating | p.1017

EDP. No.	D	R	L_1	L_2	D_2
WR502 002 002	0.2	0.02	0.4	40	4
WR502 002 005		0.05			
WR502 003 002	0.3	0.02	0.6	40	4
WR502 003 005		0.05			
WR502 004 005	0.4	0.05	0.8	40	4
WR502 004 01		0.10			
WR502 005 005	0.5	0.05	1.0	40	4
WR502 005 01		0.10			
WR502 006 005	0.6	0.05	1.2	40	4
WR502 006 01		0.10			
WR502 006 02		0.20			
WR502 007 005	0.7	0.05	1.4	40	4
WR502 007 01		0.10			
WR502 007 02		0.20			
WR502 008 005	0.8	0.05	1.6	40	4
WR502 008 01		0.10			
WR502 008 02		0.20			
WR502 009 005	0.9	0.05	1.8	40	4
WR502 009 01		0.10			
WR502 010 005	1.0	0.05	2.5	50	6
WR502 010 01		0.10			
WR502 010 02		0.20			
WR502 010 03		0.30			
WR502 012 005	1.2	0.05	3.0	50	6
WR502 012 01		0.10			
WR502 012 02		0.20			
WR502 012 03		0.30			
WR502 015 005	1.5	0.05	4.0	50	6
WR502 015 01		0.10			
WR502 015 02		0.20			
WR502 015 03		0.30			
WR502 015 05		0.50			
WR502 020 01	2.0	0.10	6.0	50	6
WR502 020 02		0.20			
WR502 020 03		0.30			
WR502 020 05		0.50			

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE CORNER RADIUS
SHORT LENGTH + REGULAR LENGTH + LONG LENGTH

- A variety of sizes on 2 flute corner R radius
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

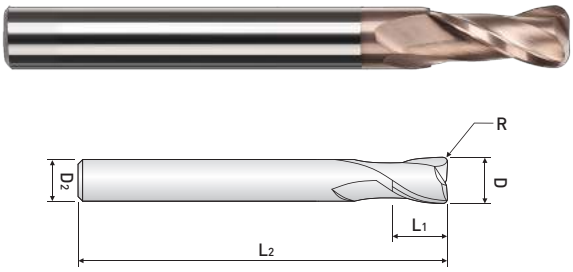
WR502 ...series

ULTRA FINE | HELIX | up to R3 | over Φ6 | W Coating | p.1017

EDP. No.	D	R	L1	L2	D2
WR502 025 01	2.5	0.10	7.0	60	6
WR502 025 02		0.20			
WR502 025 03		0.30			
WR502 025 05		0.50			
WR502 030 01	3.0	0.10	8.0	60	6
WR502 030 02		0.20			
WR502 030 03		0.30			
WR502 030 05		0.50			
WR502 030 10		1.00			
WR502 035 01	3.5	0.10	10.0	70	6
WR502 035 02		0.20			
WR502 035 03		0.30			
WR502 035 05		0.50			
WR502 040 01 S4	4.0	0.10	10.0	70	4
WR502 040 02 S4		0.20			
WR502 040 03 S4		0.30			
WR502 040 05 S4		0.50			
WR502 040 10 S4		1.00			
WR502 040 01 100 S4		0.10	10.0	100	4
WR502 040 02 100 S4		0.20			
WR502 040 03 100 S4		0.30			
WR502 040 05 100 S4		0.50			
WR502 040 10 100 S4		1.00			
WR502 040 01		0.10	10.0	70	6
WR502 040 02		0.20			
WR502 040 03		0.30			
WR502 040 05		0.50			
WR502 040 10		1.00			
WR502 045 01	4.5	0.10	11.0	80	6
WR502 045 02		0.20			
WR502 045 03		0.30			
WR502 045 05		0.50			
WR502 050 01	5.0	0.10	13.0	90	6
WR502 050 02		0.20			
WR502 050 03		0.30			
WR502 050 05		0.50			
WR502 050 10		1.00			

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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  Pre-hardened Steel, Alloy Steel, Carbon Steel

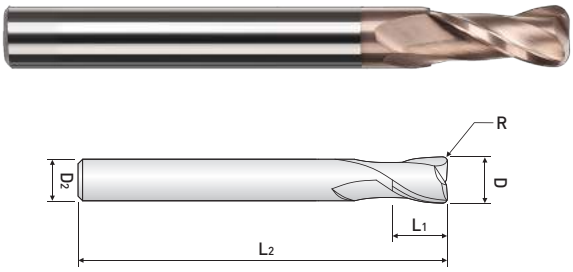
WR502 ...series

ULTRA FINE | HELIX | up to R3 | over Φ6 | W Coating | p.1017

EDP. No.	D	R	L1	L2	D2
WR502 055 01	5.5	0.10	13.0	90	6
WR502 055 02		0.20			
WR502 055 03		0.30			
WR502 055 05		0.50			
WR502 055 10		1.00			
WR502 060 03 60	6.0	0.30	15.0	60	6
WR502 060 05 60		0.50			
WR502 060 10 60		1.00			
WR502 060 01		0.10		90	
WR502 060 02		0.20			
WR502 060 03		0.30			
WR502 060 05		0.50			
WR502 060 10		1.00			
WR502 060 15		1.50			
WR502 060 20		2.00			
WR502 060 05 110		0.50		110	
WR502 060 10 110		1.00			
WR502 060 05 130		0.50		130	
WR502 060 10 130		1.00			
WR502 070 01	7.0	0.10	16.0	90	8
WR502 070 02		0.20			
WR502 070 03		0.30			
WR502 070 05		0.50			
WR502 070 10		1.00			
WR502 070 20		2.00			
WR502 080 03 70	8.0	0.30	20.0	70	8
WR502 080 05 70		0.50			
WR502 080 10 70		1.00			
WR502 080 01		0.10		100	
WR502 080 02		0.20			
WR502 080 03		0.30			
WR502 080 05		0.50			
WR502 080 10		1.00			
WR502 080 15		1.50			
WR502 080 20		2.00			
WR502 080 25		2.50			
WR502 080 30		3.00			

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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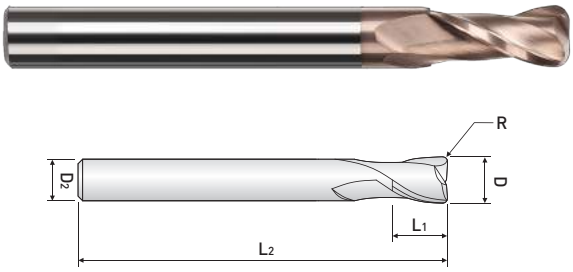
WR502 ...series

ULTRA FINE | HELIX | up to R3 | over Φ6 | W Coating | p.1017

EDP. No.	D	R	L1	L2	D2
WR502 080 05 120	8.0	0.50	20.0	120	8
WR502 080 10 120		1.00			
WR502 080 05 150		0.50		150	
WR502 080 10 150		1.00			
WR502 100 03 75	10.0	0.30	25.0	75	10
WR502 100 05 75		0.50			
WR502 100 10 75		1.00			
WR502 100 01		0.10		100	
WR502 100 02		0.20			
WR502 100 03		0.30			
WR502 100 05		0.50			
WR502 100 10		1.00			
WR502 100 15		1.50			
WR502 100 20		2.00			
WR502 100 25		2.50			
WR502 100 30		3.00			
WR502 100 40		4.00			
WR502 100 05 130		0.50		130	
WR502 100 10 130		1.00			
WR502 100 05 150		0.50		150	
WR502 100 10 150		1.00			
WR502 110 02	11.0	0.20	25.0	110	12
WR502 110 03		0.30			
WR502 110 05		0.50			
WR502 110 10		1.00			
WR502 110 20		2.00			
WR502 120 03 80	12.0	0.30	30.0	80	12
WR502 120 05 80		0.50			
WR502 120 10 80		1.00			
WR502 120 01		0.10		110	
WR502 120 02		0.20			
WR502 120 03		0.30			
WR502 120 05		0.50			
WR502 120 10		1.00			
WR502 120 15		1.50			
WR502 120 20		2.00			

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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WR502 ...series

ULTRA FINE | HELIX | up to R3 | over Φ6 | W Coating | p.1017

EDP. No.	D	R	L1	L2	D2
WR502 120 25	12.0	2.50	30.0	110	12
WR502 120 30		3.00			
WR502 120 40		4.00			
WR502 120 50		5.00			
WR502 120 05 130		0.50	30.0	130	
WR502 120 10 130		1.00			
WR502 120 05 150		0.50	30.0	150	
WR502 120 10 150		1.00			
WR502 140 05	14.0	0.50	30.0	150	16
WR502 140 10		1.00			
WR502 140 20		2.00			
WR502 160 05	16.0	0.50	32.0	150	16
WR502 160 10		1.00			
WR502 160 15		1.50			
WR502 160 20		2.00			
WR502 200 05	20.0	0.50	38.0	150	20
WR502 200 10		1.00			
WR502 200 15		1.50			
WR502 200 20		2.00			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

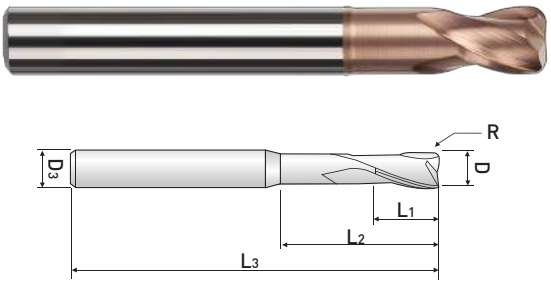
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE LONG NECK CORNER RADIUS

- Excellent effect in preventing breakage with a shape on neck without notch
- A variety of sizes on 2 flute long neck corner R radius
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

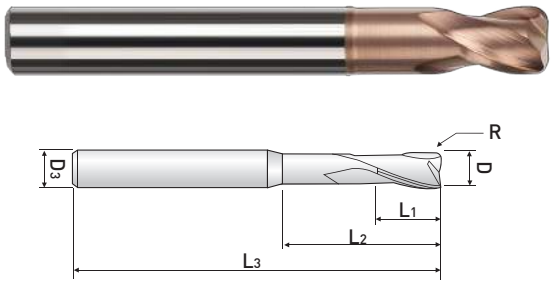
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 002 002 005	0.2	0.02	0.3	0.5	40.0	4.0
WR512 002 002 01				1.0		
WR512 002 002 015				1.5		
WR512 002 002 02				2.0		
WR512 002 005 005		0.05		0.5		
WR512 002 005 01				1.0		
WR512 002 005 015				1.5		
WR512 002 005 02				2.0		
WR512 003 002 01	0.3	0.02	0.5	1.0	40.0	4.0
WR512 003 002 02				2.0		
WR512 003 002 03				3.0		
WR512 003 005 01		0.05		1.0		
WR512 003 005 02				2.0		
WR512 003 005 03				3.0		
WR512 004 005 01	0.4	0.05	0.6	1.0	40.0	4.0
WR512 004 005 015				1.5		
WR512 004 005 02				2.0		
WR512 004 005 025				2.5		
WR512 004 005 03				3.0		
WR512 004 005 04				4.0		
WR512 004 01 01		0.1		1.0		
WR512 004 01 015				1.5		
WR512 004 01 02				2.0		
WR512 004 01 025				2.5		
WR512 004 01 03				3.0		
WR512 004 01 04				4.0		
WR512 005 005 01	0.5	0.05	0.7	1.0	45.0	4.0
WR512 005 005 015				1.5		
WR512 005 005 02				2.0		
WR512 005 005 025				2.5		
WR512 005 005 03				3.0		
WR512 005 005 04				4.0		
WR512 005 005 05				5.0		
WR512 005 005 06				6.0		
WR512 005 01 01		0.10		1.0		
WR512 005 01 015				1.5		
WR512 005 01 02				2.0		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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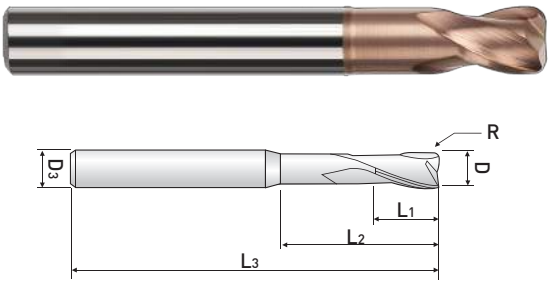
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 005 01 025	0.5	0.10	0.7	2.5	45.0	4.0
WR512 005 01 03				3.0		
WR512 005 01 04				4.0		
WR512 005 01 05				5.0		
WR512 005 01 06				6.0		
WR512 006 005 02	0.6	0.05	0.9	2.0	45.0	4.0
WR512 006 005 03				3.0		
WR512 006 005 04				4.0		
WR512 006 005 06				6.0		
WR512 006 005 08				8.0		
WR512 006 005 10				10.0		
WR512 006 01 02		0.10		2.0		
WR512 006 01 03				3.0		
WR512 006 01 04				4.0		
WR512 006 01 06				6.0		
WR512 006 01 08				8.0		
WR512 006 01 10				10.0		
WR512 006 02 02		0.20		2.0		
WR512 006 02 03				3.0		
WR512 006 02 04				4.0		
WR512 006 02 06				6.0		
WR512 006 02 08				8.0		
WR512 006 02 10				10.0		
WR512 007 005 02	0.7	0.05	1.2	2.0	45.0	4.0
WR512 007 005 04				4.0		
WR512 007 005 06				6.0		
WR512 007 005 08				8.0		
WR512 007 005 10				10.0		
WR512 007 01 02		0.10		2.0		
WR512 007 01 04				4.0		
WR512 007 01 06				6.0		
WR512 007 01 08				8.0		
WR512 007 01 10				10.0		
WR512 007 02 02		0.20		2.0		
WR512 007 02 04				4.0		
WR512 007 02 06				6.0		
WR512 007 02 08				8.0		
WR512 007 02 10				10.0		

NEXT >>

Endmills for Mold & Die(Corner Radius) WINNER Series



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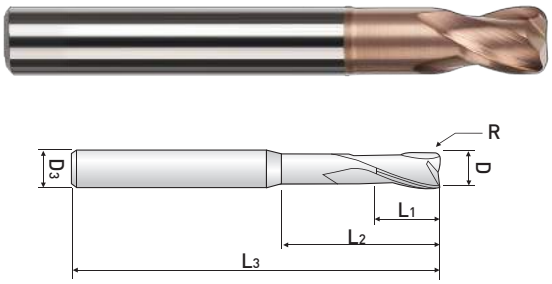
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 008 005 02	0.8	0.05	1.2	2.0	45.0	4.0
WR512 008 005 03				3.0		
WR512 008 005 04				4.0		
WR512 008 005 06				6.0		
WR512 008 005 08				8.0		
WR512 008 005 10				10.0		
WR512 008 01 02		0.10		2.0		
WR512 008 01 03				3.0		
WR512 008 01 04				4.0		
WR512 008 01 06				6.0		
WR512 008 01 08				8.0		
WR512 008 01 10				10.0		
WR512 008 02 02		0.20		2.0		
WR512 008 02 03				3.0		
WR512 008 02 04				4.0		
WR512 008 02 06				6.0		
WR512 008 02 08				8.0		
WR512 008 02 10				10.0		
WR512 010 005 03	1.0	0.05	1.5	3.0	50.0	4.0
WR512 010 005 04				4.0		
WR512 010 005 06				6.0		
WR512 010 005 08				8.0		
WR512 010 005 10				10.0		
WR512 010 005 12				12.0		
WR512 010 005 14				14.0		
WR512 010 005 16				16.0		
WR512 010 005 20				20.0		
WR512 010 01 03		0.10		3.0		
WR512 010 01 04				4.0		
WR512 010 01 06				6.0		
WR512 010 01 08				8.0		
WR512 010 01 10				10.0		
WR512 010 01 12				12.0		
WR512 010 01 14				14.0		
WR512 010 01 16				16.0		
WR512 010 01 20				20.0		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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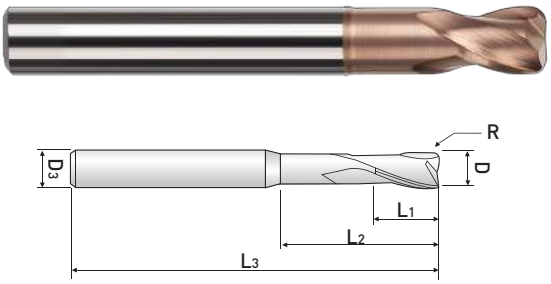
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 010 02 03	1.0	0.20	1.5	3.0	50.0	4.0
WR512 010 02 04				4.0		
WR512 010 02 06				6.0		
WR512 010 02 08				8.0		
WR512 010 02 10				10.0		
WR512 010 02 12				12.0		
WR512 010 02 14				14.0		
WR512 010 02 16				16.0		
WR512 010 02 20				20.0		
WR512 010 03 03		0.30		3.0		
WR512 010 03 04				4.0		
WR512 010 03 06				6.0		
WR512 010 03 08				8.0		
WR512 010 03 10				10.0		
WR512 010 03 12				12.0		
WR512 010 03 14				14.0		
WR512 010 03 16				16.0		
WR512 010 03 20				20.0		
WR512 012 005 03	1.2	0.05	1.8	3.0	50.0	4.0
WR512 012 005 04				4.0		
WR512 012 005 06				6.0		
WR512 012 005 08				8.0		
WR512 012 005 10				10.0		
WR512 012 005 12				12.0		
WR512 012 005 16				16.0		
WR512 012 005 20				20.0		
WR512 012 01 03		0.10		3.0		
WR512 012 01 04				4.0		
WR512 012 01 06				6.0		
WR512 012 01 08				8.0		
WR512 012 01 10				10.0		
WR512 012 01 12				12.0		
WR512 012 01 16				16.0		
WR512 012 01 20				20.0		
WR512 012 02 03		0.20		3.0		
WR512 012 02 04				4.0		
WR512 012 02 06				6.0		
WR512 012 02 08				8.0		
WR512 012 02 10				10.0		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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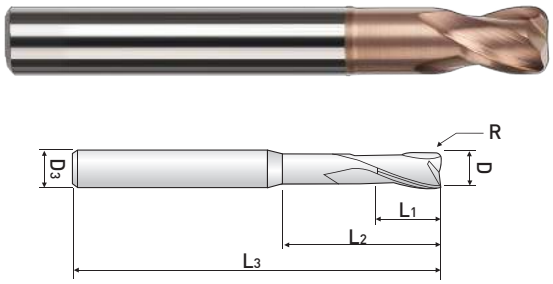
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 012 02 12	1.2	0.20	1.8	12.0	50.0	4.0
WR512 012 02 16				16.0		
WR512 012 02 20				20.0		
WR512 012 03 03		0.30		3.0		
WR512 012 03 04				4.0		
WR512 012 03 06				6.0		
WR512 012 03 08				8.0		
WR512 012 03 10				10.0		
WR512 012 03 12				12.0		
WR512 012 03 16				16.0		
WR512 012 03 20				20.0		
WR512 015 005 04	1.5	0.05	2.3	4.0	50	4.0
WR512 015 005 06				6.0		
WR512 015 005 08				8.0		
WR512 015 005 10				10.0		
WR512 015 005 12				12.0		
WR512 015 005 14				14.0		
WR512 015 005 16				16.0		
WR512 015 005 20				20.0		
WR512 015 005 22				22.0	60	
WR512 015 005 26				26.0		
WR512 015 01 04		0.10		4.0	50	
WR512 015 01 06				6.0		
WR512 015 01 08				8.0		
WR512 015 01 10				10.0		
WR512 015 01 12				12.0		
WR512 015 01 14				14.0		
WR512 015 01 16				16.0		
WR512 015 01 20				20.0		
WR512 015 01 22				22.0	60	
WR512 015 01 26				26.0		
WR512 015 02 04		0.20		4.0	50	
WR512 015 02 06				6.0		
WR512 015 02 08				8.0		
WR512 015 02 10				10.0		
WR512 015 02 12				12.0		
WR512 015 02 14				14.0		
WR512 015 02 16				16.0		
WR512 015 02 20				20.0		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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- Longer tool life and improvement on stable machining with W coating

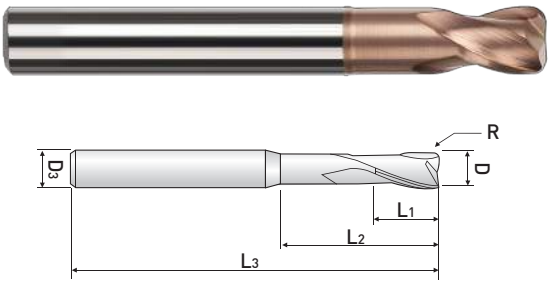
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 015 02 22	1.5	0.20	2.3	22.0	60	4.0
WR512 015 02 26				26.0		
WR512 015 03 04		0.30		4.0	50	
WR512 015 03 06				6.0		
WR512 015 03 08				8.0		
WR512 015 03 10				10.0		
WR512 015 03 12				12.0		
WR512 015 03 14				14.0		
WR512 015 03 16				16.0		
WR512 015 03 20				20.0		
WR512 015 03 22				22.0	60	
WR512 015 03 26				26.0		
WR512 015 05 04		0.50		4.0	50	
WR512 015 05 06				6.0		
WR512 015 05 08				8.0		
WR512 015 05 10				10.0		
WR512 015 05 12				12.0		
WR512 015 05 14				14.0		
WR512 015 05 16				16.0		
WR512 015 05 20				20.0		
WR512 015 05 22				22.0	60	
WR512 015 05 26				26.0		
WR512 020 01 06	2.0	0.10	3.0	6.0	50	4.0
WR512 020 01 08				8.0		
WR512 020 01 10				10.0		
WR512 020 01 12				12.0		
WR512 020 01 14				14.0		
WR512 020 01 16				16.0		
WR512 020 01 20				20.0		
WR512 020 01 22				22.0	60	
WR512 020 01 26				26.0		
WR512 020 01 30				30.0	70	
WR512 020 02 06		0.20		6.0	50	
WR512 020 02 08				8.0		
WR512 020 02 10				10.0		
WR512 020 02 12				12.0		
WR512 020 02 14				14.0		
WR512 020 02 16				16.0		
WR512 020 02 20				20.0		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE LONG NECK CORNER RADIUS

- Excellent effect in preventing breakage with a shape on neck without notch
- A variety of sizes on 2 flute long neck corner R radius
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

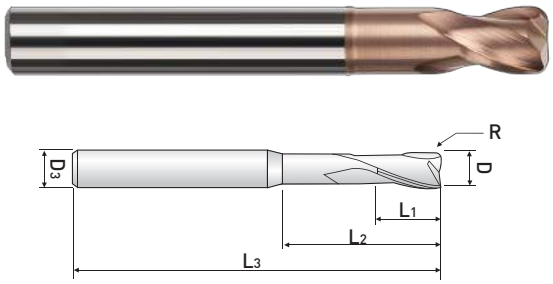
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L_1	L_2	L_3	D_3
WR512 020 02 22	2.0	0.20	3.0	22.0	60	4.0
WR512 020 02 26				26.0		
WR512 020 02 30				30.0	70	
WR512 020 03 06		0.30		6.0	50	
WR512 020 03 08				8.0		
WR512 020 03 10				10.0		
WR512 020 03 12				12.0		
WR512 020 03 14				14.0		
WR512 020 03 16				16.0		
WR512 020 03 20				20.0		
WR512 020 03 22				22.0	60	
WR512 020 03 26				26.0		
WR512 020 03 30				30.0	70	
WR512 020 05 06		0.50		6.0	50	
WR512 020 05 08				8.0		
WR512 020 05 10				10.0		
WR512 020 05 12				12.0		
WR512 020 05 14				14.0		
WR512 020 05 16				16.0		
WR512 020 05 20				20.0		
WR512 020 05 22				22.0	60	
WR512 020 05 26				26.0		
WR512 020 05 30				30.0	70	
WR512 025 01 08	2.5	0.10	4.0	8.0	50	4.0
WR512 025 01 10				10.0		
WR512 025 01 12				12.0		
WR512 025 01 14				14.0		
WR512 025 01 16				16.0		
WR512 025 01 20				20.0		
WR512 025 01 26				26.0	60	
WR512 025 01 30				30.0	70	
WR512 025 02 08		0.20		8.0	50	
WR512 025 02 10				10.0		
WR512 025 02 12				12.0		
WR512 025 02 14				14.0		
WR512 025 02 16				16.0		
WR512 025 02 20				20.0		
WR512 025 02 26				26.0	60	
WR512 025 02 30				30.0	70	

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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- Longer tool life and improvement on stable machining with W coating

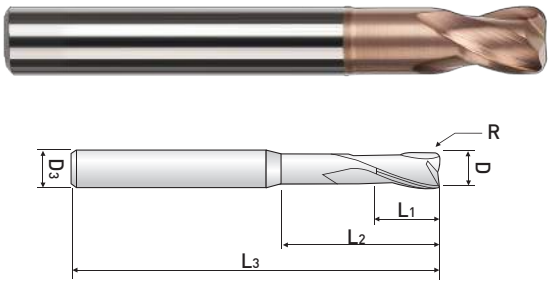
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 025 03 08	2.5	0.30	4.0	8.0	50	4.0
WR512 025 03 10				10.0		
WR512 025 03 12				12.0		
WR512 025 03 14				14.0		
WR512 025 03 16				16.0		
WR512 025 03 20				20.0		
WR512 025 03 26				26.0	60	
WR512 025 03 30				30.0	70	
WR512 025 05 08		0.50		8.0	50	
WR512 025 05 10				10.0		
WR512 025 05 12				12.0		
WR512 025 05 14				14.0		
WR512 025 05 16				16.0		
WR512 025 05 20				20.0		
WR512 025 05 26				26.0	60	
WR512 025 05 30				30.0	70	
WR512 030 01 08	3.0	0.10	4.5	8.0	50	6.0
WR512 030 01 10				10.0		
WR512 030 01 12				12.0		
WR512 030 01 14				14.0	60	
WR512 030 01 16				16.0		
WR512 030 01 20				20.0		
WR512 030 01 26				26.0	65	
WR512 030 01 30				30.0	70	
WR512 030 01 35				35.0		
WR512 030 01 40				40.0	80	
WR512 030 02 08		0.20		8.0	50	
WR512 030 02 10				10.0		
WR512 030 02 12				12.0		
WR512 030 02 14				14.0	60	
WR512 030 02 16				16.0		
WR512 030 02 20				20.0		
WR512 030 02 26				26.0	65	
WR512 030 02 30				30.0	70	
WR512 030 02 35				35.0		
WR512 030 02 40				40.0	80	

NEXT >>

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE LONG NECK CORNER RADIUS

- Excellent effect in preventing breakage with a shape on neck without notch
- A variety of sizes on 2 flute long neck corner R radius
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

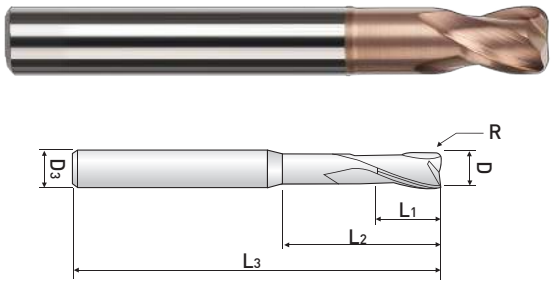
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 030 03 08	3.0	0.30	4.5	8.0	50	6.0
WR512 030 03 10				10.0		
WR512 030 03 12				12.0		
WR512 030 03 14				14.0	60	
WR512 030 03 16				16.0		
WR512 030 03 20				20.0		
WR512 030 03 26				26.0	65	
WR512 030 03 30				30.0	70	
WR512 030 03 35				35.0		
WR512 030 03 40				40.0	80	
WR512 030 05 08		0.50		8.0	50	
WR512 030 05 10				10.0		
WR512 030 05 12				12.0		
WR512 030 05 14				14.0	60	
WR512 030 05 16				16.0		
WR512 030 05 20				20.0		
WR512 030 05 26				26.0	65	
WR512 030 05 30				30.0	70	
WR512 030 05 35				35.0		
WR512 030 05 40				40.0	80	
WR512 030 10 08		1.00		8.0	50	
WR512 030 10 10				10.0		
WR512 030 10 12				12.0		
WR512 030 10 14				14.0	60	
WR512 030 10 16				16.0		
WR512 030 10 20				20.0		
WR512 030 10 26				26.0	65	
WR512 030 10 30				30.0	70	
WR512 030 10 35				35.0		
WR512 030 10 40				40.0	80	
WR512 040 01 10	4.0	0.10	6.0	10.0	50	6.0
WR512 040 01 12				12.0		
WR512 040 01 14				14.0	60	
WR512 040 01 16				16.0		
WR512 040 01 20				20.0		
WR512 040 01 26				26.0	65	
WR512 040 01 30				30.0		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE LONG NECK CORNER RADIUS

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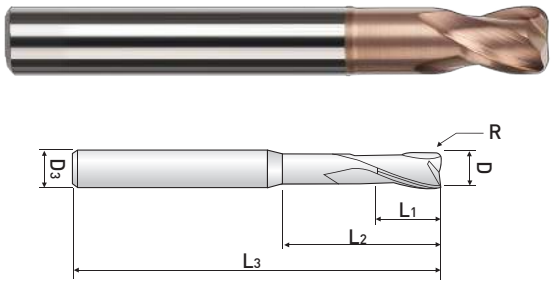
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 040 01 35	4.0	0.10	6.0	35.0	70	6.0
WR512 040 01 40				40.0	80	
WR512 040 01 45				45.0	90	
WR512 040 01 50				50.0	100	
WR512 040 02 10		0.20		10.0	50	
WR512 040 02 12				12.0		
WR512 040 02 14				14.0	60	
WR512 040 02 16				16.0		
WR512 040 02 20				20.0		
WR512 040 02 26				26.0	65	
WR512 040 02 30				30.0		
WR512 040 02 35				35.0	70	
WR512 040 02 40				40.0	80	
WR512 040 02 45				45.0	90	
WR512 040 02 50				50.0	100	
WR512 040 03 10		0.30		10.0	50	
WR512 040 03 12				12.0		
WR512 040 03 14				14.0	60	
WR512 040 03 16				16.0		
WR512 040 03 20				20.0		
WR512 040 03 26				26.0	65	
WR512 040 03 30				30.0		
WR512 040 03 35				35.0	70	
WR512 040 03 40				40.0	80	
WR512 040 03 45				45.0	90	
WR512 040 03 50				50.0	100	
WR512 040 05 10		0.50		10.0	50	
WR512 040 05 12				12.0		
WR512 040 05 14				14.0	60	
WR512 040 05 16				16.0		
WR512 040 05 20				20.0		
WR512 040 05 26				26.0	65	
WR512 040 05 30				30.0		
WR512 040 05 35				35.0	70	
WR512 040 05 40				40.0	80	
WR512 040 05 45				45.0	90	
WR512 040 05 50				50.0	100	

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



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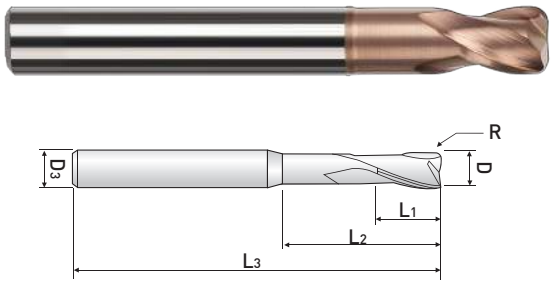
WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 040 10 10	4.0	1.00	6.0	10.0	50	6.0
WR512 040 10 12				12.0		
WR512 040 10 14				14.0	60	
WR512 040 10 16				16.0		
WR512 040 10 20				20.0		
WR512 040 10 26				26.0	65	
WR512 040 10 30				30.0		
WR512 040 10 35				35.0	70	
WR512 040 10 40				40.0	80	
WR512 040 10 45				45.0	90	
WR512 040 10 50				50.0	100	
WR512 050 01	5.0	0.10	8.0	15.0	60.0	6.0
WR512 050 02		0.20				
WR512 050 03		0.30				
WR512 050 05		0.50				
WR512 050 10		1.00				
WR512 050 15		1.50				
WR512 050 20		2.00				
WR512 060 01	6.0	0.10	9.0	20.0	60.0	6.0
WR512 060 02		0.20				
WR512 060 03		0.30				
WR512 060 05		0.50				
WR512 060 10		1.00				
WR512 060 15		1.50				
WR512 060 20		2.00				
WR512 060 03 90		0.30	15.0	30.0	90.0	6.0
WR512 060 05 90		0.50				
WR512 060 10 90		1.00				
WR512 080 01	8.0	0.10	12.0	25.0	70.0	8.0
WR512 080 02		0.20				
WR512 080 03		0.30				
WR512 080 05		0.50				
WR512 080 10		1.00				
WR512 080 15		1.50				
WR512 080 20		2.00				
WR512 080 03 100		0.30	20.0	35.0	100.0	8.0
WR512 080 05 100		0.50				
WR512 080 10 100		1.00				

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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WR512 ...series

ULTRA FINE | HELIX | up to Φ6 | over Φ6 | W Coating | p.1021

EDP. No.	D	R	L1	L2	L3	D3
WR512 100 01	10.0	0.10	15.0	30.0	75.0	10.0
WR512 100 02		0.20				
WR512 100 03		0.30				
WR512 100 05		0.50				
WR512 100 10		1.00				
WR512 100 15		1.50				
WR512 100 20		2.00				
WR512 100 03 100		0.30	25.0	40.0	100.0	
WR512 100 05 100		0.50				
WR512 100 10 100		1.00				
WR512 120 02	12.0	0.20	18.0	32.0	80.0	12.0
WR512 120 03		0.30				
WR512 120 05		0.50				
WR512 120 10		1.00				
WR512 120 15		1.50				
WR512 120 20		2.00				
WR512 120 03 110		0.30	30.0	45.0	110.0	
WR512 120 05 110		0.50				
WR512 120 10 110		1.00				
WR512 160 05	16.0	0.50	20.0	35.0	100.0	16.0
WR512 160 10		1.00				
WR512 160 05 150		0.50	35.0	50.0	150.0	
WR512 160 10 150		1.00				
WR512 200 05	20.0	0.50	25.0	40.0	100.0	20.0
WR512 200 10		1.00				
WR512 200 05 150		0.50	40.0	55.0	150.0	
WR512 200 10 150		1.00				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

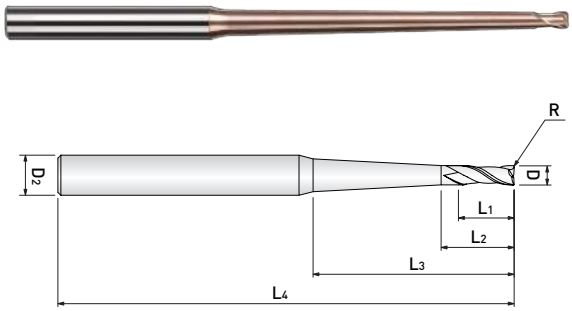
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE TAPER LONG LECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

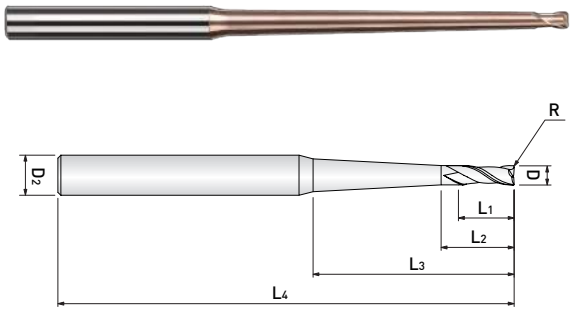
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 002 005 01 01	0.2	0.05	1°	0.3	0.4	1.0	40	4
WR542 002 005 01 02						2.0		
WR542 002 005 01 03						3.0		
WR542 002 005 02 01			2°			1.0		
WR542 002 005 02 02						2.0		
WR542 002 005 02 03						3.0		
WR542 003 005 01 02	0.3	0.05	1°	0.5	0.6	2.0	40	4
WR542 003 005 01 03						3.0		
WR542 003 005 01 04						4.0		
WR542 003 005 01 05						5.0		
WR542 003 005 02 02			2°			2.0		
WR542 003 005 02 03						3.0		
WR542 003 005 02 04						4.0		
WR542 003 005 02 05						5.0		
WR542 004 005 01 02	0.4	0.05	1°	0.6	0.8	2.0	50	4
WR542 004 005 01 03						3.0		
WR542 004 005 01 04						4.0		
WR542 004 005 01 05						5.0		
WR542 004 005 01 06						6.0		
WR542 004 005 02 02			2°			2.0		
WR542 004 005 02 03						3.0		
WR542 004 005 02 04						4.0		
WR542 004 005 02 05						5.0		
WR542 004 005 02 06						6.0		
WR542 004 01 01 02		0.10	1°			2.0		
WR542 004 01 01 03						3.0		
WR542 004 01 01 04						4.0		
WR542 004 01 01 05						5.0		
WR542 004 01 01 06						6.0		
WR542 004 01 02 02			2°			2.0		
WR542 004 01 02 03						3.0		
WR542 004 01 02 04						4.0		
WR542 004 01 02 05						5.0		
WR542 004 01 02 06						6.0		
WR542 005 005 01 04	0.50	0.05	1°	0.70	1.0	4.0	50	4
WR542 005 005 01 06						6.0		
WR542 005 005 01 08						8.0		

NEXT >>

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE TAPER LONG LECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

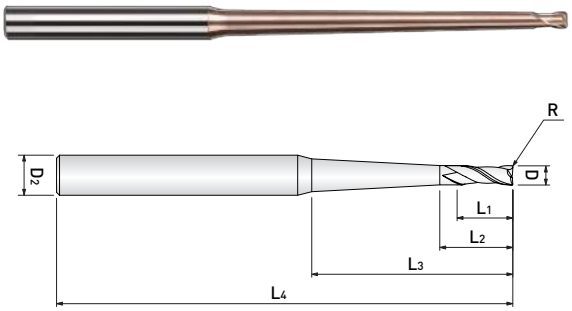
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 005 005 01 10	0.50	0.05	1°	0.70	1.0	10.0	50	4
WR542 005 005 02 04			2°			4.0		
WR542 005 005 02 06						6.0		
WR542 005 005 02 08						8.0		
WR542 005 005 02 10						10.0		
WR542 005 01 01 04		0.10	1°			4.0		
WR542 005 01 01 06						6.0		
WR542 005 01 01 08						8.0		
WR542 005 01 01 10						10.0		
WR542 005 01 02 04			2°			4.0		
WR542 005 01 02 06						6.0		
WR542 005 01 02 08						8.0		
WR542 005 01 02 10						10.0		
WR542 006 01 01 04	0.6	0.10	1°	0.9	1.2	4.0	50.0	4.0
WR542 006 01 01 06						6.0		
WR542 006 01 01 08						8.0		
WR542 006 01 01 10						10.0		
WR542 006 01 01 12						12.0		
WR542 006 01 02 04			2°			4.0		
WR542 006 01 02 06						6.0		
WR542 006 01 02 08						8.0		
WR542 006 01 02 10						10.0		
WR542 006 01 02 12						12.0		
WR542 006 02 01 04		0.20	1°			4.0		
WR542 006 02 01 06						6.0		
WR542 006 02 01 08						8.0		
WR542 006 02 01 10						10.0		
WR542 006 02 01 12						12.0		
WR542 006 02 02 04			2°			4.0		
WR542 006 02 02 06						6.0		
WR542 006 02 02 08						8.0		
WR542 006 02 02 10						10.0		
WR542 006 02 02 12						12.0		
WR542 008 01 01 04	0.8	0.10	1°	1.2	1.6	4.0	50.0	4.0
WR542 008 01 01 06						6.0		
WR542 008 01 01 08						8.0		
WR542 008 01 01 10						10.0		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



2 FLUTE TAPER LONG LECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

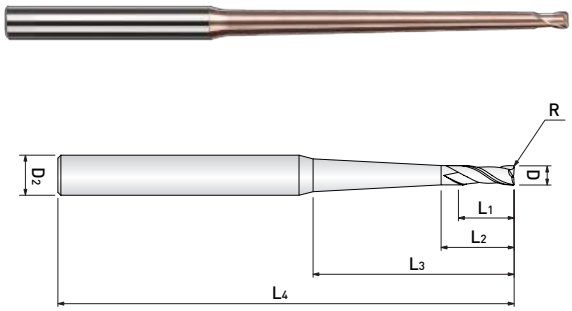
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 008 01 01 12	0.8	0.10	1°	1.2	1.6	12.0	50.0	4.0
WR542 008 01 01 16						16.0		
WR542 008 01 02 04			2°			4.0		
WR542 008 01 02 06						6.0		
WR542 008 01 02 08						8.0		
WR542 008 01 02 10						10.0		
WR542 008 01 02 12						12.0		
WR542 008 01 02 16						16.0		
WR542 008 02 01 04		0.20	1°			4.0		
WR542 008 02 01 06						6.0		
WR542 008 02 01 08						8.0		
WR542 008 02 01 10						10.0		
WR542 008 02 01 12						12.0		
WR542 008 02 01 16						16.0		
WR542 008 02 02 04			2°			4.0		
WR542 008 02 02 06						6.0		
WR542 008 02 02 08						8.0		
WR542 008 02 02 10						10.0		
WR542 008 02 02 12						12.0		
WR542 008 02 02 16						16.0		
WR542 010 01 01 06	1.0	0.10	1°	1.5	2.5	6.0	50	4
WR542 010 01 01 08						8.0		
WR542 010 01 01 10						10.0		
WR542 010 01 01 12						12.0		
WR542 010 01 01 16						16.0		
WR542 010 01 01 20						20.0		
WR542 010 01 01 25						25.0	60	
WR542 010 01 01 30						30.0	70	
WR542 010 01 01 40						40.0	80	
WR542 010 01 01 50						50.0	90	6
WR542 010 01 02 06			2°			6.0	50	4
WR542 010 01 02 08						8.0		
WR542 010 01 02 10						10.0		
WR542 010 01 02 12						12.0		
WR542 010 01 02 16						16.0		
WR542 010 01 02 20						20.0		
WR542 010 01 02 25						25.0	60	
WR542 010 01 02 30						30.0	70	

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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- Longer tool life and improvement on stable machining with W coating

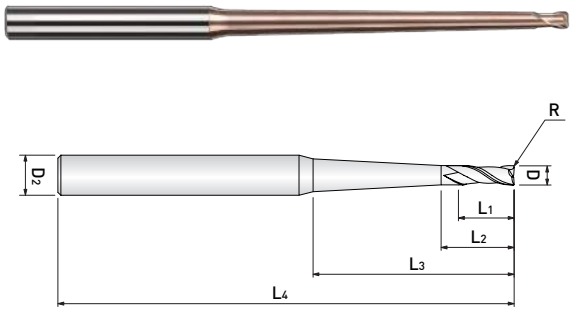
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 010 01 02 40	1.0	0.10	2°	1.5	2.5	40.0	80	4
WR542 010 01 02 50						50.0	90	6
WR542 010 02 01 06		0.20	1°			6.0	50	4
WR542 010 02 01 08						8.0		
WR542 010 02 01 10						10.0		
WR542 010 02 01 12						12.0		
WR542 010 02 01 16						16.0		
WR542 010 02 01 20						20.0		
WR542 010 02 01 25						25.0	60	
WR542 010 02 01 30						30.0	70	
WR542 010 02 01 40						40.0	80	
WR542 010 02 01 50						50.0	90	6
WR542 010 02 02 06			2°			6.0	50	4
WR542 010 02 02 08						8.0		
WR542 010 02 02 10						10.0		
WR542 010 02 02 12						12.0		
WR542 010 02 02 16						16.0		
WR542 010 02 02 20						20.0		
WR542 010 02 02 25						25.0	60	
WR542 010 02 02 30						30.0	70	
WR542 010 02 02 40						40.0	80	
WR542 010 02 02 50						50.0	90	6
WR542 012 01 01 08	1.2	0.10	1°	1.8	3.0	8.0	50	4
WR542 012 01 01 12						12.0		
WR542 012 01 01 16						16.0		
WR542 012 01 01 20						20.0		
WR542 012 01 01 25						25.0	60	
WR542 012 01 01 30						30.0	70	
WR542 012 01 02 08			2°			8.0	50	
WR542 012 01 02 12						12.0		
WR542 012 01 02 16						16.0		
WR542 012 01 02 20						20.0		
WR542 012 01 02 25						25.0	60	
WR542 012 01 02 30						30.0	70	
WR542 012 02 01 08		0.20	1°			8.0	50	
WR542 012 02 01 12						12.0		
WR542 012 02 01 16						16.0		
WR542 012 02 01 20						20.0		

NEXT >>

Endmills for Mold & Die(Corner Radius) WINNER Series



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- Longer tool life and improvement on stable machining with W coating

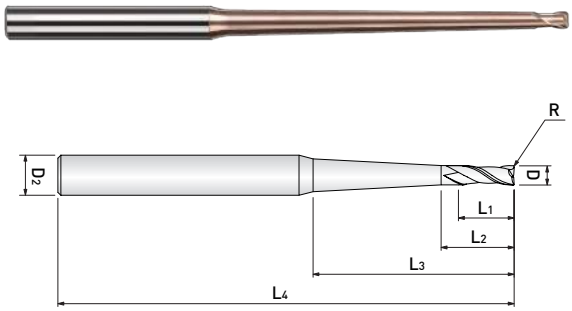
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 012 02 01 25	1.2	0.20	1°	1.8	3.0	25.0	60	4
WR542 012 02 01 30						30.0	70	
WR542 012 02 02 08			2°			8.0	50	
WR542 012 02 02 12						12.0		
WR542 012 02 02 16						16.0		
WR542 012 02 02 20						20.0		
WR542 012 02 02 25						25.0	60	
WR542 012 02 02 30						30.0	70	
WR542 015 01 01 08	1.5	0.10	1°	2.3	3.0	8.0	50	4
WR542 015 01 01 10						10.0		
WR542 015 01 01 12						12.0		
WR542 015 01 01 16						16.0		
WR542 015 01 01 20						20.0		
WR542 015 01 01 25						25.0	60	
WR542 015 01 01 30						30.0	70	
WR542 015 01 01 40						40.0	80	
WR542 015 01 01 50						50.0	90	
WR542 015 01 02 08			2°			8.0	50	
WR542 015 01 02 10						10.0		
WR542 015 01 02 12						12.0		
WR542 015 01 02 16						16.0		
WR542 015 01 02 20						20.0		
WR542 015 01 02 25						25.0	60	
WR542 015 01 02 30						30.0	70	
WR542 015 01 02 40						40.0	80	6
WR542 015 01 02 50						50.0	90	
WR542 015 02 01 08		0.20	1°			8.0	50	4
WR542 015 02 01 10						10.0		
WR542 015 02 01 12						12.0		
WR542 015 02 01 16						16.0		
WR542 015 02 01 20						20.0		
WR542 015 02 01 25						25.0	60	
WR542 015 02 01 30						30.0	70	
WR542 015 02 01 40						40.0	80	
WR542 015 02 01 50						50.0	90	
WR542 015 02 02 08			2°			8.0	50	
WR542 015 02 02 10						10.0		
WR542 015 02 02 12						12.0		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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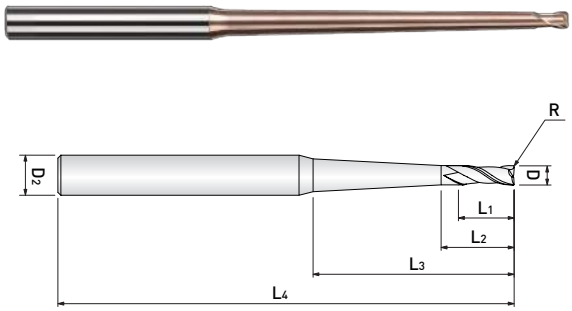
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 015 02 02 16	1.5	0.20	2°	2.3	3.0	16.0	50	4
WR542 015 02 02 20						20.0		
WR542 015 02 02 25						25.0	60	
WR542 015 02 02 30						30.0	70	
WR542 015 02 02 40						40.0	80	6
WR542 015 02 02 50						50.0	90	
WR542 015 03 01 08		0.30	1°			8.0	50	4
WR542 015 03 01 10						10.0		
WR542 015 03 01 12						12.0		
WR542 015 03 01 16						16.0		
WR542 015 03 01 20						20.0		
WR542 015 03 01 25						25.0	60	
WR542 015 03 01 30						30.0	70	
WR542 015 03 01 40						40.0	80	
WR542 015 03 01 50						50.0	90	
WR542 015 03 02 08			2°			8.0	50	
WR542 015 03 02 10						10.0		
WR542 015 03 02 12						12.0		
WR542 015 03 02 16						16.0		
WR542 015 03 02 20						20.0		
WR542 015 03 02 25						25.0	60	
WR542 015 03 02 30						30.0	70	
WR542 015 03 02 40						40.0	80	6
WR542 015 03 02 50						50.0	90	
WR542 020 01 01 10	2.0	0.10	1°	2.0	5.0	10.0	50	4
WR542 020 01 01 12						12.0		
WR542 020 01 01 16						16.0		
WR542 020 01 01 20						20.0		
WR542 020 01 01 25						25.0	60	
WR542 020 01 01 30						30.0	70	
WR542 020 01 01 40						40.0	80	6
WR542 020 01 01 50						50.0	100	
WR542 020 01 01 60						60.0		
WR542 020 01 01 80						80.0	140	
WR542 020 01 02 10			2°			10.0	50	4
WR542 020 01 02 12						12.0		
WR542 020 01 02 16						16.0		

NEXT ≫≫

Endmills for Mold & Die(Corner Radius) WINNER Series



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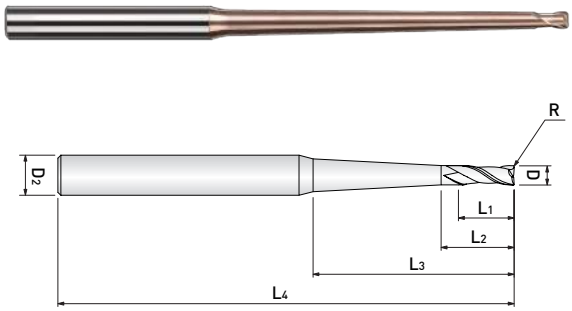
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 020 01 02 20	2.0	0.10	2°	2.0	5.0	20.0	50	4
WR542 020 01 02 25						25.0	60	
WR542 020 01 02 30						30.0	70	
WR542 020 01 02 40						40.0	80	6
WR542 020 01 02 50						50.0	100	
WR542 020 01 02 60						60.0		
WR542 020 01 02 80						80.0	140	8
WR542 020 02 01 10		0.20	1°			10.0	50	4
WR542 020 02 01 12						12.0		
WR542 020 02 01 16						16.0		
WR542 020 02 01 20						20.0		
WR542 020 02 01 25						25.0	60	
WR542 020 02 01 30						30.0	70	
WR542 020 02 01 40						40.0	80	6
WR542 020 02 01 50						50.0	100	
WR542 020 02 01 60						60.0		
WR542 020 02 01 80						80.0	140	
WR542 020 02 02 10			2°			10.0	50	4
WR542 020 02 02 12						12.0		
WR542 020 02 02 16						16.0		
WR542 020 02 02 20						20.0		
WR542 020 02 02 25						25.0	60	
WR542 020 02 02 30						30.0	70	
WR542 020 02 02 40						40.0	80	6
WR542 020 02 02 50						50.0	100	
WR542 020 02 02 60						60.0		
WR542 020 02 02 80						80.0	140	8
WR542 020 03 01 10		0.30	1°			10.0	50	4
WR542 020 03 01 12						12.0		
WR542 020 03 01 16						16.0		
WR542 020 03 01 20						20.0		
WR542 020 03 01 25						25.0	60	
WR542 020 03 01 30						30.0	70	
WR542 020 03 01 40						40.0	80	6
WR542 020 03 01 50						50.0	100	
WR542 020 03 01 60						60.0		
WR542 020 03 01 80						80.0	140	

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



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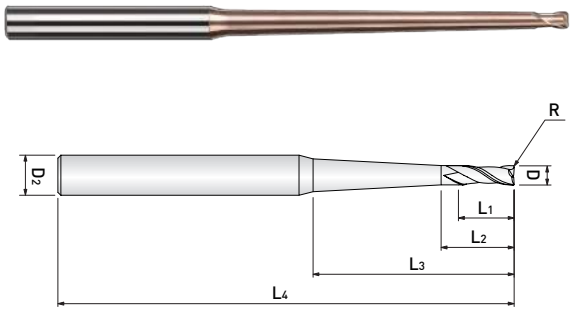
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 020 03 02 10	2.0	0.30	2°	2.0	5.0	10.0	50	4
WR542 020 03 02 12						12.0		
WR542 020 03 02 16						16.0		
WR542 020 03 02 20						20.0		
WR542 020 03 02 25						25.0	60	
WR542 020 03 02 30						30.0	70	
WR542 020 03 02 40						40.0	80	6
WR542 020 03 02 50						50.0	100	
WR542 020 03 02 60						60.0		
WR542 020 03 02 80						80.0	140	8
WR542 020 05 01 10		0.50	1°			10.0	50	4
WR542 020 05 01 12						12.0		
WR542 020 05 01 16						16.0		
WR542 020 05 01 20						20.0		
WR542 020 05 01 25						25.0	60	
WR542 020 05 01 30						30.0	70	
WR542 020 05 01 40						40.0	80	6
WR542 020 05 01 50						50.0	100	
WR542 020 05 01 60						60.0		
WR542 020 05 01 80						80.0	140	
WR542 020 05 02 10			2°			10.0	50	4
WR542 020 05 02 12						12.0		
WR542 020 05 02 16						16.0		
WR542 020 05 02 20						20.0		
WR542 020 05 02 25						25.0	60	
WR542 020 05 02 30						30.0	70	
WR542 020 05 02 40						40.0	80	6
WR542 020 05 02 50						50.0	100	
WR542 020 05 02 60						60.0		
WR542 020 05 02 80						80.0	140	8
WR542 030 02 01 16	3.0	0.20	1°	4.5	6.0	16.0	60	6
WR542 030 02 01 20						20.0	65	
WR542 030 02 01 30						30.0	70	
WR542 030 02 01 40						40.0	80	
WR542 030 02 01 50						50.0	90	
WR542 030 02 01 60						60.0	100	
WR542 030 02 02 16			2°			16.0	60	

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



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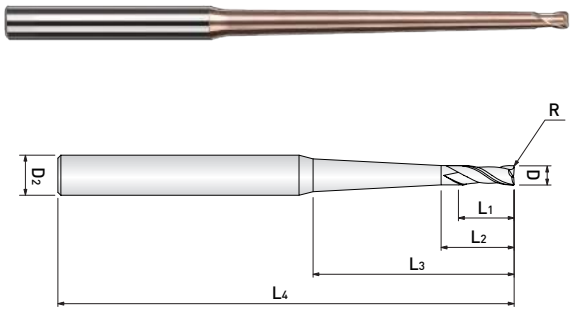
WR542 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 030 02 02 20	3.0	0.20	2°	4.5	6.0	20.0	65	6
WR542 030 02 02 30						30.0	70	
WR542 030 02 02 40						40.0	80	
WR542 030 02 02 50						50.0	90	8
WR542 030 02 02 60						60.0	100	
WR542 030 02 02 70						70.0	120	
WR542 030 03 01 16		0.30	1°			16.0	60	6
WR542 030 03 01 20						20.0	65	
WR542 030 03 01 30						30.0	70	
WR542 030 03 01 40						40.0	80	
WR542 030 03 01 50						50.0	90	
WR542 030 03 01 60						60.0	100	
WR542 030 03 02 16			2°			16.0	60	
WR542 030 03 02 20						20.0	65	
WR542 030 03 02 30						30.0	70	
WR542 030 03 02 40						40.0	80	
WR542 030 03 02 50						50.0	90	8
WR542 030 03 02 60						60.0	100	
WR542 030 03 02 70						70.0	120	
WR542 030 05 01 16		0.50	1°			16.0	60	6
WR542 030 05 01 20						20.0	65	
WR542 030 05 01 30						30.0	70	
WR542 030 05 01 40						40.0	80	
WR542 030 05 01 50						50.0	90	
WR542 030 05 01 60						60.0	100	
WR542 030 05 02 16			2°			16.0	60	
WR542 030 05 02 20						20.0	65	
WR542 030 05 02 30						30.0	70	
WR542 030 05 02 40						40.0	80	
WR542 030 05 02 50						50.0	90	8
WR542 030 05 02 60						60.0	100	
WR542 030 05 02 70						70.0	120	

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



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WR542 ...series

ULTRA FINE | 2 | 30° HELIX | R ±0.01 up to 6 | W Coating | DATA p.1018

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR542 040 02 01 40	4.0	0.20	1°	6.0	8.0	40.0	90	6
WR542 040 02 01 50						50.0	100	
WR542 040 02 01 60						60.0	110	
WR542 040 02 01 70						70.0	120	8
WR542 040 02 02 40			2°			40.0	90	
WR542 040 02 02 50						50.0	100	
WR542 040 02 02 60						60.0	110	
WR542 040 02 02 70						70.0	120	10
WR542 040 03 01 40		0.30	1°			40.0	90	6
WR542 040 03 01 50						50.0	100	
WR542 040 03 01 60						60.0	110	
WR542 040 03 01 70						70.0	120	8
WR542 040 03 02 40			2°			40.0	90	
WR542 040 03 02 50						50.0	100	
WR542 040 03 02 60						60.0	110	
WR542 040 03 02 70						70.0	120	10
WR542 040 05 01 40		0.50	1°			40.0	90	6
WR542 040 05 01 50						50.0	100	
WR542 040 05 01 60						60.0	110	
WR542 040 05 01 70						70.0	120	8
WR542 040 05 02 40			2°			40.0	90	
WR542 040 05 02 50						50.0	100	
WR542 040 05 02 60						60.0	110	
WR542 040 05 02 70						70.0	120	10

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

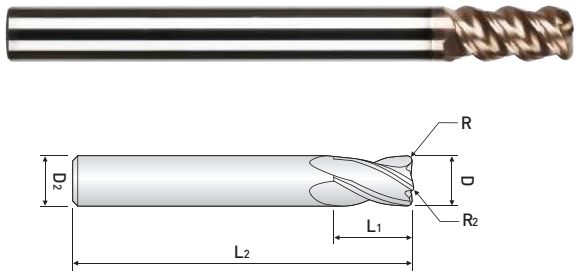
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.012	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



3 FLUTE DOUBLE CORNER RADIUS

- High speed and feed rate lead to an improved productivity due to the choice of unique double corner radius
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55
  Pre-hardened Steel, Alloy Steel, Carbon Steel

WDR503 ...series

ULTRA FINE | HELIX | up to 6 | W Coating | p.1019

EDP. No.	D	R	R2	L1	L2	D2
WDR503 060 05	6.0	0.50	6.0	10.0	90.0	6.0
WDR503 060 10		1.00				
WDR503 060 20		2.00				
WDR503 080 05	8.0	0.50	8.0	16.0	100.0	8.0
WDR503 080 10		1.00				
WDR503 080 20		2.00				
WDR503 100 05	10.0	0.50	10.0	20.0	100.0	10.0
WDR503 100 10		1.00				
WDR503 100 20		2.00				
WDR503 120 05	12.0	0.50	12.0	24.0	110.0	12.0
WDR503 120 10		1.00				
WDR503 120 20		2.00				
WDR503 160 05	16.0	0.50	16.0	32.0	150.0	16.0
WDR503 160 10		1.00				
WDR503 200 05	20.0	0.50	20.0	40.0	150.0	20.0
WDR503 200 10		1.00				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

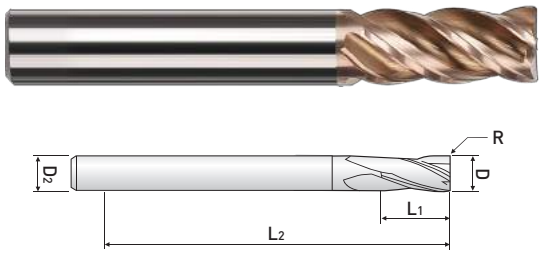
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.02	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonace by irregular exciting force
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

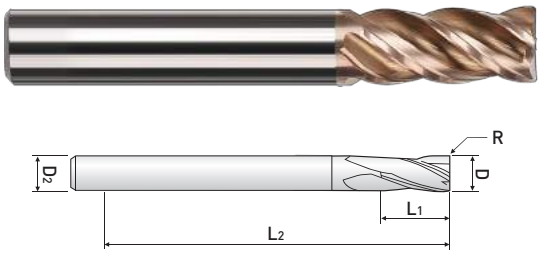
WXR504 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1018

EDP. No.	D	R	L1	L2	D2
WXR504 010 005	1.0	0.05	2.5	50	6
WXR504 010 01		0.10			
WXR504 010 02		0.20			
WXR504 010 03		0.30			
WXR504 012 005	1.2	0.05	3.0	50	6
WXR504 012 01		0.10			
WXR504 012 02		0.20			
WXR504 012 03		0.30			
WXR504 015 005	1.5	0.05	4.0	50	6
WXR504 015 01		0.10			
WXR504 015 02		0.20			
WXR504 015 03		0.30			
WXR504 015 05		0.50			
WXR504 020 01	2.0	0.10	6.0	50	6
WXR504 020 02		0.20			
WXR504 020 03		0.30			
WXR504 020 05		0.50			
WXR504 025 01	2.5	0.10	7.0	60	6
WXR504 025 02		0.20			
WXR504 025 03		0.30			
WXR504 025 05		0.50			
WXR504 030 01	3.0	0.10	8.0	60	6
WXR504 030 02		0.20			
WXR504 030 03		0.30			
WXR504 030 05		0.50			
WXR504 030 10		1.00			
WXR504 035 01	3.5	0.10	10.0	70	6
WXR504 035 02		0.20			
WXR504 035 03		0.30			
WXR504 035 05		0.50			
WXR504 040 01 S4	4.0	0.10	10.0	70	4
WXR504 040 02 S4		0.20			
WXR504 040 03 S4		0.30			
WXR504 040 05 S4		0.50			
WXR504 040 10 S4		1.00			
WXR504 040 01 100 S4		0.10		100	
WXR504 040 02 100 S4		0.20			
WXR504 040 03 100 S4		0.30			

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonace by irregular exciting force
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

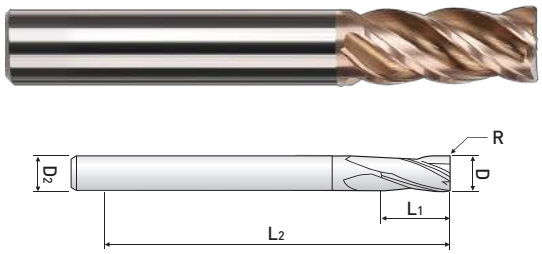
WXR504 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1018

EDP. No.	D	R	L1	L2	D2
WXR504 040 05 100 S4	4.0	0.50	10.0	100	4
WXR504 040 10 100 S4		1.00			
WXR504 040 01		0.10		70	6
WXR504 040 02		0.20			
WXR504 040 03		0.30			
WXR504 040 05		0.50			
WXR504 040 10		1.00			
WXR504 045 01	4.5	0.10	11.0	80	6
WXR504 045 02		0.20			
WXR504 045 03		0.30			
WXR504 045 05		0.50			
WXR504 050 01	5.0	0.10	13.0	90	6
WXR504 050 02		0.20			
WXR504 050 03		0.30			
WXR504 050 05		0.50			
WXR504 050 10		1.00			
WXR504 055 01	5.5	0.10	13.0	90	6
WXR504 055 02		0.20			
WXR504 055 03		0.30			
WXR504 055 05		0.50			
WXR504 055 10		1.00			
WXR504 060 01 060	6.0	0.10	15.0	60	6
WXR504 060 02 060		0.20			
WXR504 060 01		0.10		90	
WXR504 060 02		0.20			
WXR504 060 03		0.30			
WXR504 060 05		0.50			
WXR504 060 10		1.00			
WXR504 060 15		1.50			
WXR504 060 20		2.00			
WXR504 060 05 110		0.50		110	
WXR504 060 10 110		1.00			
WXR504 060 05 130		0.50		130	
WXR504 060 10 130		1.00			
WXR504 070 01	7.0	0.10	16.0	90	8
WXR504 070 02		0.20			
WXR504 070 03		0.30			
WXR504 070 05		0.50			

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonace by irregular exciting force
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

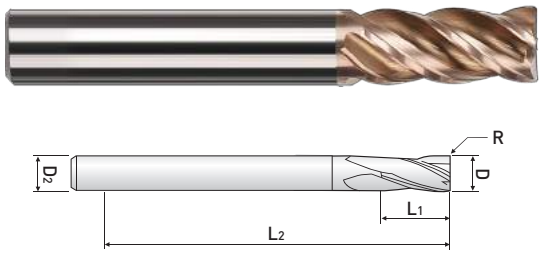
WXR504 ...series

ULTRA FINE | 4 | HELIX | HELIX | All sizes | W Coating | p.1018

EDP. No.	D	R	L1	L2	D2
WXR504 070 10	7.0	1.00	16.0	90	8
WXR504 070 20		2.00			
WXR504 080 03 070	8.0	0.30	20.0	70	8
WXR504 080 05 070		0.50			
WXR504 080 10 070		1.00			
WXR504 080 01		0.10		100	
WXR504 080 02		0.20			
WXR504 080 03		0.30			
WXR504 080 05		0.50			
WXR504 080 10		1.00			
WXR504 080 15		1.50			
WXR504 080 20		2.00			
WXR504 080 25		2.50			
WXR504 080 30		3.00			
WXR504 080 05 120		0.50		120	
WXR504 080 10 120		1.00			
WXR504 080 05 150		0.50		150	
WXR504 080 10 150		1.00			
WXR504 100 03 075	10.0	0.30	25.0	75	10
WXR504 100 05 075		0.50			
WXR504 100 10 075		1.00			
WXR504 100 01		0.10		100	
WXR504 100 02		0.20			
WXR504 100 03		0.30			
WXR504 100 05		0.50			
WXR504 100 10		1.00			
WXR504 100 15		1.50			
WXR504 100 20		2.00			
WXR504 100 25		2.50			
WXR504 100 30		3.00			
WXR504 100 40		4.00			
WXR504 100 05 130		0.50	22.0	130	
WXR504 100 10 130		1.00			
WXR504 100 05 150		0.50		150	
WXR504 100 10 150		1.00			
WXR504 110 02	11.0	0.20	25	110	12
WXR504 110 03		0.30			

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

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WXR504 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1018

EDP. No.	D	R	L1	L2	D2
WXR504 110 05	11.0	0.50	25	110	12
WXR504 110 10		1.00			
WXR504 110 20		2.00			
WXR504 120 03 080	12.0	0.30	30	80	12
WXR504 120 05 080		0.50			
WXR504 120 10 080		1.00			
WXR504 120 01		0.10		110	
WXR504 120 02		0.20			
WXR504 120 03		0.30			
WXR504 120 05		0.50			
WXR504 120 10		1.00			
WXR504 120 15		1.50			
WXR504 120 20		2.00			
WXR504 120 25		2.50			
WXR504 120 30		3.00			
WXR504 120 40		4.00			
WXR504 120 50		5.00			
WXR504 120 05 130		0.50		130	
WXR504 120 10 130		1.00			
WXR504 120 05 150		0.50		150	
WXR504 120 10 150		1.00			
WXR504 140 05	14.0	0.50	35	150	16
WXR504 140 10		1.00			
WXR504 140 20		2.00			
WXR504 160 05	16.0	0.50	32	150	16
WXR504 160 10		1.00			
WXR504 160 15		1.50			
WXR504 160 20		2.00			
WXR504 200 05	20.0	0.50	38	150	20
WXR504 200 10		1.00			
WXR504 200 15		1.50			
WXR504 200 20		2.00			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
○	○	◎	○				○		◎

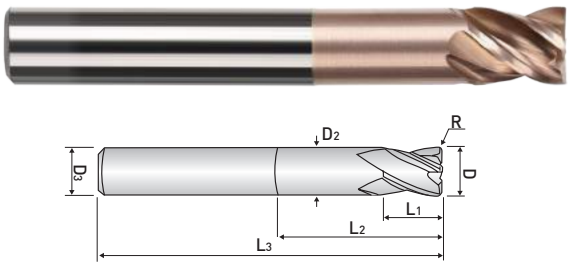
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Excellent effect in preventing breakage with a shape on neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material

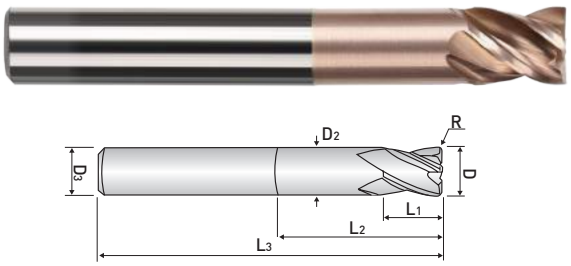
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L1	L2	L3	D2
WXR514 010 005 03	1.0	0.05	1.5	3	50.0	4.0
WXR514 010 005 04				4		
WXR514 010 005 06				6		
WXR514 010 005 08				8		
WXR514 010 005 10				10		
WXR514 010 005 12				12		
WXR514 010 005 14				14		
WXR514 010 005 16				16		
WXR514 010 005 20				20		
WXR514 010 01 03		0.10		3		
WXR514 010 01 04				4		
WXR514 010 01 06				6		
WXR514 010 01 08				8		
WXR514 010 01 10				10		
WXR514 010 01 12				12		
WXR514 010 01 14				14		
WXR514 010 01 16				16		
WXR514 010 01 20				20		
WXR514 010 02 03		0.20		3		
WXR514 010 02 04				4		
WXR514 010 02 06				6		
WXR514 010 02 08				8		
WXR514 010 02 10				10		
WXR514 010 02 12				12		
WXR514 010 02 14				14		
WXR514 010 02 16				16		
WXR514 010 02 20				20		
WXR514 010 03 03		0.30		3		
WXR514 010 03 04				4		
WXR514 010 03 06				6		
WXR514 010 03 08				8		
WXR514 010 03 10				10		
WXR514 010 03 12				12		
WXR514 010 03 14				14		
WXR514 010 03 16				16		
WXR514 010 03 20				20		
WXR514 012 005 03	1.2	0.05	1.8	3	50.0	4.0
WXR514 012 005 04				4		

NEXT ≫≫

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

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- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
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- Enhanced cutting effect and better wear resistance made from the finest raw material

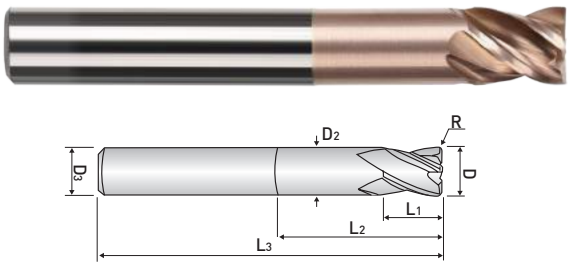
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L1	L2	L3	D2
WXR514 012 005 06	1.2	0.05	1.8	6	50.0	4.0
WXR514 012 005 08				8		
WXR514 012 005 10				10		
WXR514 012 005 12				12		
WXR514 012 005 16				16		
WXR514 012 005 20				20		
WXR514 012 01 03		0.10		3		
WXR514 012 01 04				4		
WXR514 012 01 06				6		
WXR514 012 01 08				8		
WXR514 012 01 10				10		
WXR514 012 01 12				12		
WXR514 012 01 16				16		
WXR514 012 01 20				20		
WXR514 012 02 03		0.20		3		
WXR514 012 02 04				4		
WXR514 012 02 06				6		
WXR514 012 02 08				8		
WXR514 012 02 10				10		
WXR514 012 02 12				12		
WXR514 012 02 16				16		
WXR514 012 02 20				20		
WXR514 012 03 03		0.30		3		
WXR514 012 03 04				4		
WXR514 012 03 06				6		
WXR514 012 03 08				8		
WXR514 012 03 10				10		
WXR514 012 03 12				12		
WXR514 012 03 16				16		
WXR514 012 03 20				20		
WXR514 015 005 04	1.5	0.05	2.3	4	50.0	4.0
WXR514 015 005 06				6		
WXR514 015 005 08				8		
WXR514 015 005 10				10		
WXR514 015 005 12				12		
WXR514 015 005 14				14		
WXR514 015 005 16				16		
WXR514 015 005 20				20		

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

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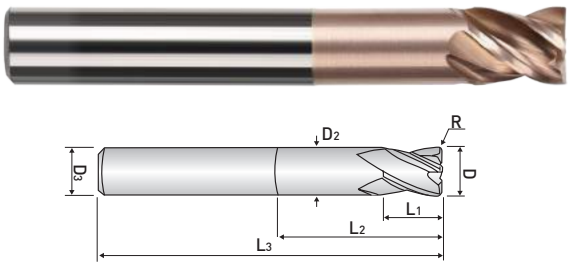
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L_1	L_2	L_3	D_2
WXR514 015 005 22	1.5	0.05	2.3	22	60	4.0
WXR514 015 005 26				26		
WXR514 015 01 04		0.10		4	50	
WXR514 015 01 06				6		
WXR514 015 01 08				8		
WXR514 015 01 10				10		
WXR514 015 01 12				12		
WXR514 015 01 14				14		
WXR514 015 01 16				16		
WXR514 015 01 20				20		
WXR514 015 01 22				22	60	
WXR514 015 01 26				26		
WXR514 015 02 04		0.20		4	50	
WXR514 015 02 06				6		
WXR514 015 02 08				8		
WXR514 015 02 10				10		
WXR514 015 02 12				12		
WXR514 015 02 14				14		
WXR514 015 02 16				16		
WXR514 015 02 20				20		
WXR514 015 02 22				22	60	
WXR514 015 02 26				26		
WXR514 015 03 04		0.30		4	50	
WXR514 015 03 06				6		
WXR514 015 03 08				8		
WXR514 015 03 10				10		
WXR514 015 03 12				12		
WXR514 015 03 14				14		
WXR514 015 03 16				16		
WXR514 015 03 20				20		
WXR514 015 03 22				22	60	
WXR514 015 03 26				26		
WXR514 015 05 04		0.50		4	50	
WXR514 015 05 06				6		

NEXT >>

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

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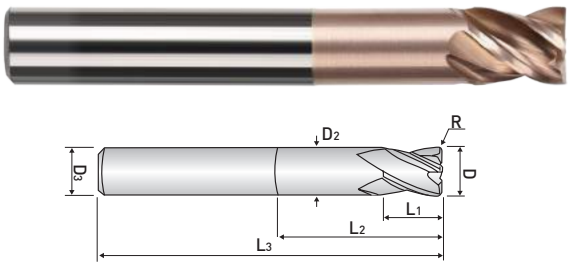
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L1	L2	L3	D2
WXR514 015 05 08	1.5	0.50	2.3	8	50	4.0
WXR514 015 05 10				10		
WXR514 015 05 12				12		
WXR514 015 05 14				14		
WXR514 015 05 16				16		
WXR514 015 05 20				20		
WXR514 015 05 22				22	60	
WXR514 015 05 26				26		
WXR514 020 01 06	2.0	0.10	3.0	6	50	4.0
WXR514 020 01 08				8		
WXR514 020 01 10				10		
WXR514 020 01 12				12		
WXR514 020 01 14				14		
WXR514 020 01 16				16		
WXR514 020 01 20				20		
WXR514 020 01 22				22	60	
WXR514 020 01 26				26		
WXR514 020 01 30				30	70	
WXR514 020 02 06		0.20		6	50	
WXR514 020 02 08				8		
WXR514 020 02 10				10		
WXR514 020 02 12				12		
WXR514 020 02 14				14		
WXR514 020 02 16				16		
WXR514 020 02 20				20		
WXR514 020 02 22				22	60	
WXR514 020 02 26				26		
WXR514 020 02 30				30	70	
WXR514 020 03 06		0.30		6		
WXR514 020 03 08				8		
WXR514 020 03 10				10		
WXR514 020 03 12				12	50	
WXR514 020 03 14				14		
WXR514 020 03 16				16		
WXR514 020 03 20				20		
WXR514 020 03 22				22	60	
WXR514 020 03 26				26		
WXR514 020 03 30				30	70	

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

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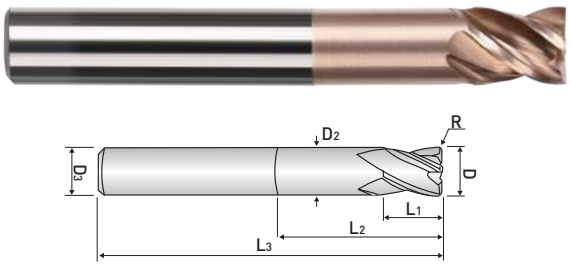
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L_1	L_2	L_3	D_2
WXR514 020 05 06	2.0	0.50	3.0	6	50	4.0
WXR514 020 05 08				8		
WXR514 020 05 10				10		
WXR514 020 05 12				12		
WXR514 020 05 14				14		
WXR514 020 05 16				16		
WXR514 020 05 20				20		
WXR514 020 05 22				22	60	
WXR514 020 05 26				26		
WXR514 020 05 30				30	70	
WXR514 025 01 08	2.5	0.10	4.0	8	50	4.0
WXR514 025 01 10				10		
WXR514 025 01 12				12		
WXR514 025 01 14				14		
WXR514 025 01 16				16		
WXR514 025 01 20				20		
WXR514 025 01 26				26	60	
WXR514 025 01 30				30	70	
WXR514 025 02 08		0.20		8	50	
WXR514 025 02 10				10		
WXR514 025 02 12				12		
WXR514 025 02 14				14		
WXR514 025 02 16				16		
WXR514 025 02 20				20		
WXR514 025 02 26				26	60	
WXR514 025 02 30				30	70	
WXR514 025 03 08		0.30		8	50	
WXR514 025 03 10				10		
WXR514 025 03 12				12		
WXR514 025 03 14				14		
WXR514 025 03 16				16		
WXR514 025 03 20				20		
WXR514 025 03 26				26	60	
WXR514 025 03 30				30	70	
WXR514 025 05 08		0.50		8	50	
WXR514 025 05 10				10		
WXR514 025 05 12				12		
WXR514 025 05 14				14		

NEXT >>

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Excellent effect in preventing breakage with a shape on neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material

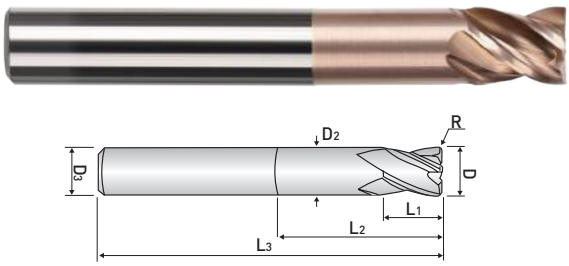
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L_1	L_2	L_3	D_2
WXR514 025 05 16	2.5	0.50	4.0	16	50	4.0
WXR514 025 05 20				20		
WXR514 025 05 26				26	60	
WXR514 025 05 30				30	70	
WXR514 030 01 08	3.0	0.10	4.5	8	50	6.0
WXR514 030 01 10				10		
WXR514 030 01 12				12		
WXR514 030 01 14				14	60	
WXR514 030 01 16				16		
WXR514 030 01 20				20		
WXR514 030 01 26				26	65	
WXR514 030 01 30				30	70	
WXR514 030 01 35				35		
WXR514 030 01 40				40	80	
WXR514 030 02 08		0.20		8	50	
WXR514 030 02 10				10		
WXR514 030 02 12				12		
WXR514 030 02 14				14	60	
WXR514 030 02 16				16		
WXR514 030 02 20				20		
WXR514 030 02 26				26	65	
WXR514 030 02 30				30	70	
WXR514 030 02 35				35		
WXR514 030 02 40				40	80	
WXR514 030 03 08		0.30		8	50	
WXR514 030 03 10				10		
WXR514 030 03 12				12		
WXR514 030 03 14				14	60	
WXR514 030 03 16				16		
WXR514 030 03 20				20		
WXR514 030 03 26				26	65	
WXR514 030 03 30				30	70	
WXR514 030 03 35				35		
WXR514 030 03 40				40	80	

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
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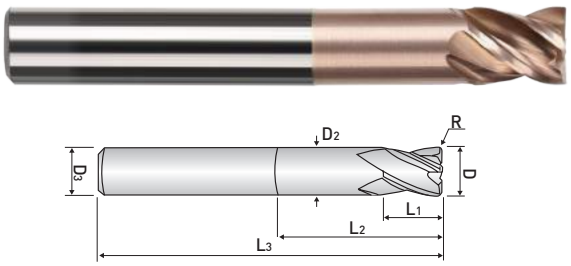
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L_1	L_2	L_3	D_2
WXR514 030 05 08	3.0	0.50	4.5	8	50	6.0
WXR514 030 05 10				10		
WXR514 030 05 12				12		
WXR514 030 05 14				14	60	
WXR514 030 05 16				16		
WXR514 030 05 20				20		
WXR514 030 05 26				26	65	
WXR514 030 05 30				30	70	
WXR514 030 05 35				35		
WXR514 030 05 40				40	80	
WXR514 030 10 08		1.00		8	50	
WXR514 030 10 10				10		
WXR514 030 10 12				12		
WXR514 030 10 14				14	60	
WXR514 030 10 16				16		
WXR514 030 10 20				20		
WXR514 030 10 26				26	65	
WXR514 030 10 30				30	70	
WXR514 030 10 35				35		
WXR514 030 10 40				40	80	
WXR514 040 01 10	4.0	0.10	6.0	10	50	6.0
WXR514 040 01 12				12		
WXR514 040 01 14				14	60	
WXR514 040 01 16				16		
WXR514 040 01 20				20		
WXR514 040 01 26				26	65	
WXR514 040 01 30				30	70	
WXR514 040 01 35				35		
WXR514 040 01 40				40	80	
WXR514 040 01 45				45	90	
WXR514 040 01 50				50	100	
WXR514 040 02 10		0.20		10	50	
WXR514 040 02 12				12		
WXR514 040 02 14				14	60	
WXR514 040 02 16				16		
WXR514 040 02 20				20		
WXR514 040 02 26				26	65	
WXR514 040 02 30				30	70	

NEXT >>

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Excellent effect in preventing breakage with a shape on neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material

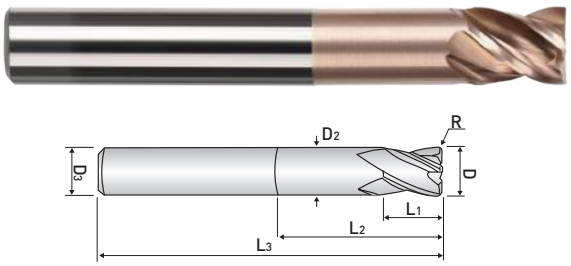
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L1	L2	L3	D2
WXR514 040 02 35	4.0	0.20	6.0	35	70	6.0
WXR514 040 02 40				40	80	
WXR514 040 02 45				45	90	
WXR514 040 02 50				50	100	
WXR514 040 03 10		0.30		10	50	
WXR514 040 03 12				12		
WXR514 040 03 14				14	60	
WXR514 040 03 16				16		
WXR514 040 03 20				20		
WXR514 040 03 26				26	65	
WXR514 040 03 30				30	70	
WXR514 040 03 35				35		
WXR514 040 03 40				40	80	
WXR514 040 03 45				45	90	
WXR514 040 03 50				50	100	
WXR514 040 05 10		0.50		10	50	
WXR514 040 05 12				12		
WXR514 040 05 14				14	60	
WXR514 040 05 16				16		
WXR514 040 05 20				20		
WXR514 040 05 26				26	65	
WXR514 040 05 30				30	70	
WXR514 040 05 35				35		
WXR514 040 05 40				40	80	
WXR514 040 05 45				45	90	
WXR514 040 05 50				50	100	
WXR514 040 10 10		1.00		10	50	
WXR514 040 10 12				12		
WXR514 040 10 14				14	60	
WXR514 040 10 16				16		
WXR514 040 10 20				20		
WXR514 040 10 26				26	65	
WXR514 040 10 30				30	70	
WXR514 040 10 35				35		
WXR514 040 10 40				40	80	
WXR514 040 10 45				45	90	
WXR514 040 10 50				50	100	

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Excellent effect in preventing breakage with a shape on neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material

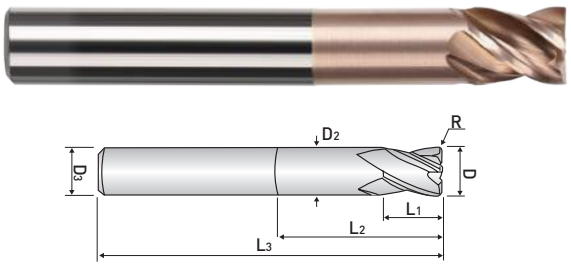
WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L1	L2	L3	D2
WXR514 050 01	5.0	0.10	8.0	15.0	60.0	6.0
WXR514 050 02		0.20				
WXR514 050 03		0.30				
WXR514 050 05		0.50				
WXR514 050 10		1.00				
WXR514 050 15		1.50				
WXR514 050 20		2.00				
WXR514 060 01	6.0	0.10	9	20	60	6
WXR514 060 02		0.20				
WXR514 060 03		0.30				
WXR514 060 05		0.50				
WXR514 060 10		1.00				
WXR514 060 15		1.50				
WXR514 060 20		2.00				
WXR514 060 03 090		0.30	15	30	90	
WXR514 060 05 090		0.50				
WXR514 060 10 090		1.00				
WXR514 080 01	8.0	0.10	12	25	70	8
WXR514 080 02		0.20				
WXR514 080 03		0.30				
WXR514 080 05		0.50				
WXR514 080 10		1.00				
WXR514 080 15		1.50				
WXR514 080 20		2.00				
WXR514 080 03 100		0.30	20	35	100	
WXR514 080 05 100		0.50				
WXR514 080 10 100		1.00				
WXR514 100 01	10.0	0.10	15	30	75	10
WXR514 100 02		0.20				
WXR514 100 03		0.30				
WXR514 100 05		0.50				
WXR514 100 10		1.00				
WXR514 100 15		1.50				
WXR514 100 20		2.00				
WXR514 100 03 100		0.30	25	40	100	
WXR514 100 05 100		0.50				
WXR514 100 10 100		1.00				

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



VARIABLE INDEX 4 FLUTE CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Excellent effect in preventing breakage with a shape on neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material

WXR514 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | R ±0.02 All sizes | W Coating | DATA p.1020

EDP. No.	D	R	L1	L2	L3	D2
WXR514 120 02	12.0	0.20	18	32	80	12
WXR514 120 03		0.30				
WXR514 120 05		0.50				
WXR514 120 10		1.00				
WXR514 120 15		1.50				
WXR514 120 20		2.00				
WXR514 120 03 110		0.30	30	45	110	
WXR514 120 05 110		0.50				
WXR514 120 10 110		1.00				
WXR514 160 05	16.0	0.50	20	35	100	16
WXR514 160 10		1.00				
WXR514 160 05 150		0.50	35	50	150	20
WXR514 160 10 150		1.00				
WXR514 200 05	20.0	0.50	25	40	100	20
WXR514 200 10		1.00				
WXR514 200 05 150		0.50	40	55	150	
WXR514 200 10 150		1.00				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		◎

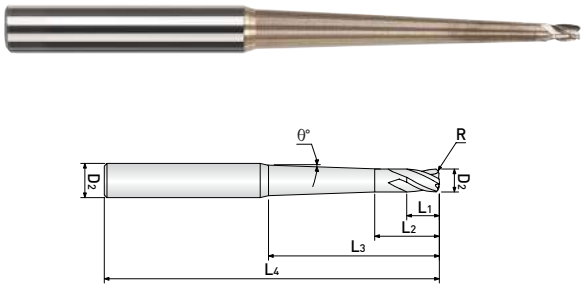
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE TAPER NECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

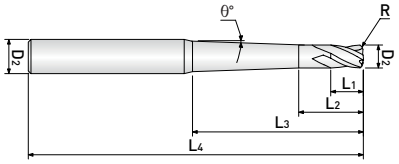
WR544 ...series

ULTRA FINE | HELIX | All sizes | W Coating | p.1020

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR544 010 01 01 06	1.0	0.10	1°	1.5	2.5	6.0	50	4
WR544 010 01 01 08						8.0		
WR544 010 01 01 10						10.0		
WR544 010 01 01 12						12.0		
WR544 010 01 01 16						16.0		
WR544 010 01 01 20						20.0		
WR544 010 01 01 25						25.0	60	
WR544 010 01 01 30						30.0	70	
WR544 010 01 01 40						40.0	80	
WR544 010 01 01 50						50.0	90	
WR544 010 01 02 06			2°			6.0	50	
WR544 010 01 02 08						8.0		
WR544 010 01 02 10						10.0		
WR544 010 01 02 12						12.0		
WR544 010 01 02 16						16.0		
WR544 010 01 02 20						20.0		
WR544 010 01 02 25						25.0	60	
WR544 010 01 02 30						30.0	70	
WR544 010 01 02 40						40.0	80	
WR544 010 01 02 50						50.0	90	6
WR544 010 02 01 06		0.20	1°			6.0	50	4
WR544 010 02 01 08						8.0		
WR544 010 02 01 10						10.0		
WR544 010 02 01 12						12.0		
WR544 010 02 01 16						16.0		
WR544 010 02 01 20						20.0		
WR544 010 02 01 25						25.0	60	
WR544 010 02 01 30						30.0	70	
WR544 010 02 01 40						40.0	80	
WR544 010 02 01 50						50.0	90	
WR544 010 02 02 06			2°			6.0	50	
WR544 010 02 02 08						8.0		
WR544 010 02 02 10						10.0		
WR544 010 02 02 12						12.0		
WR544 010 02 02 16						16.0		
WR544 010 02 02 20						20.0		
WR544 010 02 02 25						25.0	60	
WR544 010 02 02 30						30.0	70	

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE TAPER NECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

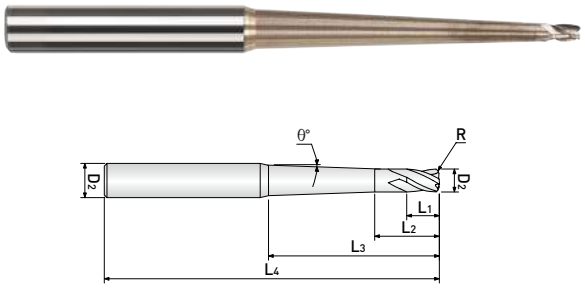
WR544 ...series

ULTRA FINE | HELIX | All sizes | W Coating | p.1020

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR544 010 02 02 40	1.0	0.20	2°	1.5	2.5	40.0	80	4
WR544 010 02 02 50						50.0	90	6
WR544 012 01 01 08	1.2	0.10	1°	1.8	3.0	8.0	50	4
WR544 012 01 01 12						12.0		
WR544 012 01 01 16						16.0		
WR544 012 01 01 20						20.0		
WR544 012 01 01 25						25.0	60	
WR544 012 01 01 30						30.0	70	
WR544 012 01 02 08			2°			8.0	50	
WR544 012 01 02 12						12.0		
WR544 012 01 02 16						16.0		
WR544 012 01 02 20						20.0		
WR544 012 01 02 25						25.0	60	
WR544 012 01 02 30						30.0	70	
WR544 012 02 01 08		0.20	1°			8.0	50	
WR544 012 02 01 12						12.0		
WR544 012 02 01 16						16.0		
WR544 012 02 01 20						20.0		
WR544 012 02 01 25						25.0	60	
WR544 012 02 01 30						30.0	70	
WR544 012 02 02 08			2°			8.0	50	
WR544 012 02 02 12						12.0		
WR544 012 02 02 16						16.0		
WR544 012 02 02 20						20.0		
WR544 012 02 02 25						25.0	60	
WR544 012 02 02 30						30.0	70	
WR544 015 01 01 08	1.5	0.10	1°	2.3	3.0	8.0	50	4
WR544 015 01 01 10						10.0		
WR544 015 01 01 12						12.0		
WR544 015 01 01 16						16.0		
WR544 015 01 01 20						20.0		
WR544 015 01 01 25						25.0	60	
WR544 015 01 01 30						30.0	70	
WR544 015 01 01 40						40.0	80	
WR544 015 01 01 50						50.0	90	
WR544 015 01 02 08			2°			8.0	50	
WR544 015 01 02 10						10.0		
WR544 015 01 02 12						12.0		

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE TAPER NECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

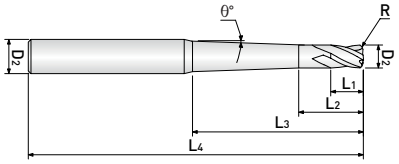
WR544 ...series

ULTRA FINE | HELIX | All sizes | W Coating | p.1020

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR544 015 01 02 16	1.5	0.10	2°	2.3	3.0	16.0	50	4
WR544 015 01 02 20						20.0		
WR544 015 01 02 25						25.0	60	
WR544 015 01 02 30						30.0	70	
WR544 015 01 02 40						40.0	80	6
WR544 015 01 02 50						50.0	90	
WR544 015 02 01 08		0.20	1°			8.0	50	4
WR544 015 02 01 10						10.0		
WR544 015 02 01 12						12.0		
WR544 015 02 01 16						16.0		
WR544 015 02 01 20						20.0		
WR544 015 02 01 25						25.0	60	
WR544 015 02 01 30						30.0	70	
WR544 015 02 01 40						40.0	80	
WR544 015 02 01 50						50.0	90	
WR544 015 02 02 08			2°			8.0	50	
WR544 015 02 02 10						10.0		
WR544 015 02 02 12						12.0		
WR544 015 02 02 16						16.0		
WR544 015 02 02 20						20.0		
WR544 015 02 02 25						25.0	60	
WR544 015 02 02 30						30.0	70	
WR544 015 02 02 40						40.0	80	6
WR544 015 02 02 50						50.0	90	
WR544 015 03 01 08		0.30	1°			8.0	50	4
WR544 015 03 01 10						10.0		
WR544 015 03 01 12						12.0		
WR544 015 03 01 16						16.0		
WR544 015 03 01 20						20.0		
WR544 015 03 01 25						25.0	60	
WR544 015 03 01 30						30.0	70	
WR544 015 03 01 40						40.0	80	
WR544 015 03 01 50						50.0	90	
WR544 015 03 02 08			2°			8.0	50	
WR544 015 03 02 10						10.0		
WR544 015 03 02 12						12.0		
WR544 015 03 02 16						16.0		
WR544 015 03 02 20						20.0		

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE TAPER NECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

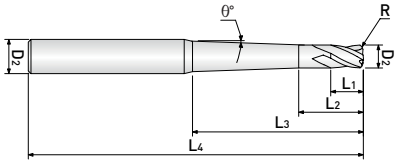
WR544 ...series

UWC ULTRA FINE | 4 | 30° HELIX | R ±0.01 All sizes | W W Coating | DATA p.1020

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR544 015 03 02 25	1.5	0.30	2°	2.3	3.0	25.0	60	4
WR544 015 03 02 30						30.0	70	
WR544 015 03 02 40						40.0	80	6
WR544 015 03 02 50						50.0	90	
WR544 020 01 01 10	2.0	0.10	1°	2.0	5.0	10.0	50	4
WR544 020 01 01 12						12.0		
WR544 020 01 01 16						16.0		
WR544 020 01 01 20						20.0		
WR544 020 01 01 25						25.0	60	
WR544 020 01 01 30						30.0	70	
WR544 020 01 01 40						40.0	80	6
WR544 020 01 01 50						50.0	100	
WR544 020 01 01 60						60.0		
WR544 020 01 01 80						80.0	140	
WR544 020 01 02 10			2°			10.0	50	4
WR544 020 01 02 12						12.0		
WR544 020 01 02 16						16.0		
WR544 020 01 02 20						20.0		
WR544 020 01 02 25						25.0	60	
WR544 020 01 02 30						30.0	70	
WR544 020 01 02 40						40.0	80	6
WR544 020 01 02 50						50.0	100	
WR544 020 01 02 60						60.0		
WR544 020 01 02 80						80.0	140	8
WR544 020 02 01 10		0.20	1°			10.0	50	4
WR544 020 02 01 12						12.0		
WR544 020 02 01 16						16.0		
WR544 020 02 01 20						20.0		
WR544 020 02 01 25						25.0	60	
WR544 020 02 01 30						30.0	70	
WR544 020 02 01 40						40.0	80	6
WR544 020 02 01 50						50.0	100	
WR544 020 02 01 60						60.0		
WR544 020 02 01 80						80.0	140	6
WR544 020 02 02 10			2°			10.0	50	4
WR544 020 02 02 12						12.0		
WR544 020 02 02 16						16.0		
WR544 020 02 02 20						20.0		
WR544 020 02 02 25						25.0	60	

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE TAPER NECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

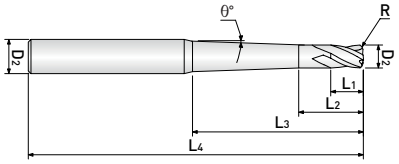
WR544 ...series

ULTRA FINE | HELIX | All sizes | W Coating | p.1020

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR544 020 02 02 30	2.0	0.20	2°	2.0	5.0	30.0	70	4
WR544 020 02 02 40						40.0	80	6
WR544 020 02 02 50						50.0	100	
WR544 020 02 02 60						60.0		
WR544 020 02 02 80						80.0	140	8
WR544 020 03 01 10		0.30	1°			10.0	50	4
WR544 020 03 01 12						12.0		
WR544 020 03 01 16						16.0		
WR544 020 03 01 20						20.0		
WR544 020 03 01 25						25.0	60	
WR544 020 03 01 30						30.0	70	
WR544 020 03 01 40						40.0	80	6
WR544 020 03 01 50						50.0	100	
WR544 020 03 01 60						60.0		
WR544 020 03 01 80						80.0	140	
WR544 020 03 02 10			2°			10.0	50	4
WR544 020 03 02 12						12.0		
WR544 020 03 02 16						16.0		
WR544 020 03 02 20						20.0		
WR544 020 03 02 25						25.0	60	
WR544 020 03 02 30						30.0	70	
WR544 020 03 02 40						40.0	80	6
WR544 020 03 02 50						50.0	100	
WR544 020 03 02 60						60.0		
WR544 020 03 02 80						80.0	140	8
WR544 020 05 01 10		0.50	1°			10.0	50	4
WR544 020 05 01 12						12.0		
WR544 020 05 01 16						16.0		
WR544 020 05 01 20						20.0		
WR544 020 05 01 25						25.0	60	
WR544 020 05 01 30						30.0	70	
WR544 020 05 01 40						40.0	80	6
WR544 020 05 01 50						50.0	100	
WR544 020 05 01 60						60.0		
WR544 020 05 01 80			2°			80.0	140	
WR544 020 05 02 10						10.0	50	4
WR544 020 05 02 12						12.0		
WR544 020 05 02 16						16.0		

NEXT ≫≫

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE TAPER NECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

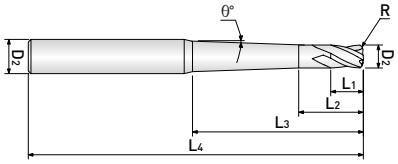
WR544 ...series

UWC ULTRA FINE | 4 | 30° HELIX | R ±0.01 All sizes | W W Coating | DATA p.1020

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR544 020 05 02 20	2.0	0.50	2°	2.0	5.0	20.0	50	4
WR544 020 05 02 25						25.0	60	
WR544 020 05 02 30						30.0	70	
WR544 020 05 02 40						40.0	80	6
WR544 020 05 02 50						50.0	100	
WR544 020 05 02 60						60.0		
WR544 020 05 02 80						80.0	140	8
WR544 030 02 01 16	3.0	0.20	1°	4.5	6.0	16.0	60	6
WR544 030 02 01 20						20.0	65	
WR544 030 02 01 30						30.0	70	
WR544 030 02 01 40						40.0	80	
WR544 030 02 01 50						50.0	90	
WR544 030 02 01 60						60.0	100	
WR544 030 02 02 16			2°			16.0	60	
WR544 030 02 02 20						20.0	65	
WR544 030 02 02 30						30.0	70	
WR544 030 02 02 40						40.0	80	
WR544 030 02 02 50						50.0	90	8
WR544 030 02 02 60						60.0	100	
WR544 030 02 02 70						70.0	120	
WR544 030 03 01 16		0.30	1°			16.0	60	6
WR544 030 03 01 20						20.0	65	
WR544 030 03 01 30						30.0	70	
WR544 030 03 01 40						40.0	80	
WR544 030 03 01 50						50.0	90	
WR544 030 03 01 60						60.0	100	
WR544 030 03 02 16			2°			16.0	60	6
WR544 030 03 02 20						20.0	65	
WR544 030 03 02 30						30.0	70	
WR544 030 03 02 40						40.0	80	
WR544 030 03 02 50						50.0	90	8
WR544 030 03 02 60						60.0	100	
WR544 030 03 02 70						70.0	120	
WR544 030 05 01 16		0.50	1°			16.0	60	6
WR544 030 05 01 20						20.0	65	
WR544 030 05 01 30						30.0	70	
WR544 030 05 01 40						40.0	80	
WR544 030 05 01 50						50.0	90	

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE TAPER NECK CORNER RADIUS

- Increasing the hardness of neck by applying Taper neck
- Strengthen the hardness of flute by applying the minute corner R to prevent chipping
- Enhanced cutting effect and better wear resistance with the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

WR544 ...series

ULTRA FINE | HELIX | All sizes | W Coating | p.1020

EDP. No.	D	R	θ	L1	L2	L3	L4	D2
WR544 030 05 01 60	3.0	0.50	1°	4.5	6.0	60.0	100	6
WR544 030 05 02 16			2°			16.0	60	
WR544 030 05 02 20						20.0	65	
WR544 030 05 02 30						30.0	70	
WR544 030 05 02 40						40.0	80	
WR544 030 05 02 50						50.0	90	8
WR544 030 05 02 60						60.0	100	
WR544 030 05 02 70						70.0	120	
WR544 040 02 01 40	4.0	0.20	1°	6.0	8.0	40.0	90	6
WR544 040 02 01 50						50.0	100	
WR544 040 02 01 60						60.0	110	
WR544 040 02 01 70						70.0	120	8
WR544 040 02 02 40			2°			40.0	90	
WR544 040 02 02 50						50.0	100	
WR544 040 02 02 60						60.0	110	
WR544 040 02 02 70						70.0	120	10
WR544 040 03 01 40		0.30	1°			40.0	90	6
WR544 040 03 01 50						50.0	100	
WR544 040 03 01 60						60.0	110	
WR544 040 03 01 70						70.0	120	8
WR544 040 03 02 40			2°			40.0	90	
WR544 040 03 02 50						50.0	100	
WR544 040 03 02 60						60.0	110	
WR544 040 03 02 70						70.0	120	10
WR544 040 05 01 40		0.50	1°			40.0	90	6
WR544 040 05 01 50						50.0	100	
WR544 040 05 01 60						60.0	110	
WR544 040 05 01 70						70.0	120	8
WR544 040 05 02 40			2°			40.0	90	
WR544 040 05 02 50						50.0	100	
WR544 040 05 02 60						60.0	110	
WR544 040 05 02 70						70.0	120	10

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

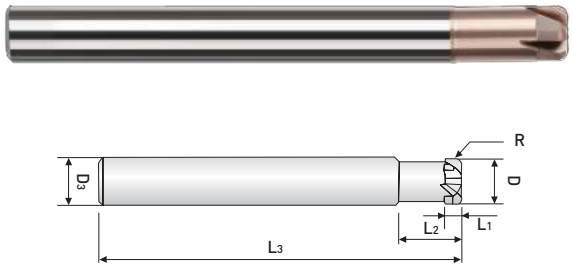
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.012	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE HIGH FEED RATE CORNER RADIUS

- High speed and feed rate lead to enhanced cutting with Low Helix
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

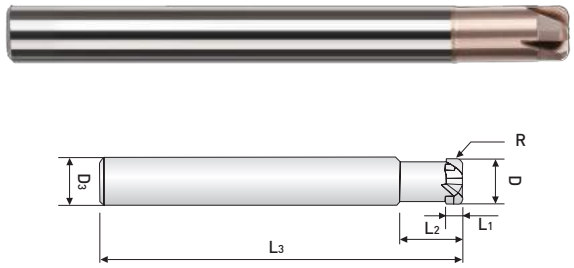
WSPM4 ...series

ULTRA FINE | HELIX | All sizes | W Coating | p.1020

EDP. No.	D	R	L_1	L_2	L_3	D_3
WSPM4010-01	1.0	0.10	1.0	2.5	50.0	6.0
WSPM4010-02		0.20				
WSPM4010-03		0.30				
WSPM4015-02	1.5	0.20	1.5	4.0	50.0	6.0
WSPM4015-03		0.30				
WSPM4015-05		0.50				
WSPM4020-02	2.0	0.20	2.0	6.0	50.0	6.0
WSPM4020-03		0.30				
WSPM4020-05		0.50				
WSPM4030-02	3.0	0.20	3.0	8.0	50.0	6.0
WSPM4030-03		0.30				
WSPM4030-05		0.50				
WSPM4040-02	4.0	0.20	4	10.0	50	6.0
WSPM4040-03		0.30				
WSPM4040-05		0.50				
WSPM4040-10		1.00				
WSPM4060-02	6.0	0.20	6.0	15.0	60.0	6.0
WSPM4060-03		0.30				
WSPM4060-05		0.50				
WSPM4060-10		1.00				
WSPM4060-20		2.00				
WSPM4060-02L		0.20			90.0	
WSPM4060-03L		0.30				
WSPM4060-05L		0.50				
WSPM4060-10L		1.00				
WSPM4060-20L		2.00				
WSPM4080-02	8.0	0.20	8.0	20.0	70.0	8.0
WSPM4080-03		0.30				
WSPM4080-05		0.50				
WSPM4080-10		1.00				
WSPM4080-20		2.00				
WSPM4080-02L		0.20			100.0	
WSPM4080-03L		0.30				
WSPM4080-05L		0.50				
WSPM4080-10L		1.00				
WSPM4080-20L		2.00				
WSPM4100-02	10.0	0.20	10.0	25.0	75	10.0
WSPM4100-03		0.30				
WSPM4100-05		0.50				

NEXT

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE HIGH FEED RATE CORNER RADIUS

- High speed and feed rate lead to enhanced cutting with Low Helix
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

WSPM4 ...series

ULTRA FINE | HELIX | All sizes | W Coating | p.1020

EDP. No.	D	R	L_1	L_2	L_3	D_3
WSPM4100-10	10.0	1.00	10.0	25.0	75	10.0
WSPM4100-15		1.50				
WSPM4100-20		2.00				
WSPM4100-02L		0.20			100	
WSPM4100-03L		0.30				
WSPM4100-05L		0.50				
WSPM4100-10L		1.00				
WSPM4100-15L		1.50				
WSPM4100-20L		2.00				
WSPM4120-03	12.0	0.30	12.0	30.0	80	12.0
WSPM4120-05		0.50				
WSPM4120-10		1.00				
WSPM4120-15		1.50				
WSPM4120-20		2.00				
WSPM4120-30		3.00				
WSPM4120-03L		0.30			110	
WSPM4120-05L		0.50				
WSPM4120-10L		1.00				
WSPM4120-15L		1.50				
WSPM4120-20L		2.00				
WSPM4120-30L		3.00				
WSPM4160-05	16.0	0.50	16.0	35.0	100	16.0
WSPM4160-10		1.00				
WSPM4160-20		2.00				
WSPM4160-05L		0.50			150	
WSPM4160-10L		1.00				
WSPM4160-20L		2.00				
WSPM4200-05	20.0	0.50	20.0	40.0	100	20.0
WSPM4200-10		1.00				
WSPM4200-20		2.00				
WSPM4200-05L		0.50			150	
WSPM4200-10L		1.00				
WSPM4200-20L		2.00				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

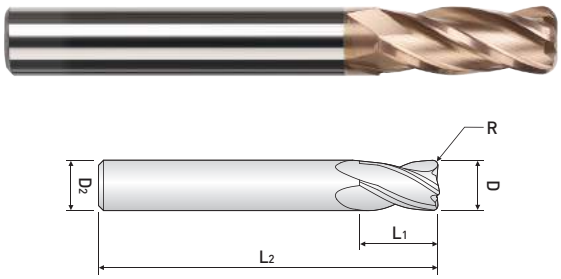
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.030	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE MULTI PURPOSE CORNER RADIUS

- Excellent surface roughness with a variable index geometry
- Increased tool life with a reduced chatter vibration and resonace by irregular exciting force
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

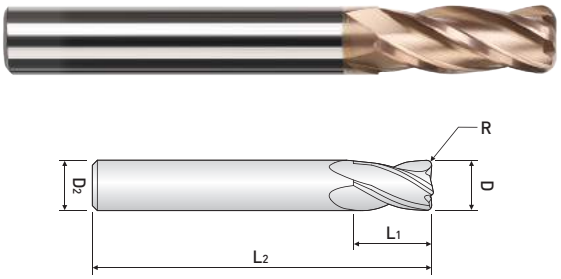
WR504 ...series

ULTRA FINE | 4 | 38° HELIX | R ±0.02 All sizes | W W Coating | DATA p.1021

EDP. No.	D	R	L_1	L_2	D_2
WR504 030 02	3.0	0.20	8.0	60.0	6.0
WR504 030 03		0.30			
WR504 030 05		0.50			
WR504 040 02	4.0	0.20	10.0	70.0	6.0
WR504 040 03		0.30			
WR504 040 05		0.50			
WR504 040 10		1.00			
WR504 050 03 060	5.0	0.30	13.0	60.0	6.0
WR504 050 05 060		0.50			
WR504 050 03		0.30		90.0	
WR504 050 05		0.50			
WR504 060 03 060	6.0	0.30	15	60	6
WR504 060 05 060		0.50			
WR504 060 10 060		1.00			
WR504 060 03		0.30		90	
WR504 060 05		0.50			
WR504 060 10		1.00			
WR504 080 03 070	8.0	0.30	20	70	8
WR504 080 05 070		0.50			
WR504 080 10 070		1.00			
WR504 080 03		0.30		100	
WR504 080 05		0.50			
WR504 080 10		1.00			
WR504 100 03 075	10.0	0.30	25	75	10
WR504 100 05 075		0.50			
WR504 100 10 075		1.00			
WR504 100 03		0.30		100	
WR504 100 05		0.50			
WR504 100 10		1.00			
WR504 120 03 080	12.0	0.30	30	80	12
WR504 120 05 080		0.50			
WR504 120 10 080		1.00			
WR504 120 03		0.30		110	
WR504 120 05		0.50			
WR504 120 10		1.00			

NEXT ≫

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE MULTI PURPOSE CORNER RADIUS

- Excellent surface roughness with a variable index geometry
- Increased tool life with a reduced chatter vibration and resonace by irregular exciting force
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

WR504 ...series

ULTRA FINE | HELIX | All sizes | W Coating | p.1021

EDP. No.	D	R	L1	L2	D2
WR504 160 05 100	16.0	0.50	32.0	100	16.0
WR504 160 10 100		1.00			
WR504 160 15 100		1.50			
WR504 160 20 100		2.00			
WR504 160 05		0.50		150	
WR504 160 10		1.00			
WR504 160 15		1.50			
WR504 160 20		2.00			
WR504 200 05 100	20.0	0.50	38.0	100	20.0
WR504 200 10 100		1.00			
WR504 200 15 100		1.50			
WR504 200 20 100		2.00			
WR504 200 05		0.50		150	
WR504 200 10		1.00			
WR504 200 15		1.50			
WR504 200 20		2.00			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		◎

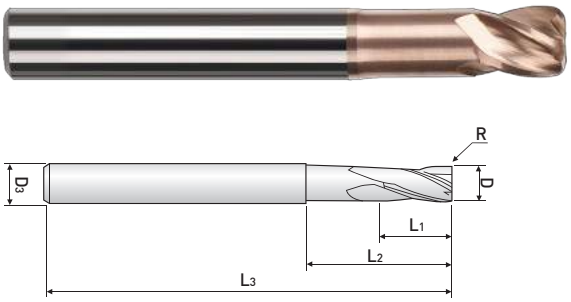
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.030	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



4 FLUTE MULTI PURPOSE LONG NECK CORNER RADIUS

- Excellent surface roughness with a variable index geometry
- Increased tool life with a reduced chatter vibration and resonace by irregular exciting force
- Excellent effect in preventing breakage with a shape of neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

WR514 ...series

ULTRA FINE | 4 | 38° HELIX | R ±0.02 All sizes | W W Coating | DATA p.1018

EDP. No.	D	R	L_1	L_2	L_3	D_3
WR514 060 05	6.0	0.50	10.0	30.0	90.0	6.0
WR514 060 10		1.00				
WR514 080 05	8.0	0.50	12.0	35.0	100.0	8.0
WR514 080 10		1.00				
WR514 100 05	10.0	0.50	15.0	40.0	100.0	10.0
WR514 100 10		1.00				
WR514 120 05	12.0	0.50	20.0	45.0	110.0	12.0
WR514 120 10		1.00				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		◎

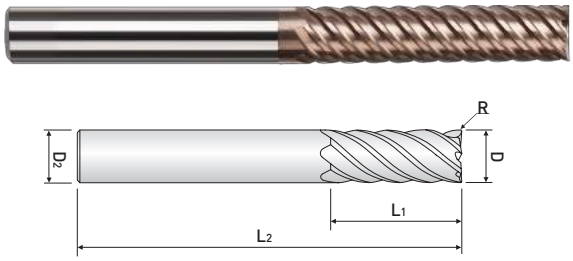
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.030	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(Corner Radius) WINNER Series



6 FLUTE 45° CORNER RADIUS

- Dramatically reduce cutting load by 6 flute with high helix
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

WR506 ...series

ULTRA FINE | 6 | 45° HELIX | R ±0.015 All sizes | W W Coating | DATA p.1021

EDP. No.	D	R	L_1	L_2	D_2
WR506 060 03	6.0	0.30	15.0	90.0	6.0
WR506 060 05		0.50			
WR506 060 10		1.00			
WR506 080 03	8.0	0.30	20.0	100.0	8.0
WR506 080 05		0.50			
WR506 080 10		1.00			
WR506 100 03	10.0	0.30	25.0	100.0	10.0
WR506 100 05		0.50			
WR506 100 10		1.00			
WR506 120 03	12.0	0.30	30.0	110.0	12.0
WR506 120 05		0.50			
WR506 120 10		1.00			
WR506 160 05	16.0	0.50	32.0	150.0	16.0
WR506 160 10		1.00			
WR506 160 15		1.50			
WR506 160 20		2.00			
WR506 200 05	20.0	0.50	38.0	150.0	20.0
WR506 200 10		1.00			
WR506 200 15		1.50			
WR506 200 20		2.00			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

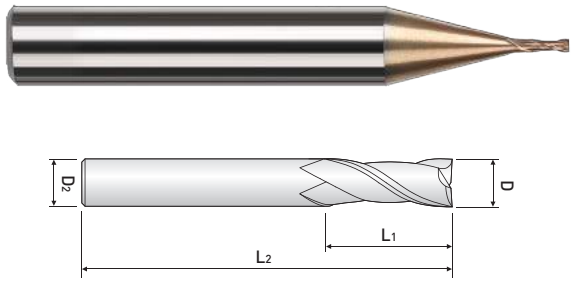
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



2 FLUTE MINIATURE & SQUARE

- From 0.03mm size made by a state of the art machine
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

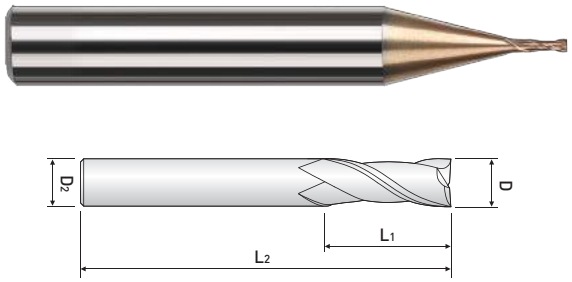
WME502 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WME502 0003	0.03	0.04	40	4
WME502 0004	0.04	0.06	40	4
WME502 0005	0.05	0.07	40	4
WME502 0006	0.06	0.09	40	4
WME502 0007	0.07	0.10	40	4
WME502 0008	0.08	0.12	40	4
WME502 0009	0.09	0.13	40	4
WME502 001	0.10	0.20	40	4
WME502 0015	0.15	0.30	40	4
WME502 002	0.20	0.40	40	4
WME502 0025	0.25	0.50	40	4
WME502 003	0.30	0.60	40	4
WME502 0035	0.35	0.70	40	4
WME502 004	0.40	0.80	40	4
WME502 0045	0.45	0.90	40	4
WME502 005	0.50	1.00	40	4
WME502 0055	0.55	1.10	40	4
WME502 006	0.60	1.20	40	4
WME502 0065	0.65	1.30	40	4
WME502 007	0.70	1.40	40	4
WME502 0075	0.75	1.50	40	4
WME502 008	0.80	1.60	40	4
WME502 0085	0.85	1.70	40	4
WME502 009	0.90	1.80	40	4
WME502 0095	0.95	2.00	40	4
WME502 010	1.00	2.50	50	6
WME502 012	1.20	3.00	50	6
WME502 015	1.50	4.00	50	6
WME502 020	2.00	6.00	50	6
WME502 025	2.50	7.00	50	6
WME502 030	3.00	8.00	50	6
WME502 035	3.50	10.00	50	6
WME502 040	4.00	10.00	50	6
WME502 045	4.50	14.00	50	6
WME502 050	5.00	15.00	60	6
WME502 055	5.50	15.00	60	6
WME502 060	6.00	15.00	60	6

NEXT

Endmills for Mold & Die(square) WINNER Series



2 FLUTE MINIATURE & SQUARE

- From 0.03mm size made by a state of the art machine
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

WME502 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WME502 065	6.50	18.00	60	8
WME502 070	7.00	20.00	60	8
WME502 075	7.50	20.00	60	8
WME502 080	8.00	20.00	70	8
WME502 085	8.50	22.00	70	10
WME502 090	9.00	22.00	70	10
WME502 095	9.50	24.00	70	10
WME502 100	10.00	25.00	75	10
WME502 105	10.50	26.00	75	12
WME502 110	11.00	30.00	75	12
WME502 115	11.50	30.00	80	12
WME502 120	12.00	30.00	80	12
WME502 130	13.00	35.00	100	12
WME502 140 S12	14.00	35.00	100	12
WME502 140				14
WME502 140 S16				16
WME502 150	15.00	38.00	100	16
WME502 160	16.00	40.00	100	16
WME502 170	17.00	42.00	100	16
WME502 180 S16	18.00	45.00	100	16
WME502 180				18
WME502 190	19.00	45.00	100	20
WME502 200	20.00	45.00	100	20
WME502 210	21.00	45.00	100	20
WME502 220	22.00	45.00	100	20
WME502 230	23.00	50.00	120	25
WME502 240	24.00	50.00	120	25
WME502 250	25.00	50.00	120	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

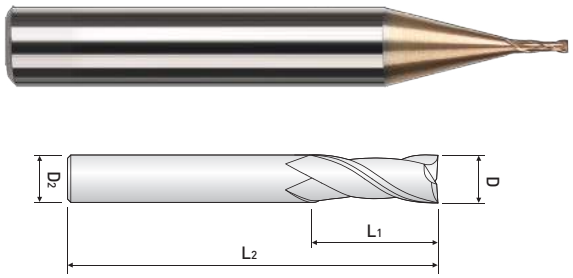
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



2 FLUTE WITH SHANK 4 BY 0.1 mm

- A variety of diameter sizes by every 0.1mm with shank 4
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

WE502...S4 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WE502 010 S4	1.0	2.5	50	4
WE502 011 S4	1.1	3.0	50	4
WE502 012 S4	1.2	3.0	50	4
WE502 013 S4	1.3	3.0	50	4
WE502 014 S4	1.4	4.0	50	4
WE502 015 S4	1.5	4.0	50	4
WE502 016 S4	1.6	4.0	50	4
WE502 017 S4	1.7	4.0	50	4
WE502 018 S4	1.8	5.0	50	4
WE502 019 S4	1.9	5.0	50	4
WE502 020 S4	2.0	6.0	50	4
WE502 021 S4	2.1	6.0	50	4
WE502 022 S4	2.2	6.0	50	4
WE502 023 S4	2.3	6.0	50	4
WE502 024 S4	2.4	6.0	50	4
WE502 025 S4	2.5	8.0	50	4
WE502 026 S4	2.6	8.0	50	4
WE502 027 S4	2.7	8.0	50	4
WE502 028 S4	2.8	8.0	50	4
WE502 029 S4	2.9	8.0	50	4
WE502 030 S4	3.0	8.0	50	4
WE502 035 S4	3.5	10.0	50	4
WE502 040 S4	4.0	10.0	50	4
WE502 040 080 S4			80	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

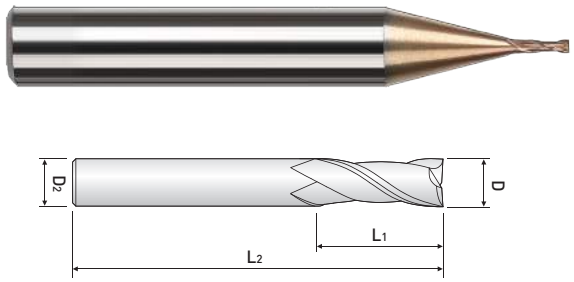
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.012	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



2 FLUTE ENDMILL WITH SHANK 3

- Excellent effect in preventing breakage with a shape of neck without notch
- A variety of diameter sizes with Shank 3
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

WE502...S3 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WE502 001 S3	0.1	0.2	40	3
WE502 002 S3	0.2	0.4	40	3
WE502 003 S3	0.3	0.6	40	3
WE502 004 S3	0.4	0.8	40	3
WE502 005 S3	0.5	1.0	40	3
WE502 006 S3	0.6	1.2	40	3
WE502 007 S3	0.7	1.4	40	3
WE502 008 S3	0.8	1.6	40	3
WE502 009 S3	0.9	1.8	40	3
WE502 010 S3	1.0	2.5	50	3
WE502 012 S3	1.2	3.0	50	3
WE502 015 S3	1.5	4.0	50	3
WE502 020 S3	2.0	6.0	50	3
WE502 025 S3	2.5	7.0	50	3
WE502 030 S3	3.0	8.0	50	3

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

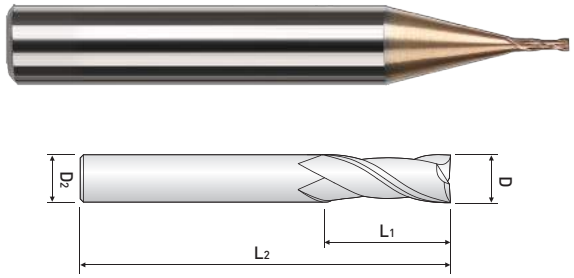
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.012	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



2 FLUTE FOR POWERFUL CUTTING

- Designed Gash touch shape to prevent flute chipping
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

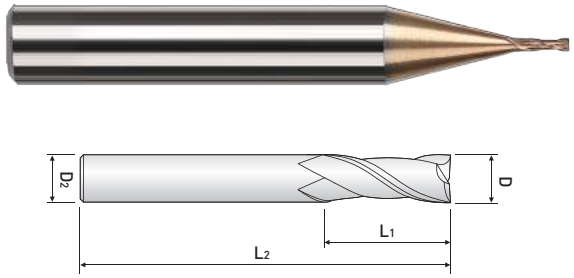
WE502 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WE502 001 001	0.1	0.1	40	4
WE502 001		0.2		
WE502 001 003		0.3		
WE502 002 002	0.2	0.2	40	4
WE502 002		0.4		
WE502 002 006		0.6		
WE502 003 003	0.3	0.3	40	4
WE502 003		0.6		
WE502 003 009		0.9		
WE502 004 004	0.4	0.4	40	4
WE502 004		0.8		
WE502 004 012		1.2		
WE502 005 005	0.5	0.5	40	4
WE502 005		1.0		
WE502 005 015		1.5		
WE502 006 006	0.6	0.6	40	4
WE502 006		1.2		
WE502 006 018		1.8		
WE502 007 007	0.7	0.7	40	4
WE502 007		1.4		
WE502 007 021		2.1		
WE502 008 008	0.8	0.8	40	4
WE502 008		1.6		
WE502 008 024		2.4		
WE502 009 009	0.9	0.9	40	4
WE502 009		1.8		
WE502 009 027		2.7		
WE502 010 01	1.0	1.0	40	6
WE502 010 02		2.0		
WE502 010		2.5	50	
WE502 010 03		3.0		
WE502 010 04		4.0		
WE502 010 06		6.0		
WE502 012 02	1.2	2.0	40	6
WE502 012		3.0	50	
WE502 012 04		4.0		
WE502 012 06		6.0		

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



2 FLUTE FOR POWERFUL CUTTING

- Designed Gash touch shape to prevent flute chipping
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

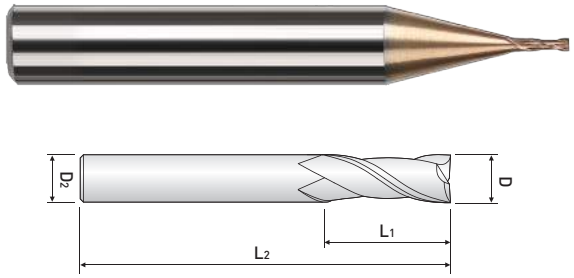
WE502 ...series

ULTRA FINE | 2 | 30° HELIX | W Coating | DATA p.1022

EDP. No.	D	L_1	L_2	D_2
WE502 015 015	1.5	1.5	40	6
WE502 015 03		3.0		
WE502 015		4.0	50	
WE502 015 06		6.0		
WE502 015 08		8.0		
WE502 015 10		10.0		
WE502 020 02	2.0	2.0	40	6
WE502 020 04		4.0		
WE502 020		6.0	50	
WE502 020 08		8.0		
WE502 020 10		10.0		
WE502 020 12		12.0		
WE502 025 025	2.5	2.5	40	6
WE502 025 05		5.0		
WE502 025		7.0	50	
WE502 025 10		10.0		
WE502 025 12		12.0		
WE502 030 03	3.0	3.0	40	6
WE502 030 06		6.0		
WE502 030		8.0	50	
WE502 030 10		10.0		
WE502 030 12		12.0		
WE502 030 14		14.0		
WE502 040 04	4.0	4.0	40	6
WE502 040 08		8.0		
WE502 040		10.0	50	
WE502 040 12		12.0		
WE502 040 14		14.0		
WE502 040 16		16.0		
WE502 050 05	5.0	5.0	50	6
WE502 050 10		10.0		
WE502 050		15.0	60	
WE502 050 20		20.0		
WE502 050 25		25.0		

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



2 FLUTE FOR POWERFUL CUTTING

- Designed Gash touch shape to prevent flute chipping
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

WE502 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WE502 060 06	6.0	6.0	50	6
WE502 060 12		12.0		
WE502 060		15.0	60	
WE502 060 20		20.0		
WE502 060 25		25.0		
WE502 080 16	8.0	16.0	60	8
WE502 080		20.0	70	
WE502 080 25		25.0		
WE502 080 30		30.0		
WE502 100 22	10.0	22.0	65	10
WE502 100		25.0	75	
WE502 100 30		30.0		
WE502 100 35		35.0		
WE502 120 26	12.0	26.0	70	12
WE502 120		30.0	80	
WE502 120 35		35.0		
WE502 120 40		40.0		
WE502 140	14.0	35.0	100	16
WE502 160	16.0	32.0	100	16
WE502 160 40		40.0		
WE502 180	18.0	45.0	100	20
WE502 200	20.0	45.0	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

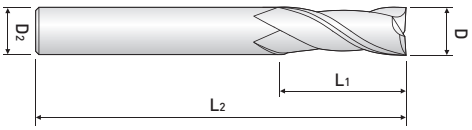
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG

- 2 Flute long type with a variety of flute length sizes
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

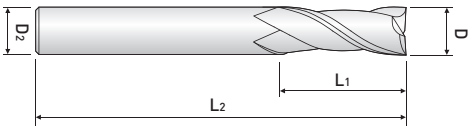
WE522 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WE522 010 03	1.0	3.0	60	6
WE522 010 04		4.0		
WE522 010 05		5.0		
WE522 010 06		6.0		
WE522 010 07		7.0		
WE522 010 08		8.0		
WE522 010 10		10.0		
WE522 010 12		12.0		
WE522 012 04	1.2	4.0	60	6
WE522 012 06		6.0		
WE522 012 08		8.0		
WE522 012 10		10.0		
WE522 012 12		12.0		
WE522 015 06	1.5	6.0	60	6
WE522 015 08		8.0		
WE522 015 10		10.0		
WE522 015 12		12.0		
WE522 015 14		14.0		
WE522 015 16		16.0		
WE522 020 08	2.0	8.0	60	6
WE522 020 10		10.0		
WE522 020 12		12.0		
WE522 020 14		14.0		
WE522 020 16		16.0		
WE522 025 10	2.5	10.0	60	6
WE522 025 12		12.0		
WE522 025 16		16.0		
WE522 025 20		20.0		
WE522 025 26		26.0		
WE522 030 16 S3	3.0	16.0	100	3
WE522 030 10		10.0	70	6
WE522 030 12		12.0		
WE522 030 14		14.0		
WE522 030 16		16.0		
WE522 030 20		20.0		
WE522 030 26		26.0		
WE522 030 30		30.0		

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG

- 2 Flute long type with a variety of flute length sizes
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

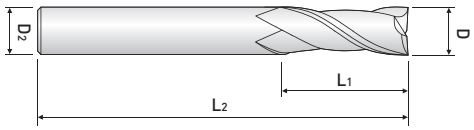
WE522 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WE522 040 20 S4	4.0	20.0	100	4
WE522 040 12		12.0	70	6
WE522 040 16		16.0		
WE522 040 20		20.0		
WE522 040 26		26.0		
WE522 040 30		30.0		
WE522 050 20	5.0	20.0	70	6
WE522 050 25		25.0	70	
WE522 050 25 100			100	
WE522 050 30		30.0	80	
WE522 050 35		35.0	90	
WE522 050 40		40.0	100	
WE522 060 15	6.0	15.0	60	6
WE522 060 15 080			80	
WE522 060 20		20.0	70	
WE522 060 20 090			90	
WE522 060 25		25.0	75	
WE522 060 30		30.0	80	
WE522 060 30 100			100	
WE522 060 30 150			150	
WE522 060 35		35.0	90	
WE522 060 40		40.0	90	
WE522 060 40 120			120	
WE522 060 45		45.0	150	
WE522 080 25	8.0	25.0	80	8
WE522 080 30		30.0	80	
WE522 080 30 100			100	
WE522 080 35		35.0	90	
WE522 080 40		40.0	90	
WE522 080 40 120			120	
WE522 080 40 150			150	
WE522 080 45		45.0	100	
WE522 080 50		50.0	100	
WE522 080 50 150			150	
WE522 100 30	10.0	30.0	80	10
WE522 100 30 100			100	
WE522 100 35		35.0	90	

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG

- 2 Flute long type with a variety of flute length sizes
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

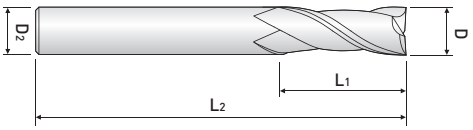
WE522 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WE522 100 40	10.0	40.0	90	10
WE522 100 40 120			120	
WE522 100 45		45.0	100	
WE522 100 50		50.0	100	
WE522 100 50 150			150	
WE522 100 50 200			200	
WE522 100 55		55.0	150	
WE522 100 60		60.0	110	
WE522 100 60 200			200	
WE522 120 35	12.0	35.0	90	12
WE522 120 40		40.0	100	
WE522 120 40 120			120	
WE522 120 45		45.0	130	
WE522 120 50		50.0	100	
WE522 120 50 150			150	
WE522 120 55		55.0	110	
WE522 120 60		60.0	110	
WE522 120 60 150			150	
WE522 120 60 200			200	
WE522 120 65		65.0	150	
WE522 120 70		70.0	120	
WE522 120 70 200			200	
WE522 140 50	14.0	50.0	110	16
WE522 140 60		60.0	150	
WE522 160 40	16.0	40.0	150	16
WE522 160 50		50.0	110	
WE522 160 50 150			150	
WE522 160 60		60.0	120	
WE522 160 70		70.0	130	
WE522 160 70 150			150	
WE522 160 70 200			200	
WE522 160 80		80.0	150	
WE522 160 90		90.0	150	
WE522 160 110		110.0	200	
WE522 160 120		120.0	250	

NEXT

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG

- 2 Flute long type with a variety of flute length sizes
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WE522 ...series

ULTRA FINE | HELIX | W Coating | p.1022

EDP. No.	D	L_1	L_2	D_2
WE522 180 50	18.0	50.0	120	20
WE522 180 70		70.0	130	
WE522 180 100		100.0	200	
WE522 200 50	20.0	50.0	110	20
WE522 200 50 150			150	
WE522 200 60		60.0	130	
WE522 200 70		70.0	130	
WE522 200 80		80.0	150	
WE522 200 90		90.0	150	
WE522 200 90 200			200	
WE522 200 110		110.0	200	
WE522 200 120		120.0	250	
WE522 220 75	22.0	75.0	150	20
WE522 220 110		110.0	200	
WE522 250 70	25.0	70.0	150	25
WE522 250 90		90.0	150	
WE522 250 110		110.0	200	
WE522 250 120		120.0	250	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

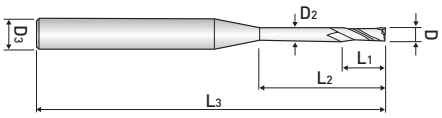
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG NECK

- Double neck below 1Ø lead to strengthened hardness and machining RIB with a various effective length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

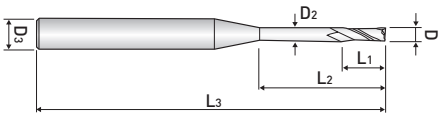
WE512 ...series

ULTRA FINE | HELIX | W Coating | p.1023~1026

EDP. No.	D	L1	L2	L3	D3
WE512 001 003	0.1	0.15	0.3	40	4
WE512 001 005			0.5		
WE512 001 01			1.0		
WE512 002 005	0.2	0.3	0.5	40	4
WE512 002 01			1.0		
WE512 002 015			1.5		
WE512 002 02			2.0		
WE512 003 01	0.3	0.5	1.0	40	4
WE512 003 015			1.5		
WE512 003 02			2.0		
WE512 003 025			2.5		
WE512 003 03			3.0		
WE512 003 04			4.0		
WE512 003 05			5.0		
WE512 004 01	0.4	0.6	1.0	40	4
WE512 004 015			1.5		
WE512 004 02			2.0		
WE512 004 025			2.5		
WE512 004 03			3.0		
WE512 004 04			4.0		
WE512 004 05			5.0		
WE512 004 06			6.0		
WE512 004 08			8.0		
WE512 004 10			10.0		
WE512 005 01	0.5	0.7	1.0	45	4
WE512 005 015			1.5		
WE512 005 02			2.0		
WE512 005 025			2.5		
WE512 005 03			3.0		
WE512 005 04			4.0		
WE512 005 05			5.0		
WE512 005 06			6.0		
WE512 005 08			8.0		
WE512 005 10			10.0		

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG NECK

- Double neck below 1Ø lead to strengthened hardness and machining RIB with a various effective length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

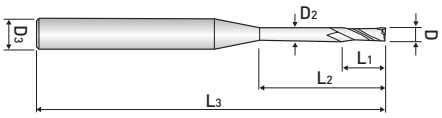
WE512 ...series

ULTRA FINE | HELIX | W Coating | p.1023~1026

EDP. No.	D	L1	L2	L3	D3
WE512 005 12	0.5	0.7	12.0	45	4
WE512 005 14			14.0		
WE512 005 16			16.0		
WE512 006 02	0.6	0.9	2.0	45	4
WE512 006 03			3.0		
WE512 006 04			4.0		
WE512 006 05			5.0		
WE512 006 06			6.0		
WE512 006 08			8.0		
WE512 006 10			10.0		
WE512 006 12			12.0		
WE512 006 14			14.0		
WE512 006 16			16.0		
WE512 007 02	0.7	1.2	2.0	45	4
WE512 007 04			4.0		
WE512 007 06			6.0		
WE512 007 08			8.0		
WE512 007 10			10.0		
WE512 007 12			12.0		
WE512 008 02	0.8	1.2	2.0	45	4
WE512 008 03			3.0		
WE512 008 04			4.0		
WE512 008 05			5.0		
WE512 008 06			6.0		
WE512 008 08			8.0		
WE512 008 10			10.0		
WE512 008 12			12.0		
WE512 008 14			14.0		
WE512 008 16			16.0		
WE512 008 20			20.0		
WE512 009 06	0.9	1.3	6.0	45	4
WE512 009 08			8.0		
WE512 009 10			10.0		

NEXT

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG NECK

- Double neck below 1Ø lead to strengthened hardness and machining RIB with a various effective length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

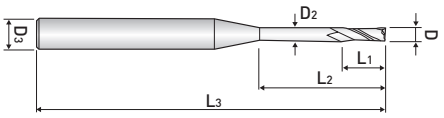
WE512 ...series

ULTRA FINE | HELIX | W Coating | p.1023~1026

EDP. No.	D	L1	L2	L3	D3
WE512 010 02	1.0	1.5	2.0	50	4
WE512 010 03			3.0		
WE512 010 04			4.0		
WE512 010 05			5.0		
WE512 010 06			6.0		
WE512 010 07			7.0		
WE512 010 08			8.0		
WE512 010 10			10.0		
WE512 010 12			12.0		
WE512 010 14			14.0		
WE512 010 16			16.0		
WE512 010 18			18.0		
WE512 010 20			20.0		
WE512 010 22			22.0	60	
WE512 010 26			26.0		
WE512 010 30			30.0	70	
WE512 010 40			40.0	80	
WE512 010 50			50.0	100	
WE512 012 04	1.2	1.8	4.0	50	4
WE512 012 06			6.0		
WE512 012 08			8.0		
WE512 012 10			10.0		
WE512 012 12			12.0		
WE512 012 14			14.0		
WE512 012 16			16.0		
WE512 012 20			20.0		
WE512 012 26			26.0	60	
WE512 012 30			30.0	70	
WE512 014 06	1.4	2.1	6.0	50	4
WE512 014 08			8.0		
WE512 014 10			10.0		
WE512 014 14			14.0		
WE512 014 16			16.0		
WE512 014 20			20.0		

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG NECK

- Double neck below 1Ø lead to strengthened hardness and machining RIB with a various effective length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

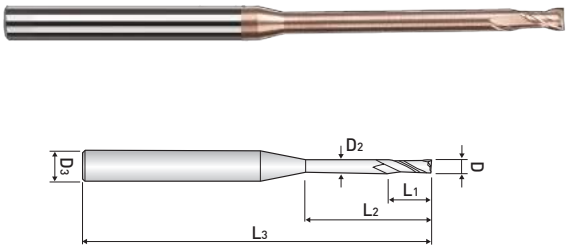
WE512 ...series

ULTRA FINE | HELIX | W Coating | p.1023~1026

EDP. No.	D	L1	L2	L3	D3
WE512 015 04	1.5	2.3	4.0	50	4
WE512 015 05			5.0		
WE512 015 06			6.0		
WE512 015 07			7.0		
WE512 015 08			8.0		
WE512 015 10			10.0		
WE512 015 12			12.0		
WE512 015 14			14.0		
WE512 015 16			16.0		
WE512 015 18			18.0		
WE512 015 20			20.0		
WE512 015 22			22.0	60	
WE512 015 26			26.0		
WE512 015 30			30.0	70	
WE512 016 08	1.6	2.3	8.0	50	4
WE512 016 10			10.0		
WE512 016 12			12.0		
WE512 016 16			16.0		
WE512 016 20			20.0		
WE512 018 08	1.8	2.7	8.0	50	4
WE512 018 10			10.0		
WE512 018 12			12.0		
WE512 018 16			16.0		
WE512 018 20			20.0		
WE512 020 06	2.0	3.0	6.0	50	4
WE512 020 08			8.0		
WE512 020 10			10.0		
WE512 020 12			12.0		
WE512 020 14			14.0		
WE512 020 16			16.0		
WE512 020 18			18.0		
WE512 020 20			20.0		

NEXT

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG NECK

- Double neck below 1Ø lead to strengthened hardness and machining RIB with a various effective length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

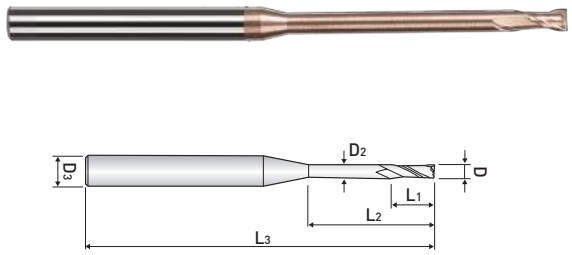
WE512 ...series

UWC ULTRA FINE | 2 | 30° HELIX | W W Coating | DATA p.1023~1026

EDP. No.	D	L_1	L_2	L_3	D_3
WE512 020 22	2.0	3.0	22.0	60	4
WE512 020 26			26.0		
WE512 020 30			30.0	70	
WE512 020 35			35.0		
WE512 020 40			40.0	80	
WE512 020 45			45.0	90	
WE512 020 50			50.0	100	
WE512 020 60			60.0	110	
WE512 025 08	2.5	4.0	8.0	50	4
WE512 025 10			10.0		
WE512 025 12			12.0		
WE512 025 14			14.0		
WE512 025 16			16.0		
WE512 025 18			18.0		
WE512 025 20			20.0		
WE512 025 22			22.0	60	
WE512 025 26			26.0		
WE512 025 30			30.0	70	
WE512 025 35			35.0		
WE512 025 40			40.0	80	
WE512 025 45			45.0	90	
WE512 025 50			50.0	100	
WE512 030 06	3.0	4.5	6.0	50	6
WE512 030 08			8.0		
WE512 030 10			10.0		
WE512 030 12			12.0		
WE512 030 14			14.0	60	
WE512 030 16			16.0		
WE512 030 18			18.0		
WE512 030 20			20.0		

NEXT

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG NECK

- Double neck below 1Ø lead to strengthened hardness and machining RIB with a various effective length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

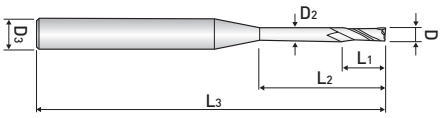
WE512 ...series

UWC ULTRA FINE | 2 | 30° HELIX | W W Coating | DATA p.1023~1026

EDP. No.	D	L_1	L_2	L_3	D_3
WE512 030 22	3.0	4.5	22.0	65	6
WE512 030 26			26.0		
WE512 030 30			30.0	70	
WE512 030 35			35.0		
WE512 030 40			40.0	80	
WE512 030 45			45.0	90	
WE512 030 50			50.0	100	
WE512 030 60			60.0		
WE512 040 08	4.0	6.0	8.0	50	6
WE512 040 10			10.0		
WE512 040 12			12.0		
WE512 040 14			14.0	60	
WE512 040 16			16.0		
WE512 040 18			18.0		
WE512 040 20			20.0		
WE512 040 22			22.0	65	
WE512 040 26			26.0		
WE512 040 30			30.0	70	
WE512 040 35			35.0		
WE512 040 40			40.0	80	
WE512 040 45			45.0	90	
WE512 040 50			50.0	100	
WE512 040 60			60.0		
WE512 050 16	5.0	8.0	16.0	60	6
WE512 050 20			20.0		
WE512 050 26			26.0	65	
WE512 050 30			30.0	70	
WE512 050 35			35.0	75	
WE512 050 40			40.0	80	
WE512 050 50			50.0	90	
WE512 050 60			60.0	100	

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



2 FLUTE LONG NECK

- Double neck below 1Ø lead to strengthened hardness and machining RIB with a various effective length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Prehardened Steel, Alloy Steel, Carbon Steel

WE512 ...series

ULTRA FINE | HELIX | W Coating | p.1023~1026

EDP. No.	D	L_1	L_2	L_3	D_3
WE512 060 15	6.0	9.0	15.0	60	6
WE512 060 20			20.0		
WE512 060 30			30.0	70	
WE512 060 32			32.0	90	
WE512 080 25	8.0	12.0	25.0	70	8
WE512 080 30			30.0	80	
WE512 080 42			42.0	100	
WE512 100 30	10.0	15.0	30.0	75	10
WE512 100 35			35.0	80	
WE512 100 45			45.0	100	
WE512 120 35	12.0	20.0	35.0	80	12
WE512 120 40			40.0	90	
WE512 120 50			50.0	110	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

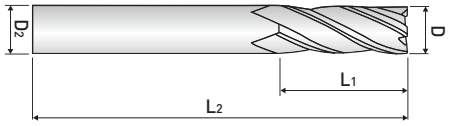
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
up to 6	0~-0.012	h6
over 6	0~-0.015	

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



VARIABLE INDEX 4 FLUTE SQUARE

- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

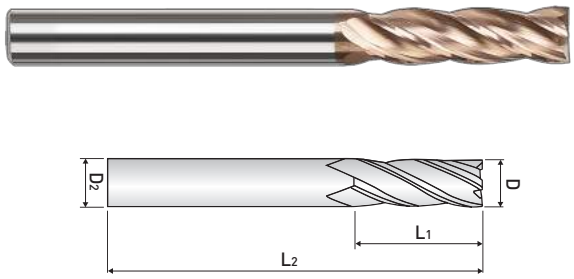
WME504 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | W Coating | DATA p.1027

EDP. No.	D	L_1	L_2	D_2
WME504 008	0.8	1.6	40	4
WME504 009	0.9	1.8	40	4
WME504 010	1.0	2.5	50	6
WME504 012	1.2	3.0	50	6
WME504 015	1.5	4.0	50	6
WME504 020	2.0	6.0	50	6
WME504 025	2.5	7.0	50	6
WME504 030	3.0	8.0	50	6
WME504 035	3.5	10.0	50	6
WME504 040	4.0	10.0	50	6
WME504 045	4.5	14.0	50	6
WME504 050	5.0	15.0	60	6
WME504 055	5.5	15.0	60	6
WME504 060	6.0	15.0	60	6
WME504 065	6.5	18.0	60	8
WME504 070	7.0	20.0	60	8
WME504 075	7.5	20.0	60	8
WME504 080	8.0	20.0	70	8
WME504 085	8.5	22.0	70	10
WME504 090	9.0	22.0	70	10
WME504 095	9.5	24.0	70	10
WME504 100	10.0	25.0	75	10
WME504 105	10.5	26.0	75	12
WME504 110	11.0	30.0	75	12
WME504 115	11.5	30.0	80	12
WME504 120	12.0	30.0	80	12
WME504 130	13.0	35.0	100	12
WME504 140 S12	14.0	35.0	100	12
WME504 140 S14				14
WME504 140				16
WME504 150	15.0	38.0	100	16
WME504 160	16.0	40.0	100	16
WME504 170	17.0	42.0	100	16
WME504 180 S16	18.0	45.0	100	16
WME504 180				18
WME504 190	19.0	45.0	100	20
WME504 200	20.0	45.0	100	20
WME504 210	21.0	45.0	100	20

NEXT >>

Endmills for Mold & Die(square) WINNER Series



VARIABLE INDEX 4 FLUTE SQUARE

- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

WME504 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | W Coating | DATA p.1027

EDP. No.	D	L_1	L_2	D_2
WME504 220	22.0	45.0	100	20
WME504 230	23.0	50.0	120	25
WME504 240	24.0	50.0	120	25
WME504 250	25.0	50.0	120	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

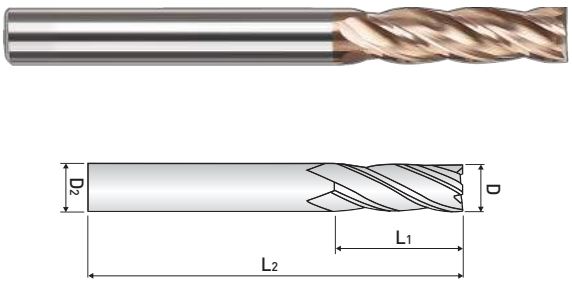
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



VARIABLE INDEX 4 FLUTE FOR POWERFUL CUTTING

- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Gash touch shape applied to prevent flute chipping
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

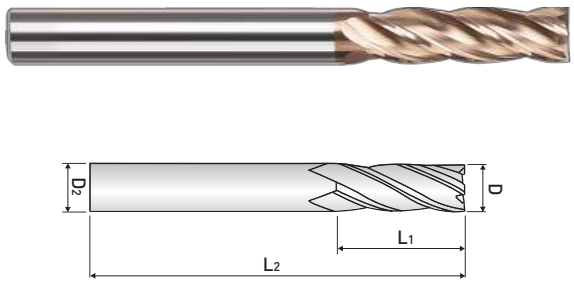
WXE504 ...series

UWC ULTRA FINE | 4 | 29° HELIX | 31° HELIX | W W Coating | DATA p.1027

EDP. No.	D	L1	L2	D2
WXE504 010 01	1.0	1.0	40	6
WXE504 010 02		2.0		
WXE504 010		2.5	50	
WXE504 010 03		3.0		
WXE504 010 04		4.0		
WXE504 010 06		6.0		
WXE504 012 02	1.2	2.0	40	6
WXE504 012		3.0	50	
WXE504 012 04		4.0		
WXE504 012 06		6.0		
WXE504 015 015	1.5	1.5	40	6
WXE504 015 03		3.0		
WXE504 015		4.0	50	
WXE504 015 06		6.0		
WXE504 015 08		8.0		
WXE504 015 10		10.0		
WXE504 020 02	2.0	2.0	40	6
WXE504 020 04		4.0		
WXE504 020		6.0	50	
WXE504 020 08		8.0		
WXE504 020 10		10.0		
WXE504 020 12		12.0		
WXE504 025 025	2.5	2.5	40	6
WXE504 025 05		5.0		
WXE504 025		7.0	50	
WXE504 025 10		10.0		
WXE504 025 12		12.0		
WXE504 030 03	3.0	3.0	40	6
WXE504 030 06		6.0		
WXE504 030		8.0	50	
WXE504 030 10		10.0		
WXE504 030 12		12.0		
WXE504 030 14		14.0		
WXE504 040 04	4.0	4.0	40	6
WXE504 040 08		8.0		
WXE504 040		10.0	50	
WXE504 040 12		12.0		

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



VARIABLE INDEX 4 FLUTE FOR POWERFUL CUTTING

- Excellent surface roughness with a variable index geometry for more than 3Ø
- Increased tool life with a reduced chatter vibration and resonance by irregular exciting force
- Gash touch shape applied to prevent flute chipping
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating

WXE504 ...series

ULTRA FINE | 4 | 29° HELIX | 31° HELIX | W Coating | DATA p.1027

EDP. No.	D	L1	L2	D2
WXE504 040 14	4.0	14.0	50	6
WXE504 040 16		16.0		
WXE504 050 05	5.0	5.0	50	6
WXE504 050 10		10.0		
WXE504 050		15.0	60	
WXE504 050 20		20.0		
WXE504 050 25		25.0		
WXE504 060 06	6.0	6.0	50	6
WXE504 060 12		12.0		
WXE504 060		15.0	60	
WXE504 060 20		20.0		
WXE504 060 25		25.0		
WXE504 080 16	8.0	16.0	60	8
WXE504 080		20.0	70	
WXE504 080 25		25.0		
WXE504 080 30		30.0		
WXE504 100 22	10.0	22.0	65	10
WXE504 100		25.0	75	
WXE504 100 30		30.0		
WXE504 100 35		35.0		
WXE504 120 26	12.0	26.0	70	12
WXE504 120		30.0	80	
WXE504 120 35		35.0		
WXE504 120 40		40.0		
WXE504 140	14.0	35.0	100	16
WXE504 160 32	16.0	32.0	100	16
WXE504 160		40.0		
WXE504 180	18.0	45.0	100	20
WXE504 200	20.0	45.0	100	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

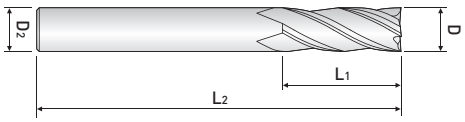
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.030	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



4 FLUTE LONG

- A wide range of choices due to a variety of sizes of cutting length and overall length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

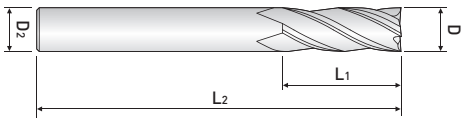
WE524 ...series

ULTRA FINE | HELIX | W Coating | p.1027

EDP. No.	D	L_1	L_2	D_2
WE524 010 03	1.0	3.0	60	6
WE524 010 04		4.0		
WE524 010 05		5.0		
WE524 010 06		6.0		
WE524 010 07		7.0		
WE524 010 08		8.0		
WE524 010 10		10.0		
WE524 010 12		12.0		
WE524 012 04	1.2	4.0	60	6
WE524 012 06		6.0		
WE524 012 08		8.0		
WE524 012 10		10.0		
WE524 012 12		12.0		
WE524 015 06	1.5	6.0	60	6
WE524 015 08		8.0		
WE524 015 10		10.0		
WE524 015 12		12.0		
WE524 015 14		14.0		
WE524 015 16		16.0		
WE524 020 08	2.0	8.0	60	6
WE524 020 10		10.0		
WE524 020 12		12.0		
WE524 020 14		14.0		
WE524 020 16		16.0		
WE524 025 10	2.5	10.0	60	6
WE524 025 12		12.0		
WE524 025 16		16.0		
WE524 025 20		20.0		
WE524 025 26		26.0		
WE524 030 16 S3	3.0	16.0	100	3
WE524 030 10		10.0	70	6
WE524 030 12		12.0		
WE524 030 14		14.0		
WE524 030 16		16.0		
WE524 030 20		20.0		
WE524 030 26		26.0		
WE524 030 30		30.0		

NEXT >>

Endmills for Mold & Die(square) WINNER Series



4 FLUTE LONG

- A wide range of choices due to a variety of sizes of cutting length and overall length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

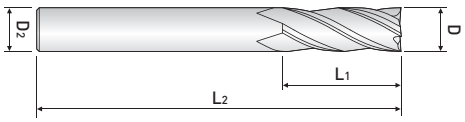
WE524 ...series

UWC ULTRA FINE | 4 | 30° HELIX | W W Coating | DATA p.1027

EDP. No.	D	L1	L2	D2
WE524 040 20 S4	4.0	20.0	100	4
WE524 040 12		12.0	70	6
WE524 040 16		16.0		
WE524 040 20		20.0		
WE524 040 26		26.0		
WE524 040 30		30.0		
WE524 050 20	5.0	20.0	70	6
WE524 050 25		25.0	70	
WE524 050 25 100			100	
WE524 050 30		30.0	80	
WE524 050 35		35.0	90	
WE524 050 40		40.0	100	
WE524 060 15	6.0	15.0	60	6
WE524 060 15 080			80	
WE524 060 20		20.0	70	
WE524 060 20 090			90	
WE524 060 25		25.0	75	
WE524 060 30		30.0	80	
WE524 060 30 100			100	
WE524 060 30 150			150	
WE524 060 35		35.0	90	
WE524 060 40		40.0	90	
WE524 060 40 120			120	
WE524 060 45		45.0	150	
WE524 080 25	8.0	25.0	80	8
WE524 080 30		30.0	80	
WE524 080 30 100			100	
WE524 080 35		35.0	90	
WE524 080 40		40.0	90	
WE524 080 40 120			120	
WE524 080 40 150			150	
WE524 080 45		45.0	100	
WE524 080 50		50.0	100	
WE524 080 50 150			150	

NEXT ≫≫

Endmills for Mold & Die(square) WINNER Series



4 FLUTE LONG

- A wide range of choices due to a variety of sizes of cutting length and overall length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

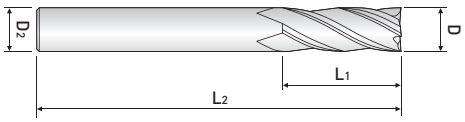
WE524 ...series

UWC ULTRA FINE | 4 | 30° HELIX | W W Coating | DATA p.1027

EDP. No.	D	L1	L2	D2
WE524 100 30	10.0	30.0	80	10
WE524 100 30 100			100	
WE524 100 35		35.0	90	
WE524 100 40		40.0	90	
WE524 100 40 120			120	
WE524 100 45		45.0	100	
WE524 100 50		50.0	100	
WE524 100 50 150			150	
WE524 100 50 200			200	
WE524 100 55		55.0	150	
WE524 100 60		60.0	110	
WE524 100 60 200			200	
WE524 120 35	12.0	35.0	90	12
WE524 120 40		40.0	100	
WE524 120 40 120			120	
WE524 120 45		45.0	130	
WE524 120 50		50.0	100	
WE524 120 50 150			150	
WE524 120 55		55.0	110	
WE524 120 60		60.0	110	
WE524 120 60 150			150	
WE524 120 60 200			200	
WE524 120 65		65.0	150	
WE524 120 70		70.0	120	
WE524 120 70 200			200	
WE524 140 50	14.0	50.0	110	16
WE524 140 60		60.0	150	
WE524 160 40	16.0	40.0	150	16
WE524 160 50		50.0	110	
WE524 160 50 150			150	
WE524 160 60		60.0	120	
WE524 160 70		70.0	130	
WE524 160 70 150			150	
WE524 160 70 200			200	
WE524 160 80		80.0	150	
WE524 160 90		90.0	150	
WE524 160 110		110.0	200	
WE524 160 120		120.0	250	

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



4 FLUTE LONG

- A wide range of choices due to a variety of sizes of cutting length and overall length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WE524 ...series

ULTRA FINE | HELIX | W Coating | p.1027

EDP. No.	D	L_1	L_2	D_2
WE524 180 50	18.0	50.0	120	20
WE524 180 70		70.0	130	
WE524 180 100		100.0	200	
WE524 200 50	20.0	50.0	110	20
WE524 200 50 150			150	
WE524 200 60		60.0	130	
WE524 200 70		70.0	130	
WE524 200 80		80.0	150	
WE524 200 90		90.0	150	
WE524 200 90 200			200	
WE524 200 110		110.0	200	
WE524 200 120		120.0	250	
WE524 220 75	22.0	75.0	150	20
WE524 220 110		110.0	200	
WE524 250 70	25.0	70.0	150	25
WE524 250 90		90.0	150	
WE524 250 110		110.0	200	
WE524 250 120		120.0	250	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

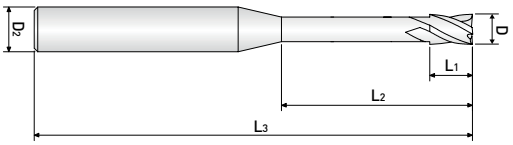
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.030	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



4 FLUTE LONG NECK

- Excellent effect in preventing breakage with a shape of neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre- hardened Steel, Alloy Steel, Carbon Steel

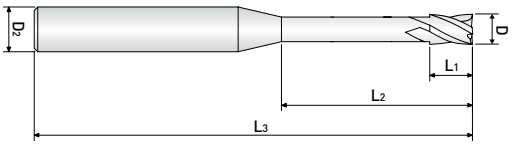
WE514 ...series

ULTRA FINE | HELIX | W Coating | p.1028

EDP. No.	D	L_1	L_2	L_3	D_2
WE514 010 02	1.0	1.5	2.0	50	4
WE514 010 03			3.0		
WE514 010 04			4.0		
WE514 010 05			5.0		
WE514 010 06			6.0		
WE514 010 07			7.0		
WE514 010 08			8.0		
WE514 010 10			10.0		
WE514 010 12			12.0		
WE514 010 14			14.0		
WE514 010 16			16.0		
WE514 010 18			18.0		
WE514 010 20			20.0		
WE514 010 22			22.0	60	
WE514 010 26			26.0		
WE514 010 30			30.0	70	
WE514 010 40			40.0	80	
WE514 010 50			50.0	100	
WE514 012 04	1.2	1.8	4.0	50	4
WE514 012 06			6.0		
WE514 012 08			8.0		
WE514 012 10			10.0		
WE514 012 12			12.0		
WE514 012 14			14.0		
WE514 012 16			16.0		
WE514 012 20			20.0		
WE514 012 26			26.0	60	
WE514 012 30			30.0	70	
WE514 015 04	1.5	2.3	4.0	50	4
WE514 015 05			5.0		
WE514 015 06			6.0		
WE514 015 07			7.0		
WE514 015 08			8.0		
WE514 015 10			10.0		
WE514 015 12			12.0		
WE514 015 14			14.0		
WE514 015 16			16.0		

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



4 FLUTE LONG NECK

- Excellent effect in preventing breakage with a shape of neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre- hardened Steel, Alloy Steel, Carbon Steel

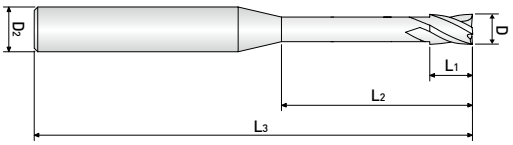
WE514 ...series

ULTRA FINE | HELIX | W Coating | p.1028

EDP. No.	D	L_1	L_2	L_3	D_2
WE514 015 18	1.5	2.3	18.0	50	4
WE514 015 20			20.0		
WE514 015 22			22.0	60	
WE514 015 26			26.0		
WE514 015 30			30.0	70	
WE514 020 06	2.0	3.0	6.0	50	4
WE514 020 08			8.0		
WE514 020 10			10.0		
WE514 020 12			12.0		
WE514 020 14			14.0		
WE514 020 16			16.0		
WE514 020 18			18.0		
WE514 020 20			20.0		
WE514 020 22			22.0	60	
WE514 020 26			26.0		
WE514 020 30			30.0	70	
WE514 020 35			35.0		
WE514 020 40			40.0	80	
WE514 020 45			45.0	90	
WE514 020 50			50.0	100	
WE514 020 60			60.0	110	
WE514 025 08	2.5	4.0	8.0	50	4
WE514 025 10			10.0		
WE514 025 12			12.0		
WE514 025 14			14.0		
WE514 025 16			16.0		
WE514 025 18			18.0		
WE514 025 20			20.0		
WE514 025 22			22.0	60	
WE514 025 26			26.0		
WE514 025 30			30.0	70	
WE514 025 35			35.0		
WE514 025 40			40.0	80	
WE514 025 45			45.0	90	
WE514 025 50			50.0	100	

NEXT >>

Endmills for Mold & Die(square) WINNER Series



4 FLUTE LONG NECK

- Excellent effect in preventing breakage with a shape of neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre- hardened Steel, Alloy Steel, Carbon Steel

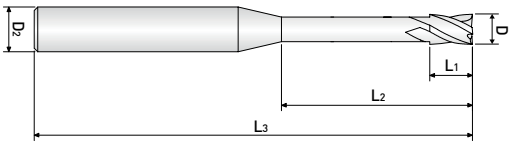
WE514 ...series

ULTRA FINE | HELIX | W Coating | p.1028

EDP. No.	D	L_1	L_2	L_3	D_2
WE514 030 06	3.0	4.5	6.0	50	6
WE514 030 08			8.0		
WE514 030 10			10.0		
WE514 030 12			12.0		
WE514 030 14			14.0	60	
WE514 030 16			16.0		
WE514 030 18			18.0		
WE514 030 20			20.0		
WE514 030 22			22.0	65	
WE514 030 26			26.0		
WE514 030 30			30.0	70	
WE514 030 35			35.0		
WE514 030 40			40.0	80	
WE514 030 45			45.0	90	
WE514 030 50			50.0	100	
WE514 030 60			60.0	100	
WE514 040 08	4.0	4.5	8.0	50	6
WE514 040 10			10.0		
WE514 040 12			12.0		
WE514 040 14			14.0	60	
WE514 040 16			16.0		
WE514 040 18			18.0		
WE514 040 20			20.0		
WE514 040 22			22.0	65	
WE514 040 26			26.0		
WE514 040 30			30.0	70	
WE514 040 35			35.0		
WE514 040 40			40.0	80	
WE514 040 45			45.0	90	
WE514 040 50			50.0	100	
WE514 040 60			60.0		
WE514 050 16	5.0	8.0	16.0	60	6
WE514 050 20			20.0		
WE514 050 26			26.0	65	
WE514 050 30			30.0	70	
WE514 050 35			35.0	75	
WE514 050 40			40.0	80	

NEXT ≫

Endmills for Mold & Die(square) WINNER Series



4 FLUTE LONG NECK

- Excellent effect in preventing breakage with a shape of neck without notch
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre- hardened Steel, Alloy Steel, Carbon Steel

WE514 ...series

ULTRA FINE | HELIX | W Coating | p.1028

EDP. No.	D	L_1	L_2	L_3	D_2
WE514 050 50	5.0	8.0	50.0	90	6
WE514 050 60			60.0	100	
WE514 060 15	6.0	9.0	15.0	60	6
WE514 060 20			20.0		
WE514 060 30			30.0	70	
WE514 060 32			32.0	90	
WE514 080 25	8.0	12.0	25.0	70	8
WE514 080 30			30.0	80	
WE514 080 42			42.0	100	
WE514 100 30	10.0	15.0	30.0	75	10
WE514 100 35			35.0	80	
WE514 100 45			45.0	100	
WE514 120 35	12.0	20.0	35.0	80	12
WE514 120 40			40.0	90	
WE514 120 50			50.0	110	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

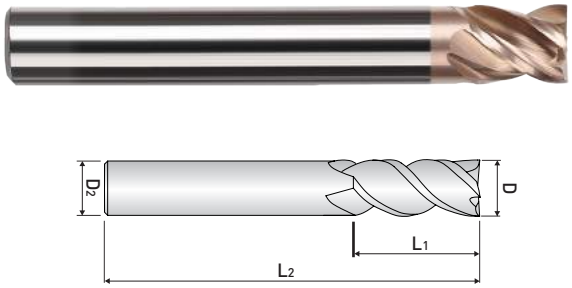
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



4 FLUTE HIGH HELIX (45°)

- Reduce cutting load with 45° High Helix
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

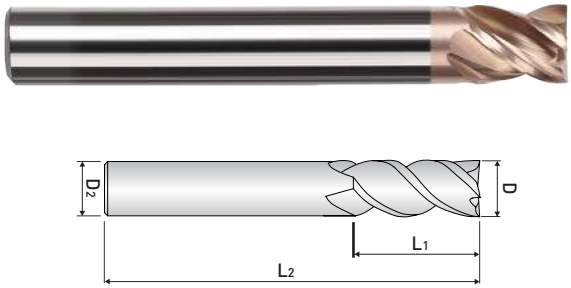
WE504...H ...series

UWC ULTRA FINE | 4 | 45° HELIX | W W Coating | DATA p.1028

EDP. No.	D	L1	L2	D2
WE504H 010	1.0	2.5	50	6
WE504H 010 04		4.0	60	
WE504H 010 06		6.0		
WE504H 015	1.5	4.0	50	6
WE504H 015 06		6.0	60	
WE504H 015 08		8.0		
WE504H 020	2.0	6.0	50	6
WE504H 020 08		8.0	60	
WE504H 020 10		10.0		
WE504H 030	3.0	8.0	50	6
WE504H 030 10		10.0	70	
WE504H 030 12		12.0		
WE504H 030 16		16.0		
WE504H 040	4.0	10.0	50	6
WE504H 040 12		12.0	70	
WE504H 040 16		16.0		
WE504H 040 20		20.0		
WE504H 050	5.0	15.0	50	6
WE504H 050 30		30.0	80	
WE504H 060	6.0	15.0	60	6
WE504H 060 20		20.0	70	
WE504H 060 30		30.0	80	
WE504H 080	8.0	20.0	70	8
WE504H 080 30		30.0	80	
WE504H 080 35		35.0	90	
WE504H 080 40		40.0	90	
WE504H 100	10.0	25.0	75	10
WE504H 100 30		30.0	80	
WE504H 100 40		40.0	90	
WE504H 100 50		50.0	100	
WE504H 120	12.0	30.0	80	12
WE504H 120 40		40.0	90	
WE504H 120 50		50.0	100	
WE504H 120 60		60.0	110	

NEXT

Endmills for Mold & Die(square) WINNER Series



4 FLUTE HIGH HELIX (45°)

- Reduce cutting load with 45° High Helix
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WE504...H ...series

UWC ULTRA FINE | 4 | 45° HELIX | W W Coating | DATA p.1028

EDP. No.	D	L1	L2	D2
WE504H 160	16.0	40.0	100	16
WE504H 160 50		50.0	110	
WE504H 160 60		60.0	120	
WE504H 160 110		110.0	200	
WE504H 200	20.0	45.0	100	20
WE504H 200 60		60.0	120	
WE504H 200 70		70.0	130	
WE504H 200 110		110.0	200	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

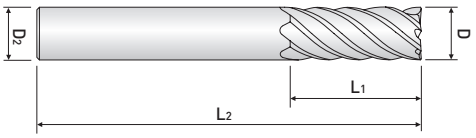
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.030	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



6 FLUTE HIGH HELIX (45°)

- Dramatically reduced cutting load using 6 flute with high helix
- Enhanced cutting effect and better wear resistance made from the f inest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WE506 ...series

ULTRA FINE | HELIX | W Coating | p.1029

EDP. No.	D	L_1	L_2	D_2
WE506 060	6.0	15.0	60	6
WE506 060 20		20.0	70	
WE506 060 30		30.0	80	
WE506 060 30 110			110	
WE506 080	8.0	20.0	70	8
WE506 080 30		30.0	80	
WE506 080 35		35.0	90	
WE506 080 40		40.0	90	
WE506 080 40 130			130	
WE506 100	10.0	25.0	75	10
WE506 100 30		30.0	80	
WE506 100 40		40.0	90	
WE506 100 50		50.0	100	
WE506 100 50 150			150	
WE506 120	12.0	30.0	80	12
WE506 120 40		40.0	90	
WE506 120 50		50.0	100	
WE506 120 60		60.0	110	
WE506 120 60 150			150	
WE506 160	16.0	40.0	100	16
WE506 160 50		50.0	110	
WE506 160 60		60.0	120	
WE506 160 90		90.0	150	
WE506 160 110		110.0	200	
WE506 160 110 250			250	
WE506 200	20.0	45.0	100	20
WE506 200 60		60.0	120	
WE506 200 70		70.0	130	
WE506 200 110		110.0	200	
WE506 200 110 250			250	
WE506 200 110 300			300	

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

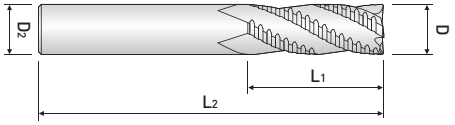
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.030	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(square) WINNER Series



3, 4, 5 FLUTE 20° ROUGHING

- Strengthen the hardness with Low Helix
- Effective cutting by reduction of chipping due to the shape of chamfer at the end of teeth
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WF61 ...series

UWC ULTRA FINE | 3~5 | 20° HELIX | W W Coating | DATA p.1030

EDP. No.	D	L_1	L_2	D_2	FLUTE
WF613 030	3.0	8.0	50	6	3
WF613 040	4.0	10.0	50	6	3
WF613 050	5.0	13.0	50	6	3
WF613 060	6.0	15.0	60	6	3
WF613 060 20		20.0			3
WF613 070	7.0	18.0	70	8	3
WF613 080	8.0	20.0	70	8	3
WF613 080 25		25.0			3
WF614 090	9.0	22.0	75	10	4
WF614 100	10.0	25.0	75	10	4
WF614 100 30		30.0			4
WF614 110	11.0	27.0	80	12	4
WF614 120	12.0	30.0	80	12	4
WF614 120 35		35.0			4
WF614 130	13.0	35.0	100	12	4
WF614 140	14.0	35.0	100	16	4
WF614 160	16.0	40.0	100	16	4
WF614 180	18.0	40.0	100	18	4
WF614 200	20.0	50.0	100	20	4
WF615 250	25.0	50.0	100	25	5

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

○:General Application ◎:The most suitable Application

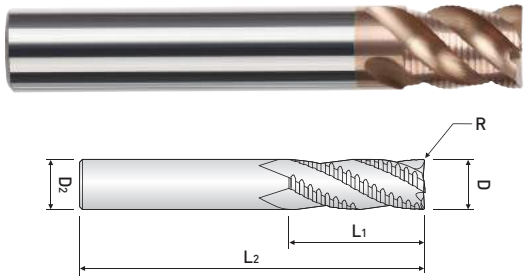
■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Mill Dia(mm)(h10)	0 -40	0 -48	0 -58	0 -70	0 -84
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

※ These tools are manufactured based on order received.

Endmills for Mold & Die(roughing) WINNER Series



VARIABLE INDEX 3, 4, 5 FLUTE ROUGHING

- Powerful cutting with variable index + Corner R
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WF60 ...series

UWC ULTRA FINE | 3~5 | 29° HELIX | 31° HELIX | W W Coating | DATA p.1030

EDP. No.	D	R	L_1	L_2	D_2	FLUTE
WF603 030	3.0	0.2	8.0	50	6	3
WF603 040	4.0	0.2	10.0	50	6	3
WF604 050	5.0	0.2	13.0	50	6	4
WF604 060	6.0	0.2	10.0	50	6	4
WF604 060 15			15.0	60		4
WF604 070	7.0	0.2	18.0	70	8	4
WF604 080	8.0	0.2	12.0	60	8	4
WF604 080 20			20.0	70		4
WF604 090	9.0	0.3	22.0	75	10	4
WF604 100	10.0	0.3	15.0	65	10	4
WF604 100 25			25.0	75		4
WF604 110	11.0	0.3	27.0	80	12	4
WF604 120	12.0	0.3	20.0	70	12	4
WF604 120 30			30.0	80		4
WF605 130	13.0	0.5	35.0	100	12	5
WF605 140	14.0	0.5	35.0	100	14	5
WF605 140 S16					16	5
WF605 160	16.0	1.0	25.0	80	16	5
WF605 160 40			40.0	100		5
WF605 180	18.0	1.0	40.0	100	18	5
WF605 180 S20					20	5
WF605 200	20.0	1.0	25.0	80	20	5
WF605 200 45			45.0	100		5
WF605 250	25.0	1.0	45.0	100	25	5

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

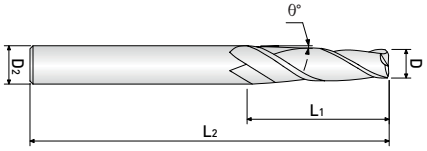
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.05	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(taper) WINNER Series



2 FLUTE TAPER

- A wide range of choices due to a variety of taper angles
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

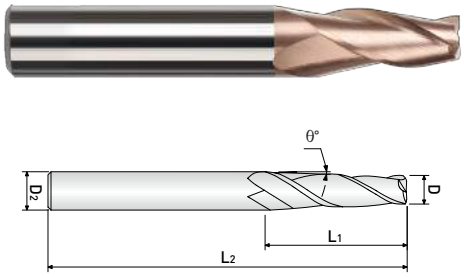
WTE502 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L1	L2	D2
WTE502 003 005	0.3	30`	1.2	40	4
WTE502 003 01		1°	1.2		
WTE502 003 015		1°30`	1.2		
WTE502 003 02		2°	1.2		
WTE502 003 03		3°	1.5		
WTE502 003 05		5°	1.5		
WTE502 003 07		7°	1.5		
WTE502 003 10		10°	1.5		
WTE502 004 005	0.4	30`	1.6	40	4
WTE502 004 01		1°	1.6		
WTE502 004 015		1°30`	1.6		
WTE502 004 02		2°	1.6		
WTE502 004 03		3°	1.6		
WTE502 004 05		5°	2.0		
WTE502 004 07		7°	2.0		
WTE502 004 10		10°	2.0		
WTE502 005 005	0.5	30`	2.0	45	4
WTE502 005 01		1°	2.0		
WTE502 005 015		1°30`	2.0		
WTE502 005 02		2°	2.0		
WTE502 005 03		3°	2.0		
WTE502 005 05		5°	2.5		
WTE502 005 07		7°	2.5		
WTE502 005 10		10°	2.5		
WTE502 006 005	0.6	30`	2.4	45	4
WTE502 006 01		1°	2.4		
WTE502 006 015		1°30`	2.4		
WTE502 006 02		2°	2.4		
WTE502 006 03		3°	2.4		
WTE502 006 05		5°	3.0		
WTE502 006 07		7°	3.0		
WTE502 006 10		10°	3.0		
WTE502 007 005	0.7	30`	2.8	45	4
WTE502 007 01		1°	2.8		
WTE502 007 015		1°30`	2.8		
WTE502 007 02		2°	2.8		
WTE502 007 03		3°	2.8		
WTE502 007 05		5°	3.5		

NEXT ≫

Endmills for Mold & Die(taper) WINNER Series



2 FLUTE TAPER

- A wide range of choices due to a variety of taper angles
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

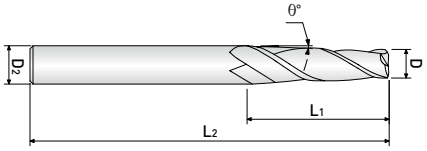
WTE502 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L1	L2	D2
WTE502 007 07	0.7	7°	3.5	45	4
WTE502 007 10		10°	3.5		
WTE502 008 005	0.8	30`	3.2	45	4
WTE502 008 01		1°	3.2		
WTE502 008 015		1°30`	3.2		
WTE502 008 02		2°	3.2		
WTE502 008 03		3°	3.2		
WTE502 008 05		5°	4.0		
WTE502 008 07		7°	4.0		
WTE502 008 10		10°	4.0		
WTE502 010 005	1.0	30`	4.0	50	4
WTE502 010 01		1°	4.0		
WTE502 010 015		1°30`	4.0		
WTE502 010 02		2°	6.0		
WTE502 010 03		3°	6.0		
WTE502 010 05		5°	8.0		
WTE502 010 07		7°	8.0		
WTE502 010 10		10°	8.0		
WTE502 015 005	1.5	30`	6.0	50	4
WTE502 015 01		1°	6.0		
WTE502 015 015		1°30`	6.0		
WTE502 015 02		2°	8.0		
WTE502 015 03		3°	8.0		
WTE502 015 05		5°	10.0		
WTE502 015 07		7°	10.0		
WTE502 015 10		10°	10.0		6
WTE502 020 005	2.0	30`	8.0	50	4
WTE502 020 01		1°	8.0		
WTE502 020 015		1°30`	8.0		
WTE502 020 02		2°	10.0		
WTE502 020 03		3°	10.0		
WTE502 020 05		5°	12.0		6
WTE502 020 07		7°	12.0		
WTE502 020 10		10°	12.0		8

NEXT

Endmills for Mold & Die(taper) WINNER Series



2 FLUTE TAPER

- A wide range of choices due to a variety of taper angles
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

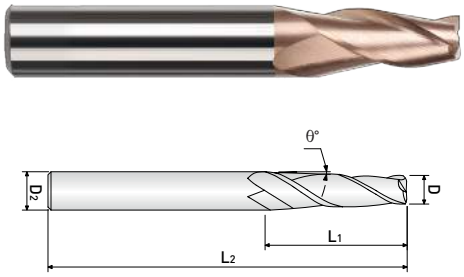
WTE502 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L_1	L_2	D_2
WTE502 025 005	2.5	30`	10.0	50	6
WTE502 025 01		1°	10.0		
WTE502 025 015		1°30`	10.0		
WTE502 025 02		2°	12.0		
WTE502 025 03		3°	12.0		
WTE502 025 05		5°	14.0		
WTE502 025 07		7°	14.0		
WTE502 025 10		10°	14.0		8
WTE502 030 005	3.0	30`	12.0	50	6
WTE502 030 01		1°	12.0		
WTE502 030 015		1°30`	12.0		
WTE502 030 02		2°	14.0		
WTE502 030 03		3°	14.0		
WTE502 030 05		5°	16.0		
WTE502 030 07		7°	16.0		8
WTE502 030 10		10°	16.0		10
WTE502 040 005	4.0	30`	16.0	60	6
WTE502 040 01		1°	16.0		
WTE502 040 015		1°30`	16.0		
WTE502 040 02		2°	16.0		
WTE502 040 03		3°	19.0		
WTE502 040 05		5°	22.0	65	8
WTE502 040 07		7°	16.0		
WTE502 040 10		10°	17.0		10
WTE502 060 005	6.0	30`	20.0	65	8
WTE502 060 01		1°	20.0		
WTE502 060 015		1°30`	20.0		
WTE502 060 02		2°	20.0		
WTE502 060 03		3°	19.0		
WTE502 060 05		5°	22.0	75	10
WTE502 060 07		7°	24.0		12
WTE502 060 10		10°	17.0		

NEXT ≫≫

Endmills for Mold & Die(taper) WINNER Series



2 FLUTE TAPER

- A wide range of choices due to a variety of taper angles
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WTE502 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L_1	L_2	D_2
WTE502 070 005	7.0	30`	28.0	70	8
WTE502 070 01		1°	28.0		
WTE502 070 015		1°30`	28.0	80	10
WTE502 070 02		2°	28.0		
WTE502 070 03		3°	28.0		
WTE502 070 05		5°	28.0		12
WTE502 080 005	8.0	30`	35.0	90	10
WTE502 080 01		1°	35.0		
WTE502 080 015		1°30`	35.0		
WTE502 080 02		2°	28.0		
WTE502 080 03		3°	38.0		12
WTE502 080 05		5°	45.0	100	16
WTE502 080 07		7°	32.0	90	16
WTE502 080 10		10°	34.0	100	20
WTE502 080 10 S25		10°	48.0	150	25
WTE502 100 005	10.0	30`	40.0	90	12
WTE502 100 01		1°	40.0		
WTE502 100 015		1°30`	38.0		
WTE502 100 02		2°	40.0	75	16
WTE502 100 03		3°	40.0	100	
WTE502 100 05		5°	34.0		
WTE502 100 07		7°	40.0	90	20
WTE502 100 10		10°	42.0	100	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

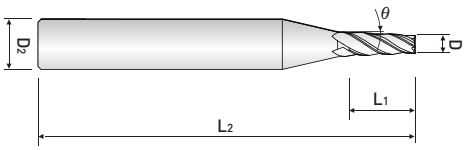
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.030	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(taper) WINNER Series



4 FLUTE TAPER

- A wide range of choices due to a variety of taper angles
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

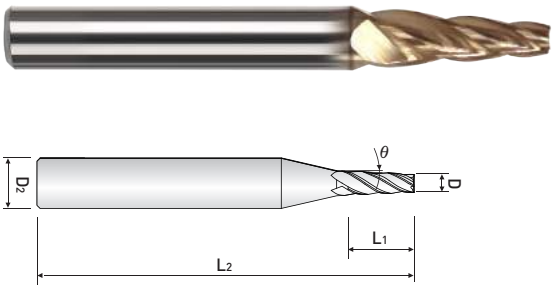
WTE504 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L1	L2	D2
WTE504 030 005	3.0	30`	12.0	50	6
WTE504 030 01		1°	12.0		
WTE504 030 015		1°30`	12.0		
WTE504 030 02		2°	14.0		
WTE504 030 03		3°	14.0		
WTE504 030 05		5°	16.0		
WTE504 030 07		7°	16.0		8
WTE504 030 10		10°	16.0		10
WTE504 040 005	4.0	30`	16.0	60	6
WTE504 040 01		1°	16.0		
WTE504 040 015		1°30`	16.0		
WTE504 040 02		2°	16.0		
WTE504 040 03		3°	19.0		
WTE504 040 05		5°	22.0	65	8
WTE504 040 07		7°	16.0		
WTE504 040 10		10°	17.0		10
WTE504 060 005	6.0	30`	20.0	65	8
WTE504 060 01		1°	20.0		
WTE504 060 015		1°30`	20.0		
WTE504 060 02		2°	20.0		
WTE504 060 03		3°	19.0		
WTE504 060 05		5°	22.0	75	10
WTE504 060 07		7°	24.0		12
WTE504 060 10		10°	17.0		
WTE504 070 005	7.0	30`	28.0	70	8
WTE504 070 01		1°	28.0		
WTE504 070 015		1°30`	28.0		10
WTE504 070 02		2°	28.0	80	
WTE504 070 03		3°	28.0		
WTE504 070 05		5°	28.0		12
WTE504 080 005	8.0	30`	35.0	90	10
WTE504 080 01		1°	35.0		
WTE504 080 015		1°30`	35.0		
WTE504 080 02		2°	28.0		
WTE504 080 03		3°	38.0		12
WTE504 080 05		5°	45.0	100	16
WTE504 080 07		7°	32.0	90	
WTE504 080 10		10°	34.0	100	20

NEXT

Endmills for Mold & Die(taper) WINNER Series



4 FLUTE TAPER

- A wide range of choices due to a variety of taper angles
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WTE504 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L_1	L_2	D_2
WTE504 100 005	10.0	30`	40.0	90	12
WTE504 100 01		1°	40.0		
WTE504 100 015		1°30`	38.0		
WTE504 100 02		2°	40.0		16
WTE504 100 03		3°	40.0	100	
WTE504 100 05		5°	34.0		
WTE504 100 07		7°	40.0	90	20
WTE504 100 10		10°	42.0	100	25

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

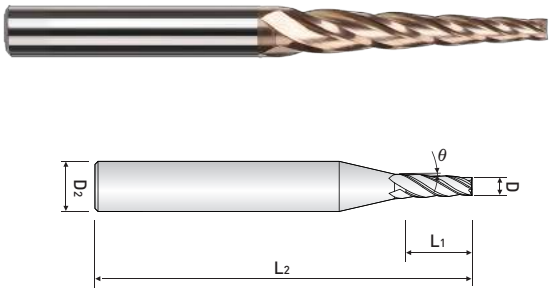
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(taper) WINNER Series



4 FLUTE TAPER LONG RIB

- A wide range of choices due to a variety of taper angles & flute length
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

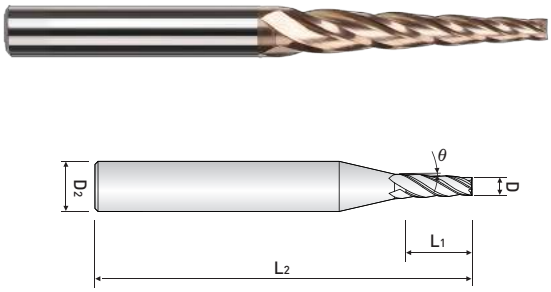
WTE514 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L1	L2	D2
WTE514 008 005 04	0.8	30`	4.0	45	4
WTE514 008 005 06			6.0		
WTE514 008 005 08			8.0		
WTE514 008 005 10			10.0		
WTE514 008 005 12			12.0		
WTE514 008 010 04		1°	4.0		
WTE514 008 010 06			6.0		
WTE514 008 010 08			8.0		
WTE514 008 010 10			10.0		
WTE514 008 010 12			12.0		
WTE514 008 015 04		1°30`	4.0		
WTE514 008 015 06			6.0		
WTE514 008 015 08			8.0		
WTE514 008 015 10			10.0		
WTE514 008 015 12			12.0		
WTE514 008 020 04		2°	4.0		
WTE514 008 020 06			6.0		
WTE514 008 020 08			8.0		
WTE514 008 020 10			10.0		
WTE514 008 020 12			12.0		
WTE514 010 005 04	1.0	30`	4.0	50	4
WTE514 010 005 06			6.0		
WTE514 010 005 08			8.0		
WTE514 010 005 10			10.0		
WTE514 010 005 12			12.0		
WTE514 010 005 16			16.0		
WTE514 010 010 04		1°	4.0		
WTE514 010 010 06			6.0		
WTE514 010 010 08			8.0		
WTE514 010 010 10			10.0		
WTE514 010 010 12			12.0		
WTE514 010 010 16			16.0		
WTE514 010 015 04		1°30`	4.0		
WTE514 010 015 06			6.0		
WTE514 010 015 08			8.0		
WTE514 010 015 10			10.0		
WTE514 010 015 12			12.0		
WTE514 010 015 16			16.0		

NEXT ≫

Endmills for Mold & Die(taper) WINNER Series



4 FLUTE TAPER LONG RIB

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- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

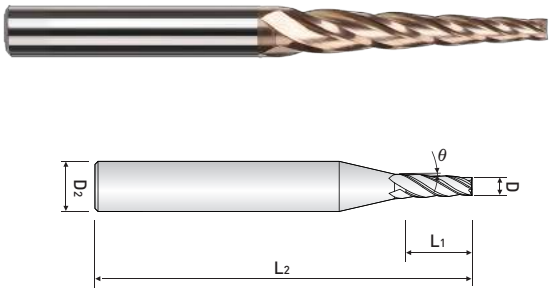
WTE514 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L1	L2	D2
WTE514 010 020 04	1.0	2°	4.0	50	4
WTE514 010 020 06			6.0		
WTE514 010 020 08			8.0		
WTE514 010 020 10			10.0		
WTE514 010 020 12			12.0		
WTE514 010 020 16			16.0		
WTE514 010 030 04		3°	4.0		
WTE514 010 030 06			6.0		
WTE514 010 030 08			8.0		
WTE514 010 030 10			10.0		
WTE514 010 030 12			12.0		
WTE514 010 030 16			16.0		
WTE514 012 005 06	1.2	30`	6.0	50	4
WTE514 012 005 08			8.0		
WTE514 012 005 10			10.0		
WTE514 012 005 12			12.0		
WTE514 012 005 16			16.0		
WTE514 012 010 06		1°	6.0		
WTE514 012 010 08			8.0		
WTE514 012 010 10			10.0		
WTE514 012 010 12			12.0		
WTE514 012 010 16			16.0		
WTE514 012 015 06		1°30`	6.0		
WTE514 012 015 08			8.0		
WTE514 012 015 10			10.0		
WTE514 012 015 12			12.0		
WTE514 012 015 16			16.0		
WTE514 012 020 06		2°	6.0		
WTE514 012 020 08			8.0		
WTE514 012 020 10			10.0		
WTE514 012 020 12			12.0		
WTE514 012 020 16			16.0		
WTE514 012 030 06		3°	6.0		
WTE514 012 030 08			8.0		
WTE514 012 030 10			10.0		
WTE514 012 030 12			12.0		
WTE514 012 030 16			16.0		

NEXT ≫

Endmills for Mold & Die(taper) WINNER Series



4 FLUTE TAPER LONG RIB

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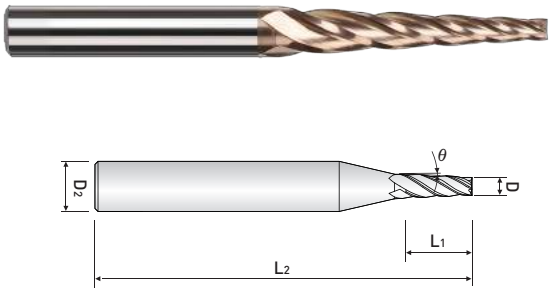
WTE514 ...series

UWC ULTRA FINE | 4 | 30° HELIX | W W Coating | DATA p.1031

EDP. No.	D	θ	L1	L2	D2
WTE514 015 005 06	1.5	30`	6.0	50	4
WTE514 015 005 08			8.0		
WTE514 015 005 10			10.0		
WTE514 015 005 12			12.0		
WTE514 015 005 16			16.0		
WTE514 015 005 20			20.0	60	
WTE514 015 010 06		1°	6.0	50	
WTE514 015 010 08			8.0		
WTE514 015 010 10			10.0		
WTE514 015 010 12			12.0		
WTE514 015 010 16			16.0		
WTE514 015 010 20			20.0	60	
WTE514 015 015 06		1°30`	6.0	50	
WTE514 015 015 08			8.0		
WTE514 015 015 10			10.0		
WTE514 015 015 12			12.0		
WTE514 015 015 16			16.0		
WTE514 015 015 20			20.0	60	
WTE514 015 020 06		2°	6.0	50	
WTE514 015 020 08			8.0		
WTE514 015 020 10			10.0		
WTE514 015 020 12			12.0		
WTE514 015 020 16			16.0		
WTE514 015 020 20			20.0	60	
WTE514 015 030 06		3°	6.0	50	
WTE514 015 030 08			8.0		
WTE514 015 030 10			10.0		
WTE514 015 030 12			12.0		
WTE514 015 030 16			16.0		
WTE514 015 030 20			20.0	60	

NEXT

Endmills for Mold & Die(taper) WINNER Series



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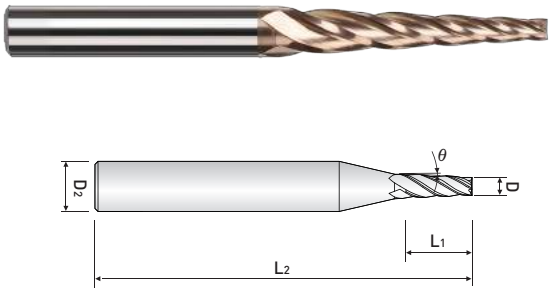
WTE514 ...series

UWC ULTRA FINE | 4 | 30° HELIX | W W Coating | DATA p.1031

EDP. No.	D	θ	L1	L2	D2
WTE514 020 005 08	2.0	30`	8.0	50	4
WTE514 020 005 10			10.0		
WTE514 020 005 12			12.0		
WTE514 020 005 16			16.0		
WTE514 020 005 20			20.0	60	
WTE514 020 005 25			25.0		
WTE514 020 010 08		1°	8.0	50	
WTE514 020 010 10			10.0		
WTE514 020 010 12			12.0		
WTE514 020 010 16			16.0		
WTE514 020 010 20			20.0	60	
WTE514 020 010 25			25.0		
WTE514 020 015 08		1°30`	8.0	50	
WTE514 020 015 10			10.0		
WTE514 020 015 12			12.0		
WTE514 020 015 16			16.0		
WTE514 020 015 20			20.0	60	
WTE514 020 015 25			25.0		
WTE514 020 020 08		2°	8.0	50	
WTE514 020 020 10			10.0		
WTE514 020 020 12			12.0		
WTE514 020 020 16			16.0		
WTE514 020 020 20			20.0	60	
WTE514 020 020 25			25.0		
WTE514 020 030 08		3°	8.0	50	
WTE514 020 030 10			10.0		
WTE514 020 030 12			12.0		
WTE514 020 030 16			16.0		
WTE514 020 030 20			20.0	60	6
WTE514 020 030 25			25.0		

NEXT

Endmills for Mold & Die(taper) WINNER Series



4 FLUTE TAPER LONG RIB

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- Enhanced cutting effect and better wear resistance made from the finest raw material
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- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WTE514 ...series

ULTRA FINE | HELIX | W Coating | p.1031

EDP. No.	D	θ	L1	L2	D2
WTE514 025 005 10	2.5	30`	10.0	50	4
WTE514 025 005 12			12.0		
WTE514 025 005 16			16.0		
WTE514 025 005 20			20.0	60	
WTE514 025 005 25			25.0		
WTE514 025 005 30			30.0		
WTE514 025 010 10		1°	10.0	50	
WTE514 025 010 12			12.0		
WTE514 025 010 16			16.0		
WTE514 025 010 20			20.0	60	
WTE514 025 010 25			25.0		
WTE514 025 010 30			30.0		
WTE514 025 015 10		1°30`	10.0	50	
WTE514 025 015 12			12.0		
WTE514 025 015 16			16.0		
WTE514 025 015 20			20.0	60	
WTE514 025 015 25			25.0		
WTE514 025 015 30			30.0		6
WTE514 025 020 10		2°	10.0	50	4
WTE514 025 020 12			12.0		
WTE514 025 020 16			16.0		
WTE514 025 020 20			20.0	60	
WTE514 025 020 25			25.0		6
WTE514 025 020 30			30.0		
WTE514 025 030 10		3°	10.0	50	4
WTE514 025 030 12			12.0		
WTE514 025 030 16			16.0		6
WTE514 025 030 20			20.0	60	
WTE514 025 030 25			25.0		
WTE514 025 030 30			30.0		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

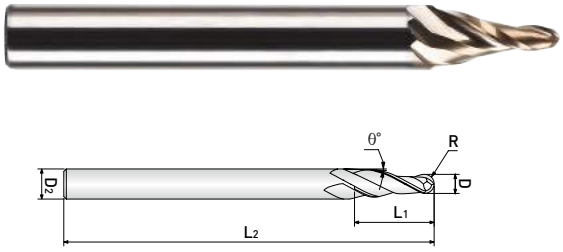
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(taper) WINNER Series



2 FLUTE TAPER BALL

- A wide range of choices due to a variety of taper angles
- Enhanced cutting effect and better wear resistance made from the finest raw material
- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

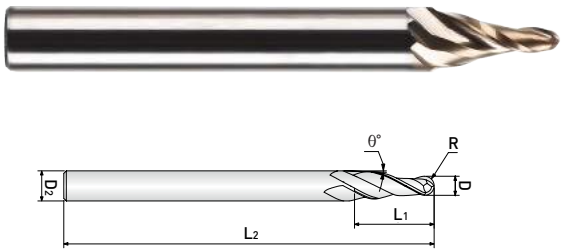
WTB502 ...series

ULTRA FINE | HELIX | All Sizes | W Coating | p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTB502 003 005	0.3	0.15	30`	1.2	40	4
WTB502 003 01			1°			
WTB502 003 015			1°30`			
WTB502 003 02			2°			
WTB502 003 03			3°			
WTB502 003 05			5°			
WTB502 003 07			7°	1.5		
WTB502 003 10			10°			
WTB502 004 005	0.4	0.2	30`	1.6	40	4
WTB502 004 01			1°			
WTB502 004 015			1°30`			
WTB502 004 02			2°			
WTB502 004 03			3°			
WTB502 004 05			5°			
WTB502 004 07			7°	2		
WTB502 004 10			10°			
WTB502 005 005	0.5	0.25	30`	2	45	4
WTB502 005 01			1°			
WTB502 005 015			1°30`			
WTB502 005 02			2°			
WTB502 005 03			3°			
WTB502 005 05			5°			
WTB502 005 07			7°	2.5		
WTB502 005 10			10°			
WTB502 006 005	0.6	0.3	30`	2	45	4
WTB502 006 01			1°			
WTB502 006 015			1°30`			
WTB502 006 02			2°			
WTB502 006 03			3°			
WTB502 006 05			5°			
WTB502 006 07			7°	2.5		
WTB502 006 10			10°			
WTB502 007 005	0.7	0.35	30`	2.5	45	4
WTB502 007 01			1°			
WTB502 007 015			1°30`			
WTB502 007 02			2°			
WTB502 007 03			3°			
WTB502 007 05			5°			

NEXT

Endmills for Mold & Die(taper) WINNER Series



2 FLUTE TAPER BALL

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- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

WTB502 ...series

ULTRA FINE | HELIX | All Sizes | W Coating | p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTB502 007 07	0.7	0.35	7°	3	45	4
WTB502 007 10			10°			
WTB502 008 005	0.8	0.4	30`	3.2	45	4
WTB502 008 01			1°			
WTB502 008 015			1°30`			
WTB502 008 02			2°			
WTB502 008 03			3°			
WTB502 008 05			5°			
WTB502 008 07			7°			
WTB502 008 10			10°			
WTB502 010 005	1.0	0.5	30`	4.0	50	4
WTB502 010 01			1°			
WTB502 010 015			1°30`			
WTB502 010 02			2°			
WTB502 010 03			3°			
WTB502 010 05			5°			
WTB502 010 07			7°			
WTB502 010 10			10°			
WTB502 015 005	1.5	0.75	30`	6.0	50	4
WTB502 015 01			1°			
WTB502 015 015			1°30`			
WTB502 015 02			2°	7.0		
WTB502 015 03			3°	8.0		
WTB502 015 05			5°	10.0		
WTB502 015 07			7°			
WTB502 015 10			10°			6
WTB502 020 005	2.0	1	30`	6.0	50	4
WTB502 020 01			1°			
WTB502 020 015			1°30`			
WTB502 020 02			2°	10.0		
WTB502 020 03			3°			
WTB502 020 05			5°			
WTB502 020 07			7°			6
WTB502 020 10			10°	11.0		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

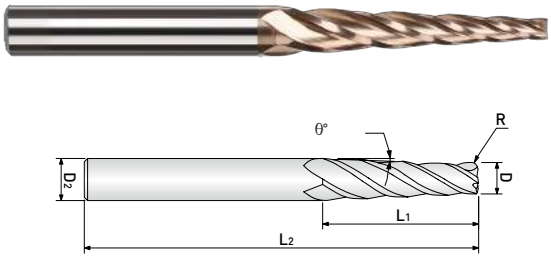
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

Endmills for Mold & Die(taper) WINNER Series



4 FLUTE TAPER CORNER RADIUS

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- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

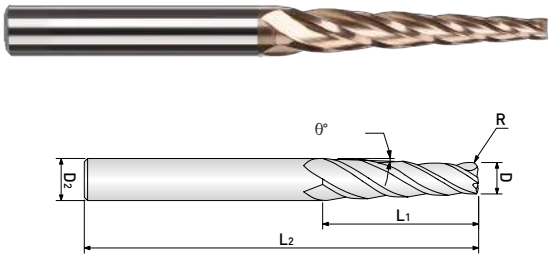
WTR504 ...series

ULTRA FINE | 4 | 30° HELIX | R ±0.01 All Sizes | W Coating | DATA p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTR504 008 01 01 04	0.8	0.1	1°	4.0	45	4
WTR504 008 01 01 06				6.0		
WTR504 008 01 01 08				8.0		
WTR504 008 01 015 04			1°30`	4.0		
WTR504 008 01 015 06				6.0		
WTR504 008 01 015 08				8.0		
WTR504 008 02 01 04		0.2	1°	4.0		
WTR504 008 02 01 06				6.0		
WTR504 008 02 01 08				8.0		
WTR504 008 02 015 04			1°30`	4.0		
WTR504 008 02 015 06				6.0		
WTR504 008 02 015 08				8.0		
WTR504 010 01 01 04	1.0	0.1	1°	4.0	50	4
WTR504 010 01 01 06				6.0		
WTR504 010 01 01 08				8.0		
WTR504 010 01 01 10				10.0		
WTR504 010 01 01 12				12.0		
WTR504 010 01 015 04			1°30`	4.0		
WTR504 010 01 015 06				6.0		
WTR504 010 01 015 08				8.0		
WTR504 010 01 015 10				10.0		
WTR504 010 01 015 12				12.0		
WTR504 010 01 02 04			2°	4.0		
WTR504 010 01 02 06				6.0		
WTR504 010 01 02 08				8.0		
WTR504 010 01 02 10				10.0		
WTR504 010 01 02 12				12.0		
WTR504 010 01 03 04			3°	4.0		
WTR504 010 01 03 06				6.0		
WTR504 010 01 03 08				8.0		
WTR504 010 01 03 10				10.0		
WTR504 010 01 03 12				12.0		
WTR504 010 02 01 04		0.2	1°	4.0		
WTR504 010 02 01 06				6.0		
WTR504 010 02 01 08				8.0		
WTR504 010 02 01 10				10.0		
WTR504 010 02 01 12				12.0		
WTR504 010 02 015 04			1°30`	4.0		

NEXT ≫

Endmills for Mold & Die(taper) WINNER Series



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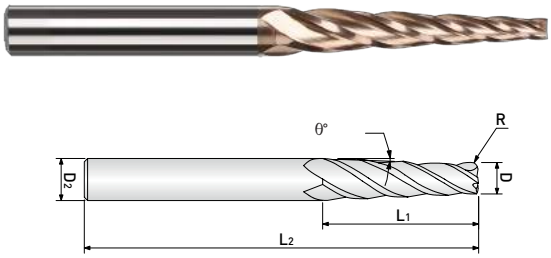
WTR504 ...series

ULTRA FINE | 4 | 30° HELIX | R ±0.01 All Sizes | W Coating | DATA p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTR504 010 02 015 06	1.0	0.2	1°30`	6.0	50	4
WTR504 010 02 015 08				8.0		
WTR504 010 02 015 10				10.0		
WTR504 010 02 015 12				12.0		
WTR504 010 02 02 04			2°	4.0		
WTR504 010 02 02 06				6.0		
WTR504 010 02 02 08				8.0		
WTR504 010 02 02 10				10.0		
WTR504 010 02 02 12				12.0		
WTR504 010 02 03 04			3°	4.0		
WTR504 010 02 03 06				6.0		
WTR504 010 02 03 08				8.0		
WTR504 010 02 03 10				10.0		
WTR504 010 02 03 12				12.0		
WTR504 010 03 01 04		0.3	1°	4.0		
WTR504 010 03 01 06				6.0		
WTR504 010 03 01 08				8.0		
WTR504 010 03 01 10				10.0		
WTR504 010 03 01 12				12.0		
WTR504 010 03 015 04			1°30`	4.0		
WTR504 010 03 015 06				6.0		
WTR504 010 03 015 08				8.0		
WTR504 010 03 015 10				10.0		
WTR504 010 03 015 12				12.0		
WTR504 010 03 02 04			2°	4.0		
WTR504 010 03 02 06				6.0		
WTR504 010 03 02 08				8.0		
WTR504 010 03 02 10				10.0		
WTR504 010 03 02 12				12.0		
WTR504 010 03 03 04			3°	4.0		
WTR504 010 03 03 06				6.0		
WTR504 010 03 03 08				8.0		
WTR504 010 03 03 10				10.0		
WTR504 010 03 03 12				12.0		
WTR504 012 01 01 06	1.2	0.1	1°	6.0	50	4
WTR504 012 01 01 08				8.0		
WTR504 012 01 01 10				10.0		
WTR504 012 01 01 12				12.0		

NEXT ≫

Endmills for Mold & Die(taper) WINNER Series



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- Longer tool life and improvement on stable machining with W coating
- Suitable for Mold & Die machining below HRc 55 Pre-hardened Steel, Alloy Steel, Carbon Steel

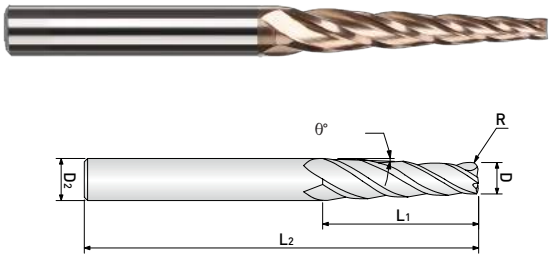
WTR504 ...series

ULTRA FINE | 4 | 30° HELIX | R ±0.01 All Sizes | W Coating | DATA p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTR504 012 01 02 06	1.2	0.1	2°	6.0	50	4
WTR504 012 01 02 08				8.0		
WTR504 012 01 02 10				10.0		
WTR504 012 01 02 12				12.0		
WTR504 012 01 03 06			3°	6.0		
WTR504 012 01 03 08				8.0		
WTR504 012 01 03 10				10.0		
WTR504 012 01 03 12				12.0		
WTR504 012 02 01 06		0.2	1°	6.0		
WTR504 012 02 01 08				8.0		
WTR504 012 02 01 10				10.0		
WTR504 012 02 01 12				12.0		
WTR504 012 02 02 06			2°	6.0		
WTR504 012 02 02 08				8.0		
WTR504 012 02 02 10				10.0		
WTR504 012 02 02 12				12.0		
WTR504 012 02 03 06			3°	6.0		
WTR504 012 02 03 08				8.0		
WTR504 012 02 03 10				10.0		
WTR504 012 02 03 12				12.0		
WTR504 012 03 01 06		0.3	1°	6.0		
WTR504 012 03 01 08				8.0		
WTR504 012 03 01 10				10.0		
WTR504 012 03 01 12				12.0		
WTR504 012 03 02 06			2°	6.0		
WTR504 012 03 02 08				8.0		
WTR504 012 03 02 10				10.0		
WTR504 012 03 02 12				12.0		
WTR504 012 03 03 06			3°	6.0		
WTR504 012 03 03 08				8.0		
WTR504 012 03 03 10				10.0		
WTR504 012 03 03 12				12.0		

NEXT ≫

Endmills for Mold & Die(taper) WINNER Series



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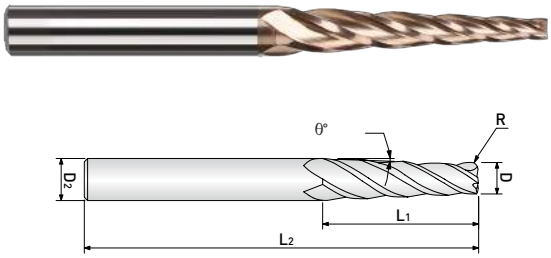
WTR504 ...series

ULTRA FINE | HELIX | All Sizes | W Coating | p.1032

EDP. No.	D	R	θ	L₁	L₂	D₂
WTR504 015 01 01 06	1.5	0.1	1°	6.0	50	4
WTR504 015 01 01 08				8.0		
WTR504 015 01 01 10				10.0		
WTR504 015 01 01 12				12.0		
WTR504 015 01 01 16				16.0		
WTR504 015 01 01 20				20.0	60	
WTR504 015 01 02 06			2°	6.0	50	
WTR504 015 01 02 08				8.0		
WTR504 015 01 02 10				10.0		
WTR504 015 01 02 12				12.0		
WTR504 015 01 02 16				16.0		
WTR504 015 01 02 20				20.0	60	
WTR504 015 01 03 06			3°	6.0	50	
WTR504 015 01 03 08				8.0		
WTR504 015 01 03 10				10.0		
WTR504 015 01 03 12				12.0		
WTR504 015 01 03 16				16.0		
WTR504 015 01 03 20				20.0	60	
WTR504 015 02 01 06	1.5	0.2	1°	6.0	50	4
WTR504 015 02 01 08				8.0		
WTR504 015 02 01 10				10.0		
WTR504 015 02 01 12				12.0		
WTR504 015 02 01 16				16.0		
WTR504 015 02 01 20				20.0	60	
WTR504 015 02 02 06			2°	6.0	50	
WTR504 015 02 02 08				8.0		
WTR504 015 02 02 10				10.0		
WTR504 015 02 02 12				12.0		
WTR504 015 02 02 16				16.0		
WTR504 015 02 02 20				20.0	60	
WTR504 015 02 03 06			3°	6	50	
WTR504 015 02 03 08				8		
WTR504 015 02 03 10				10		
WTR504 015 02 03 12				12		
WTR504 015 02 03 16				16		
WTR504 015 02 03 20				20	60	
WTR504 015 03 01 06		0.3	1°	6	50	
WTR504 015 03 01 08				8		
WTR504 015 03 01 10				10		

NEXT ≫

Endmills for Mold & Die(taper) WINNER Series



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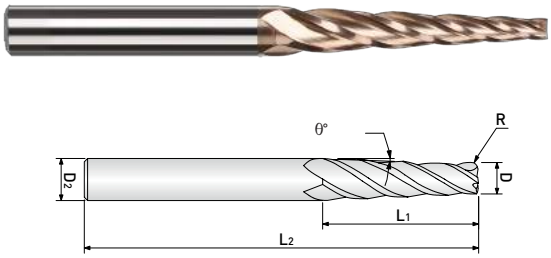
WTR504 ...series

ULTRA FINE | 4 | 30° HELIX | R ±0.01 All Sizes | W Coating | DATA p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTR504 015 03 01 12	1.5	0.3	1°	12	50	4
WTR504 015 03 01 16				16		
WTR504 015 03 01 20				20	60	
WTR504 015 03 02 06			2°	6	50	
WTR504 015 03 02 08				8		
WTR504 015 03 02 10				10		
WTR504 015 03 02 12				12		
WTR504 015 03 02 16				16		
WTR504 015 03 02 20				20	60	
WTR504 015 03 03 06			3°	6	50	
WTR504 015 03 03 08				8		
WTR504 015 03 03 10				10		
WTR504 015 03 03 12				12		
WTR504 015 03 03 16				16		
WTR504 015 03 03 20				20	60	
WTR504 020 01 01 08	2.0	0.1	1°	8.0	50	4
WTR504 020 01 01 10				10.0		
WTR504 020 01 01 12				12.0		
WTR504 020 01 01 16				16.0		
WTR504 020 01 01 20				20.0	60	
WTR504 020 01 01 25				25.0		
WTR504 020 01 02 08			2°	8.0	50	
WTR504 020 01 02 10				10.0		
WTR504 020 01 02 12				12.0		
WTR504 020 01 02 16				16.0		
WTR504 020 01 02 20				20.0	60	
WTR504 020 01 02 25				25.0		
WTR504 020 01 03 08			3°	8.0	50	4
WTR504 020 01 03 10				10.0		
WTR504 020 01 03 12				12.0		
WTR504 020 01 03 16				16.0		
WTR504 020 01 03 20				20.0	60	6
WTR504 020 01 03 25				25.0		
WTR504 020 02 01 08		0.2	1°	8.0	50	4
WTR504 020 02 01 10				10.0		
WTR504 020 02 01 12				12.0		
WTR504 020 02 01 16				16.0		
WTR504 020 02 01 20				20.0	60	
WTR504 020 02 01 25				25.0		

NEXT >>

Endmills for Mold & Die(taper) WINNER Series



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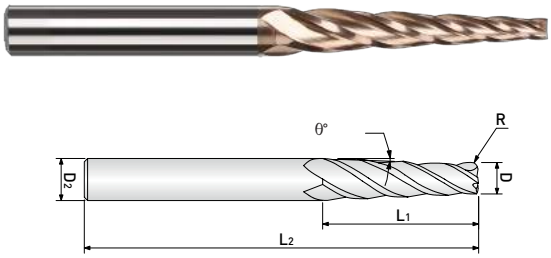
WTR504 ...series

ULTRA FINE | 4 | 30° HELIX | R ±0.01 All Sizes | W Coating | DATA p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTR504 020 02 02 08	2.0	0.2	2°	8.0	50	4
WTR504 020 02 02 10				10.0		
WTR504 020 02 02 12				12.0		
WTR504 020 02 02 16				16.0		
WTR504 020 02 02 20				20.0	60	
WTR504 020 02 02 25				25.0		
WTR504 020 02 03 08			3°	8.0	50	
WTR504 020 02 03 10				10.0		
WTR504 020 02 03 12				12.0		
WTR504 020 02 03 16				16.0		
WTR504 020 02 03 20				20.0	60	6
WTR504 020 03 02 25				25.0		
WTR504 020 03 01 08		0.3	1°	8.0	50	4
WTR504 020 03 01 10				10.0		
WTR504 020 03 01 12				12.0		
WTR504 020 03 01 16				16.0		
WTR504 020 03 01 20				20.0	60	
WTR504 020 03 01 25				25.0		
WTR504 020 03 02 08			2°	8.0	50	
WTR504 020 03 02 10				10.0		
WTR504 020 03 02 12				12.0		
WTR504 020 03 02 16				16.0		
WTR504 020 03 02 20				20.0	60	
WTR504 020 03 02 25				25.0		
WTR504 020 03 03 08			3°	8.0	50	
WTR504 020 03 03 10				10.0		
WTR504 020 03 03 12				12.0		
WTR504 020 03 03 16				16.0		
WTR504 020 03 03 20				20.0	60	6
WTR504 020 03 03 25				25.0		

NEXT ≫

Endmills for Mold & Die(taper) WINNER Series



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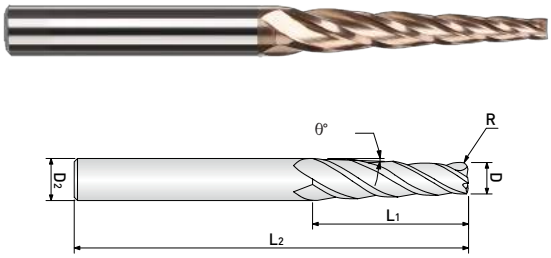
WTR504 ...series

UWC ULTRA FINE | 4 | 30° HELIX | R ±0.01 All Sizes | W W Coating | DATA p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTR504 025 01 01 10	2.5	0.1	1°	10.0	50	4
WTR504 025 01 01 12				12.0		
WTR504 025 01 01 16				16.0		
WTR504 025 01 01 20				20.0	60	
WTR504 025 01 01 25				25.0		
WTR504 025 01 01 30				30.0		
WTR504 025 01 02 10			2°	10.0	50	
WTR504 025 01 02 12				12.0		
WTR504 025 01 02 16				16.0		
WTR504 025 01 02 20				20.0	60	
WTR504 025 01 02 25				25.0		6
WTR504 025 01 02 30				30.0		
WTR504 025 01 03 10			3°	10.0	50	4
WTR504 025 01 03 12				12.0		
WTR504 025 01 03 16				16.0		6
WTR504 025 01 03 20				20.0	60	
WTR504 025 01 03 25				25.0		
WTR504 025 01 03 30				30.0		
WTR504 025 02 01 10		0.2	1°	10.0	50	4
WTR504 025 02 01 12				12.0		
WTR504 025 02 01 16				16.0		
WTR504 025 02 01 20				20.0	60	
WTR504 025 02 01 25				25.0		
WTR504 025 02 01 30				30.0		
WTR504 025 02 02 10			2°	10.0	50	
WTR504 025 02 02 12				12.0		
WTR504 025 02 02 16				16.0		
WTR504 025 02 02 20				20.0	60	
WTR504 025 02 02 25				25.0		6
WTR504 025 02 02 30				30.0		

NEXT

Endmills for Mold & Die(taper) WINNER Series



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WTR504 ...series

ULTRA FINE | 4 | 30° HELIX | R ±0.01 All Sizes | W Coating | DATA p.1032

EDP. No.	D	R	θ	L1	L2	D2
WTR504 025 02 03 10	2.5	0.2	3°	10.0	50	4
WTR504 025 02 03 12				12.0		
WTR504 025 02 03 16				16.0		6
WTR504 025 02 03 20				20.0	60	
WTR504 025 02 03 25				25.0		
WTR504 025 02 03 30				30.0		
WTR504 025 03 01 10		0.3	1°	10.0	50	4
WTR504 025 03 01 12				12.0		
WTR504 025 03 01 16				16.0		
WTR504 025 03 01 20				20.0	60	
WTR504 025 03 01 25				25.0		
WTR504 025 03 01 30				30.0		
WTR504 025 03 02 10			2°	10.0	50	
WTR504 025 03 02 12				12.0		
WTR504 025 03 02 16				16.0		
WTR504 025 03 02 20				20.0	60	
WTR504 025 03 02 25				25.0		6
WTR504 025 03 02 30				30.0		
WTR504 025 03 03 10			3°	10.0	50	4
WTR504 025 03 03 12				12.0		
WTR504 025 03 03 16				16.0		6
WTR504 025 03 03 20				20.0	60	
WTR504 025 03 03 25				25.0		
WTR504 025 03 03 30				30.0		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	○				○		○

○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0~-0.03	h6

※ These tools are manufactured based on order received.

3

DRILL SERIES >

WIDIN®

3

Drills for high hardened steel
(Power Max Drill Series) 573

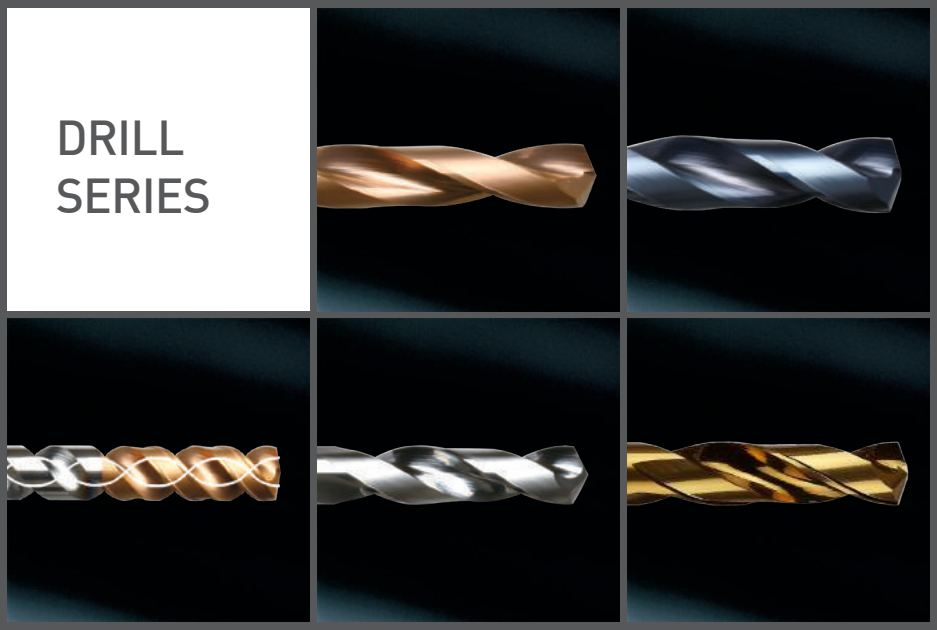
Drills for General Speed Cutting
(Power Drill Series) 619

Drills for Multi-purpose
(Solid Spiral Drill Series) 641

Drills for high hardened steel

POWER MAX DRILL SERIES

DRILL SERIES



Drills for high hardened steel *Power Max Drill Series*

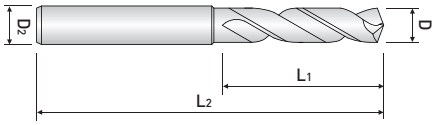
Drills for high hardened steel _ Power Max Drill Series

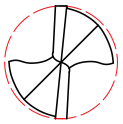
WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
PF503 ...series		3XD	INCH & METRIC	•	574
PF505 ...series		5XD	INCH & METRIC	•	578
SF503 ...series		3XD / INTERNAL COOLANT	INCH & METRIC	•	582
SF505 ...series		5XD / INTERNAL COOLANT	INCH & METRIC	•	586
SF510 ...series		10 X D / INTERNAL COOLANT / DOUBLE MARGIN	METRIC	•	590
SF520 ...series		20 X D / INTERNAL COOLANT / DOUBLE MARGIN	METRIC	•	592
HP503 ...series		HIGH PRECISION 3XD / DOUBLE MARGIN	INCH & METRIC	•	593
HPI 503 ...series		HIGH PRECISION 3 X D / INTERNAL COOLANT / DOUBLE MARGIN	INCH & METRIC	•	596
HPI 505 ...series		HIGH PRECISION 5 X D / INTERNAL COOLANT/ Double margin	INCH & METRIC	•	599
HPI 508 ...series		HIGH PRECISION / 8 X D / INTERNAL COOLANT / Double margin	INCH & METRIC	•	603
P503A(F) ...series		STUB / DIN 6537K	METRIC	•	606
PI503A(F) ...series		STUB INTERNAL COOLANT / DIN 6537K	METRIC	•	610
PI505A(F) ...series		MEDIUM INTERNAL COOLANT / DIN 6537L	METRIC	•	614

NEXT ≫≫

Drills for high hardened steel *Power Max Drill Series*





POWER MAX DRILL - STUB
HIGH SPEED MACHINING, 3 X D

- Suitable for high speed cutting with newly developed raw-material and new coating

PF503 ...series

ULTRA FINE HELIX h8 p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
PF503020	2.0	-	.0787	14	50	3
PF503021	2.1	-	.0827			
PF503022	2.2	-	.0866			
PF503023	2.3	-	.0906			
PF503024	2.4	-	.0945			
PF503025	2.5	-	.0984			
PF503026	2.6	-	.1024			
PF503027	2.7	-	.1063			
PF503028	2.8	-	.1102			
PF503029	2.9	-	.1142			
PF503030	3.0	-	.1181	18	60	
PF503031	3.1	-	.1220	20	60	4
PF50303175	3.175	1/8	.1250			
PF503032	3.2	-	.1260			
PF50303264	3.264	-	.1285			
PF503033	3.3	-	.1299			
PF503034	3.4	-	.1339	22		
PF503035	3.5	-	.1378			
PF50303572	3.572	9/64	.1406			
PF503036	3.6	-	.1417			
PF503037	3.7	-	.1457			
PF503038	3.8	-	.1496	24		
PF503039	3.9	-	.1535			
PF503040	4.0	-	.1575			
PF50304039	4.039	-	.1590			
PF503041	4.1	-	.1614			
PF503042	4.2	-	.1654	26	62	5
PF503043	4.3	-	.1693			
PF503044	4.4	-	.1732			
PF503045	4.5	-	.1772			
PF503046	4.6	-	.1811			
PF503047	4.7	-	.1850			
PF50304763	4.763	3/16	.1875			
PF503048	4.8	-	.1890			
PF503049	4.9	-	.1920			
PF503050	5.0	-	.1969			
PF503051	5.1	-	.2008			
PF50305159	5.159	13/64	.2031	28	66	6
PF503052	5.2	-	.2047			
PF503053	5.3	-	.2087			
PF503054	5.4	-	.2126			
PF503055	5.5	-	.2165			

NEXT ≫

PF503 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
PF50305558	5.558	7/32	.2188	30	66	6
PF503056	5.6	-	.2205			
PF503057	5.7	-	.2244			
PF503058	5.8	-	.2283			
PF503059	5.9	-	.2323			
PF50305953	5.953	15/64	.2344			
PF503060	6.0	-	.2362			
PF503061	6.1	-	.2402			
PF503062	6.2	-	.2441	34	74	7
PF503063	6.3	-	.2480			
PF5030635	6.350	1/4	.2500			
PF503064	6.4	-	.2520			
PF503065	6.5	-	.2559			
PF503066	6.6	-	.2598			
PF503067	6.7	-	.2638	37		
PF50306747	6.747	17/64	.2656			
PF503068	6.8	-	.2677			
PF503069	6.9	-	.2717			
PF503070	7.0	-	.2756			
PF503071	7.1	-	.2795			
PF50307145	7.145	9/32	.2813	40	79	8
PF503072	7.2	-	.2835			
PF503073	7.3	-	.2874			
PF503074	7.4	-	.2913			
PF503075	7.5	-	.2953			
PF50307541	7.541	19/64	.2969			
PF503076	7.6	-	.2992			
PF503077	7.7	-	.3031			
PF503078	7.8	-	.3071			
PF503079	7.9	-	.3110			
PF50307938	7.938	5/16	.3125			
PF503080	8.0	-	.3150			
PF503081	8.1	-	.3189			
PF503082	8.2	-	.3228	43	84	9
PF503083	8.3	-	.3268			
PF50308334	8.334	21/64	.3281			
PF503084	8.4	-	.3307			
PF503085	8.5	-	.3320			
PF503086	8.6	-	.3346			
PF503087	8.7	-	.3386			
PF50308733	8.733	-	.3425			
PF503088	8.8	-	.3438			
PF503089	8.9	-	.3465			
PF503090	9.0	-	.3504			
PF503091	9.1	-	.3543			
PF50309129	9.129	23/64	.3594	47	89	10
PF503092	9.2	-	.3622			
PF503093	9.3	-	.3661			
PF50309347	9.347	-	.3680			
PF503094	9.4	-	.3701			
PF503095	9.5	-	.3740			
PF50309525	9.525	3/8	.3750			
PF503096	9.6	-	.3780			
PF503097	9.7	-	.3819			
PF503098	9.8	-	.3858			
PF503099	9.9	-	.3898			
PF50309921	9.921	25/64	.3906			
PF503100	10.0	-	.3937			
PF503101	10.1	-	.3976			

NEXT ≫

PF503 ...series

ULTRA FINE | HELIX | h8 | p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
PF503102	10.2	-	.4016	51	95	11
PF503103	10.3	-	.4055			
PF5031032	10.32	13/32	.4063			
PF503104	10.4	-	.4094			
PF503105	10.5	-	.4134			
PF503106	10.6	-	.4173			
PF503107	10.7	-	.4213			
PF50310716	10.716	27/64	.4219			
PF503108	10.8	-	.4252			
PF503109	10.9	-	.4291			
PF503110	11.0	-	.4331			
PF503111	11.1	-	.4370			
PF50311113	11.113	7/16	.4375	54	102	12
PF503112	11.2	-	.4409			
PF503113	11.3	-	.4449			
PF503114	11.4	-	.4488			
PF503115	11.5	-	.4528			
PF503116	11.6	-	.4531			
PF503117	11.7	-	.4567			
PF503118	11.8	-	.4606			
PF503119	11.9	15/32	.4646			
PF50311908	11.908	-	.4685			
PF503120	12.0	-	.4688			
PF503121	12.1	-	.4724			
PF503122	12.2	-	.4803	57	102	13
PF503123	12.3	-	.4843			
PF50312304	12.304	31/64	.4844			
PF503124	12.4	-	.4882			
PF503125	12.5	-	.4921			
PF503126	12.6	-	.4961			
PF503127	12.7	-	.5000			
PF503128	12.8	-	.5039			
PF503129	12.9	-	.5079			
PF503130	13.0	-	.5118			
PF50313096	13.096	33/64	.5156			
PF503131	13.1	-	.5157			
PF503132	13.2	-	.5197	60	107	14
PF503133	13.3	-	.5236			
PF503134	13.4	-	.5276			
PF50313494	13.494	17/32	.5313			
PF503135	13.5	-	.5315			
PF503136	13.6	-	.5354			
PF503137	13.7	-	.5394			
PF503138	13.8	-	.5433			
PF50313891	13.891	35/64	.5469			
PF503139	13.9	-	.5472			
PF503140	14.0	-	.5512			
PF503141	14.1	-	.5551			
PF503142	14.2	-	.5591	62	111	15
PF50314288	14.288	9/16	.5625			
PF503143	14.3	-	.5630			
PF503144	14.4	-	.5669			
PF503145	14.5	-	.5709			
PF503146	14.6	-	.5748			
PF503147	14.7	-	.5787			
PF503148	14.8	-	.5827			
PF503149	14.9	-	.5866			
PF503150	15.0	-	.5906			
PF50315081	15.081	19/32	.5937			
PF503151	15.1	-	.5945			

NEXT ≫

PF503 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
PF503152	15.2	-	.5984	64	115	16
PF503153	15.3	-	.6063			
PF503154	15.4	-	.6102			
PF503155	15.5	-	.6142			
PF503156	15.6	-	.6181			
PF503157	15.7	-	.6220			
PF503158	15.8	-	.6250			
PF50315875	15.875	5/8	.6299			
PF503160	16.0	-	.6339			
PF503161	16.1	-	.3071			
PF503163	16.3	-	.6417	66	119	17
PF503165	16.5	-	.6496			
PF50316667	16.667	21/32	.6562			
PF503170	17.0	-	.6693			
PF503171	17.1	-	.6732			
PF503172	17.2	-	.6772	66	123	18
PF50317463	17.463	11/16	.6772			
PF503175	17.5	-	.6875			
PF503177	17.7	-	.6890			
PF503178	17.8	-	.6969			
PF503180	18.0	-	.7008			
PF503181	18.1	-	.7087			
PF503182	18.2	-	.7165	70	127	19
PF503185	18.5	-	.7283			
PF503190	19.0	-	.7480			
PF503191	19.1	-	.7520			
PF503195	19.5	-	.7677	70	131	20
PF503197	19.7	-	.7756			
PF503200	20.0	-	.7874			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

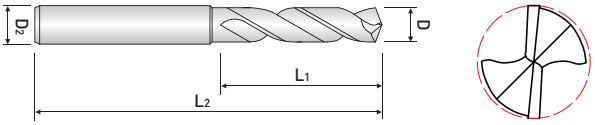
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



POWER MAX DRILL- MEDIUM HIGH SPEED MACHINING, 5 X D

- Suitable for high speed cutting due to newly developed raw-material and new coating.

PF505 ...series

ULTRA FINE · HELIX · h8 · p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
PF505030	3.0	-	.1181	25	60	3
PF505031	3.1	-	.1220	27		4
PF50503175	3.175	1/8	.1250			
PF505032	3.2	-	.1260			
PF50503264	3.264	#30	.1285			
PF505033	3.3	-	.1299			
PF505034	3.4	-	.1339	30	65	
PF505035	3.5	-	.1378			
PF50503572	3.572	9/64	.1406			
PF505036	3.6	-	.1417			
PF505037	3.7	-	.1457			
PF505038	3.8	-	.1496	33	71	
PF505039	3.9	-	.1535			
PF505040	4.0	-	.1575			
PF50504039	4.039	#21	.1575	33	71	5
PF505041	4.1	-	.1590			
PF505042	4.2	-	.1614			
PF505043	4.3	-	.1654	36		
PF505044	4.4	-	.1693			
PF505045	4.5	-	.1732			
PF505046	4.6	-	.1772			
PF505047	4.7	-	.1811			
PF50504763	4.763	3/16	.1850	39		
PF505048	4.8	-	.1875			
PF505049	4.9	-	.1890			
PF505050	5.0	-	.1920			
PF505051	5.1	-	.2008	39	83	6
PF50505159	5.159	13/64	.2031			
PF505052	5.2	-	.2047			
PF505053	5.3	-	.2087			
PF505054	5.4	-	.2126	43		
PF505055	5.5	-	.2165			
PF50505558	5.558	7/32	.2188			
PF505056	5.6	-	.2205			
PF505057	5.7	-	.2244			
PF505058	5.8	-	.2283			
PF505059	5.9	-	.2323			
PF50505953	5.953	15/64	.2344			
PF505060	6.0	-	.2362			

NEXT ≫

PF505 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
PF505061	6.1	-	.2402	47	87	7
PF505062	6.2	-	.2441			
PF505063	6.3	-	.2480			
PF5050635	6.350	1/4	.2500			
PF505064	6.4	-	.2520			
PF505065	6.5	-	.2559			
PF505066	6.6	-	.2598			
PF505067	6.7	-	.2638			
PF50506747	6.747	17/64	.2656			
PF505068	6.8	-	.2677			
PF505069	6.9	-	.2717			
PF505070	7.0		.2756			
PF505071	7.1	-	.2795	52	92	8
PF50507145	7.145	9/32	.2813			
PF505072	7.2	-	.2835			
PF505073	7.3	-	.2874			
PF505074	7.4	-	.2913			
PF505075	7.5	-	.2953			
PF50507541	7.541	19/64	.2969			
PF505076	7.6	-	.2992			
PF505077	7.7	-	.3031			
PF505078	7.8	-	.3071			
PF505079	7.9		.3110			
PF50507938	7.938	5/16	.3125			
PF505080	8.0	-	.3150			
PF505081	8.1	-	.3189	56	96	9
PF505082	8.2	-	.3228			
PF505083	8.3	-	.3268			
PF50508334	8.334	21/64	.3281			
PF505084	8.4	-	.3307			
PF505085	8.5	-	.3346			
PF505086	8.6	-	.3386			
PF505087	8.7	-	.3425			
PF50508733	8.733	11/32	.3438			
PF505088	8.8	-	.3465			
PF505089	8.9	-	.3504			
PF505090	9.0	-	.3543			
PF505091	9.1	-	.3583	62	105	10
PF50509129	9.129	23/64	.3594			
PF505092	9.2	-	.3622			
PF505093	9.3	-	.3661			
PF505094	9.4	-	.3701			
PF505095	9.5	-	.3740			
PF50509525	9.525	3/8	.3750			
PF505096	9.6	-	.3780			
PF505097	9.7	-	.3819			
PF505098	9.8	-	.3858			
PF505099	9.9	-	.3898			
PF50509921	9.921	25/64	.3906			
PF505100	10.0	-	.3937			
PF505101	10.1	-	.3976	68	115	11
PF505102	10.2	-	.4016			
PF505103	10.3	-	.4055			
PF50501032	10.32	13/32	.4063			
PF505104	10.4	-	.4094			
PF505105	10.5	-	.4134			
PF505106	10.6	-	.4173			
PF505107	10.7	-	.4213			
PF50510716	10.716	27/64	.4219			
PF505108	10.8	-	.4252			
PF505109	10.9	-	.4291			
PF505110	11.0	-	.4331			

NEXT ≫

PF505 ...series

ULTRA FINE | HELIX | h8 | p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
PF505111	11.1	-	.4370	71	121	12
PF50511113	11.113	7/16	.4375			
PF505112	11.2	-	.4409			
PF505113	11.3	-	.4449			
PF505114	11.4	-	.4488			
PF505115	11.5	-	.4528			
PF505116	11.6	-	.4567			
PF505117	11.7	-	.4606			
PF505118	11.8	-	.4646			
PF505119	11.9	-	.4685			
PF50511908	11.908	15/32	.4688			
PF505120	12.0	-	.4724			
PF505121	12.1	-	.4764	75	125	13
PF505122	12.2	-	.4803			
PF505123	12.3	-	.4843			
PF50512304	12.304	31/64	.4844			
PF505124	12.4	-	.4882			
PF505125	12.5	-	.4921			
PF505126	12.6	-	.4961			
PF505127	12.7	-	.5000			
PF505128	12.8	-	.5039			
PF505129	12.9	-	.5079			
PF505130	13.0	-	.5118			
PF50513096	13.096	33/64	.5156	80	134	14
PF505131	13.1	-	.5157			
PF505132	13.2	-	.5197			
PF505133	13.3	-	.5236			
PF505134	13.4	-	.5276			
PF50513494	13.494	17/32	.5313			
PF505135	13.5	-	.5315			
PF505136	13.6	-	.5354			
PF505137	13.7	-	.5394			
PF505138	13.8	-	.5433			
PF50513891	13.891	35/64	.5469			
PF505139	13.9	-	.5472			
PF505140	14.0	-	.5512			
PF505141	14.1	-	.5551	83	143	15
PF505142	14.2	-	.5591			
PF50514288	14.288	-	.5625			
PF505143	14.3	-	.5630			
PF505144	14.4	-	.5669			
PF505145	14.5	-	.5709			
PF505146	14.6	-	.5748			
PF505147	14.7	-	.5787			
PF505148	14.8	-	.5827			
PF505149	14.9	-	.5866			
PF505150	15.0	-	.5906			
PF50515081	15.081	19/32	.5937	90	152	16
PF505151	15.1	-	.5945			
PF505152	15.2	-	.5984			
PF505154	15.4	-	.6063			
PF505155	15.5	-	.6102			
PF505156	15.6	-	.6142			
PF505157	15.7	-	.6181			
PF505158	15.8	-	.6220			
PF50515875	15.875	5/8	.6250			
PF505160	16.0	-	.6299			

NEXT ≫

PF505 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
PF505161	16.1	-	.6339	95	155	17
PF505163	16.3	-	.6417			
PF505165	16.5	-	.6496			
PF50516667	16.667	21/32	.6562			
PF505170	17.0	-	.6693			
PF505171	17.1	-	.6732	100	157	18
PF505172	17.2	-	.6772			
PF50517463	17.463	11/16	.6875			
PF505175	17.5	-	.6890			
PF505177	17.7	-	.6969			
PF505178	17.8	-	.7008			
PF505180	18.0	-	.7087			
PF505181	18.1	-	.7126	105	160	19
PF505182	18.2	-	.7165			
PF505185	18.5	-	.7283			
PF505190	19.0	-	.7480			
PF505191	19.1	-	.7520	110	163	20
PF505195	19.5	-	7677			
PF505197	19.7	-	.7756			
PF505200	20.0	-	.7874			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

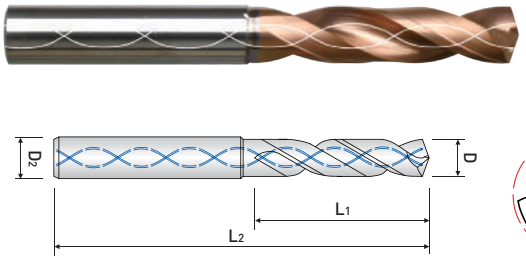
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



3 X D / POWER MAX DRILL - STUB INTERNAL COOLANT

- Suitable for high speed cutting with newly developed raw-material and new coating.

SF503 ...series

ULTRA FINE | HELIX | h8 | p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
SF503030	3.0	-	.1181	18	60	3
SF503031	3.1	-	.1220	20		4
SF50303175	3.175	1/8	.1250			
SF503032	3.2	-	.1260			
SF50303264	3.264	-	.1285			
SF503033	3.3	-	.1299			
SF503034	3.4	-	.1339	22		
SF503035	3.5	-	.1378			
SF50303572	3.572	9/64	.1406			
SF503036	3.6	-	.1417			
SF503037	3.7	-	.1457			
SF503038	3.8	-	.1496	24		
SF503039	3.9	-	.1535			
SF503040	4.0	-	.1575			
SF50304039	4.039	-	.1590	24	62	5
SF503041	4.1	-	.1614			
SF503042	4.2	-	.1654	26		
SF503043	4.3	-	.1693			
SF503044	4.4	-	.1732			
SF503045	4.5	-	.1772			
SF503046	4.6	-	.1811			
SF503047	4.7	-	.1850			
SF50304763	4.763	3/16	.1875			
SF503048	4.8	-	.1890			
SF503049	4.9	-	.1920			
SF503050	5.0	-	.1969			
SF503051	5.1	-	.2008	28	66	6
SF50305159	5.159	13/64	.2031			
SF503052	5.2	-	.2047			
SF503053	5.3	-	.2087			
SF503054	5.4	-	.2126			
SF503055	5.5	-	.2165			
SF50305558	5.558	7/32	.2188	30		
SF503056	5.6	-	.2205			
SF503057	5.7	-	.2244			
SF503058	5.8	-	.2283			
SF503059	5.9	-	.2323			
SF50305953	5.953	15/64	.2344			
SF503060	6.0	-	.2362			
SF503061	6.1	-	.2402	34	74	7
SF503062	6.2	-	.2441			
SF503063	6.3	-	.2480			

NEXT >>

SF503 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
SF5030635	6.350	1/4	.2500	34	74	7
SF503064	6.4	-	.2520			
SF503065	6.5	-	.2559			
SF503066	6.6	-	.2598			
SF503067	6.7	-	.2638	37		
SF50306747	6.747	17/64	.2656			
SF503068	6.8	-	.2677			
SF503069	6.9	-	.2717			
SF503070	7.0	-	.2756			
SF503071	7.1	-	.2795	40	79	8
SF50307145	7.145	9/32	.2813			
SF503072	7.2	-	.2835			
SF503073	7.3	-	.2874			
SF503074	7.4	-	.2913			
SF503075	7.5	-	.2953			
SF50307541	7.541	19/64	.2969			
SF503076	7.6	-	.2992			
SF503077	7.7	-	.3031			
SF503078	7.8	-	.3071			
SF503079	7.9	-	.3110			
SF50307938	7.938	5/16	.3125			
SF503080	8.0	-	.3150			
SF503081	8.1	-	.3189	43	84	9
SF503082	8.2	-	.3228			
SF503083	8.3	-	.3268			
SF50308334	8.334	21/64	.3281			
SF503084	8.4	-	.3307			
SF503085	8.5	-	.3346			
SF503086	8.6	-	.3386			
SF503087	8.7	-	.3425			
SF50308733	8.733	11/32	.3438			
SF503088	8.8	-	.3465			
SF503089	8.9	-	.3504			
SF503090	9.0	-	.3543			
SF503091	9.1	-	.3583	47	89	10
SF50309129	9.129	23/64	.3594			
SF503092	9.2	-	.3622			
SF503093	9.3	-	.3661			
SF503094	9.4	-	.3701			
SF503095	9.5	-	.3740			
SF50309525	9.525	3/8	.3750			
SF503096	9.6	-	.3780			
SF503097	9.7	-	.3819			
SF503098	9.8	-	.3858			
SF503099	9.9	-	.3898			
SF50309921	9.921	25/64	.3906			
SF503100	10.0	-	.3937			
SF503101	10.1	-	.3976	51	95	11
SF503102	10.2	-	.4016			
SF503103	10.3	-	.4055			
SF5031032	10.32	13/32	.4063			
SF503104	10.4	-	.4094			
SF503105	10.5	-	.4134			
SF503106	10.6	-	.4173			
SF503107	10.7	-	.4213			
SF50310716	10.716	27/64	.4219			
SF503108	10.8	-	.4252			
SF503109	10.9	-	.4291			
SF503110	11.0	-	.4331			

NEXT ≫

SF503 ...series

ULTRA FINE | HELIX | h8 | p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
SF503111	11.1	-	.4370	54	102	12
SF50311113	11.113	7/16	.4375			
SF503112	11.2	-	.4409			
SF503113	11.3	-	.4449			
SF503114	11.4	-	.4488			
SF503115	11.5	-	.4528			
SF50311509	11.509	29/64	.4531			
SF503116	11.6	-	.4567			
SF503117	11.7	-	.4606			
SF503118	11.8	-	.4646			
SF503119	11.9	-	.4685			
SF50311908	11.908	15/32	.4688			
SF503120	12.0	-	.4724			
SF503121	12.1	-	.4764	57	102	13
SF503122	12.2	-	.4803			
SF503123	12.3	-	.4843			
SF50312304	12.304	31/64	.4844			
SF503124	12.4	-	.4882			
SF503125	12.5	-	.4921			
SF503126	12.6	-	.4961			
SF503127	12.7	1/2	.5000			
SF503128	12.8	-	.5039			
SF503129	12.9	-	.5079			
SF503130	13.0	-	.5118			
SF50313096	13.096	33/64	.5156	60	107	14
SF503131	13.1	-	.5157			
SF503132	13.2	-	.5197			
SF503133	13.3	-	.5236			
SF503134	13.4	-	.5276			
SF50313494	13.494	17/32	.5313			
SF503135	13.5	-	.5315			
SF503136	13.6	-	.5354			
SF503137	13.7	-	.5394			
SF503138	13.8	-	.5433			
SF50313891	13.891	35/64	.5469			
SF503139	13.9	-	.5472			
SF503140	14.0	-	.5512			
SF503141	14.1	-	.5551	62	111	15
SF503142	14.2	-	.5591			
SF50314288	14.288	9/16	.5625			
SF503143	14.3	-	.5630			
SF503144	14.4	-	.5669			
SF503145	14.5	-	.5709			
SF503146	14.6	-	.5748			
SF503147	14.7	-	.5787			
SF503148	14.8	-	.5827			
SF503149	14.9	-	.5866			
SF503150	15.0	-	.5906			
SF50315081	15.081	19/32	.5937	64	115	16
SF503151	15.1	-	.5945			
SF503152	15.2	-	.5984			
SF503154	15.4	-	.6063			
SF503155	15.5	-	.6102			
SF503156	15.6	-	.6142			
SF503157	15.7	-	.6181			
SF503158	15.8	-	.6220			
SF50315875	15.875	5/8	.6250			
SF503160	16.0	-	.6299			

NEXT

SF503 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
SF503161	16.1	-	.6339	66	119	17
SF503163	16.3	-	.6417			
SF503165	16.5	-	.6496			
SF50316667	16.667	21/32	.6562			
SF503170	17.0	-	.6693			
SF503171	17.1	-	.6732	66	123	18
SF503172	17.2	-	.6772			
SF50317463	17.463	11/16	.6875			
SF503175	17.5	-	.6890			
SF503177	17.7	-	.6969			
SF503178	17.8	-	.7008			
SF503180	18.0	-	.7087			
SF503181	18.1	-	.7126	70	127	19
SF503182	18.2	-	.7165			
SF503185	18.5	-	.7283			
SF503190	19.0	-	.7480			
SF503191	19.1	-	.7520	70	131	20
SF503195	19.5	-	.7677			
SF503197	19.7	-	.7756			
SF503200	20.0	-	.7874			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

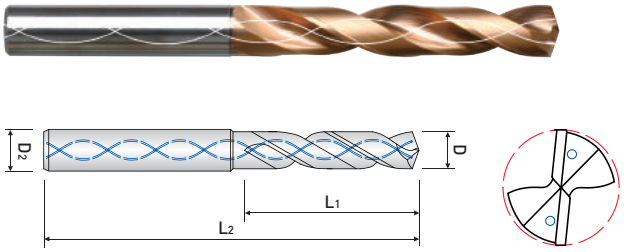
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



5 X D / POWER MAX DRILL- MEDIUM INTERNAL COOLANT

- Suitable for high speed cutting with newly developed raw-material and new coating.

SF505 ...series

ULTRA FINE | HELIX | h8 | p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
SF505031	3.1	-	.1220	27	74	4
SF50503175	3.175	1/8	.1250			
SF505032	3.2	-	.1260			
SF50503264	3.264	-	.1285			
SF505033	3.3	-	.1299			
SF505034	3.4	-	.1339	30		
SF505035	3.5	-	.1378			
SF50503572	3.572	9/64	.1406			
SF505036	3.6	-	.1417			
SF505037	3.7	-	.1457			
SF505038	3.8	-	.1496	33		
SF505039	3.9	-	.1535			
SF505040	4.0	-	.1575			
SF50504039	4.039	-	.1590	33	80	5
SF505041	4.1	-	.1614			
SF505042	4.2	-	.1654			
SF505043	4.3	-	.1693	36		
SF505044	4.4	-	.1732			
SF505045	4.5	-	.1772			
SF505046	4.6	-	.1811			
SF505047	4.7	-	.1850			
SF50504763	4.763	3/16	.1875	39		
SF505048	4.8	-	.1890			
SF505049	4.9	-	.1920			
SF505050	5.0	-	.1969			
SF505051	5.1	-	.2008	39	87	6
SF50505159	5.159	13/64	.2031			
SF505052	5.2	-	.2047			
SF505053	5.3	-	.2087			
SF505054	5.4	-	.2126	43		
SF505055	5.5	-	.2165			
SF50505558	5.558	7/32	.2188			
SF505056	5.6	-	.2205			
SF505057	5.7	-	.2244			
SF505058	5.8	-	.2283			
SF505059	5.9	-	.2323			
SF50505953	5.953	15/64	.2344			
SF505060	6.0	-	.2362			
SF505061	6.1	-	.2402	47	95	7
SF505062	6.2	-	.2441			
SF505063	6.3	-	.2480			
SF5050635	6.350	1/4	.2500			

NEXT ≫

SF505 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
SF505064	6.4	-	.2520	47	95	7
SF505065	6.5	-	.2559			
SF505066	6.6	-	.2598			
SF505067	6.7	-	.2638			
SF50506747	6.747	17/64	.2656			
SF505068	6.8	-	.2677			
SF505069	6.9	-	.2717			
SF505070	7.0	-	.2756			
SF505071	7.1	-	.2795	52	103	8
SF50507145	7.145	9/32	.2813			
SF505072	7.2	-	.2835			
SF505073	7.3	-	.2874			
SF505074	7.4	-	.2913			
SF505075	7.5	-	.2953			
SF50507541	7.541	19/64	.2969			
SF505076	7.6	-	.2992			
SF505077	7.7	-	.3031			
SF505078	7.8	-	.3071			
SF505079	7.9	-	.3110			
SF50507938	7.938	5/16	.3125			
SF505080	8.0	-	.3150			
SF505081	8.1	-	.3189	56	105	9
SF505082	8.2	-	.3228			
SF505083	8.3	-	.3268			
SF50508334	8.334	21/64	.3281			
SF505084	8.4	-	.3307			
SF505085	8.5	-	.3346			
SF505086	8.6	-	.3386			
SF505087	8.7	-	.3425			
SF50508733	8.733	11/32	.3438			
SF505088	8.8	-	.3465			
SF505089	8.9	-	.3504			
SF505090	9.0	-	.3543			
SF505091	9.1	-	.3583	62	108	10
SF50509129	9.129	23/64	.3594			
SF505092	9.2	-	.3622			
SF505093	9.3	-	.3661			
SF505094	9.4	-	.3701			
SF505095	9.5	-	.3740			
SF50509525	9.525	3/8	.3750			
SF505096	9.6	-	.3780			
SF505097	9.7	-	.3819			
SF505098	9.8	-	.3858			
SF505099	9.9	-	.3898			
SF50509921	9.921	25/64	.3906			
SF505100	10.0	-	.3937			
SF505101	10.1	-	.3976	68	125	11
SF505102	10.2	-	.4016			
SF505103	10.3	-	.4055			
SF5051032	10.32	13/32	.4063			
SF505104	10.4	-	.4094			
SF505105	10.5	-	.4134			
SF505106	10.6	-	.4173			
SF505107	10.7	-	.4213			
SF50510716	10.716	27/64	.4219			
SF505108	10.8	-	.4252			
SF505109	10.9	-	.4291			
SF505110	11.0	-	.4331			

NEXT ≫

SF505 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
SF505111	11.1	-	.4370	71	133	12
SF50511113	11.113	7/16	.4375			
SF505112	11.2	-	.4409			
SF505113	11.3	-	.4449			
SF505114	11.4	-	.4488			
SF505115	11.5	-	.4528			
SF505116	11.6	-	.4567			
SF505117	11.7	-	.4606			
SF505118	11.8	-	.4646			
SF505119	11.9	-	.4685			
SF50511908	11.908	15/32	.4688			
SF505120	12.0	-	.4724			
SF505121	12.1	-	.4764	75	137	13
SF505122	12.2	-	.4803			
SF505123	12.3	-	.4843			
SF50512304	12.304	31/64	.4844			
SF505124	12.4	-	.4882			
SF505125	12.5	-	.4921			
SF505126	12.6	-	.4961			
SF505127	12.7	-	.5000			
SF505128	12.8	-	.5039			
SF505129	12.9	-	.5079			
SF505130	13.0	-	.5118			
SF50513096	13.096	33/64	.5156	80	142	14
SF505131	13.1	-	.5157			
SF505132	13.2	-	.5197			
SF505133	13.3	-	.5236			
SF505134	13.4		.5276			
SF50513494	13.494	-	.5313			
SF505135	13.5	17/32	.5315			
SF505136	13.6	-	.5354			
SF505137	13.7	-	.5394			
SF505138	13.8	-	.5433			
SF50513891	13.891	35/64	.5469			
SF505139	13.9	-	.5472			
SF505140	14.0	-	.5512			
SF505141	14.1	-	.5551	83	148	15
SF505142	14.2	-	.5591			
SF50514288	14.288	9/16	.5625			
SF505143	14.3	-	.5630			
SF505144	14.4	-	.5669			
SF505145	14.5	-	.5709			
SF505146	14.6	-	.5748			
SF505147	14.7	-	.5787			
SF505148	14.8	-	.5827			
SF505149	14.9	-	.5866			
SF505150	15.0	-	.5906			
SF50515081	15.081	19/32	.5937	90	152	16
SF505151	15.1	-	.5945			
SF505152	15.2	-	.5984			
SF505154	15.4	-	.6063			
SF505155	15.5	-	.6102			
SF505156	15.6	-	.6142			
SF505157	15.7	-	.6181			
SF505158	15.8	-	.6220			
SF50515875	15.875	5/8	.6250			
SF505160	16.0	-	.6299			

NEXT ≫

SF505 ...series

ULTRA FINE

HELIX

h8

p.1035

EDP. No.	D			L_1	L_2	D_2
	mm	fraction	inch			
SF505161	16.1	-	.6339	95	155	17
SF505163	16.3	-	.6417			
SF505165	16.5	-	.6496			
SF50516667	16.667	21/32	.6562			
SF505170	17.0	-	.6693			
SF505171	17.1	-	.6732	100	157	18
SF505172	17.2	-	.6772			
SF50517463	17.463	11/16	.6875			
SF505175	17.5	-	.6890			
SF505177	17.7	-	.6969			
SF505178	17.8	-	.7008			
SF505180	18.0	-	.7087			
SF505181	18.1	-	.7126	105	160	19
SF505182	18.2	-	.7165			
SF505185	18.5	-	.7283			
SF505190	19.0	-	.7480			
SF505191	19.1	-	.7520	110	163	20
SF505195	19.5	-	.7677			
SF505197	19.7	-	.7756			
SF505200	20.0	-	.7874			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

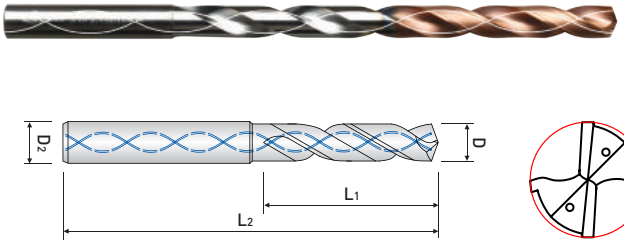
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



10 X D / POWER MAX DRILL
- LONG / INTERNAL COOLANT

- Double margin

SF510 ...series

ULTRA FINE HELIX

p.1036

EDP. No.	D	L1	L2	D2
SF510030	3.0	39	87	3
SF510031	3.1	46	94	4
SF510032	3.2			
SF510033	3.3			
SF510034	3.4			
SF510035	3.5			
SF510036	3.6	52	101	
SF510037	3.7			
SF510038	3.8			
SF510039	3.9			
SF510040	4.0			
SF510041	4.1	59	108	5
SF510042	4.2			
SF510043	4.3			
SF510044	4.4			
SF510045	4.5			
SF510046	4.6	66	117	
SF510047	4.7			
SF510048	4.8			
SF510049	4.9			
SF510050	5.0			
SF510051	5.1	72	123	6
SF510052	5.2			
SF510053	5.3			
SF510054	5.4			
SF510055	5.5			
SF510056	5.6	79	130	
SF510057	5.7			
SF510058	5.8			
SF510059	5.9			
SF510060	6.0			
SF510061	6.1	85	138	7
SF510062	6.2			
SF510063	6.3			
SF510064	6.4			
SF510065	6.5			
SF510066	6.6	92	145	

EDP. No.	D	L1	L2	D2
SF510 067	6.7	92	145	7
SF510 068	6.8			
SF510 069	6.9			
SF510 070	7.0			
SF510 071	7.1	98	153	8
SF510 072	7.2			
SF510 073	7.3			
SF510 074	7.4			
SF510 075	7.5			
SF510 076	7.6	105	160	
SF510 077	7.7			
SF510 078	7.8			
SF510 079	7.9			
SF510 080	8.0			
SF510 081	8.1	111	166	9
SF510 082	8.2			
SF510 083	8.3			
SF510 084	8.4			
SF510 085	8.5			
SF510 086	8.6	118	173	
SF510 087	8.7			
SF510 088	8.8			
SF510 089	8.9			
SF510 090	9.0			
SF510 091	9.1	124	179	10
SF510 092	9.2			
SF510 093	9.3			
SF510 094	9.4			
SF510 095	9.5			
SF510 096	9.6	131	186	
SF510 097	9.7			
SF510 098	9.8			
SF510 099	9.9			
SF510 100	10.0			
SF510 101	10.1	138	193	11
SF510 102	10.2			
SF510 103	10.3			

NEXT

SF510 ...series

ULTRA FINE HELIX

p.1036

EDP. No.	D	L_1	L_2	D_2
SF510104	10.4	138	193	11
SF510105	10.5			
SF510106	10.6	144	205	
SF510107	10.7			
SF510108	10.8			
SF510109	10.9			
SF510110	11.0			
SF510111	11.1	151	212	12
SF510112	11.2			
SF510113	11.3			
SF510114	11.4			
SF510115	11.5			

EDP. No.	D	L_1	L_2	D_2
SF510116	11.6	157	218	12
SF510117	11.7			
SF510118	11.8			
SF510119	11.9			
SF510120	12.0			
SF510121	12.1	164	225	13
SF510122	12.2			
SF510123	12.3			
SF510124	12.4			
SF510125	12.5			
SF510126	12.6	170	236	
SF510127	12.7			
SF510128	12.8			
SF510129	12.9			
SF510130	13.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

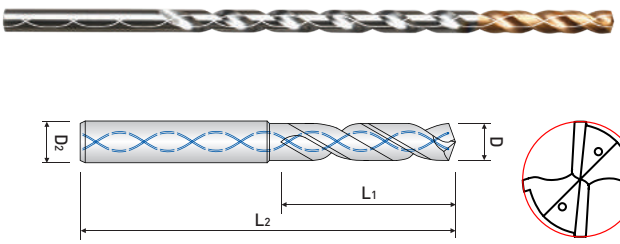
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



20 X D / POWER MAX DRILL
- EXTRA LONG / INTERNAL COOLANT

- Double margin

SF520 ...series

ULTRA FINE HELIX p.1036

EDP. No.	D	L1	L2	D2
SF520041	4.1	104	155	5
SF520042	4.2			
SF520043	4.3			
SF520044	4.4			
SF520045	4.5			
SF520046	4.6	116	167	
SF520047	4.7			
SF520048	4.8			
SF520049	4.9			
SF520050	5.0			
SF520051	5.1	127	178	6
SF520052	5.2			
SF520053	5.3			
SF520054	5.4			
SF520055	5.5			
SF520056	5.6	139	190	
SF520057	5.7			
SF520058	5.8			
SF520059	5.9			
SF520060	6.0			
SF520061	6.1	150	203	7
SF520062	6.2			
SF520063	6.3			
SF520064	6.4			
SF520065	6.5			
SF520066	6.6	162	215	
SF520067	6.7			
SF520068	6.8			
SF520069	6.9			
SF520070	7.0			

EDP. No.	D	L1	L2	D2
SF520071	7.1	173	228	8
SF520072	7.2			
SF520073	7.3			
SF520074	7.4			
SF520075	7.5			
SF520076	7.6	185	240	
SF520077	7.7			
SF520078	7.8			
SF520079	7.9			
SF520080	8.0			
SF520081	8.1	196	251	9
SF520082	8.2			
SF520083	8.3			
SF520084	8.4			
SF520085	8.5			
SF520086	8.6	208	263	
SF520087	8.7			
SF520088	8.8			
SF520089	8.9			
SF520090	9.0			
SF520091	9.1	219	274	10
SF520092	9.2			
SF520093	9.3			
SF520094	9.4			
SF520095	9.5			
SF520096	9.6	231	286	
SF520097	9.7			
SF520098	9.8			
SF520099	9.9			
SF520100	10.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels ~HRc55 SKD61	Hardened Steels ~HRc55 SKD11	Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
○	◎	◎	○	○			◎		◎

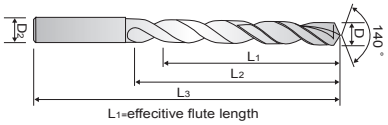
○:General Application ◎:The most suitable Application

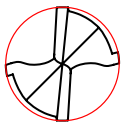
■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*





POWER MAX DRILL-HIGH PRECISION

- Applyed highly precise hole tolerance on the tool.
- Increased tool life by minimizing chatter and resonance on the (through hole) penetrated hole or (blind hole) one-side open hole area.
- Double margin

HP503 ...series

ULTRA FINE HELIX

EDP. No.	D		D_2	L_1	L_2	L_3
	mm	inch				
HP503030	3.0	.1181	6	14	20	62
HP503031	3.1	.1220				
HP503032	3.2	.1260				
HP503033	3.3	.1299				
HP503034	3.4	.1339				
HP503035	3.5	.1378				
HP503036	3.6	.1417				
HP503037	3.7	.1457				
HP503038	3.8	.1496	6	17	24	66
HP503039	3.9	.1535				
HP503040	4.0	.1575				
HP503041	4.1	.1614				
HP503042	4.2	.1654				
HP503043	4.3	.1693				
HP503044	4.4	.1732				
HP503045	4.5	.1772				
HP503046	4.6	.1811				
HP503047	4.7	.1850				
HP503048	4.8	.1890	6	20	28	66
HP503049	4.9	.1929				
HP503050	5.0	.1969				
HP503051	5.1	.2008				
HP503052	5.2	.2047				
HP503053	5.3	.2087				
HP503054	5.4	.2126				
HP503055	5.5	.2165				
HP503056	5.6	.2205				
HP503057	5.7	.2244				
HP503058	5.8	.2283				
HP503059	5.9	.2322				
HP503060	6.0	.2362				

NEXT

HP503 ...series

EDP. No.	D		D_2	L_1	L_2	L_3
	mm	inch				
HP503061	6.1	.2402	8	24	34	79
HP503062	6.2	.2441				
HP503063	6.3	.2480				
HP503064	6.4	.2520				
HP503065	6.5	.2559				
HP503066	6.6	.2598				
HP503067	6.7	.2638				
HP503068	6.8	.2677				
HP503069	6.9	.2717				
HP503070	7.0	.2756				
HP503071	7.1	.2795	8	29	41	79
HP503072	7.2	.2835				
HP503073	7.3	.2874				
HP503074	7.4	.2913				
HP503075	7.5	.2953				
HP503076	7.6	.2992				
HP503077	7.7	.3031				
HP503078	7.8	.3071				
HP503079	7.9	.3110				
HP503080	8.0	.3150				
HP503081	8.1	.3189	10	35	47	89
HP503082	8.2	.3228				
HP503083	8.3	.3268				
HP503084	8.4	.3307				
HP503085	8.5	.3346				
HP503086	8.6	.3386				
HP503087	8.7	.3425				
HP503088	8.8	.3465				
HP503089	8.9	.3504				
HP503090	9.0	.3543				
HP503091	9.1	.3583				
HP503092	9.2	.3622				
HP503093	9.3	.3661				
HP503094	9.4	.3701				
HP503095	9.5	.3740				
HP503096	9.6	.3780				
HP503097	9.7	.3819				
HP503098	9.8	.3858				
HP503099	9.9	.3898				
HP503100	10.0	.3937				
HP503101	10.1	.3976	12	40	55	102
HP503102	10.2	.4016				
HP503103	10.3	.4055				
HP503104	10.4	.4094				
HP503105	10.5	.4134				
HP503106	10.6	.4173				
HP503107	10.7	.4213				
HP503108	10.8	.4252				
HP503109	10.9	.4291				
HP503110	11.0	.4331				
HP503111	11.1	.4370				
HP503112	11.2	.4409				
HP503113	11.3	.4449				

NEXT ≫

HP503 ...series

ULTRA FINE HELIX

EDP. No.	D		D_2	L_1	L_2	L_3
	mm	inch				
HP503114	11.4	.4488	12	40	55	102
HP503115	11.5	.4528				
HP503116	11.6	.4567				
HP503117	11.7	.4606				
HP503118	11.8	.4646				
HP503119	11.9	.4685				
HP503120	12.0	.4724				
HP503121	12.1	.4764	14	43	60	107
HP503122	12.2	.4803				
HP503123	12.3	.4843				
HP503124	12.4	.4882				
HP503125	12.5	.4921				
HP503126	12.6	.4961				
HP503127	12.7	.5000				
HP503128	12.8	.5039				
HP503129	12.9	.5079				
HP503130	13.0	.5118				
HP503131	13.1	.5157				
HP503132	13.2	.5157				
HP503133	13.3	.5236				
HP503135	13.5	.5315				
HP503137	13.7	.5394				
HP503140	14.0	.5512				
HP503142	14.2	.5591	16	45	65	115
HP503143	14.3	.5630				
HP503145	14.5	.5709				
HP503146	14.6	.5787				
HP503148	14.8	.5827				
HP503150	15.0	.5906				
HP503155	15.5	.6102				
HP503157	15.7	.6181				
HP503160	16.0	.6299				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

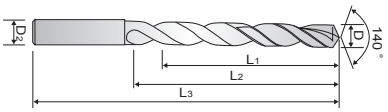
○:General Application ◎:The most suitable Application

■ Tolerance

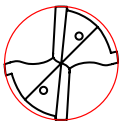
㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m7)	+12 +2	+16 +4	+21 +6	+25 +7	+29 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



L1=effecitive flute length



3 X D / POWER MAX DRILL
- HIGH PRECISION

- Applyed highly precise hole tolerance on the tool.
- Increased tool life by minimizing chatter and resonance on the (through hole) penetrated hole or (blind hole) one-side open hole area.
- Double margin

HPI 503 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI50303175	3.175	1/8	.1250	6	14	20	62
HPI50303264	3.264	-	.1285				
HPI50303572	3.572	9/64	.1406				
HPI5030397	3.97	5/32	.1563	6	17	24	66
HPI503040	4	-	.1590				
HPI50304039	4.039	-	.1575				
HPI503042	4.2	-	.1654				
HPI503043	4.3	-	.1693				
HPI503045	4.5	-	.1772				
HPI503046	4.6	-	.1811				
HPI50304763	4.763	3/16	.1875	6	20	28	66
HPI503048	4.8	-	.1890				
HPI503049	4.9	-	.1929				
HPI503050	5	-	.1969				
HPI503051	5.1	-	.2008				
HPI50305159	5.159	13/64	.2031				
HPI503052	5.2	-	.2047				
HPI503053	5.3	-	.2087				
HPI503054	5.4	-	.2126				
HPI503055	5.5	-	.2165				
HPI50305558	5.558	7/32	.2188				
HPI503056	5.6	-	.2205				
HPI503057	5.7	-	.2244				
HPI503058	5.8	-	.2283				
HPI50305953	5.953	15/64	.2344				
HPI503060	6	-	.2362				
HPI503061	6.1	-	.2402	8	24	34	79
HPI503062	6.2	-	.2441				
HPI5030635	6.35	1/4	.2500				
HPI503065	6.5	-	.2559				
HPI503066	6.6	-	.2598				
HPI50306747	6.747	17/64	.2656				
HPI503068	6.8	-	.2677				
HPI503070	7	-	.2756				
HPI50307145	7.145	9/32	.2813	8	29	41	79
HPI503072	7.2	-	.2835				
HPI503074	7.4	-	.2913				
HPI503075	7.5	-	.2953				
HPI50307541	7.541	19/64	.2969				

NEXT

HPI 503 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI503078	7.8	-	.3071	8	29	41	79
HPI503079	7.9	-	.3110				
HPI50307938	7.938	5/16	.3125				
HPI503080	8	-	.3150				
HPI503081	8.1	-	.3189	10	35	47	89
HPI503082	8.2	-	.3228				
HPI503083	8.3	-	.3268				
HPI50308334	8.334	21/64	.3281				
HPI503085	8.5	-	.3346				
HPI503086	8.6	-	.3386				
HPI503087	8.7	-	.3425				
HPI50308733	8.733	11/32	.3438				
HPI503088	8.8	-	.3465				
HPI503090	9	-	.3543				
HPI503091	9.1	-	.3583				
HPI50309129	9.129	23/64	.3594				
HPI503092	9.2	-	.3622				
HPI503093	9.3	-	.3661				
HPI503095	9.5	-	.3740				
HPI50309525	9.525	3/8	.3750				
HPI503096	9.6	-	.3780				
HPI503097	9.7	-	.3819				
HPI503098	9.8	-	.3858				
HPI50309921	9.921	25/64	.3906				
HPI503100	10	-	.3937				
HPI503102	10.2	-	.4016	12	40	55	105
HPI5031032	10.32	13/32	.4063				
HPI503105	10.5	-	.4134				
HPI503107	10.7	-	.4213				
HPI50310716	10.716	27/64	.4219				
HPI503108	10.8	-	.4252				
HPI503110	11	-	.4331				
HPI50311113	11.113	7/16	.4375				
HPI503112	11.2	-	.4409				
HPI503115	11.5	-	.4528				
HPI50311509	11.509	29/64	.4531				
HPI503117	11.7	-	.4606				
HPI50311908	11.908	15/32	.4688				
HPI503120	12	-	.4724				
HPI503123	12.3	-	.4843	14	43	60	107
HPI50312304	12.304	31/64	.4844				
HPI503125	12.5	-	.4921				
HPI503127	12.7	1/2	.5000				
HPI503128	12.8	-	.5039				
HPI503130	13	-	.5118				
HPI503133	13.3	-	.5236				
HPI50313494	13.494	17/32	.5313				
HPI503135	13.5	-	.5315				
HPI503137	13.7	-	.5394				
HPI50313891	13.891	35/64	.5469				
HPI503140	14	-	.5512				
HPI503141	14.1	-	.5551	16	45	65	115
HPI503142	14.2	-	.5591				
HPI50314288	14.288	9/16	.5625				
HPI503145	14.5	-	.5709				
HPI503147	14.7	-	.5787				
HPI503150	15	-	.5906				
HPI50315081	15.081	19/32	.5937				
HPI503155	15.5	-	.6102				
HPI50315875	15.875	5/8	.6250				
HPI503160	16	-	.6299				

NEXT ≫

HPI 503 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI503165	16.5	-	.6496	18	51	73	123
HPI503168	16.8	-	.6614				
HPI503170	17	-	.6693				
HPI503171	17.1	-	.6732				
HPI50317463	17.463	11/16	.6875				
HPI503175	17.5	-	.6890				
HPI503180	18	-	.7087				
HPI503190	19	-	.7480	20	55	79	131
HPI5031905	19.05	3/4	.7500				
HPI503197	19.7	-	.7756				
HPI503200	20	-	.7874				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

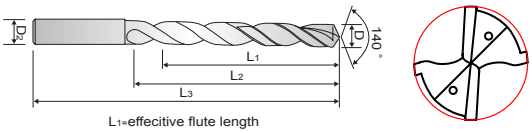
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m7)	+12 +2	+16 +4	+21 +6	+25 +7	+29 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



5 X D / POWER MAX DRILL -HIGH PRECISION

- Applyed highly precise hole tolerance on the tool.
- Increased tool life by minimizing chatter and resonance on the (through hole) penetrated hole or (blind hole) one-side open hole area.
- Double margin

HPI 505 ...series

ULTRA FINE HELIX p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI50503175	3.175	1/8	.1250	6	24	30	66
HPI50503264	3.264	-	.1285				
HPI50503572	3.572	9/64	.1406				
HPI5050397	3.97	5/32	.1563	6	29	36	74
HPI505040	4	-	.1575				
HPI50504039	4.039	-	.1590				
HPI505041	4.1	-	.1614				
HPI505042	4.2	-	.1654				
HPI505043	4.3	-	.1693				
HPI505044	4.4	-	.1732				
HPI505045	4.5	-	.1772				
HPI5050458	4.58	-	.1803				
HPI505046	4.6	-	.1811				
HPI50504623	4.623	-	.1820				
HPI505047	4.7	-	.1850				
HPI50504763	4.763	3/16	.1875	6	35	44	82
HPI505048	4.8	-	.1890				
HPI505049	4.9	-	.1920				
HPI505050	5	-	.1969				
HPI505051	5.1	-	.2008				
HPI50505159	5.159	13/64	.2031				
HPI505052	5.2	-	.2047				
HPI505053	5.3	-	.2087				
HPI505054	5.4	-	.2126				
HPI5050541	5.41	-	.2130				
HPI505055	5.5	-	.2165				
HPI50505558	5.558	7/32	.2188				
HPI505056	5.6	-	.2205				
HPI505057	5.7	-	.2244				
HPI505058	5.8	-	.2283				
HPI505059	5.9	-	.2323				
HPI50505953	5.953	15/64	.2344				
HPI505060	6	-	.2362				

NEXT ≫

HPI 505 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI505061	6.1	-	.2402				
HPI505062	6.2	-	.2441				
HPI505063	6.3	-	.2480				
HPI5050635	6.35	1/4	.2500				
HPI505064	6.4	-	.2520				
HPI505065	6.5	-	.2559				
HPI50506528	6.528	-	.2570				
HPI505066	6.6	-	.2598				
HPI505067	6.7	-	.2638				
HPI50506747	6.747	17/64	.2656				
HPI505068	6.8	-	.2677				
HPI505069	6.9	-	.2717				
HPI50506909	6.909	-	.2720				
HPI505070	7	-	.2756	8	43	53	91
HPI505071	7.1	-	.2795				
HPI50507145	7.145	9/32	.2813				
HPI505072	7.2	-	.2835				
HPI505073	7.3	-	.2874				
HPI505074	7.4	-	.2913				
HPI505075	7.5	-	.2953				
HPI50507541	7.541	19/64	.2969				
HPI505076	7.6	-	.2992				
HPI505077	7.7	-	.3031				
HPI505078	7.8	-	.3071				
HPI505079	7.9	-	.3110				
HPI50507938	7.938	5/16	.3125				
HPI505080	8	-	.3150				
HPI505081	8.1	-	.3189				
HPI505082	8.2	-	.3228				
HPI505083	8.3	-	.3268				
HPI50508334	8.334	21/64	.3281				
HPI505084	8.4	-	.3307				
HPI50508433	8.433	-	.3320				
HPI505085	8.5	-	.3346				
HPI505086	8.6	-	.3386				
HPI505087	8.7	-	.3425				
HPI50508733	8.733	11/32	.3438				
HPI505088	8.8	-	.3465				
HPI505089	8.9	-	.3504				
HPI505090	9	-	.3543				
HPI505091	9.1	-	.3583				
HPI50509129	9.129	23/64	.3594	10	49	61	103
HPI505092	9.2	-	.3622				
HPI505093	9.3	-	.3661				
HPI50509347	9.347	-	.3680				
HPI505094	9.4	-	.3701				
HPI505095	9.5	-	.3740				
HPI50509525	9.525	3/8	.3750				
HPI505096	9.6	-	.3780				
HPI505097	9.7	-	.3819				
HPI50509703	9.703	-	.3858				
HPI50509746	9.746	-	.3898				
HPI505098	9.8	-	.3906				
HPI505099	9.9	-	.3937				
HPI50509921	9.921	25/64	.3976				
HPI505100	10	-	.4016				

NEXT ≫

HPI 505 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI505101	10.1	-	.4055	12	56	71	118
HPI505102	10.2	-	.4063				
HPI505103	10.3	-	.4094				
HPI5051032	10.32	13/32	.4134				
HPI505104	10.4	-	.4173				
HPI505105	10.5	-	.4213				
HPI505106	10.6	-	.4219				
HPI505107	10.7	-	.4252				
HPI50510716	10.716	27/64	.4291				
HPI505108	10.8	-	.4331				
HPI505109	10.9	-	.4370				
HPI505110	11	-	.4375				
HPI505111	11.1	-	.4409				
HPI50511113	11.113	7/16	.4449				
HPI505112	11.2	-	.4488				
HPI505113	11.3	-	.4528				
HPI505114	11.4	-	.4488				
HPI505115	11.5	-	.4528				
HPI50511509	11.509	29/64	.4531				
HPI505116	11.6	-	.4567				
HPI505117	11.7	-	.4606				
HPI505118	11.8	-	.4646				
HPI505119	11.9	-	.4685				
HPI50511908	11.908	15/32	.4688				
HPI505120	12	-	.4724				
HPI505121	12.1	-	.4764	14	60	77	124
HPI505122	12.2	-	.4803				
HPI505123	12.3	-	.4843				
HPI50512304	12.304	31/64	.4844				
HPI505124	12.4	-	.4882				
HPI505125	12.5	-	.4921				
HPI505126	12.6	-	.4961				
HPI505127	12.7	1/2	.5000				
HPI505128	12.8	-	.5039				
HPI505129	12.9	-	.5079				
HPI50512903	12.903	-	.5118				
HPI505130	13	-	.5156				
HPI50513096	13.096	33/64	.5157				
HPI505131	13.1	-	.5236				
HPI505133	13.3	-	.5313				
HPI50513494	13.494	17/32	.5315				
HPI505135	13.5	-	.5394				
HPI505137	13.7	-	.5433				
HPI505138	13.8	-	.5469				
HPI50513891	13.891	35/64	.5512				
HPI505140	14	-	.5591				
HPI505142	14.2	-	.5625	16	63	83	133
HPI50514288	14.288	9/16	.5709				
HPI505145	14.5	-	.5748				
HPI505146	14.6	-	.5787				
HPI505147	14.7	-	.5866				
HPI505149	14.9	-	.5906				
HPI505150	15	-	.5937				
HPI50515081	15.081	19/32	.5945				
HPI505151	15.1	-	.5945				
HPI505155	15.5	-	.6102				
HPI505157	15.7	-	.6181				
HPI505158	15.8	-	.6220				
HPI50515875	15.875	5/8	.6250				
HPI505159	15.9	-	.6260				
HPI505160	16	-	.6299				

NEXT >>

HPI 505 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI50516078	16.078	-	.6330	18	71	93	143
HPI505162	16.2	-	.6378				
HPI505164	16.4	-	.6457				
HPI505165	16.5	-	.6496				
HPI505166	16.6	-	.6535				
HPI50516667	16.667	21/32	.6562				
HPI505167	16.7	-	.6575				
HPI505170	17	-	.6693				
HPI50517463	17.463	11/16	.6875				
HPI505175	17.5	-	.6890				
HPI505177	17.7	-	.6969				
HPI505180	18	-	.7087				
HPI505184	18.4	-	.7244	20	77	101	153
HPI505185	18.5	-	.7283				
HPI505186	18.6	-	.7323				
HPI505188	18.8	-	.7402				
HPI505190	19	-	.7480				
HPI5051905	19.05	3/4	.7500				
HPI505192	19.2	-	.7559				
HPI50519253	19.253	-	.7580				
HPI50519446	19.446	49/64	.7656				
HPI505195	19.5	-	.7677				
HPI505197	19.7	-	.7756				
HPI50519844	19.844	25/32	.7813				
HPI505200	20	-	.7874				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

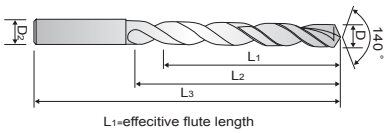
○:General Application ◎:The most suitable Application

■ Tolerance

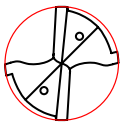
㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m7)	+12 +2	+16 +4	+21 +6	+25 +7	+29 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



L1=effecitive flute length



8 X D / POWER MAX DRILL -HIGH PRECISION

- Applyed highly precise hole tolerance on the tool.
- Increased tool life by minimizing chatter and resonance on the (through hole) penetrated hole or (blind hole) one-side open hole area.
- Double margin

HPI 508 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI508030N	3	-	.1181	6	37	43	80
HPI50803175N	3.175	1/8	.1250				
HPI50803264N	3.264	-	.1285				
HPI50803572N	3.572	9/64	.1406				
HPI5080397N	3.97	5/32	.1563	6	41	49	87
HPI50804039N	4.039	-	.1590				
HPI50804763N	4.763	3/16	.1875	6	48	56	94
HPI508050N	5	-	.1969				
HPI508051N	5.1	-	.2008				
HPI50805159N	5.159	13/64	.2031				
HPI508052N	5.2	-	.2047				
HPI508053N	5.3	-	.2087				
HPI508055N	5.5	-	.2165				
HPI50805558N	5.558	7/32	.2188				
HPI508057N	5.7	-	.2244				
HPI50805953N	5.953	15/64	.2344				
HPI508060N	6	-	.2362				
HPI508061N	6.1	-	.2402	8	57	67	105
HPI508062N	6.2	-	.2441				
HPI508063N	6.3	-	.2480				
HPI5080635N	6.35	1/4	.2500				
HPI508064N	6.4	-	.2520				
HPI508065N	6.5	-	.2559				
HPI508066N	6.6	-	.2598				
HPI508067N	6.7	-	.2638				
HPI50806746N	6.746	17/64	.2656				
HPI508068N	6.8	-	.2677				
HPI508070N	7	-	.2756	8	65	76	116
HPI50807145N	7.145	9/32	.2813				
HPI508075N	7.5	-	.2953				
HPI50807541N	7.541	19/64	.2969				
HPI508077N	7.7	-	.3031				
HPI508078N	7.8	-	.3071				
HPI50807938N	7.938	5/16	.3125				
HPI508080N	8	-	.3150				

NEXT

HPI 508 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI508081N	8.1	-	.3189	10	74	87	131
HPI50808334N	8.334	-	.3281				
HPI508085N	8.5	11/32	.3346				
HPI508086N	8.6	-	.3386				
HPI508087N	8.7	-	.3425				
HPI50808733N	8.733	-	.3438				
HPI508088N	8.8	23/64	.3465				
HPI508090N	9	-	.3543				
HPI508091N	9.1	3/8	.3583	10	81	95	139
HPI50809129N	9.129	-	.3594				
HPI508095N	9.5	-	.3740				
HPI50809525N	9.525	-	.3750				
HPI508097N	9.7	25/64	.3819				
HPI508098N	9.8	-	.3858				
HPI508099N	9.9	-	.3898				
HPI50809921N	9.921	-	.3906				
HPI508100N	10	-	.3937				
HPI508101N	10.1	13/32	.3979	12	90	106	155
HPI508102N	10.2	-	.4016				
HPI508103N	10.3	27/64	.4055				
HPI5081032N	10.32	-	.4063				
HPI508105N	10.5	-	.4134				
HPI50810716N	10.716	7/16	.4219				
HPI508108N	10.8	-	.4252				
HPI508110N	11	-	.4331				
HPI50811113N	11.113	-	.4375	12	97	114	163
HPI508112N	11.2	-	.4409				
HPI508113N	11.3	29/64	.4449				
HPI508114N	11.4	-	.4488				
HPI508115N	11.5	-	.4528				
HPI50811509N	11.509	15/32	.4531				
HPI508117N	11.7	-	.4606				
HPI508118N	11.8	31/64	.4646				
HPI50811908N	11.908	-	.4688				
HPI508120N	12	1/2	.4724				
HPI50812304N	12.304	-	.4844	14	113	133	182
HPI508125N	12.5	-	.4921				
HPI508127N	12.7	-	.5000				
HPI508128N	12.8	-	.5039				
HPI508130N	13	9/16	.5118				
HPI508135N	13.5	-	.5315				
HPI508140N	14	-	.5512				
HPI50814288N	14.288	-	.5625	16	129	152	204
HPI508145N	14.5	-	.5709				
HPI508150N	15	-	.5906				
HPI508151N	15.1	-	.5945				
HPI508152N	15.2	-	.5984				
HPI508153N	15.3	5/8	.6024				
HPI508155N	15.5	-	.6102				
HPI508158N	15.8	5/8	.6220				
HPI50815875N	15.875	-	.6250				
HPI508160N	16	-	.6299				

NEXT

HPI 508 ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D			D_2	L_1	L_2	L_3
	mm	fraction	inch				
HPI50816078N	16.078	-	.6330	18	145	171	223
HPI508162N	16.2	-	.6378				
HPI508165N	16.5	-	.6496				
HPI508170N	17	-	.6693				
HPI50817463N	17.463	11/16	.6875				
HPI508175N	17.5	-	0.689				
HPI508180N	18	-	.7087				
HPI508185N	18.5	-	.7283	20	162	191	244
HPI508190N	19	-	.7480				
HPI5081905N	19.05	3/4	.7500				
HPI50819253N	19.253	-	.7580				
HPI508198N	19.8	-	.7795				
HPI508200N	20	-	.7874				

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

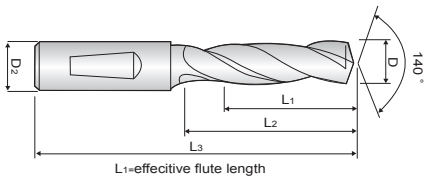
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m7)	+12 +2	+16 +4	+21 +6	+25 +7	+29 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



POWER MAX DRILL - STUB / DIN 6537K

■ Shank Type

- P503A : DIN 6535 HA - straight A type
- P503F : DIN 6535 HE - 2°Whistle Flat F type

P503A / P503F ...series

DIN 6537K | UWC ULTRA FINE | 30° HELIX | TiAlN HH | 3XD | 140° | DATA

p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
P503A030	P503F030	3.0	6	14	20	62
P503A031	P503F031	3.1				
P503A032	P503F032	3.2				
P503A033	P503F033	3.3				
P503A034	P503F034	3.4				
P503A035	P503F035	3.5				
P503A036	P503F036	3.6				
P503A037	P503F037	3.7				
P503A038	P503F038	3.8	6	17	24	66
P503A039	P503F039	3.9				
P503A040	P503F040	4.0				
P503A041	P503F041	4.1				
P503A042	P503F042	4.2				
P503A043	P503F043	4.3				
P503A044	P503F044	4.4				
P503A045	P503F045	4.5				
P503A046	P503F046	4.6				
P503A047	P503F047	4.7				
P503A048	P503F048	4.8	6	20	28	66
P503A049	P503F049	4.9				
P503A050	P503F050	5.0				
P503A051	P503F051	5.1				
P503A052	P503F052	5.2				
P503A053	P503F053	5.3				
P503A054	P503F054	5.4				
P503A055	P503F055	5.5				
P503A056	P503F056	5.6				
P503A057	P503F057	5.7				
P503A058	P503F058	5.8				
P503A059	P503F059	5.9				
P503A060	P503F060	6.0				
P503A061	P503F061	6.1	8	24	34	79
P503A062	P503F062	6.2				
P503A063	P503F063	6.3				
P503A064	P503F064	6.4				
P503A065	P503F065	6.5				
P503A066	P503F066	6.6				

※ These tools are manufactured based on order received.

NEXT ≫

P503A / P503F ...series

p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
P503A067	P503F067	6.7	8	24	34	79
P503A068	P503F068	6.8				
P503A069	P503F069	6.9				
P503A070	P503F070	7.0				
P503A071	P503F071	7.1	8	29	41	79
P503A072	P503F072	7.2				
P503A073	P503F073	7.3				
P503A074	P503F074	7.4				
P503A075	P503F075	7.5				
P503A076	P503F076	7.6				
P503A077	P503F077	7.7				
P503A078	P503F078	7.8				
P503A079	P503F079	7.9				
P503A080	P503F080	8.0				
P503A081	P503F081	8.1	10	35	47	89
P503A082	P503F082	8.2				
P503A083	P503F083	8.3				
P503A084	P503F084	8.4				
P503A085	P503F085	8.5				
P503A086	P503F086	8.6				
P503A087	P503F087	8.7				
P503A088	P503F088	8.8				
P503A089	P503F089	8.9				
P503A090	P503F090	9.0				
P503A091	P503F091	9.1				
P503A092	P503F092	9.2				
P503A093	P503F093	9.3				
P503A094	P503F094	9.4				
P503A095	P503F095	9.5				
P503A096	P503F096	9.6				
P503A097	P503F097	9.7				
P503A098	P503F098	9.8				
P503A099	P503F099	9.9				
P503A100	P503F100	10.0				
P503A101	P503F101	10.1	12	40	55	102
P503A102	P503F102	10.2				
P503A103	P503F103	10.3				
P503A104	P503F104	10.4				
P503A105	P503F105	10.5				
P503A106	P503F106	10.6				
P503A107	P503F107	10.7				
P503A108	P503F108	10.8				
P503A109	P503F109	10.9				
P503A110	P503F110	11.0				
P503A111	P503F111	11.1				
P503A112	P503F112	11.2				
P503A113	P503F113	11.3				
P503A114	P503F114	11.4				
P503A115	P503F115	11.5				
P503A116	P503F116	11.6				
P503A117	P503F117	11.7				
P503A118	P503F118	11.8				
P503A119	P503F119	11.9				
P503A120	P503F120	12.0				

※ These tools are manufactured based on order received.

NEXT ≫

P503A / P503F ...series

p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
P503A104	P503F104	10.4	12	40	55	102
P503A105	P503F105	10.5				
P503A106	P503F106	10.6				
P503A107	P503F107	10.7				
P503A108	P503F108	10.8				
P503A109	P503F109	10.9				
P503A110	P503F110	11.0				
P503A111	P503F111	11.1				
P503A112	P503F112	11.2				
P503A113	P503F113	11.3				
P503A114	P503F114	11.4				
P503A115	P503F115	11.5				
P503A116	P503F116	11.6				
P503A117	P503F117	11.7				
P503A118	P503F118	11.8				
P503A119	P503F119	11.9				
P503A120	P503F120	12.0				
P503A121	P503F121	12.1	14	43	60	107
P503A122	P503F122	12.2				
P503A123	P503F123	12.3				
P503A124	P503F124	12.4				
P503A125	P503F125	12.5				
P503A126	P503F126	12.6				
P503A127	P503F127	12.7				
P503A128	P503F128	12.8				
P503A129	P503F129	12.9				
P503A130	P503F130	13.0				
P503A131	P503F131	13.1				
P503A132	P503F132	13.2				
P503A133	P503F133	13.3				
P503A134	P503F134	13.4				
P503A135	P503F135	13.5				
P503A136	P503F136	13.6				
P503A137	P503F137	13.7				
P503A138	P503F138	13.8				
P503A139	P503F139	13.9				
P503A140	P503F140	14.0				
P503A141	P503F141	14.1	16	45	65	115
P503A142	P503F142	14.2				
P503A143	P503F143	14.3				
P503A144	P503F144	14.4				
P503A145	P503F145	14.5				
P503A146	P503F146	14.6				
P503A147	P503F147	14.7				
P503A148	P503F148	14.8				
P503A149	P503F149	14.9				
P503A150	P503F150	15.0				
P503A151	P503F151	15.1				
P503A152	P503F152	15.2				
P503A153	P503F153	15.3				
P503A154	P503F154	15.4				
P503A155	P503F155	15.5				
P503A156	P503F156	15.6				
P503A157	P503F157	15.7				
P503A158	P503F158	15.8				
P503A159	P503F159	15.9				
P503A160	P503F160	16.0				

※ These tools are manufactured based on order received.

NEXT ≫

P503A / P503F ...series

ULTRA FINE HELIX

p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
P503A161	P503F161	16.1	18	51	73	123
P503A163	P503F163	16.3				
P503A165	P503F165	16.5				
P503A170	P503F170	17.0				
P503A171	P503F171	17.1				
P503A172	P503F172	17.2				
P503A175	P503F175	17.5				
P503A177	P503F177	17.7				
P503A178	P503F178	17.8				
P503A180	P503F180	18.0				
P503A181	P503F181	18.1	20	55	79	131
P503A182	P503F182	18.2				
P503A185	P503F185	18.5				
P503A190	P503F190	19.0				
P503A191	P503F191	19.1				
P503A195	P503F195	19.5				
P503A197	P503F197	19.7				
P503A200	P503F200	20.0				

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

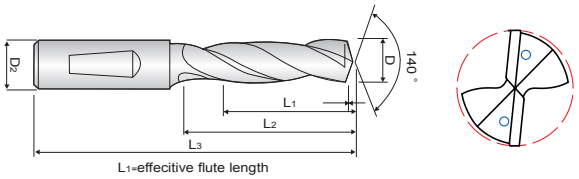
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting Edge(m7)	+12 +2	+16 +4	+21 +6	+25 +7	+29 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



POWER MAX DRILL
STUB INTERNAL COOLANT / DIN 6537K

■ Shank Type

- PI503A : DIN 6535 HA - straight A type
- PI503F : DIN 6535 HE - 2°Whistle Flat F type

PI503A / PI503F ...series

DIN 6537K | UWC ULTRA FINE | 30° HELIX | TiAlN HH | 3xD | m7 | 140° | DATA p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
PI503A030	PI503F030	3.0	6	14	20	62
PI503A031	PI503F031	3.1				
PI503A032	PI503F032	3.2				
PI503A033	PI503F033	3.3				
PI503A034	PI503F034	3.4				
PI503A035	PI503F035	3.5				
PI503A036	PI503F036	3.6				
PI503A037	PI503F037	3.7				
PI503A038	PI503F038	3.8	6	17	24	66
PI503A039	PI503F039	3.9				
PI503A040	PI503F040	4.0				
PI503A041	PI503F041	4.1				
PI503A042	PI503F042	4.2				
PI503A043	PI503F043	4.3				
PI503A044	PI503F044	4.4				
PI503A045	PI503F045	4.5				
PI503A046	PI503F046	4.6				
PI503A047	PI503F047	4.7				
PI503A048	PI503F048	4.8	6	20	28	66
PI503A049	PI503F049	4.9				
PI503A050	PI503F050	5.0				
PI503A051	PI503F051	5.1				
PI503A052	PI503F052	5.2				
PI503A053	PI503F053	5.3				
PI503A054	PI503F054	5.4				
PI503A055	PI503F055	5.5				
PI503A056	PI503F056	5.6				
PI503A057	PI503F057	5.7				
PI503A058	PI503F058	5.8				
PI503A059	PI503F059	5.9				
PI503A060	PI503F060	6.0				
PI503A061	PI503F061	6.1	8	24	34	79
PI503A062	PI503F062	6.2				
PI503A063	PI503F063	6.3				
PI503A064	PI503F064	6.4				
PI503A065	PI503F065	6.5				
PI503A066	PI503F066	6.6				

※ These tools are manufactured based on order received.

NEXT ≫

PI503A / PI503F ...series

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
PI503A067	PI503F067	6.7	8	24	34	79
PI503A068	PI503F068	6.8				
PI503A069	PI503F069	6.9				
PI503A070	PI503F070	7.0				
PI503A071	PI503F071	7.1	8	29	41	79
PI503A072	PI503F072	7.2				
PI503A073	PI503F073	7.3				
PI503A074	PI503F074	7.4				
PI503A075	PI503F075	7.5				
PI503A076	PI503F076	7.6				
PI503A077	PI503F077	7.7				
PI503A078	PI503F078	7.8				
PI503A079	PI503F079	7.9				
PI503A080	PI503F080	8.0				
PI503A081	PI503F081	8.1	10	35	47	89
PI503A082	PI503F082	8.2				
PI503A083	PI503F083	8.3				
PI503A084	PI503F084	8.4				
PI503A085	PI503F085	8.5				
PI503A086	PI503F086	8.6				
PI503A087	PI503F087	8.7				
PI503A088	PI503F088	8.8				
PI503A089	PI503F089	8.9				
PI503A090	PI503F090	9.0				
PI503A091	PI503F091	9.1				
PI503A092	PI503F092	9.2				
PI503A093	PI503F093	9.3				
PI503A094	PI503F094	9.4				
PI503A095	PI503F095	9.5				
PI503A096	PI503F096	9.6				
PI503A097	PI503F097	9.7				
PI503A098	PI503F098	9.8				
PI503A099	PI503F099	9.9				
PI503A100	PI503F100	10.0				
PI503A101	PI503F101	10.1	12	40	55	102
PI503A102	PI503F102	10.2				
PI503A103	PI503F103	10.3				
PI503A104	PI503F104	10.4				
PI503A105	PI503F105	10.5				
PI503A106	PI503F106	10.6				
PI503A107	PI503F107	10.7				
PI503A108	PI503F108	10.8				
PI503A109	PI503F109	10.9				
PI503A110	PI503F110	11.0				
PI503A111	PI503F111	11.1				
PI503A112	PI503F112	11.2				
PI503A113	PI503F113	11.3				
PI503A114	PI503F114	11.4				
PI503A115	PI503F115	11.5				
PI503A116	PI503F116	11.6				
PI503A117	PI503F117	11.7				
PI503A118	PI503F118	11.8				
PI503A119	PI503F119	11.9				
PI503A120	PI503F120	12.0				

※ These tools are manufactured based on order received.

NEXT ≫

PI503A / PI503F ...series

DIN 6537K | UWC ULTRA FINE | 30 HELIX | TiAlN HH | 3xD | m7 | 140° | DATA p.1035

EDP. No.	EDP. No.	D_1	D_2	L_1	L_2	L_3
PI503A121	PI503F121	12.1	14	43	60	107
PI503A122	PI503F122	12.2				
PI503A123	PI503F123	12.3				
PI503A124	PI503F124	12.4				
PI503A125	PI503F125	12.5				
PI503A126	PI503F126	12.6				
PI503A127	PI503F127	12.7				
PI503A128	PI503F128	12.8				
PI503A129	PI503F129	12.9				
PI503A130	PI503F130	13.0				
PI503A131	PI503F131	13.1				
PI503A132	PI503F132	13.2				
PI503A133	PI503F133	13.3				
PI503A134	PI503F134	13.4				
PI503A135	PI503F135	13.5				
PI503A136	PI503F136	13.6				
PI503A137	PI503F137	13.7				
PI503A138	PI503F138	13.8				
PI503A139	PI503F139	13.9				
PI503A140	PI503F140	14.0				
PI503A141	PI503F141	14.1	16	45	65	115
PI503A142	PI503F142	14.2				
PI503A143	PI503F143	14.3				
PI503A144	PI503F144	14.4				
PI503A145	PI503F145	14.5				
PI503A146	PI503F146	14.6				
PI503A147	PI503F147	14.7				
PI503A148	PI503F148	14.8				
PI503A149	PI503F149	14.9				
PI503A150	PI503F150	15.0				
PI503A151	PI503F151	15.1				
PI503A152	PI503F152	15.2				
PI503A153	PI503F153	15.3				
PI503A154	PI503F154	15.4				
PI503A155	PI503F155	15.5				
PI503A156	PI503F156	15.6				
PI503A157	PI503F157	15.7				
PI503A158	PI503F158	15.8				
PI503A159	PI503F159	15.9				
PI503A160	PI503F160	16.0				
PI503A161	PI503F161	16.1	18	51	73	123
PI503A163	PI503F163	16.3				
PI503A165	PI503F165	16.5				
PI503A170	PI503F170	17.0				
PI503A171	PI503F171	17.1				
PI503A172	PI503F172	17.2				
PI503A175	PI503F175	17.5				
PI503A177	PI503F177	17.7				
PI503A178	PI503F178	17.8				
PI503A180	PI503F180	18.0				

※ These tools are manufactured based on order received.

NEXT ≫

PI503A / PI503F ...series

ULTRA FINE HELIX m7 p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
PI503A181	PI503F181	18.1	20	55	79	131
PI503A182	PI503F182	18.2				
PI503A185	PI503F185	18.5				
PI503A190	PI503F190	19.0				
PI503A191	PI503F191	19.1				
PI503A195	PI503F195	19.5				
PI503A197	PI503F197	19.7				
PI503A200	PI503F200	20.0				

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

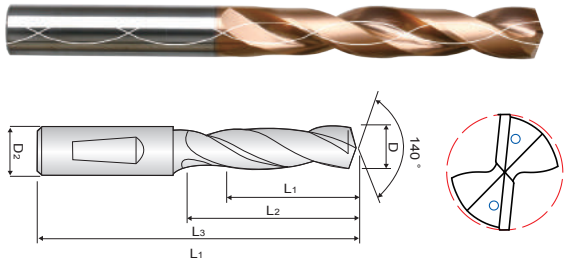
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m7)	+12 +2	+16 +4	+21 +6	+25 +7	+29 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for high hardened steel *Power Max Drill Series*



POWER MX DRILL
MEDIUM INTERNAL COOLANT

■ Shank Form

- PI505A : DIN 6535 HA - straight A type
- PI505F : DIN 6535 HE - 2°Whistle Flat F type

PI505A / PI505F ...series

ULTRA FINE | HELIX | m7 | p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
PI505A040	PI505F040	4.0	6	29	36	74
PI505A041	PI505F041	4.1				
PI505A042	PI505F042	4.2				
PI505A043	PI505F043	4.3				
PI505A044	PI505F044	4.4				
PI505A045	PI505F045	4.5				
PI505A046	PI505F046	4.6				
PI505A047	PI505F047	4.7				
PI505A048	PI505F048	4.8	6	35	44	82
PI505A049	PI505F049	4.9				
PI505A050	PI505F050	5.0				
PI505A051	PI505F051	5.1				
PI505A052	PI505F052	5.2				
PI505A053	PI505F053	5.3				
PI505A054	PI505F054	5.4				
PI505A055	PI505F055	5.5				
PI505A056	PI505F056	5.6				
PI505A057	PI505F057	5.7				
PI505A058	PI505F058	5.8				
PI505A059	PI505F059	5.9				
PI505A060	PI505F060	6.0				
PI505A061	PI505F061	6.1	8	43	53	91
PI505A062	PI505F062	6.2				
PI505A063	PI505F063	6.3				
PI505A064	PI505F064	6.4				
PI505A065	PI505F065	6.5				
PI505A066	PI505F066	6.6				
PI505A067	PI505F067	6.7				
PI505A068	PI505F068	6.8				
PI505A069	PI505F069	6.9				
PI505A070	PI505F070	7.0				
PI505A071	PI505F071	7.1				
PI505A072	PI505F072	7.2				
PI505A073	PI505F073	7.3				
PI505A074	PI505F074	7.4				
PI505A075	PI505F075	7.5				
PI505A076	PI505F076	7.6				

※ These tools are manufactured based on order received.

NEXT ≫

PI505A / PI505F ...series

ULTRA FINE

HELIX

m7

p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
PI505A077	PI505F077	7.7	8	43	53	91
PI505A078	PI505F078	7.8				
PI505A079	PI505F079	7.9				
PI505A080	PI505F080	8.0				
PI505A081	PI505F081	8.1	10	49	61	103
PI505A082	PI505F082	8.2				
PI505A083	PI505F083	8.3				
PI505A084	PI505F084	8.4				
PI505A085	PI505F085	8.5				
PI505A086	PI505F086	8.6				
PI505A087	PI505F087	8.7				
PI505A088	PI505F088	8.8				
PI505A089	PI505F089	8.9				
PI505A090	PI505F090	9.0				
PI505A091	PI505F091	9.1				
PI505A092	PI505F092	9.2				
PI505A093	PI505F093	9.3				
PI505A094	PI505F094	9.4				
PI505A095	PI505F095	9.5				
PI505A096	PI505F096	9.6				
PI505A097	PI505F097	9.7				
PI505A098	PI505F098	9.8				
PI505A099	PI505F099	9.9				
PI505A100	PI505F100	10.0				
PI505A101	PI505F101	10.1	12	56	71	118
PI505A102	PI505F102	10.2				
PI505A103	PI505F103	10.3				
PI505A104	PI505F104	10.4				
PI505A105	PI505F105	10.5				
PI505A106	PI505F106	10.6				
PI505A107	PI505F107	10.7				
PI505A108	PI505F108	10.8				
PI505A109	PI505F109	10.9				
PI505A110	PI505F110	11.0				
PI505A111	PI505F111	11.1				
PI505A112	PI505F112	11.2				
PI505A113	PI505F113	11.3				
PI505A114	PI505F114	11.4				
PI505A115	PI505F115	11.5				
PI505A116	PI505F116	11.6				
PI505A117	PI505F117	11.7				
PI505A118	PI505F118	11.8				
PI505A119	PI505F119	11.9				
PI505A120	PI505F120	12.0				
PI505A121	PI505F121	12.1	14	60	77	124
PI505A122	PI505F122	12.2				
PI505A123	PI505F123	12.3				
PI505A124	PI505F124	12.4				
PI505A125	PI505F125	12.5				
PI505A126	PI505F126	12.6				
PI505A127	PI505F127	12.7				
PI505A128	PI505F128	12.8				
PI505A129	PI505F129	12.9				
PI505A130	PI505F130	13.0				
PI505A131	PI505F131	13.1				
PI505A132	PI505F132	13.2				
PI505A133	PI505F133	13.3				
PI505A134	PI505F134	13.4				
PI505A135	PI505F135	13.5				
PI505A136	PI505F136	13.6				
PI505A137	PI505F137	13.7				
PI505A138	PI505F138	13.8				
PI505A139	PI505F139	13.9				
PI505A140	PI505F140	14.0				

※ These tools are manufactured based on order received.

NEXT ≫

PI505A / PI505F ...series

ULTRA FINE

HELIX

m7

p.1035

EDP. No.	EDP. No.	D	D_2	L_1	L_2	L_3
PI505A141	PI505F141	14.1	16	63	83	133
PI505A142	PI505F142	14.2				
PI505A143	PI505F143	14.3				
PI505A144	PI505F144	14.4				
PI505A145	PI505F145	14.5				
PI505A146	PI505F146	14.6				
PI505A147	PI505F147	14.7				
PI505A148	PI505F148	14.8				
PI505A149	PI505F149	14.9				
PI505A150	PI505F150	15.0				
PI505A151	PI505F151	15.1				
PI505A152	PI505F152	15.2				
PI505A153	PI505F153	15.3				
PI505A154	PI505F154	15.4				
PI505A155	PI505F155	15.5				
PI505A156	PI505F156	15.6				
PI505A157	PI505F157	15.7				
PI505A158	PI505F158	15.8				
PI505A159	PI505F159	15.9				
PI505A160	PI505F160	16.0				
PI505A161	PI505F161	16.1	18	71	93	143
PI505A163	PI505F163	16.3				
PI505A165	PI505F165	16.5				
PI505A170	PI505F170	17.0				
PI505A171	PI505F171	17.1				
PI505A172	PI505F172	17.2				
PI505A175	PI505F175	17.5				
PI505A177	PI505F177	17.7				
PI505A178	PI505F178	17.8				
PI505A180	PI505F180	18.0				
PI505A181	PI505F181	18.1	20	77	101	153
PI505A182	PI505F182	18.2				
PI505A185	PI505F185	18.5				
PI505A190	PI505F190	19.0				
PI505A191	PI505F191	19.1				
PI505A195	PI505F195	19.5				
PI505A197	PI505F197	19.7				
PI505A200	PI505F200	20.0				

※ These tools are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m7)	+12 +2	+16 +4	+21 +6	+25 +7	+29 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

MEMO

Drills for General Speed Cutting

POWER DRILL SERIES

DRILL SERIES

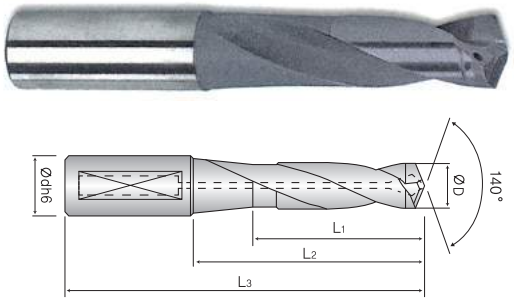
Drills for General Speed Cutting *Power Drill Series*

Drills for General Speed Cutting _ Power Drill Series

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
TDSI ...series		TIPPED DRILL STUB LENGTH -INTERNAL COOLANT TYPE	METRIC	•	620
TDLI ...series		TIPPED DRILL STUB LENGTH -INTERNAL COOLANT TYPE	METRIC	•	622
PDS ...series		STUB TYPE - 3 X D	METRIC	•	624
PDM ...series		MEDIUM TYPE - 5 X D	METRIC	•	626
PDSI ...series		STUB TYPE - 3 x D	METRIC	•	628
PDMI ...series		MEDIUM TYPE - 5 x D	METRIC	•	630
PX503G ...series		POWER DRILL (X-treme)	METRIC	•	632
PX505G ...series		POWER DRILL (X-treme)	METRIC	•	634
PXI505 ...series		POWER DRILL (X-treme)	METRIC	•	636
CTS ...series		COUNTER BORE SOLID-BOTTOM DRILL	METRIC	•	638

Drills for General Speed Cutting *Power Drill Series*



Tipped Drill Stub length
- Internal coolant type

TDSI ...series

MG FINE GRAIN · 25° HELIX · TiAlN · h8 · 140°

EDP. No.	D	L1	L2	L3	d
TDSI135	13.5	51	67	115	16
TDSI136	13.6				
TDSI137	13.7				
TDSI138	13.8				
TDSI139	13.9				
TDSI140	14				
TDSI141	14.1				
TDSI142	14.2				
TDSI143	14.3				
TDSI144	14.4				
TDSI145	14.5				
TDSI146	14.6	54	75	125	20
TDSI147	14.7				
TDSI148	14.8				
TDSI149	14.9				
TDSI150	15				
TDSI151	15.1				
TDSI152	15.2				
TDSI153	15.3				
TDSI154	15.4				
TDSI155	15.5				
TDSI156	15.6	58	80	130	20
TDSI157	15.7				
TDSI158	15.8				
TDSI59	15.9				
TDSI160	16				
TDSI161	16.1				
TDSI162	16.2				
TDSI163	16.3				
TDSI164	16.4				
TDSI165	16.5				

EDP. No.	D	L1	L2	L3	d
TDSI166	16.6	61	85	135	20
TDSI167	16.7				
TDSI168	16.8				
TDSI169	16.9				
TDSI170	17				
TDSI171	17.1				
TDSI172	17.2				
TDSI173	17.3				
TDSI174	17.4				
TDSI175	17.5				
TDSI177	17.7	65	90	140	20
TDSI178	17.8				
TDSI180	18				
TDSI181	18.1				
TDSI182	18.2				
TDSI185	18.5				
TDSI190	19	68	99	155	25
TDSI191	19.1				
TDSI193	19.3				
TDSI195	19.5				
TDSI197	19.7	72	99	155	25
TDSI200	20				
TDSI205	20.5				
TDSI210	21	75			
TDSI215	21.5				
TDSI220	22	79	104	160	25
TDSI225	22.5				
TDSI230	23	82			
TDSI235	23.5				

NEXT ≫≫

TDSI ...series

FINE GRAIN HELIX h8

EDP. No.	D	L_1	L_2	L_3	d
TDSI240	24	86	110	170	32
TDSI245	24.5				
TDSI250	25	88			
TDSI255	25.5				
TDSI260	26	92	115	175	32
TDSI265	26.5				
TDSI270	27	94			
TDSI275	27.5				
TDSI280	28	97	120	180	32
TDSI285	28.5				

EDP. No.	D	L_1	L_2	L_3	d
TDSI310	31	110	135	210	40
TDSI315	31.5				
TDSI320	32	115			
TDSI325	32.5				
TDSI330	33	120		220	40
TDSI335	33.5		150		
TDSI340	34	125			
TDSI345	34.5				
TDSI350	35	130	160	230	40

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

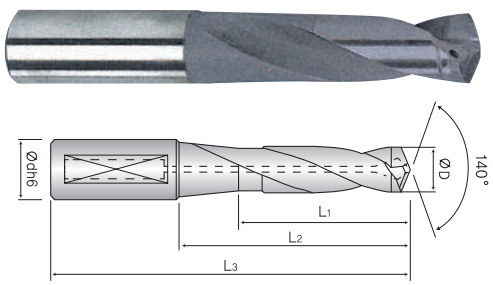
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33	0 -39
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

Drills for General Speed Cutting *Power Drill Series*



Tipped Drill Long length
- Internal coolant type

TDLI ...series

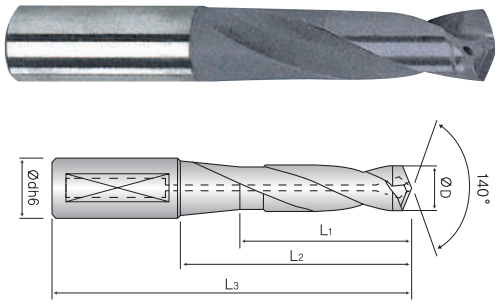
MG FINE GRAIN · 25° HELIX · TiAlN · h8 · 140°

EDP. No.	D	L1	L2	L3	d
TDLI135	13.5	80	97	145	16
TDLI136	13.6				
TDLI137	13.7				
TDLI138	13.8				
TDLI139	13.9				
TDLI140	14				
TDLI141	14.1				
TDLI142	14.2				
TDLI143	14.3				
TDLI144	14.4				
TDLI145	14.5				
TDLI146	14.6	85	105	155	20
TDLI147	14.7				
TDLI148	14.8				
TDLI149	14.9				
TDLI150	15				
TDLI151	15.1				
TDLI152	15.2				
TDLI153	15.3				
TDLI154	15.4				
TDLI155	15.5				
TDLI156	15.6	91	115	165	20
TDLI157	15.7				
TDLI158	15.8				
TDLI159	15.9				
TDLI160	16				
TDLI161	16.1				
TDLI162	16.2				
TDLI163	16.3				
TDLI164	16.4				
TDLI165	16.5				

EDP. No.	D	L1	L2	L3	d
TDLI166	16.6	96	120	175	20
TDLI170	17				
TDLI171	17.1				
TDLI172	17.2				
TDLI173	17.3				
TDLI175	17.5				
TDLI166	16.6	96	120	175	20
TDLI170	17				
TDLI171	17.1				
TDLI172	17.2				
TDLI173	17.3				
TDLI175	17.5				
TDLI177	17.7	102	125	175	20
TDLI178	17.8				
TDLI180	18				
TDLI181	18.1				
TDLI182	18.2				
TDLI185	18.5				
TDLI190	19	107	134	190	25
TDLI191	19.1				
TDLI193	19.3				
TDLI195	19.5				
TDLI197	19.7	113	139	195	25
TDLI200	20				
TDLI201	20.1				
TDLI203	20.3				
TDLI205	20.5				
TDLI210	21	118	139	195	25
TDLI212	21.2				
TDLI215	21.5				

NEXT ≫≫

Drills for General Speed Cutting *Power Drill Series*



Tipped Drill Long length
- Internal coolant type

TDLI ...series

FINE GRAIN HELIX h8

EDP. No.	D	L1	L2	L3	d
TDLI220	22	124	144	200	25
TDLI225	22.5				
TDLI230	23	129	154	210	25
TDLI235	23.5				
TDLI240	24	135	160	220	32
TDLI245	24.5				
TDLI250	25	140	165	225	32
TDLI255	25.5				
TDLI260	26	146	170	230	32
TDLI265	26.5				
TDLI270	27	151	175	235	32
TDLI275	27.5				
TDLI280	28	157	180	240	32
TDLI285	28.5				

EDP. No.	D	L1	L2	L3	d
TDLI290	29	162	185	245	32
TDLI295	29.5				
TDLI300	30	167	195	255	32
TDLI305	30.5				
TDLI310	31	172	210	280	40
TDLI315	31.5				
TDLI320	32				
TDLI325	32.5				
TDLI330	33	177	220	290	40
TDLI335	33.5				
TDLI340	34				
TDLI345	34.5				
TDLI350	35	183	230	300	40

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

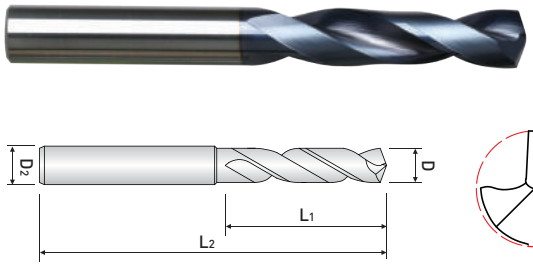
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33	0 -39
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

Drills for General Speed Cutting *Power Drill Series*



POWER DRILL - STUB / 3 x D

PDS ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D	L1	L2	D2
PDS010	1	8	38	3
PDS011	1.1	10	42	
PDS012	1.2			
PDS013	1.3			
PDS014	1.4	11		
PDS015	1.5			
PDS016	1.6	12		
PDS017	1.7			
PDS018	1.8	13		
PDS019	1.9			
PDS020	2.0	14	50	3
PDS021	2.1			
PDS022	2.2			
PDS023	2.3			
PDS024	2.4			
PDS025	2.5			
PDS026	2.6			
PDS027	2.7			
PDS028	2.8			
PDS029	2.9			
PDS030	3.0	18	60	
PDS031	3.1	20	60	4
PDS032	3.2			
PDS033	3.3			
PDS034	3.4	22		
PDS035	3.5			
PDS036	3.6			
PDS037	3.7			
PDS038	3.8	24		
PDS039	3.9			
PDS040	4.0			
PDS041	4.1	24	62	5
PDS042	4.2	26		
PDS043	4.3			
PDS044	4.4			
PDS045	4.5			
PDS046	4.6			
PDS047	4.7			
PDS048	4.8			
PDS049	4.9			
PDS050	5.0			
PDS051	5.1	28	66	6

EDP. No.	D	L1	L2	D2
PDS052	5.2	28	66	6
PDS053	5.3			
PDS054	5.4			
PDS055	5.5			
PDS056	5.6	30		
PDS057	5.7			
PDS058	5.8			
PDS059	5.9			
PDS060	6.0			
PDS061	6.1	34	74	7
PDS062	6.2			
PDS063	6.3			
PDS064	6.4			
PDS065	6.5			
PDS066	6.6			
PDS067	6.7	37		
PDS068	6.8			
PDS069	6.9			
PDS070	7.0			
PDS071	7.1	40	79	8
PDS072	7.2			
PDS073	7.3			
PDS074	7.4			
PDS075	7.5			
PDS076	7.6			
PDS077	7.7			
PDS078	7.8			
PDS079	7.9			
PDS080	8.0			
PDS081	8.1	43	84	9
PDS082	8.2			
PDS083	8.3			
PDS084	8.4			
PDS085	8.5			
PDS086	8.6			
PDS087	8.7			
PDS088	8.8			
PDS089	8.9			
PDS090	9.0			
PDS091	9.1	47	89	10
PDS092	9.2			
PDS093	9.3			

NEXT >>

PDS ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D	L_1	L_2	D_2
PDS094	9.4	47	89	10
PDS095	9.5			
PDS096	9.6			
PDS097	9.7			
PDS098	9.8			
PDS099	9.9			
PDS100	10.0			
PDS101	10.1	51	95	11
PDS102	10.2			
PDS103	10.3			
PDS104	10.4			
PDS105	10.5			
PDS106	10.6			
PDS107	10.7			
PDS108	10.8			
PDS109	10.9			
PDS110	11.0			
PDS111	11.1	54	102	12
PDS112	11.2			
PDS113	11.3			
PDS114	11.4			
PDS115	11.5			
PDS116	11.6			
PDS117	11.7			
PDS118	11.8			
PDS119	11.9			
PDS120	12.0			
PDS121	12.1	57	102	13
PDS122	12.2			
PDS123	12.3			
PDS124	12.4			
PDS125	12.5			
PDS126	12.6			
PDS127	12.7			
PDS128	12.8			
PDS129	12.9			
PDS130	13.0			
PDS131	13.1	60	107	14
PDS132	13.2			
PDS133	13.3			
PDS132	13.4			
PDS135	13.5			
PDS136	13.6			
PDS137	13.7			
PDS138	13.8			
PDS139	13.9			
PDS140	14.0			

EDP. No.	D	L_1	L_2	D_2
PDS141	14.1	62	111	15
PDS142	14.2			
PDS143	14.3			
PDS144	14.4			
PDS145	14.5			
PDS146	14.6			
PDS147	14.7			
PDS148	14.8			
PDS149	14.9			
PDS150	15.0			
PDS151	15.1	64	115	16
PDS152	15.2			
PDS154	15.4			
PDS155	15.5			
PDS156	15.6			
PDS157	15.7			
PDS158	15.8			
PDS159	15.9			
PDS160	16.0			
PDS161	16.1	66	119	17
PDS163	16.3			
PDS164	16.4			
PDS165	16.5			
PDS170	17.0			
PDS171	17.1	66	123	18
PDS172	17.2			
PDS173	17.3			
PDS175	17.5			
PDS177	17.7			
PDS178	17.8			
PDS180	18.0			
PDS181	18.1	70	127	19
PDS182	18.2			
PDS185	18.5			
PDS190	19.0			
PDS191	19.1	70	131	20
PDS192	19.2			
PDS195	19.5			
PDS197	19.7			
PDS200	20.0			
PDS220	22.0	75	131	22
PDS225	22.5	80	131	23
PDS230	23.0	86	140	23
PDS235	23.5	86	140	24
PDS240	24.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

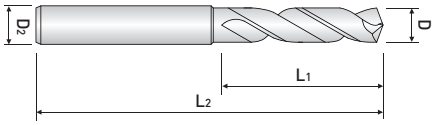
○:General Application ◎:The most suitable Application

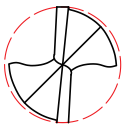
■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for General Speed Cutting *Power Drill Series*





POWER DRILL - MEDIUM / 5 x D

PDM ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D	L1	L2	D2
PDM030	3.0	25	60	3
PDM031	3.1	27		4
PDM032	3.2			
PDM033	3.3			
PDM034	3.4	30	65	
PDM035	3.5			
PDM036	3.6			
PDM037	3.7			
PDM038	3.8	33	71	
PDM039	3.9			
PDM040	4.0			
PDM041	4.1	33	71	5
PDM042	4.2			
PDM043	4.3	36		
PDM044	4.4			
PDM045	4.5			
PDM046	4.6			
PDM047	4.7			
PDM048	4.8	39		
PDM049	4.9			
PDM050	5.0			
PDM051	5.1	39	83	6
PDM052	5.2			
PDM053	5.3			
PDM054	5.4	43		
PDM055	5.5			
PDM056	5.6			
PDM057	5.7			
PDM058	5.8			
PDM059	5.9			
PDM060	6.0			
PDM061	6.1	47	87	7
PDM062	6.2			
PDM063	6.3			
PDM064	6.4			
PDM065	6.5			
PDM066	6.6			

EDP. No.	D	L1	L2	D2
PDM067	6.7	47	87	7
PDM068	6.8			
PDM069	6.9			
PDM070	7.0			
PDM071	7.1	52	92	8
PDM072	7.2			
PDM073	7.3			
PDM074	7.4			
PDM075	7.5			
PDM076	7.6			
PDM077	7.7			
PDM078	7.8			
PDM079	7.9			
PDM080	8.0			
PDM081	8.1	56	96	9
PDM082	8.2			
PDM083	8.3			
PDM084	8.4			
PDM085	8.5			
PDM086	8.6			
PDM087	8.7			
PDM088	8.8			
PDM089	8.9			
PDM090	9.0			
PDM091	9.1	62	105	10
PDM092	9.2			
PDM093	9.3			
PDM094	9.4			
PDM095	9.5			
PDM096	9.6			
PDM097	9.7			
PDM098	9.8			
PDM099	9.9			
PDM100	10.0			
PDM101	10.1	68	115	11
PDM102	10.2			
PDM103	10.3			

NEXT

PDM ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D	L_1	L_2	D_2
PDM104	10.4	68	115	11
PDM105	10.5			
PDM106	10.6			
PDM107	10.7			
PDM108	10.8			
PDM109	10.9			
PDM110	11.0			
PDM111	11.1	71	121	12
PDM112	11.2			
PDM113	11.3			
PDM114	11.4			
PDM115	11.5			
PDM116	11.6			
PDM117	11.7			
PDM118	11.8			
PDM119	11.9			
PDM120	12.0			
PDM121	12.1	75	125	13
PDM122	12.2			
PDM123	12.3			
PDM124	12.4			
PDM125	12.5			
PDM126	12.6			
PDM127	12.7			
PDM128	12.8			
PDM129	12.9			
PDM130	13.0			
PDM131	13.1	80	134	14
PDM132	13.2			
PDM133	13.3			
PDM134	13.4			
PDM135	13.5			
PDM136	13.6			
PDM137	13.7			
PDM138	13.8			
PDM139	13.9			
PDM140	14.0			

EDP. No.	D	L_1	L_2	D_2
PDM141	14.1	83	143	15
PDM142	14.2			
PDM143	14.3			
PDM144	14.4			
PDM145	14.5			
PDM146	14.6			
PDM147	14.7			
PDM148	14.8			
PDM149	14.9			
PDM150	15.0			
PDM151	15.1	90	152	16
PDM152	15.2			
PDM154	15.4			
PDM155	15.5			
PDM156	15.6			
PDM157	15.7			
PDM158	15.8			
PDM160	16.0			
PDM161	16.1	95	155	17
PDM163	16.3			
PDM165	16.5			
PDM170	17.0			
PDM171	17.1	100	157	18
PDM172	17.2			
PDM175	17.5			
PDM177	17.7			
PDM178	17.8			
PDM180	18.0			
PDM181	18.1	105	160	19
PDM182	18.2			
PDM185	18.5			
PDM190	19.0			
PDM191	19.1	110	163	20
PDM195	19.5			
PDM197	19.7			
PDM200	20.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

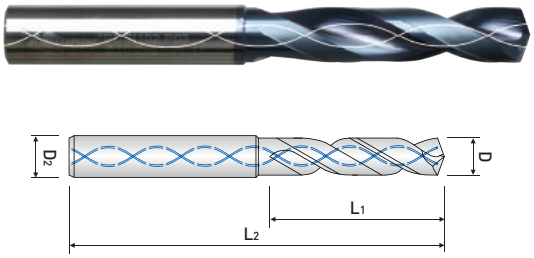
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for General Speed Cutting *Power Drill Series*



POWER DRILL - STUB
INTERNAL COOLANT / 3 x D

PDSI ...series

UWC ULTRA FINE | 30° HELIX | TiAlN | 3xD | h8 | 140° | DATA p.1034

EDP. No.	D	L1	L2	D2
PDSI030	3.0	18	60	3
PDSI031	3.1	20		4
PDSI032	3.2			
PDSI033	3.3			
PDSI034	3.4	22		
PDSI035	3.5			
PDSI036	3.6			
PDSI037	3.7			
PDSI038	3.8	24		
PDSI039	3.9			
PDSI040	4.0			
PDSI041	4.1	24	62	5
PDSI042	4.2	26		
PDSI043	4.3			
PDSI044	4.4			
PDSI045	4.5			
PDSI046	4.6			
PDSI047	4.7			
PDSI048	4.8			
PDSI049	4.9			
PDSI050	5.0			
PDSI051	5.1	28	66	6
PDSI052	5.2			
PDSI053	5.3			
PDSI054	5.4			
PDSI055	5.5			
PDSI056	5.6	30		
PDSI057	5.7			
PDSI058	5.8			
PDSI059	5.9			
PDSI060	6.0			
PDSI061	6.1	34	74	7
PDSI062	6.2			
PDSI063	6.3			
PDSI064	6.4			
PDSI065	6.5			
PDSI066	6.6			

EDP. No.	D	L1	L2	D2
PDSI067	6.7	37	74	7
PDSI068	6.8			
PDSI069	6.9			
PDSI070	7.0			
PDSI071	7.1	40	79	8
PDSI072	7.2			
PDSI073	7.3			
PDSI074	7.4			
PDSI075	7.5			
PDSI076	7.6			
PDSI077	7.7			
PDSI078	7.8			
PDSI079	7.9			
PDSI080	8.0			
PDSI081	8.1	43	84	9
PDSI082	8.2			
PDSI083	8.3			
PDSI084	8.4			
PDSI085	8.5			
PDSI086	8.6			
PDSI087	8.7			
PDSI088	8.8			
PDSI089	8.9			
PDSI090	9.0			
PDSI091	9.1	47	89	10
PDSI092	9.2			
PDSI093	9.3			
PDSI094	9.4			
PDSI095	9.5			
PDSI096	9.6			
PDSI097	9.7			
PDSI098	9.8			
PDSI099	9.9			
PDSI100	10.0			
PDSI101	10.1	51	95	11
PDSI102	10.2			
PDSI103	10.3			

NEXT >>

PDSI ...series

ULTRA FINE HELIX

p.1034

EDP. No.	D	L1	L2	D2
PDSI104	10.4	51	95	11
PDSI105	10.5			
PDSI106	10.6			
PDSI107	10.7			
PDSI108	10.8			
PDSI109	10.9			
PDSI110	11.0			
PDSI111	11.1	54	102	12
PDSI112	11.2			
PDSI113	11.3			
PDSI114	11.4			
PDSI115	11.5			
PDSI116	11.6			
PDSI117	11.7			
PDSI118	11.8			
PDSI119	11.9			
PDSI120	12.0			
PDSI121	12.1	57	102	13
PDSI122	12.2			
PDSI123	12.3			
PDSI124	12.4			
PDSI125	12.5			
PDSI126	12.6			
PDSI127	12.7			
PDSI128	12.8			
PDSI129	12.9			
PDSI130	13.0			
PDSI131	13.1	60	107	14
PDSI132	13.2			
PDSI133	13.3			
PDSI134	13.4			
PDSI135	13.5			
PDSI136	13.6			
PDSI137	13.7			
PDSI138	13.8			
PDSI139	13.9			
PDSI140	14.0			

EDP. No.	D	L1	L2	D2
PDSI141	14.1	62	111	15
PDSI142	14.2			
PDSI143	14.3			
PDSI144	14.4			
PDSI145	14.5			
PDSI146	14.6			
PDSI147	14.7			
PDSI148	14.8			
PDSI149	14.9			
PDSI150	15.0			
PDSI151	15.1	64	115	16
PDSI152	15.2			
PDSI154	15.4			
PDSI155	15.5			
PDSI156	15.6			
PDSI157	15.7			
PDSI158	15.8			
PDSI160	16.0			
PDSI161	16.1	66	119	17
PDSI163	16.3			
PDSI165	16.5			
PDSI170	17.0			
PDSI171	17.1	66	123	18
PDSI172	17.2			
PDSI175	17.5			
PDSI177	17.7			
PDSI178	17.8			
PDSI180	18.0			
PDSI181	18.1	70	127	19
PDSI182	18.2			
PDSI185	18.5			
PDSI190	19.0			
PDSI191	19.1	70	131	20
PDSI195	19.5			
PDSI197	19.7			
PDSI200	20.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

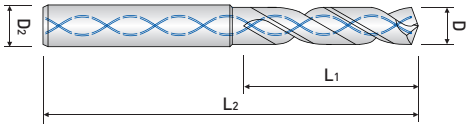
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for General Speed Cutting *Power Drill Series*



POWER DRILL - MEDIUM INTERNAL COOLANT / 5 x D

PDMI ...series

UWC ULTRA FINE · 30° HELIX · TiAlN · 5xD · h8 · 140° · DATA p.1034

EDP. No.	D	L1	L2	D2
PDMI031	3.1	27	74	4
PDMI032	3.2			
PDMI033	3.3			
PDMI034	3.4	30		
PDMI035	3.5			
PDMI036	3.6			
PDMI037	3.7			
PDMI038	3.8	33		
PDMI039	3.9			
PDMI040	4.0			
PDMI041	4.1	33	80	5
PDMI042	4.2			
PDMI043	4.3	36		
PDMI044	4.4			
PDMI045	4.5			
PDMI046	4.6			
PDMI047	4.7			
PDMI048	4.8	39		
PDMI049	4.9			
PDMI050	5.0			
PDMI051	5.1	39	87	6
PDMI052	5.2			
PDMI053	5.3			
PDMI054	5.4	43		
PDMI055	5.5			
PDMI056	5.6			
PDMI057	5.7			
PDMI058	5.8			
PDMI059	5.9			
PDMI060	6.0			
PDMI061	6.1	47	95	7
PDMI062	6.2			
PDMI063	6.3			
PDMI064	6.4			
PDMI065	6.5			
PDMI066	6.6			
PDMI067	6.7			

EDP. No.	D	L1	L2	D2
PDMI068	6.8	47	95	7
PDMI069	6.9			
PDMI070	7.0			
PDMI071	7.1	52	103	8
PDMI072	7.2			
PDMI073	7.3			
PDMI074	7.4			
PDMI075	7.5			
PDMI076	7.6			
PDMI077	7.7			
PDMI078	7.8			
PDMI079	7.9			
PDMI080	8.0			
PDMI081	8.1	56	105	9
PDMI082	8.2			
PDMI083	8.3			
PDMI084	8.4			
PDMI085	8.5			
PDMI086	8.6			
PDMI087	8.7			
PDMI088	8.8			
PDMI089	8.9			
PDMI090	9.0			
PDMI091	9.1	62	108	10
PDMI092	9.2			
PDMI093	9.3			
PDMI094	9.4			
PDMI095	9.5			
PDMI096	9.6			
PDMI097	9.7			
PDMI098	9.8			
PDMI099	9.9			
PDMI100	10.0			
PDMI101	10.1	68	125	11
PDMI102	10.2			
PDMI103	10.3			
PDMI104	10.4			

NEXT »»

PDMI ...series

ULTRA FINE HELIX h8 p.1034

EDP. No.	D	L_1	L_2	D_2
PDMI105	10.5	68	125	11
PDMI106	10.6			
PDMI107	10.7			
PDMI108	10.8			
PDMI109	10.9			
PDMI110	11.0			
PDMI111	11.1	71	133	12
PDMI112	11.2			
PDMI113	11.3			
PDMI114	11.4			
PDMI115	11.5			
PDMI116	11.6			
PDMI117	11.7			
PDMI118	11.8			
PDMI119	11.9			
PDMI120	12.0			
PDMI121	12.1	75	137	13
PDMI122	12.2			
PDMI123	12.3			
PDMI124	12.4			
PDMI125	12.5			
PDMI126	12.6			
PDMI127	12.7			
PDMI128	12.8			
PDMI129	12.9			
PDMI130	13.0			
PDMI131	13.1	80	142	14
PDMI132	13.2			
PDMI133	13.3			
PDMI134	13.4			
PDMI135	13.5			
PDMI136	13.6			
PDMI137	13.7			
PDMI138	13.8			
PDMI139	13.9			
PDMI140	14.0			

EDP. No.	D	L_1	L_2	D_2
PDMI141	14.1	83	148	15
PDMI142	14.2			
PDMI143	14.3			
PDMI144	14.4			
PDMI145	14.5			
PDMI146	14.6			
PDMI147	14.7			
PDMI148	14.8			
PDMI149	14.9			
PDMI150	15.0			
PDMI151	15.1	90	152	16
PDMI152	15.2			
PDMI154	15.4			
PDMI155	15.5			
PDMI156	15.6			
PDMI157	15.7			
PDMI158	15.8			
PDMI160	16.0			
PDMI161	16.1	95	155	17
PDMI163	16.3			
PDMI165	16.5			
PDMI170	17.0			
PDMI171	17.1	100	157	18
PDMI172	17.2			
PDMI175	17.5			
PDMI177	17.7			
PDMI178	17.8			
PDMI180	18.0			
PDMI181	18.1	105	160	19
PDMI182	18.2			
PDMI185	18.5			
PDMI190	19.0			
PDMI191	19.1	110	163	20
PDMI195	19.5			
PDMI197	19.7			
PDMI200	20.0			

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			○		◎

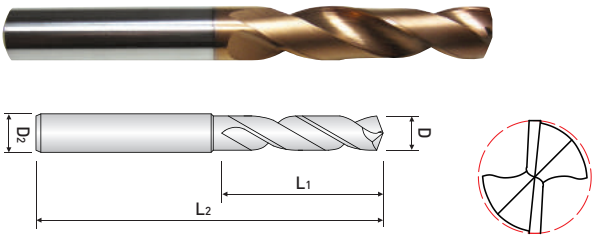
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Drills for General Speed Cutting *Power Drill Series*



POWER DRILL X-treme

- Superior chip evacuation with unique flute design
- Outstanding performance for high ductility materials or soft steels like stainless steel
- Longer tool life and improvement on stable machining with W coating

PX503G ...series

ULTRA FINE | HELIX | W Coating | | h8 | | p.1037

EDP. No.	D	L_1	L_2	D_2
PX503G010	1	8	38	3
PX503G011	1.1	10	42	3
PX503G012	1.2	10	42	3
PX503G013	1.3	10	42	3
PX503G014	1.4	11	42	3
PX503G015	1.5	11	42	3
PX503G016	1.6	12	42	3
PX503G017	1.7	12	42	3
PX503G018	1.8	13	42	3
PX503G019	1.9	13	42	3
PX503G020	2	15	50	3
PX503G021	2.1	15	50	3
PX503G022	2.2	15	50	3
PX503G023	2.3	15	50	3
PX503G024	2.4	15	50	3
PX503G025	2.5	15	50	3
PX503G026	2.6	15	50	3
PX503G027	2.7	15	50	3
PX503G028	2.8	15	50	3
PX503G029	2.9	15	50	3
PX503G030	3	18	60	4
PX503G031	3.1	18	60	4
PX503G032	3.2	18	60	4
PX503G033	3.3	18	60	4
PX503G034	3.4	18	60	4
PX503G035	3.5	18	60	4
PX503G036	3.6	23	60	4
PX503G037	3.7	23	60	4
PX503G038	3.8	23	60	4
PX503G039	3.9	23	60	4
PX503G040	4	23	60	4
PX503G041	4.1	23	60	4
PX503G042	4.2	30	62	5
PX503G043	4.3	30	62	5
PX503G044	4.4	30	62	5
PX503G045	4.5	30	62	5

EDP. No.	D	L_1	L_2	D_2
PX503G046	4.6	30	62	5
PX503G047	4.7	30	62	5
PX503G048	4.8	30	62	5
PX503G049	4.9	30	62	5
PX503G050	5	30	62	5
PX503G051	5.1	30	62	5
PX503G052	5.2	34	66	6
PX503G053	5.3	34	66	6
PX503G054	5.4	34	66	6
PX503G055	5.5	34	66	6
PX503G056	5.6	34	66	6
PX503G057	5.7	34	66	6
PX503G058	5.8	34	66	6
PX503G059	5.9	34	66	6
PX503G060	6	34	66	6
PX503G061	6.1	34	66	6
PX503G062	6.2	40	74	7
PX503G063	6.3	40	74	7
PX503G064	6.4	40	74	7
PX503G065	6.5	40	74	7
PX503G066	6.6	40	74	7
PX503G067	6.7	40	74	7
PX503G068	6.8	40	74	7
PX503G069	6.9	40	74	7
PX503G070	7	40	74	7
PX503G071	7.1	40	74	7
PX503G072	7.2	44	79	8
PX503G073	7.3	44	79	8
PX503G074	7.4	44	79	8
PX503G075	7.5	44	79	8
PX503G076	7.6	44	79	8
PX503G077	7.7	44	79	8
PX503G078	7.8	44	79	8
PX503G079	7.9	44	79	8
PX503G080	8	44	79	8
PX503G081	8.1	44	79	8

NEXT

PX503G ...series

ULTRA FINE | HELIX | W Coating | h8 | p.1037

EDP. No.	D	L_1	L_2	D_2
PX503G082	8.2	48	84	9
PX503G083	8.3	48	84	9
PX503G084	8.4	48	84	9
PX503G085	8.5	48	84	9
PX503G086	8.6	48	84	9
PX503G087	8.7	48	84	9
PX503G088	8.8	48	84	9
PX503G 089	8.9	48	84	9
PX503G090	9	48	84	9
PX503G091	9.1	48	84	9
PX503G092	9.2	51	89	10
PX503G093	9.3	51	89	10
PX503G094	9.4	51	89	10
PX503G095	9.5	51	89	10
PX503G096	9.6	51	89	10
PX503G097	9.7	51	89	10
PX503G098	9.8	51	89	10
PX503G099	9.9	51	89	10
PX503G100	10	51	89	10
PX503G101	10.1	51	89	10
PX503G102	10.2	53	95	11
PX503G103	10.3	53	95	11
PX503G104	10.4	53	95	11
PX503G105	10.5	53	95	11
PX503G106	10.6	53	95	11
PX503G107	10.7	53	95	11
PX503G108	10.8	53	95	11
PX503G109	10.9	53	95	11
PX503G110	11	53	95	11
PX503G111	11.1	53	95	11
PX503G112	11.2	60	102	12
PX503G113	11.3	60	102	12
PX503G114	11.4	60	102	12
PX503G115	11.5	60	102	12
PX503G116	11.6	60	102	12
PX503G117	11.7	60	102	12
PX503G118	11.8	60	102	12
PX503G119	11.9	60	102	12
PX503G120	12	60	102	12
PX503G121	12.1	60	102	12
PX503G122	12.2	60	102	13
PX503G123	12.3	60	102	13
PX503G124	12.4	60	102	13
PX503G125	12.5	60	102	13
PX503G126	12.6	60	102	13
PX503G127	12.7	60	120	13
PX503G128	12.8	60	102	13
PX503G129	12.9	60	102	13
PX503G130	13	60	102	13
PX503G131	13.1	60	102	13
PX503G132	13.2	62	107	14

EDP. No.	D	L_1	L_2	D_2
PX503G133	13.3	62	107	14
PX503G134	13.4	62	107	14
PX503G135	13.5	62	107	14
PX503G136	13.6	62	107	14
PX503G137	13.7	62	107	14
PX503G138	13.8	62	107	14
PX503G139	13.9	62	107	14
PX503G140	14	62	107	14
PX503G141	14.1	62	107	14
PX503G142	14.2	65	111	15
PX503G143	14.3	65	111	15
PX503G144	14.4	65	111	15
PX503G145	14.5	65	111	15
PX503G146	14.6	65	111	15
PX503G147	14.7	65	111	15
PX503G148	14.8	65	111	15
PX503G149	14.9	65	111	15
PX503G150	15	65	111	15
PX503G151	15.1	65	111	15
PX503G152	15.2	67	115	16
PX503G153	15.3	67	115	16
PX503G154	15.4	67	115	16
PX503G155	15.5	67	115	16
PX503G156	15.6	67	115	16
PX503G157	15.7	67	115	16
PX503G158	15.8	67	115	16
PX503G159	15.9	67	115	16
PX503G160	16	67	115	16
PX503G161	16.1	67	115	16
PX503G163	16.3	69	119	17
PX503G165	16.5	69	119	17
PX503G170	17	69	119	17
PX503G171	17.1	69	119	17
PX503G172	17.2	72	123	18
PX503G173	17.3	72	123	18
PX503G175	17.5	72	123	18
PX503G177	17.7	72	123	18
PX503G180	18	72	123	18
PX503G181	18.1	72	123	18
PX503G182	18.2	74	127	19
PX503G185	18.5	74	127	19
PX503G190	19	74	127	19
PX503G191	19.1	74	127	19
PX503G193	19.3	78	131	20
PX503G195	19.5	78	131	20
PX503G197	19.7	78	131	20
PX503G200	20	78	131	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	○				○		

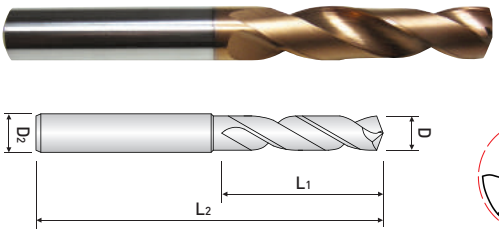
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33	0 -39
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

Drills for General Speed Cutting *Power Drill Series*



POWER DRILL X-treme

- Superior chip evacuation with unique flute design
- Outstanding performance for high ductility materials or soft steels like stainless steel

PX505G ...series

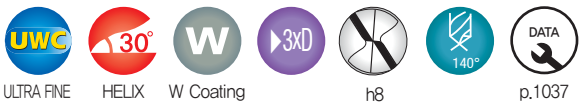
ULTRA FINE | HELIX | W Coating | h8 | p.1037

EDP. No.	D	L_1	L_2	D_2
PX505G030	3	30	60	4
PX505G031	3.1	30	60	4
PX505G032	3.2	30	60	4
PX505G033	3.3	30	60	4
PX505G034	3.4	35	70	4
PX505G035	3.5	35	70	4
PX505G036	3.6	35	70	4
PX505G037	3.7	35	70	4
PX505G038	3.8	43	80	4
PX505G039	3.9	43	80	4
PX505G040	4	43	80	4
PX505G041	4.1	43	80	4
PX505G042	4.2	43	80	5
PX505G043	4.3	43	80	5
PX505G044	4.4	43	80	5
PX505G045	4.5	43	80	5
PX505G046	4.6	43	80	5
PX505G047	4.7	43	80	5
PX505G048	4.8	43	80	5
PX505G049	4.9	43	80	5
PX505G050	5	43	80	5
PX505G051	5.1	43	80	5
PX505G052	5.2	48	83	6
PX505G053	5.3	48	83	6
PX505G054	5.4	48	83	6
PX505G055	5.5	48	83	6
PX505G056	5.6	48	83	6
PX505G057	5.7	48	83	6
PX505G058	5.8	48	83	6
PX505G059	5.9	48	83	6
PX505G060	6	48	83	6
PX505G061	6.1	48	83	6
PX505G062	6.2	51	85	7
PX505G063	6.3	51	85	7
PX505G064	6.4	51	85	7
PX505G065	6.5	51	85	7

EDP. No.	D	L_1	L_2	D_2
PX505G066	6.6	51	85	7
PX505G067	6.7	51	85	7
PX505G068	6.8	51	85	7
PX505G069	6.9	51	85	7
PX505G070	7	51	85	7
PX505G071	7.1	51	85	7
PX505G072	7.2	56	90	8
PX505G073	7.3	56	90	8
PX505G074	7.4	56	90	8
PX505G075	7.5	56	90	8
PX505G076	7.6	56	90	8
PX505G077	7.7	56	90	8
PX505G078	7.8	56	90	8
PX505G079	7.9	56	90	8
PX505G080	8	56	90	8
PX505G081	8.1	56	90	8
PX505G082	8.2	62	98	9
PX505G083	8.3	62	98	9
PX505G084	8.4	62	98	9
PX505G085	8.5	62	98	9
PX505G086	8.6	62	98	9
PX505G087	8.7	62	98	9
PX505G088	8.8	62	98	9
PX505G089	8.9	62	98	9
PX505G090	9	62	98	9
PX505G091	9.1	62	98	9
PX505G092	9.2	66	105	10
PX505G093	9.3	66	105	10
PX505G094	9.4	66	105	10
PX505G095	9.5	66	105	10
PX505G096	9.6	66	105	10
PX505G097	9.7	66	105	10
PX505G098	9.8	66	105	10
PX505G099	9.9	66	105	10
PX505G100	10	66	105	10
PX505G101	10.1	66	105	10

NEXT ≫

PX505G ...series



ULTRA FINE HELIX W Coating h8 p.1037

EDP. No.	D	L_1	L_2	D_2
PX505G102	10.2	71	110	11
PX505G103	10.3	71	110	11
PX505G 104	10.4	71	110	11
PX505G105	10.5	71	110	11
PX505G106	10.6	71	110	11
PX505G 107	10.7	71	110	11
PX505G108	10.8	71	110	11
PX505G109	10.9	71	110	11
PX505G110	11	71	110	11
PX505G111	11.1	71	110	11
PX505G112	11.2	79	120	12
PX505G113	11.3	79	120	12
PX505G114	11.4	79	120	12
PX505G115	11.5	79	120	12
PX505G116	11.6	79	120	12
PX505G171	11.7	79	120	12
PX505G118	11.8	79	120	12
PX505G119	11.9	79	120	12
PX505G120	12	79	120	12
PX505G121	12.1	79	120	12
PX505G122	12.2	88	137	13
PX505G123	12.3	88	137	13
PX505G124	12.4	88	137	13
PX505G125	12.5	88	137	13
PX505G126	12.6	88	137	13
PX505G127	12.7	88	137	13
PX505G128	12.8	88	137	13
PX505G129	12.9	88	137	13
PX505G130	13	88	137	13
PX505G131	13.1	88	137	13
PX505G132	13.2	94	147	14
PX505G133	13.3	94	147	14
PX505G134	13.4	94	147	14
PX505G135	1.35	94	147	14
PX505G136	13.6	94	147	14
PX505G137	13.7	94	147	14
PX505G138	13.8	94	147	14
PX505G139	13.9	94	147	14
PX505G140	14	94	147	14
PX505G141	14.1	94	147	14
PX505G142	14.2	98	153	15
PX505G143	14.3	98	153	15
PX505G144	14.1	98	153	15
PX505G145	14.5	98	153	15
PX505G146	14.6	98	153	15
PX505G147	14.7	98	153	15
PX505G148	14.8	98	153	15
PX505G149	14.9	98	153	15
PX505G150	15	98	153	15

EDP. No.	D	L_1	L_2	D_2
PX505G151	15.1	98	153	15
PX505G152	15.2	110	160	16
PX505G153	15.3	110	160	16
PX505G154	15.4	110	160	16
PX505G155	15.5	110	160	16
PX505G156	15.6	110	160	16
PX505G157	15.7	110	160	16
PX505G158	15.8	110	160	16
PX505G159	15.9	110	160	16
PX505G160	16	110	160	16
PX505G161	16.1	110	160	16
PX505G163	16.3	110	160	17
PX505G165	16.5	110	160	17
PX505G170	17	110	160	17
PX505G171	17.1	110	160	17
PX505G172	17.2	110	160	18
PX505G173	17.3	110	160	18
PX505G175	17.5	110	160	18
PX505G177	17.7	110	160	18
PX505G180	18	110	160	18
PX505G181	18.1	110	160	18
PX505G182	18.2	110	160	19
PX505G185	18.5	110	160	19
PX505G190	19	110	160	19
PX505G191	19.1	110	160	19
PX505G193	19.3	110	160	20
PX505G195	19.5	110	160	20
PX505G197	19.7	110	160	20
PX505G200	20	110	160	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	○				○		

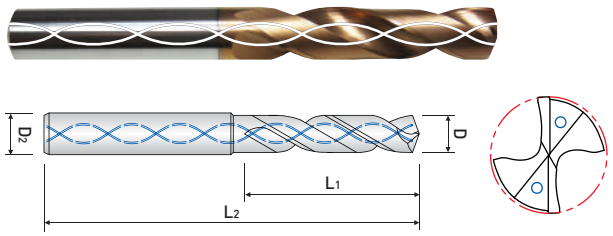
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33	0 -39
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

Drills for General Speed Cutting *Power Drill Series*



POWER DRILL *X-treme*

- Superior chip evacuation with unique flute design
- Outstanding performance for high ductility materials or soft steels like stainless steel

PXI505 ...series

ULTRA FINE | HELIX | W Coating | h8 | p.1037

EDP. No.	D	F.L	OAL	SH. Dia.
PXI505030	3	30	60	4
PXI505031	3.1	30	60	4
PXI505032	3.2	30	60	4
PXI505033	3.3	30	60	4
PXI505034	3.4	35	70	4
PXI505035	3.5	35	70	4
PXI505036	3.6	35	70	4
PXI505037	3.7	35	70	4
PXI505038	3.8	43	80	4
PXI505039	3.9	43	80	4
PXI505040	4	43	80	4
PXI505041	4.1	43	80	5
PXI505042	4.2	43	80	5
PXI505043	4.3	43	80	5
PXI505044	4.4	43	80	5
PXI505045	4.5	43	80	5
PXI505046	4.6	43	80	5
PXI505047	4.7	43	80	5
PXI505048	4.8	43	80	5
PXI505049	4.9	43	80	5
PXI505050	5	43	80	5
PXI505051	5.1	43	80	6
PXI505052	5.2	48	83	6
PXI505053	5.3	48	83	6
PXI505054	5.4	48	83	6
PXI505055	5.5	48	83	6
PXI505056	5.6	48	83	6
PXI505057	5.7	48	83	6
PXI505058	5.8	48	83	6
PXI505059	5.9	48	83	6
PXI505060	6	48	83	6
PXI505061	6.1	48	83	7
PXI505062	6.2	51	85	7
PXI505063	6.3	51	85	7
PXI505064	6.4	51	85	7
PXI505065	6.5	51	85	7

EDP. No.	D	F.L	OAL	SH. Dia.
PXI505066	6.6	51	85	7
PXI505067	6.7	51	85	7
PXI505068	6.8	51	85	7
PXI505069	6.9	51	85	7
PXI505070	7	51	85	7
PXI505071	7.1	51	85	8
PXI505072	7.2	56	90	8
PXI505073	7.3	56	90	8
PXI505074	7.4	56	90	8
PXI505075	7.5	56	90	8
PXI505076	7.6	56	90	8
PXI505077	7.7	56	90	8
PXI505078	7.8	56	90	8
PXI505079	7.9	56	90	8
PXI505080	8	56	90	8
PXI505081	8.1	56	90	9
PXI505082	8.2	62	98	9
PXI505083	8.3	62	98	9
PXI505084	8.4	62	98	9
PXI505085	8.5	62	98	9
PXI505086	8.6	62	98	9
PXI505087	8.7	62	98	9
PXI505088	8.8	62	98	9
PXI505089	8.9	62	98	9
PXI505090	9	62	98	9
PXI505091	9.1	62	98	10
PXI505092	9.2	66	105	10
PXI505093	9.3	66	105	10
PXI505094	9.4	66	105	10
PXI505095	9.5	66	105	10
PXI505096	9.6	66	105	10
PXI505097	9.7	66	105	10
PXI505098	9.8	66	105	10
PXI505099	9.9	66	105	10
PXI505100	10	66	105	10
PXI505101	10.1	66	105	11

NEXT

PXI505 ...series

ULTRA FINE | HELIX | W Coating | h8 | p.1037

EDP. No.	D	F.L	OAL	SH. Dia.
PXI505102	10.2	71	110	11
PXI505103	10.3	71	110	11
PXI505104	10.4	71	110	11
PXI505105	10.5	71	110	11
PXI505106	10.6	71	110	11
PXI505107	10.7	71	110	11
PXI505108	10.8	71	110	11
PXI505109	10.9	71	110	11
PXI505110	11	71	110	11
PXI505111	11.1	71	110	12
PXI505112	11.2	79	120	12
PXI505113	11.3	79	120	12
PXI505114	11.4	79	120	12
PXI505115	11.5	79	120	12
PXI505116	11.6	79	120	12
PXI505117	11.7	79	120	12
PXI505118	11.8	79	120	12
PXI505119	11.9	79	120	12
PXI505120	12	79	120	12
PXI505121	12.1	79	120	13
PXI505122	12.2	88	137	13
PXI505123	12.3	88	137	13
PXI505124	12.4	88	137	13
PXI505125	12.5	88	137	13
PXI505126	12.6	88	137	13
PXI505127	12.7	88	137	13
PXI505128	12.8	88	137	13
PXI505129	12.9	88	137	13
PXI505130	13	88	137	13
PXI505131	13.1	88	137	14
PXI505132	13.2	94	147	14
PXI505133	13.3	94	147	14
PXI505134	13.4	94	147	14
PXI505135	13.5	94	147	14
PXI505136	13.6	94	147	14
PXI505137	13.7	94	147	14
PXI505138	13.8	94	147	14
PXI505139	13.9	94	147	14
PXI505140	14	94	147	14
PXI505141	14.1	94	147	15
PXI505142	14.2	98	153	15
PXI505143	14.3	98	153	15
PXI505144	14.4	98	153	15
PXI505145	14.5	98	153	15
PXI505146	14.6	98	153	15
PXI505147	14.7	98	153	15
PXI505148	14.8	98	153	15
PXI505149	14.9	98	153	15
PXI505150	15	98	153	15

EDP. No.	D	F.L	OAL	SH. Dia.
PXI505151	15.1	98	153	16
PXI505152	15.2	110	160	16
PXI505153	15.3	110	160	16
PXI505154	15.4	110	160	16
PXI505155	15.5	110	160	16
PXI505156	15.6	110	160	16
PXI505157	15.7	110	160	16
PXI505158	15.8	110	160	16
PXI505159	15.9	110	160	16
PXI505160	16	110	160	16
PXI505161	16.1	110	160	17
PXI505163	16.3	110	160	17
PXI505165	16.5	110	160	17
PXI505170	17	110	160	17
PXI505171	17.1	110	160	18
PXI505172	17.2	110	160	18
PXI505173	17.3	110	160	18
PXI505175	17.5	110	160	18
PXI505177	17.7	110	160	18
PXI505180	18	110	160	18
PXI505181	18.1	110	160	19
PXI505182	18.2	110	160	19
PXI505185	18.5	110	160	19
PXI505190	19	110	160	19
PXI505191	19.1	110	160	20
PXI505193	19.3	110	160	20
PXI505195	19.5	110	160	20
PXI505197	19.7	110	160	20
PXI505200	20	110	160	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
◎	◎	○	○				○		

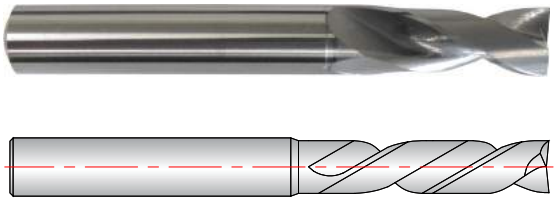
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

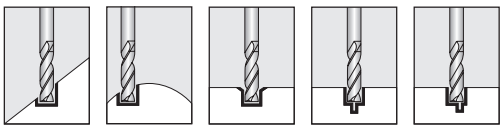
Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33	0 -39
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

Drills for General Speed Cutting *Power Drill Series*



Counter Bore Solid

- Bottom Drill



Machining for slant face | Machining for round face | Z axis cutting for chamfer | Hole spot facing | Hole correction

(impossible to cut in direction of outside of periphery)

CTS ...series

MG FINE GRAIN | 20° HELIX | TiAlN

EDP. No.	Dimension(mm)			SH.Dia
	D	F.L	OAL	
CTS030	3	18	60	4
CTS033	3.3	20	60	4
CTS035	3.5	22	60	4
CTS040	4	24	60	4
CTS042	4.2	26	62	5
CTS045	4.5	26	62	5
CTS050	5	26	62	5
CTS053	5.3	28	66	6
CTS055	5.5	28	66	6
CTS060	6	30	66	6
CTS065	6.5	34	74	7
CTS068	6.8	37	74	7
CTS070	7	37	74	7
CTS075	7.5	40	79	8
CTS080	8	40	79	8
CTS085	8.5	43	84	9
CTS088	8.8	43	84	9
CTS090	9	43	84	9
CTS095	9.5	47	89	10
CTS100	10	47	89	10
CTS103	10.3	51	95	11
CTS105	10.5	51	95	11
CTS108	10.8	51	95	11
CTS110	11	51	95	11
CTS115	11.5	54	102	12
CTS120	12	54	102	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

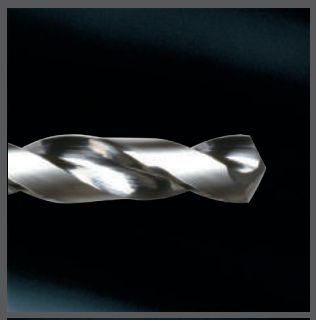
Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27	0 -33
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

MEMO

Drills for Multi-purpose

SOLID SPIRAL DRILL SERIES

DRILL SERIES



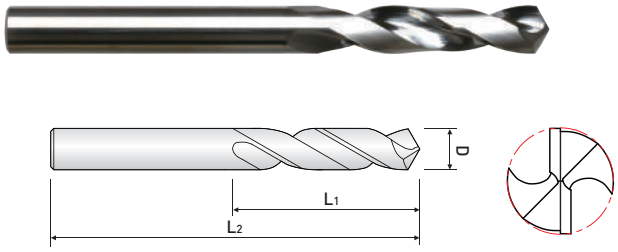
Drills for Multi-purpose Solid Spiral Drill Series

Drills for Multi-purpose _ Solid Spiral Drill Series

WIDIN

EDP. No.	APPEARANCE	FEATURE	INCH & METRIC	STOCK	PAGE
SSD ...series		REGULAR LENGTH	METRIC	•	642
SSDL ...series		LONG LENGTH	METRIC	•	644
SSTD ...series		REGULAR LENGTH(3XD)	METRIC	•	645

Drills for Multi-purpose *Solid Spiral Drill Series*



REGULAR LENGTH

- Suitable for nonferrous metal and Aluminum

SSD ...series

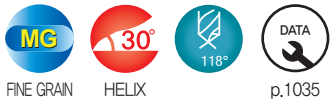
MG FINE GRAIN | 30° HELIX | 118° | DATA p.1035

EDP. No.	D	L1	L2
SSD010	1.0	10	38
SSD011	1.1		
SSD012	1.2		
SSD013	1.3		
SSD014	1.4		
SSD015	1.5	13	38
SSD016	1.6		
SSD017	1.7		
SSD018	1.8		
SSD019	1.9		
SSD020	2.0	16	45
SSD021	2.1		
SSD022	2.2		
SSD023	2.3		
SSD024	2.4	18	50
SSD025	2.5	20	50
SSD026	2.6		
SSD027	2.7	22	50
SSD028	2.8		
SSD029	2.9		
SSD030	3.0		
SSD031	3.1	25	50
SSD032	3.2		
SSD033	3.3		
SSD034	3.4		
SSD035	3.5		
SSD036	3.6	28	55
SSD037	3.7		
SSD038	3.8		
SSD039	3.9		
SSD040	4.0		

EDP. No.	D	L1	L2
SSD041	4.1	30	60
SSD042	4.2		
SSD043	4.3		
SSD044	4.4		
SSD045	4.5		
SSD046	4.6	33	65
SSD047	4.7		
SSD048	4.8	35	65
SSD049	4.9		
SSD050	5.0		
SSD051	5.1		
SSD052	5.2		
SSD053	5.3		
SSD054	5.4		
SSD055	5.5		
SSD056	5.6	38	75
SSD057	5.7		
SSD058	5.8		
SSD059	5.9		
SSD060	6.0		
SSD061	6.1		
SSD062	6.2		
SSD063	6.3		
SSD064	6.4		
SSD065	6.5		

NEXT ≫

SSD ...series



FINE GRAIN HELIX p.1035

EDP. No.	D	L_1	L_2
SSD066	6.6	45	80
SSD067	6.7		
SSD068	6.8		
SSD069	6.9		
SSD070	7.0		
SSD071	7.1		
SSD072	7.2		
SSD073	7.3		
SSD074	7.4		
SSD075	7.5		
SSD076	7.6	50	85
SSD077	7.7		
SSD078	7.8		
SSD079	7.9		
SSD080	8.0		
SSD081	8.1		
SSD082	8.2		
SSD083	8.3		
SSD084	8.4		
SSD085	8.5		
SSD086	8.6	50	95
SSD087	8.7		
SSD088	8.8		
SSD089	8.9		
SSD090	9.0		
SSD091	9.1		
SSD092	9.2		
SSD093	9.3		

EDP. No.	D	L_1	L_2
SSD094	9.4	50	95
SSD095	9.5		
SSD096	9.6		
SSD097	9.7		
SSD098	9.8		
SSD099	9.9	55	100
SSD100	10.0		
SSD101	10.1	55	115
SSD102	10.2		
SSD103	10.3		
SSD104	10.4		
SSD105	10.5		
SSD106	10.6	60	115
SSD107	10.7		
SSD108	10.8		
SSD109	10.9		
SSD110	11.0		
SSD111	11.1	65	120
SSD112	11.2		
SSD113	11.3		
SSD115	11.5		
SSD118	11.8		
SSD119	11.9		
SSD120	12.0		
SSD124	12.4	70	125
SSD125	12.5		
SSD130	13.0	75	130

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
					○			◎	

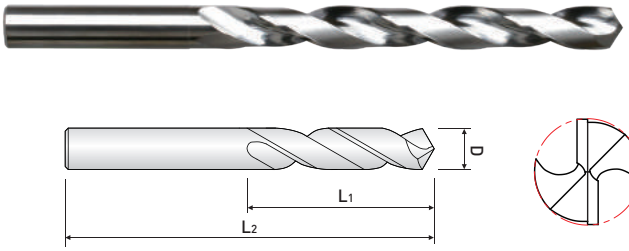
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27
Shank(h7)	0 -10	0 -12	0 -15	0 -18

Drills for Multi-purpose *Solid Spiral Drill Series*



SOLID SPIRAL DRILL - LONG

- Suitable for nonferrous metal and Aluminum

SSDL ...series

MG FINE GRAIN | 30° HELIX | 118° | DATA p.1035

EDP. No.	D	L1	L2
SSDL030	3.0	42	73
SSDL031	3.1		
SSDL032	3.2		
SSDL033	3.3		
SSDL034	3.4		
SSDL035	3.5		
SSDL036	3.6	45	80
SSDL037	3.7		
SSDL038	3.8	48	80
SSDL039	3.9	50	80
SSDL040	4.0	54	85
SSDL041	4.1		
SSDL042	4.2		
SSDL043	4.3		
SSDL044	4.4		
SSDL045	4.5		
SSDL046	4.6	59	90
SSDL047	4.7		
SSDL048	4.8		
SSDL049	4.9		
SSDL050	5.0		
SSDL051	5.1	63	95
SSDL052	5.2		
SSDL053	5.3		
SSDL054	5.4		
SSDL055	5.5		
SSDL056	5.6	66	100
SSDL057	5.7		
SSDL058	5.8		
SSDL059	5.9		
SSDL060	6.0		
SSDL061	6.1	70	105
SSDL062	6.2		
SSDL063	6.3		
SSDL064	6.4		
SSDL065	6.5		

EDP. No.	D	L1	L2
SSDL066	6.6	73	105
SSDL067	6.7		
SSDL068	6.8		
SSDL069	6.9		
SSDL070	7.0		
SSDL071	7.1	76	110
SSDL072	7.2		
SSDL073	7.3		
SSDL074	7.4		
SSDL075	7.5		
SSDL076	7.6	80	115
SSDL077	7.7		
SSDL078	7.8		
SSDL079	7.9		
SSDL080	8.0		
SSDL081	8.1	85	125
SSDL082	8.2		
SSDL083	8.3		
SSDL084	8.4		
SSDL085	8.5		
SSDL086	8.6		
SSDL087	8.7		
SSDL088	8.8		
SSDL089	8.9		
SSDL090	9.0		
SSDL091	9.1	88	130
SSDL092	9.2		
SSDL093	9.3		
SSDL094	9.4		
SSDL095	9.5		
SSDL096	9.6	90	130
SSDL097	9.7		
SSDL098	9.8		
SSDL099	9.9		
SSDL100	10.0		

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
					○			◎	

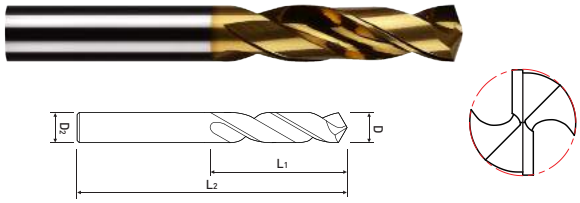
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27
Shank(h7)	0 -10	0 -12	0 -15	0 -18

Drills for Multi-purpose *Solid Spiral Drill Series*



REGULAR LENGTH

- Improved surface roughness
- Suitable for non-ferrous and aluminum machining
- Suitable for High Speed Machining

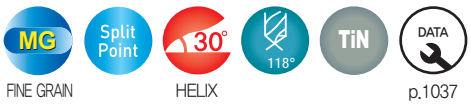
SSTD ...series

MG FINE GRAIN | Split Point | 30° HELIX | 118° | TiN | DATA p.1037

EDP. No.	D	L_1	L_2	D_2
SSTD005	0.5	6	22	0.5
SSTD0055	0.55	7	24	0.55
SSTD006	0.6			0.6
SSTD0065	0.65	8	26	0.65
SSTD007	0.7	9	28	0.7
SSTD0075	0.75			0.75
SSTD008	0.8	10	30	0.8
SSTD0085	0.85			0.85
SSTD009	0.9	11	32	0.9
SSTD0095	0.95			0.95
SSTD010	1.0	10	38	1.0
SSTD011	1.1			1.1
SSTD012	1.2			1.2
SSTD013	1.3			1.3
SSTD014	1.4			1.4
SSTD015	1.5	13	38	1.5
SSTD016	1.6			1.6
SSTD017	1.7			1.7
SSTD018	1.8			1.8
SSTD019	1.9			1.9
SSTD020	2.0	16	45	2.0
SSTD021	2.1			2.1
SSTD022	2.2			2.2
SSTD023	2.3			2.3
SSTD024	2.4	18	50	2.4
SSTD025	2.5	20	50	2.5
SSTD026	2.6			2.6
SSTD027	2.7	22	50	2.7
SSTD028	2.8			2.8
SSTD029	2.9			2.9
SSTD030	3.0			3.0
SSTD031	3.1	25	50	3.1
SSTD032	3.2			3.2
SSTD033	3.3			3.3
SSTD034	3.4			3.4
SSTD035	3.5			3.5

NEXT >>

SSTD ...series

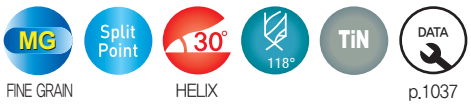


FINE GRAIN HELIX p.1037

EDP. No.	D	L_1	L_2	D_2
SSTD036	3.6	28	55	3.6
SSTD037	3.7			3.7
SSTD038	3.8			3.8
SSTD039	3.9			3.9
SSTD040	4.0			4.0
SSTD041	4.1	30	60	4.1
SSTD042	4.2			4.2
SSTD043	4.3			4.3
SSTD044	4.4			4.4
SSTD045	4.5			4.5
SSTD046	4.6	33	65	4.6
SSTD047	4.7			4.7
SSTD048	4.8	35	65	4.8
SSTD049	4.9			4.9
SSTD050	5.0			5.0
SSTD051	5.1			5.1
SSTD052	5.2			5.2
SSTD053	5.3			5.3
SSTD054	5.4			5.4
SSTD055	5.5			5.5
SSTD056	5.6	38	75	5.6
SSTD057	5.7			5.7
SSTD058	5.8			5.8
SSTD059	5.9			5.9
SSTD060	6.0			6.0
SSTD061	6.1			6.1
SSTD062	6.2			6.2
SSTD063	6.3			6.3
SSTD064	6.4			6.4
SSTD066	6.6	45	80	6.6
SSTD067	6.7			6.7
SSTD068	6.8			6.8
SSTD069	6.9			6.9
SSTD070	7.0			7.0
SSTD071	7.1			7.1
SSTD072	7.2			7.2
SSTD073	7.3			7.3
SSTD074	7.4			7.4
SSTD075	7.5			7.5
SSTD076	7.6	50	85	7.6
SSTD077	7.7			7.7
SSTD078	7.8			7.8
SSTD079	7.9			7.9
SSTD080	8.0			8.0
SSTD081	8.1			8.1
SSTD082	8.2			8.2
SSTD083	8.3			8.3
SSTD084	8.4			8.4
SSTD085	8.5			8.5

NEXT »»

SSTD ...series



FINE GRAIN HELIX p.1037

EDP. No.	D	L_1	L_2	D_2
SSTD086	8.6	50	95	8.6
SSTD087	8.7			8.7
SSTD088	8.8			8.8
SSTD089	8.9			8.9
SSTD090	9.0			9.0
SSTD091	9.1			9.1
SSTD092	9.2			9.2
SSTD093	9.3			9.3
SSTD094	9.4			9.4
SSTD095	9.5			9.5
SSTD096	9.6			9.6
SSTD097	9.7			9.7
SSTD098	9.8			9.8
SSTD099	9.9	55	100	9.9
SSTD100	10.0			10.0
SSTD101	10.1	55	115	10.1
SSTD102	10.2			10.2
SSTD103	10.3			10.3
SSTD104	10.4			10.4
SSTD105	10.5			10.5
SSTD106	10.6	60	115	10.6
SSTD107	10.7			10.7
SSTD108	10.8			10.8
SSTD109	10.9			10.9
SSTD110	11.0			11.0
SSTD111	11.1	65	120	11.1
SSTD112	11.2			11.2
SSTD113	11.3			11.3
SSTD115	11.5			11.5
SSTD118	11.8			11.8
SSTD119	11.9			11.9
SSTD120	12.0			12.0
SSTD124	12.4	70	125	12.4
SSTD125	12.5			12.5
SSTD130	13.0	75	130	13.0

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○					○		○	◎	○

○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18
Cutting edge(h8)	0 -14	0 -18	0 -22	0 -27
Shank(h7)	0 -10	0 -12	0 -15	0 -18

4

CENTERING TOOLS & REAMERS ›

WIDIN®

4

Centering Tools
(General Purpose) 651

Reamers
(General Purpose) 664

CENTERING TOOLS & REAMERS

Centering Tools

WIDIN

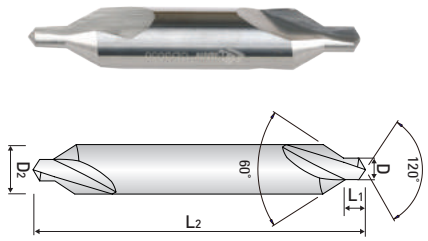
EDP. No.	APPEARANCE	FEATURE	STOCK	PAGE
CDS ...series		SOLID CENTER DRILL	•	652
LDS ...series		NC SPOTTING DRILL	•	653
LDF ...series		NC SPOTTING DRILL MULTY TYPE	•	654
LDA ...series		NC SPOTTING DRILL	•	655
CES302 ...series		CENTERING END MILL - SOLID	•	656
CEM ...series		CENTERING END MILL - BRAZED TYPE	•	657
CRC ...series		CORNER ROUNDING CUTTER	•	658
CFT ...series		CHAMFER TOOL	•	659
BFT ...series		BACK CHAMFER TOOL	•	660
BFD ...series		BACK CHAMFER TOOL	•	661
CCT ...series		CHAMFER CUTTER	•	662
CCF ...series		CHAMFER CUTTER FACE	•	603

Reamers

WIDIN

EDP. No.	APPEARANCE	FEATURE	STOCK	PAGE
SSR ...series		STRAIGHT FLUTE REAMERS	•	664
SHR ...series		HELICAL FLUTE REAMERS	•	665
SBR ...series		BROACH REAMERS	•	666
HRS ...series		MACHINE CHUCKING REAMER	•	667

Centering Tools Series



{ SOLID CENTER DRILL

CDS ...series

MG FINE GRAIN | 15° HELIX | DATA p.1039

EDP. No.	D	L_1	L_2	D_2
CDS010	1	1	40	3
CDS015	1.5	1.5	40	4
CDS020	2	2	45	5
CDS025	2.5	2.5	45	6
CDS030	3	3	55	8
CDS040	4	4.5	60	10
CDS050	5	5.5	65	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○			○			○	○	○

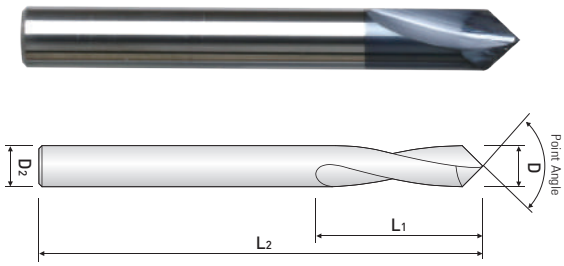
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
All sizes 0~+0.1	h6

※ These tools are manufactured based on order received.

Centering Tools



NC SPOTTING DRILL

LDS ...series

FINE GRAIN HELIX

p.1039

EDP. No.	D	L_1	L_2	D_2	Point Angle
LDS030	3	9	50	3	90°
LDS030A					120°
LDS040	4	10	50	4	90°
LDS040A					120°
LDS050	5	12	50	5	90°
LDS050A					120°
LDS060	6	13	60	6	90°
LDS060A					120°
LDS080	8	23	70	8	90°
LDS080A					120°
LDS100	10	24	80	10	90°
LDS100A					120°
LDS120	12	28	80	12	90°
LDS120A					120°
LDS160	16	32	90	16	90°
LDS160A					120°
LDS200	20	35	100	20	90°
LDS200A					120°

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○		○

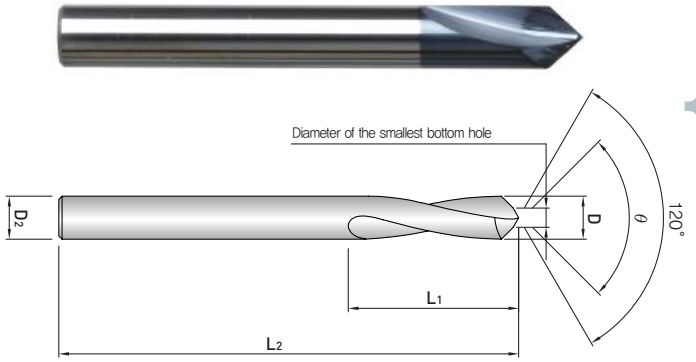
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.01	h6

※ These tools are manufactured based on order received.

Centering Tools Series



NC SPOTTING DRILL MULTY TYPE

- Minimize breakage of chisel edge by adjusting 120° point angle in the smallest bottom hole

LDF ...series

MG FINE GRAIN · 20° HELIX · TiAlN · 60° · 90°

EDP. No.	D	L_1	L_2	D_2	θ	The smallest bottom hole
LDF0360	3	9	50	3	60°	1.5
LDF0390					90°	1.2
LDF0460	4	10	50	4	60°	1.7
LDF0490					90°	1.3
LDF0560	5	12	50	5	60°	1.9
LDF0590					90°	1.5
LDF0660	6	13	60	6	60°	1.9
LDF0690					90°	1.5
LDF0860	8	23	70	8	60°	1.9
LDF0890					90°	1.6
LDF1060	10	24	80	10	60°	2.1
LDF1090					90°	2.1
LDF1260	12	28	80	12	60°	2.1
LDF1290					90°	2.1

※ The smallest bottom hole means the smallest size of bottom hole on the use of chamfer

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○		○

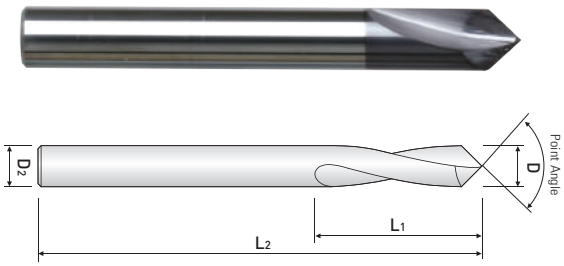
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.01	h6

※ These tools are manufactured based on order received.

Centering Tools



NC SPOTTING DRILL

LDA ...series

MG FINE GRAIN · 12° HELIX · TiAlN · 90° · 120° · 142°

EDP. No.	D			L_1	L_2	D_2	Point Angle
	INCH (DECIMAL)	INCH (FRACTION)	mm	INCH (FRACTION)			
LDA006A	.0938	3/32	2.383	2"	3/8"	3/32"	90°
LDA006B							120°
LDA006C							142°
LDA008A	.1250	1/8	3.175	2"	3/8"	1/8"	90°
LDA008B							120°
LDA008C							142°
LDA012A	.1875	3/16	4.763	3"	3/4"	3/16"	90°
LDA012B							120°
LDA012C							142°
LDA016A	.2500	1/4	6.350	3"	3/4"	1/4"	90°
LDA016B							120°
LDA016C							142°
LDA020A	.3125	5/16	7.938	3"	1"	5/16"	90°
LDA020B							120°
LDA020C							142°
LDA024A	.3750	3/8	9.525	3"	1"	3/8"	90°
LDA024B							120°
LDA024C							142°
LDA028A	.4375	7/16	11.113	4"	1"	7/16"	90°
LDA028B							120°
LDA028C							142°
LDA032A	.5000	1/2	12.700	4"	1"	1/2"	90°
LDA032B							120°
LDA032C							142°

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○	○	○

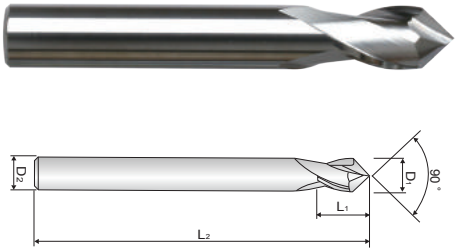
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.01	h6

※ These tools are manufactured based on order received.

Centering Tools Series

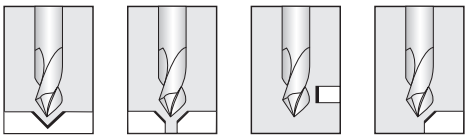


CENTERING END MILL - SOLID

CES302 ...series

FINE GRAIN HELIX p.1040

EDP. No.		D_1	L_1	L_2	D_2
비코팅	코팅				
CES302030	CES302030-C	3	6	50	6
CES302040	CES302040-C	4	8	50	6
CES302050	CES302050-C	5	10	50	6
CES302060	CES302060-C	6	12	60	6
CES302080	CES302080-C	8	16	70	8
CES302100	CES302100-C	10	18	70	10
CES302120	CES302120-C	12	20	75	12
CES302140	CES302140-C	14	24	80	14
CES302160	CES302160-C	16	26	80	16
CES302200	CES302200-C	20	32	100	20



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○			○	○

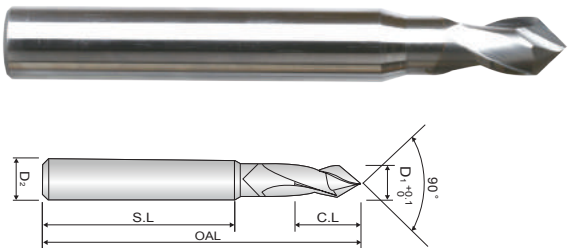
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
-0.05~0	h6

※ These tools are manufactured based on order received.

Centering Tools

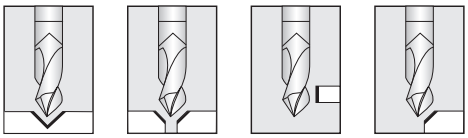


CENTERING END MILL
- BRAZED TYPE

CEM ...series

WC 2 30° HELIX 90° DATA p.1040

EDP. No.	D_1	C.L	S.L	OAL	D_2
CEM1016	10	15	80	115	16
CEM1216	12	20	100	145	16
CEM1620	16	23	100	150	20
CEM2025	20	25	100	155	25



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○	○	○

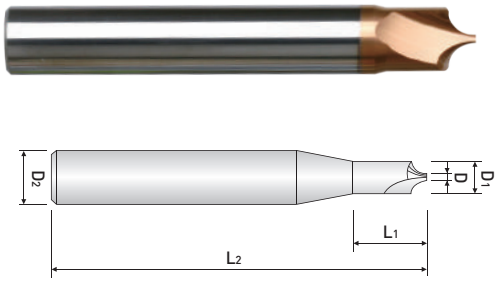
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ +0.1	h7

※ These tools are manufactured based on order received.

Centering Tools Series



CORNER ROUNDING CUTTER

- Designed for prehardened, hardened and stainless steels and cast iron up to HRc 52.
- By using the newly developed raw-material(0.2 um), it provides excellent performance during high speed cutting.

CRC ...series

ULTRA FINE HELIX p.1041

EDP. No.	D	R	D_1	L_1	L_2	D_2
CRC 209 050	0.9	0.5	2	3	45	4
CRC 209 075	0.9	0.75	2.5	4	45	4
CRC 209 100	0.9	1.0	3	5	50	6
CRC 259 100	5.9	1.0	8	-	60	8
CRC 214 150	1.4	1.5	4.5	8	50	6
CRC 249 150	4.9	1.5	8	-	60	8
CRC 214 200	1.4	2	5.5	10	50	6
CRC 239 200	3.9	2	8	-	60	8
CRC 219 250	1.9	2.5	7	13	60	8
CRC 219 300	1.9	3	8	-	60	8
CRC 219 350	1.9	3.5	9	13	70	10
CRC 219 400	1.9	4	10	-	70	10
CRC 219 450	1.9	4.5	11	13	80	12
CRC 219 500	1.9	5	12	-	80	12
CRC 239 600	3.9	6	16	-	85	16
CRC 259 700	5.9	7	20	-	85	20
CRC 239 800	3.9	8	20	-	85	20

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	◎	◎	◎	○		○	○	○

○:General Application ◎:The most suitable Application

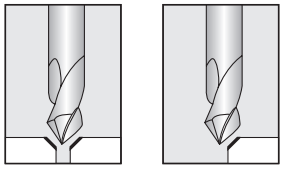
Centering Tools

3F, 4F CHAMFER TOOL

CFT ...series

FINE GRAIN HELIX

EDP. No.	D	θ	L_1	L_2	D_2	Z
CFT0660	6	60°	5.1	50	6	3
CFT0690	6	90°	3	50	6	3
CFT0860	8	60°	6.9	60	8	3
CFT0890	8	90°	4	60	8	3
CFT1060	10	60°	8.6	70	10	4
CFT1090	10	90°	5	70	10	4
CFT1260	12	60°	10.3	75	12	4
CFT1290	12	90°	6	75	12	4



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○		○

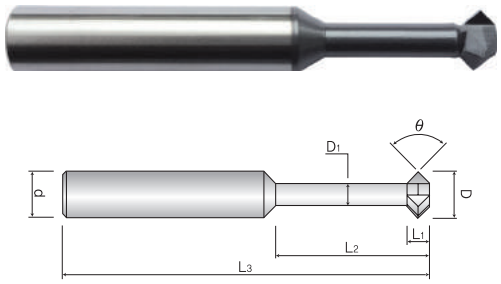
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.01	h6

※ These tools are manufactured based on order received.

Centering Tools Series

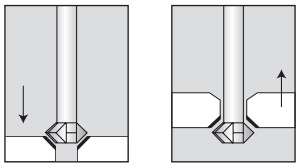


4F BACK CHAMFER TOOL

BFT ...series

FINE GRAIN HELIX

EDP. No.	D	θ	L_1	L_2	D_1	L_3	d
BFT0660	6	60°	1.73	15	3	50	6
BFT0690	6	90°	2.8	15	3	50	6
BFT0860	8	60°	2.3	20	4	60	8
BFT0890	8	90°	3.8	20	4	60	8
BFT1060	10	60°	2.8	25	5	70	10
BFT1090	10	90°	4.8	25	5	70	10
BFT1260	12	60°	3.4	30	6	75	12
BFT1290	12	90°	5.8	30	6	75	12



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○		○

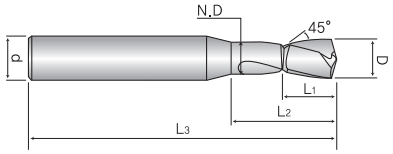
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
-0.5~0	h6

※ These tools are manufactured based on order received.

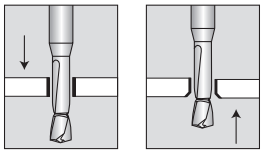
Centering Tools



BACK CHAMFER DRILL

BFD ...series

EDP. No.	D	N.D	L_1	L_2	L_3	d	Mac. C
BFD050	5	3.7	8	26	62	5	0.5
BFD051	5.1	3.8	8	28	66	6	0.5
BFD053	5.3	4	8	28	66	6	0.5
BFD055	5.5	4.2	8	28	66	6	0.5
BFD060	6	4.7	10	30	66	6	0.5
BFD065	6.5	4.6	10	34	74	7	0.5
BFD068	6.8	4.9	10	37	74	7	0.5
BFD070	7	5.1	10	37	74	7	0.8
BFD075	7.5	5.2	12	40	79	8	1
BFD078	7.8	5.5	12	40	79	8	1
BFD080	8	5.7	12	40	79	8	1
BFD085	8.5	6.2	12	43	84	9	1
BFD088	8.5	6.5	12	43	84	9	1
BFD090	9	6.7	12	43	84	9	1
BFD095	9.5	7.2	12	47	89	10	1
BFD100	10	7.7	12	47	89	10	1
BFD103	10.3	8	12	51	95	11	1
BFD105	10.5	8.2	12	51	95	11	1
BFD108	10.8	8.5	12	51	95	11	1
BFD110	11	8.7	12	51	95	11	1
BFD115	11.5	9.2	12	54	102	12	1
BFD120	12	9.7	12	54	102	12	1



■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	◎	◎	○	○			◎		◎

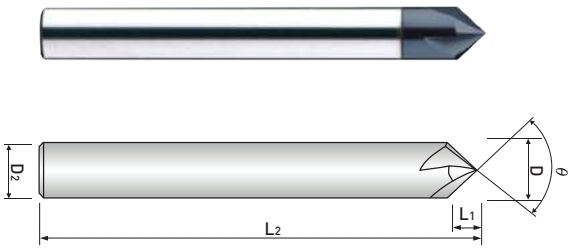
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
h8	h6

※ These tools are manufactured based on order received.

Centering Tools Series



CHAMFER CUTTER

- Superior workpiece surface and excellent cutting performance on edge chamfer machining
- Use micro grain cemented carbide material which has high deflective strength

CCT ...series

FINE GRAIN HELIX

EDP. No.	D	θ	L_1	L_2	D_2
CCT502 030 S3	3	90°	1.5	60	3
CCT502 040 S4	4	90°	2	60	4
CCT502 060	6	90°	3	60	6
CCT502 080	8	90°	4	65	8
CCT502 100	10	90°	5	70	10
CCT502 120	12	90°	6	75	12

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○		○

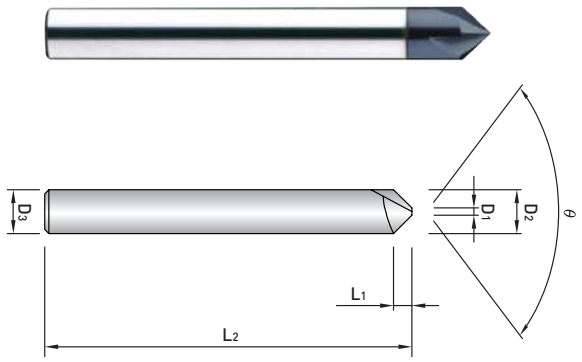
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.01	h6

※ These tools are manufactured based on order received.

Centering Tools



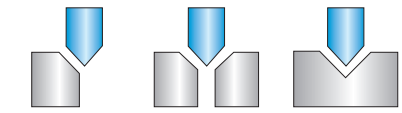
CHAMFER CUTTER FACE

- Superior workpiece surface and excellent cutting performance on edge chamfer machining with 2 Flutes Helix type
- Use micro grain cemented carbide material which has high deflective strength

CCF ...series

ULTRA FINE HELIX

EDP. No.	D_1	θ	D_2	L_1	L_2	D_3
CCF502 020 S4	0.3	90°	2	0.85	50	4
CCF502 020	0.3	90°	2	0.85	50	6
CCF502 040 S4	0.3	90°	4	1.85	50	4
CCF502 040	0.3	90°	4	1.85	50	6
CCF502 060	0.3	90°	6	2.85	50	6
CCF502 080	0.4	90°	8	3.8	60	8
CCF502 100	0.5	90°	10	4.75	70	10
CCF502 120	0.5	90°	12	5.75	75	12



Applicable(○) Applicable(○) Applicable(△)

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○	○	○

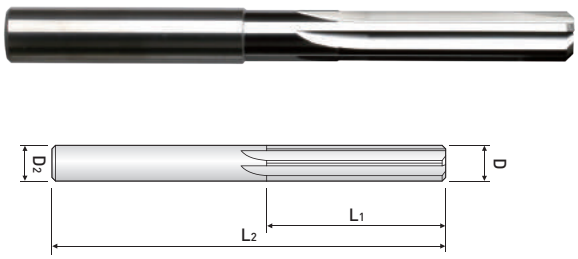
○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)	Shank Dia.
±0.01	h6

※ These tools are manufactured based on order received.

Reamers



STRAIGHT FLUTE REAMERS

SSR ...series

WC 4&6 0° HELIX

EDP. No.	D	L_1	L_2	D_2	Z
SSR020	2	25	60	4	4
SSR025	2.5	25	60	4	4
SSR030	3	28	70	4	6
SSR035	3.5	30	75	4	6
SSR040	4	30	75	4	6
SSR045	4.5	35	80	6	6
SSR050	5	35	80	6	6
SSR055	5.5	35	80	6	6
SSR060	6	35	80	6	6
SSR065	6.5	45	100	8	6
SSR070	7	45	100	8	6
SSR080	8	45	100	8	6
SSR090	9	50	110	10	6
SSR100	10	50	110	10	6
SSR110	11	50	120	12	6
SSR120	12	50	120	12	6

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○	○	○

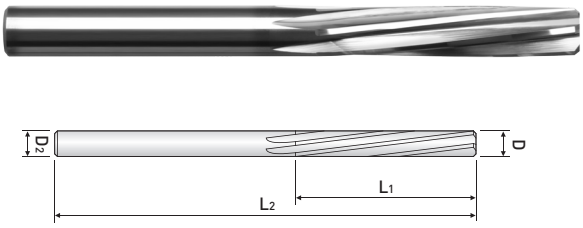
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m5)	+6 +2	+9 +4	+12 +6	+15 +7	+17 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Reamers



HELICAL FLUTE REAMERS

SHR ...series

WC 4&6 7° HELIX

EDP. No.	D	L_1	L_2	D_2	Z
SHR020	2	25	60	4	4
SHR025	2.5	25	60	4	4
SHR030	3	28	70	4	6
SHR035	3.5	30	75	4	6
SHR040	4	30	75	4	6
SHR045	4.5	35	80	6	6
SHR050	5	35	80	6	6
SHR055	5.5	35	80	6	6
SHR060	6	35	80	6	6
SHR065	6.5	45	100	8	6
SHR070	7	45	100	8	6
SHR080	8	45	100	8	6
SHR090	9	50	110	10	6
SHR100	10	50	110	10	6
SHR110	11	50	120	12	6
SHR120	12	50	120	12	6

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○	○	○

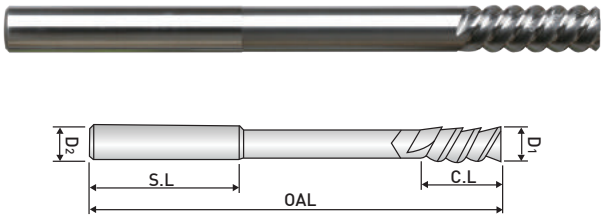
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m5)	+6 +2	+9 +4	+12 +6	+15 +7	+17 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Reamers



BROACH REAMERS

SBR ...series

WC 4&6 60° HELIX

EDP. No.	D_1	C.L	S.L	OAL	D_2	Z
SBR030	3	12	30	70	4	4
SBR040	4	12	30	75	4	4
SBR050	5	16	35	80	6	4
SBR060	6	16	35	80	6	4
SBR080	8	20	40	100	8	4
SBR100	10	25	45	110	10	4
SBR120	12	28	50	120	12	4
SBR140	14	30	55	145	14	4
SBR160	16	35	55	155	16	6
SBR180	18	38	60	170	18	6
SBR200	20	40	60	180	20	6

* Above ø 14 will be manufactured with brazed type.
* ø 14~20 are manufactured based on order received.

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○	○	○

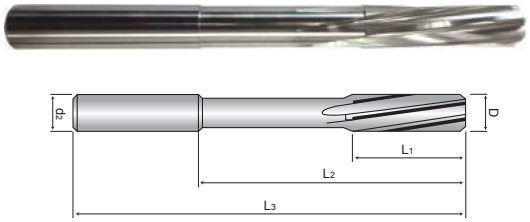
○:General Application ◎:The most suitable Application

■ Tolerance

㎛=1/1000㎜

Tolerance \ Diameter	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
Cutting edge(m5)	+6 +2	+9 +4	+12 +6	+15 +7	+17 +8
Shank(h6)	0 -6	0 -8	0 -9	0 -11	0 -13

Reamers



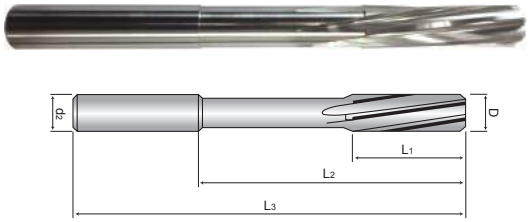
MACHINE CHUCKING REAMER
- Solid Type

HRS ...series

WC 4&6 7° HELIX

EDP. No.	D	L_1	L_2	L_3	d_2	Z
HRS0198	1.98	12	22	50	4	4
HRS0199	1.99	12	22	50	4	4
HRS0200	2	12	22	50	4	4
HRS0201	2.01	12	22	50	4	4
HRS0202	2.02	12	22	50	4	4
HRS0203	2.03	12	22	50	4	4
HRS0248	2.48	16	26	60	4	4
HRS0249	2.49	16	26	60	4	4
HRS0250	2.5	16	26	60	4	4
HRS0251	2.51	16	26	60	4	4
HRS0252	2.52	16	26	60	4	4
HRS0253	2.53	16	26	60	4	4
HRS0297	2.97	18	30	65	4	6
HRS0298	2.98	18	30	65	4	6
HRS0299	2.99	18	30	65	4	6
HRS0300	3	18	30	65	4	6
HRS0301	3.01	18	30	65	4	6
HRS0302	3.02	18	30	65	4	6
HRS0303	3.03	18	30	65	4	6
HRS0350	3.5	20	35	75	4	6
HRS0397	3.97	20	35	75	4	6
HRS0398	3.98	20	35	75	4	6
HRS0399	3.99	20	35	75	4	6
HRS0400	4	20	35	75	4	6
HRS0401	4.01	20	35	75	4	6
HRS0402	4.02	20	35	75	4	6
HRS0403	4.03	20	35	75	4	6
HRS0450	4.5	25	40	80	6	6
HRS0497	4.97	25	40	80	6	6
HRS0498	4.98	25	40	80	6	6
HRS0499	4.99	25	40	80	6	6
HRS0500	5	25	40	80	6	6
HRS0501	5.01	25	40	80	6	6
HRS0502	5.02	25	40	80	6	6
HRS0503	5.03	25	40	80	6	6
HRS0550	5.5	25	45	80	6	6
HRS0597	5.97	25	45	80	6	6
HRS0598	5.98	25	45	80	6	6
HRS0599	5.99	25	45	80	6	6

Reamers



MACHINE CHUCKING REAMER
- Solid Type

HRS ...series

WC 4&6 7° HELIX

EDP. No.	D	L_1	L_2	L_3	d_2	Z
HRS0600	6	25	45	80	6	6
HRS0601	6.01	25	45	80	6	6
HRS0602	6.02	25	45	80	6	6
HRS0603	6.03	25	45	80	6	6
HRS0650	6.5	30	60	100	8	6
HRS0700	7	30	60	100	8	6
HRS0750	7.5	33	65	100	8	6
HRS0797	7.97	33	65	100	8	6
HRS0798	7.98	33	65	100	8	6
HRS0799	7.99	33	65	100	8	6
HRS0800	8	33	65	100	8	6
HRS0801	8.01	33	65	100	8	6
HRS0802	8.02	33	65	100	8	6
HRS0803	8.03	33	65	100	8	6
HRS0850	8.5	35	70	110	10	6
HRS0900	9	35	70	110	10	6
HRS0997	9.97	35	70	110	10	6
HRS0998	9.98	35	70	110	10	6
HRS0999	9.99	35	70	110	10	6
HRS1000	10	35	70	110	10	6
HRS1001	10.01	35	70	110	10	6
HRS1002	10.02	35	70	110	10	6
HRS1003	10.03	35	70	110	10	6
HRS1004	10.04	35	70	110	10	6
HRS1005	10.05	35	70	110	10	6
HRS1100	11	40	80	120	12	6
HRS1197	11.97	40	80	120	12	6
HRS1198	11.98	40	80	120	12	6
HRS1199	11.99	40	80	120	12	6
HRS1200	12	40	80	120	12	6
HRS1201	12.01	40	80	120	12	6
HRS1202	12.02	40	80	120	12	6
HRS1203	12.03	40	80	120	12	6
HRS1204	12.04	40	80	120	12	6
HRS1205	12.05	40	80	120	12	6

■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB22 ~325	Prehardened Steels(NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Steels
			~HRc55 SKD61	~HRc55 SKD11					
○	○	○			○		○		○

○:General Application ◎:The most suitable Application

■ Tolerance

Mill Dia. (mm)		Shank Dia.
Diameter	Tolerance	
~ ø 5.03	0~+0.004	h6
ø 5.5 ~ ø 12.05	0~+0.005	

※ These tools are manufactured based on order received.

MEMO

5

CUTTER SERIES ›

5

CUTTER SERIES

WIDIN

Series	Appearance	EDP. No.	Page
EndMill Cutter		ENCC	678
		ENCC	679
		ENCC	680
		AHU	681
Radius Cutter		RMCC	682
		RMCC	683
		C-RDT	684
Finishing Endmill Cutter		ASMC	685
		MPMC	685
Multi Mill Cutter		RSCC	686
		SSCC	687

Series	Appearance	EDP. No.	Page
Multi Mill Cutter		SSC	687
Ball Cutter		BMCC	688
		BMCC-MD	689
		BPUX	689
		BPUX	690
		WRMC-T	690
		WRMC-T	690
		TRMC	691
		TRMS	691
		TRMC	692
		TRMS	692

CUTTER SERIES

Series	Appearance	EDP. No.	Page
Ball Cutter		BWSF (Finish)	693
		BWSC (Rough)	693
		SRM	694
		BHSF	694
		GBEC	695
Helical Cutter		HESC	696
		HMCC-BT	697
		HNCC	697
		HMCC-MD	698
		FPCC	698
Shell Mill Cutter		SMCC	699

Series	Appearance	EDP. No.	Page
Shell Mill Cutter		SECC	699
Ball Cutter Finishing		BFCC	700
		C-BFCC	700
		ABPF	701
		C-ABPF	701
		SRFH	702
		C-SRFH	702
		C-RMMC	703
Multi Mill Cutter		AJUL	704
		AJSL	704

CUTTER SERIES

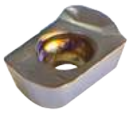
WIDIN

Series	Appearance	EDP. No.	Page
EndMill Cutter		AQXR	705
		TEBL	706
		SECL	707
		AHJL	707
		ASRL	708
		ASRL-Pico	709
		ASRL-Pico	709
		BSR	710
		BSR	710
		AJXC	711
		SKSC	712

Series	Appearance	EDP. No.	Page
Finishing Endmill Cutter		IHCC	713
Ball Cutter		M-ABPF	714
		M-SRFH	714
		M-BFCC	715
		M-SRM	715
		M-BHSF	716
		M-GBEC	716
EndMill Cutter		M-AJXC	717
		M-SKSC	717
		M-ASRL	718
		M-ASRL-Pico	718

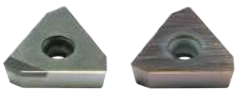
CUTTER SERIES

Series	Appearance	EDP. No.	Page
EndMill Cutter		M-RMCC	719
		M-AQXR	719
		M-SECL	720
Chamfer Mill Cutter		CHCL	721
		CSCC	721
Blades		SD Blade	722
		CTHT	722
Insert tip		Finishing Ball Insert (ZPSW)	723
		Finishing Ball Insert (SP3204)	723
		Finishing Corner Radius Insert (ZPSR)	724
		Round Insert (RDMW)	725

Series	Appearance	EDP. No.	Page
Insert tip		Ball Insert (LBH)	725
		Corner Radius LRH Insert(LRH)	726
		Ball Cutter (RB-MX50M)	727
		Helical Cutter Insert (SPMT)	727
		Helical Cutter Insert (ZPMT)	727
		Finishing Mill Insert (WDMW)	728
		Finishing Mill Insert (EOMT)	728
		Indexable Milling Insert (EDNW)	729
		Indexable Milling Insert (EDNW)	729
		Indexable Milling Insert (JOMW)	729
		Indexable Insert (ZPET)	730

CUTTER SERIES

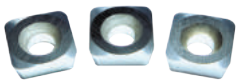
WIDIN

Series	Appearance	EDP. No.	Page
Insert tip		Indexable Milling Insert(JDMT)	730
		APKT17 (MT, EM, SU) Insert	731
		APKT17 (AL)Insert	732
		APKT09 (MT, SU) Insert	733, 734
		APKT09 (EM) Insert	733
		APKT09 (AL)Insert	734
		Chamfering Mill Insert	735
		Rounding Insert	735
		Finishing Mill Insert (QOMT)	736
		CBN Insert	736
		Rounding Insert	737

Series	Appearance	EDP. No.	Page
Face Cutter		Medium Cutting Cutter	738
		IMCC	738
		CMCC	739
Side Cutter		Side Millng Cutter	740
		Circular Face Cutter	740
Key-Home Cutter		Key-Home Cutter	741
		Key-Home Cutter, Outside Cutter	741
		Corner R Holder	741
Relief Cutter		Relief Cutter	742

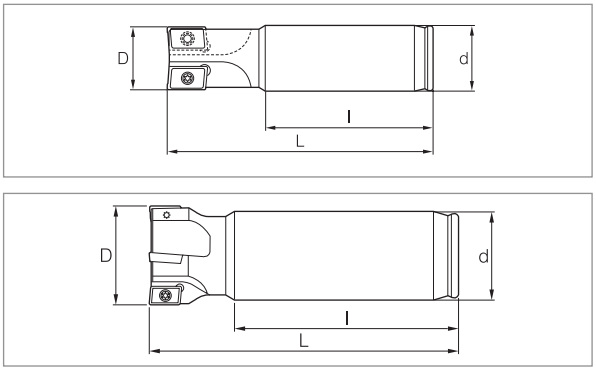
CUTTER SERIES

Series	Appearance	EDP. No.	Page
Relief Cutter		U-Home Cutter	742
Post U-Drill		Post U-Drill	743
		T-Cutter	743
Ball Gauge		Ball Gauge	744
		Outside Setting Bar	744
Post Medium Cutting Cutter		Medium Cutter Arbor/ SSCC Cutter Arbor	745
		Medium Boring Cutter	745
Quick Change Collet		Radial Tapping Chuck	746
Counter Bore		Counter Bore	747
Reamer		Helix Reamer	747
Post Medium Cutting Cutter Arbor		FPCC-ST Arbor	748
		Extention Arbor	748

Series	Appearance	EDP. No.	Page
Plunge Cutter		Slotting Cutter	749
Arbor		Arbor	749
Finish Cutter		M.S Cutter	750
		M.S Cutter Part	750
		M.S Cutter Insert	750
Arbor		BT50-WMA	751
		FPM	752
Shrink Fit Chuck		Shrink Fit Chuck	753
		Shrink Fit Chuck	753
Block		Setting Block	754
		Setting Block	755

ENDMILL CUTTER

▶ ENCC



- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN, TAEGU-TEC

Part No.	Dimensions(mm)							
	D	d	L	l				
ENCC-1609180	16	16	180	145	2	APKT09T3	ST2553-55 M2.5	TX-8
ENCC-1709180	17		180	155				
ENCC-2009200	20	20	200	160				
ENCC-2109150	21		150	120				
ENCC-2109200	21		200	170				
ENCC-2509200	25	25	200	160	3			
ENCC-2609150	26		150	120				
ENCC-2609200	26		200	170				
ENCC-3209200	32	32	200	150	4			
ENCC-3309150	33		150	110				
ENCC-3309200	33		200	160				
ENCC-3309250	33		250	210				

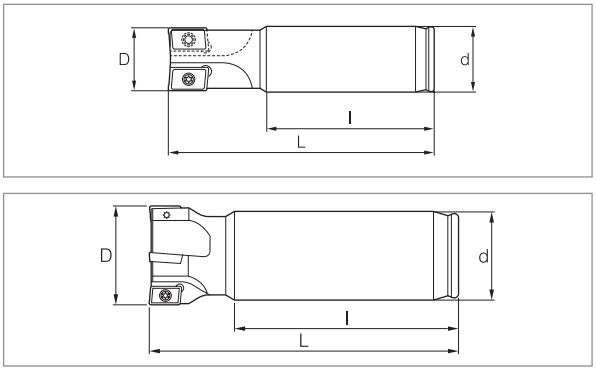
- STRAIGHT SHANK TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)							
	D	d	L	l				
ENCC-2515150	25	25	150	110	2	AP..15T3	ST3509-55 M3.5	TX-15
ENCC-2515200	25	25	200	160	2			
ENCC-2615200	26	25	200	160	2			
ENCC-3215150	32	32	150	110	2			
ENCC-3215200	32	32	200	160	2			
ENCC-3215250	32	32	250	210	2			
ENCC-3215300	32	32	300	260	2			
ENCC-3315200	33	32	200	160	2			
ENCC-4015150	40	32	150	110	3			
ENCC-4015200	40	32	200	100	3			
ENCC-4015250	40	32	250	210	3			
ENCC-4015300	40	32	300	200	3			
ENCC-5015150	50	32	150	70	4			
ENCC-5015200	50	32	200	150	4			
ENCC-5015250	50	32	250	250	4			
ENCC-5015300	50	32	300	300	4			
ENCC-5015150L	50	42	150	100	4			
ENCC-5015200L	50	42	200	150	4			
ENCC-5015250L	50	42	250	200	4			
ENCC-5015300L	50	42	300	250	4			

ENDMILL CUTTER

▶ ENCC



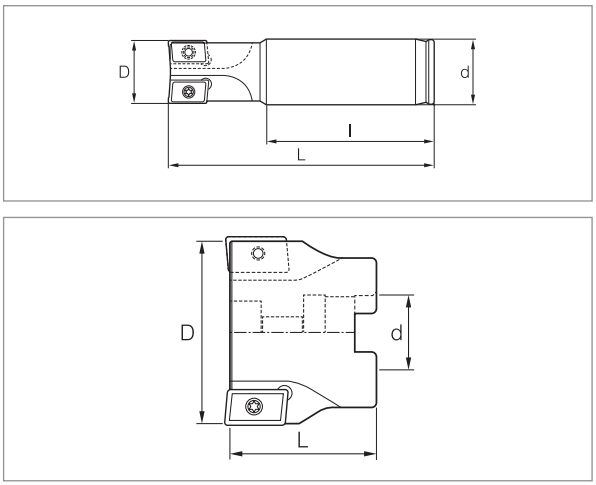
- STRAIGHT SHANK TYPE

INSERT TYPE → DURACARB, SECO, KORLOY, WIDIN

Part No.	Dimensions(mm)							
	D	d	L	l				
ENCC-2516150	25	25	150	110	2	AP..1604	ST4084-60 M4	TX-15
ENCC-2516200	25	25	200	160				
ENCC-2516250	25	25	250	210				
ENCC-2616150	26	25	150	110				
ENCC-2616200	26	25	200	160				
ENCC-3216150	32	32	150	110				
ENCC-3216200	32	32	200	160				
ENCC-3216250	32	32	250	210				
ENCC-3216300	32	32	300	260				
ENCC-3316150	33	32	150	110				
ENCC-3316200	33	32	200	160				
ENCC-3316250	33	32	150	210				
ENCC-4016150	40	32	150	110	3		ST4101-60W M4	
ENCC-4016200	40	32	200	160				
ENCC-4016250	40	32	250	210				
ENCC-4016300	40	32	300	260				
ENCC-5016150	50	32	150	110	4			
ENCC-5016200	50	32	200	160				
ENCC-5016250	50	32	250	210				
ENCC-5016300	50	32	300	260				
ENCC-5016150L	50	42	150	110				
ENCC-5016200L	50	42	200	160				
ENCC-5016250L	50	42	250	210				
ENCC-5016300L	50	42	300	260				

ENDMILL CUTTER

▶ ENCC



- STRAIGHT SHANK TYPE

INSERT TYPE → TAEGU–TEC, WIDIN

Part No.	Dimensions(mm)							
	D	d	L	l				
ENCC-2517150	25	25	150	110	2	APKT 1705	ST4084-60 M4	TX-15
ENCC-2517200	25	25	200	160				
ENCC-2617150	26	25	150	110				
ENCC-2617200	26	25	200	160				
ENCC-3217150	32	32	150	110				
ENCC-3217200	32	32	200	160				
ENCC-3217250	32	32	250	210				
ENCC-3317150	33	32	150	110				
ENCC-3317200	33	32	200	160				
ENCC-3317250	33	32	250	210				
ENCC-4017150	40	32	150	110	3		ST4101-60W M4	
ENCC-4017200	40	32	200	160				
ENCC-4017250	40	32	250	210				
ENCC-5017150	50	32	150	110	4			
ENCC-5017200	50	32	200	160				
ENCC-5017250	50	32	250	210				
ENCC-5017150-L	50	42	150	110				
ENCC-5017200-L	50	42	200	160				
ENCC-5017250-L	50	42	250	210				

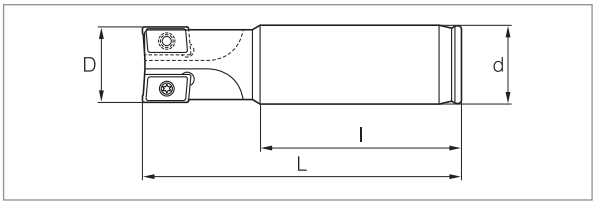
- BORE MOUNTED TYPE

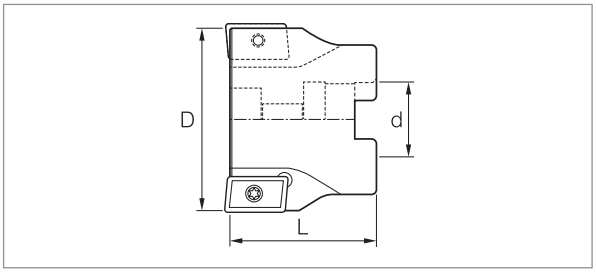
INSERT TYPE → TAEGU–TEC, WIDIN

Part No.	Dimensions(mm)						
	D	d	L				
ESCC-501722	50	22	50	3	APKT 1705	ST4101-60W M4	TX-15
ESCC-631722	63	22	50	4			
ESCC-801727	80	27	50	7			

ENDMILL CUTTER

▶ AHU





- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)							
	D	d	L	l				
AHU-1610170	16	16	170	140	2	JDMT 1003..R	ST2553-55 M2.5	TX-8
AHU-1710170	17	16	170	140				
AHU-2010200	20	20	200	170				
AHU-2010250	20	20	250	210				
AHU-2110200	21	20	200	170				
AHU-2110250	21	20	250	210				
AHU-2515200	25	25	200	160		JDMT 1505..R	ST4084-60 M4	TX-15
AHU-2515250	25	25	250	210				
AHU-2615200	26	25	200	160				
AHU-2615250	26	25	250	210				
AHU-3215200	32	32	200	160				
AHU-3215250	32	32	250	210				
AHU-3215300	32	32	300	260				
AHU-3315200	33	32	200	160				
AHU-3315250	33	32	250	210				
AHU-3315300	33	32	300	260				

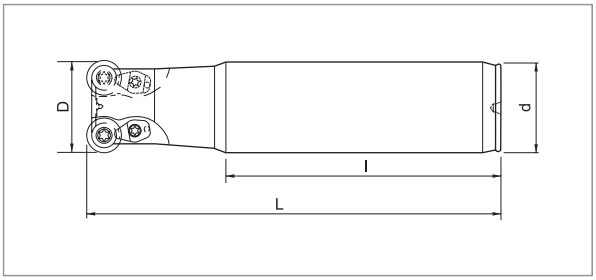
- BORE MOUNTED TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)						
	D	d	L				
AHUS–3050–22	50	22	50	3	JDMT 1505..R	ST4101–60W M4	TX–15
AHUS–4050–22	50	22	50	4			
AHUS–3063–22	63	22	50	3			
AHUS–4063–22	63	22	50	4			
AHUS–3050–22.225	50	22.225	50	3			
AHUS–4050–22.225	50	22.225	50	4			
AHUS–3063–25.4	63	25.4	50	3			
AHUS–4063–25.4	63	25.4	50	4			

RADIUS CUTTER

▶ RMCC



- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI, WALTER, WIDIN

Part No.	Dimensions(mm)								
	D	d	L	l					
RMCC-1608170	16	16	170	135	2	RDMW0803		ST307-55 M3	TX-8
RMCC-1708170	17	16	170	135					
RMCC-2008200	20	20	200	165			CL2C 2CICN		
RMCC-2108200	21	20	200	165					
RMCC-2010200	20	20	200	165		RDMT10T3		ST408-43 M4	TX-15
RMCC-2110200	21	20	200	165					
RMCC-2510150	25	25	150	115					
RMCC-2510200	25	25	200	155					
RMCC-2610150	26	25	150	115					
RMCC-2610200	26	25	200	155					

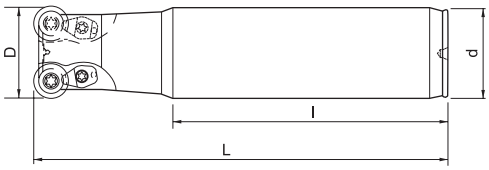
- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)								
	D	d	L	l					
RMCC-1608170-H	16	16	170	135	2	RDMT0802	CL2C 2CLCN	ST307-55 M3	TX-8
RMCC-1708170-H	17	16	170	135					
RMCC-2008200-H	20	20	200	165					
RMCC-2108200-H	21	20	200	165					

RADIUS CUTTER

▶ RMCC



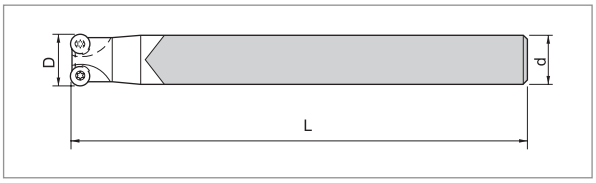
- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI, WALTER, WIDIN

Part No.	Dimensions(mm)								
	D	d	L	l					
RMCC-2512150	25	25	150	105	2	RDMT 1204 RDMW 1204	CL2C 2CLCN	ST4084-60 M4	TX-15
RMCC-2512200	25	25	200	155					
RMCC-2512250	25	25	250	205					
RMCC-2612150	26	25	150	105					
RMCC-2612200	26	25	200	155					
RMCC-2612250	26	25	250	205					
RMCC-2612300	26	25	300	255					
RMCC-3212150	32	32	150	100					
RMCC-3212200	32	32	200	150					
RMCC-3212250	32	32	250	200					
RMCC-3212300	32	32	300	250					
RMCC-3312150	33	32	150	100					
RMCC-3312200	33	32	200	150					
RMCC-3312250	33	32	250	200					
RMCC-3312300	33	32	300	250					
RMCC-3512150	35	32	150	105	3			ST4101-60W M4	
RMCC-3512200	35	32	200	155					
RMCC-3512300	35	32	300	255					
RMCC-4012150	40	32	150	105					
RMCC-4012200	40	32	200	155					
RMCC-4012300	40	32	300	255					
RMCC-5012150	50	32	150	105	4				
RMCC-5012200	50	32	200	155					
RMCC-5012300	50	32	300	255					
RMCC-5012150L	50	42	150	105					
RMCC-5012200L	50	42	200	155					
RMCC-5012300L	50	42	300	255					

RADIUS CUTTER

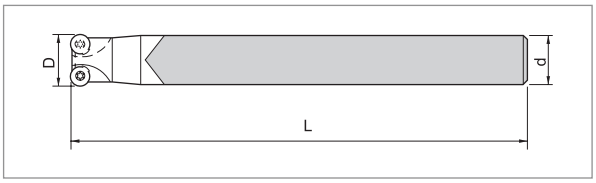
▶ C-RDT



- CARBIDE SHANK TYPE

INSERT TYPE → TUNGALOY, WIDIN

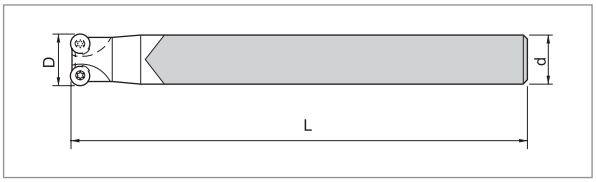
Part No.	Dimensions(mm)						
	D	d	L				
C-RDTT-1010135	10	10	135	2	RDMW 0501M0	ST18042-50 M1.8	TX-6
C-RDTT-1110135	11	10	135				
C-RDTT-1212150	12	12	150				
C-RDTT-1312150	13	12	150				
C-RDTT-1312150-3F	13	12	150	3			
C-RDTT-1616200	16	16	200	2	RDMW 0702M0	ST2553-55 M2.5	TX-8
C-RDTT-1716200	17	16	200				



- CARBIDE SHANK TYPE

INSERT TYPE → DIJET

Part No.	Dimensions(mm)						
	D	d	L				
C-RDTD-1010135	10	10	135	2	RDMW 0501MOEN	ST18042-50 M1.8	TX-6
C-RDTD-1110135	11	10	135				
C-RDTD-1212150	12	12	150				
C-RDTD-1312150	13	12	150				
C-RDTD-1312150-3F	13	12	150	3			
C-RDTD-1616200	16	16	200	2	RDMW 0701M05	ST2553-55 H2.5	TX-8
C-RDTD-1716200	17	16	200				



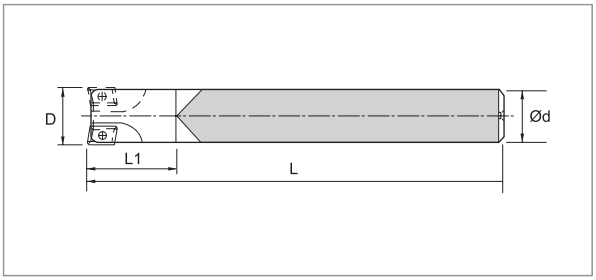
- CARBIDE SHANK TYPE

INSERT TYPE → MITSUBISHI

Part No.	Dimensions(mm)						
	D	d	L				
C-RDTM-1010135	10	10	135	2	RDMW 0517MOE	ST2043-60H H2.0	TX-6
C-RDTM-1110135	11	10	135				
C-RDTM-1212150	12	12	150				
C-RDTM-1312150	13	12	150				
C-RDTM-1312150-3F	13	12	150	3			
C-RDTM-1616200	16	16	200	2	RDMW 0724MOE	ST22045-55 M2.2	TX-8
C-RDTM-1716200	17	16	200				

FINISHING ENDMILL CUTTER

▶ ASMC

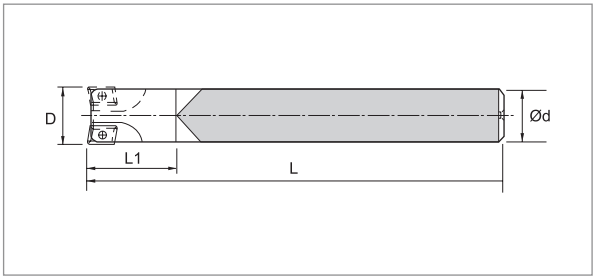


- CARBIDE SHANK TYPE

INSERT TYPE → HITACHI

Part No.	Dimensions(mm)							
	D	d	L	L_1				
C-ASMC-1010120	10	10	120	30	2	JDMT0702	TS-M1.8	TX-6
C-ASMC-1110120	11	10	120					
C-ASMC-1212150	12	12	150					
C-ASMC-1312150	13	12	150					
C-ASMC-1616180	16	16	180		4			
C-ASMC-1716180	17	17	180					

▶ MPMC



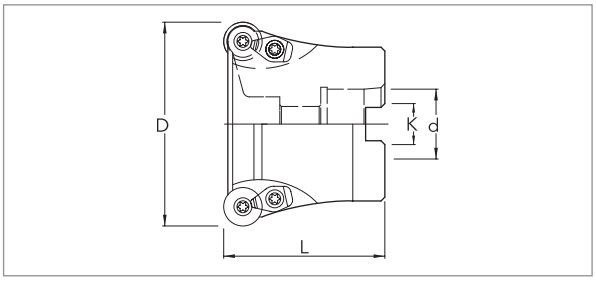
- CARBIDE SHANK

INSERT TYPE → DIJET, WIDIN

Part No.	Dimensions(mm)							
	D	d	L	L_1				
C-MPMC-1010120	10	10	120	30	2	EQMC060210ER EOMT060210ZER	TS-M1.8	TX-6
C-MPMC-1110120	11	10	120					
C-MPMC-1212150	12	12	150					
C-MPMC-1312150	13	12	150					
C-MPMC-1616180	16	16	180		4			
C-MPMC-1716180	17	16	180					

MULTI MILL CUTTER

▶ RSCC



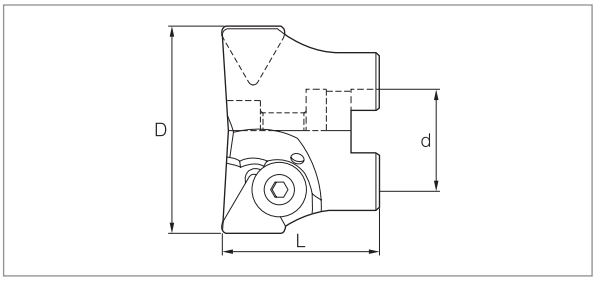
- BORE MOUNTED TYPE

INSERT TYPE → HITACHI, WALTER, WIDIN

Part No.	Dimensions(mm)								
	D	d	L	K					
RSCC-0501222D-3F	50	22	50	10.4	3	RDMT1204	CL2C 2CLCN	ST4101-60W M4	TX-15
RSCC-0501222D-4F	50	22		10.4	4				
RSCC-0631222D	63	22		10.4	5				
RSCC-0631227D	63	27		12.4	5				
RSCC-0801232D	80	32		14.4	6				
RSCC-1001232D	100	32		14.4	8				
RSCC-0501622D	50	22		10.4	3	RDMT1605	3CLCN	ST512-63P M5	TX-20
RSCC-0631627D	63	27		12.4	4				
RSCC-0801632D	80	32		14.4	4				

MULTI MILL CUTTER

▶ SSCC

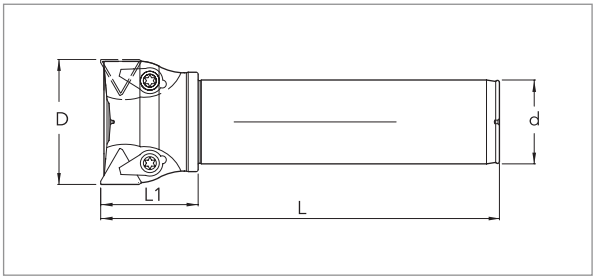


- BORE MOUNTED TYPE

INSERT TYPE → TAEGU-TEC

Part No.	Dimensions(mm)				SHIM				
	D	d	L						
SSCC-6322254	63	25.4	50	3	-	-	TP..2204	CSB-8018	L-5
SSCC-8022254	80	25.4		4	CST-42SE	ST307-55 M3.0			
SSCC-1002231	100	31.75		5					

▶ SSC



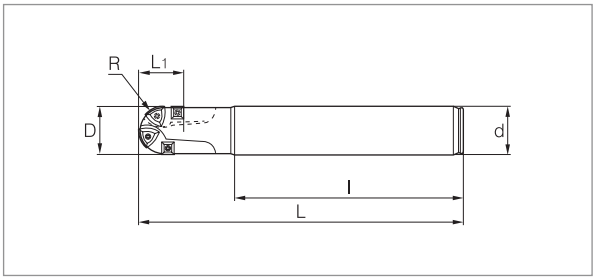
- STRAIGHT SHANK TYPE

INSERT TYPE → TAEGU-TEC

Part No.	Dimensions(mm)							
	D	d	L	l				
SSC-D504222-200	50	42	200	50	3	TP... 2204	TP22	L-5
SSC-D504222-250	50		250					
SSC-D634222-200	63		200					
SSC-D634222-250	63		250					
SSC-D634222-300	63		300					

BALL CUTTER

▶ BMCC



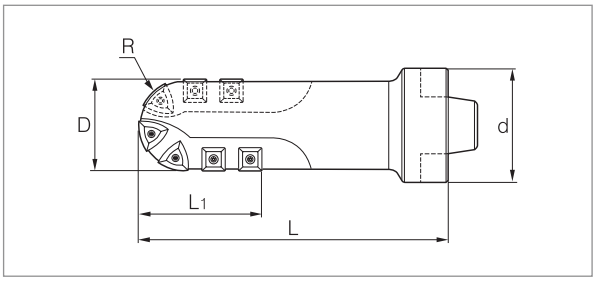
- STRAIGHT SHANK TYPE

INSERT TYPE → WALTER, DURACARB, TAEGU-TEC, WIDIN

Part No.	Dimensions(mm)							NO.OF INSERT		NO.OF INSERT		
	R	D	d	L	l	L_1						
BMCC-R1020135	10	20	20	135	90	20.5	P26315-R10 RBET 20-M	2	P28415-00 SPMT060308	2	ST2553-55 M2.5	TX-8
BMCC-R1020170	10	20	20	170	125	20.5						
BMCC-R1020200	10	20	20	200	155	20.5						
BMCC-R1225140	12.5	25	25	140	90	23	P26315-R12 RBET 25-M					
BMCC-R1225170	12.5	25	25	170	120	23						
BMCC-R1225200	12.5	25	25	200	150	23						
BMCC-R1225250	12.5	25	25	250	200	23						
BMCC-R1225300	12.5	25	25	300	250	23						
BMCC-R1532150	15	30	32	150	80	30.5	P26315-R15 RBET 30-M		CSM090308 SDMT090308		ST408-43 M4	TX-15
BMCC-R1532200	15	30	32	200	120	30.5						
BMCC-R1532250	15	30	32	250	150	30.5						
BMCC-R1532300	15	30	32	300	250	30.5						
BMCC-R1632150	16	32	32	150	80	31.5	P26315-R16 RBET 32-M					
BMCC-R1632200	16	32	32	200	120	31.5						
BMCC-R1632250	16	32	32	250	150	31.5						
BMCC-R1632300	16	32	32	300	250	31.5						
BMCC-R2042150	20	40	42	150	80	39.5	P26315-R20 RBEX 40-M		CSM1208 SP..1204		ST511-43 M5	TX-20
BMCC-R2042200	20	40	42	200	80	39.5						
BMCC-R2542150	25	50	42	150	80	49.5	RBEX 50-M	3				
BMCC-R2542200	25	50	42	200	85	49.5						
BMCC-R2542250	25	50	42	250	85	49.5						
BMCC-R2550.8200	25	50	50.8	200	100	67				4		
BMCC-R2550.8250	25	50	50.8	250	100	67						

BALL CUTTER

▶ BMCC-MD

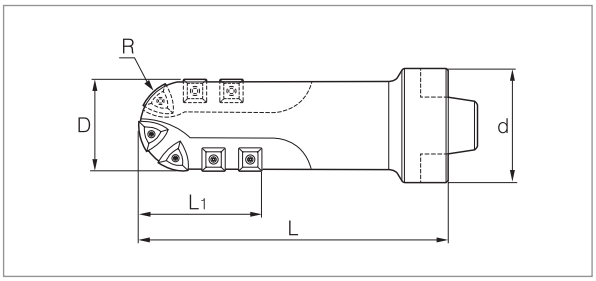


- STRAIGHT SHANK TYPE

INSERT TYPE → WALTER, TAEGU–TEC, WIDIN

Part No.	Dimensions(mm)						NO.OF INSERT		NO.OF INSERT		
	R	D	d	L	L_1						
BMCC-R2563140	25	50	63	140	67	RBEX 50M RBMX 50-M	3	SP..1204	4	ST511-43 M5	TX-20
BMCC-R2563170			63	170	67						
BMCC-R2563170-SP			63	170	87				6		
BMCC-R2563200			63	200	87						
BMCC-R2563250			63	250	87						
BMCC-R2580300			80	300	87						
BMCC-R2580350			80	350	87						

▶ BPUX



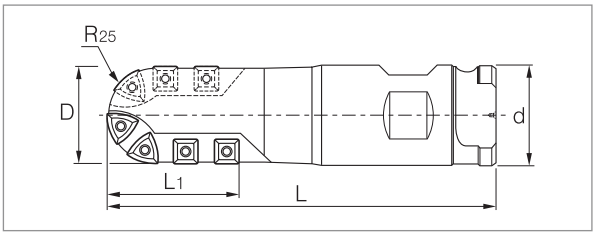
- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)						NO.OF INSERT		NO.OF INSERT		
	R	D	d	L	L_1						
BPUX-R2563140	25	50	63	140	67	YPNW25006S YPMT25006S	3	SPMT120408	4	912-141 M6 ST511-43 M5	TX-25 TX-20
BPUX-R2563170				170							
BPUX-R2563200				200							
BPUX-R2563250				250							

BALL CUTTER

▶ BPUX

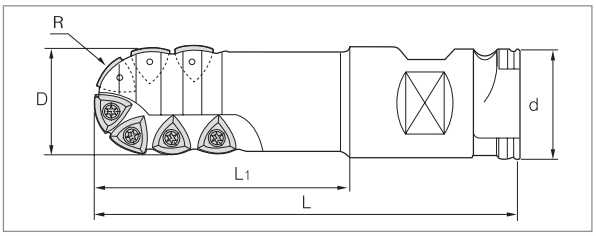


- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)					NO.OF INSERT		NO.OF INSERT		
	R	D	d	L	L1					
BPUX-R2550.8200	25	50	50.8	200	67	YPNW 25006S YPMT 25006S	3	SPMT120408	4	912-141 M6 ST511-43 M5	TX-25 TX-20
BPUX-R2550.8250				250							
BPUX-R2550.8300				300							

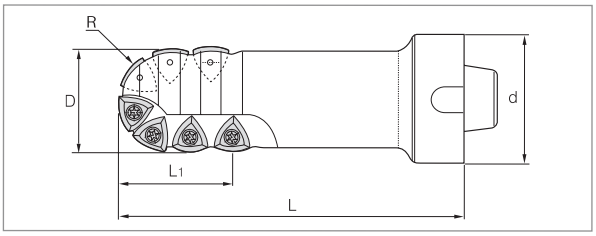
▶ WRMC-T



- STRAIGHT SHANK TYPE

INSERT TYPE → TAEGU–TEC, WIDIN, DURACARB

Part No.	Dimensions(mm)					NO.OF INSERT			
	R	D	d	L	L1				
WRMC-R2550.8200-T	25	50	50.8	200	100	7	RBEX 50-M	ST511-43	TX-20
WRMC-R2550.8250-T				250	150				
WRMC-R2550.8300-T				300	200				



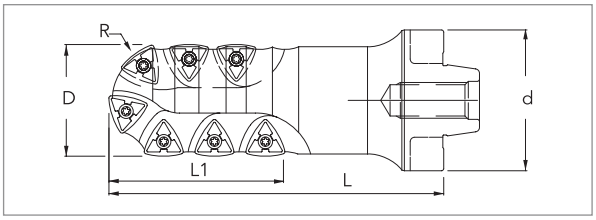
- MODULAR SHANK TYPE

INSERT TYPE → TAEGU–TEC, WIDIN, DURACARB

Part No.	Dimensions(mm)					NO.OF INSERT			
	R	D	d	L	L1				
WRMC-R2563140-T	25	50	63	140	65	7	RBEX 50-M	ST511-43	TX-20
WRMC-R2563170-T				170					
WRMC-R2563200-T				200					

BALL CUTTER

▶ TRMC

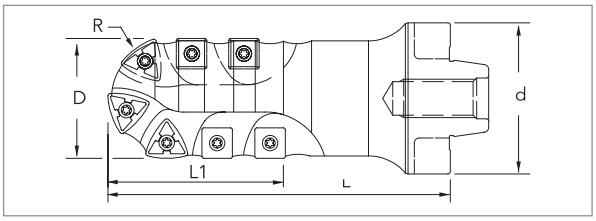


- MODULAR SHANK TYPE

INSERT TYPE → TAEGU-TEC

Part No.	Dimensions(mm)						NO.OF INSERT		
	R	D	d	L	L_1				
TRMC-R2563140	25	50	63	140	77	6RBE-50M	7	ST511-43 M5	TX-20
TRMC-R2563170				170					
TRMC-R2563200				200					

▶ TRMS



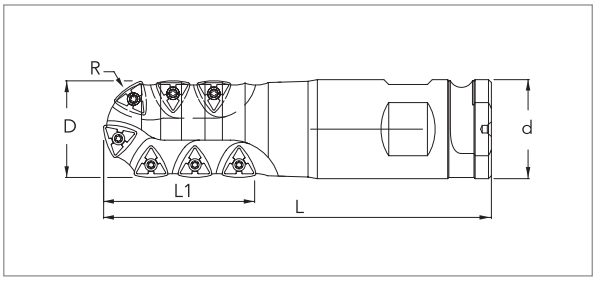
- MODULAR SHANK TYPE

INSERT TYPE → TAEGU-TEC

Part No.	Dimensions(mm)						NO.OF INSERT		NO.OF INSERT		
	R	D	d	L	L_1						
TRMS-R2563140	25	50	63	140	67	6RBE-50M	3	SP...1204	4	ST511-43 M5	TX-20
TRMS-R2563170				170							
TRMS-R2563200				200							

BALL CUTTER

▶ TRMC

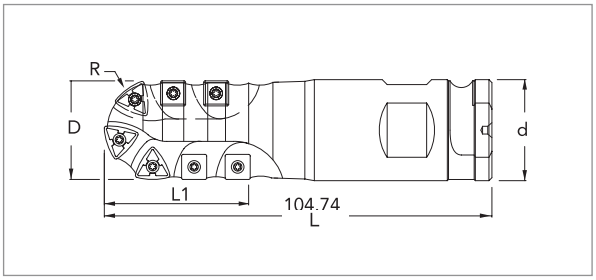


- STRAIGHT SHANK TYPE

INSERT TYPE → TAEGU-TEC

Part No.	Dimensions(mm)						NO.OF INSERT		
	R	D	d	L	L_1				
TRMC-R2550.8200	25	50	50.8	200	77	6RBE-50M	7	ST511-43 M5	TX-20
TRMC-R2550.8250				250					
TRMC-R2550.8300				300					

▶ TRMS



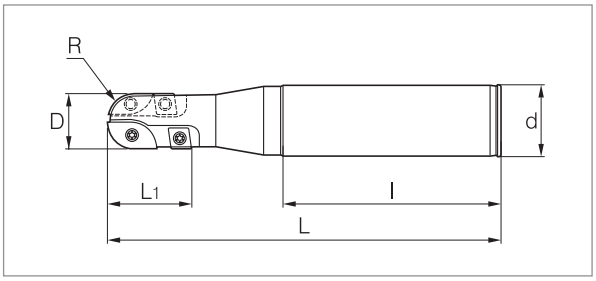
- STRAIGHT SHANK TYPE

INSERT TYPE → TAEGU-TEC

Part No.	Dimensions(mm)						NO.OF INSERT		NO.OF INSERT		
	R	D	d	L	L_1						
TRMS-R2550.8200	25	50	50.8	200	67	6RBE-50M	3	SP..1204	4	ST511-43 M5	TX-20
TRMS-R2550.8250				250							
TRMS-R2550.8300				300							

BALL CUTTER

▶ BWSF(Finish)

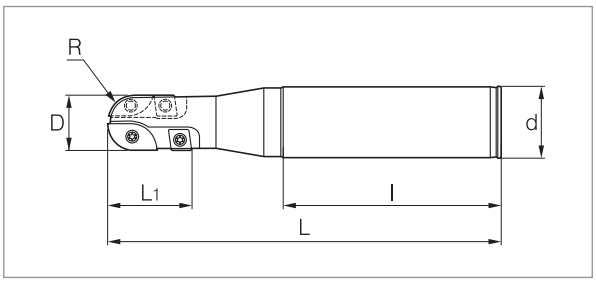


- STRAIGHT SHANK TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)						NO.OF INSERT				
	R	D	d	L	l	L_1					
BWSF-R1020160	10	20	20	160	95	28	4	XD..16T3100R	SP..0603	ST3072-60H M3 ST2553-55 M2.5	TX-8
BWSF-R1020200	10	20	20	200	130	28					
BWSF-R1225160	12.5	25	25	160	95	32		XD..2004125R		ST4101-60W M4 ST2553-55 M2.5	TX-15 TX-8
BWSF-R1225200	12.5	25	25	200	130	32					
BWSF-R1532180	15	30	32	180	109	42		XD..2405150R	SP..09T3	ST512-63P M5 ST4084-60 M4	TX-20 TX-15
BWSF-R1532250	15	30	32	250	150	42					
BWSF-R1632180	16	32	32	180	100	43		XD..2506160R			
BWSF-R1632250	16	32	32	250	150	43					

▶ BWSC (Rough)



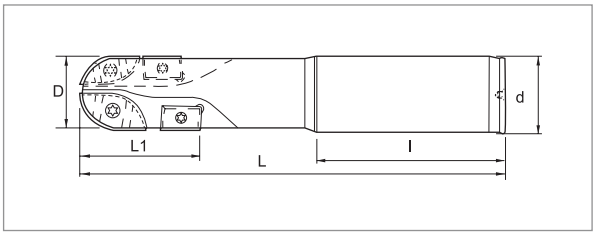
- STRAIGHT SHANK TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)					NO.OF INSERT				
	R	D	d	L	l					
BWSC-R1020160	10	20	20	160	95	4	XDMT 16T3100R	SPMT 0603	ST3072-60H M3 ST2553-55 M2.5	TX-8
BWSC-R1020200	10	20	20	200	130					
BWSC-R1225160	12.5	25	25	160	95		XDMT 2004125R		ST4101-60W M4 ST2553-55 M2.5	TX-15 TX-8
BWSC-R1225200	12.5	25	25	200	130					
BWSC-R1532180	15	30	32	180	109		XDMT 2405150R	SPMT 09T3	ST512-63P M5 ST4084-60 M4	TX-20 TX-15
BWSC-R1532250	15	30	32	250	150					
BWSC-R1632180	16	32	32	180	100		XDMT 2506160R			
BWSC-R1632250	16	32	32	250	150					

BALL CUTTER

▶ SRM

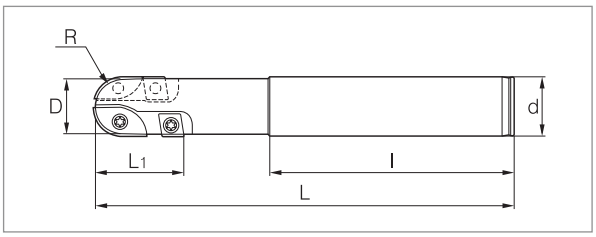


- STRAIGHT SHANK TYPE

INSERT TYPE → MITSUBISHI

Part No.	Dimensions(mm)						Master insert	Slave insert	Peripheral insert		
	R	D	d	L	l	L_1					
SRM-R0816200-2F	8	16	16	200	150	30	SRM-16C	SR.16E	APMT 1135	ST2553-55 M2.5	TX-8
SRM-R1020200-4F	10	20	20	200	140	30	SRM-20C	SR.20E		ST3072-60H M3 ST2553-55 M2.5	TX-8
SRM-R1225200-4F	12.5	25	25	200	130	37	SRM-25C	SR.25E		ST4101-60W M4 ST2553-55 M2.5	TX-15 TX-8
SRM-R1225250-4F	12.5	25	25	250	130	37					
SRM-R1532200-4F	15	30	32	200	100	44	SRM-30C	SR.30E	APMT 1604	ST511-60H ST4084-60 M4	TX-20 TX-15
SRM-R1532250-4F	15	30	32	250	150	44					
SRM-R1532300-4F	15	30	32	300	250	44					

▶ BHSF



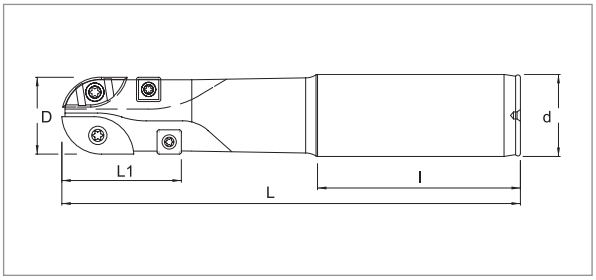
- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI

Part No.	Dimensions(mm)CN						Master insert	Slave insert	Peripheral insert		
	R	D	d	L	l	L_1					
BHSF-R0816200	8	16	16	200	150	15	ZCET080CE	ZCET080SE		ST2553-55 M2.5	TX-8
BHSF-R1020160	10	20	20	160	100	30	ZCE.100CE	ZCE.100SE	CPMT 080204	ST3072-60H M3 ST2553-55 M2.5	
BHSF-R1020200	10	20	20	200	140	30					
BHSF-R1225200	12.5	25	25	200	130	37	ZCE.125CE	ZCE.125SE	CPMT 090308	ST4101-60W M4 ST408-43 M4	TX-15
BHSF-R1225250	12.5	25	25	250	170	37					
BHSF-R1532200	15	30	32	200	100	44	ZCE.150CE	ZCE.150SE		ST511-60H ST408-43 M4	TX-20 TX-15
BHSF-R1532250	15	30	32	250	100	44					
BHSF-R1532300	15	30	32	300	250	44					
BHSF-R1632200	16	32	32	200	100	44	ZCE.160CE	ZCE.160SE			
BHSF-R1632250	16	32	32	250	200	44					
BHSF-R1632300	16	32	32	300	250	44					

BALL CUTTER

▶ GBEC



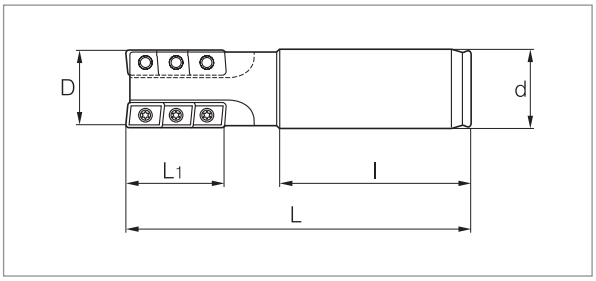
- STRAIGHT SHANK TYPE

INSERT TYPE → KORLOY, WIDIN

Part No.	Dimensions(mm)						Master insert	Slave insert	Peripheral insert		
	R	D	d	L	l	L_1					
GBEC-R0816200-2F	8	16	16	200	150	15	ZPET080M	ZPET080S		ST2553-55 M2.5	TX-8
GBEC-R1020200-4F	10	20	20	200	140	28	ZPET100M	ZPET100S	SPMT 060304	ST3072-60H M3 ST2553-55 M2.5	TX-8
GBEC-R1225200-4F	12.5	25	25	200	130	33	ZPET125M	ZPET125S		ST4101-60W M4 ST2553-55 M2.5	TX-8 TX-15
GBEC-R1225250-4F	12.5	25	25	250	130	33					
GBEC-R1532200-4F	15	30	32	200	100	41	ZPET150M	ZPET150S	SDMT 090308	ST511-63P ST4084-60 M4	TX-15 TX-20
GBEC-R1532250-4F	15	30	32	250	150	41					
GBEC-R1532300-4F	15	30	32	300	250	41					

HELICAL CUTTER

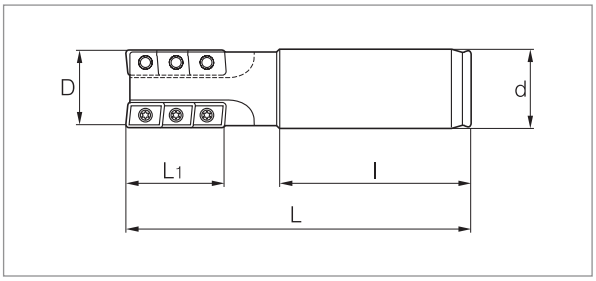
▶ HESC



- STRAIGHT SHANK TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)							NO.OF INSERT		
	D	d	L	l	L_1					
HESC-3216120-W	32	32	120	60	40	2	ADMT160608R	6	ST4084-60 M4	TX-15
HESC-3216150-W	32	32	150	60	67			10		
HESC-4016135-W	40	32	135	80	40	3		12	ST4101-60W M4	
HESC-4016160-W	40	32	160	80	67			15		
HESC-5016170-W	50	42	170	80	67			15		
HESC-501650.8220-W	50	50.8	220	80	67			15		



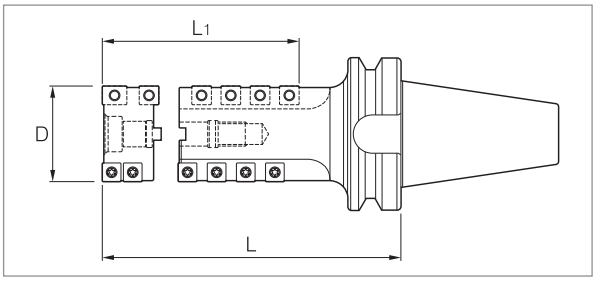
- STRAIGHT SHANK TYPE

INSERT TYPE → TAEGU-TEC, SECO, KORLOY, WIDIN

Part No.	Dimensions(mm)							NO.OF INSERT		
	D	d	L	l	L_1					
HESC-3216120	32	32	120	60	42	2	AP...1604	6	ST4084-60 M4	TX-15
HESC-3216150	32	32	150	60	70			10		
HESC-4016135	40	32	135	60	56	3		12	ST4101-60W M4	
HESC-4016160	40	32	160	70	70			15		
HESC-5016170	50	42	170	80	70			15		
HESC-501650.8220	50	50.8	220	80	112			24		

HELICAL CUTTER

▶ HMCC-BT

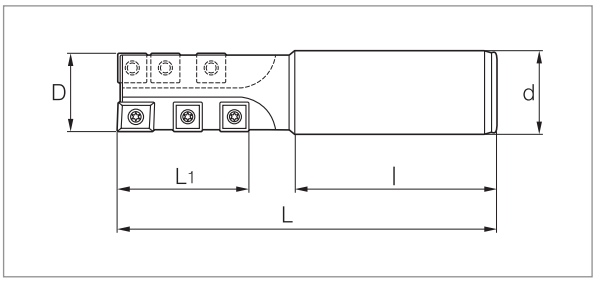


- MODULAR SHANK TYPE

INSERT TYPE → WALTER, TAEGU-TEC, WIDIN

Part No.	Dimensions(mm)					NO.OF INSERT		NO.OF INSERT			
	D	L	L1								
HMCC-BT5050185	50	185	110	4	APMT 1504T-WT ZPMT 1504-WM	2	SPMT1204	22	FPB 5024	ST511-43 M5	TX-20
HMCC-BT5050205	50	205	130					26			
HMCC-BT5050235	50	235	160					32			
HMCC-BT5050255	50	255	180					36			
HMCC-BT5063165	63	169	90					18	FPB 6334		
HMCC-BT5063195	63	195	120					24			
HMCC-BT5063225	63	225	150					30			
HMCC-BT5063265	63	265	190					38			
HMCC-BT5063390	63	390	220					44			

▶ HNCC



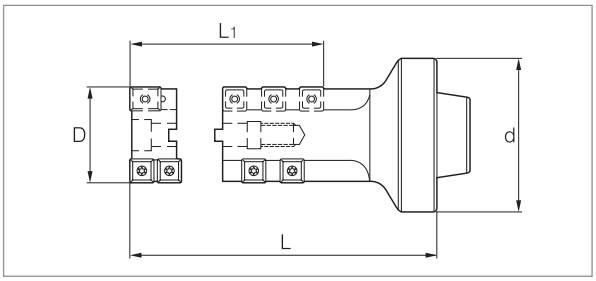
- STRAIGHT SHANK TYPE

INSERT TYPE → WALTER, TAEGU-TEC, WIDIN

Part No.	Dimensions(mm)					NO.OF INSERT					
	D	d	L	l	L1						
HNCC-2025110	20	25	110	65	32	1 / 6	2	P27215-00	P28415-00 (SP..0603)	ST2553-55 M2.5	TX-8
HNCC-2525120	25	25	120	75	32	1 / 6					
HNCC-3232150	32	32	150	75	42	1 / 5		P27215-3	P28415-0 (SD..0903)	ST408-43 M4	TX-15
HNCC-4032155	40	32	155	75	50	2 / 12	4				
HNCC-4042165	40	42	165	85	50	2 / 12					
HNCC-5042170	50	42	170	85	56	2 / 10		ZPMT1504-WM	(SP..1204)	ST511-43 M5	TX-20
HNCC-5050.8200	50	50.8	200	85	76	2 / 14					

HELICAL CUTTER

▶ HMCC-MD

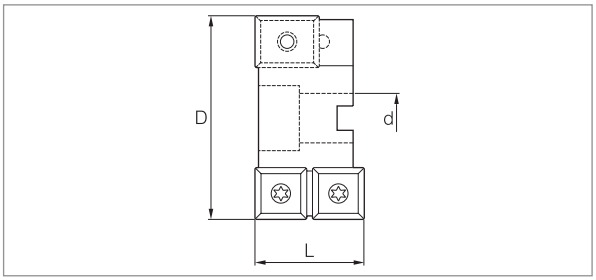


- MODULAR SHANK TYPE

INSERT TYPE → WALTER, TAEGU-TEC, WIDIN

Part No.	Dimensions(mm)						NO.OF INSERT		NO.OF INSERT			
	D	d	L	L_1								
HMCC-5080135	50	80	135	76	4	APMT 1504T-WT ZPMT 1504-WM	2	SPMT1204	14	FPB 5024	ST511-43 M5	TX-20
HMCC-5080155	50	80	155	96					18			
HMCC-5080185	50	80	185	126					24			
HMCC-5080205	50	80	205	146					28			
HMCC-6380135	63	80	135	86					16	FPB 6334		
HMCC-6380165	63	80	165	114					22			
HMCC-6380195	63	80	195	146					28			
HMCC-6380235	63	80	235	186					36			
HMCC-8080155	80	80	155	106	6		3		30	FPB8034		

▶ FPCC



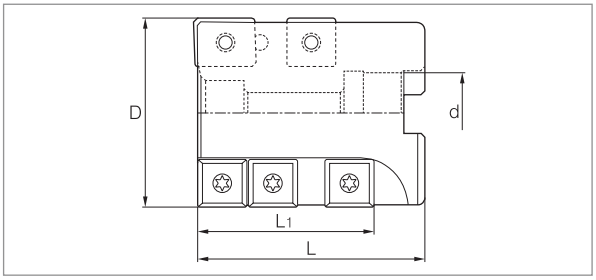
- BORE MOUNTED TYPE

INSERT TYPE → WALTER, TAEGU-TEC, WIDIN

Part No.	Dimensions(mm)					NO.OF INSERT		NO.OF INSERT			
	D	d	L								
FPCC-5024	50	12.5	24	4	APMT 1504T-WT ZPMT 1504-WM	2	SPMT1204	4	FPB5024	ST511-43 M5	TX-20
FPCC-5055	50	12.5	50					10	FPB5050		
FPCC-5424	54	12.5	24					4	FPB5024		
FPCC-5455	54	12.5	50					10	FPB5050		
FPCC-6334	63	16.5	34					6	FPB6334		
FPCC-6365	63	16.5	65					12	FPB6365		
FPCC-8034	80	18.0	34	6		3		9	FPB8034		

SHELL MILL CUTTER

▶ SMCC

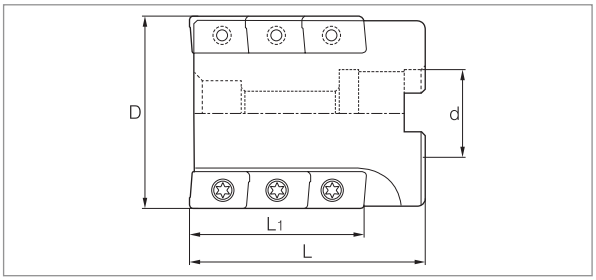


- BORE MOUNTED TYPE

INSERT TYPE → WALTER, TAEGU-TEC, KORLOY, WIDIN

Part No.	Dimensions(mm)					NO.OF INSERT				
	D	d	L	L1						
SMCC-5022060	50	22	60	34	4	2/6	APMT1504T-WT ZPMT1504-WM	SP..1204	ST511-43 M5	TX-20
SMCC-6327060	63	27	60	34	4	2/6				
SMCC-8032080	80	32	80	67	6	3/18				

▶ SECC



- BORE MOUNTED TYPE

INSERT TYPE → TAEGU-TEC, SECO, KORLOY, WIDIN

Part No.	Dimensions(mm)					NO.OF INSERT			
	D	d	L	L1					
SECC-502255	50	22	55	42	3	9	AP..1604	ST4101-60W M4	TX-15
SECC-632763	63	27	63	42	4	12			
SECC-803285	80	32	85	70	5	25			

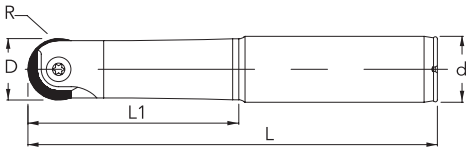
- BORE MOUNTED TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)					NO.OF INSERT			
	D	d	L	L1					
SECC-502255-W	50	22	55	42	3	9	ADMT160608R	ST4101-60W M4	TX-15
SECC-632763-W	63	27	63	42	4	12			
SECC-803285-W	80	32	85	70	5	25			

BALL CUTTER FINISHING

▶ BFCC

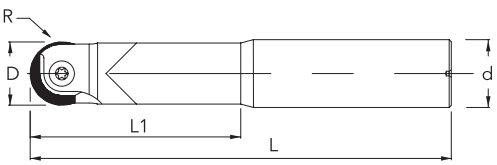


- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN, WALTER

Part No.	Dimensions(mm)							
	R	D	d	L	L_1			
BFCC-R0612150	6	12	12	150	35	P3204-D120 SP3204-D120	FS-391	TX-15
BFCC-R0612180	6	12	12	180	35			
BFCC-R0816160	8	16	16	160	50	P3204-D150 SP3204-D150	FS-392	TX-15
BFCC-R0816200	8	16	16	200	50			
BFCC-R1020200	10	20	20	200	70	P3204-D200 SP3204-D200	FS-393	TX-20
BFCC-R1020250	10	20	20	250	70			
BFCC-R1225200	12.5	25	25	200	80	P3204-D250 SP3204-D250	FS-394	TX-20
BFCC-R1225250	12.5	25	25	250	80			
BFCC-R1532200	15	30	32	200	100	P3204-D300 SP3204-D300	FS-395	TX-30
BFCC-R1532250	15	30	32	250	100			
BFCC-R1532300	15	30	32	300	100			

▶ C-BFCC



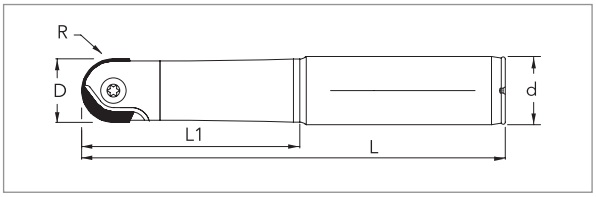
- CARBIDE SHANK TYPE

INSERT TYPE → WIDIN, WALTER

Part No.	Dimensions(mm)							
	R	D	d	L	L_1			
C-BFCC-R0510150	5	10	10	150	25	P3204-D100	FS-90	TX-15
C-BFCC-R0612165	6	12	12	165	35	P3204-0120 SP3204-D120	FS-391	
C-BFCC-R0612200	6	12	12	200	35			
C-BFCC-R0816200	8	16	16	200	50	P3204-D160 SP3204-D160	FS-392	
C-BFCC-R0816250	8	16	16	250	50			
C-BFCC-R1020220	10	20	20	220	70	P3204-D200 SP3204-D200	FS-393	TX-20
C-BFCC-R1020300	10	20	20	300	70			
C-BFCC-R1225200	12.5	25	25	200	80	P3204-D250 SP3204-D250	FS-394	
C-BFCC-R1225250	12.5	25	25	250	80			
C-BFCC-R1225300	12.5	25	25	300	80			
C-BFCC-R1532250	15	30	32	250	100	P3204-D300 SP3204-D300	FS-395	TX-30
C-BFCC-R1532300	15	30	32	300	100			

BALL CUTTER FINISHING

▶ ABPF

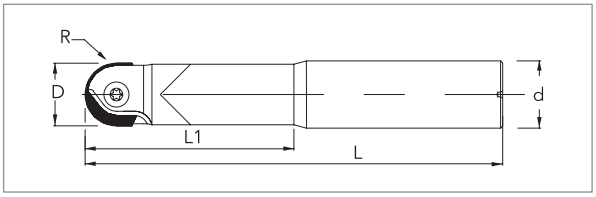


- STRAIGHT STEEL SHANK

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)							
	R	D	d	L	L_1			
ABPF-R0816160	8	16	16	160	45	ZPSW 160	TSB-5844	T-20
ABPF-R0816200	8	16	16	200	45			
ABPF-R1020200	10	20	20	200	70	ZPSW 200	TSB-5845	T-25
ABPF-R1020250	10	20	20	250	70			
ABPF-R1225200	12.5	25	25	200	80	ZPSW 250	TSB-5846	T-30
ABPF-R1225250	12.5	25	25	250	80			
ABPF-R1532200	15	30	32	200	100	ZPSW 300	TSB-5847	
ABPF-R1532250	15	30	32	250	100			
ABPF-R1532300	15	30	32	300	100			
ABPF-R1532350	15	30	32	350	100			

▶ C-ABPF



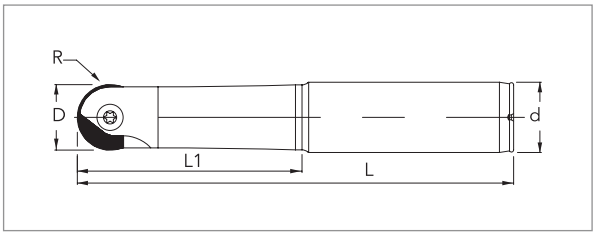
- CARBIDE SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)							
	R	D	d	L	L_1			
C-ABPF-08S08x25x135L	4	08	08	135	25	ZPSW 080	TSB-5841	TX-10
C-ABPF-10S10x25x150L	5	10	10	150	25	ZPSW 100	TSB-5842	
C-ABPF-10S10x25x180L	5	10	10	180	25			
C-ABPF-10S10x25x200L	5	10	10	200	25			
C-ABPF-12S12x35x165L	6	12	12	165	35	ZPSW 120	TSB-5843	TX-20
C-ABPF-12S12x35x200L	6	12	12	200	35			
C-ABPF-16S16x50x200L	8	16	16	200	50	ZPSW 160	TSB-5844	
C-ABPF-16S16x50x250L	8	16	16	250	50			
C-ABPF-20S20x70X220L	10	20	20	220	70	ZPSW 200	TSB-5845	TX-25
C-ABPF-20S20x70x250L	10	20	20	250	70			
C-ABPF-20S20x70x300L	10	20	20	300	70			
C-ABPF-25S25x100x200L	12.5	25	25	200	100	ZPSW 250	TSB-5846	TX-30
C-ABPF-25S25x100x250L	12.5	25	25	250	100			
C-ABPF-25S25x100x300L	12.5	25	25	300	100			
C-ABPF-30S32x100x250L	15	30	32	250	100	ZPSW 300	TSB-5847	
C-ABPF-30S32x100x300L	15	30	32	300	100			
C-ABPF-30S32x100x350L	15	30	32	350	100			
C-ABPF-30S32x100x400L	15	30	32	400	100			

BALL CUTTER FINISHING

▶ SRFH

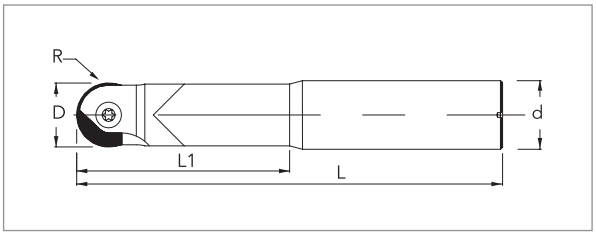


- STRAIGHT SHANK TYPE

INSERT TYPE → DIJET, MITSUBISHI, KORLOY, WIDIN

Part No.	Dimensions(mm)							
	D	R	d	L	L_1			
SRFH-R0816160	16	8	16	160	45	SRFT 160 LBH 160~170	FSW-4013	TX-15
SRFH-R0816200	16	8	16	200	45			
SRFH-R1020200	20	10	20	200	70	SRFT 200 LBH 200~210	FSW-5016	TX-20
SRFH-R1020250	20	10	20	250	70			
SRFH-R1225200	25	12.5	25	200	100	SRFT 250 LBH 250~260	FSW-6020	TX-30
SRFH-R1225250	25	12.5	25	250	100			
SRFH-R1532200	30	15	32	200	100	SRFT 300 LBH 300~320	FSW-8025	TX-40
SRFH-R1532250	30	15	32	250	100			
SRFH-R1532300	30	15	32	300	100			

▶ C-SRFH



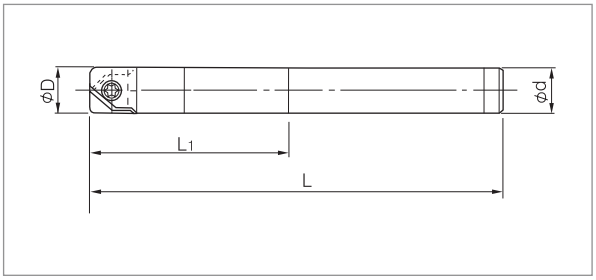
- CARBIDE SHANK TYPE

INSERT TYPE → DIJET, MITSUBISHI, KORLOY, WIDIN

Part No.	Dimensions(mm)							
	R	D	d	L	L_1			
C-SRFH-R0408135	4	08	08	135	25	SRFT 080 LBH 080	FSW-2506	TX-07
C-SRFH-R0510150	5	10	10	150	25	SRFT 100 LBH 100	FSW-3007	TX-08
C-SRFH-R0612165	6	12	12	165	35	SRFT 120 LBH 120~130	FSW-3509	TX-10
C-SRFH-R0612200	6	12	12	200	35			
C-SRFH-R0816200	8	16	16	200	50	SRFT 160 LBH 160~170	FSW-4013	TX-15
C-SRFH-R0816250	8	16	16	250	50			
C-SRFH-R1020220	10	20	20	220	70	SRFT 200 LBH 200~210	FSW-5016	TX-20
C-SRFH-R1020250	10	20	20	250	70			
C-SRFH-R1020300	10	20	20	300	70			
C-SRFH-R1225200	12.5	25	25	200	100	SRFT 250 LBH 250~260	FSW-6020	TX-30
C-SRFH-R1225250	12.5	25	25	250	100			
C-SRFH-R1225300	12.5	25	25	300	100			
C-SRFH-R1532250	15	30	32	250	100	SRFT 300 LBH 300~320	FSW-8025	TX-40
C-SRFH-R1532300	15	30	32	300	100			

BALL CUTTER FINISHING

▶ C-RMMC



- CARBIDE SHANK TYPE

INSERT TYPE → DIJET, MITSUBISHI, WIDIN

Part No.	Dimensions(mm)						
	D	d	L	L_1			
C-RMMC-1212165	12	12	165	35	RNM-120 LRH-120~130	FSW-3509	TX-10
C-RMMC-1212200	12	12	200	35			
C-RMMC-1616160	16	16	160	40	RNM-160 LRH-160~170	FSW-4013	TX-15
C-RMMC-1616200	16	16	200	40			
C-RMMC-2020200	20	20	200	45	RNM-200 LRH-200~210	FSW-5016	TX-20
C-RMMC-2020250	20	20	250	45			
C-RMMC-2525200	25	25	200	50	RNM-250 LRH-250~260	FSW-6020	TX-30
C-RMMC-2525250	25	25	250	50			
C-RMMC-3032200	30	32	200	50	RNM-300 LRH-300	FSW-8025	TX-40
C-RMMC-3032250	30	32	250	50			
C-RMMC-3032300	30	32	300	50			
C-RMMC-3232200	32	32	200	50	RNM-320 LRH-320~330	FSW-8025	TX-40
C-RMMC-3232250	32	32	250	50			
C-RMMC-3232300	32	32	300	50			

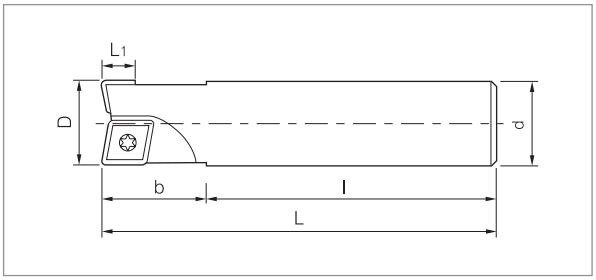
- STRAIGHT SHANK TYPE

INSERT TYPE → DIJET, MITSUBISHI, WIDIN

Part No.	Dimensions(mm)						
	D	d	L	L_1			
RMMC-1212165	12	12	150	35	RNM-120 LRH-120~130	FSW-3509	TX-10
RMMC-1212200	12	12	180	35			
RMMC-1616160	16	16	160	40	RNM-160 LRH-160~170	FSW-4013	TX-15
RMMC-1616200	16	16	200	40			
RMMC-2020200	20	20	200	45	RNM-200 LRH-200~210	FSW-5016	TX-20
RMMC-2020250	20	20	250	45			
RMMC-2525200	25	25	200	50	RNM-250 LRH-250~260	FSW-6020	TX-30
RMMC-2525250	25	25	250	50			
RMMC-3032200	30	32	200	50	RNM-300 LRH-300	FSW-8025	TX-40
RMMC-3032250	30	32	250	50			
RMMC-3032300	30	32	300	50			
RMMC-3232200	32	32	200	50	RNM-320 LRH-320~330	FSW-8025	TX-40
RMMC-3232250	32	32	250	50			
RMMC-3232300	32	32	300	50			

MULTI MILL CUTTER

▶ AJUL

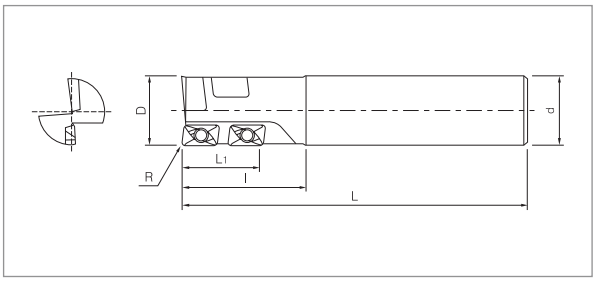


- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI

ITEM CODE	NO.OF INSERTS	Dimensions(mm)						INSERTS
		D	L	d	L_1	b	l	
AJUL-1616175	2	16	175	16	6	40	135	CCMT060204, CPMT080204Z
AJUL-2020185	2	20	185	20	6	50	135	CPMT060204, CPMT090204Z
AJUL-2525220	2	25	220	25	9	70	150	CPMT090308, CPMT120308Z
AJUL-3232230	2	32	230	32	12	80	150	CPMT120408, 120430 CPMT160408, 160430Z
AJUL-4032240	2	40	240	32	15	50	190	CPMT160408Z, 160430Z CPMT190408Z, 190430Z
AJUL-5042250	2(3)	50	250	42	12	50	200	CPMT090308 CPMT120408, 120430 CPMT160408Z, 160430Z

▶ AJSL



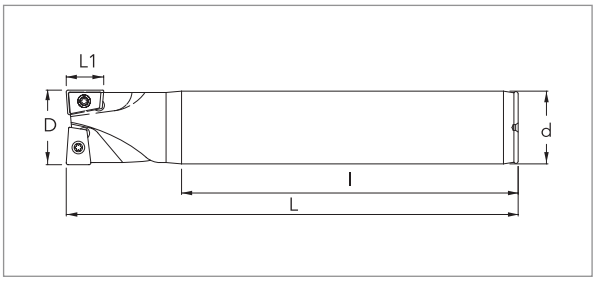
- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI

ITEM CODE		NO.OF INSERTS		Dimensions(mm)					INSERTS USED NOTE	
		END	PERPHERY	D	L	L_1	l	d	ON END	ON PERIPHERY
Long Shank	AJSL-16R 175	1	3	16	175	16	50	16	ADMT080308L	APMT090208R
	AJSL-17R 175			17	175	16	30	16		
	AJSL-20R 185			20	185	20	60	20	ADMT1003○○L	ACMT1003○○R
	AJSL-21R 185			21	185	20	35	20		
	AJSL-25R 220			25	220	25	75	25	ADMT12T3 ○○L	APMT12T3○○R
	AJSL-26R 220			26	220	25	40	25		
	AJSL-32R 230			32	230	32	90	32	APMT1604 ○○L	APMT1504○○R
	AJSL-33R 230			33	230	32	50	32		
	AJSL-35R 230			35	230	35	50	32	APMT1704 ○○L	
	AJSL-40R 240		4	40	240	40	55	32	APMT1905 ○○L	
	AJSL-50R 250		6	50	250	50	70	42	APMT2505 ○○L	

ENDMILL CUTTER

▶ AQXR-2F



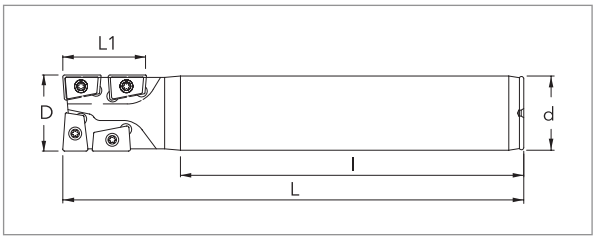
- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)								
	D	d	L_1	L	l				
AQXR-1616200-2F	16	16	7.4	200	150	2	QOMT0830R	ST2043-60H	TX-6
AQXR-1716200-2F	17	16	7.4	200	170				
AQXR-2020200-2F	20	20	9.2	200	145		QOMT1035R	ST2553-55 M2.5	TX-8
AQXR-2120200-2F	21	20	9.2	200	160				
AQXR-2120250-2F	21	20	9.2	250	210				
AQXR-2120300-2F	21	20	9.2	300	260				
AQXR-2525200-2F	25	25	11.5	200	135		QOMT1342R	ST3072-60H M3	
AQXR-2525250-2F	25	25	11.5	250	185				
AQXR-2625200-2F	26	25	11.5	200	160				
AQXR-2625250-2F	26	25	11.5	250	210				
AQXR-2625300-2F	26	25	11.5	300	260				
AQXR-3232200-2F	32	32	14.5	200	100		QOMT1651R	ST4084-60 M4	TX-15
AQXR-3232250-2F	32	32	14.5	250	160				
AQXR-3332200-2F	33	32	14.5	200	150				
AQXR-3332250-2F	33	32	14.5	250	200				
AQXR-3332300-2F	33	32	14.5	300	250				
AQXR-4032200-2F	40	32	18	200	130		QOMT2062R	ST511-60H	TX-25
AQXR-4032250-2F	40	32	18	250	180				

ENDMILL CUTTER

▶ AQXR-4F

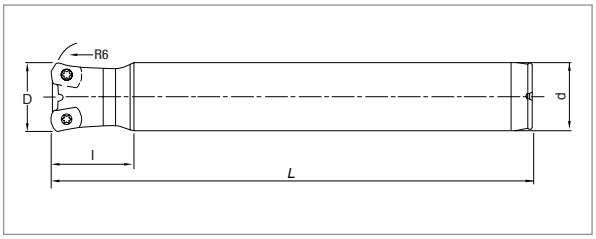


- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)								
	D	d	L_1	L	l				
AQXR-1616200-4F	16	16	17.6	200	150	4	QOMT0830R	ST2043-60H M2	TX-6
AQXR-1716200-4F	17	16	17.6	200	170				
AQXR-2020200-4F	20	20	22	200	145		QOMT1035R	ST2553-55 M2.5	TX-8
AQXR-2120200-4F	21	20	22	200	160				
AQXR-2525200-4F	25	25	27.5	200	135		QOMT1342R	ST3072-60H M3	
AQXR-2525250-4F	25	25	27.5	250	185				
AQXR-2625200-4F	26	25	27.5	200	160				
AQXR-2625250-4F	26	25	27.5	250	210				
AQXR-3232200-4F	32	32	35.2	200	110		QOMT1651R	ST4084-60 M4	TX-15
AQXR-3232250-4F	32	32	35.2	250	160				
AQXR-3332200-4F	33	32	35.2	200	150				
AQXR-3332250-4F	33	32	35.2	250	200				
AQXR-4032200-4F	40	32	44	200	130		QOMT2062R	ST511-60H	TX-25
AQXR-4032250-4F	40	32	44	250	180				

▶ TEBL



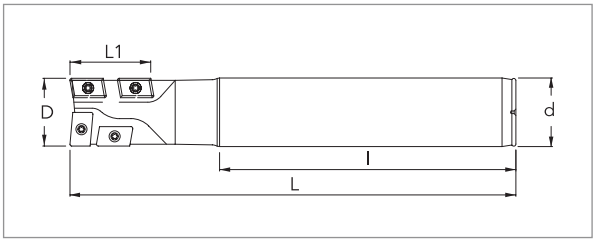
- STRAIGHT SHANK TYPE

INSERT TYPE → TAEGU–TEC

Part No.	Dimensions(mm)							
	D	d	L	l				
TEBL-D16x2Fx150L	16	16	150	40	2	BLMP 0603R	ST25060-60S M2.5	TX-8
TEBL-D16x2Fx200L	16	16	200	40	2			
TEBL-D17x2Fx150L	17	16	150	30	2			
TEBL-D17x2Fx200L	17	16	200	30	2			
TEBL-D20x3Fx150L	20	20	150	40	3			
TEBL-D20x3Fx200L	20	20	200	40	3			
TEBL-D21x3Fx150L	21	20	150	30	3			
TEBL-D21x3Fx200L	21	20	200	30	3			
TEBL-D21x3Fx250L	21	20	250	30	3			
TEBL-D25x4Fx200L	25	25	200	40	4			
TEBL-D25x4Fx250L	25	25	250	40	4			
TEBL-D26x3Fx200L	26	25	200	30	3			
TEBL-D26x3Fx250L	26	25	250	30	3			
TEBL-D26x4Fx200L	26	25	200	30	4			
TEBL-D26x4Fx250L	26	25	250	30	4			
TEBL-D32x5Fx200L	32	32	200	40	5			
TEBL-D32x5Fx250L	32	32	250	40	5			
TEBL-D33x4Fx200L	33	32	200	30	4			
TEBL-D33x4Fx250L	33	32	250	30	4			
TEBL-D33x5Fx200L	33	32	200	30	5			
TEBL-D33x5Fx250L	33	32	250	30	5			

ENDMILL CUTTER

▶ SECL

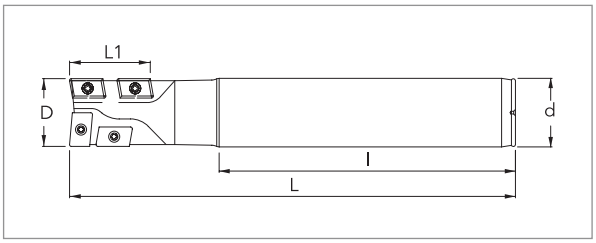


- STRAIGHT SHANK TYPE

INSERT TYPE → DIJET

Part No.	Dimensions(mm)					NO.OF INSERT	For use of an external diameter	NO.OF INSERT	For use of an internal diameter		
	D	d	L	L_1	l						
SECL-1616200	16	16	200	16	150	1	ZDMT 08T208L	3	ZPMT 09T208R	ST22045-55 M2.2	TX-6
SECL-1716200	17	16	200	16	160						
SECL-2020200	20	20	200	21	140		ZDMT 100308L		ZCMT 100308R	ST2553-55 M2.5	TX-8
SECL-2120200	21	20	200	21	160						
SECL-2525200	25	25	200	27	125		ZDMT 13T308L		ZPMT 13T308R	ST3070-60H M3	
SECL-2525250	25	25	250	27	175						
SECL-2625200	26	25	200	27	160						
SECL-2625250	26	25	250	27	210						
SECL-3232200	32	32	200	35	110		ZDMT 160408L		ZPMT 160408R	ST4084-60 M4	TX-15
SECL-3232250	32	32	250	35	160						
SECL-3232300	32	32	300	35	210						
SECL-3332200	33	32	200	35	150						
SECL-3332250	33	32	250	35	200						
SECL-3332300	33	32	300	35	250						

▶ AHJL



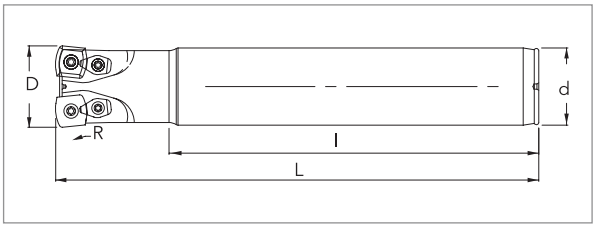
- STRAIGHT SHANK TYPE

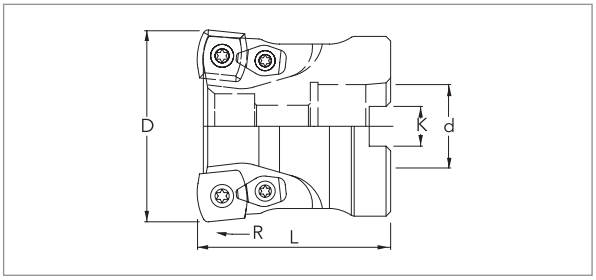
INSERT TYPE → HITACHI

Part No.	Dimensions(mm)								
	D	d	L	L_1	l				
AHJL-16R 175-4F	16	16	175	19	130	4	JDMT080308L JDMT090308R	TX-6	ST2043-60H M2
AHJL-17R 175-4F	17	16	175	19	138				
AHJL-20R 185-4F	20	20	185	23	135		JDMT100308L JDMT100308R	TX-8	ST2553-55 M2.5
AHJL-21R 185-4F	21	20	185	23	145				
AHJL-25R 220-4F	25	25	220	29	165		JDMT12T308L JDMT12T308R	TX-8	ST3072-60H M3
AHJL-26R 220-4F	26	25	220	29	170				
AHJL-32R 230-4F	32	32	230	34	160		JDMT160508L JDMT150508R	TX-15	ST4084-60 M4
AHJL-33R 230-4F	33	32	230	34	175				

ENDMILL CUTTER

▶ ASRL





- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)									
	D	L	d	R	l					
ASRL-2020200	20	200	20	10	150	2	EP.W0803TN -10	ST3509-55 M3.5	TX-15	
ASRL-2120200	21	200	20	10	150	2				
ASRL-2525200	25	200	25	10	140	2	ED.W10T3TN -10	ST408-43 M4		CL2C 2CLCN
ASRL-2525250	25	250	25	10	190	2				
ASRL-2625200	26	200	25	10	160	2				
ASRL-2625250	26	250	25	10	210	2				
ASRL-3232200	32	200	32	15(10)	130	2	ED.W13T4TN -15(10)	ST512-63P M5	TX-20	3CLCN
ASRL-3232250	32	250	32	15(10)	180	2				
ASRL-3332200	33	200	32	15(10)	150	2				
ASRL-3332250	33	250	32	15(10)	200	2				
ASRL-3532200	35	200	32	15(10)	150	2				
ASRL-3532250	35	250	32	15(10)	200	2				
ASRL-4032200	40	200	32	15(10)	150	3				
ASRL-4032250	40	250	32	15(10)	200	3				
ASRL-5042200	50	200	42	15	150	3	ED.W15T4TN -15			
ASRL-5042250	50	250	42	15	200	3				

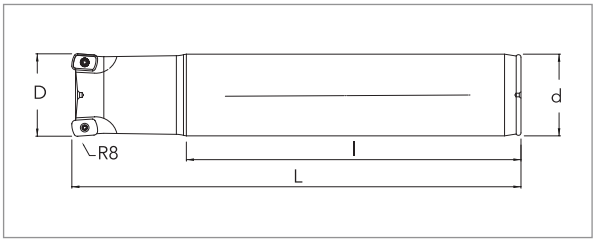
- BORE MOUNTED TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)									
	D	L	d	K	R					
ASRL-505022	50	50	22	10.4	15(10)	3	ED.W13T4TN-15	555-141 M5 ST512-63P	TX-20	3CLCN
ASRL-605022	60	50	22	10.4	15(10)	4				
ASRL-635022	63	50	22	10.4	15(10)	4	ED.W15T4TN-15			
ASRL-807027	80	70	27	12.7	15(10)	5				
ASRL-1007031.75	100	70	31.75	12.7	15(10)	6				

ENDMILL CUTTER

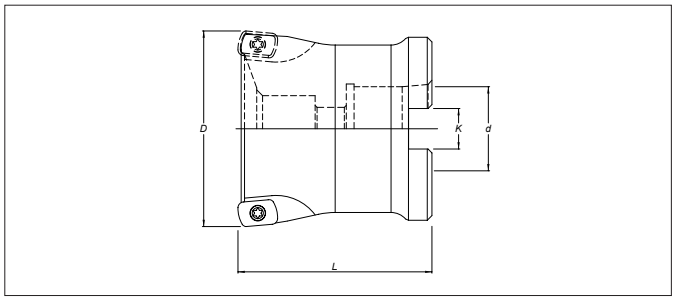
▶ ASRL-Pico



- STRAIGHT SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)							
	D	d	L	l				
ASRL-1616160-2F	16	16	160	120	2	EPNW0603TN-8	ST2553-55 M2.5	TX-8
ASRL-1716160-2F	17	16	160	130	2			
ASRL-1716200-2F	17	16	200	170	2			
ASRL-2020200-3F	20	20	200	160	3			
ASRL-2120200-3F	21	20	200	170	3			
ASRL-2525200-4F	25	25	200	150	4			
ASRL-2525250-4F	25	25	250	200	4			
ASRL-2625200-4F	26	25	200	160	4			
ASRL-2625250-4F	26	25	250	210	4			
ASRL-3232200-5F	32	32	200	135	5			
ASRL-3232250-5F	32	32	250	185	5			
ASRL-3332200-5F	33	32	200	160	5			
ASRL-3332250-5F	32	32	250	210	5			



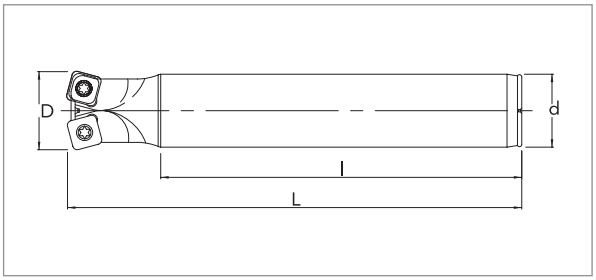
- BORE MOUNTED TYPE

INSERT TYPE → KORLOY, WIDIN

Part No.	Dimensions(mm)							
	D	d	L	K				
ASRL-D42x16x6F	42	16	40	10.4	6	EPNW0603TN-8	ST2553-55 M2.5	TX-8
ASRL-D50x22x7F	50	22	50	10.4	7			
ASRL-D52x22x7F	52	22	50	10.4	7			
ASRL-D63x27x8F	63	27	50	12.7	8			
ASRL-D66x27x8F	66	27	50	12.7	8			
ASRL-D80x27x10F	80	27	65	12.7	10			

ENDMILL CUTTER

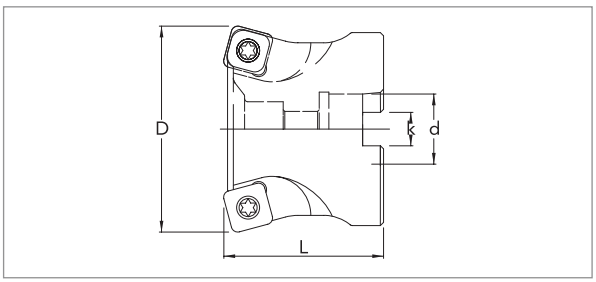
▶ BSR



- STRAIGHT SHANK TYPE

INSERT TYPE → KORLOY, WIDIN

Part No.	Dimensions(mm)							
	D	d	L	l				
BSR-2020200	20	20	200	150	2	SPCW 070312R	ST307-55 M3	TX-08
BSR-2020250	20	20	250	200	2			
BSR-2120200	21	20	200	160	2			
BSR-2120250	21	20	250	210	2			
BSR-2525200	25	25	200	140	2	SDCW 090412R	ST35084-60 M3.5	TX-15
BSR-2525250	25	25	250	190	2			
BSR-2525300	25	25	300	240	2			
BSR-2625200	26	25	200	160	2			
BSR-2625250	26	25	250	210	2			
BSR-2625300	26	25	300	260	2			
BSR-3232200	32	32	200	130	2	SBCW 130723SR	ST511-60H M5	TX-20
BSR-3232250	32	32	250	180	2			
BSR-3232300	32	32	300	230	2			
BSR-3332200	33	32	200	160	2			
BSR-3332250	33	32	250	210	2			
BSR-3332300	33	32	300	260	2			
BSR-4032200	40	32	200	160	3			
BSR-4032250	40	32	250	210	3			
BSR-4032300	40	32	300	260	3			



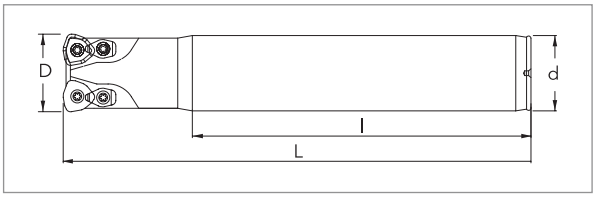
- BORE MOUNTED TYPE

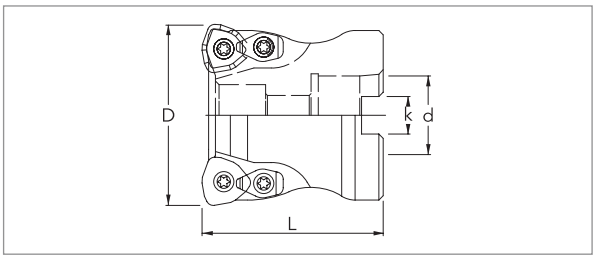
INSERT TYPE → KORLOY, WIDIN

Part No.	Dimensions(mm)							
	D	d	L	K				
BSR-D50×22×3F	50	22	50	10.4	3	SBCW 130723SR	ST511-60H M5	TX-20
BSR-D63×22×4F	63	22	50	10.4	4			
BSR-D80×27×5F	80	27	65	12.4	5			

ENDMILL CUTTER

▶ AJXC





- STRAIGHT SHANK TYPE

INSERT TYPE → MITSUBISHI, WIDIN

Part No.	Dimensions(mm)								
	D	d	L	l					
AJXC-1616180	16	16	180	145	2	JOMW06T	ST2553-55 M2.5		TX-8
AJXC-1716180	17	16	180	145					
AJXC-2020200	20	20	200	150		JOMW080	ST3072-60H M3		TX-8
AJXC-2120200	21	20	200	155					
AJXC-2120250	21	20	250	205					
AJXC-2525200	25	25	200	145		JDMW09T	ST3509-55 M3.5	CL2C 2CLCN	TX-15
AJXC-2525250	25	25	250	195					
AJXC-2625200	26	25	200	155					
AJXC-2625250	26	25	250	205					TX-15
AJXC-3232200	32	32	200	145		JDMW 120420	ST4084-60 M4		
AJXC-3232250	32	32	250	195					
AJXC-3232300	32	32	300	245					
AJXC-3332200	33	32	200	150					
AJXC-3332250	33	32	250	200					
AJXC-3332300	33	32	300	250					

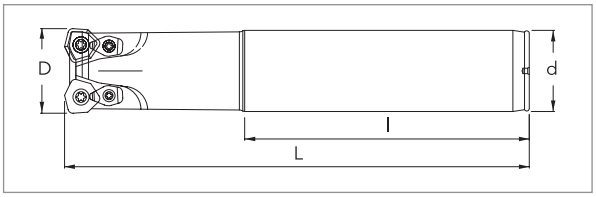
- BORE MOUNTED TYPE

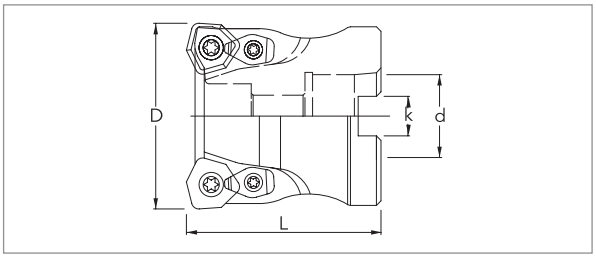
INSERT TYPE → MITSUBISHI, WIDIN

Part No.	Dimensions(mm)								
	D	d	L	K					
AJXC-3050-22	50	22	50	10.4	3	JDMW 120420	ST4101-60W M4	CL2C 2CLCN	TX-15
AJXC-4050-22	50	22	50	10.4	4				
AJXC-3063-22	63	22	50	10.4	3	JDMW 140520	ST511-60H M5	3CLCN	TX-25
AJXC-4063-22	63	22	50	10.4	4				
AJXC-5080-32	80	32	70	14.4	5				
AJXC-6080-32	80	32	70	14.4	6				

ENDMILL CUTTER

▶ SKSC





- STRAIGHT SHANK TYPE

INSERT TYPE → DIJET, WIDIN

Part No.	Dimensions(mm)								
	D	d	L	l					
SKSC-1616180	16	16	180	145	2	WDMW04	ST2553-55 M2.5		TX-8
SKSC-1716180	17	16	180	145	2				
SKSC-2020200	20	20	200	150	2	WDMW 05	ST3072-60H M3		TX-8
SKSC-2120200	21	20	200	155	2				
SKSC-2120250	21	20	250	205	2				
SKSC-2525200	25	25	200	140	2	WDMW 06	ST408-43 M4	CL2C 2CLCN	TX-15
SKSC-2525250	25	25	250	190	2				
SKSC-2625200	26	25	200	150	2				
SKSC-2625250	26	25	250	205	2				
SKSC-3232200	32	32	200	130	2	WDMW 08	ST4510-60 M4.5	3CLCN	TX-20
SKSC-3232250	32	32	250	180	2				
SKSC-3232300	32	32	300	230	2				
SKSC-3332200	33	32	200	150	2				
SKSC-3332250	33	32	250	200	2				
SKSC-3332300	33	32	300	250	2				

▶ SKSS

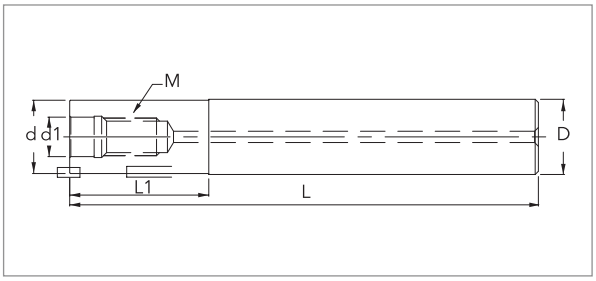
- BORE MOUNTED TYPE

INSERT TYPE → DIJET, WIDIN

Part No.	Dimensions(mm)								
	D	d	L	K					
SKSS-3050-22	50	22	50	10.4	3	WDMW 08	ST4510-60 M4.5	3CLCN	TX-20
SKSS-4050-22	50	22	50	10.4	4				
SKSS-3063-27	63	27	50	12.4	3				
SKSS-4063-27	63	27	50	12.4	4				
SKSS-5080-32	80	32	70	14.4	5				
SKSS-6080-32	80	32	70	14.4	6				

MODULAR CUTTTT SHANK

▶ IHCC

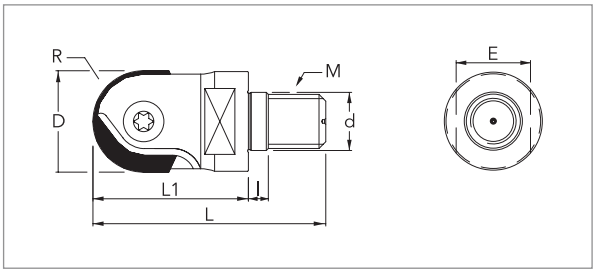


- M-Steel Shank Type - C-carbide Shank Type

Part No.	Dimensions(mm)						SHANK	APPLICABLE HEAD
	D	d	L	L_1	d_1	M		
M-IHCC-16172(200)	16	15.5	172	22(50)	8.5	8	STEEL	M-0000 D16 D17
M-IHCC-20187(220)	20	19.5	187	37(70)	10.5	10		M-0000 D20 D21
M-IHCC-20217(250)	20	19.5	217	37(70)	10.5	10		
M-IHCC-25212(250)	25	24.5	212	62(100)	12.5	12		M-0000 D25 D26
M-IHCC-25262(300)	25	24.5	262	62(100)	12.5	12		
M-IHCC-30155(200)	32	29.5	155	55(100)	17	16		M-0000 D30 D32 D33
M-IHCC-30205(220)	32	29.5	205	55(100)	17	16		
M-IHCC-30255(300)	32	29.5	255	55(200)	17	16		
C-IHCC-16172(200)	16	15.5	172	22(50)	8.5	8	CARBIDE	M-0000 D16 D17
C-IHCC-20187(220)	20	19.5	187	37(70)	10.5	10		M-0000 D20 D21
C-IHCC-20217(250)	20	19.5	217	37(70)	10.5	10		
C-IHCC-25212(250)	25	24.5	212	62(100)	12.5	12		M-0000 D25 D26
C-IHCC-25262(300)	25	24.5	262	62(100)	12.5	12		
C-IHCC-30155(200)	32	29.5	155	55(100)	17	16		M-0000 D30 D32 D33
C-IHCC-30205(250)	32	29.5	205	55(100)	17	16		
C-IHCC-30255(300)	32	29.5	255	55(100)	17	16		

BALL CUTTER

▶ M-ABPF

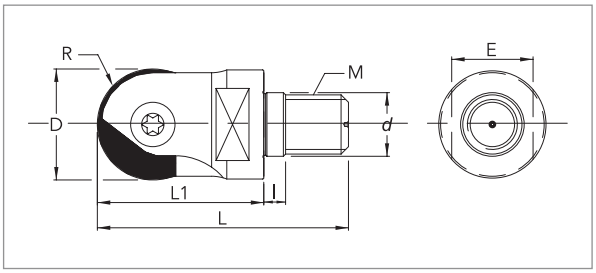


- MODULAR SHANK TYPE

INSERT TYPE → WIDIN, HITACHI

Part No.	Dimensions(mm)										
	R	D	d	L	L_1	l	M	E			
M-ABPF-R08xM8	8	16	8.5	45	28	6	8	12	ZPSW 160.170	TSB-5844	TX-20
M-ABPF-R10xM10	10	20	10.5	52	33	6	10	15	ZPSW 200.210	TSB-5845	TX-25
M-ABPF-R12.5xM12	12.5	25	12.5	60	38	6	12	19	ZPSW 250.260	TSB-5846	TX-30
M-ABPF-R15XM16	15	30	17	68	45	6	12	22	ZPSW 300.320	TSB-5847	TX-30

▶ M-SRFH



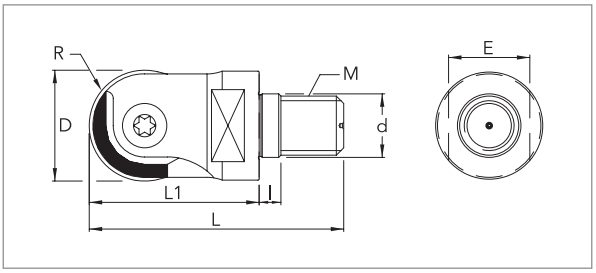
- MODULAR SHANK TYPE

INSERT TYPE → DIJET, MITSUBISHI, KORLOY, WIDIN

Part No.	Dimensions(mm)										
	R	D	d	L	L_1	l	M	E			
M-SRFH-R08xM8	8	16	8.5	45	28	6	8	12	SRFT 160 / LBH 160.170	FSW-4013	TX-15
M-SRFH-R10xM10	10	20	10.5	52	33	6	10	15	SRFT 200 / LBH 200.210	FSW-5016	TX-20
M-SRFH-R12.5xM12	12.5	25	12.5	60	38	6	12	19	SRFT 250 / LBH 250.260	FSW-6062	TX-30
M-SRFH-R15xM16	15	30	17	68	45	6	12	22	SRFT 300 / LBH 300.320	FSW-8025	TX-40

BALL CUTTER

▶ M-BFCC

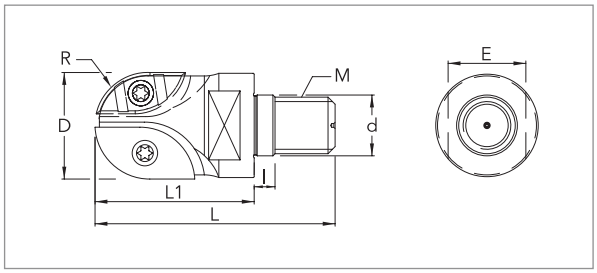


- MODULAR SHANK TYPE

INSERT TYPE → WIDIN, WALTER

Part No.	Dimensions(mm)										
	R	D	d	L	L_1	l	M	E			
M-BFCC-R08xM8	8	16	8.5	45	28	6	8	12	SP3204..D16	TSB-392	TX-15
M-BFCC-R10xM10	10	20	10.5	52	33	6	10	15	SP3204..D20	TSB-393	TX-25
M-BFCC-R12.5xM12	12.5	25	12.5	60	38	6	12	19	SP3204..D25	TSB-394	TX-25
M-BFCC-R15xM16	15	30	17	68	45	6	16	22	SP3204..D30	TSB-395	TX-30

▶ M-SRM



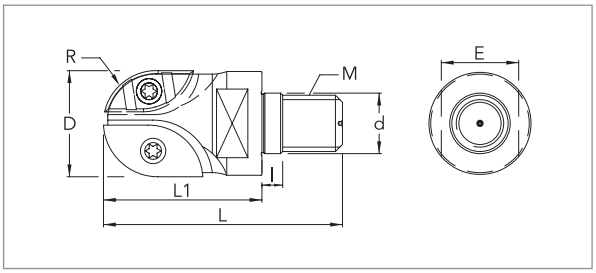
- MODULAR SHANK TYPE

INSERT TYPE → MITSUBISHI

Part No.	Dimensions(mm)								Master insert	Slave insert	NO.OF INSERT		
	R	D	d	L	L_1	l	M	E					
M-SRM-R08xM8	8	16	8.5	45	28	6	8	12	SR.16C	SR.16E	2	ST2553-55 M2.5	TX-8
M-SRM-R10xM10	10	20	10.5	52	33	6	10	15	SR.20C	SR.20E		ST3072-60H M3	TX-8
M-SRM-R12.5xM12	12.5	25	12.5	60	38	6	12	19	SR.25C	SR.25E		ST4104-60W M4	TX-15
M-SRM-R15xM16	15	30	17	68	45	6	12	22	SR.30C	SR.30E		ST511-60H M5	TX-20

BALL CUTTER

▶ M-BHSF

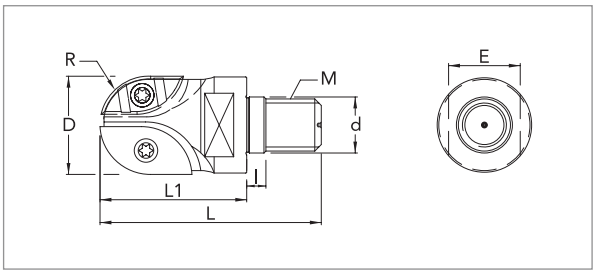


- MODULAR SHANK TYPE

INSERT TYPE → HITACHI

Part No.	Dimensions(mm)								Master insert	Slave insert	NO.OF INSERT		
	R	D	d	L	L_1	l	M	E					
M-BHSF-R08xM8	8	16	8.5	45	28	6	8	12	ZCE.080CE	ZCE.080SE	2	ST2553-55 M2.5	TX-8
M-BHSF-R10xM10	10	20	10.5	52	33	6	10	15	ZCE.100CE	ZCE.100SE		ST3072-60H M3	TX-8
M-BHSF-R12.5xM12	12.5	25	12.5	60	38	6	12	19	ZCE.125CE	ZCE.125SE		ST4101-60W M4	TX-15
M-BHSF-R15xM16	15	30	17	68	45	6	12	22	ZCE.150CE	ZCE.150SE		ST511-60H M5	TX-20

▶ M-GBEC



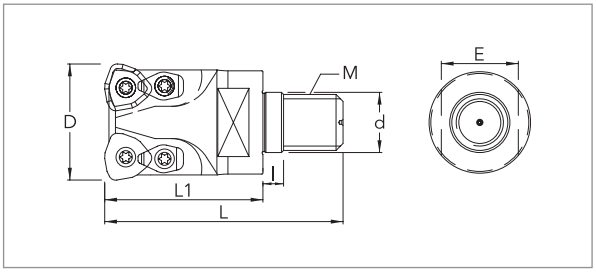
- MODULAR SHANK TYPE

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)								Master insert	Slave insert	NO.OF INSERT		
	R	D	d	L	L_1	l	M	E					
M-GBEC-R08xM8	8	16	8.5	45	28	6	8	12	ZPET080M	ZPET080S	2	ST2553-55 M2.5	TX-8
M-GBEC-R10xM10	10	20	10.5	52	33	6	10	15	ZPET100M	ZPET100S		ST3072-60H M3	TX-8
M-GBEC-R12.5xM12	12.5	25	12.5	60	38	6	12	19	ZPET125M	ZPET125S		ST4101-60W M4	TX-15
M-GBEC-R15xM16	15	30	17	68	45	6	16	22	ZPET150M	ZPET150S		ST5115-63P M5	TX-20

ENDMILL CUTTER

▶ M-AJXC

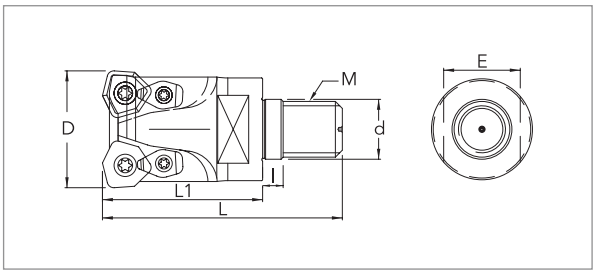


- MODULAR SHANK TYPE

INSERT TYPE → MITSUBISHI, WIDIN

Part No.	Dimensions(mm)											
	D	d	L	L_1	l	M	E					
M-AJXC-D16xM8	16	8.5	45	28	6	8	12	2	JOMW06T		ST2553-55 M2.5	TX-8
M-AJXC-D17xM8	17	8.5	45	28	6	10	15					
M-AJXC-D20xM10	20	10.5	52	33	6	10	15		JOMW080		ST3072-60H M3	
M-AJXC-D21xM10	21	10.5	52	33	6	10	15					
M-AJXC-D25xM12	25	12.5	60	38	6	12	19		JOMW09T	CL2C 2CLCN	ST3509-55 M3.5	TX-15
M-AJXC-D26xM12	26	12.5	60	38	6	12	19					
M-AJXC-D32xM16	32	17	68	45	6	16	24		JOMW1204		ST4084-60 M4	
M-AJXC-D33xM16	33	17	68	45	6	16	24					

▶ M-SKSC



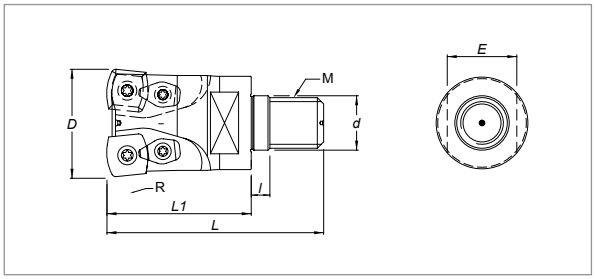
- MODULAR SHANK TYPE

INSERT TYPE → DIJET, WIDIN

Part No.	Dimensions(mm)											
	D	d	L	L_1	l	M	E					
M-SKSC-D16xM8	16	8.5	45	28	6	8	12	2	WDMW04		ST2553-55 M2.5	TX-8
M-SKSC-D17xM8	17	8.5	45	28	6	8	12					
M-SKSC-D20xM10	20	10.5	52	33	6	10	15		WDMW05		ST3072-60H M3	
M-SKSC-D21xM10	21	10.5	52	33	6	10	15					
M-SKSC-D25xM12	25	12.5	60	38	6	12	19		WDMW06	CL2C 2CLCN	ST408-43 M4	TX-15
M-SKSC-D26xM12	26	12.5	60	38	6	12	19					
M-SKSC-D32xM16	32	17	68	45	6	16	24		WDMW08	3CLCN	ST4510-60 M4.5	TX-20
M-SKSC-D33xM16	33	17	68	45	6	16	24					

ENDMILL CUTTER

▶ M-ASRL

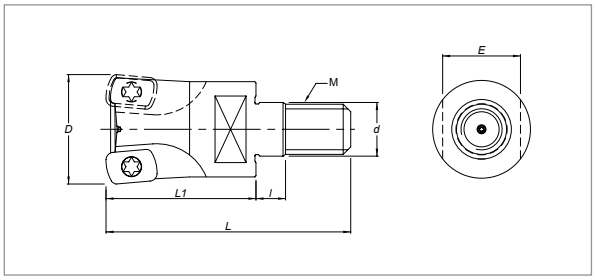


- MODULAR SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)												
	D	d	L	L_1	l	M	E	R					
M-ASRL-D20xM10	20	10.5	52	33	6	10	15	10	2	ED.W 0803TN-10		ST509-55 M3.5	TX-15
M-ASRL-D21xM10	21	10.5	52	33	6	10	15	10					
M-ASRL-D25xM12	25	12.5	60	38	6	12	19	10		ED.W 10T3TN-10	CL2C 2CLCN	ST408-43 M4	
M-ASRL-D26xM12	26	12.5	60	38	6	12	19	10					
M-ASRL-D32xM16	32	17	68	45	6	12	24	15(10)		ED.W 13T4TN-15(10)	3CLCN	ST512-63P M4	TX-20
M-ASRL-D33xM16	33	17	68	45	6	16	24	15(10)					

▶ M-ASRL-Pico



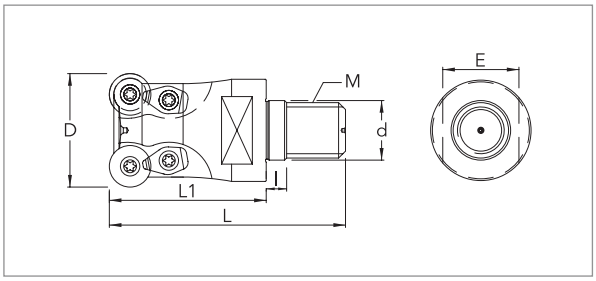
- MODULAR SHANK TYPE

INSERT TYPE → HITACHI, WIDIN

Part No.	Dimensions(mm)										
	D	d	L	L_1	l	M	E				
M-ASRL-D16xM8	16	8.5	45	28	6	8	12	2	EPMW0603	ST2553-55 M2.5	TX-8
M-ASRL-D17xM8	17	8.5	45	28	6	8	12	2			
M-ASRL-D20xM10	20	10.5	52	33	6	10	15	3			
M-ASRL-D21xM10	21	10.5	52	33	6	10	15	3			
M-ASRL-D25xM12	25	12.5	60	38	6	12	19	4			
M-ASRL-D26xM12	26	12.5	60	38	6	12	19	4			
M-ASRL-D32xM16	32	17	68	45	6	12	24	5			
M-ASRL-D33xM16	33	17	68	45	6	16	24	5			
M-ASRL-D40xM16	40	17	68	45	6	16	24	6			

ENDMILL CUTTER

▶ M-RMCC

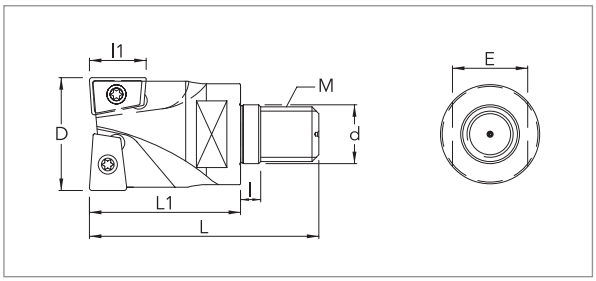


- MODULAR SHANK TYPE

INSERT TYPE → HITACHI, WALTER, WIDIN

Part No.	Dimensions(mm)										
	D	d	L	L_1	l	M	E				
M-RMCC-D1608xM8-H	16	8.5	45	28	6	8	12	2	RDMW 0802-H		ST307-55 M3	TX-8
M-RMCC-D1708xM8-H	17	8.5	45	28	6	8	12					
M-RMCC-D1608xM8	16	8.5	45	25	6	8	12		RDMT 0803			
M-RMCC-D1708xM8	17	8.5	45	25	6	8	12					
M-RMCC-D2010xM10	20	10.5	52	33	6	10	15		RDMT 10T3	CL2C 2CLCN	ST408-43 M4	TX-15
M-RMCC-D2110xM10	21	10.5	52	33	6	10	15					
M-RMCC-D2512xM12	25	12.5	60	38	6	12	19		RDMT 1204		ST4084-60 M4	
M-RMCC-D2612xM12	26	12.5	60	38	6	12	19					
M-RMCC-D3212xM16	32	17	68	45	6	16	24					
M-RMCC-D3312xM16	33	17	68	45	6	16	24					

▶ M-AQXR



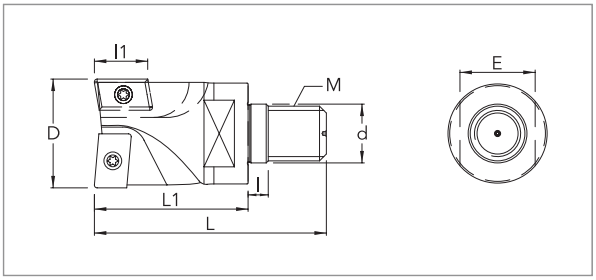
- MODULAR SHANK TYPE

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)										
	D	d	L	L_1	l	II	M	E			
M-AQXR-D16xM8	16	8.5	45	28	6	7.4	8	12	2	QOMT0830R	ST2043-60H M2	TX-6
M-AQXR-D17xM8	17	8.5	45	28	6	7.4	8	12				
M-AQXR-D20xM10	20	10.5	52	33	6	9.2	10	15		QOMT1035R	ST2553-55 M2.5	TX-8
M-AQXR-D21xM10	21	10.5	52	33	6	9.2	10	15				
M-AQXR-D25xM12	25	12.5	60	38	6	11.5	12	19		QOMT1342R	ST3072-60H M3	
M-AQXR-D26xM12	26	12.5	60	38	6	11.5	12	19				
M-AQXR-D32xM16	32	17	68	45	6	14.5	16	24		QOMT1651R	ST4084-60 M4	TX-15
M-AQXR-D33xM16	33	17	68	45	6	14.5	16	24				

ENDMILL CUTTER

▶ M-SECL



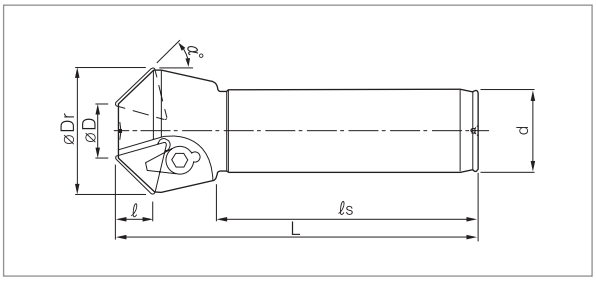
- MODULAR SHANK TYPE

INSERT TYPE → HITACHI

Part No.	Dimensions(mm)									Master insert	Slave insert		
	D	d	L	L_1	l	ll	M	E					
M-SECL-D16xM8	16	8.5	45	28	6	8	8	12	2	ZDMT 08T208L	ZPMT 09T208R	ST22045-55 M2.2	TX-6
M-SECL-D17xM8	17	8.5	45	28	6	8	8	12					
M-SECL-D20xM10	20	10.5	52	33	6	9.4	10	15		ZDMT 100308L	ZCMT 100308R	ST2553-55 M2.5	TX-8
M-SECL-D21xM10	21	10.5	52	33	6	9.4	10	15					
M-SECL-D25xM12	25	12.5	60	38	6	12.3	12	19		ZDMT 13T308L	ZPMT 13T308R	ST3072-60H M3	
M-SECL-D26xM12	26	12.5	60	38	6	12.3	12	19					
M-SECL-D32xM16	32	17	68	45	6	15	16	24		ZDMT 160408L	ZPMT 160408R	ST4084-60 M4	TX-15
M-SECL-D33xM16	33	17	68	45	6	15	16	24					

CHAMPER MILL CUTTER

▶ CHCL

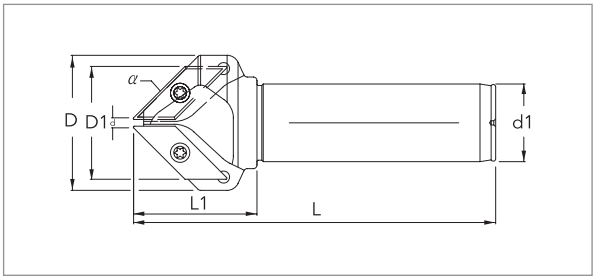


- STRAIGHT SHANK TYPE

INSERT TYPE → TAEGU–TEC

ITEM CODE		NO.OF INSERT	Dimensions(mm) α°	ØD	ØDr	L	Ød	ℓ	ℓ S		INSERTS USED
Long Shank	CHCL10-30°	1	30°	10	25	120	25	7.1	90	TP16	TPKN16030 ○□□
	CHCL20-30°	2	30°	20	35	150	32	9.9	110	TP16	TPKN16030 ○□□
	CHCL35-30°	2	30°	35	55.8	150	32	9.9	110	TP22	TPKN22040 ○□□
	CHCL05-45°	1	45°	5	25	120	20	10.1	90	TP16	TPKN16030 ○□□
	CHCL10-45°	2	45°	10	31.0	140	25	10.1	110	TP16	TPKN16030 ○□□
	CHCL20-45°	2	45°	20	48.8	150	32	14.0	110	TP22	TPKN22040 ○□□
	CHCL35-45°	3	45°	35	63.8	150	32	14.0	110	TP22	TPKN22040 ○□□

▶ CSCC



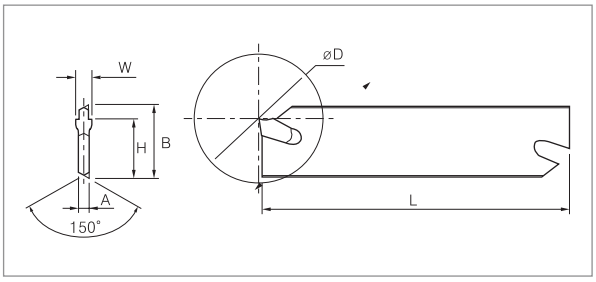
- STRAIGHT SHANK TYPE

INSERT TYPE → TUNGALOY, WIDIN

Part No.	Dimensions(mm) α°	D	D1	d	d1	L	L1				
CSCC-05031R-10°	10°	26	27	14	32	130	50	1	XCET 310404ER	ST512-63P M5	TX-20
CSCC-05031R-15°	15°	29	30	13							
CSCC-05031R-20°	20°	29	30	9							
CSCC-05031R-25°	25°	37	33	6							
CSCC-05031R-30°	30°	44	34	5							
CSCC-05031R-35°	35°	49	40	4							
CSCC-05031R-40°	40°	51	43	4							
CSCC-05031R-45°	45°	56	48	4				2			
CSCC-05031R-50°	50°	60	53	4							
CSCC-05031R-55°	55°	65	55	4							
CSCC-05031R-60°	60°	74	57	4							

BLADES

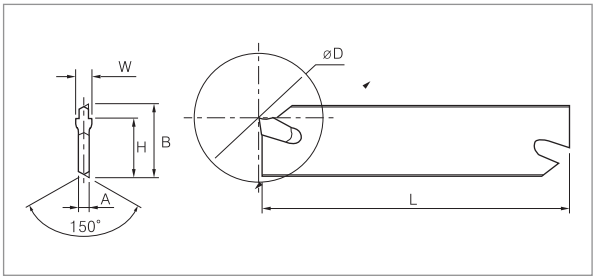
▶ SD Blade



INSERT TYPE → TAEGU–TEC

Part No.	B	L	H	A	W	Dwax.	Insert	Wrenches	Block
SD 26 - 3	26.0	110	21.4	2.4	3.1	75	KSXN 3	KTW R1	CTHT□□-26
SD 26 - 4	26.0	110	21.4	3.2	4.1	80	KSXN 4		
SD 32 - 3	32.0	150	24.8	2.4	3.1	100	KSXN 3		CTHT□□-32
SD 32 - 4	32.0	150	24.8	3.2	4.1	100	KSXN 4		

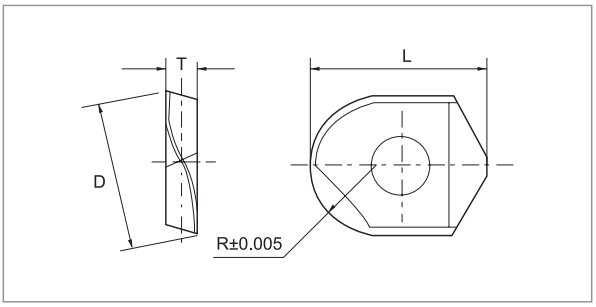
▶ CTHT



Part No.	Dimensions(mm)									Screw	Wrenches
	H	H1	H2	H3	H4	B	L_1	L_2	L_3		
CTHT 20 - 26	26	21.4	20	8	38	4.0	87	19	33	M6×1.0 S.H.C.S	L-W5
CTHT 20 - 32	32	24.8	20	13	38	4.0	100	19	35		
CTHT 25 - 26	26	21.4	25	8	48	5.5	110	20	36		
CTHT 25 - 32	32	24.8	25	3	48	5.5	120	28	44		
CTHT 32 - 32	32	30	32	4	53	5.5	110	31	48		

INSERT TIP

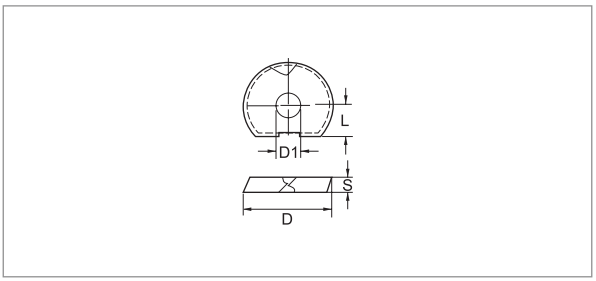
▶ Finishing Ball Insert



- APPLICABLE HEAD : ABPF(701p), C-ABPF(701p), M-ABPF(714p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	R	D	L	T
ZPSW 120	6	12	14.5	3.2
ZPSW 130	6.5	13	14.5	3.2
ZPSW 160	8	16	16.5	4.2
ZPSW 170	8.5	17	16.5	4.2
ZPSW 200	10	20	20.5	5.2
ZPSW 210	10.5	21	20.5	5.2
ZPSW 250	12.5	25	24.0	6.2
ZPSW 260	13	26	24.0	6.2
ZPSW 300	15	30	29.0	7.2
ZPSW 320	16	32	30.0	7.2



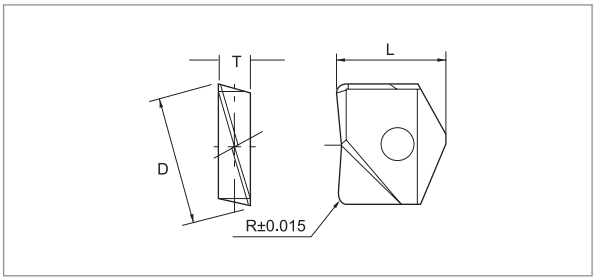
- APPLICABLE HEAD : BFCC(700p), M-BFCC(714p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	D	D1	L	S
SP3204-D100	10	4	5	2.5
SP3204-D120	12	5	6	2.5
SP3204-D160	16	5	6	3
SP3204-D200	20	5	6	3
SP3204-D250	25	6	9	4
SP3204-D300	30	8	10	5
SP3204-D320	32	8	10	5

INSERT TIP

▶ Finishing Corner Radius Insert



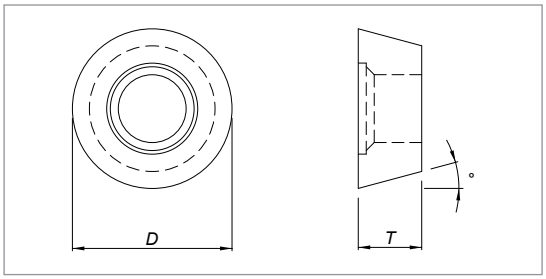
- APPLICABLE HEAD : ABPF(701p), C-ABPF(701p), M-ABPF(714p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	L	D	T	R
ZPSR-100-0.5R	12.0	10	2.7	0.5
ZPSR-100-1.0R	12.0	10	2.7	1.0
ZPSR-100-2.0R	12.0	10	2.7	2.0
ZPSR-120-0.5R	14.5	12	3.2	0.5
ZPSR-120-1.0R	14.5	12	3.2	1.0
ZPSR-120-2.0R	14.5	12	3.2	2.0
ZPSR-130-0.5R	14.5	13	3.2	0.5
ZPSR-130-1.0R	14.5	13	3.2	1.0
ZPSR-130-2.0R	14.5	13	3.2	2.0
ZPSR-160-0.5R	16.5	16	4.2	0.5
ZPSR-160-1.0R	16.5	16	4.2	1.0
ZPSR-160-2.0R	16.5	16	4.2	2.0
ZPSR-170-0.5R	16.5	17	4.2	0.5
ZPSR-170-1.0R	16.5	17	4.2	1.0
ZPSR-170-2.0R	16.5	17	4.2	2.0
ZPSR-200-0.5R	20.0	20	5.2	0.5
ZPSR-200-1.0R	20.0	20	5.2	1.0
ZPSR-200-2.0R	20.0	20	5.2	2.0
ZPSR-210-0.5R	20.0	21	5.2	0.5
ZPSR-210-1.0R	20.0	21	5.2	1.0
ZPSR-210-2.0R	20.0	21	5.2	2.0
ZPSR-250-0.5R	22.5	25	6.2	0.5
ZPSR-250-1.0R	22.5	25	6.2	1.0
ZPSR-250-2.0R	22.5	25	6.2	2.0
ZPSR-260-0.5R	22.5	26	6.2	0.5
ZPSR-260-1.0R	22.5	26	6.2	1.0
ZPSR-260-2.0R	22.5	26	6.2	2.0
ZPSR-300-0.5R	27.0	30	7.2	0.5
ZPSR-300-1.0R	27.0	30	7.2	1.0
ZPSR-300-2.0R	27.0	30	7.2	2.0

INSERT TIP

▶ Round Insert

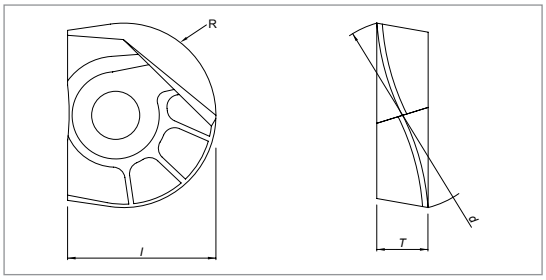


- APPLICABLE HEAD : C-RDT(684p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	D	T	Q	MATERIAL
RDMW0501	5.0	1.4	15°	
RDMW0702	7.0	2.38	15°	
RDMW1003	10.0	3.18	15°	

▶ Ball Insert(Indexable Milling)



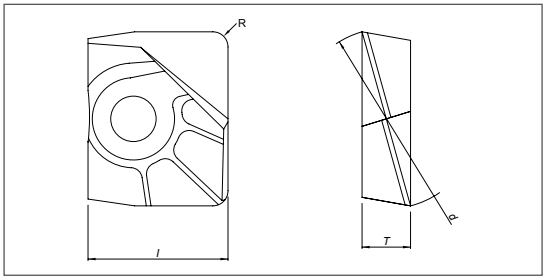
- APPLICABLE HEAD : SRFH(702p), C-SRFH(702p), M-SRFH(714p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	l	d	T	R
LBH-080	7.0	8.0	2.4	4
LBH-090	7.5	9.0	2.4	4.5
LBH-100	8.5	10.0	2.6	5
LBH-110	9.0	11.0	2.6	5.5
LBH-120	10.0	12.0	3	6
LBH-130	10.5	13.0	3	6.5
LBH-160	12.0	16.0	4	8
LBH-170	12.5	17.0	4	8.5
LBH-200	15.0	20.0	5	10
LBH-210	15.5	21.0	5	10.5
LBH-250	18.5	25.0	6	12.5
LBH-260	19.0	26.0	6	13
LBH-300	22.5	30.0	7	15
LBH-310	23.0	31.0	7	15.5
LBH-320	23.5	32.0	7	16

INSERT TIP

▶ Corner Radius Insert (Indexable Milling)



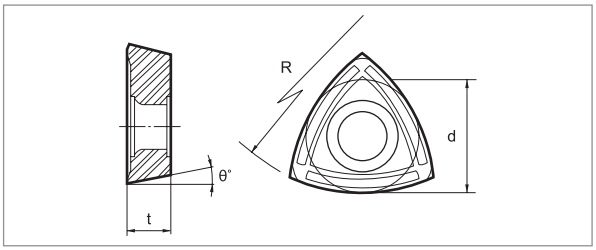
- APPLICABLE HEAD : SRFH(702p), C-SRFH(702p), M-SRFH(714p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	l	d	T	R
LRH100-R0.5	8.5	10.0	2.6	0.5
LRH100-R1.0	8.5	10.0	2.6	1.0
LRH100-R2.0	8.5	10.0	2.6	2.0
LRH110-R0.5	9.0	11.0	2.6	0.5
LRH110-R1.0	9.0	11.0	2.6	1.0
LRH110-R2.0	9.0	11.0	2.6	2.0
LRH120-R0.5	10.0	12.0	3	0.5
LRH120-R1.0	10.0	12.0	3	1.0
LRH120-R2.0	10.0	12.0	3	2.0
LRH130-R0.5	10.5	13.0	3	0.5
LRH130-R1.0	10.5	13.0	3	1.0
LRH130-R2.0	10.5	13.0	3	2.0
LRH160-R0.5	12.0	16.0	4	0.5
LRH160-R1.0	12.0	16.0	4	1.0
LRH160-R2.0	12.0	16.0	4	2.0
LRH170-R0.5	12.5	17.0	4	0.5
LRH170-R1.0	12.5	17.0	4	1.0
LRH170-R2.0	12.5	17.0	4	2.0
LRH200-R0.5	15.0	20.0	5	0.5
LRH200-R1.0	15.0	20.0	5	1.0
LRH200-R2.0	15.0	20.0	5	2.0
LRH210-R0.5	15.0	21.0	5	0.5
LRH210-R1.0	15.0	21.0	5	1.0
LRH210-R2.0	15.0	21.0	5	2.0
LRH250-R0.5	18.5	25.0	6	0.5
LRH250-R1.0	18.5	25.0	6	1.0
LRH250-R2.0	18.5	25.0	6	2.0
LRH260-R0.5	19.0	26.0	6	0.5
LRH260-R1.0	19.0	26.0	6	1.0
LRH260-R2.0	19.0	26.0	6	2.0
LRH300-R0.5	22.5	30.0	7	0.5
LRH300-R1.0	22.5	30.0	7	1.0
LRH300-R2.0	22.5	30.0	7	2.0
LRH320-R0.5	22.5	32.0	7	0.5
LRH320-R1.0	22.5	32.0	7	1.0
LRH320-R2.0	22.5	32.0	7	2.0

INSERT TIP

▶ Ball Cutter Insert

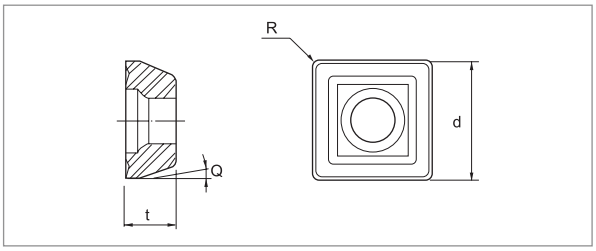


- APPLICABLE HEAD : BMCC-MD(689p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	R	d	t	Θ°
RBMX50	25	12.7	5.56	11°

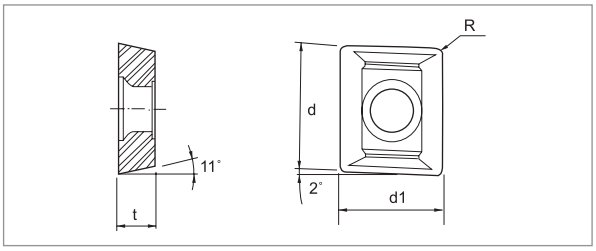
▶ Helical Cutter Insert



- APPLICABLE HEAD : BMCC-MD(689p), HMCC-MD(698p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	d	t	R	Θ°
SPMT090308	9.525	3.8	0.8	14°
SPMT120408	12.7	4.76	0.8	11°



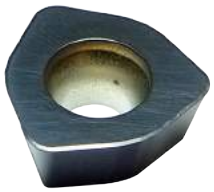
- APPLICABLE HEAD : HMCC-MD(698p)

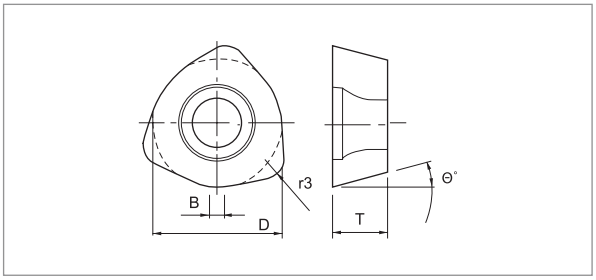
INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	d	d_1	t	R
ZPMT1504...	15.88	12.7	4.76	0.8

INSERT TIP

▶ Finishing Mill Insert

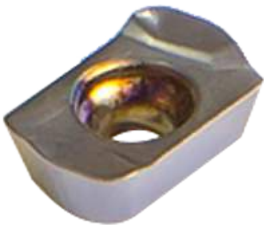


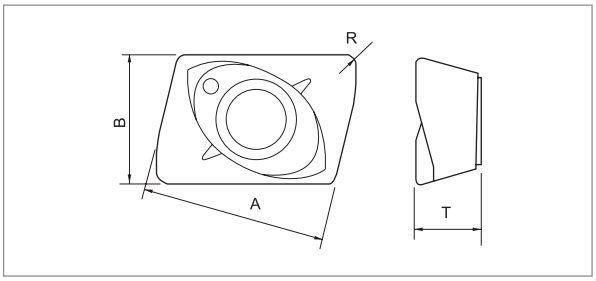


- APPLICABLE HEAD : SKSC(712p), SKSS(712p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)				
	D	R	T	Θ°	C
WDMW04T215	6.5	0.8	2.8	13	0.8
WDMW050310	8	1.0	3.2	15	1.0
WDMW06T312	10	1.2	3.9	15	1.2
WDMW080415	13	1.5	5.5	15	1.5





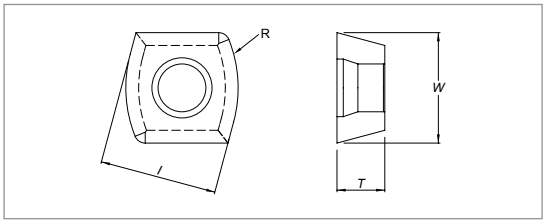
- APPLICABLE HEAD : MPMC(685p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	B	A	T	R
EOMT-060210ER	4.3	6.43	2.5	1.0

INSERT TIP

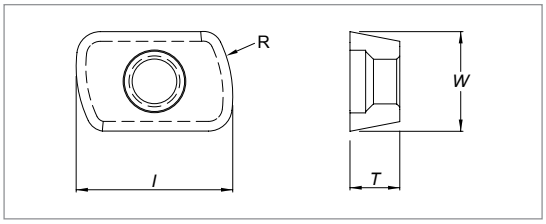
▶ Indexable Milling Insert



- APPLICABLE HEAD : ASRL(708p)

INSERT TYPE → WIDIN

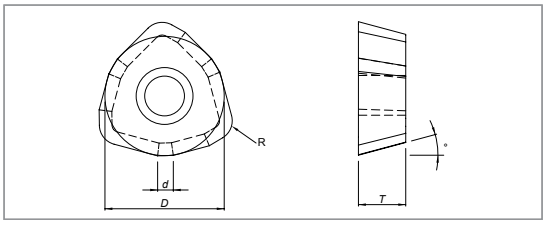
Part No.	Dimensions(mm)			
	R	I	T	W
EDNW080308	10	8.1	3.18	7.94
EDNW10T3	10	10	3.97	10
EDNW13T4	10	13.5	5.56	12.7
EDNW15T4	15	15	5.56	14



- APPLICABLE HEAD : ASRL(708p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	R	I	T	W
EDNW0603	8	10	3.18	6.35



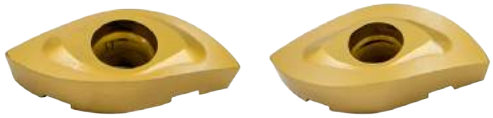
- APPLICABLE HEAD : AJXC(711p)

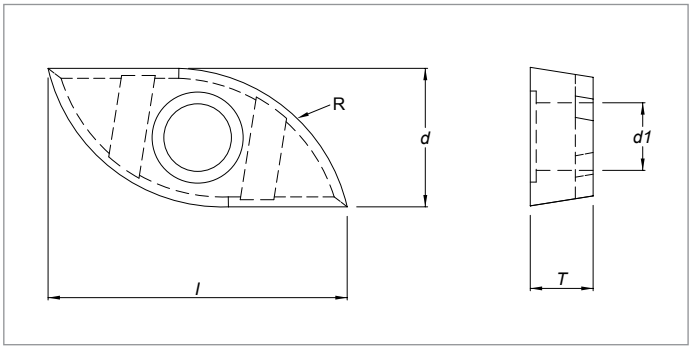
INSERT TYPE → WIDIN

Part No.	Dimensions(mm)				
	D	d	R	T	Θ
JOMW06T215	6.35	1.2	1.5	2.78	13°
JOMW080320	8	1.4	2	3.18	13°
JOMW09T320	9.525	1.8	2	3.97	15°
JOMW120420	12	2.5	2	4.76	15°
JOMW140520	4	2.8	2	5.56	15°

INSERT TIP

▶ Indexable Insert



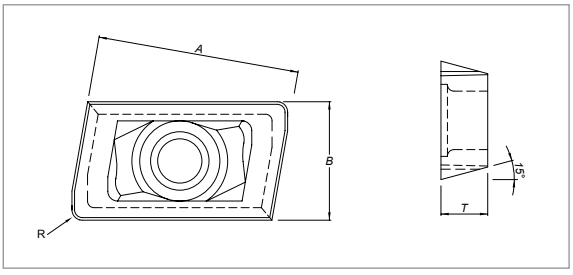


- APPLICABLE HEAD : GBEC(695p)

INSERT TYPE → WIDIN

Part No.		Dimensions(mm)				
		l	d	T	R	d_1
	ZPET080-M	16	8.0	3.5	8	2.9
	ZPET100-M	19	10.4	4.5	10	3.4
	ZPET125-M	24	12.9	5.3	12.5	4.5
	ZPET150-M	28	15.4	7	15	5.6
	ZPET080-S	15	6.6	3.1	8	2.9
	ZPET100-S	15.5	8.4	3.8	10	3.4
	ZPET125-S	20.5	10.7	4.5	12.5	4.5
	ZPET150-S	25	12.4	6.5	15	5.6

▶ Indexable Insert



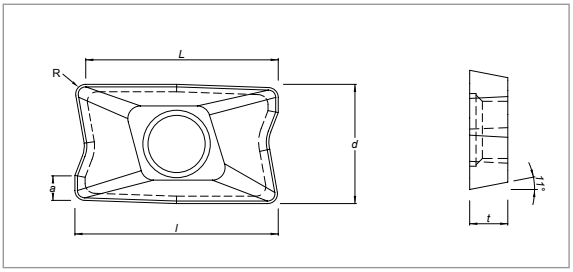
- APPLICABLE HEAD : AHU(681p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	A	B	T	R
JDMT100308R	11	6.1	3.5	0.8
JDMT150508R	16	9.12	5	0.8

INSERT TIP

▶ APKT17(MT)Insert

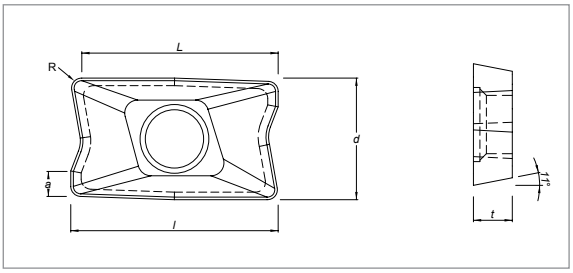


- APPLICABLE HEAD : ENCC(680p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					
	l	d	t	a	L	R
APKT170508-MT	18.5	10.7	5.56	2.0	16.1	0.8

▶ APKT17(EM)Insert



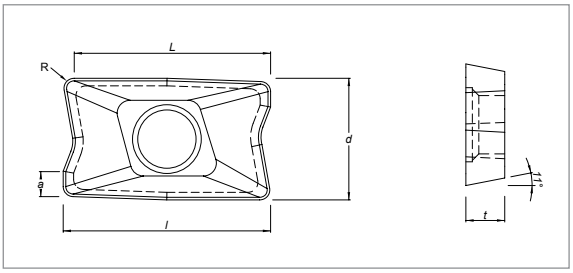
- APPLICABLE HEAD : ENCC(680p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					
	l	d	t	a	L	R
APKT170508-EM	18.5	10.7	5.56	2.0	16.1	0.8

INSERT TIP

▶ APKT17(SU)Insert

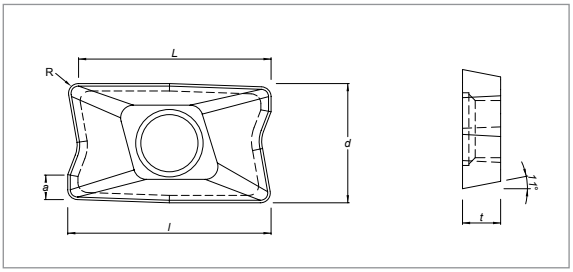


- APPLICABLE HEAD : ENCC(680p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					
	l	d	t	a	L	R
APKT170508-SU	18.5	10.7	5.56	2.0	16.1	0.8

▶ APKT17(AL)Insert



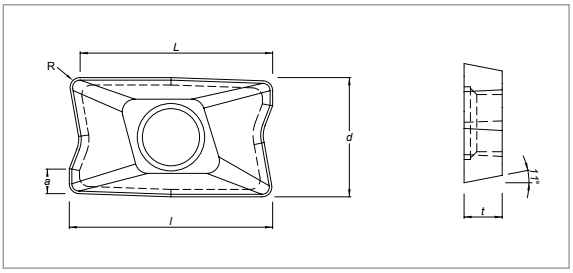
- APPLICABLE HEAD : ENCC(680p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					
	l	d	t	a	L	R
APKT170508-AL	17.6	10.7	5.27	3.0	16.1	0.8

INSERT TIP

▶ APKT09(MT)Insert

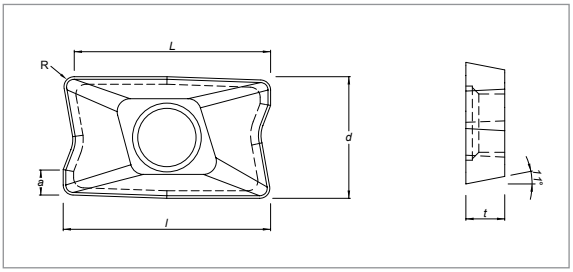


- APPLICABLE HEAD : ENCC(680p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					
	l	d	t	a	L	R
APKT09T304-MT	10.5	6.20	3.8	1.0	8.8	0.4

▶ APKT09(EM)Insert



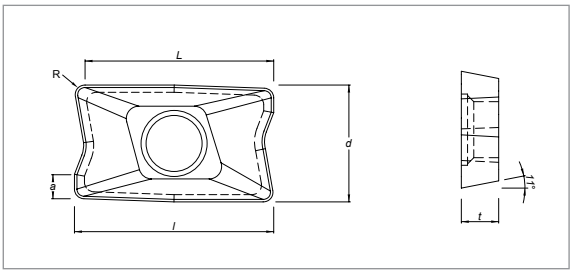
- APPLICABLE HEAD : ENCC(680p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					
	l	d	t	a	L	R
APKT09T304-EM	10.5	6.20	3.8	1.0	8.8	0.4

INSERT TIP

▶ APKT09(SU)Insert

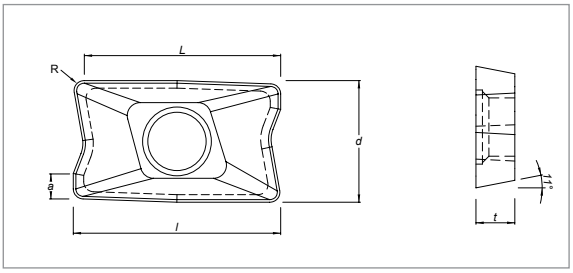


- APPLICABLE HEAD : ENCC(680p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					
	l	d	t	a	L	R
APKT09T304-SU	10.5	6.20	3.8	1.0	8.8	0.4

▶ APKT09(AL)Insert



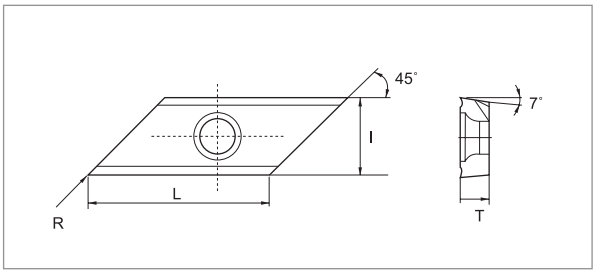
- APPLICABLE HEAD : ENCC(680p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					
	l	d	t	a	L	R
APKT09T304-AL	10.5	6.20	3.8	1.0	8.8	0.4

INSERT TIP

▶ Chamfering Mill Insert

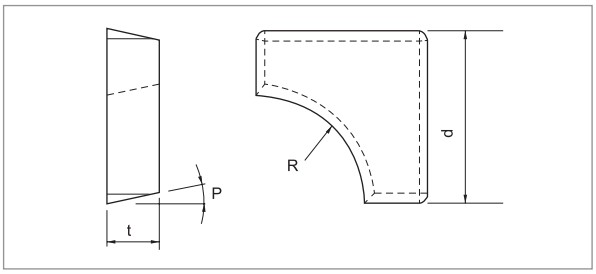


- APPLICABLE HEAD : CSCC(720p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	L	l	T	R
XCET310404ER-NON-COATING	22	12.7	4.5	0.4
XCET310404ER-TIALN COATING	22	12.7	4.5	0.4

▶ Rounding Insert



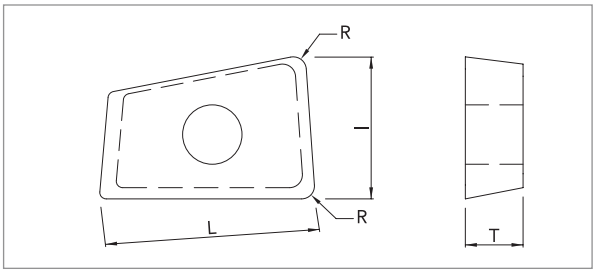
- APPLICABLE HEAD : Reverse R cutter(738p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	R	d	t	P°
SPKR-R	10	15.875	4.76	11°

INSERT TIP

▶ Finishing Mill Insert

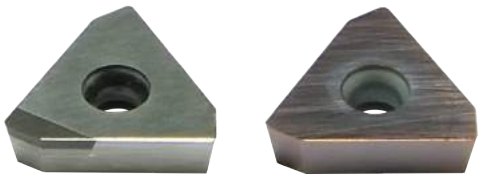


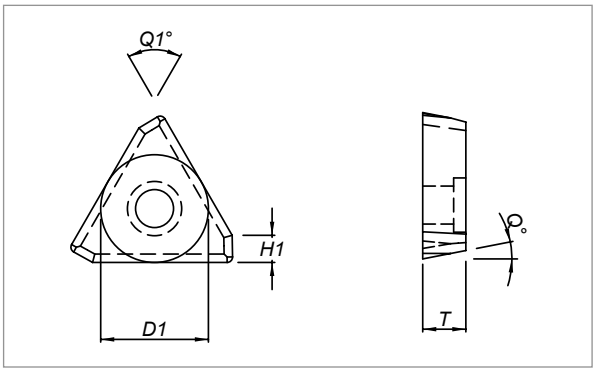
- APPLICABLE HEAD : AQXR(705p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			
	L	I	T	R
QOMT0830R	8.4	5.5	3	0.8
QOMT1035R	10.6	7	3.5	0.8
QOMT1342R	13.1	8.7	4.2	0.8
QOMT1651R	16.5	11	5.1	0.8

▶ CBN Insert





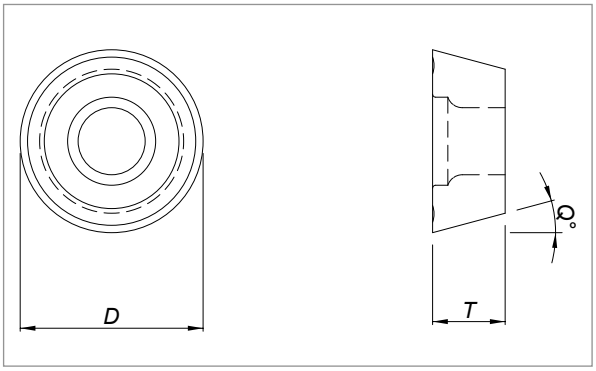
- APPLICABLE HEAD : Slotting Cutter(746p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)					MATERIAL	COATING
	D1	T	H1	Q	Q1		
TPEN130302-P	7.94	3.18	2	11°	60°	P	TIN
TPEN130302-CBN	7.94	3.18	2	11°	60°	CBN	O

INSERT TIP

▶ Round Mill Insert



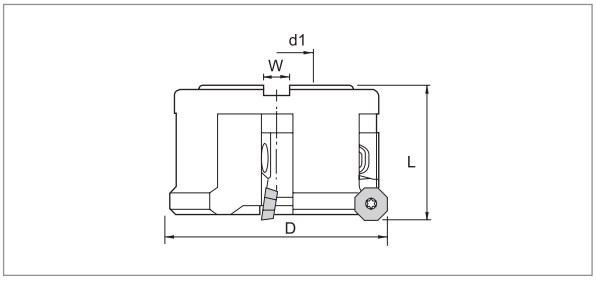
- APPLICABLE HEAD : RMCC(682p), C-RDT(684p)

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)			COATING
	D	T	Q	
RDMW0802(Z)	8	2.38	15°	TIN, TIALN
RDMW10T3(Z)	10	3.97		
RDMW1204(Z)	12	4.76		
RDMW1605(Z)	16	5.56		

FACE-CUTTER

▶ Medium Cutting Cutter

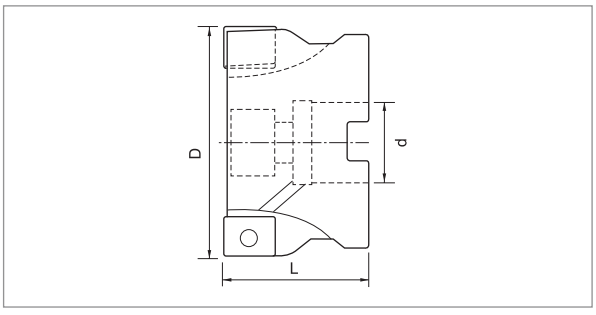


- BORE MOUNTED TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)									
	D	L	d1	W						
OFC-8063254	80	63	25.4	9.5	5	ODMT0605	ODHA0605	R592	FS1030	T20
OFC-1063317	100	63	31.75	12.7	6					
OFC-1363381	130	63	38.1	15.9	8					

▶ IMCC



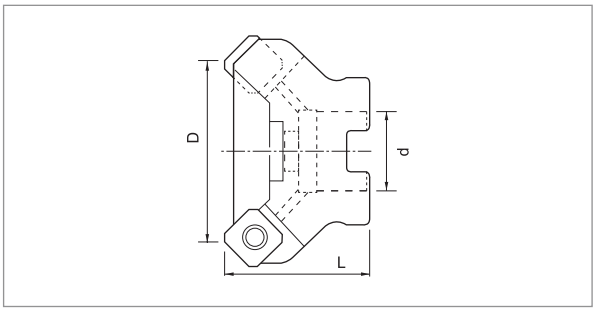
- BORE MOUNTED TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)						
	D	d	L				
IMCC-502240	50	22	40	3	ADMT 160608	FS-1458	T-15
IMCC-632240	63	22	40	4			
IMCC-8025,450	80	25.4	50	5			
IMCC-10031.7550	100	31.75	50	5			
IMCC-12538.150	125	38.1	50	7			
IMCC-16050.850	160	50.8	50	8			
IMCC-20047.625 63	200	47.625	63	10			

FACE-CUTTER

▶ CMCC



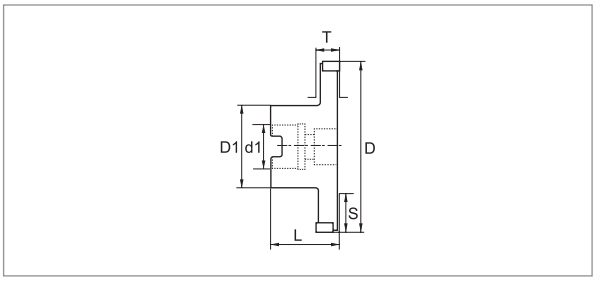
- BORE MOUNTED TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)						
	D	d	L				
CMCC-502240	50	22	40	4	SN.X 1205...	FS-1458	T-15
CMCC-632240	63	22	40	6			
CMCC-8025,450	80	25.4	50	7			
CMCC-10031.7550	100	31.75	50	8			
CMCC-12538.150	125	38.1	63	10			
CMCC-16058.863	160	50.8	63	12			
CMCC-20047.625 63	200	47.625	63	18			

SIDE CUTTER

▶ Side Milling Cutter

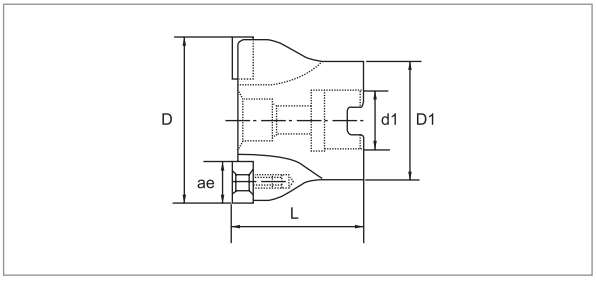


- BORE MOUNTED TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)									
	D	L	D1	d1	T	S				
CC-100254-T10	100	50	50	25.4	10	23	10	CNMU080508	M3 FS 1015	T8
CC-100254-T12	100	50	50	25.4	12	23	10	CNMU080508	M3 FS 1015	T8
CC-125371-T10	125	50	60	31.75	10	31	12	CNMU080508	M3 FS 1015	T8
CC-125371-T12	125	50	60	31.75	12	31	12	CNMU080508	M3 FS 1015	T8
CC-160381-T12	160	52	80	38.1	12	38	14	CNMU080508	M3 FS 1015	T8
CC-160381-T16	160	52	80	38.1	16	38	12	CNMU120608	M4 FS 1007	T15
CC-200508-T16	200	55	80	50.8	16	48	14	CNMU120608	M4 FS 1007	T15
CC-200508-T20	200	55	80	50.8	20	48	14	CNMU120608	M4 FS 1007	T15

▶ Circular Face Cutter



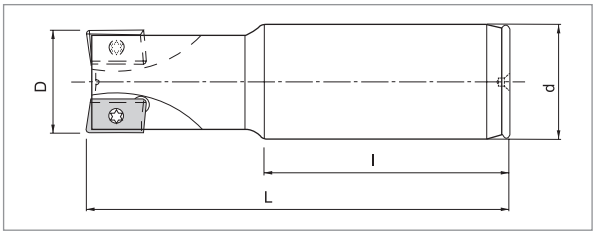
- BORE MOUNTED TYPE

INSERT TYPE → WALTER

Part No.	Dimensions(mm)							
	D	d1	L	D1				
CC-401640	40	16	40	35	3	CNMU080508	M3 FS 1015	T8
CC-502250	50	22	50	47	3	CNMU120608	M4 FS 1007	T15
CC-632250	63	22	50	60	4	CNMU120608	M4 FS 1007	T15
CC-802550	80	25.4	50	70	5	CNMU120608	M4 FS 1007	T15

KEY-HOME CUTTER

▶ Key-Home Cutter

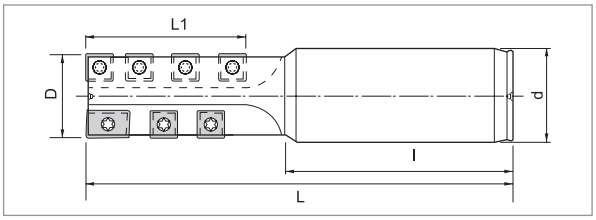


- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN, WALTER, TAEGU-TEC

Part No.	Dimensions(mm)							
	D	d	L	l				
ENCC-2416120	24	25	120	75	2	AP..1604	ST4084-60 M4	TX-15
ENCC-2716120	27	25	120	75				
ENCC-2916120	29	32	120	75				
ENCC-3116120	31	32	120	75				
ENCC-3516120	35	32	120	75				

▶ Key-Home Cutter, Outside Cutter

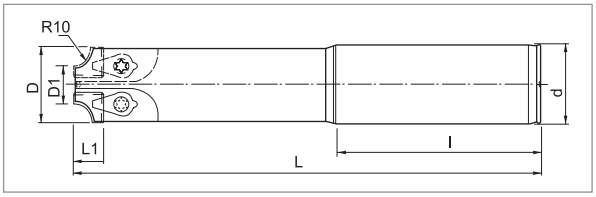


- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN, WALTER, TAEGU-TEC

Part No.	Dimensions(mm)						NO.OF INSERT		NO.OF INSERT			
	D	d	L	L1	l							
KEYHOME-D27x32x150L	27	32	150	70	80	2	1	P27215 -3R	6	SDMT 090308	ST408-43 M4	TX-15
KEYHOME-D29x32x150L	29	32	150	70	80							
KEYHOME-D29x32x160L	29	32	160	80	80				8			
KEYHOME-D29x32x200L	29	32	200	80	80							

▶ Corner R Holder



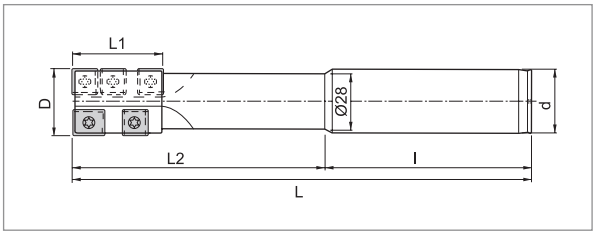
- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)							
	D	D1	d	L	l			
Reverse R cutter	40	20	42	250	110	2	SPKR-10R	TP22

RELIEF CUTTER

▶ Relief Cutter

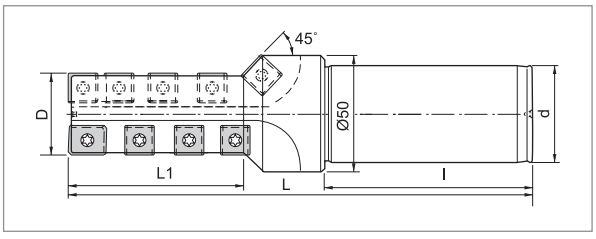


- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN, WALTER, TAEGU–TEC

Part No.	Dimensions(mm)						NO.OF INSERT		NO.OF INSERT			
	D	d	L	L_1	l							
RELIEF-D15x10x100L	15	12	100	10	52	2	1		2	SPMG 060204	ST2204-55 M2.2	TX-06
RELIFE-D19x10x100L	19	16	100	10	52				2			
RELIFE-D33x25x230L	33	32	230	25	100			ZPMT-1504WM APMT1504 WT	2	SPMT 120408	ST511-43 M5	TX-20
RELIFE-D33x45x230L	33	32	230	45	100				4			
RELIFE-D33x45x300L	33	32	300	45	100				4			
RELIFE-D34x25x230L	34	32	230	25	100				2			
RELIFE-D34x35x230L	34	32	230	35	100				3			
RELIFE-D34x45x230L	34	32	230	45	100				4			
RELIFE-D34x45x300L	34	32	300	45	100				4			
RELIFE-D35x25x230L	35	32	230	25	100				2			
RELIFE-D35x45x230L	35	32	230	45	100				4			
RELIFE-D35x45x300L	35	32	300	45	100				4			
RELIFE-D54x45x265L	54	42	265	45	220	4	2		10			

▶ U-Home Cutter



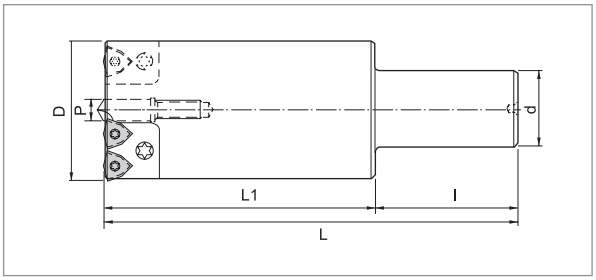
- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN, WALTER, TAEGU–TEC

Part No.	Dimensions(mm)						NO.OF INSERT		NO.OF INSERT			
	D	d	L	L_1	l							
U-HOME-D32x42x200L	32	42	200	75	90	2	1	ZPMT-1504WM	7	SPMT 120408	ST511-43 M5	TX-20
U-HOME-D34x42x200L	34	42	200	75	90				8			
U-HOME-D35x42x200L	35	42	200	75	90							
U-HOME-D39x42x200L	39	42	200	75	90							
U-HOME-D40x42x200L	40	42	200	75	90							
U-HOME-D44x42x200L	44	42	200	75	90							
U-HOME-D45x42x200L	45	42	200	75	90							

POST U-DRILL

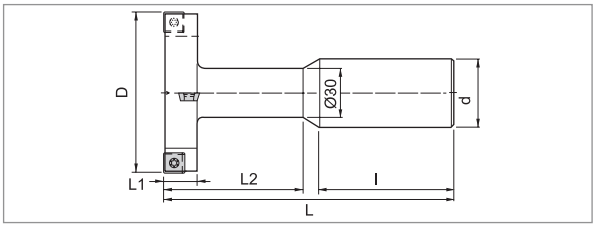
▶ Post U-Drill



- STRAIGHT SHANK TYPE

Part No.	Dimensions(mm)							
	D	P	L_1	l	d			
PU-561242	56	12	270	90	42	WCMT 08	M4.5 ST4510-60 M4.5	T-20
PU-581242	58	12						
PU-681642	68	16						
PU-761242	76	12						
PU-781242	78	12						
PU-881642	88	16						
PU-961642	96	16						
PU-981642	98	16						

▶ T-Cutter



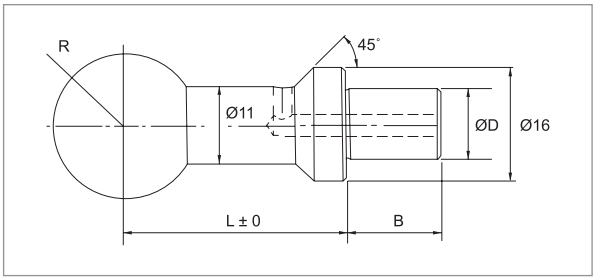
- STRAIGHT SHANK TYPE

INSERT TYPE → WIDIN, WALTER, TAEGU–TEC

Part No.	Dimensions(mm)								
	D	L_1	d	L	l				
TC-80	D80	22	42	180	95	4	SPMT1204	ST511-43 M5	TX-20
TC-100	D100								
TC-125	D125								
TC-150	D150					6			
TC-180	D180								

BALL GAUGE

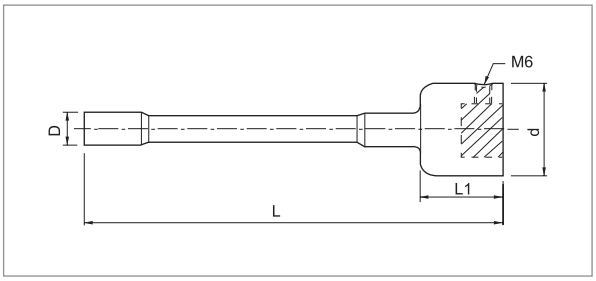
▶ Ball Gauge



- STRAIGHT SHANK TYPE

Part No.	Dimensions(mm)			
	R	D	L	B
BG8004-8	10	8-0.04	20(30)	8
BG8002-8		8-0.02		
BG8000-8		8±0		
BG8002P-8		8+0.02		
BG8004P-8		8+0.04		
BG1004-10		10-0.04		10
BG1002-10		10-0.02		
BG1000-10		10±0		
BG1002P-10		10+0.02		
BG1004P-10		10+0.04		

▶ Outside Setting Bar

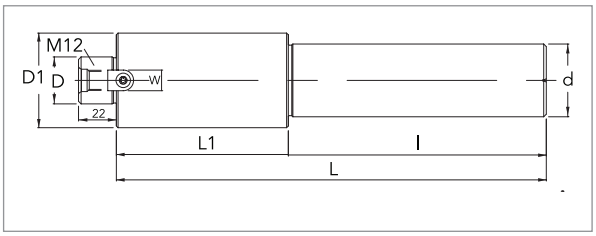


- STRAIGHT SHANK TYPE

Part No.	Dimensions(mm)			
	D	d	L	L_1
OS-125100	12.5	35	100	30
OS-125150	12.5	35	150	30

POST MEDIUM CUTTING CUTTER

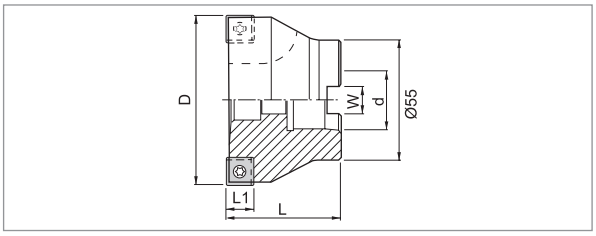
▶ Medium Cutter Arbor, SSCC Cutter Arbor



- STRAIGHT SHANK TYPE

Part No.	Dimensions(mm)						
	D	D_1	d	L	L_1	l	W
ST42x27x315L	27	55	42	260	110	150	12
ST42x27x365L	27	55		310	160		12
ST42xD63x25.4x250L	25.4	50		200	50		9.5
ST42xD63x25.4x300L	25.4	50		250	100		9.5
ST42xD80x25.4x250L	25.4	65		200	50		9.5
ST42xD80x25.4x300L	25.4	65		250	100		9.5

▶ Medium Boring Cutter



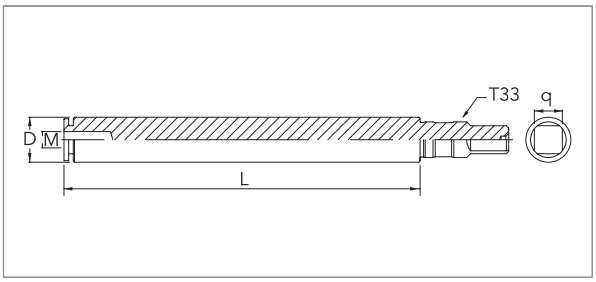
- BORE MOUNTED TYPE

INSERT TYPE → WIDIN, WALTER, TAEGU-TEC

Part No.	Dimensions(mm)							
	D	d	L	W				
RBC-582755	D58	27	55	12	2	SPMT1204	ST511-43 M5	TX-20
RBC-632755	D63							
RBC-682755	D68							
RBC-782755	D78							
RBC-882755	D88							
RBC-982755	D98							
RBC-1032755	D103							
RBC-1082755	D108							
RBC-1132755	D113							
RBC-1182755	D118							
RBC-1232755	D123							
MBC-5942755	D59.4							
MBC-6442755	D64.4							
MBC-6942755	D69.4							
MBC-7942755	D79.4							
MBC-8942755	D89.4							
MBC-9942755	D99.4							
MBC-10442755	D104.4							
MBC-10942755	D109.4							
MBC-11942755	D119.4							

QUICK CHANGE COLLET

▶ Radial Machine Tap, Counter Bore, Reamer Chuck

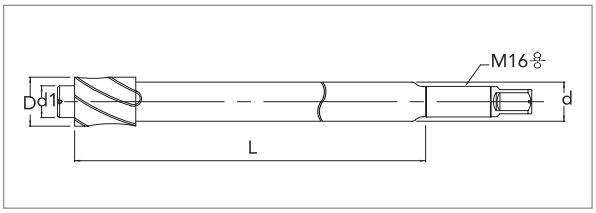


- STRAIGHT SHANK TYPE

Part No.	Dimensions(mm)				
	D	M	L	T33	□
RTC-19200	19	M6.M8.M10.M12	200	M20	12
RTC-19300	19	M6.M8.M10.M12	300	M20	12
RTC-19400	19	M6.M8.M10.M12	400	M20	12
RTC-31200	31	M16.M20.M24	200	M24	15
RTC-31300	31	M16.M20.M24	300	M24	15
RTC-31400	31	M16.M20.M24	400	M24	15

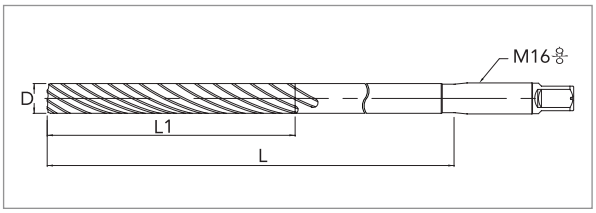
COUNTER BORE, REAMER

▶ Counter Bore



Part No.	Dimensions(mm)					
	D	d_1	d	L	Size	M
D14x25xM16x200L	14	9	12	200	M08	M16
D14x25xM16x300L				300		
D14x25xM16x400L				400		
D18x25xM16x200L	18	11	16	200	M10	
D18x25xM16x300L				300		
D18x25xM16x400L				400		
D20x25xM16x200L	20	13		200	M12	
D20x25xM16x300L				300		
D20x25xM16x400L				400		
D27x25xM16x200L	27	17		200	M16	
D27x25xM16x300L				300		
D27x25xM16x400L				400		

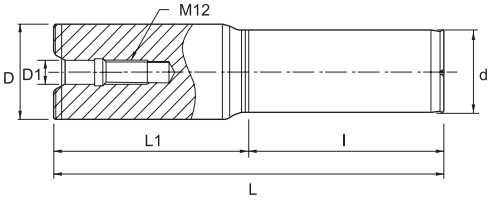
▶ Helix Reamer



Part No.	Dimensions(mm)				
	D	L_1	L	Size	M
D06x100xM16x200L	6	100	200	M06	M16
D06x100xM16x300L			300		
D06x100xM16x400L			400		
D08x100xM16x200L	8		200	M08	
D08x100xM16x300L			300		
D08x100xM16x400L			400		
D10x100xM16x200L	10		200	M10	
D10x100xM16x300L			300		
D10x100xM16x400L			400		
D12x100xM16x200L	12		200	M12	
D12x100xM16x300L			300		
D12x100xM16x400L			400		
D16x100xM16x200L	16		200	M16	
D16x100xM16x300L			300		
D16x100xM16x400L			400		

POST MEDIUM CUTTING CUTTER ARBOR

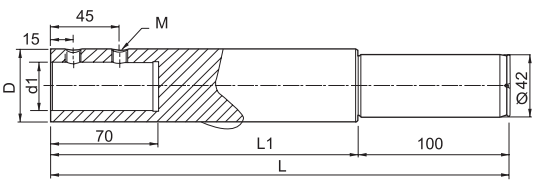
▶ FPCC-ST Arbor



- STRAIGHT SHANK TYPE

Part No.	Dimensions(mm)					
	D	D_1	d	L	L_1	l
FPCC-ST42200-50	48	12.5	42	200	100	100
FPCC-ST42250-50				250	150	
FPCC-ST42300-50				300	200	
FPCC-ST42200-63	60	16.5		200	100	
FPCC-ST42250-63				250	150	
FPCC-ST42300-63				300	200	

▶ Extention Arbor

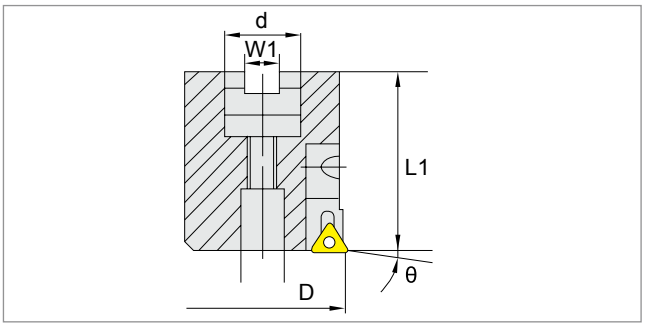


- STRAIGHT SHANK TYPE

Part No.	Dimensions(mm)				
	D	d1	L1	L	M
ST42x25x300L	50	25	300	200	10
ST42x25x400L			400	300	
ST42x32x200L		32	200	100	
ST42x32x300L			300	200	
ST42x32x400L			400	300	
ST42x32x500L			500	400	
ST42x40x200L	63	40	200	100	12
ST42x40x300L			300	200	
ST42x42x200L		42	200	100	
ST42x42x300L			300	200	
ST42x42x400L			400	300	
ST42x42x500L			500	400	

PLUNGE CUTTER

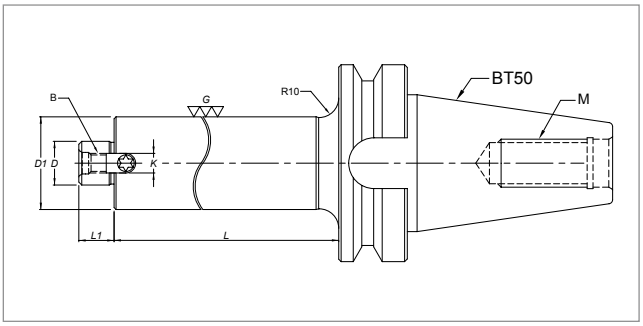
▶ Plunge Cutter



- BORE MOUNTED TYPE

INSERT TYPE → WIDIN

Part No.	Dimensions(mm)							
	D	L1	d	W1	Θ			
PPMF-050-22R	50	65	22	10.4	1°	4	PPMA-013A	TPEN-130302-P TPEN-130302-CBN
PPMF-063-22R	63	65	22	10.4	1°	6		
PPMF-080-27R	80	55	27	12.4	1°	8		

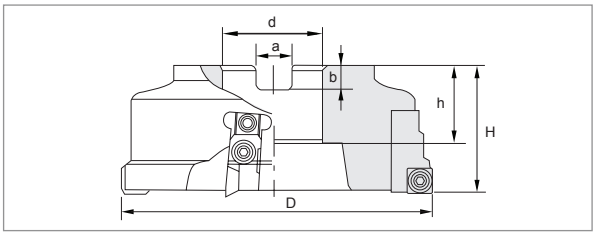


- ARBOR

Part No.	Dimensions(mm)						
	D	D1	L	L1	W	B	M
BT50-PPMT-5022100	22	47	100	18	10	M10	M24
BT50-PPMT-5022150			150				
BT50-PPMT-5022200			200				
BT50-PPMT-5022250			250				
BT50-PPMT-5022300			300				
BT50-PPMT-5022350			350				
BT50-PPMT-5022400			400				
BT50-PPMT-6322100		60	100				
BT50-PPMT-6322150			150				
BT50-PPMT-6322200			200				
BT50-PPMT-6322250			250				
BT50-PPMT-6322300			300				
BT50-PPMT-6322350			350				
BT50-PPMT-6322400			400				
BT50-PPMT-6322450			450				
BT50-PPMT-6322500			500				
BT50-PPMT-6322550			500				

FINISH CUTTER

▶ M.S. Cutter

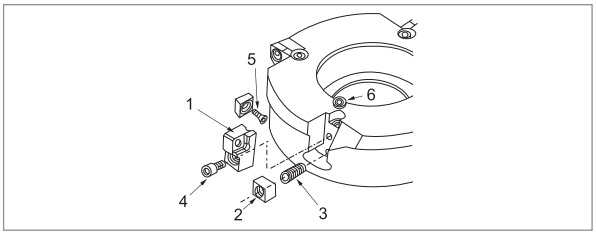


- BORE MOUNTED TYPE

INSERT TYPE → WIDIN

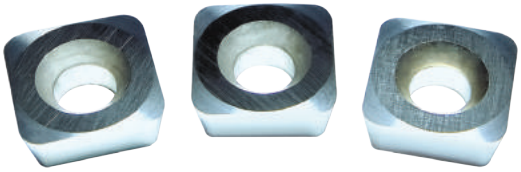
Part No.	Dimensions(mm)					
	D	d	L	a	h	
MSFR-100	100	31.75	65	12.7	32	2
MSFR-125	125	38.1		15.9	38	2
MSFR-160	160	50.8		19.0	38	4
MSFR-200	200	47.625		25.4	38	4

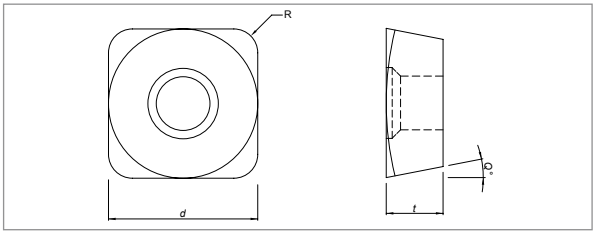
▶ M.S. Cutter Part



Part No.	Dimensions(mm)					
	1 (Locate)	2 (Adjustment Clamp)	3 (Adjustment Clamp screw)	4 (Locate fix screw)	5 (Insert screw)	6 (Bolt)
Standard	MSFR-1	MSFR-2	MSFR-3	SCM-M5×15	ST511-43 M5	SCM-M5×5

▶ M.S. Cutter Insert



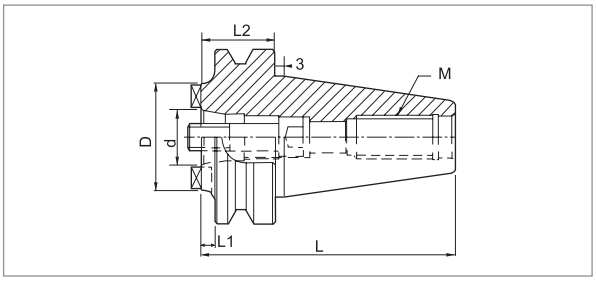


INSERT TYPE → TUNGALOY

Part No.	Dimensions(mm)			
	d	t	R	Θ
SPHA435FNW	12.7	4.76	2.0	11°

ARBOR

▶ BT50-WMA



- Applicable Cutter : Ball Cutter(689p, 690p, 691p) / Modular Cutter(698p)–Modular

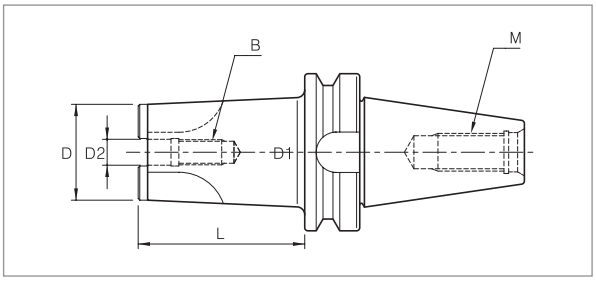
Part No.	Dimensions(mm)						Bolt
	D	L	d	L2	L1	M	
BT50-WMA63040	63	148	32	46	8	M24	M16
BT50-WMA63065		170		68	30		
BT50-WMA63085		190		88	50		
BT50-WMA63115		220		118	80		
BT50-WMA63135		240		138	100		
NT50-WMA63043		153		26	8	1"×8pitch	
NT50-WMA63065		175		48	30		
NT50-WMA63085		195		68	50		
NT50-WMA63115		225		98	80		
NT50-WMA63135		245		118	100		

- Applicable Cutter : Ball Cutter(689p) / Helical Cutter(698p)–Modular

Part No.	Dimensions(mm)						Bolt
	D	L	d	L2	L1	M	
BT50-WMA80040	80	150	45	48	10	M24	M20
BT50-WMA80065		170		68	30		
BT50-WMA80085		190		88	50		
BT50-WMA80115		220		118	80		
BT50-WMA80135		240		138	100		
NT50-WMA80045		155		28	10	1"×8pitch	
NT50-WMA80065		175		48	30		
NT50-WMA80085		195		68	50		
NT50-WMA80115		225		98	80		
NT50-WMA80135		245		118	100		

ARBOR

▶ FPM



- FPCC-5024, FPCC-5055, FPCC-6334, FPCC-6365 ARBOR

Part No.	Dimensions(mm)					
	D	D1	D2	L	B	M
FPM-NT50-12.5100	48	50	12.5	100	M12	1"x 8pitch
FPM-NT50-12.5150				150		
FPM-NT50-12.5200				200		
FPM-NT50-12.5250				250		
FPM-NT50-12.5300				300		
FPM-NT50-12.5350				350		
FPM-NT50-12.5400				400		
FPM-NT50-16.5100	60	63	16.5	100	M16	1"x 8pitch
FPM-NT50-16.5150				150		
FPM-NT50-16.5200				200		
FPM-NT50-16.5250				250		
FPM-NT50-16.5300				300		
FPM-NT50-16.5350				350		
FPM-NT50-16.5400				400		
FPM-BT50-12.5100	48	50	12.5	100	M12	M24
FPM-BT50-12.5150				150		
FPM-BT50-12.5200				200		
FPM-BT50-12.5250				250		
FPM-BT50-12.5300				300		
FPM-BT50-12.5350				350		
FPM-BT50-12.5400				400		
FPM-BT50-16.5100	60	63	16.5	100	M16	M24
FPM-BT50-16.5150				150		
FPM-BT50-16.5200				200		
FPM-BT50-16.5250				250		
FPM-BT50-16.5300				300		
FPM-BT50-16.5350				350		
FPM-BT50-16.5400				400		
FPM-BT50-16.5450				450		
FPM-BT50-16.5500				500		
FPM-BT50-16.5550				550		
FPM-BT50-16.5600				600		
FPM-BT50-16.5650				650		
FPM-BT50-16.5700				700		

SHRINK FIT CHUCK

▶ Shrink Fit Chuck

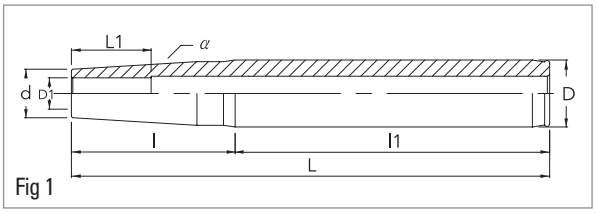


Fig 1

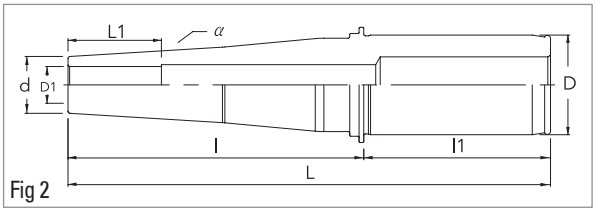


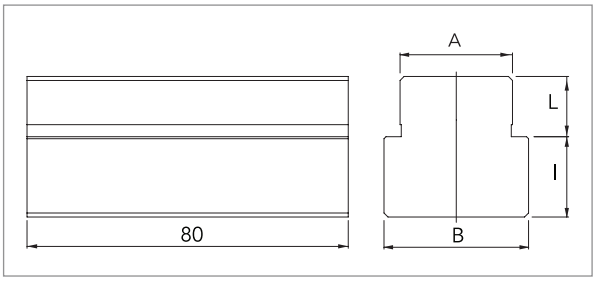
Fig 2

- STRAIGHT SHANK TYPE

Part No.	D	D1	d	α°	L	L1	l	ll	Fig
SL20-D06x185L	20	6	12			20	77	108	
SL20-D08x185L	20	8	14			25	58	127	
SL20-D10x185L	20	10	16			30	38	147	
SL25-D12x185L	25	12	18			30	67	118	
SL32-D16x185L	32	16	25			40	100	85	
SC20-D06x185L	20	6	9.5		185	20	86	99	1
SC20-D08x185L	20	8	11.5			25	70	115	
SC20-D10x185L	20	10	13.5			30	55	130	
SC25-D12x185L	25	12	15.5			30	80	105	
SC32-D16x185L	32	16	19.5			40	103	82	
ML32-D06x90S	32	6	12			20	90	60	
ML32-D08x90S	32	8	14			25	90	60	
ML32-D10x90S	32	10	16			30	90	60	
ML32-D12x90S	32	12	18			30	90	60	
ML32-D16x90S	32	16	22	3° 30′	150	40	90	60	
MC32-D06x55S	32	6	12			20	55	60	
MC32-D08x55S	32	8	14			25	55	60	
MC32-D10x55S	32	10	16			30	55	60	
MC32-D12x55S	32	12	18			30	55	60	
MC32-D16x55S	32	16	22		115	40	55	60	2
MC32-D06x45S	32	6	12			20	45	60	
MC32-D08x45S	32	8	14			25	45	60	
MC32-D10x45S	32	10	16			30	45	60	
MC32-D12x45S	32	12	18			30	45	60	
MC32-D16x45S	32	16	22		105	40	45	60	

BLOCK

▶ Setting Block



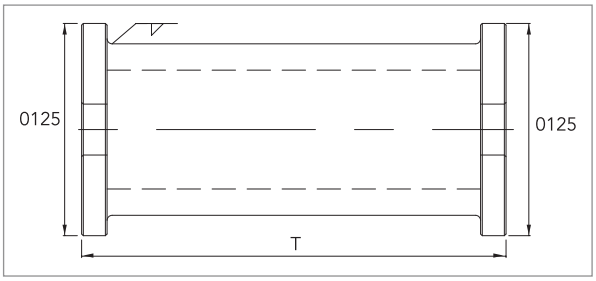
- BLOCK - SETTING BLOCK

Part No.	Dimensions(mm)			
	A(Machine side)	B(Product side)	L	l
KB-2225	22	25	23	18
KB-22254		25.4		
KB-22275		27.5		
KB-2228		28		
KB-2230		30		
KB-2232		32		
KB-2236		36		
KB-2238		38		
KB-2425	24	25		
KB-24254		25.4		
KB-24275		27.5		
KB-2428		28		
KB-2430		30		
KB-2432		32		
KB-2436		36		
KB-2438		38		
KB-2825	28	25		
KB-28254		25.4		
KB-28275		27.5		
KB-2828		28		
KB-2830		30		
KB-2832		32		
KB-2836		36		
KB-2838		38		

※ L, l sizes can be changeable on customer's request

BLOCK

▶ Setting Block

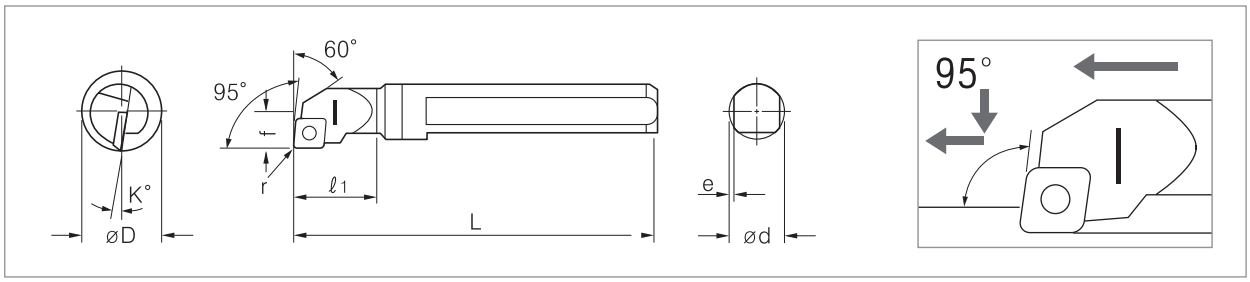


- BLOCK - SETTING BLOCK

Part No.	Dimensions(mm)	B(Product side)
	T	
PB-100	100	25
PB-150	150	
PB-200	200	
PB-250	250	
PB-300	300	
PB-350	350	
PB-400	400	

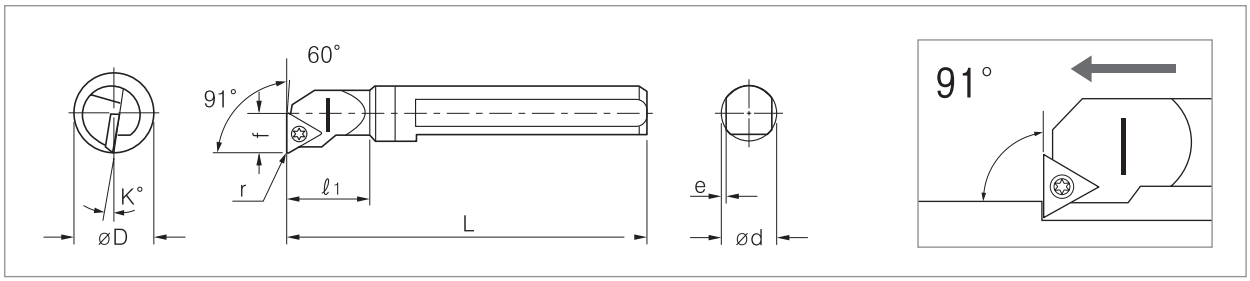
BORING BAR

▶ SCLC



Part No.	Stock	Range of application		SIZE(mm)						D	R		
	R			d	L	l1	F	E	K°				
C08HSCLCR06	•	CCMW CCMT CCGW	0602○○	8	100	12	6	0.5	15	11	0.4	TS25	TX08
C10KSCLCR06	•			10	125	16	7	0.5	13	13	0.4		
C12MSCLCR06	•			12	150	20	9	0.5	10	16	0.4		
C16RSCLCR06	•		09T3○○	16	200	25	11	1	7	20	0.8	TS4	TX15
C20SSCLCR06	•			20	250	32	13	1	7	25	0.8		

▶ STFC



Part No.	Stock	Range of application		SIZE(mm)						D	R		
	R			d	L	l1	F	E	K°				
C08HSTFCR09	•	TCMW TCMT	0902○○	8	100	12	6	0.5	15	11	0.4	TS22	TX06
C10KSTFCR11	•		1102○○	10	125	16	7	0.5	13	13	0.4	TS25	TX08
C12MSTFCR11	•			12	150	20	9	0.5	10	16	0.4		
C16RSTFCR11	•			16	200	25	11	1	7	20	0.4		
C20SSTFCR16	•		16T3○○	20	200	32	13	1	7	25	0.8	TS4	TX15
C25TSFCR16	•			25	250	40	17	1	5	32	0.8		

MEMO

6

CARBIDE RODS & BLANKS >

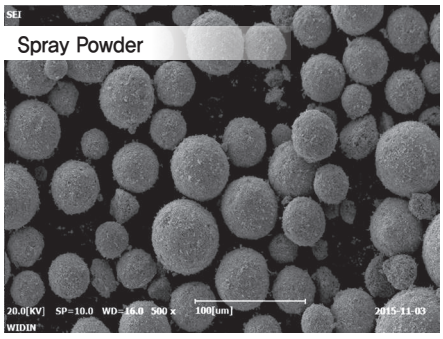
WIDIN®

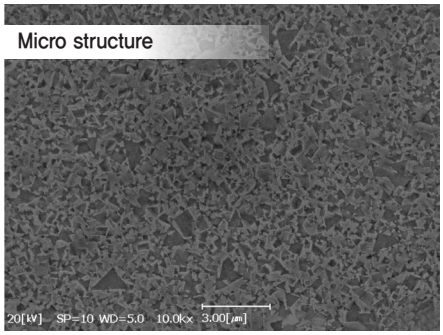
CARBIDE RODS & BLANKS

▶ Thugsten Carbide Rods & Blanks

GRADE	SERIES	FEATURE
WF08	Reaming	Suitable for Grey Cast Iron, Chilled Cast Iron, Hardened Steel, Aluminum Alloy, Plastic
WF10	Drilling/Milling	Suitable for Titanium Alloys, Inconel, Heat resisting Steel, Stainless Steel, Grey Cast Iron
WF12	Drilling/Milling/Machine tapping	Suitable for Titanium Alloys, Inconel, Stainless Steel, Hardening Steel, Grey Cast Iron, Composite Material, Drill
WK10	Drilling/Milling	Suitable for material Hrc45 or more, Stainless Steel, Titanium-Nickel Alloy, Low speed cutting machine, Continuous cutting and Intermitten Cutting
WN09	Drilling/Milling/Planing	Suitable for high speed cutting and dry machining to high wear resistance material like Graphite and composite material like CFRP and Industrial Fiber
WU08	Drilling/Milling/Planing	Suitable for High Hardened Steel for high speed cutting and dry cutting and high wear resistance for composite material like Aluminum Alloy

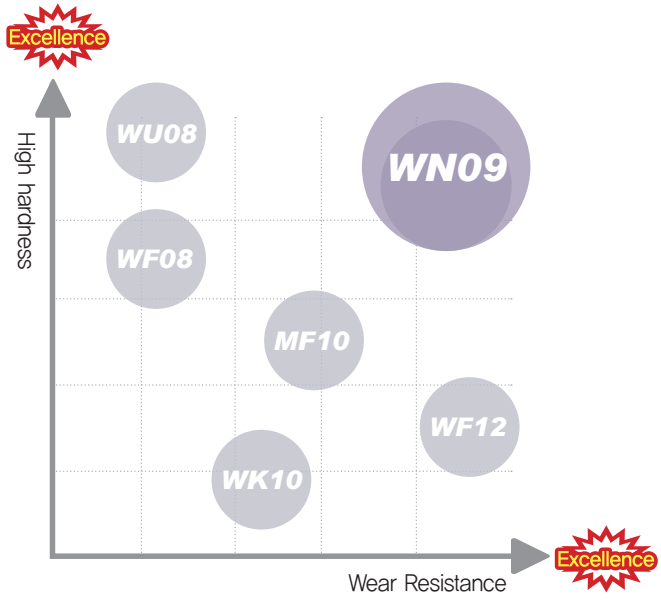
▶ Carbide Grades

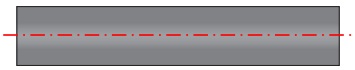




GRADE		WN09	WU08	WF08	MF10	WF12	WK10
ISO-RANGE		K01-K05	K05-K10	K10	K15	K20	K30
Diameter	mm	3.0 ~ 25.0					
Length	mm	330					
Co	wt%	9	8	8	10	12	10
Density	g/cm³	14.25	14.30	14.40	14.20	14.10	14.10
Hv10	kg/mm²	2130 ↑	2080	2000	1850	1730	1650
HRA	ISO3738	94.5 ↑	94.2	93.5	92.5	92.0	91.0
TRS	N/mm²	4200 ↑	3,800 ≥	3,800 ≥	4,000 ≥	4,100 ≥	3,900 ≥
A 〈10㎛		≤ 02	≤ 02	≤ 02	≤ 02	≤ 02	≤ 02
B 〉10㎛		00	00	00	00	00	00
C (F.C)		00	00	00	00	00	00
WC grain size (㎛)		≤ 0.2	0.3	0.5	0.5	0.5	0.8

CARBIDE RODS & BLANKS



Product	Unground & Cutting	Ground & Polished Rods
Shape		
Grinding		
Size		
Tolerance		h6
Grade		

ΦD (mm)	ΦD Tolerance	L(mm)	L Tolerance	Grade
3.0 ~ 10.0	0.2 ~ 0.4	330	0.1 ~ 6.0	K10 : WK10 K10, K15, K20 : WF08, MF10, WF12 K05~K10 : WU08
11.0 ~ 15.0	0.3 ~ 0.6			
16.0 ~ 25.0	0.3 ~ 0.8			

MEMO

7

TOOL HOLDER SERIES >

7

Tool Holder Series

TOOL HOLDER SERIES

WIDIN

Series	Appearance	Page
HYDRAULIC CHUCK		774
REDUCTION SLEEVE		786
SHRINK FIT CHUCK		788
MILLING CHUCK		801
DOUBLE BEARING MILLING CHUCK		807
MILLING CHUCK COLLET		811
QUICK CHANGE ARBOR		813
ER COLLET CHUCK		818

Series	Appearance	Page
ER COLLET & ACCESSORIES		826
WSK COLLET CHUCK		830
WSK COLLET & ACCESSORIES		834
DRILL CHUCK		836
JACOBS TAPER ARBOR		838
MORES TAPER ADAPTOR		839
END MILL HOLDER		842
SIDE CUTTER ARBOR		846

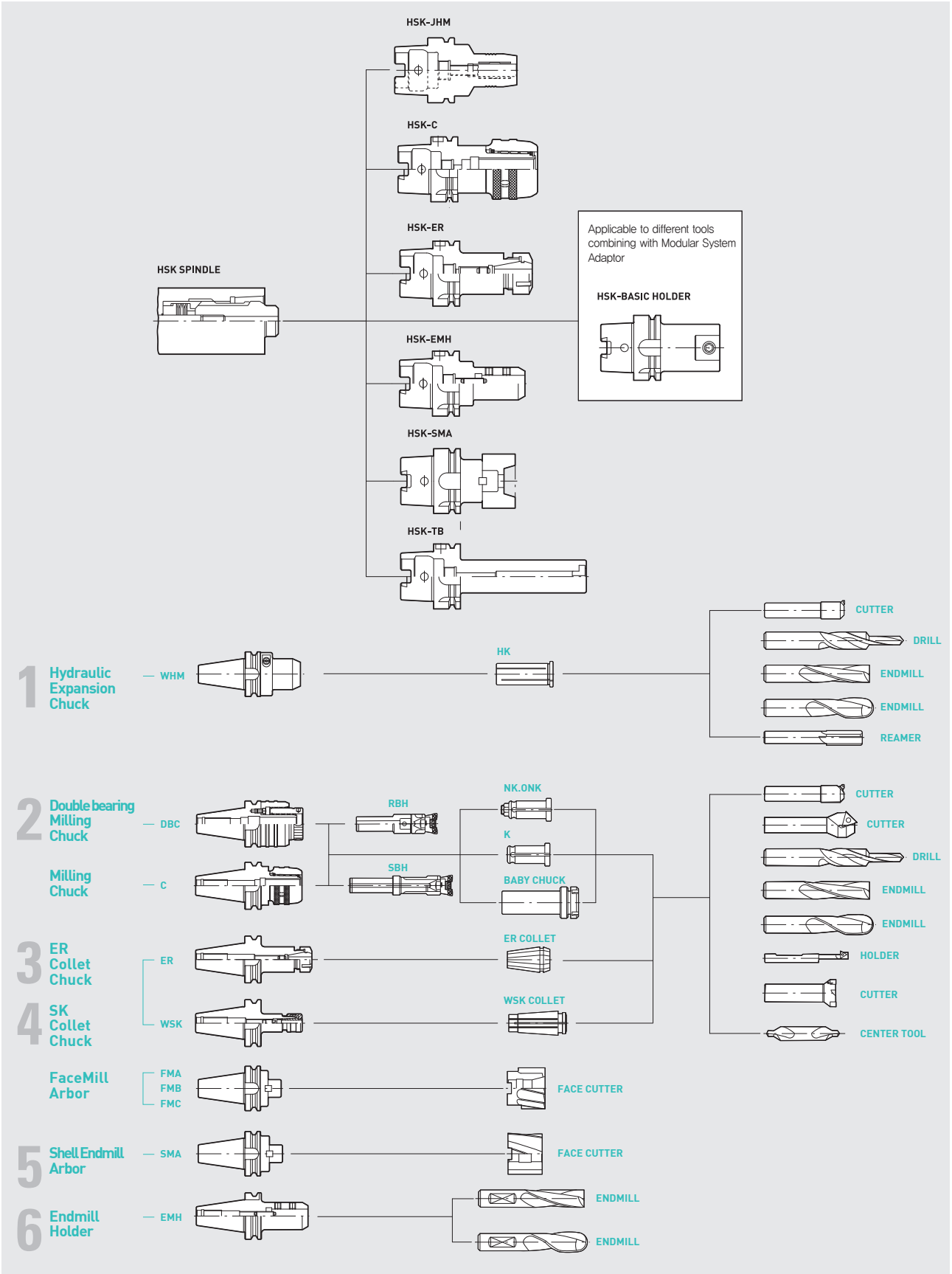
NEXT ≫

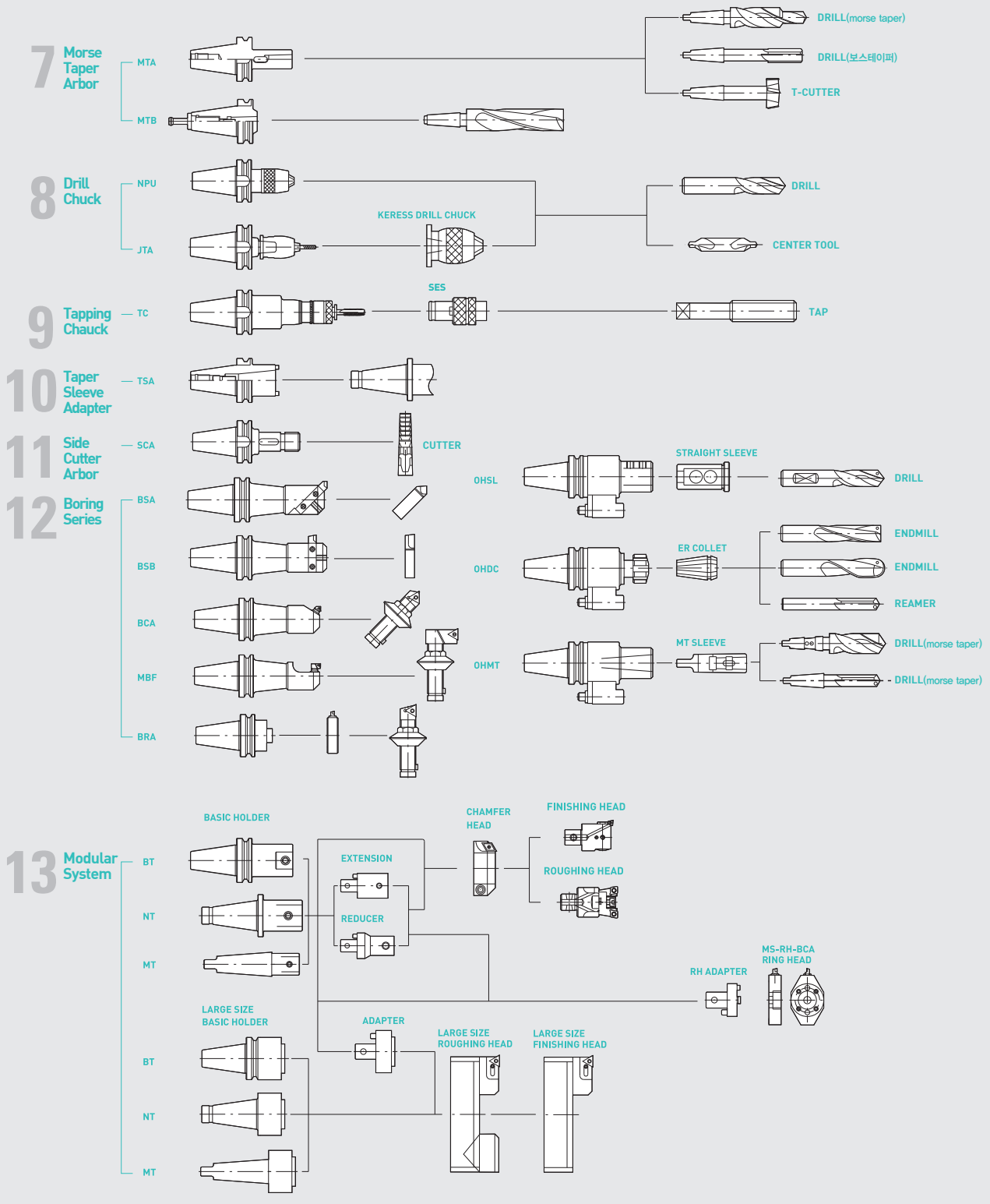
TOOL HOLDER SERIES

WIDIN

Series	Appearance	Page
FACE MILL ARBOR		847
SHELL MILL ARBOR		853
TAPPING CHUCK		856
TAP COLLET		858
OIL HOLE HOLDER		860
MICRO BORING BAR		863
BORING HEAD		871
BASIC HOLDER		880

Series	Appearance	Page
DRILL TAPER CHUCK		884
TOOL SETTING STAND		888
BASE MASTER BOLT		890
PULL STUD BOLT		891
NEW ANGLE HEAD		892
NEW ROTATING TOOL HOLDER		894


HSK-JHM
HSK-C
HSK-ER
HSK SPINDLE
Applicable to different tools combining with Modular System Adaptor
HSK-BASIC HOLDER
HSK-EMH
HSK-SMA
HSK-TB
1 Hydraulic Expansion Chuck
WHM
HK
CUTTER
DRILL
ENDMILL
ENDMILL
REAMER
2 Double bearing Milling Chuck
DBC
Milling Chuck
C
RBH
SBH
NK.ONK
K
BABY CHUCK
CUTTER
CUTTER
DRILL
ENDMILL
ENDMILL
HOLDER
CUTTER
CENTER TOOL
3 ER Collet Chuck
ER
ER COLLET
4 SK Collet Chuck
WSK
WSK COLLET
FaceMill Arbor
FMA
FMB
FMC
FACE CUTTER
5 Shell Endmill Arbor
SMA
FACE CUTTER
6 Endmill Holder
EMH
ENDMILL
ENDMILL


7 Morse Taper Arbor
MTA
MTB
DRILL(morse taper)
DRILL(보스테이퍼)
T-CUTTER
8 Drill Chuck
NPU
JTA
KERESS DRILL CHUCK
DRILL
CENTER TOOL
9 Tapping Chauck
TC
SES
TAP
10 Taper Sleeve Adapter
TSA
11 Side Cutter Arbor
SCA
CUTTER
12 Boring Series
BSA
BSB
BCA
MBF
BRA
OHSL
STRAIGHT SLEEVE
DRILL
OHDC
ER COLLET
ENDMILL
ENDMILL
REAMER
OHMT
MT SLEEVE
DRILL(morse taper)
DRILL(morse taper)
13 Modular System
BT
NT
MT
BASIC HOLDER
EXTENSION
REDUCER
CHAMFER HEAD
FINISHING HEAD
ROUGHING HEAD
RH ADAPTER
MS-RH-BCA RING HEAD
LARGE SIZE BASIC HOLDER
ADAPTER
LARGE SIZE ROUGHING HEAD
LARGE SIZE FINISHING HEAD
BT
NT
MT

HYDRAULIC EXPANSION CHUCK SYSTEM

Existing Milling chuck and spring collet chuck have banausic clamping method such as clamping by a nut or chuck head, but there is limit to keep high precision.

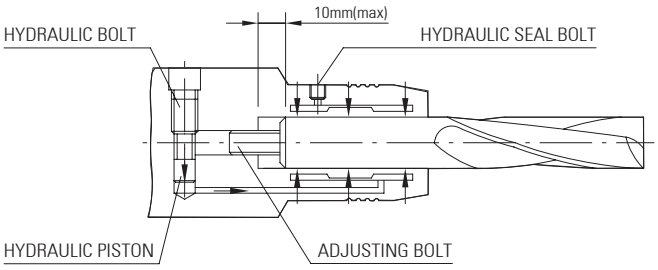
However, hydraulic chuck have special clamping method by removing and expansion the sleeve which were brazed on inside of chuck. This method completely clamping a cutting tool on all around inner bore face of chuck and keep high precision and proper for high speed machining as well.

HYDRAULIC EXPANSION CHUCK

BASIC PLAN

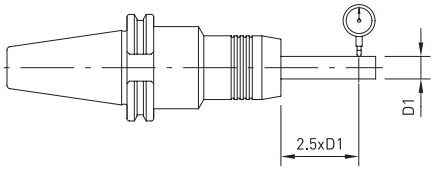
Application

Fine finishing, High speed & high accuracy machining



T.I R accuracy

Below 0.005mm at 2.5xD / This high accuracy extends tool life including improving machining condition



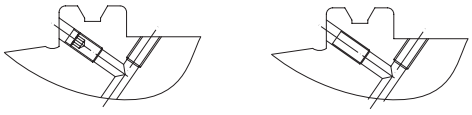
ID(Inner bore) size can reducible with reduction sleeve Using Reduction Sleeve D12 / D20 / D32 / OD12 / OD20 / OD32

Easy Clamping and Un clamping by T-Wrench Clamping / Un clamping.

It is able to tool change after assembling the chuck into the spindle of Machine.

Coolant System

Center through coolant system(AD) + Flange through coolant system(B)

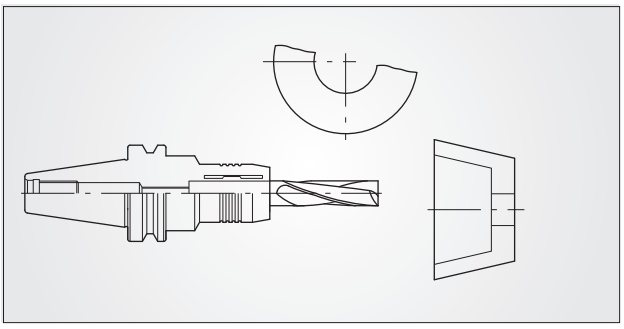


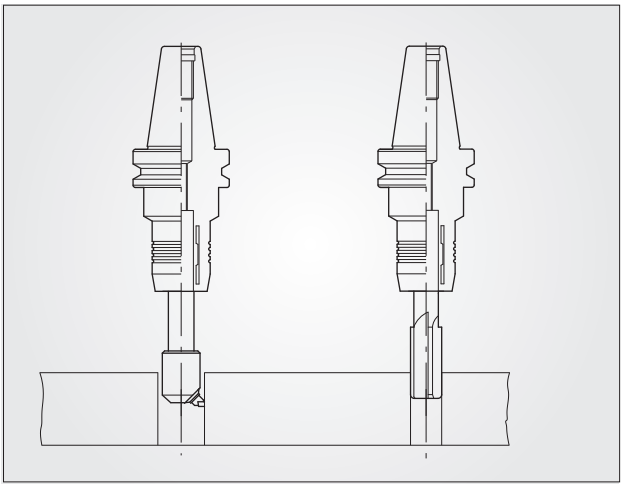
Good for High Speed Machining

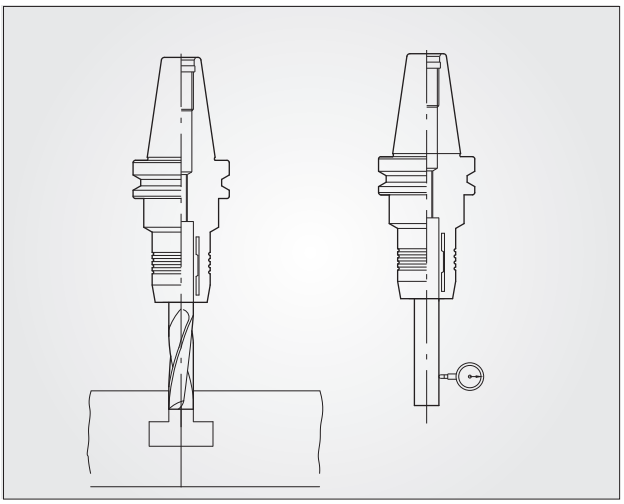
Even under high speed, it works very fast without vibration and makes sure of fine process and safety with fine balance up to G2.5 at 25,000rpm

HYDRAULIC EXPANSION CHUCK

• Example applications for hydraulic expansion chuck in standard version







PRECISION

- Due to the absolute precision of 3microns run out accuracy
- WIDIN hydraulic expension chucks are excellently suitable for precision machining with CBN, Solid carbide and polycrystal-diamond tools.

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve D12/D20/D32/OD12/OD20/OD32

DIVISION \ SHANKØ	Ø3 - 6	Ø6.1 - 10	Ø10.1 - 14	Ø14.1 - 18	Ø18.1 - 24	Ø24.1 - 30	Ø30.1 - 40
h6	0 - 8um	0 - 9um	0 - 11um	0 - 11um	0 - 13um	0 - 13um	0 - 16um

- The above chart is standard tolerance tool shank for hydraulic chuck application.

Feature of Hydraulic chuck

Existing Milling chuck and spring collet chuck have banausic clamping method such as clamping by a nut or chuck head, but there is limit to keep high precision. However, hydraulic chuck have special clamping method by removing and expansion the sleeve which were brazed on inside of chuck. This method completely clamping a cutting tool on all around inner bore face of chuck and keep high precision and proper for high speed machining as well.

Advantages of Hydraulic chuck

1) Guarantee the best T.I.R(Concentricity)
- In case using the Collet within 2.5 x D1, It is proper to 5/1000um(max). When directly Chucking, guarantees 3/1000um(max).
- While cutting, It led to more uniform chip extraction, expanded life span of cutting tools, improved a precision and intensity of illumination of workpieces, and enhanced 3 times longer life span of tools than existing Chuck.

2) 'Zero' Maintenance cost
- Hydraulic Chuck of WIDIN is completely sealed hydraulic system. By minimizing a possibility of penetration into an internal chuck of cutting oil and Substances like chips, we basically removed the damage of chuck. It improves a life span and zeroises the maintenance cost.

3) Easy lock
- By Chucking using a different T-Wrench, It minimizes an inconvenience of locking and time.

4) Best at high-speed machining
- All-in-one structure allows to manufacture without vibration

5) Increased economic feasibility using Collet
By developing a private Collet with high precision and high degree, a Chuck is able to apply for the various Size of Collets. It means we do our best to minimize costs.

Note of caution when operating hydraulic chuck

1) Please fully clamping the clamping screw by T-Wrench (The clamping screw will be stopped, if it was fully clamped by human power)

2) Please fully insert a cutting tool into the chuck. At the least, tool shank edge to be arrived at 8mm from end of inner bore depth.

3) Please eliminate a dust or tiny chip or humidity on the tool shank and inner bore face of the chuck.

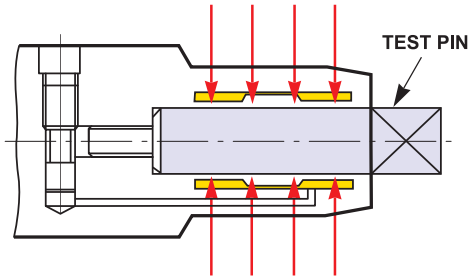
4) Please do not pull out the Clamping Screw and Oil Sealing from the chuck.

5) Please do not using hydraulic chuck for rough cutting.

6) Please do not disposal it by oneself when come out operating problem such as broken the chuck or clamping & unclamping problem etc.
(If you have some problem for the hydraulic chuck, please contact us at first)

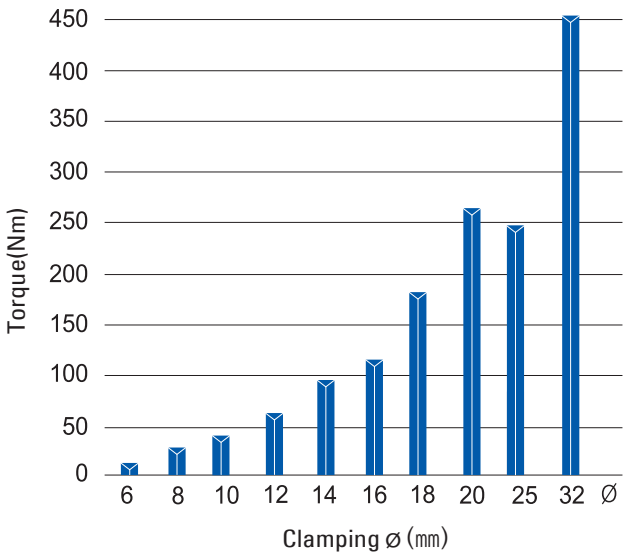
HYDRAULIC CHUCK

TORQUE
(Hydraulic chucks)



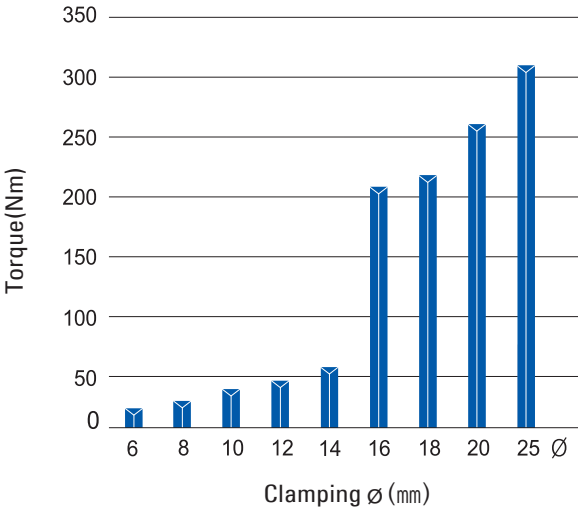
※This is torque(Nm) when clamped tools with straight cylindrical shanks

No Sleeves



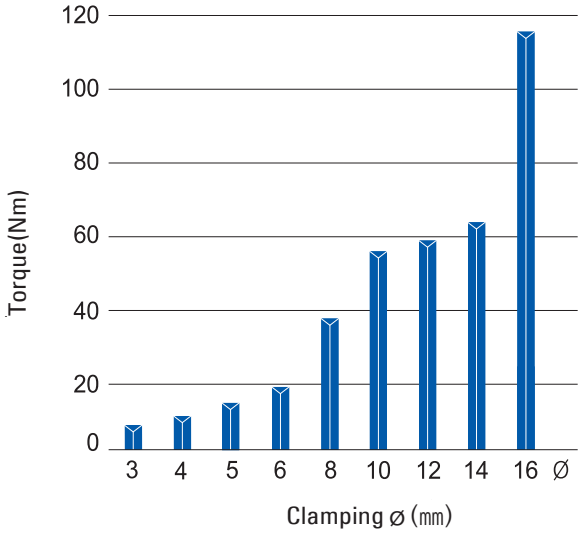
※This is torque(Nm) of Hydraulic chucks with direct clamping ø6-32mm

32mm dia. Chuck with Sleeves



※This is torque(Nm) of Hydraulic chucks clamping ø32mm with HK collet

20mm dia. Chuck with Sleeves

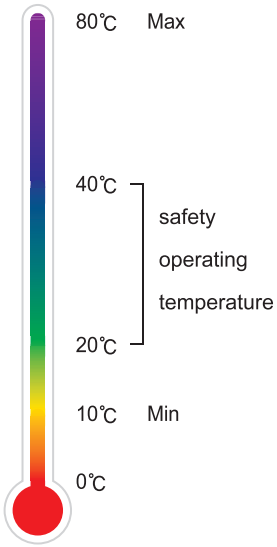


※This is torque(Nm) of Hydraulic chucks clamping ø20mm with HK collet

R·P·M / BALANCE

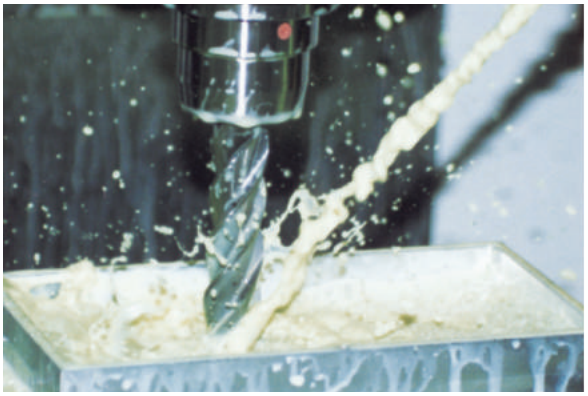
Fine Balanced	G2.5/15000rpm G2.5/20000rpm G2.5/25000rpm
Standard Balanced	G6.3/12000rpm G6.3/15000rpm

TEMPERATURE

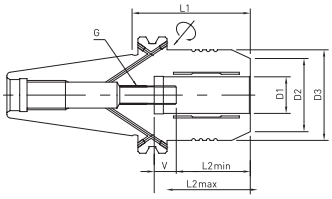


Operating Temperature

Generally, the normal operating temperature of hydraulic chuck is between 20℃ and 40℃
When operating temperature isn't the normal range, pls ask technical information.



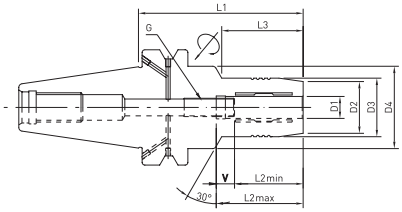
HYDRAULIC CHUCK - Short & Heavy Design



MAS403 BT-WHM(P type)

mm

CODE NO.		D1	D2	D3	L1	L2max	L2min	V	G
BT30	WHM20P-85	20	40	44	85	52.5	42.5	10	M8 X 1.0
BT40	WHM20P-72.5	20	40	49.5	72.5	52.5	42.5	10	M8 X 1.0
BT50	WHM32P-90	32	60	72	90	65	55	10	M16 X 1.0

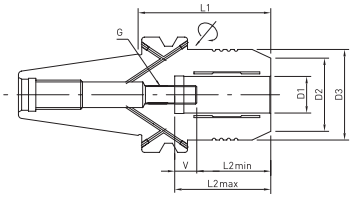


DIN69871 SK-WHM(P type)

mm

CODE NO.		D1	D2	D3	L1	L2max	L2min	V	G
SK40	WHM20P-64.5	20	40	49.5	64.5	52.5	42.5	10	M8 X 1.0
SK50	WHM32P-81	32	60	72	81	65	55	10	M16 X 1.0

HYDRAULIC EXPANSION CHUCK



BT-WHM

mm

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	G
BT30	WHM6-70	6	25	28	45	70	37.5	27.5	10	28	M5 X 0.8
	WHM8-70	8	27	30	45	70	37.5	27.5	10	28	M6 X 1.0
	WHM10-75	10	29	32	45	75	42.5	32.5	10	38	M6 X 1.0
	WHM12-75	12	31	34	45	75	47.5	37.5	10	36	M6 X 1.0
	WHM14-85	14	33	36	45	85	47.5	37.5	10	44	M6 X 1.0
	WHM16-90	16	35	38	45	90	52.5	42.5	10	48	M8 X 1.0
	WHM18-90	18	38	41	45	90	52.5	42.5	10	48	M8 X 1.0
	WHM20-90	20	40	43	-	90	52.5	42.5	10	-	M8 X 1.0

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve D12/D20/D32/OD12/OD20/OD32
- Balancing Grade : BT30, BT40, SK40 - G2.5/20,000rpm / BT50, SK50 - G 2.5 / 15,000rpm

HYDRAULIC EXPANSION CHUCK

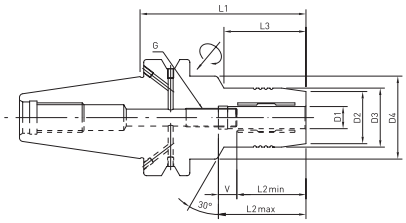


Fig1

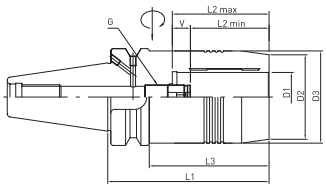


Fig2

MAS403 BT-WHM

mm

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	G	Type
BT40	WHM6-65	6	25	28	50	65	37.5	27.5	10	23	M5 X 0.8	Fig1
	WHM6-90					90				44		
	WHM6-140					140				44		
	WHM8-65	8	27	30		65				23	M6 X 1.0	
	WHM8-90					90				39		
	WHM8-140					140				44		
	WHM10-65	10	29	32		65	42.5	32.5		23	M6 X 1.0	
	WHM10-90					90				44		
	WHM10-140					140				44		
	WHM12-65	12	31	34		65	47.5	37.5		23		
	WHM12-90					90				44		
	WHM12-140					140				44		
	WHM14-65	14	33	36		65				23		
	WHM14-90					90				44		
	WHM14-140					140				44		
	WHM16-65	16	35	38		65	52.5	42.5		23	M8 X 1.0	
	WHM16-90					90				48		
	WHM16-140					140				48		
	WHM18-75	18	38	41		75				30		
	WHM18-90					90				48		
	WHM18-140					140				48		
	WHM20-75	20	40	43		75				30		
	WHM20-90					90				48		
	WHM20-140					140				48		
	WHM25-100	25	53	57	-	100	61	51		73	M16 X 1.0	Fig2
	WHM25-135					135				108		
	WHM32-105	32	58	63		105	65	55		-		
	WHM32-135					135				-		

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD, AD/B

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve
  D12/D20/D32/OD12/OD20/OD32

HYDRAULIC EXPANSION CHUCK

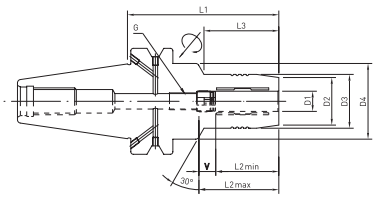


Fig1

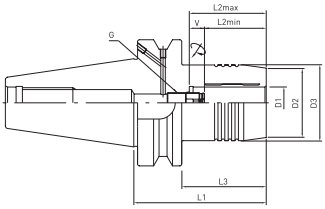


Fig2

MAS403 BT-WHM

mm

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	G	Type
BT50	WHM6-90	6	25	28	50	90	37.5	27.5	10	32	M5 X 0.8	Fig1
	WHM6-120					120				44		
	WHM6-140					140				44		
	WHM8-90	8	27	30		90				32	M6 X 1.0	
	WHM8-120					120				40		
	WHM8-140					140				44		
	WHM10-90	10	29	32		90	42.5	32.5		32	M6 X 1.0	
	WHM10-120					120				44		
	WHM10-140					140				44		
	WHM12-90	12	31	34		90	47.5	37.5		32		
	WHM12-120					120				44		
	WHM12-140					140				44		
	WHM14-90	14	33	36		90				32		
	WHM14-120					120				44		
	WHM14-140					140				44		
	WHM16-90	16	35	38		90	52.5	42.5		32	M8 X 1.0	
	WHM16-120					120				48		
	WHM16-140					140				48		
	WHM18-90	18	38	41		90				32		
	WHM18-120					120				48		
	WHM18-140					140				48		
	WHM20-90	20	40	43		90				32		
	WHM20-120					120				48		
	WHM20-140					140				48		
	WHM25-105	25	53	57	-	105	61	51		67	M16 X 1.0	Fig2
	WHM25-150					150				112		
	WHM32-115	32	58	63		115	65	55		77		
	WHM32-150					150				112		

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/15000 | **Coolant** : AD, AD/B

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve
  D12/D20/D32/OD12/OD20/OD32

HYDRAULIC EXPANSION CHUCK

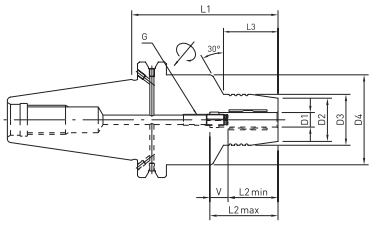


Fig1

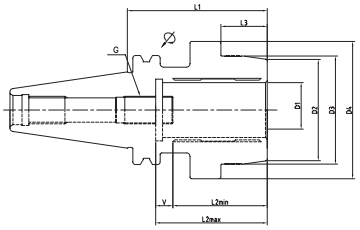


Fig2

DIN69871 SK-WHM

mm

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	G	Type
SK40	WHM6-65	6	25	28	50	65	37.5	27.5	10	23	M5 X 0.8	Fig1
	WHM6-80.5					80.5				44		
	WHM6-110					110				44		
	WHM8-65	8	27	30		65				23	M6 X 1.0	
	WHM8-80.5					80.5				44		
	WHM8-110					110				44		
	WHM10-65	10	29	32		65	42.5	32.5		23	M6 X 1.0	
	WHM10-80.5					80.5				44		
	WHM10-110					110				44		
	WHM12-65	12	31	34		65	47.5	37.5		23		
	WHM12-80.5					80.5				44		
	WHM12-110					110				44		
	WHM14-75	14	33	36		75				30		
	WHM14-80.5					80.5				44		
	WHM14-110					110				44		
	WHM16-75	16	35	38		75	52.5	42.5		30	M8 X 1.0	
	WHM16-80.5					80.5				48		
	WHM16-110					110				48		
	WHM18-75	18	38	41		75				30		
	WHM18-80.5					80.5				30		
	WHM18-135					135				48		
	WHM20-75	20	40	43		75				30		
	WHM20-80.5					80.5				48		
	WHM20-110					110				48		
	WHM25-80.5	25	53	57	66	80.5	61.0	51.0		26	M16 X 1.0	Fig2
	WHM32-80.5	32	60	63	80	80.5	65.0	55.0		26		

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD, AD/B

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve
  D12/D20/D32/OD12/OD20/OD32

HYDRAULIC EXPANSION CHUCK

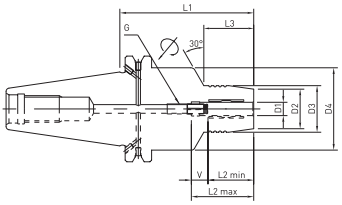


Fig1

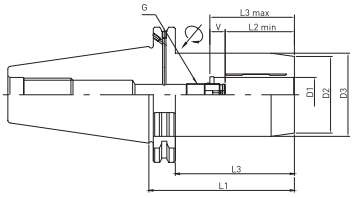


Fig2

DIN69871 SK-WHM(P type)

mm

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	G	Type
SK50	WHM6-90	6	25	28	50	90	37.5	27.5	10	44	M5 X 0.8	Fig1
	WHM6-140					140				44		
	WHM8-90	8	27	30		90				44	M6 X 1.0	
	WHM8-140					140				44		
	WHM10-90	10	29	32		90	42.5	32.5		44	M6 X 1.0	
	WHM10-140					140				44		
	WHM12-90	12	31	34		90	47.5	37.5		44		
	WHM12-140					140				44		
	WHM14-90	14	33	36		90				44		
	WHM14-140					140				44		
	WHM16-90	16	35	38		90	52.5	42.5		48	M8 X 1.0	
	WHM16-140					140				48		
	WHM18-90	18	38	41		90				48		
	WHM18-140					140				48		
	WHM20-80.5	20	40	43		80.5				44		
	WHM20-90					90				48		
	WHM20-110					110				48		
	WHM20-140					140				48		
	WHM25-105	25	53	57	-	105	61.0	51.0		85.9	M16 X 1.0	Fig2
	WHM25-140					140				120.9		
	WHM32-115	32	58	63		115	65.0	55.0		95.9	M16 X 1.0	
	WHM32-140					140				120.9		

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/15000 | **Coolant** : AD, AD/B

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve
  D12/D20/D32/OD12/OD20/OD32

HYDRAULIC EXPANSION CHUCK

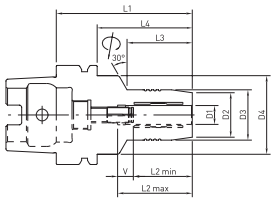


Fig1

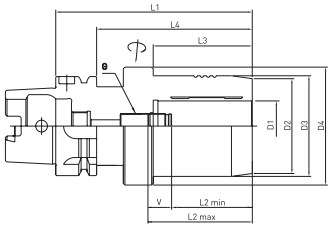


Fig2

DIN69893 HSK/A-WHM

mm

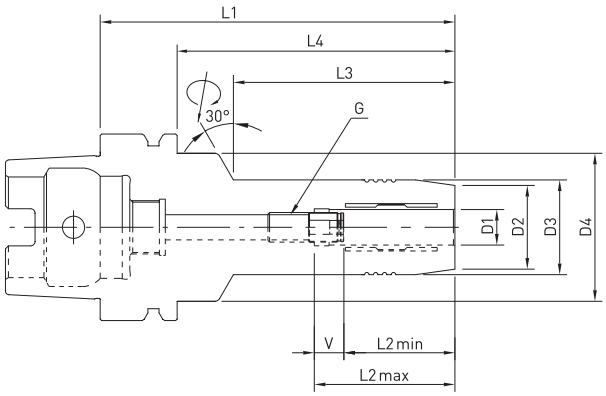
CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	L4	G	Type
HSK40A	WHM6-70	6	25	28	34	70	37.5	27.5	10	28	50	M5 X 0.8	Fig1
	WHM8-70	8	27	30	34	70	37.5	27.5		28	50		
	WHM10-75	10	29	32	34	75	42.5	32.5		34	55		
	WHM12-85	12	31	34	34	80	47.5	37.5		-	65	M6 X 1.0	
HSK50A	WHM6-70	6	25	28	40	70	37.5	27.5		28	44	M5 X 0.8	
	WHM8-70	8	27	30	40	70	37.5	27.5		28	44	M6 X 1.0	
	WHM10-80	10	29	32	40	75	42.5	32.5		34	54		
	WHM12-85	12	31	34	40	85	47.5	37.5		44	59		
	WHM14-85	14	33	36	40	85	47.5	37.5		44	59		
	WHM16-90	16	35	38	60	90	52.5	42.5		30	64		Fig2
	WHM18-90	18	38	41	-	90	52.5	42.5		-	64		Fig1
	WHM20-90	20	40	42	-	90	52.5	42.5		-	64		
HSK63A	WHM6-70	6	25	28	50	70	37.5	27.5		24	44	M5 X 0.8	Fig1
	WHM8-70	8	27	30	50	70	37.5	27.5		24	44	M6 X 1.0	
	WHM10-80	10	29	32	50	80	42.5	32.5		35	54		
	WHM12-85	12	31	34	50	85	47.5	37.5		40	59		
	WHM14-85	14	33	36	50	85	47.5	37.5		40	59		
	WHM16-90	16	35	38	50	90	52.5	42.5		46	64	M8 X 1.0	
	WHM18-90	18	38	41	50	90	52.5	42.5		47	64		
	WHM20-90	20	40	43	50	90	52.5	42.5		48	64		
	WHM25-120	25	53	57	63	120	61	51		59	94	M16 X 1.0	Fig2
	WHM32-125	32	58	63	75	125	65	55		63	99		
HSK100A	WHM6-75	6	25	28	54	75	37.5	27.5		26	46	M5 X 0.8	Fig1
	WHM8-75	8	27	30	54	75	37.5	27.5		26	46	M6 X 1.0	
	WHM10-90	10	29	32	50	90	42.5	32.5		42	61		
	WHM12-95	12	31	34	50	95	47.5	37.5		47	66		
	WHM14-95	14	33	36	50	95	47.5	37.5		47	66		
	WHM16-100	16	35	38	50	100	52.5	42.5		53	71	M8 X 1.0	
	WHM18-100	18	38	41	50	100	52.5	42.5		53	71		
	WHM20-105	20	40	43	50	105	52.5	42.5		59	76		
	WHM25-110	25	53	57	63	110	61	51		62	81	M8 X 1.0	
	WHM32-110	32	58	63	75	110	65	55		62	81	M8 X 1.0	

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve D12/D20/D32/OD12/OD20/OD32
- Balancing Grade : HSK40, 50, 63 - G2.5/20,000rpm / HSK100 - G2.5/15,000rpm

HYDRAULIC EXPANSION CHUCK



DIN69893 HSK/A-WHM

mm

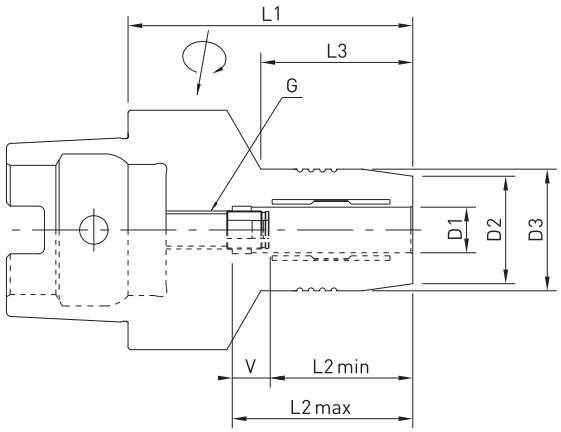
CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	L4	G
HSK63A	WHM6-150	6	25	28	50	150	37.5	27.5	10	103	124	M5 X 0.8
	WHM6-200					200				103	174	
	WHM8-150	8	27	30		150				104	124	M6 X 1.0
	WHM8-200					200				104	174	
	WHM10-150	10	29	32		150	42.5	32.5		104	124	M6 X 1.0
	WHM10-200					200				104	174	
	WHM12-150	12	31	34		150	47.5	37.5		105	124	
	WHM12-200					200				105	174	
	WHM14-150	14	33	36		150				105	124	
	WHM14-200					200				105	174	
	WHM16-150	16	35	38		150	52.5	42.5		106	124	M8 X 1.0
	WHM16-200					200				106	174	
	WHM18-150	18	38	41		150				107	124	
	WHM18-200					200				107	174	
	WHM20-150	20	40	43		150	52.5			108	124	M8 X 1.0
	WHM20-200					200				108	174	

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve D12/D20/D32/OD12/OD20/OD32

HYDRAULIC EXPANSION CHUCK



DIN69893 HSK/C-WHM

mm

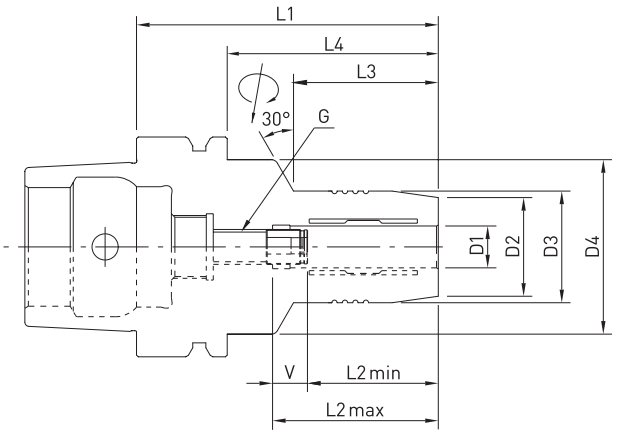
CODE NO.		D1	D2	D3	L1	L2max	L2min	V	L3	G
HSK40C	WHM6-60	6	25	28	60	37.5	27.5	10	35	M5 X 0.8
	WHM8-60	8	27	30					36	M6 X 1.0
	WHM10-65	10	29	32	65	42.5	32.5		41	
	WHM12-70	12	31	34	70	47.5	37.5		47	M6 X 1.0
HSK50C	WHM6-60	6	25	28	60	37.5	27.5		30	M5 X 0.8
	WHM8-60	8	27	30					30	M6 X 1.0
	WHM10-65	10	29	32	65	42.5	32.5		35	M6 X 1.0
	WHM12-75	12	31	34	75	47.5	37.5		44	
	WHM14-75	14	33	36					46	
	WHM16-80	16	35	38	80	52.5	42.5		51	M8 X 1.0
	WHM18-80	18	38	41					51	
	WHM20-80	20	40	43					52	

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve
  D12/D20/D32/OD12/OD20/OD32

HYDRAULIC EXPANSION CHUCK



DIN69893 HSK/E-WHM

mm

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	L4	G
HSK40E	WHM6-75	6	25	28	34	75	37.5	27.5	10	28	55	M5 X 0.8
	WHM8-70	8	27	30		70					50	
	WHM10-75	10	29	32		75	42.5	32.5		34	55	
	WHM12-85	12	31	34		85	47.5	37.5		-	65	M6 X 1.0
HSK50E	WHM6-70	6	25	28	40.0	70	37.5	27.5		28	44	M5 X 0.8
	WHM8-70	8	27	30								M6 X 1.0
	WHM10-80	10	29	32		80	42.5	32.5		34	54	M6 X 1.0
	WHM12-85	12	31	34		85	47.5	37.5		44	59	
	WHM16-90	16	35	38	60	90	52.5	42.5		30	64	
	WHM20-90	20	40	42	-					-		

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve
  D12/D20/D32/OD12/OD20/OD32

Tool Lenght Adjustable Design by Gear

- Using Special Gear to tool Length Adjusting
- Easy Tool length adjusting by gear after assembling the chuck into the spindle of Machine

Easy Clamping and Unclamping by T-Wrench

Clamping/ Un clamping It is able to tool change after assembling the chuck into the spindle of Machine

Easy Tool length adjusting up to 10mm by gear after assembling the chuck into the spindle of Machine

Good for High Speed Machining

Even under high speed, it works very fast without vibration and makes sure of fine process and safety with fine balance up to G2.5 at 25,000rpm

T.IR accuracy

Below 0.005mm at 2.5XD This high accuracy extends tool life including improving mechining codition.

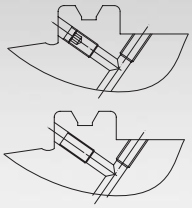
ID(Inner bore) size can reducible with reduction sleeve

Using Reduction sleeve D12/D20/D32/OD12/OD20/ OD32

Coolant System

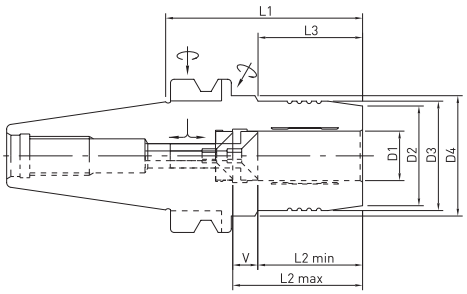
DIN69871 AD+B type

Center through coolant system(AD) + Flange through coolant system(B) = AD/B coolant system



HYDRAULIC EXPANSION CHUCK

- Tool Length Adjustable Design by Gear

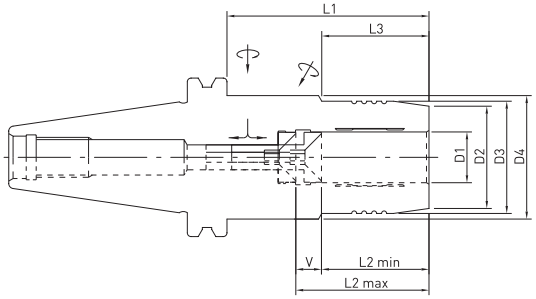


MAS403 BT-WHM(G type)

㎜

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3
BT40	WHM20G-90	20	40	43	50	90	52.5	42.5	10	50
BT50	WHM20G-90	20	40	43	50	85	52.5	42.5	10	32

Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD, AD/B



DIN69871 SK-WHM(G type)

㎜

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3
SK40	WHM20G-85	20	40	43	50	85	52.5	42.5	10	50
SK50	WHM20G-85	20	40	43	50	85	52.5	42.5	10	32

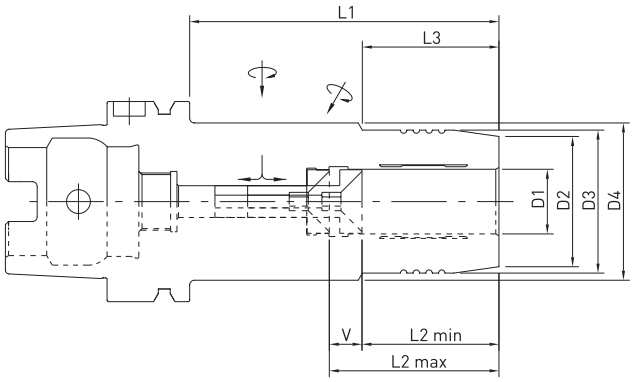
Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD, AD/B

NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve
  D12/D20/D32/OD12/OD20/OD32

HYDRAULIC EXPANSION CHUCK

- Tool Length Adjustable Design by Gear



DIN69893 HSK/A-WHM(G Type)

㎜

CODE NO.		D1	D2	D3	D4	L1	L2max	L2min	V	L3	L4
HSK63A	WHM12G-95	12	31	34	50.0	95	47.5	37.5	10	42	69
	WHM20G-100	20	40	43	50.0	100	52.5	42.5	10	50	74
HSK100A	WHM12G-105	12	31	34	50.0	105	47.5	37.5	10	42	76
	WHM20G-110	20	40	43	50.0	110	52.5	42.5	10	50	81
	WHM32G-120	32	60	63	75.0	120	65	55	10	61	91

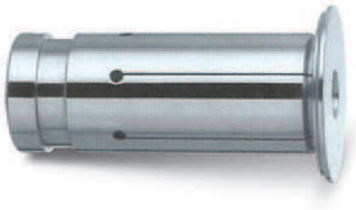
Taper : AT3 | **T.I.R** ≥5 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD

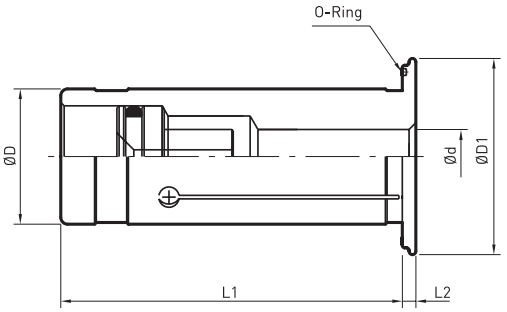
NOTE

- Tolerance of cutting tool shank should be configured within h6
- ID(Inner bore) size can reducible by using reduction sleeve D12/D20/D32/OD12/OD20/OD32
- Balancing Grade : HSK40, 50, 63 - G2.5/20,000rpm / HSK100 - G 2.5/15,000rpm

HYDRAULIC EXPANSION CHUCK COLLET

-Reducation Sleeve(Oil hole type)





OD-Coolant Waterproof Design

mm

CODE NO.		d	D	D1	L1	L2
OD12	3	3	12	21	45	2
	4	4				
	5	5				
	6	6				
	8	8				
OD20	3	3	20	29	50.5	2
	4	4				
	5	5				
	6	6				
	8	8				
	10	10				
	12	12				
	16	16				
OD32	6	6	32	39	60.5	3
	8	8				
	10	10				
	12	12				
	16	16				
	20	20				
	25	25				

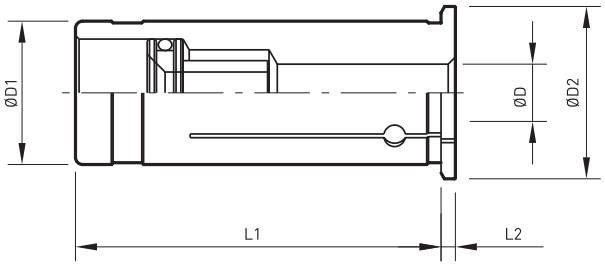
T.I.R ≥5 : /2.5xD

Peature

- ID(Inner bore) size can reducible by using reduction sleeve
  OD12/OD20/OD32
- OD type is 100% coolant waterproof
- There is a little bit tighten when insert the reduction sleeve into the chuck due to high precision tolerance of reduction sleeve and chuck.
- Please insert the reduction sleeve into the chuck after insert a cutting tool into the reduction sleeve.

HYDRAULIC EXPANSION CHUCK COLLET

- Reduction Sleeve



D-Standard Reduction Sleeve

㎜

CODE NO.		d	D	D1	L1	L2
D12	3	3	12	16	44.5	2
	4	4				
	5	5				
	6	6				
	8	8				
D20	3	3	20	24	50.5	2
	4	4				
	5	5				
	6	6				
	8	8				
	10	10				
	12	12				
	14	14				
	16	16				
D32	6	6	32	36	60.5	3
	8	8				
	10	10				
	12	12				
	14	14				
	16	16				
	18	18				
	20	20				
	25	25				

T.I.R ≥5 : /2.5xD

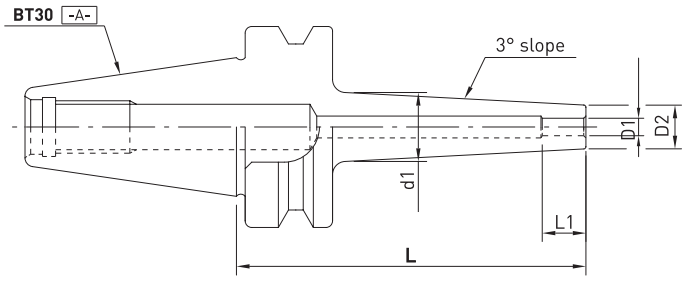
Peature

- ID(Inner bore) size can reducible by using reduction sleeve
  OD12/OD20/OD32
- There is a little bit tighten when insert the reduction sleeve into the chuck due to high precision tolerance of reduction sleeve and chuck.
- Please insert the reduction sleeve into the chuck after insert a cutting tool into the reduction sleeve.

SHRINK FIT CHUCK
SHRINK FIT EXTENSION SLEEVE

- *Strong Torque Power*
- *Quickly and Easy Tool change*
- *Excellent for High Speed Machining*

SHRINK FIT CHUCK -Designed 3° slope



MAS403 BT-SHR

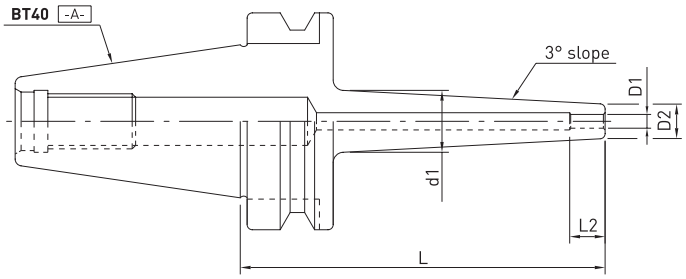
mm

CODE NO.		Ød1	D1	D2	L1	L2
BT30	SHR3-80	14.8	3	9	9	80
	SHR4-80	15.8	4	10	12	80
	SHR5-80	16.8	5	11	15	80
	SHR6-80	17.8	6	12	25	80
	SHR8-80	19.8	8	14	25	80
	SHR10-80	21.8	10	16	32	80
	SHR12-80	23.8	12	18	38	80
	SHR14-80	25.8	14	20	40	80
	SHR16-90	27.8	16	22	40	90
	SHR18-90	29.8	18	24	42	90
	SHR20-90	31.8	20	26	44	90

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD, AD/B | **For** : Solid Carbide

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT CHUCK -Designed 3° slope



MAS403 BT-SHR

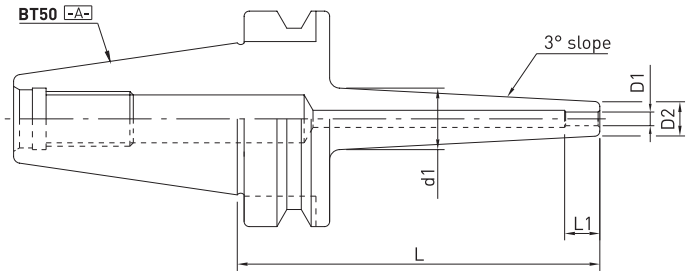
mm

CODE NO.		Ød1	D1	D2	L2	L
BT40	SHR3-90	17	3	9	9	90
	SHR4-90	18	4	10	12	90
	SHR5-90	19	5	11	15	90
	SHR6-90	20	6	12	25	90
	SHR8-90	22	8	14	25	90
	SHR10-90	24	10	16	32	90
	SHR12-90	26	12	18	38	90
	SHR14-90	28	14	20	40	90
	SHR16-90	30	16	22	40	90
	SHR18-95	32	18	24	42	95
	SHR20-95	34	20	26	44	95
	SHR25-100	39	25	31	50	100

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD, AD/B | **For** : Solid Carbide

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT CHUCK -Designed 3° slope



MAS403 BT-SHR

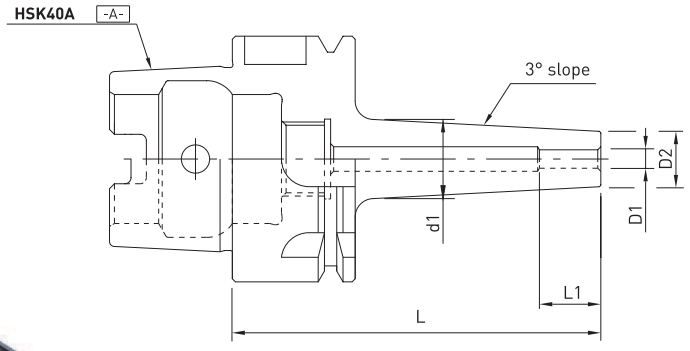
㎜

CODE NO.		Ød1	D1	D2	L1	L
BT50	SHR6-100	20.4	6	12	25	100
	SHR8-100	22.4	8	14	25	100
	SHR10-100	24.4	10	16	32	100
	SHR12-100	26.4	12	18	38	100
	SHR14-100	28.4	14	20	40	100
	SHR16-100	30.4	16	22	40	100
	SHR18-100	32.4	18	24	42	100
	SHR20-100	34.4	20	26	44	100
	SHR25-100	39.4	25	31	50	100
	SHR32-100	46.4	32	38	50	100

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD, AD/B | **For** : Solid Carbide

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT CHUCK -Designed 3° slope



DIN69893 HSK/A-SHR

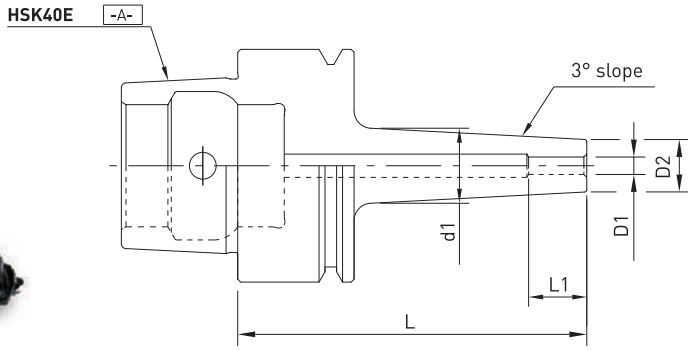
mm

CODE NO.		Ød1	D1	D2	L1	L
HSK40A	SHR3-60	19	3	9	9	60
	SHR3-120	19	3	9	9	120
	SHR4-60	20	4	10	12	60
	SHR4-120	20	4	10	12	120
	SHR5-60	21	5	11	15	60
	SHR5-120	21	5	11	15	120
	SHR6-80	22	6	12	25	80
	SHR6-120	22	6	12	25	120
	SHR8-80	24	8	14	25	80
	SHR8-120	24	8	14	25	120
	SHR10-80	26	10	16	32	80
	SHR10-120	26	10	16	32	120
	SHR12-90	28	12	18	38	90
	SHR12-120	28	12	18	38	120

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD | **For** : Solid Carbide

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT CHUCK -Designed 3° slope



DIN69893 HSK/E-SHR

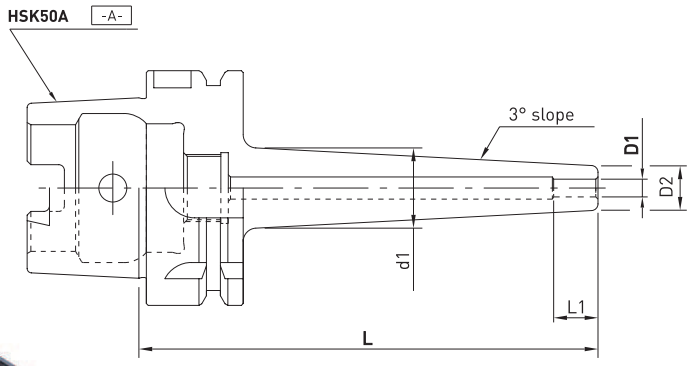
mm

CODE NO.		Ød1	D1	D2	L1	L
HSK40E	SHR3-60	19	3	9	9	60
	SHR3-120	19	3	9	9	120
	SHR4-60	20	4	10	12	60
	SHR4-120	20	4	10	12	120
	SHR5-60	21	5	11	15	60
	SHR5-120	21	5	11	15	120
	SHR6-80	22	6	12	25	80
	SHR6-120	22	6	12	25	120
	SHR8-80	24	8	14	25	80
	SHR8-120	24	8	14	25	120
	SHR10-80	26	10	16	32	80
	SHR10-120	26	10	16	32	120
	SHR12-90	28	12	18	38	90
	SHR12-120	28	12	18	38	120

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD | **For** : Solid Carbide

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT CHUCK -Designed 3° slope



DIN69893 HSK/A-SHR

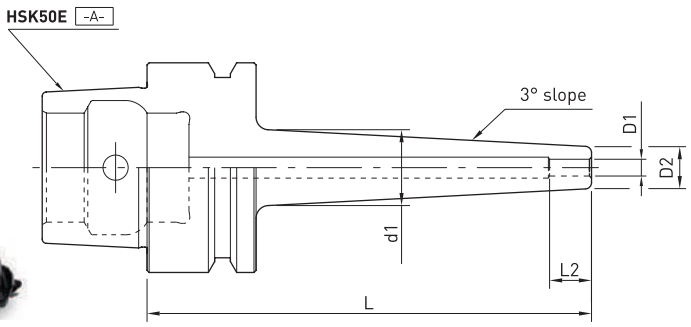
mm

CODE NO.		Ød1	D1	D2	L1	L
HSK50A	SHR4-60	18.6	4	10	12	60
	SHR5-60	19.6	5	11	15	60
	SHR6-60	19.6	6	12	25	60
	SHR8-80	21.6	8	14	25	80
	SHR8-120	21.6	8	14	25	120
	SHR10-80	23.6	10	16	32	80
	SHR10-120	23.6	10	16	32	120
	SHR12-85	25.6	12	18	38	85
	SHR12-120	25.6	12	18	38	120
	SHR14-90	27.6	14	20	38	90
	SHR14-120	27.6	14	20	38	120
	SHR16-90	29.6	16	22	40	90
	SHR16-120	29.6	16	22	40	120
	SHR18-95	31.6	18	24	42	95
	SHR18-120	31.6	18	24	42	120
	SHR20-100	31.6	20	26	44	100
	SHR20-120	31.6	20	26	44	120

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD | **For** : Solid Carbide

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT CHUCK -Designed 3° slope



DIN69893 HSK/E-SHR

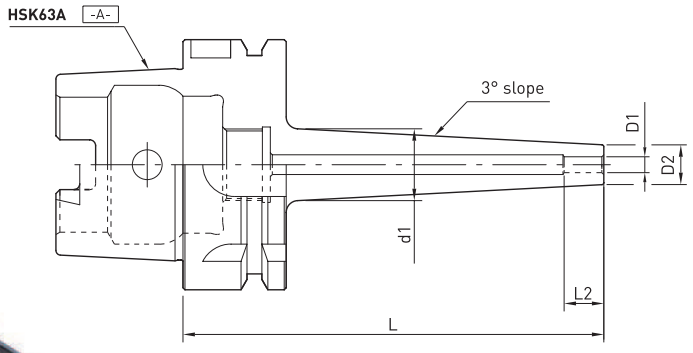
mm

CODE NO.		Ød1	D1	D2	L1	L
HSK50E	SHR4-60	18.6	4	10	12	60
	SHR5-60	19.6	5	11	15	60
	SHR6-60	19.6	6	12	25	60
	SHR8-80	21.6	8	14	25	80
	SHR8-120	21.6	8	14	25	120
	SHR10-80	23.6	10	16	25	80
	SHR10-120	23.6	10	16	25	120
	SHR12-85	25.6	12	18	38	85
	SHR12-120	25.6	12	18	38	120
	SHR14-90	27.6	14	20	38	90
	SHR14-120	27.6	14	20	38	120
	SHR16-90	29.6	16	22	40	90
	SHR16-120	29.6	16	22	40	120
	SHR18-95	31.6	18	24	42	95
	SHR18-120	31.6	18	24	42	120
	SHR20-100	31.6	20	26	44	100
	SHR20-120	31.6	20	26	44	120

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD | **For** : Solid Carbide

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT CHUCK -Designed 3° slope



DIN69893 HSK/A-SHR

mm

CODE NO.		Ød1	D1	D2	L1	L
HSK63A	SHR3-80	17.1	3	9	9	80
	SHR4-80	18.1	4	10	12	80
	SHR5-80	19.1	5	11	15	80
	SHR6-80	20.1	6	12	25	80
	SHR6-120	20.1	6	12	25	120
	SHR8-80	22.1	8	14	25	80
	SHR8-120	22.1	8	14	25	120
	SHR10-85	24.1	10	16	32	85
	SHR10-120	24.1	10	16	32	120
	SHR12-90	26.1	12	18	38	90
	SHR12-120	26.1	12	18	38	120
	SHR14-90	28.1	14	20	38	90
	SHR14-120	28.1	14	20	38	120
	SHR16-95	30.1	16	22	40	95
	SHR16-120	30.1	16	22	38	120
	SHR18-95	32.1	18	24	42	95
	SHR18-120	32.1	18	24	42	120
	SHR20-100	34.1	20	26	44	100
	SHR20-120	34.1	20	26	44	120
	SHR25-115	39.1	25	31	50	115
	SHR25-130	39.1	25	31	50	130
	SHR32-120	46.1	32	38	50	120
	SHR32-130	46.1	32	38	50	130

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD | **For** : Solid Carbide

mm

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT CHUCK -Designed 3° slope

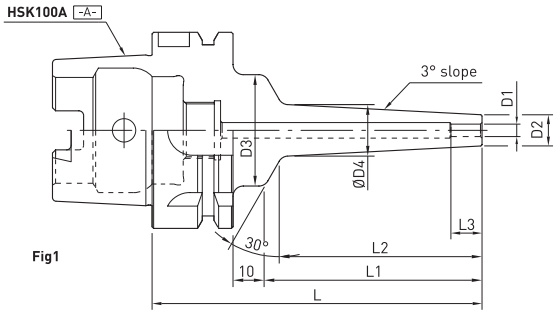


Fig1

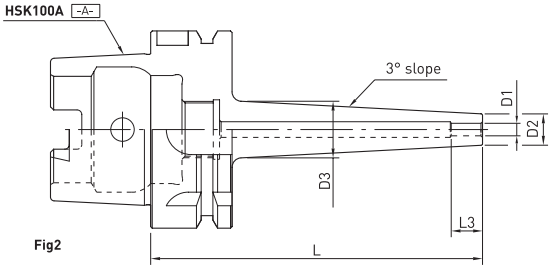


Fig2

DIN69893 HSK/A-SHR

mm

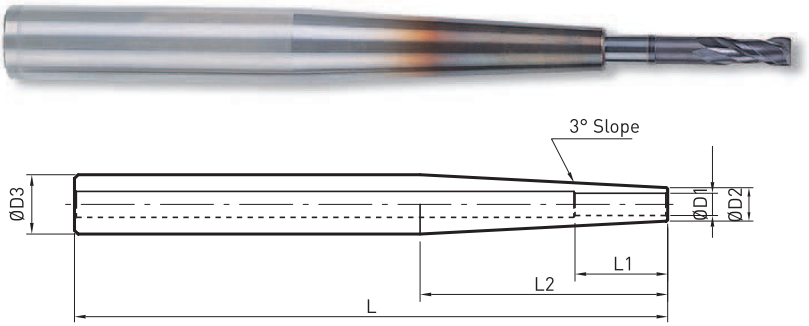
CODE NO.		D1	D2	D3	D4	L1	L2	L3	L	TYPE
HSK100A	SHR6-85	6	12	50	24.8	91	83.84	25	80	Fig1
	SHR8-85	8	14	50	24.8	91	83.84	25	85	Fig1
	SHR10-90	10	16	50	24.8	91	83.84	32	90	Fig1
	SHR12-95	12	18	50	24.8	91	83.84	38	95	Fig1
	SHR14-95	14	20	50	24.8	91	83.84	38	95	Fig1
	SHR16-100	16	22	50	24.8	91	83.84	40	100	Fig1
	SHR18-100	18	24	-	39.2	-	-	42	100	Fig2
	SHR20-105	20	26	-	39.2	-	-	44	105	Fig2
	SHR25-115	25	31	-	39.2	-	-	50	115	Fig2
	SHR32-120	32	38	-	39.2	-	-		120	Fig2

Taper : AT3 | **T.I.R** ≥3 : /2.5xD | **Bal/rpm** : G2.5/20000 | **Coolant** : AD | **For** : Solid Carbide

mm

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

SHRINK FIT EXPANSION CHUCK -Designed 3° slope



SR-SHR (STANDARD)

mm

CODE NO.		D1	D2	D3	L1	L2	L	Shank Tolerance
SR16	SHR3-160	3	9	16	10	66.8	160	h6
	SHR4-160	4	10	16	10	66.8	160	h6
	SHR5-160	5	11	16	10	66.8	160	h6
	SHR6-160	6	12	16	10	66.8	160	h6
	SHR8-160	8	14	16	10	66.8	160	h6
SR20	SHR10-160	6	12	20	10	105	160	h6
	SHR6-160	8	14	20	10	105	160	h6
	SHR8-160	10	16	20	26	105	160	h6
	SHR10-160	10	16	20	26	105	160	h6
	SHR12-160	12	18	20	32	105	160	h6

(EXTRA SLIM)

mm

CODE NO.		D1	D2	D3	L1	L2	L	Shank Tolerance
SSR12	SHR3-160	3	6	12	9	52.2	160	h4
	SHR4-160	4	7		12	47.7		
	SHR5-160	5	8		15	38.2		
	SHR6-160	6	9		25	28.6		
SSR16	SHR3-160	3	6	16	9	85.9		h6
	SHR4-160	4	7		12	85.9		
	SHR5-160	5	8		15	76.3		
	SHR6-160	6	9		25	47.7		
	SHR8-160	8	11			47.7		
	SHR10-160	10	13		32	28.6		
SSR20	SHR6-160	6	9	20	25	95		
	SHR8-160	8	11			85.9		
	SHR10-160	10	13		32	66.8		
	SHR12-160	12	15		38	47.7		

For : Solid Carbide

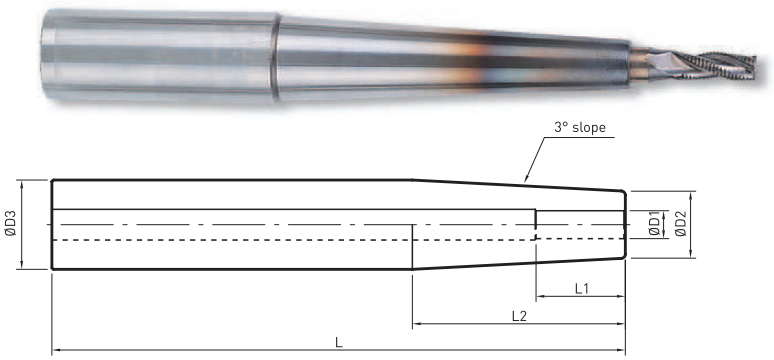
mm

DIVISION \ SHANKØ	Ø3-6	Ø6.1-10	Ø10.1-14	Ø14.1-18	Ø18.1-24	Ø24.1-30	Ø30.1-40
h6	0-8um	0-9um	0-11um	0-11um	0-13um	0-13um	0-16um

The universal solution for your machining issues.

- Highest runout accuracy optimum and almost unlimited extensions likely the most economic way special machining requirements for carbide steel

SHRINK FIT EXPANSION CHUCK -Designed 3° slope



SR-SHR

㎜

CODE NO.		D1	D2	D3	L1	L2	L	Shank Tolerance
SR20	SHR6-300	6	12	20	25	76.3	300	h6
	SHR8-300	8	14	20	25	76.3	300	h6
SR25	SHR8-300	8	14	25	25	124	300	h6
	SHR10-300	10	16	25	32	124	300	h6
	SHR12-300	12	18	25	38	124	300	h6
	SHR14-300	14	20	25	38	124	300	h6
	SHR16-300	16	22	25	40	124	300	h6
SR32	SHR10-300	10	16	32	32	190.8	300	h6
	SHR12-300	12	18	32	38	190.8	300	h6
	SHR14-300	14	20	32	38	190.8	300	h6
	SHR16-300	16	22	32	40	190.8	300	h6
	SHR20-300	20	26	32	42	190.8	300	h6

For : Solid Carbide

The universal solution for your machining issues.

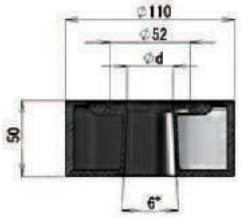
- Highest runout accuracy optimum and almost unlimited extensions likely the most economic way special machining requirements for carbide steel

Induction Machine for Shrink Fit Chuck

SF4200

Feature

- Low Consumption Power : Max. 3.6W
- Chuck material : STEEL & SUS
- Cost-effective price and competitive price
- Delivery : within 10 days from order date
- Using Volatage : Free Voltage
- All-in-one Inducting & Air Cooling System
  Easy Operating Manual



Specification

모델Model	Sf4200
Power	AC 110V -240V
Rated Ampere	Max 3.6KW
Dimension(mm)	325 X 340 X 690
Shrink Time	See below Chart
Induction Coil size	20mm, 30mm, 40mm, 50mm
Induction Coil size	Bt30, Bt40, BT50
Holder Support Size	HSK32, HSK40, HSK50, HSK63, HSK100
Inducting range of Chuck ID	3mm - 32mm
Weight	19kgs
Output Hz	7kHz ~ 45kHz

Shrinking Time

Chuck ID	Induction Coil	Carbide Tool	
		Heating	Cooling
Ø 4	Ø 20	4 Sec.	6 Sec.
Ø 6	Ø 20	4 Sec.	5 Sec.
Ø 8	Ø 20	4 Sec.	4 Sec.
Ø 12	Ø 20	4 Sec.	6 Sec.
Ø 16	Ø 30	6 Sec.	10 Sec.
Ø 20	Ø 40	8 Sec.	12 Sec.

Standard Parts

- Induction Coil : Ød = 30mm
- Holder Support : BT & HSK
- Heatproof Gloves
- Fuse

- Induction Coil Size [Ø d]
  Ø d = 20mm
  Ø d = 30mm
  Ø d = 40mm
  Ø d = 50mm

- [Standard Parts]
  Ød = 30mm
  And other size is optional

SINGLE MILLING CHUCK

Durability

– Milling chuck will be maintained long life through retainer that is accepted 300pcs bearings and minimized the friction on its rolling side.

Slot

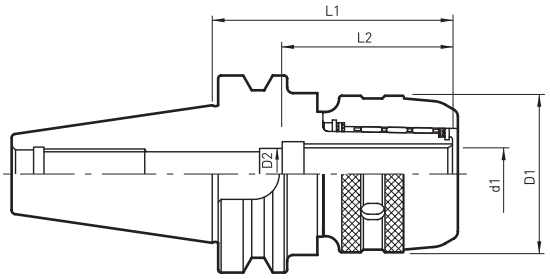
– Eliminates the oil and dregs owing to 6pcs-slots and improves torque power due to prevent slip and come off the tools.

Needle Roller Bearing

– The Needle Bearing with high precision & high strength is working softly and no friction noise even heavy load.

MILLING CHUCK

▶ SINGLE MILLING CHUCK



MAS403 BT-C

mm

CODE NO.		d1	D2	D1	L1	L2	COLLET
BT30	C20-75	20	19	59	75	65	K20
	C20-90	20	19	59	90	65	K20
BT40	C20-80	20	19	59	80	65	K20
	C20-90	20	19	59	90	65	K20
	C20-135	20	19	59	135	65	K20
	C25-90	25	25.5	62	90	70	K25
	C25-135	25	25.5	62	135	70	K25
	C32-90	32	25	75	90	75	K32
	C32-105	32	25.5	75	105	75	K32
	C32-135	32	25.5	75	135	75	K32
BT50	C20-105	20	19	59	105	65	K20
	C20-150	20	19	59	150	65	K20
	C25-105	25	25.5	62	105	70	K25
	C25-135	25	25.5	62	135	70	K25
	C32-110	32	25	75	110	75	K32
	C32-135	32	25	75	135	75	K32
	C32-165	32	25	75	165	75	K32
	C42-110	42	25	94	110	85	K42
	C42-135	42	25	94	135	85	K42
	C42-165	42	25	94	165	85	K42

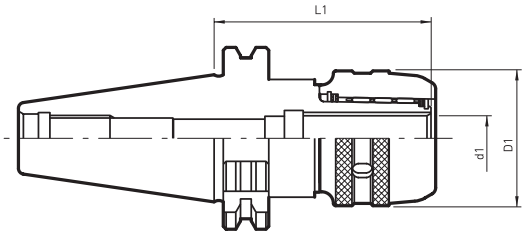
Taper : AT3 | **T.I.R** ≥10 : /2.5xD | **Coolant** : AD

COOLANT

- If you want to use the Milling Chuck with Spindle Through Coolant system, please use our ONK Collet.

MILLING CHUCK

▶ SINGLE MILLING CHUCK



DIN69871 SK-C

mm

CODE NO.		d1	D1	L1	COLLET
SK40	C20-105	20	59	105	K20
	C25-105	25	62	105	K25
	C32-105	32	75	105	K32
	C32-135	32	75	135	K32
SK50	C20-105	20	59	105	K20
	C25-105	25	62	105	K25
	C32-105	32	75	105	K32
	C32-135	32	75	135	K32
	C32-165	32	75	165	K32
	C42-115	42	94	115	K42
	C42-135	42	94	135	K42
	C42-165	42	94	165	K42

Taper : AT3 I **Coolant** : AD

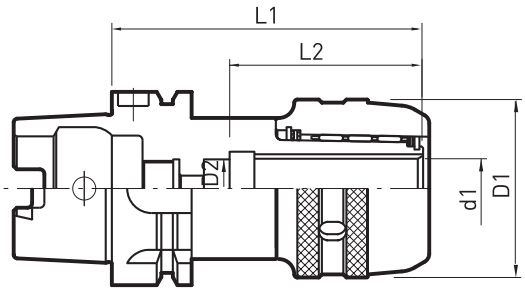


Fig.1

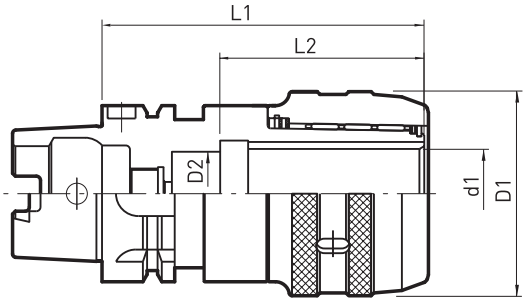


Fig.2

DIN69893 HSK-C

mm

CODE NO.		FIG	d1	D2	D1	L1	L2
HSK50A	C20-100	1	20	19	59	100	65
HSK63A	C20-105	1	20	19	59	105	65
	C32-130	2	32	25	75	130	75
HSK100A	C20-110	1	20	19	59	110	65
	C32-135	1	32	25	75	135	75
	C42-135	1	42	25	94	135	85

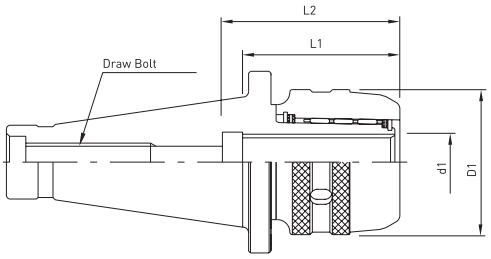
Taper : AT3 I **Coolant** : AD

COOLANT

• If you want to use the Milling Chuck with Spindle Through Coolant system, please use our ONK Collet.

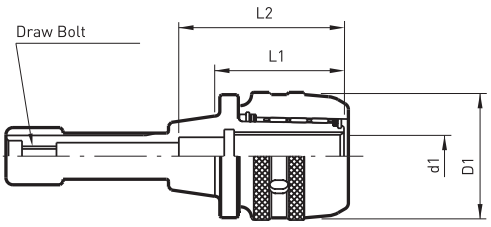
MILLING CHUCK

▶ SINGLE MILLING CHUCK



DIN2080 NT-C

CODE NO.		d1	D1	L1	L2	Draw Bolt		COLLET
						INCH	METRIC	
NT30	C20	20	59	60.6	65	1/2"-12UNC	M12X1.75	K20
NT40	C20	20	59	60.6	70	5/8"-11UNC	M16X2.0	K20
	C32	32	75	79.6	73	5/8"-11UNC	M16X2.0	K32
NT50	C32	32	75	76.7	90	1"-8UNC	M24X3.0	K32
	C42	42	94	86.2	110	1"-8UNC	M24X3.0	K42



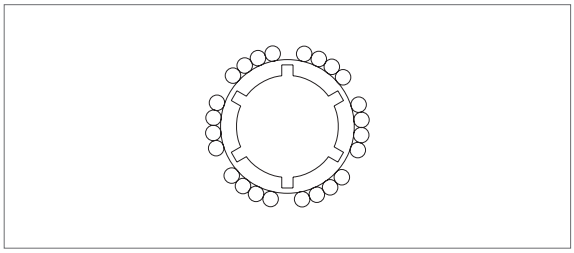
R8-C

CODE NO.		d1	D1	L1	L2	Draw Bolt	COLLET
R8	C20	20	59	62.5	85	7/16"-20UNC	K20

Durability

- Milling chuck will be maintained long life through retainer that is accepted 300pcs bearings and minimized the friction on its rolling side.

Slot



Needle Roller Bearing

- The Needle Bearing with high precision & high strength is working softly and no friction noise even heavy load.

- Eliminates the oil and dregs owing to 6pcs-slots and improves torque power due to prevent slip and come off the tools.

MILLING CHUCK

▶ SINGLE MILLING CHUCK _Set

SR8-C, SNT-C

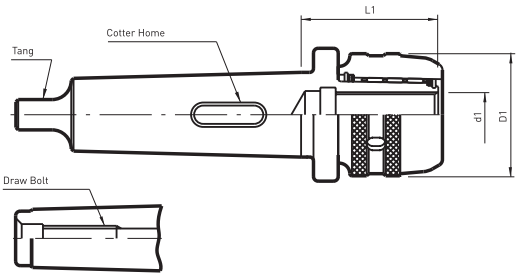
CODE NO.		Set Contants				
		Chuck	COLLET		MT Collet	Drill Chuck Bar
SR8	C20	R8-C20	K20	6.8.10.12.16	K20-MT1.2	K20-JT6
SNT30	C20	NT30-C20	K20	6.8.10.12.16	K20-MT1.2	K20-JT6
SNT40	C32	NT40-C32	K32	6.8.10.12.16	K32-MT1.2.3	K32-JT6
	C32			20.25		
SNT50	C32	NT50-C32	K32	6.8.10.12.16	K32-MT1.2.3	K32-JT6
	C32			20.25		
	C42	NT50-C42	K42	6.8.10.12.16	K42-MT1.2.3.4	K42-JT6
	C42			20.25.32		

NOTE

- Please make designate the Draw Bolt dimension between Inch and Metric at ordering step.
- Unless any notifying, NT40 and NT50 will be supplied with Inch Draw bolt.
- Drill chuck bar(JT6) is excluding a Drill chuck
- Centering Bar is excluding in set contents.

MILLING CHUCK

▶ SINGLE MILLING CHUCK



MT-C

mm

CODE NO.		d1	D1	L1	Draw Bolt	COLLET
MT4	C32-90	32	75	90	M16X2.0	K32
	C42-95	42	94	95		K42
MT5	C32-90	32	75	90	M20X2.5	K32
	C42-95	42	94	95		K42
MT6	C32-90	32	75	90	-	K32
	C42-95	42	94	96	-	K42

NOTE

- Please make designate the Draw Bolt dimension between Inch and Metric including Tang type at ordering step.
- Please inform about Model and Manufacturer of Machine in order to make designate of Cotter Home for Tang type.

▶ SINGLE MILLING CHUCK _Set

SMT-C

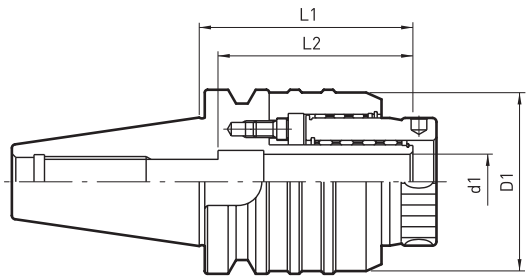
CODE NO.		Set Contants				
		Chuck	COLLET		MT Collet	Drill Chuck Bar
SMT3	C20	MT3-C20	K20	6.8.10.12.16	K20-MT1.2	K20-JT6
SMT4	C32	MT4-C32	K32	6.8.10.12.16	K32-MT1.2.3	K32-JT6
				20.25		
SMT5	C32	MT5-C32	K32	6.8.10.12.16		
				20.25		
	C42	MT5-C42	K42	6.8.10.12.16	K42-MT1.2.3.4	K42-JT6
				20.25.32		
SMT6	C42	MT6-C42	K42	6.8.10.12.16		
				20.25.32		

NOTE

- Drill Chuck Bar is excluding Drill Chuck
- Centering Bar is excluding in set contents.

MILLING CHUCK

▶ DOUBLE BEARING MILLING CHUCK



MAS403 BT-DBC

mm

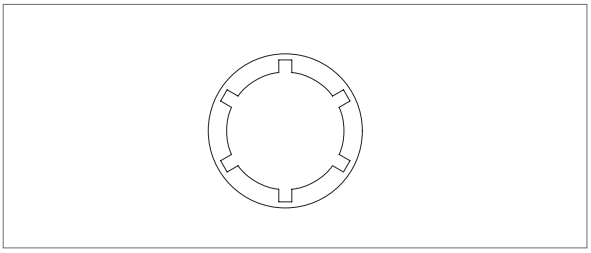
CODE NO.		d1	D1	L1	L2	WEIGHT(kg)	COLLET
BT50	DBC42-120	42	107	120	107	7.8	K42
	DBC42-135			135		8.6	
	DBC42-165			165		9.7	

Taper : AT3 I **Coolant** : AD

FEATURES

- It adopt a form double Roll-Lock and it give full play to high power from high holding. (A form of Heavy Duty Cutting)
- External diameter grinding in combination with guide Ring is keep precision on cutting tools. (For precise working.)
- With Lock Ring rotate side to side, the exchange tool is quickly and simple.
- The double Roll-Lock on construction prevent vibration during working with effect. (No Vibration)

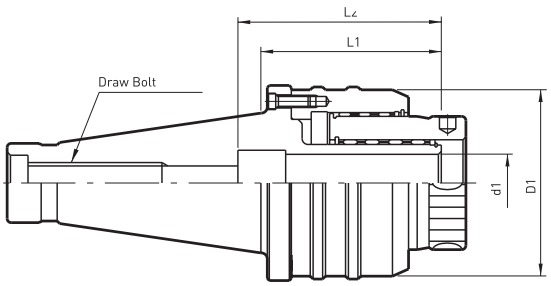
Slot



- Eliminates the oil and dregs owing to 6pcs-slots and improves torque power due to prevent slip and come off the tools.

MILLING CHUCK

▶ DOUBLE BEARING MILLING CHUCK



DIN2080 NT-DBC

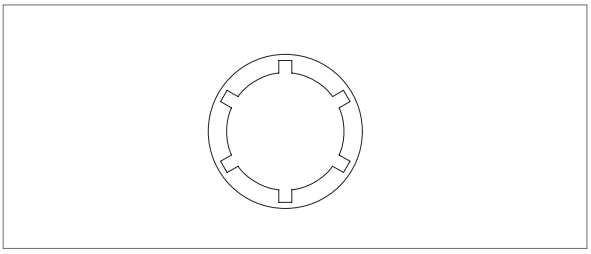
mm

CODE NO.		d1	D1	L1	L2	Draw Bolt		COLLET
						INCH	METRIC	
NT50	DBC42	42	107	97.7	100	1"-8UNC	M24X3	K42

FEATURES

- It adopt a form double Roll-Lock and it give full play to high power from high holding. (A form of Heavy Duty Cutting)
- External diameter grinding in combination with guide Ring is keep precision on cutting tools. (For precise working.)
- With Lock Ring rotate side to side, the exchange tool is quickly and simple.
- The double Roll-Lock on construction prevent vibration during working with effect. (No Vibration)

Slot



- Eliminates the oil and dregs owing to 6pcs-slots and improves torque power due to prevent slip and come off the tools.

MILLING CHUCK

▶ DOUBLE BEARING MILLING CHUCK _Set

SNT-DBC

mm

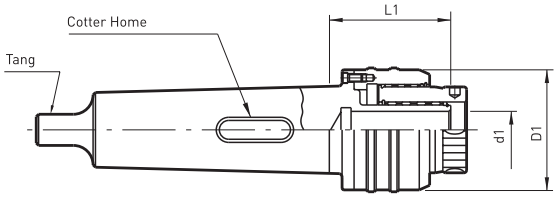
CODE NO.		Set Contants				
		Chuck	COLLET		MT Collet	Drill Chuck Bar
SNT50	DBC42	NT50-DBC42	K42	6.8.10.12 16.20.25.32	K42-MT1.2.3.4	K42-J6

NOTE

- Please make designate the Draw Bolt dimension between Inch and Metric at ordering step.
- Unless any notifying, NT40 and NT50 will be supplied with Inch Draw bolt.
- Drill chuck bar(JT6) is excluding a Drill chuck
- Centering Bar is excluding in set contents.

MILLING CHUCK

▶ DOUBLE BEARING MILLING CHUCK



MT-DBC

mm

CODE NO.		d1	D1	L1	COLLET
MT6	DBC42-100	42	107	96.5	K42

FEATURES

- It adopt a form double Roll-Lock and it give fully play to high power from strong torque power. (A form of Heavy Duty Cutting)
- External diameter grinding in combination with guide Ring is keep precision on cutting tools. (For precise working.)
- With Lock Ring rotate side to side, the exchange tool is quickly and simple.(The working hours shortening)
- The double Roll-Lock on construction prevent vibration during working with effect. (No Vibration)

▶ DOUBLE BEARING MILLING CHUCK _Set

SMT-DBC

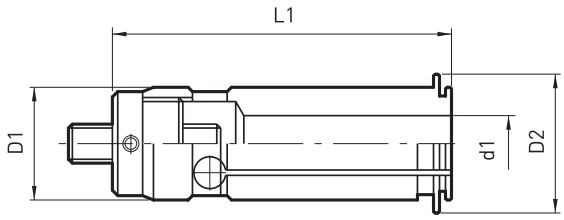
CODE NO.		Set Contants				
		Chuck	COLLET		MT Collet	Drill Chuck Bar
SMT6	DBC42	MT6-DBC42	K42	6.8.10.12 16.20.25.32	K42-MT1.2.3.4	K42-JT6

NOTE

- Drill Chuck Bar is excluding Drill Chuck
- Centering Bar is excluding in set contents.

MILLING CHUCK COLLET

▶ NC COLLET

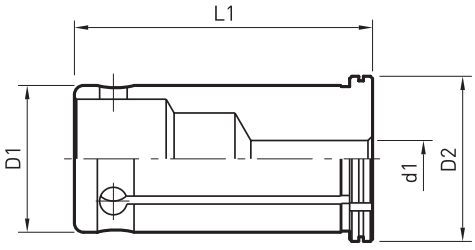


NK

mm

CODE NO.(d1)		D1	D2	L1
NK20	6.8.10.12.16	20	24	66
NK32	6.8.10.12.16.20.25	32	37	80
NK42	6.8.10.12.16.20.25.32	42	48	87

▶ STRAIGHT COLLET

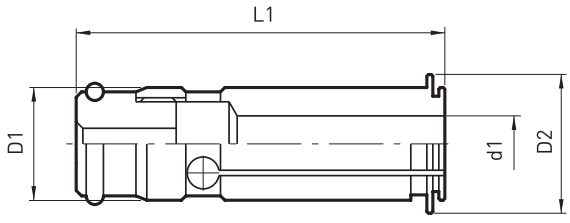


K

mm

CODE NO.(d1)		D1	D2	L1
K20	6.8.10.12.16	20	24	50
K32	6.8.10.12.16.20.25	32	36	65
K42	6.8.10.12.16.20.25.32	42	48	75

▶ - COOLANT COLLET



ONK

mm

CODE NO.(d1)		D1	D2	L1
ONK20	6.8.10.12.16	20	24	77
ONK32	6.8.10.12.16.20.25	32	37	90
ONK42	6.8.10.12.16.20.25.32	42	48	97

• ONK collet is able to apply for Spindle Coolant system with Milling Chuck and Double Bearing Milling Chuck

MILLING CHUCK COLLET

▶ MORSE TAPER CHUCK

K-MT

CODE NO.		Drilling Range	MT.NO
K20	MT1	2.0-14	MT1
	MT2	14.1-23	MT2
K32	MT1	2.0-14	MT1
	MT2	14.1-23	MT2
	MT3	23.1-32	MT3
K42	MT1	2.0-14	MT1
	MT2	14.1-23	MT2
	MT3	23.1-32	MT3
	MT4	32.1-50	MT4

▶ STRAIGHT DRILL CHUCK

K-JT

CODE NO.		Drilling Range	MT.NO
K20	JT6	1.0-13.0	JT6
K32	JT6	1.0-13.0	JT6
K42	JT6	1.0-13.0	JT6

NOTE

- Drill chuck to be purchased separately.

QUICK CHANGE HOLDER

▶ QUICK CHANGE MASTER HOLDER

MH-T

CODE NO.		Taper	Q.C Taper
MH40	T35	ISO40	T35
MH50	T45	ISO50	T45

NOTE

- Please make designate the Draw Bolt dimension between Inch and Metric at ordering step.
- Unless any notifying, NT40 and NT50 will be supplied with Inch Draw bolt.

▶ QUICK CHANGE FACE MILLING CHUCK

T-FMA

CODE NO.		Q.C Taper	Face Mill Cutter Size	
			Face Mill Cutter OD	Face Mill Cutter ID
T35	3R	T35	76	25.4
	4R		102	31.75
	5R		127	38.1
T45	3R	T45	76	25.4
	4R		102	31.75
	5R		127	38.1
	6R		152	50.8

▶ QUICK CHANGE MT SLEEVE

T-MT

CODE NO.		Q.C Taper	MT-NO	Drill Range
T35	MT1	T35	MT1	2.0-14
	MT2		MT2	14.1-23
	MT3		MT3	23.1-32
T45	MT1	T45	MT1	2.0-14
	MT2		MT2	14.1-23
	MT3		MT3	23.1-32
	MT4		MT4	32.1-50

▶ QUICK CHANGE DRILL HOLDER

T-JT

CODE NO.		Q.C Taper	Drill Chuck	
			JT.NO	드릴능력 Drill Range
T35	JT6	T35	JT6	1-13
T45	JT6	T45	JT6	1-13

NOTE

- Drill chuck to be purchased separately

▶ QUICK CHANGE MILLING CHUCK

T-C

CODE NO.		Q.C Taper	Inner Bore
T35	C32	T35	C32
T45	C32	T45	C32
	C42		C42

QUICK CHANGE HOLDER

▶ QUICK CHANGE MILLING CHUCK _Set

SMH-C

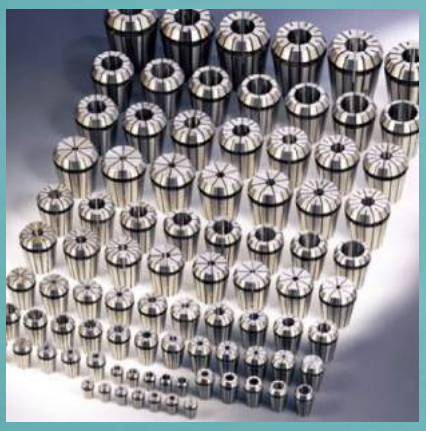
mm

CODE NO.		Set Contents							
		Master Holder	Chuck	COLLET		Face Arbor	Drill Chuck	Drill Chuck Bar	MT.Collet
SMH40	T35-C32A	MH40	T35-C32	K32	6.8.10.12.16 20.25	T35-4R	-	K32-JT6	-
	T35-C32B				6.8.10.12.16 20.25		T35-JT6	-	T35-MT2.3.4
SMH50	T45-C32A	MH50	T45-C32	K32	6.8.10.12.16 20.25	T45-5R	-	K32-JT6	-
	T45-C32B				6.8.10.12.16 20.25		T45-JT6	-	T45-MT2.3.4
	T45-C42A	MH50	T45-C42	K42	6.8.10.12.16 20.25.32		-	K42-JT6	-
	T45-C42B				6.8.10.12.16 20.25.32		T45-JT6	-	T45-MT2.3.4

NOTE

- Please make designate the Draw Bolt dimension between Inch and Metric at ordering step.
- Unless any notifying, NT40 and NT50 will be supplied with Inch Draw bolt.
- Drill chuck bar(JT6) is excluding a Drill chuck

WIDIN®



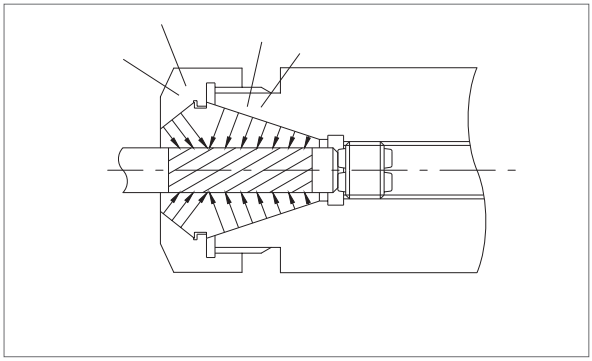
ER COLLET CHUCK

ER COLLET CHUCK

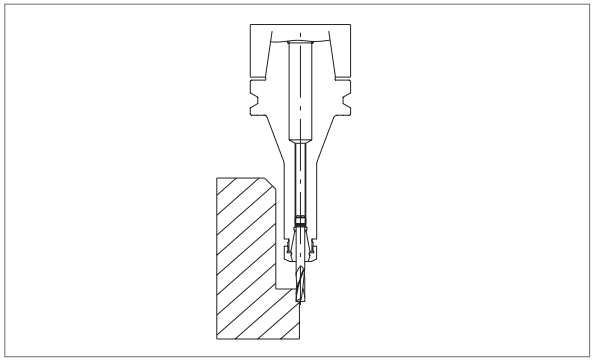
ER

Strong Torque Power

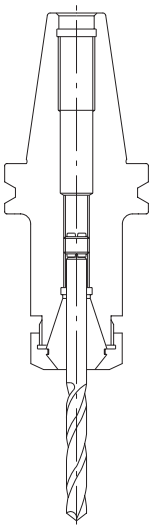
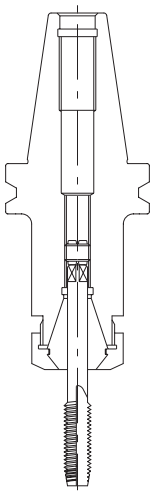
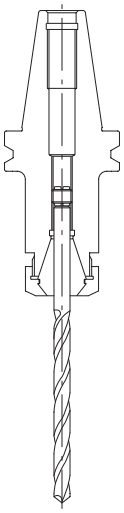
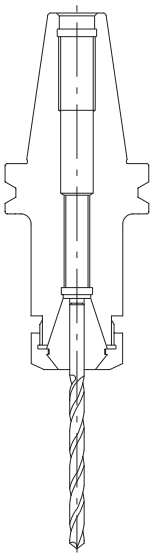
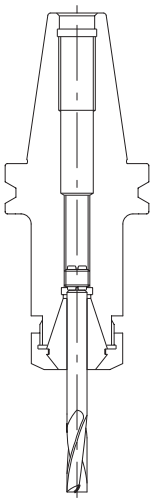
- ER Chuck have strong torque power.
- Slim designed ER Nut were minimized an interruption to workpiece.



Double taper Collet



Spindle

Use Carbide Drill and Coating Drill	Usable for Tapping Chuck	Improve Workability of Long Drilling Process	Use a small Drill of 0.5mm	Possible to High-precision cutiing of Endmill
				
If using Carbide Drill and coated drill, it can be improve workability up to 4~8 times.	ER chuck is using for Tapping process with Machine which have function of Rigid Tapping.	There is no drilling vibration and it will improve workability with long drilling process.	It using o.o5mm small dia. drill, it will improve workability when high speed drilling process	It is possible to high precision cutting with end-maill.

ER COLLET CHUCK

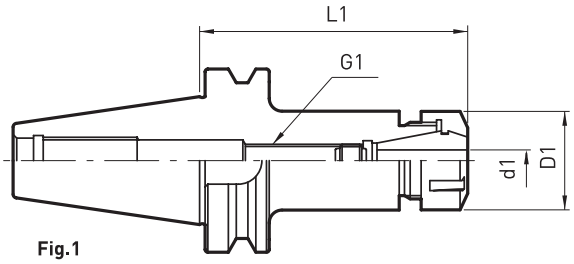


Fig.1

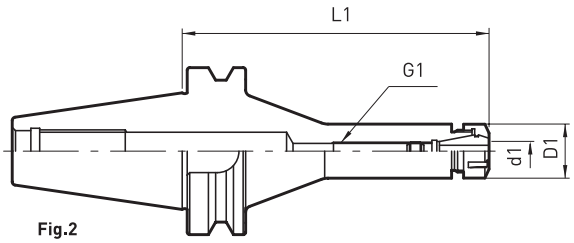


Fig.2

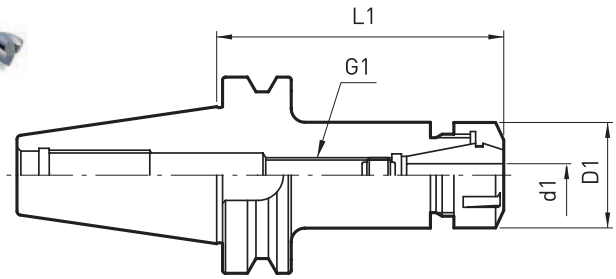
MAS403 BT-ER

mm

CODE NO.		FIG	d1 (Clamping Range)	D1	L1	G1	WEIGHT (kg)	NUT	SPANNER
BT30	ER11-60	1	1.0-7.0	19	60	M8X1.0	0.5	ERN11	ERS11
	ER11-90				90		0.6		
	ER11-120	2			120		0.7		
	ER16-60	1	1.0-10.0	28	60	M11X1.0	0.5	ERN16	ERS16
	ER16-90				90		0.6		
	ER16-120				120		0.8		
	ER20-60		1.0-13.0	34	60	M14X1.0	0.6	ERN20	ERS20
	ER20-90				90		0.7		
	ER20-120				120		0.9		
	ER25-75		1.0-16.0	42	75	M18X1.5	1.0	ERN25	ERS25
	ER25-105				105		1.1		
	ER25-120				120		1.2		
	ER32-75		2.0-20.0	50	75	M24X1.5	1.1	ERN32	ERS32
	ER32-105				105		1.2		
	ER32-120				120		1.5		

Taper : AT3 | **Coolant** : AD

ER COLLET CHUCK



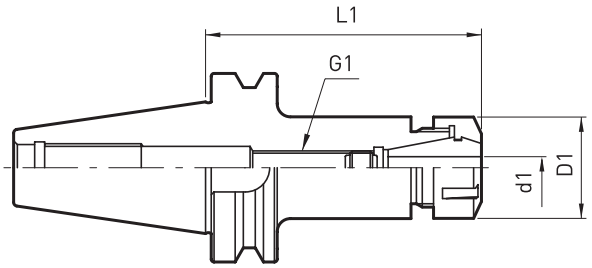
MAS403 BT-ER

mm

CODE NO.		d1 (Clamping Range)	D1	L1	G1	WEIGHT (kg)	NUT	SPANNER
BT40	ER11-60	1.0-7.0	19	60	M8X1.0	1.0	ERN11	ERS11
	ER16-60	1.0-10.0	28	60	M11X1.0	1.1	ERN16	ERS16
	ER16-90			90		1.3		
	ER16-120			120		1.5		
	ER20-80	1.0-13.0	34	80	M14X1.0	1.2	ERN20	ERS20
	ER20-105			105		1.4		
	ER20-135			135		1.6		
	ER25-80	1.0-16.0	42	80	M18X1.5	1.3	ERN25	ERS25
	ER25-105			105		1.5		
	ER25-135			135		1.8		
	ER32-80	2.0-20.0	50	80	M24X1.5	1.4	ERN32	ERS32
	ER32-105			105		1.7		
	ER32-135			135		2.0		
	ER40-80	3.0-26.0	63	80	M28X1.5	1.6	ERN40	ERS40
	ER40-105			105		2.2		
	ER40-135			135		2.6		

Taper : AT3 | **Coolant** : AD

ER COLLET CHUCK



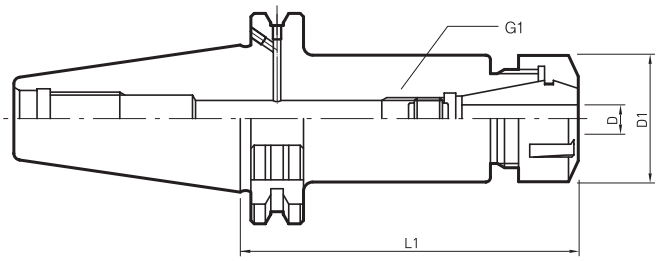
MAS403 BT-ER

mm

	CODE NO.	d1 (Clamping Range)	D1	L1	G1	WEIGHT(kg)	NUT	SPANNER
BT50	ER16-90	1.0-10.0	28	90	M11X1.0	3.9	ERN16	ERS16
	ER16-120			120		4.1		
	ER16-150			150		4.3		
	ER20-90	1.0-13.0	34	90	M14X1.0	4.0	ERN20	ERS20
	ER20-120			120		4.2		
	ER20-150			150		4.5		
	ER25-105	1.0-16.0	42	105	M18X1.5	4.0	ERN25	ERS25
	ER25-135			135		4.3		
	ER25-165			165		4.6		
	ER32-105	2.0-20.0	50	105	M24X1.5	4.1	ERN32	ERS32
	ER32-135			135		4.4		
	ER32-165			165		4.8		
	ER40-105	3.0-26.0	63	105	M28X1.5	4.3	ERN40	ERS40
	ER40-135			135		4.7		
	ER40-165			165		5.3		

Taper : AT3 | **Coolant** : AD

ER COLLET CHUCK



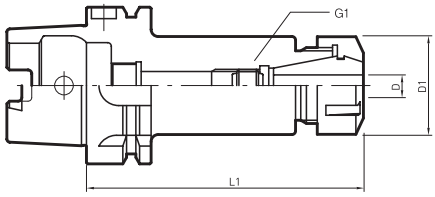
DIN69871 SK-ER

㎜

CODE NO.		CHUCKING(D) (Clamping Range)	D1	L1	G1	NUT	SPANNER
SK40	ER16-70	1.0-10.0	28	70	M11X1.0	ERN16	ERS16
	ER16-100			100			
	ER16-160			160			
	ER20-70	1.0-13.0	34	70	M14X1.0	ERN20	ERS20
	ER20-100			100			
	ER20-160			160			
	ER25-70	1.0-16.0	42	70	M18X1.5	ERN25	ERS25
	ER25-100			100			
	ER25-160			160			
	ER32-70	1.5-20.0	50	70	M24X1.5	ERN32	ERS32
	ER32-100			100			
	ER32-160			160			
SK50	ER16-70	1.0-10.0	28	70	M11X1.0	ERN16	ERS16
	ER16-100			100			
	ER16-160			160			
	ER20-70	1.0-13.0	34	70	M14X1.0	ERN20	ERS20
	ER20-100			100			
	ER20-160			160			
	ER25-70	1.0-16.0	42	70	M18X1.5	ERN25	ERS25
	ER25-100			100			
	ER25-160			160			
	ER32-70	2.0-20.0	50	70	M24X1.5	ERN32	ERS32
	ER32-100			100			
	ER32-160			160			
	ER40-70	3.0-26.0	63	70	M28X1.5	ERN40	ERS40
	ER40-100			100			
	ER40-160			160			

Taper : AT3 | **Coolant** : AD

ER COLLET CHUCK



DIN69893 HSK/A-ER

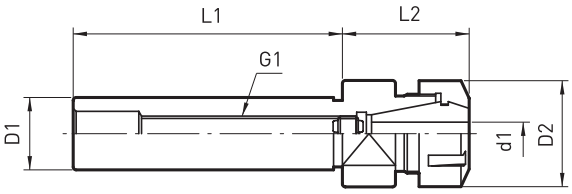
mm

CODE NO.		CHUCKING(D) (Clamping Range)	D1	L1	G1	NUT	SPANNER
HSK50A	ER11-60	1.0-7.0	19	60	M8X1.0	ERN11	ERS11
	ER16-60	1.0-10.0	28	60	M11X1.0	ERN16	ERS16
	ER16-100	1.0-10.0	28	100	M11X1.0	ERN16	ERS16
	ER20-70	1.0-13.0	34	70	M14X1.0	ERN20	ERS20
	ER20-100	1.0-13.0	34	100	M14X1.0	ERN20	ERS20
	ER25-70	1.0-16.0	42	70	M18X1.5	ERN25	ERS25
	ER25-100	1.0-16.0	42	100	M18X1.5	ERN25	ERS25
	ER32-80	2.0-20.0	50	80	M24X1.5	ERN32	ERS32
	ER32-100	2.0-20.0	50	100	M24X1.5	ERN32	ERS32
HSK63A	ER11-75	1.0-7.0	19	75	M8X1.0	ERN11	ERS11
	ER11-100	1.0-7.0	19	100		ERN11	ERS11
	ER16-75	1.0-10.0	28	75	M11X1.0	ERN16	ERS16
	ER16-100	1.0-10.0	28	100		ERN16	ERS16
	ER16-160	1.0-10.0	28	160		ERN16	ERS16
	ER20-75	1.0-13.0	34	75	M14X1.0	ERN20	ERS20
	ER20-100	1.0-13.0	34	100		ERN20	ERS20
	ER20-160	1.0-13.0	34	160		ERN20	ERS20
	ER25-75	1.0-16.0	42	75	M18X1.5	ERN25	ERS25
	ER25-100	1.0-16.0	42	100		ERN25	ERS25
	ER25-160	1.0-16.0	42	160		ERN25	ERS25
	ER32-75	2.0-20.0	50	75	M24X1.5	ERN32	ERS32
	ER32-100	2.0-20.0	50	100		ERN32	ERS32
	ER32-160	2.0-20.0	50	160		ERN32	ERS32
	ER40-75	3.0-26.0	63	75	M28X1.0	ERN40	ERS40
	ER40-120	3.0-26.0	63	120		ERN40	ERS40
	ER40-160	3.0-26.0	63	160		ERN40	ERS40
HSK100A	ER16-100	1.0-10.0	28	100	M11X1.0	ERN16	ERS16
	ER16-160	1.0-10.0	28	160		ERN16	ERS16
	ER20-100	1.0-13.0	34	100	M14X1.0	ERN20	ERS20
	ER20-160	1.0-13.0	34	160		ERN20	ERS20
	ER25-100	1.0-16.0	42	100	M18X1.5	ERN25	ERS25
	ER25-160	1.0-16.0	42	160		ERN25	ERS25
	ER32-100	2.0-20.0	50	100	M24X1.5	ERN32	ERS32
	ER32-160	2.0-20.0	50	160		ERN32	ERS32
	ER40-120	3.0-26.0	63	120	M28X1.5	ERN40	ERS40
	ER40-160	3.0-26.0	63	160		ERN40	ERS40

Taper : AT3 | **Coolant** : AD

ER COLLET CHUCK

▶ STRAIGHT SHANK COLLET CHUCK



K-ER

mm

CODE NO.		d1 (Clamping Range)	D1	D2	L1	L2	G1	SPANNER
K16	ER11-75	1.0~7.0	16	19	40	35	M8X1.0	ERS11
	ER11-110	1.0~7.0	16	19	70	40	M8X1.0	ERS11
K20	ER11-100	1.0~7.0	20	19	60	40	M8X1.0	ERS11
	ER11-130	1.0~7.0	20	19	90	40	M8X1.0	ERS11
	ER16-105	1.0~10.0	20	28	60	45	M11X1.0	ERS16
	ER16-135	1.0~10.0	20	28	90	45	M11X1.0	ERS16
	ER20-120	1.0~13.0	20	34	70	50	M14X1.0	ERS20
	ER20-150	1.0~13.0	20	34	100	50	M14X1.0	ERS20
K25	ER16-130	1.0~10.0	25	28	80	50	M11X1.0	ERS16
	ER16-160	1.0~10.0	25	28	110	50	M11X1.0	ERS16
	ER20-130	1.0~13.0	25	34	80	50	M14X1.0	ERS20
	ER20-160	1.0~13.0	25	34	110	50	M14X1.0	ERS20
	ER25-135	1.0~16.0	25	42	80	55	M18X1.5	ERS25
K32	ER20-130	1.0~13.0	32	34	80	50	M14X1.0	ERS20
	ER20-160	1.0~13.0	32	34	110	50	M14X1.0	ERS20
	ER25-135	1.0~16.0	32	42	80	55	M18X1.5	ERS25
	ER25-165	1.0~16.0	32	42	110	55	M18X1.5	ERS25
K42	ER32-170	2.0~20.0	42	50	110	50	M24X1.5	ERS32
	ER32-210	2.0~20.0	42	50	150	50	M24X1.5	ERS32
	ER50-185	5.0~34.0	42	78	110	85	M16X2.0	ERS50
	ER50-225	5.0~34.0	42	78	140	85	M16X2.0	ERS50

mm

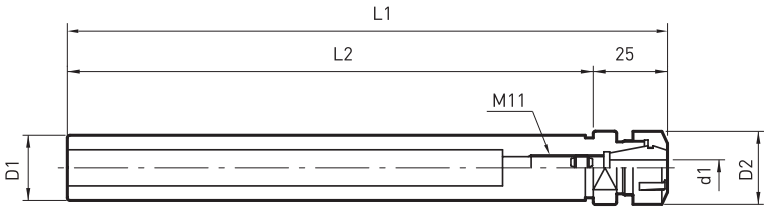
CODE NO.		d1	D1	D2	L1	L2	G1	SPANNER
K16	ER11M-140	1.0~7.0	16	16	140	30	M8X1.0	ERS11M
K20	ER16M-140	1.0~10.0	20	22	140	40	M11X1.0	ERS16M

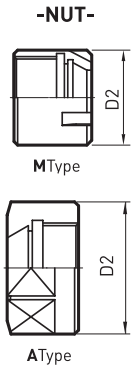
Bady Chuck

- This Baby Chuck are applying(extension) with Double bearing Milling Chuck, Single Milling Chuck, Hydraulic Chuck, ER Collet Chuck etc.

ER COLLET CHUCK

▶ LONG MINI ER COLLET CHUCK





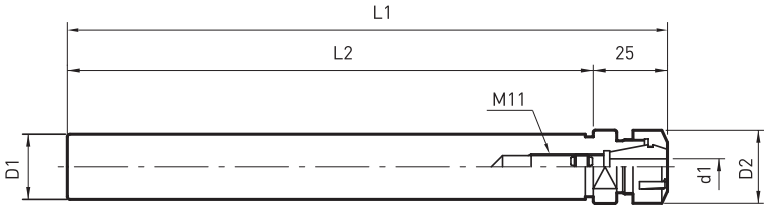
MEC

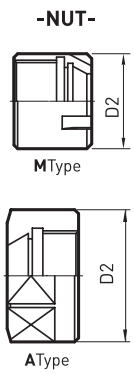
mm

CODE NO.		d1 (Clamping Range)	D1	D1	L1	L2	NUT	SPANNER
S20	MEC16-200	1.0-10.0	20	22	200	175	ERN16M	ERS16M
	MEC16-250				250	225		
S25	MEC16-250		25	28	250	225	ERN16A	ERS16A
	MEC16-300				300	275		

- Using for Drilling and Endmill process with Milling Chuck ID 32mm(C32) & 42mm(C42)
- A straight shank body of this chuck has been filled with a carbide bar so that it is good for deep hole machining.
- Slim designed ER Nut were minimized an interruption to workpiece.

▶ LONG MINI ER COLLET CHUCK





MER

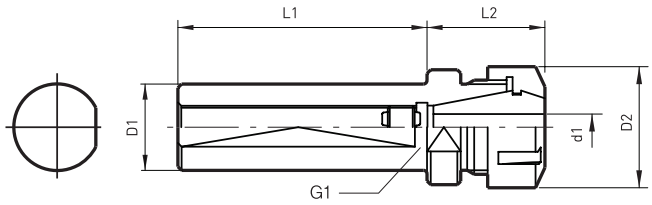
mm

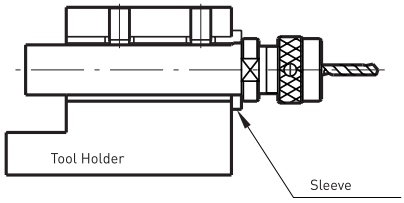
CODE NO.		d1	D1	D1	L1	L2	NUT	SPANNER
S20	MER16-200	1.0-10.0	20	22	200	175	ERN16M	ERS16M
	MER16-250				250	225		
S25	MER16-250	1.0-10.0	25	28	250	225	ERN16A	ERS16A
	MER16-300				300	275		

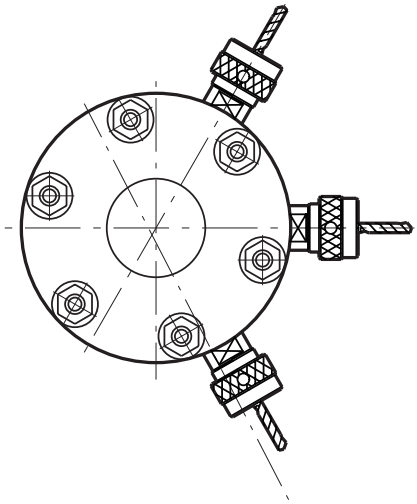
- Using for Drilling and Endmill process with Milling Chuck ID 32mm(C32) & 42mm(C42)

ER COLLET CHUCK

▶ STRAIGHT SHANK COLLET CHUCK







N-ER

mm

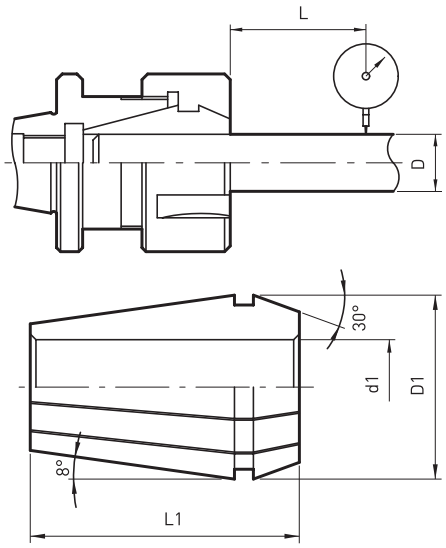
CODE NO.		d1 (Clamping Range)	D1	D2	L1	L2	NUT	G1
N16	ER11-32	1.0-7.0	16	19	32	22	ERN11	M8X1.0
	ER11-70	1.0-7.0	16	19	70	30	ERN11	M8X1.0
N20	ER11-70	1.0-7.0	20	19	70	30	ERN11	M8X1.0
	ER11-105	1.0-7.0	20	19	105	30	ERN11	M8X1.0
	ER16-40	1.0-10.0	20	28	40	25	ERN16	M11X1.0
	ER16-70	1.0-10.0	20	28	70	35	ERN16	M11X1.0
	ER16-105	1.0-10.0	20	28	105	35	ERN16	M11X1.0
	ER20-70	1.0-13.0	20	34	70	41	ERN20	M14X1.0
N25	ER16-105	1.0-10.0	25	28	105	30	ERN16	M11X1.0
	ER20-70	1.0-13.0	25	34	70	32	ERN20	M14X1.0
	ER25-70	1.0-16.0	25	42	70	43.5	ERN25	M18X1.5
N32	ER20-80	1.0-13.0	25	34	70	32	ERN20	M14X1.0
	ER25-80	1.0-16.0	32	42	80	43.5	ERN25	M18X1.5
	ER32-80	2.0-20.0	32	50	80	55.5	ERN32	M24X1.5
N40	ER32-110	2.0-20.0	42	50	110	45.5	ERN32	M24X1.5

ER Chuck for NC Lathe Machine

- Application of drill and boring tools including various tools.
- Improving productivity by using internal coolant tool such as U-Drill, Super-Drill.

ER COLLET CHUCK

▶ GER COLLET



GER

mm

L	D	RUNOUT(TIR)
6	1.0-1.4	0.015
10	1.5-2.9	0.015
16	3.0-5.9	0.015
25	6.0-9.9	0.015
40	10.0-17.9	0.02
50	18.0-26.9	0.02

mm

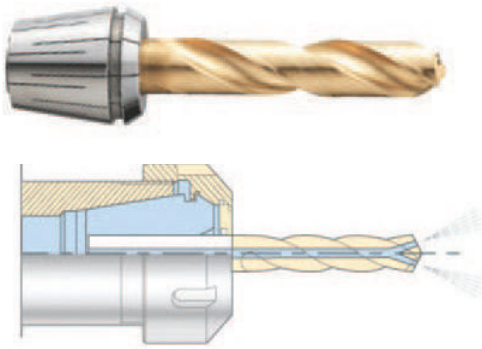
CODE NO.	d1 (Clamping Range)	D1	L1	CHUCK	NUT
GER11	1.0-7.0	11.5	18.0	ER11	ERN11
GER16	1.0-10.0	17.0	27.5	ER16	ERN16
GER20	1.0-13.0	21.0	31.5	ER20	ERN20
GER25	1.0-16.0	26.0	34.0	ER25	ERN25
GER32	2.0-20.0	33.0	40.0	ER32	ERN32
GER40	3.0-26.0	41.0	46.0	ER40	ERN40

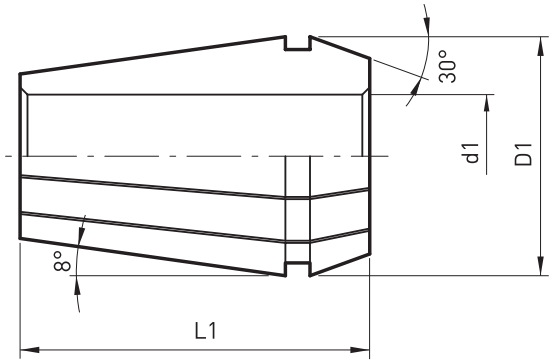
mm

	ER COLLET CODE NO. (d)1	SET
GER11	1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0	13PCS
GER16	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	10PCS
GER20	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	12PCS
GER25	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	15PCS
GER32	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20	18PCS
GER40	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	23PCS

ER COLLET CHUCK

▶ GER COLLET _Oil hole type





ERC For Spindle Through Coolant

mm

CODE NO.	d1 (Clamping Range)	D1	L1	CHUCK	NUT
ERC16	4.0-10.0	17.0	27.5	ER16	ERN16
ERC20	6.0-13.0	21.0	31.5	ER20	ERN20
ERC25	6.0-16.0	26.0	34.0	ER25	ERN25
ERC32	8.0-20.0	33.0	40.0	ER32	ERN32
ERC40	10.0-26.0	41.0	46.0	ER40	ERN40

mm

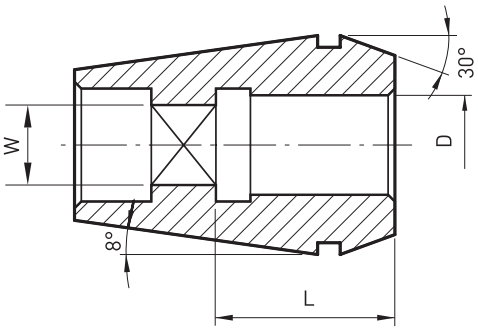
CODE NO.	ER COLLET CODE NO. (d)1	SET
ERC16	4, 5, 6, 7, 8, 9, 10,	7PCS
ERC20	6, 7, 8, 9, 10, 11, 12, 13	8PCS
ERC25	6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	11PCS
ERC32	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20	13PCS
ERC40	10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	17PCS

NOTE

- Other size can be supplied based on order made.
- Wooden tray for ER collet set to be supplied with Sets.

ER COLLET CHUCK

▶ ER TAP COLLET



TER FOR TAPPING

mm

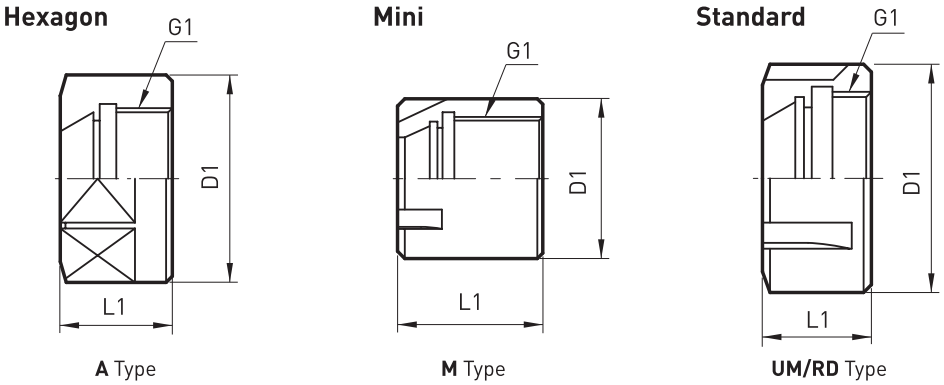
CODE					SIZE					
TER16	TER20	TER25	TER32	TER40	W(□)	L	D(Ø)	Tapping		
								M	U	U
M4	M4	M4	M4		4	15	5	M4		
M5	M5	M5	M5		4.5	15	5.5	M5		
M6	M6	M6	M6		4.5	15	6	M6	U1/4	
U5/16	U5/16	U5/16	U5/16		5	15	6.1		U5/16	
M8	M8	M8	M8		5	20	6.2	M8		
M10	M10	M10	M10	M10	5.5	20	7	M10	U3/8	
U7/16	U7/16	U7/16	U7/16	U7/16	6	20	8	M11	U7/16	
P1/8	P1/8	P1/8	P1/8	P1/8	6	20	8			P1/8
	M12	M12	M12	M12	6.5	20	8.5	M12		
	U1/2	U1/2	U1/2	U1/2	7	20	9		U1/2	
		M14	M14	M14	8	25	10.5	M14	U9/16	
		P1/4	P1/4	P1/4	9	17	11			P1/4
		U5/8	U5/8	U5/8	9	25	12		U5/8	
		M16	M16	M16	10	25	12.5	M16		
		P3/8	P3/8	P3/8	11	18	14			P3/8
			M18	M18	11	18	14	M18	U3/4	
			M20	M20	12	30	15	M20		
				M22	13	30	17	M22	U7/8	
				P1/2	14	21	18			P1/2
				M24	15	35	19	M24		
				M27	15	35	20	M27	U1	

NOTE

・Other size to be supplied based on order made.

ER COLLET CHUCK

▶ ER NUT

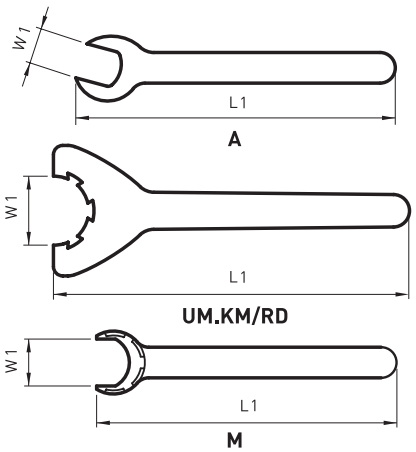


ERN

mm

CODE NO.	D1	L1	G1	COLLET	CHUCK
ERN11-A	19	11.3	M14X0.75	ER11	ER11
ERN16-A	28	17.5	M22X1.5	ER16	ER16
ERN20-A	34	19	M25X1.5	ER20	ER20
ERN11-M	16	12	M13X0.75	ER11	ER11
ERN16-M	22	18	M19X1.0	ER16	ER16
ERN20-M	28	19	M24X1.0	ER20	ER20
ERN25-M	35	20	M30X1.0	ER25	ER25
ERN25-UM/RD	42	20	M32X1.5	ER25	ER25
ERN32-UM/RD	50	22.5	M40X1.5	ER32	ER32
ERN40-UM/RD	63	22.5	M50X1.5	ER40	ER40

▶ ER SPANNER

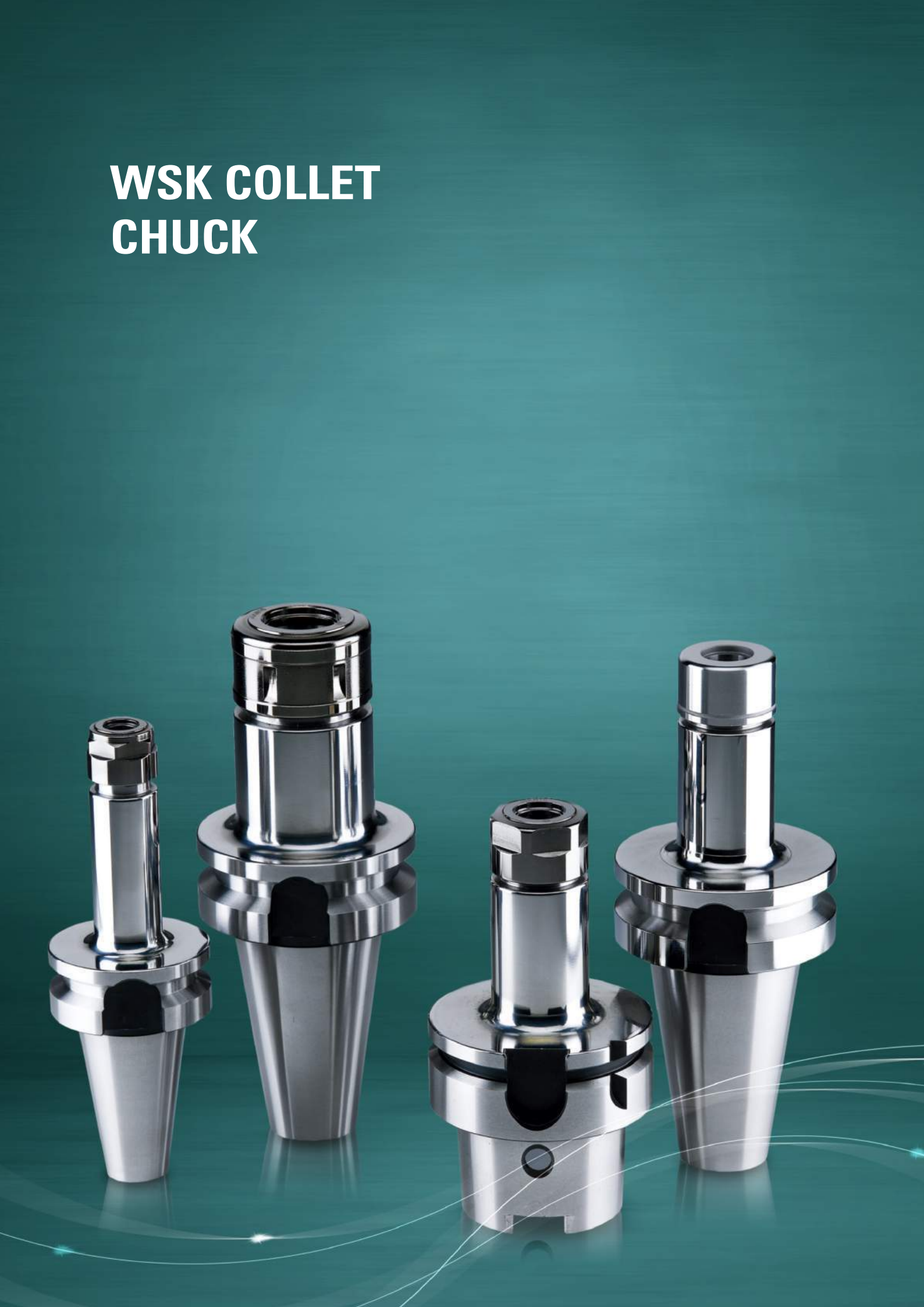


ERS

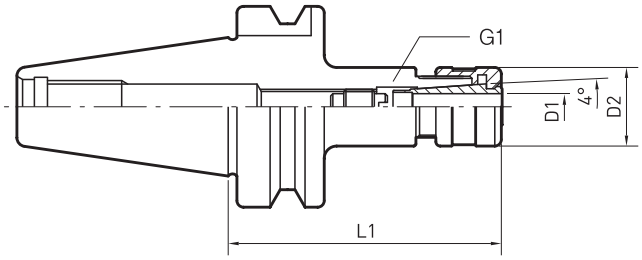
mm

CODE NO.	W1	L1
ERS11-A	17.0	115
ERS16-A	25.0	210
ERS20-A	30.0	250
ERS25-UM.KM/RD	37.0	206
ERS32-UM.KM/RD	46.5	253
ERS40-UM.KM/RD	58.0	289
ERS11-M	11.5	95
ERS16-M	15.0	117
ERS20-M	19.5	129
ERS25-M	25.0	142

WSK COLLET CHUCK



WSK COLLET CHUCK



MAS403 BT-WSKP

㎜

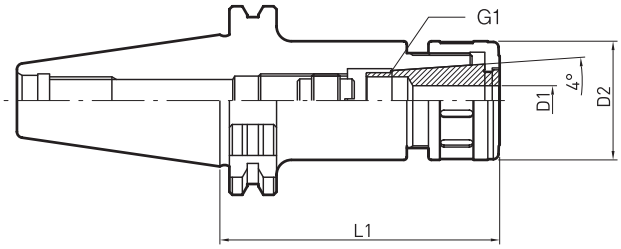
CODE NO.		D1	D2	L1	COLLET	NUT	G1
BT30	WSKP6-90	2.0-6.0	19.6	90	WSK6	WSKN6	M8X1.0
	WSKP10-90	2.0-10.0	27.5	90	WSK10	WSKN10	M11X1.0
BT40	WSKP6-90	2.0-6.0	19.6	90	WSK6	WSKN6	M8X1.0
	WSKP6-120	2.0-6.0	19.6	120	WSK6	WSKN6	M8X1.0
	WSKP10-90	2.0-10.0	27.5	90	WSK10	WSKN10	M11X1.0
	WSKP10-120	2.0-10.0	27.5	120	WSK10	WSKN10	M11X1.0
	WSKP16-90	3.0-16.0	40	90	WSK16	WSKN16	M18X1.5
	WSKP16-120	3.0-16.0	40	120	WSK16	WSKN16	M18X1.5
	WSKP25-90	16.0-25.0	55	90	WSK25	WSKN25	M24X1.5
	WSKP25-120	16.0-25.0	55	120	WSK25	WSKN25	M24X1.5
BT50	WSKP6-120	2.0-6.0	19.6	120	WSK6	WSKN6	M8X1.0
	WSKP6-165	2.0-6.0	19.6	165	WSK6	WSKN6	M8X1.0
	WSKP6-195	2.0-6.0	19.6	195	WSK6	WSKN6	M8X1.0
	WSKP10-120	2.0-10.0	27.5	120	WSK10	WSKN10	M11X1.0
	WSKP10-165	2.0-10.0	27.5	165	WSK10	WSKN10	M11X1.0
	WSKP10-195	2.0-10.0	27.5	195	WSK10	WSKN10	M11X1.0
	WSKP16-120	3.0-16.0	40	120	WSK16	WSKN16	M18X1.5
	WSKP16-165	3.0-16.0	40	165	WSK16	WSKN16	M18X1.5
	WSKP16-195	3.0-16.0	40	195	WSK16	WSKN16	M18X1.5
	WSKP25-120	16.0-25.0	55	120	WSK25	WSKN25	M24X1.5
	WSKP25-165	16.0-25.0	55	165	WSK25	WSKN25	M24X1.5
	WSKP25-195	16.0-25.0	55	195	WSK25	WSKN25	M24X1.5

Taper : AT3 | **Coolant** : AD

NOTE

- WSK Collet for Spindle Through Coolant are available depend on customer request

WSK COLLET CHUCK



DIN69871 SK-WSKP

mm

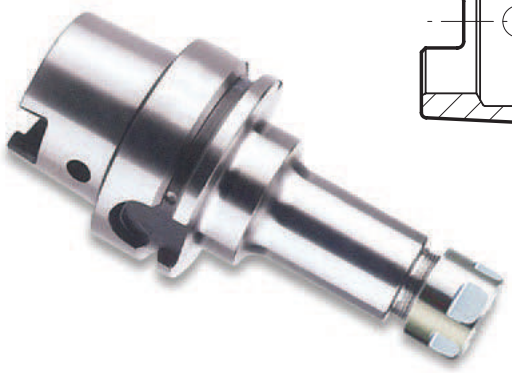
CODE NO.		D1	D2	L1	COLLET	NUT	G2
SK40	WSKP6-90	2.0-6.0	19.6	90	WSK6	WSKN6	M8X1.0
	WSKP6-120			120			
	WSKP10-90	2.0-10.0	27.5	90	WSK10	WSKN10	M11X1.0
	WSKP10-120			120			
	WSKP16-90	3.0-16.0	40.0	90	WSK16	WSKN16	M18X1.5
	WSKP16-120			120			
	WSKP25-90	16.0-25.0	55.0	90	WSK25	WSKN25	M24X1.5
	WSKP25-120			120			
SK50	WSKP6-120	2.0-6.0	19.6	120	WSK6	WSKN6	M8X1.0
	WSKP6-165			165			
	WSKP6-195			195			
	WSKP10-120	2.0-10.0	27.5	120	WSK10	WSKN10	M11X1.0
	WSKP10-165			165			
	WSKP10-195			195			
	WSKP16-120	3.0-16.0	40.0	120	WSK16	WSKN16	M18X1.5
	WSKP16-165			165			
	WSKP16-195			195			
	WSKP25-120	16.0-25.0	55.0	120	WSK25	WSKN25	M24X1.5
	WSKP25-165			165			
	WSKP25-195			195			

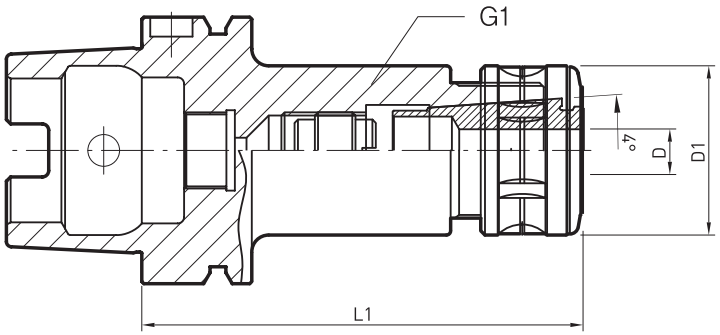
Taper : AT3 | **Coolant** : AD

NOTE

- JSK Collet for Spindle Through Coolant are available depend on customer request

WSK COLLET CHUCK





DIN69893 HSK/A-WSKP

mm

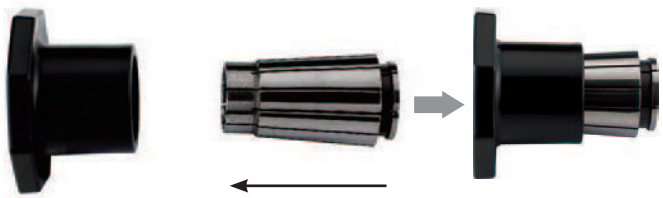
CODE NO.		CHUCKING(d)	D1	L1	COLLET	NUT	G1
HSK50A	WSKP6-80	2.0-6.0	19.6	80	WSK6	WSKN6	M8X1.0
	WSKP10-90	2.0-10.0	27.5	90	WSK10	WSKN10	M11X1.0
	WSKP16-100	3.0-16.0	40	100	WSK16	WSKN16	M18X1.0
HSK63A	WSKP6-80	2.0-6.0	19.6	80	WSK6	WSKN6	M8X1.0
	WSKP10-90	2.0-10.0	27.5	90	WSK10	WSKN10	M11X1.0
	WSKP16-100	3.0-16.0	40	100	WSK16	WSKN16	M18X1.0
	WSKP25-120	16.0-25.0	55	120	WSK25	WSKN25	M24X1.5
HSK100A	WSKP6-80	2.0-6.0	19.6	80	WSK6	WSKN6	M8X1.0
	WSKP10-90	2.0-10.0	27.5	90	WSK10	WSKN10	M11X1.0
	WSKP16-100	3.0-16.0	40	100	WSK16	WSKN16	M18X1.0
	WSKP25-120	16.0-25.0	55	120	WSK25	WSKN25	M24X1.5

Taper : AT3 | **Coolant** : AD

NOTE

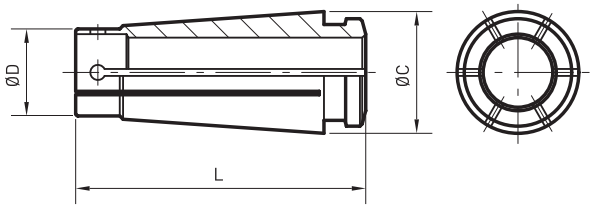
- WSK Collet for Spindle Through Coolant are available depend on customer request

>> How to use Collet Holder for WSK collet



- Collet holder is necessary to assemble the WSK collet into Nut.
- Collet holder to be purchased separately.

WSK COLLET CHUCK



WSK

STYLE	CODE NO.	RANGE
WSK6	WSK6-2.0	1.5-2.0
	WSK6-2.5	2.0-2.5
	WSK6-3.0	2.5-3.0
	WSK6-3.5	3.0-3.5
	WSK6-4.0	3.5-4.0
	WSK6-4.5	4.0-4.5
	WSK6-5.0	4.5-5.0
	WSK6-5.5	5.0-5.5
	WSK6-6.0	5.5-6.0
WSK10	WSK10-2.0	1.5-2.0
	WSK10-2.5	2.0-2.5
	WSK10-3.0	2.5-3.0
	WSK10-3.5	3.0-3.5
	WSK10-4.0	3.5-4.0
	WSK10-4.5	4.0-4.5
	WSK10-5.0	4.5-5.0
	WSK10-5.5	5.0-5.5
	WSK10-6.0	5.5-6.0
	WSK10-6.5	6.0-6.5
	WSK10-7.0	6.5-7.0
	WSK10-7.5	7.0-7.5
	WSK10-8.0	7.5-8.0
	WSK10-8.5	8.0-8.5
	WSK10-9.0	8.5-9.0
	WSK10-9.5	9.0-9.5
	WSK10-10.0	9.5-10.0

STYLE	CODE NO.	RANGE
WSK16	WSK16-3.0	2.5-3.0
	WSK16-3.5	3.0-3.5
	WSK16-4.0	3.5-4.0
	WSK16-4.5	4.0-4.5
	WSK16-5.0	4.5-5.0
	WSK16-5.5	5.0-5.5
	WSK16-6.0	5.5-6.0
	WSK16-6.5	6.0-6.5
	WSK16-7.0	6.5-7.0
	WSK16-7.5	7.0-7.5
	WSK16-8.0	7.5-8.0
	WSK16-8.5	8.0-8.5
	WSK16-9.0	8.5-9.0
	WSK16-9.5	9.0-9.5
	WSK16-10.0	9.5-10
	WSK16-10.5	10-10.5
	WSK16-11.0	10.5-11
	WSK16-11.5	11-11.5
	WSK16-12.0	11.5-12
	WSK16-12.5	12-12.5
	WSK16-13.0	12.5-13
	WSK16-13.5	13-13.5
	WSK16-14.0	13.5-14
	WSK16-14.5	14-14.5
	WSK16-15.0	14.5-15
	WSK16-15.5	15-15.5
	WSK16-16.0	15.5-16

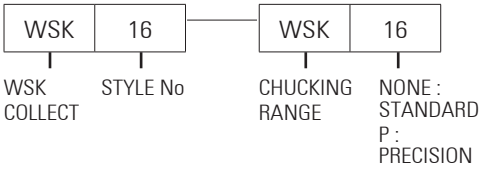
STYLE	CODE NO.	RANGE
WSK25	WSK25-10.0	9.5-10.0
	WSK25-11.0	10.5-11.0
	WSK25-12.0	11.5-12.0
	WSK25-13.0	12.5-13.0
	WSK25-14.0	13.5-14.0
	WSK25-15.0	14.5-15.0
	WSK25-16.0	15.5-16.0
	WSK25-16.5	16.0-16.5
	WSK25-17.0	16.5-17.0
	WSK25-17.5	17.0-17.5
	WSK25-18.0	17.5-18.0
	WSK25-18.5	18.0-18.5
	WSK25-19.0	18.5-19.0
	WSK25-19.5	19.0-19.5
	WSK25-20.0	19.5-20.0
	WSK25-20.5	20.0-20.5
	WSK25-21.0	20.5-21.0
	WSK25-21.5	21.0-21.5
	WSK25-22.0	21.5-22.0
	WSK25-22.5	22.0-22.5
	WSK25-23.0	22.5-23.0
	WSK25-23.5	23.0-23.5
	WSK25-24.0	23.5-24.0
	WSK25-24.5	24.0-24.5
	WSK25-25.0	24.5-25.0

DIMENSION				
STYLE	WSK6	WSK10	WSK16	WSK25
ØD	7.5	12.0	18.8	28.8
L	25.0	30.6	45.0	57.0
ØC	10.4	15.5	24.6	35.7

Strong Torque Power

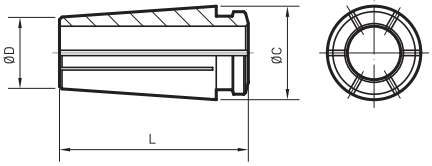
- T.I.R below 0.0005mm
- Good for Endmill, Drill, Reamer etc.
- Good for deep hole machining

ORDERRING EXAMPLE



WSK COLLET CHUCK

▶ WSK COLLET(Oil hole type)



WSKC For Spindle Through Coolant (Customized Production)

STYLE	CODE NO.	RANGE
WSKC6	WSKC6-4.0	4
	WSKC6-5.0	5
	WSKC6-6.0	6
	WSKC10-6.0	6
WSKC10	WSKC10-7.0	7
	WSKC10-8.0	8
	WSKC10-9.0	9
	WSKC10-10.0	10

STYLE	CODE NO.	RANGE
WSKC16	WSKC16-8.0	8
	WSKC16-9.0	9
	WSKC16-10.0	10
	WSKC16-11.0	11
	WSKC16-12.0	12
	WSKC16-13.0	13
	WSKC16-14.0	14
	WSKC16-15.0	15
	WSKC16-16.0	16

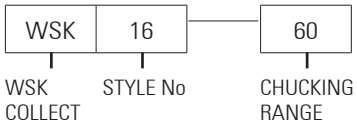
STYLE	CODE NO.	RANGE
WSKC25	WSKC25-16.0	7.5-8.0
	WSKC25-17.0	8.0-8.5
	WSKC25-18.0	8.5-9.0
	WSKC25-19.0	9.0-9.5
	WSKC25-20.0	9.5-10
	WSKC25-21.0	10-10.5
	WSKC25-22.0	10.5-11.0
	WSKC25-23.0	11.0-11.5
	WSKC25-24.0	11.5-12.0
	WSKC25-25.0	12.0-12.5

DIMENSION				
STYLE	WSKC6	WSKC10	WSKC16	WSKC25
ØD	7.97	12.51	20.12	29.69
L	21.0	25.6	37.0	48.5
ØC	10.4	15.5	24.6	35.7

For Spindle Through Coolant

- T.I.R below 0.0005mm
- Good for Endmill, Drill, Reamer etc.
- Good for deep hole machining

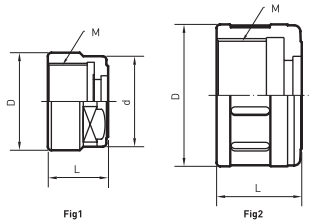
ORDERRING EXAMPLE



▶ WSK NUT(Short & Heavy Design)

WSKN

DIMENSION					
CODE NO.	L	D	d	M	Type
WSKN6	7.8	12.0	20.7	M15.5X1.0P	Fig1
WSKN10	21.0	25.6	37.0	M21.5X1.0P	Fig1
WSKN16	10.0	15.0	-	M32X1.5P	Fig2
WSKN25	10.0	15.0	-	M45X1.5P	Fig2



WSS-Spanner

CODE NO.	APPLICABLE HOLDER
WSS6	WSKP6
WSS10	WSKP10
WSS16	WSKP16
WSS25	WSKP25

DRILL CHUCK

Strong Rigidity

- Strong unified Drill Chuck and Arbor Body

T.I.R Accuracy

- Below 0.04mm

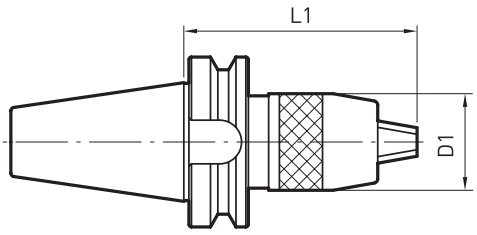
Safety

- Do not out drill at high speed machining
- Do not broken a drill due to reverse thrust after finishing drilling
- Chuck never dispatched at the sudden stop of main spindle

Comparison Chart of Torque Power

Drll Chuck	Clamping Method	Torsion Load	Lotio(%)
Keyless Chuck	By hand	0.7kgf-m	100
NPU Chucking	By hand	0.7kgf-m	100
NPU + Wrench	By Wrench	2.2kgf-m	314

DRILL CHUCK

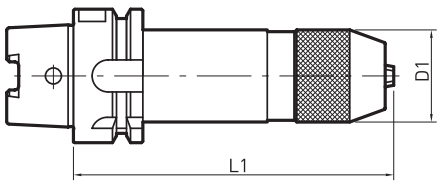


MAS403 BT-NPU

mm

CODE NO.		Chuchking	D1	L1	
				MIN	MAX
BT30	NPU8-70	1-8	38	72	78
	NPU13-105	1-13	50,5	97	108
BT40	NPU8-70	1-8	38	72	78
	NPU8-110			111	117
	NPU8-155			156	162
	NPU13-100	1-13	50,5	100	111
	NPU13-130			132	143
	NPU13-175			177	188
BT50	NPU8-85	1-8	38	83	89
	NPU8-110			111	117
	NPU8-170			171	177
	NPU13-100	1-13	50,5	100	111
	NPU13-130			132	143
	NPU13-190			192	203

Taper : AT3



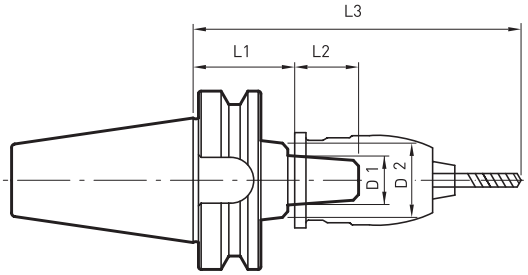
DIN69893 HSK/A-NPU

mm

CODE NO.		Chuchking	D1	L1	
				MIN	MAX
HSK50A	NPU8-140	1-8	34.5	141	147
HSK63A	NPU8-140	1-8	34.5	141	147
	NPU13-140	1-13	46.0	142	153
HSK100A	NPU8-150	1-8	34.5	151	157
	NPU13-170	1-13	46.0	172	183

Taper : AT3

JACOBS TAPER ARBOR



MAS403 BT-JTA

mm

CODE NO.		JT.NO	D1	D2	L1	L2	WEIGHT (kg)
BT40	JTA1-45	1	9.754	30	45	15	1.2
	JTA1-90				90		1.4
	JTA2S-45	2SHORT	13.94		45	18	1.2
	JTA2S-90				90		1.4
	JTA2-45	2	14.199		45	20	1.2
	JTA2-90				90		1.4
	JTA33-45	33	15.85		45	24	1.2
	JTA33-90				90		1.4
	JTA6-45	6	17.17	45	45		1.2
	JTA6-90				90		1.5
BT50	JTA1-45	1	9.754	30	45	15	4.0
	JTA1-105				105		4.2
	JTA2S-45	2SHORT	13.94		45	18	4.0
	JTA2S-105				105		4.2
	JTA2-45	2	14.199		45	20	4.0
	JTA2-105				105		4.2
	JTA33-45	33	15.85		45	24	4.0
	JTA33-105				105		4.2
	JTA6-45	6	17.17	45	45		4.0
	JTA6-105				105		4.2

Taper : AT3

DRILL DIA	Drill depth	L3	DRILL DIA	Drill depth	L3	DRILL DIA	Drill depth	L3	DRILL DIA	Drill depth	L3
2.0-2.1	55	171.5	3.9	79	192.5	6.4-7.0	105	214.5	9.6-10.0	130	235.0
2.2-2.3	58	174.0	4.0-4.3	83	196.0	7.1-7.3	108	217.0	10.1-10.4	133	237.5
2.4-2.5	61	176.5	4.4-4.6	86	199.0	7.4-7.6	111	219.5	10.5-10.7	137	241.0
2.0-2.7	64	179.5	4.7-4.8	89	201.5	7.7-8.0	114	222.0	10.8-11.1	140	243.5
2.8	67	182.0	4.9-5.1	92	204.0	8.1-8.3	117	224.5	11.2-11.5	143	246.0
2.9-3.2	71	185.5	5.2-5.5	95	206.5	8.4-8.7	121	206.5	11.6-11.9	146	248.5
3.3-3.5	73	187.5	5.6-5.9	98	209.5	8.8-9.1	124	230.5	12.0-12.3	149	251.0
3.6-3.8	76	190.0	6.0-6.3	102	212.5	9.2-9.5	127	233.0	12.4-13.0	152	253.0

MORSE TAPER ADAPTER

- With Tang

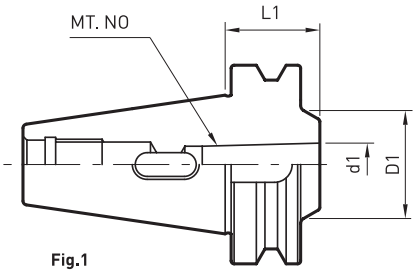


Fig.1

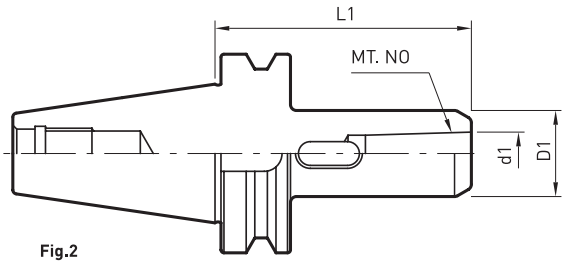


Fig.2

MAS403 BT-MTA

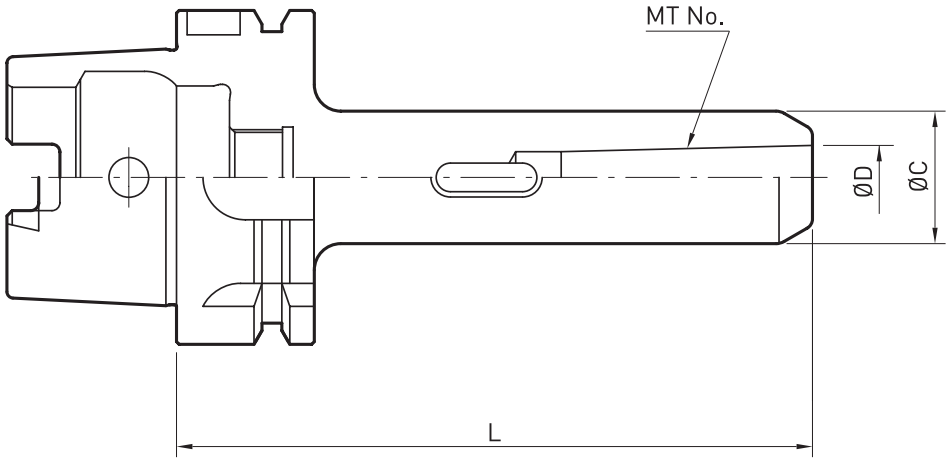
mm

CODE NO.		FIG	MT.NO	d1	DRILL능력		D1	L1	WEIGHT (kg)
					MIN	MAX			
BT30	MTA1-45	1	1	12.065	13.5	14.0	25	45	0.8
	MTA2-60	1	2	17.780	14.1	23.0	32	60	0.9
BT40	MTA1-45	1	1	12.065	13.5	14.0	25	45	1.0
	MTA1-120	2	1					120	1.3
	MTA2-60	1	2	17.780	14.1	23.0	32	60	1.1
	MTA2-120	2	2					120	1.4
	MTA3-75	1	3	23.825	23.1	32.0	40	75	1.2
	MTA3-135	2	3					135	1.8
	MTA4-95	1	4	31.267	32.1	50.0	48	95	1.4
	MTA4-165	2	4					165	2.4
BT50	MTA1-45	1	1	12.065	13.5	14.0	25	45	4.0
	MTA1-120	2	1					120	4.3
	MTA1-180	2	1					180	4.3
	MTA2-45	1	2	17.780	14.1	23.0	32	45	4.0
	MTA2-135	2	2					135	4.4
	MTA2-180	2	2					180	4.6
	MTA3-45	1	3	23.825	23.1	32.0	40	45	3.9
	MTA3-150	2	3					150	4.7
	MTA3-180	2	3					180	4.9
	MTA4-75	1	4	31.267	32.1	50.0	48	75	5.0
	MTA4-180	2	4					180	5.4
	MTA5-105	1	5	44.399	50.1	75.0	63	105	4.6

Taper : AT3

MORSE TAPER ADAPTER

· With Tang



DIN69893 HSK/A-MTA

mm

CODE NO.		MT No.	ØD	ØC	L
HSK50A	MTA1-110	1	12.065	25	110
	MTA2-135	2	17.780	32	135
	MTA3-155	3	23.825	40	155
HSK63A	MTA1-120	1	12.065	25	120
	MTA2-135	2	17.780	32	135
	MTA3-155	3	23.825	40	155
	MTA4-165	4	31.267	48	165
HSK100A	MTA1-120	1	12.065	25	120
	MTA2-135	2	17.780	32	135
	MTA3-160	3	23.825	40	160
	MTA4-185	4	31.267	48	185
	MTA5-215	5	44.399	63	215

Taper : AT3

MORSE TAPER ADAPTER

· With Draw Bolt

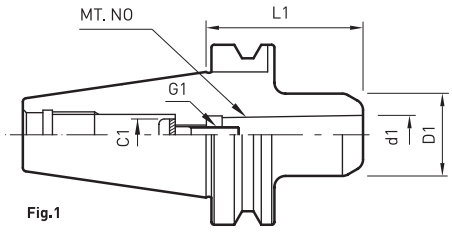


Fig.1

Draw Bolt Type

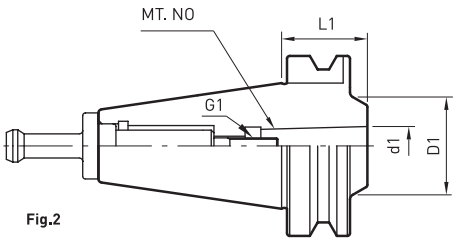


Fig.2

Pull Stud Bolt Type

MAS403 BT-MTB

mm

CODE NO.		FIG	MT.NO	d1	D1	L1	Draw Bolt Type	Pull Stud Bolt Type	G1	WEIGHT (kg)
							C1	CODE		
BT30	MTB1-45	1	1	12.065	25	40	10.1	-	M6X1.0	0.8
	MTB2-60	2	2	17.780	32	60	-	MTB2	M10X1.5	0.8
BT40	MTB1-45	1	1	12.065	25	45	10.0	-	M6X1.0	1.0
	MTB2-60		2	17.780	32	60	13.5	-	M10X1.5	1.1
	MTB3-45	2	3	23.825	40	45	-	MTB3	M12X1.75	1.1
	MTB4-85		4	31.267	48	85	-	MTB4	M16X2.0	1.3
BT50	MTA1-45	1	1	12.065	25	45	10.0	-	M6X1.0	3.9
	MTA2-45		2	17.780	32	45	16.0	-	M10X1.5	3.9
	MTA3-60		3	23.825	40	60	18.0	-	M12X1.75	3.9
	MTA4-75		4	31.267	48	75	20.5	-	M16X2.0	3.9
	MTA5-105	2	5	44.399	70	105	-	MTB5	M20X2.5	4.0

Taper : AT3

· *Draw Bolt to be purchased separately

NOTE

· Fig 1 to be used special Draw Bolt
· Fig 2 to used special P/S bolt

END MILL HOLDER

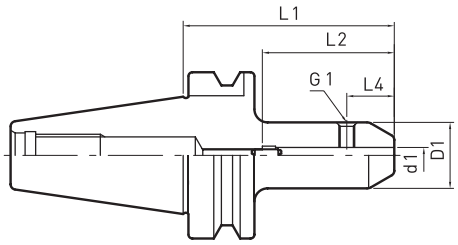


Fig1

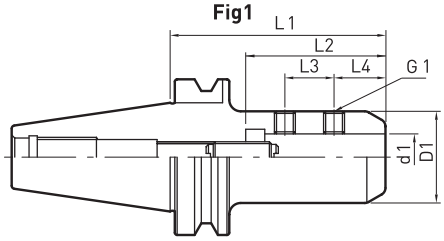


Fig2

MAS403 BT-EMH

mm

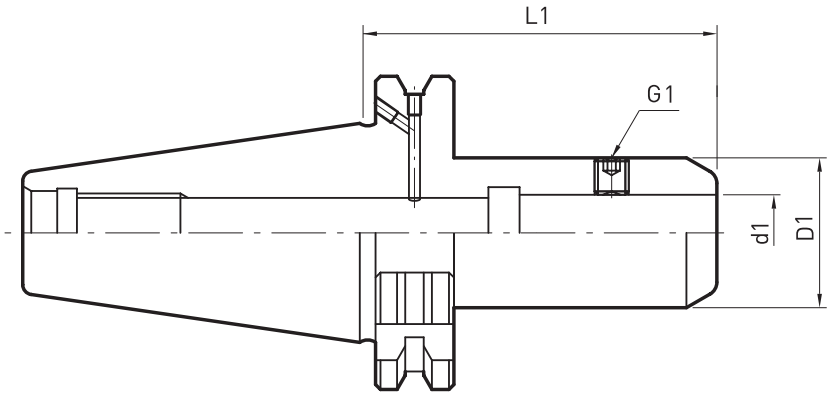
CODE NO.		d1	D1	L1	L2	L3	L4	G1	FIG
BT30	EMH6-60	6	25	60	50	-	18	M6X0.75	1
	EMH8-60	8	28					M8X1.0	
	EMH10-60	10	35	60	54		20	M10X1.25	
	EMH12-60	12	37	60	59		22.5		
	EMH16-75	16	40	75	62	20	24		2
	EMH20-75	20	43	75	64				
	EMH25-75	25	48	75	69	20	20		
BT40	EMH6-80	6	25	80	50	-	18	M6X0.75	1
	EMH8-80	8	28					M8X1.0	
	EMH10-80	10	35		54		20	M10X1.25	
	EMH12-80	12	42		59		22.5	M12X1.5	
	EMH16-80	16	48		62	20	24		2
	EMH20-90	20	52	90	69			M16X1.5	
	EMH25-90	25	55		74	25			
	EMH35-105	32	60	105	78	28			
BT50	EMH6-90	6	25	90	50	-	18	M6X0.75	1
	EMH8-90	8	28					M8X1.0	
	EMH10-90	10	35	90	54		20	M10X1.25	
	EMH12-90	12	42		59		22.5	M12X1.5	
	EMH16-105	16	48	105	62	20	24		2
	EMH20-105	20	52		69			M16X1.5	
	EMH25-105	25	62		74	25			
	EMH32-105	32	75		78	28			
	EMH40-120	40	80	120	88	32	30	M20X2.0	
	EMH42-120	42							
	EMH50-120	50	100		98	35	35		
	●EMH50.8-120	50.8			94	36	34		

Taper : AT3 | **Coolant** : AD/B

NOTE

・The model ●mark is for saddle Pin Type(for DIN 1835C)

END MILL HOLDER



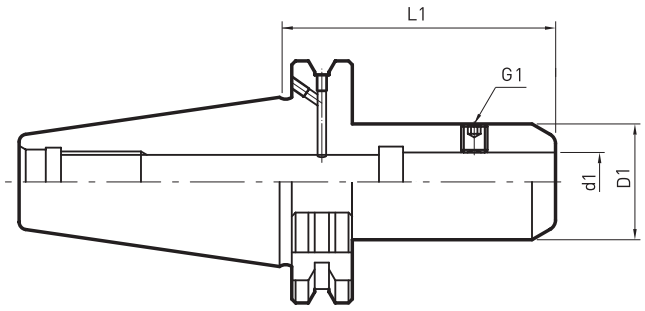
DIN69871 SK-EMH

mm

	CODE NO.	d1	D1	L1	G1
SK40	EMH6-50	6	25	50	M6
	EMH6-100	6	25	100	M6
	EMH8-50	8	28	50	M8
	EMH8-100	8	28	100	M8
	EMH10-50	10	35	50	M10
	EMH10-100	10	35	100	M10
	EMH12-100	12	42	100	M12
	EMH14-100	14	44	100	M12
	EMH16-100	16	48	100	M14
	EMH18-100	18	48	100	M14
	EMH20-100	20	52	100	M16
	EMH25-100	25	55	100	M18
	EMH32-100	32	60	100	M20

Taper : AT3 | **Coolant** : AD/B

END MILL HOLDER



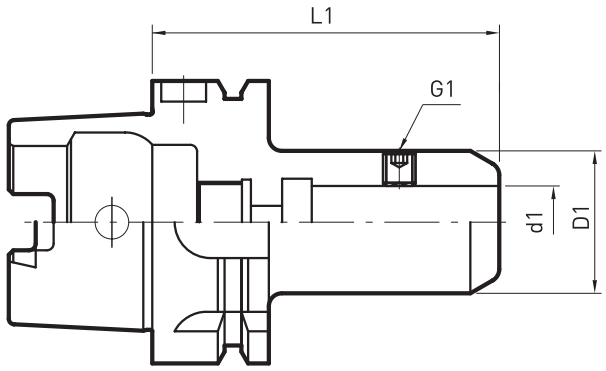
DIN69871 SK-EMH

mm

	CODE NO.	d1	D1	L1	G1
SK50	EMH6-63	6	25	63	M6
	EMH6-100			100	
	EMH6-160			160	
	EMH8-63	8	28	63	M8
	EMH8-100			100	
	EMH8-160			160	
	EMH10-63	10	35	63	M10
	EMH10-100			100	
	EMH10-160			160	
	EMH12-63	12	42	63	M12
	EMH12-100			100	
	EMH12-160			160	
	EMH14-100	14	44	100	
	EMH14-160			160	
	EMH16-100	16	48	100	M14
	EMH16-160			160	
	EMH18-63	18		63	
	EMH18-100			100	
	EMH18-160			160	
	EMH20-100	20	52	100	M16
	EMH20-160			160	
	EMH25-100	25	62	100	M18
	EMH25-160			160	
	EMH32-100	32	75	100	M20
	EMH32-160			160	
	EMH40-100	40	80	100	
	EMH40-160			160	

Taper : AT3 | **Coolant** : AD/B

END MILL HOLDER



DIN69893 HSK/A-EMH

mm

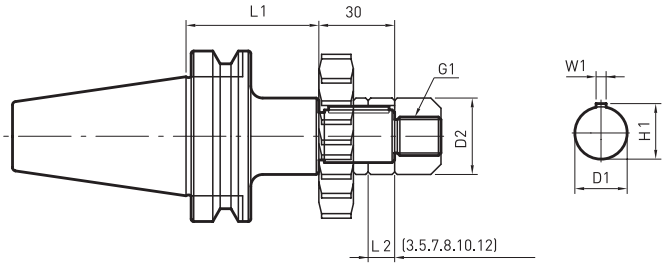
CODE NO.		d1	D1	L1	G1
HSK50A	EMH6-65	6	25	65	M6
	EMH8-65	8	28	65	M8
	EMH10-65	10	35	65	M10
	EMH12-80	12	42	80	M12
	EMH16-80	16	48	80	M14
	EMH20-80	20	52	80	M16
HSK63A	EMH6-65	6	25	65	M6
	EMH6-100	6	25	100	M6
	EMH6-160	6	25	160	M6
	EMH8-65	8	28	65	M8
	EMH8-100	8	28	100	M8
	EMH8-160	8	28	160	M8
	EMH10-65	10	35	65	M10
	EMH10-100	10	35	100	M10
	EMH10-160	10	35	160	M10
	EMH12-80	12	42	80	M12
	EMH12-160	12	42	160	M12
	EMH14-80	14	44	80	M12
	EMH14-160	14	44	160	M12
	EMH16-80	16	48	80	M14
	EMH16-160	16	48	160	M14
	EMH18-80	18	50	80	M14
	EMH18-160	18	50	160	M14
	EMH20-80	20	52	80	M16
	EMH20-160	20	52	160	M16
	EMH25-110	25	62	110	M16
	EMH25-160	25	62	160	M16
	EMH32-110	32	75	110	M20
	EMH32-160	32	75	160	M20

mm

CODE NO.		d1	D1	L1	G1
HSK100A	EMH6-80	6	25	80	M6
	EMH6-160	6	25	160	M6
	EMH8-80	8	28	80	M8
	EMH8-160	8	28	160	M8
	EMH10-80	10	35	80	M10
	EMH10-160	10	35	160	M10
	EMH12-80	12	42	80	M12
	EMH12-160	12	42	160	M12
	EMH14-80	14	44	80	M12
	EMH14-160	14	44	160	M12
	EMH16-100	16	48	100	M14
	EMH16-160	16	48	160	M14
	EMH18-100	18	50	100	M14
	EMH18-160	18	50	160	M14
	EMH20-100	20	52	100	M16
	EMH20-160	20	52	160	M16
	EMH25-100	25	62	100	M16
	EMH25-160	25	62	160	M16
	EMH32-100	32	75	100	M20
	EMH32-160	32	75	160	M20

Taper : AT3 | **Coolant** : AD/B

SIDE CUTTER ARBOR



MAS403 BT-SCA

mm

CODE NO. (INCH TYPE)			D2	H1		W1		G1	WEIGHT	CODE NO.(METRIC TYPE)		
TAPER	D1	L1		INCH	METRIC	INCH	METRIC		(kg)	TAPER	D1	L1
BT40	SCA12.7	60	20	-	-	-	-	M12X1.75	1.3	BT40	SCA13	60
	SCA12.7	90							1.4			90
	SCA15.875	75	26	17.42	17.2	3.18	4	M14X1.5	1.4		SCA16	75
	SCA15.875	105							1.5			105
	SCA22.225	75	34	23.82	23.6	3.18	6	M20X1.5	1.6		SCA22	75
	SCA22.225	120							1.9			120
	SCA25.4	75	40	27.78	29.0	6.35	7	M24X2.0	2.1		SCA27	75
	SCA25.4	120							2.5			120
	SCA31.75	90	46	34.92	34.0	7.92	8	M30X2.0	2.5		SCA32	90
BT50	SCA12.7	75	20	-	-	-	-	M12X1.75	3.7	BT50	SCA13	75
	SCA12.7	105							3.8			105
	SCA15.875	90	26	17.42	17.2	3.18	4	M14X1.5	4.0		SCA16	90
	SCA15.875	120							4.1			120
	SCA22.225	90	34	23.82	23.6	3.18	6	M20X1.5	4.3		SCA22	90
	SCA22.225	135							4.6			135
	SCA25.4	90	40	27.78	29.0	6.35	7	M24X2.0	4.7		SCA27	90
	SCA25.4	135							5.1			135
	SCA31.75	90	46	34.92	34.0	7.92	8	M30X2.0	5.1		SCA32	90
	SCA31.75	135							5.7			135
	SCA38.1	90	55	42.06	42.5	9.52	10	M36X3.0	5.8		SCA40	90
	SCA38.1	135							6.8			135

Taper : AT3

NOTE

- Using with Side Cutter standard JIS B4206, JIS B4219, JIS B4107, JIS B41092.
- Key and Collars to be supplied with the Arbor.
- Specified weight are not including Cutter weight.

FACE MILL ARBOR

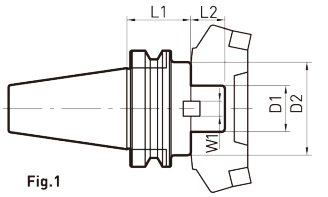


Fig.1

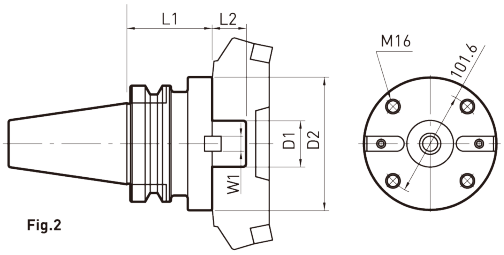


Fig.2

MAS403 BT-FMA

mm

CODE NO.			FIG	L2	D2	W1	D4	L4	WEIGHT (kg)
TAPER	D1	L1							
BT30	FMA25.4	45	1	22	50	9.5	33	10	1.3
BT40	FMA25.4	45	1	22	50	9.5	33	10	1.5
	FMA25.4	90	1	22	50	9.5	33	10	3.1
	FMA31.75	45	1	30	60	12.7	40	10	1.7
	FMA31.75	75	1	30	60	12.7	40	10	3.1
	FMA38.1	60	1	34	80	15.9	50	14	2.9
BT50	FMA25.4	45	1	22	50	9.5	33	10	3.7
	FMA25.4	90	1	22	50	9.5	33	10	4.6
	FMA25.4	150	1	22	50	9.5	33	10	5.5
	FMA31.75	45	1	30	60	12.7	40	10	4.5
	FMA31.75	75	1	30	60	12.7	40	10	5.3
	FMA31.75	105	1	30	60	12.7	40	10	6.1
	FMA38.1	45	1	34	80	15.9	50	14	4.3
	FMA38.1	75	1	34	80	15.9	50	14	5.6
	FMA50.8	45	1	36	98	19	65	14	4.9
	FMA50.8	75	1	36	98	19	65	14	6.8
	FMA47.625	75	2	38	128.57	25.4	-	-	7.7

Taper : AT3

NOTE

- Specified weight are not including Face Cutter.

FACE MILL ARBOR

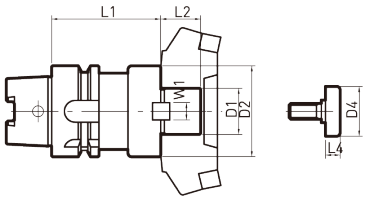


Fig.1

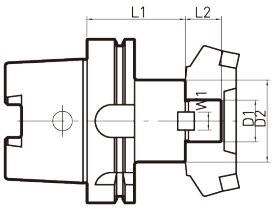


Fig.2

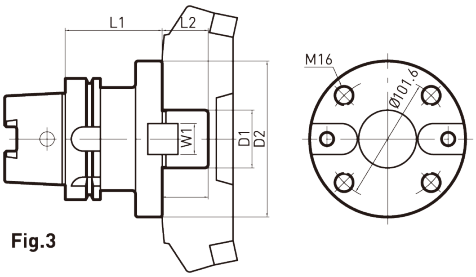


Fig.3

DIN69893 HSK-FMA

mm

CODE NO.			FIG	L2	D2	W1	D4	L4
TAPER	D1	L1						
HSK50A	FMA25.4	60	1	22	50	9.5	33	10
HSK63A	FMA25.4	60	1	22	50	9.5	33	10
	FMA31.75	65	1	30	60	12.7	40	10
	FMA38.1	65	1	34	80	15.9	50	14
HSK100A	FMA25.4	60	2	22	50	9.5	33	10
	FMA31.75	65	2	30	60	12.7	40	10
	FMA38.1	65	2	34	80	15.9	50	14
	FMA50.8	75	2	36	98	19	65	14
	FMA47.625	80	3	38	128.57	25.4	-	-

Taper : AT3

FACE MILL ARBOR

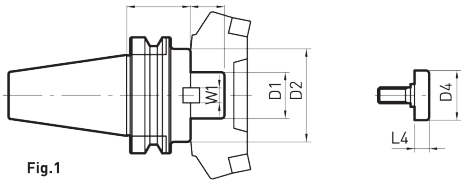


Fig.1

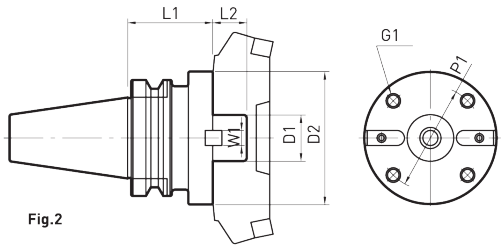


Fig.2

MAS403 BT-FMB

mm

CODE NO.(INCH TYPE)			FIG	L2	D2	W1		G1	P1	D4	L4	WEIGHT	CODE NO..(METRIC TYPE)		
TAPER	D1	L1				INCH	METRIC					(kg)	TAPER	D1	L1
BT30	FMB25.4	45	1	26	80	9.5	12			33	10	1.7	BT30	FMB27	45
BT40	FMB25.4	60	1	26	80	9.5	12	-	-	33	10	2.5	BT40	FMB27	60
	FMB25.4	90	1	26	80	9.5	12			33	10	4.7	BT40	FMB27	90
	FMB38.1	60	1	26	85	15.9	16	-	-	50	14	7.4	BT40	FMB40	60
BT50	FMB25.4	45	1	26	80	9.5	12			33	10	4.0	BT50	FMB27	45
	FMB25.4	90	1	26	80	9.5	12	-	-	33	10	5.8	BT50	FMB27	90
	FMB25.4	150	1	26	80	9.5	12			33	10	8.2	BT50	FMB27	150
	FMB38.1	45	1	26	85	15.9	16			50	14	4.7	BT50	FMB40	45
	FMB38.1	75	1	26	85	15.9	16	-	-	50	14	6.1	BT50	FMB40	75
	FMB38.1	105	1	26	85	15.9	16			50	14	8.7	BT50	FMB40	105
	FMB38.1F	75	2	26	110	15.9	16	M12	66.7	50	14	6.6	BT50	FMB40F	75
	-	-		25	140		25.4	M16	101.6	-	-	7.9	BT50	FMB60	75

Taper : AT3

NOTE

- Specified weight are not including Face Cutter.

FACE MILL ARBOR

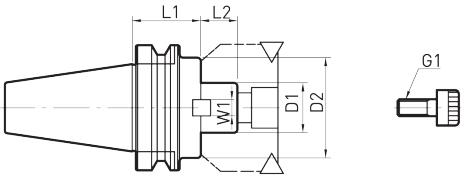


Fig.1

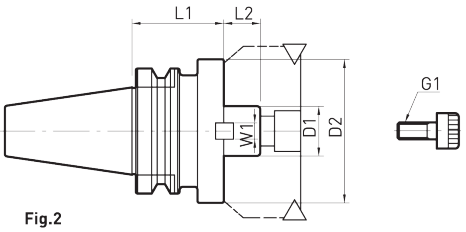


Fig.2

MAS403 BT-FMC

mm

CODE NO.(INCH TYPE)			FIG	L2	D2	W1		G1	WEIGHT	CODE NO..(METRIC TYPE)		
TAPER	D1	L1				INCH	METRIC		(kg)	TAPER	D1	L1
BT30	-	-	1	18	45	-	10	M10X30	1.4	BT30	FMC22	40
BT40	-	-	1	18	45	-	10	M10X30	1.3	BT40	FMC22	45
	-	-	1	18	45	-	10	M10X30	2.0	BT40	FMC22	90
	FMC25.4	60	2	20	70	9.5	12	M12X35	1.5	BT40	FMC27	60
	FMC25.4	90	2	20	70	9.5	12	M12X35	2.2	BT40	FMC27	90
	FMC38.1	60	2	22	85	15.9	14	M16X35	2.3	BT40	FMC32	60
	FMC38.1	75	2	22	85	15.9	14	M16X35	2.6	BT40	FMC32	75
BT50	-	-		18	45	-	10	M10X30	4.2	BT50	FMC22	60
	-	-		18	45	-	10	M10X30	4.7	BT50	FMC22	105
	-	-		18	45	-	10	M10X30	5.3	BT50	FMC22	150
	FMC25.4	45	1	20	70	9.5	12	M12X35	4.1	BT50	FMC27	45
	FMC25.4	90	1	20	70	9.5	12	M12X35	5.5	BT50	FMC27	90
	FMC25.4	150	1	20	70	9.5	12	M12X35	7.3	BT50	FMC27	150
	FMC38.1	45	1	22	85	15.9	14	M16X35	4.2	BT50	FMC32	45
	FMC38.1	75	1	22	85	15.9	14	M16X35	5.5	BT50	FMC32	75
	FMC38.1	105	1	22	85	15.9	14	M16X35	7.0	BT50	FMC32	105

Taper : AT3

NOTE

- Specified weight are not including Face Cutter.

FACE MILL ARBOR

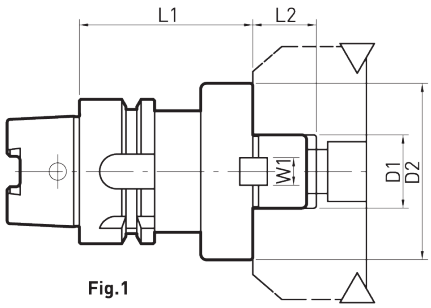
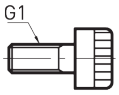


Fig.1



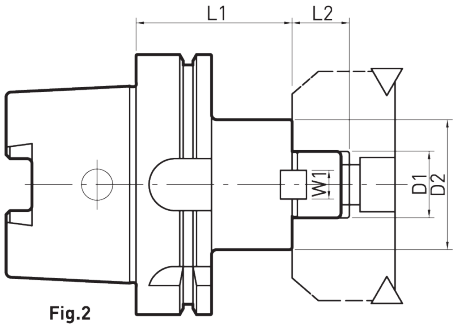


Fig.2

DIN69893 HSK/A-FMC

mm

CODE NO.(METRIC TYPE)			FIG	L2	D2	W1	G1
TAPER	D1	L1				METRIC	
HSK40A	FMC16	45	1	17	38	8	M8X3.0
	FMC22	45		18	45	10	M10X3.0
HSK50A	FMC16	45	2	17	38	8	M8X3.0
	FMC22	50		18	45	10	M10X3.0
	FMC27	50	1	20	70	12	M12X3.5
	FMC32	50		22	85	14	M16X3.5
HSK63A	FMC16	60	2	17	38	8	M8X3.0
	FMC22	60		18	45	10	M10X3.0
	FMC27	60	1	20	70	12	M12X3.5
	FMC32	60		22	85	14	M16X3.5
HSK100A	FMC16	75	2	17	38	8	M8X3.0
	FMC22	75		18	45	10	M10X3.0
	FMC27	75		20	70	12	M12X3.5
	FMC32	75		22	85	14	M16X3.5

Taper : AT3

FACE MILL ARBOR

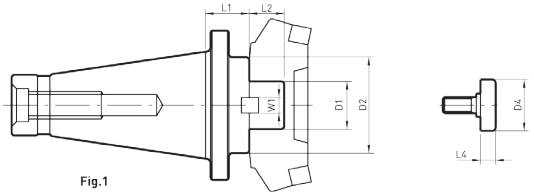


Fig.1

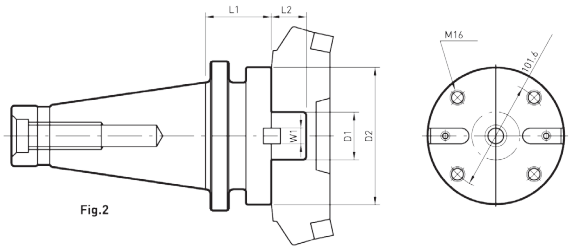


Fig.2

- JIS B4113 Face Mill
  KOREA TUNGSTEN, KORLOY, IGETALLOY, MITSUBISHI,
  TUNGALOY, DI JET, HITACHI

DIN2080 NT-FMA

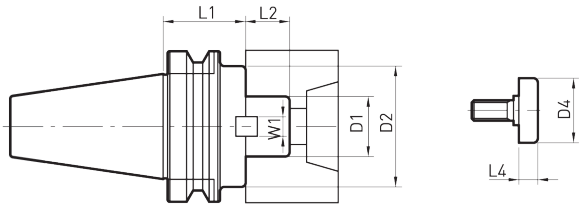
mm

CODE NO.			FIG	L2	D2	W1	D4	L4
TAPER	D1	L1						
NT40	FMA25.4	30	1	22	50	9.5	33	10
	FMA31.75			30	60	12.7	40	
	FMA38.1			34	80	15.9	50	14
	FMA50.8			36	98	19.05	65	
NT50	FMA25.4	30	1	22	50	9.5	33	10
	FMA31.75			30	60	12.7	40	
	FMA38.1			34	80	15.9	50	14
	FMA50.8	28		36	97.5	19.05	65	
	FMA47.625	45	2	38	128.57	25.4	-	-

NOTE

- Please make designate the Draw Bolt dimension between Inch and Metric depend on using Face Mill.
- Unless any notifying, NT40 and NT50 will be supplied with Inch Draw bolt.

SHELL END MILL ARBOR



• JIS B4214 SHELL END MILL

MAS403 BT-SMA

mm

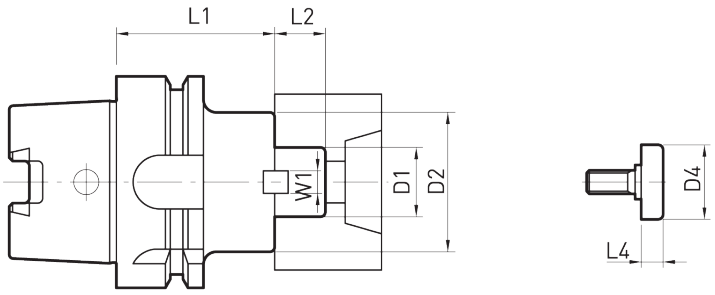
CODE NO.(INCH TYPE)			L2	D2	W1	D4	L4	WEIGHT (kg)	CODE NO..(METRIC TYPE)		
TAPER	D1	L1							TAPER	D1	L1
BT30	SMA15.875	30	17	34	-	20	7	0.9	BT30	SMA16	30
	SMA22.225		27	42		28	9	1.0		SMA22	
BT40	SMA15.875	60	17	34	-	20	7	1.3	BT40	SMA16	60
		120						1.7			120
	SMA22.225	60	27	42		28	9	1.4		SMA22	60
		120						2.1			120
	SMA25.4	45	36	50	10	33	10	1.4		SMA27	45
		105						2.3			105
	SMA31.75	45	38	60		40		1.6		SMA32	45
		75						2.3			75
	SMA38.1	60		80	12	50	14	3.0		SMA40	60
BT50	SMA15.875	75	17	34	-	20	7	4.2	BT50	SMA16	75
		120						5.8			120
	SMA22.225	75	27	42		28	9	4.3		SMA22	75
		120						4.8			120
		180						5.5			180
	SMA25.4	60	36	50	10	33	10	4.3		SMA27	60
		105						5.2			105
		150						5.8			150
	SMA31.75	45	38	60		40		4.2		SMA32	45
		75						5.2			75
		105						6.2			105
	SMA38.1	45		80	12	50	14	4.3		SMA40	45
		75						5.5			75

Taper : AT3

NOTE

• Specified weight are not including Face Cutter.

SHELL END MILL ARBOR



- JIS B4214 SHELL END MILL

DIN69893 HSK/A-SMA

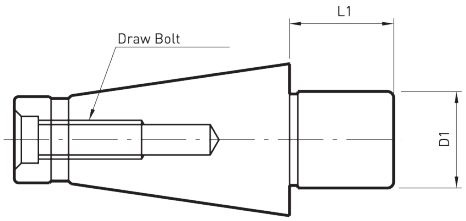
mm

CODE NO.(INCH TYPE)			L2	D2	W1	D4	L4	CODE NO..(METRIC TYPE)		
TAPER	D1	L1						TAPER	D1	L1
HSK50A	SMA15.875	30	17	34	-	20	7	HSK50A	SMA16	30
	SMA22.225		27	42		28	9		SMA22	
	SMA25.4	50	36	50	10	33	10		SMA27	50
HSK63A	SMA22.225	60	27	42	-	28	9	HSK63A	SMA22	60
	SMA25.4		36	50	10	33	10		SMA27	
	SMA31.75		38	60		40			SMA32	
	SMA38.1		38	80	12	50	14		SMA40	
HSK100A	SMA22.225	50	27	42	-	28	9	HSK100A	SMA22	50
	SMA25.4		36	50	10	33	10		SMA27	
	SMA31.75		38	60		40			SMA32	
	SMA38.1	60	38	80	12	50	14		SMA40	60

Taper : AT3

TAPER SLEEVE

▶ CENTERING PLUG

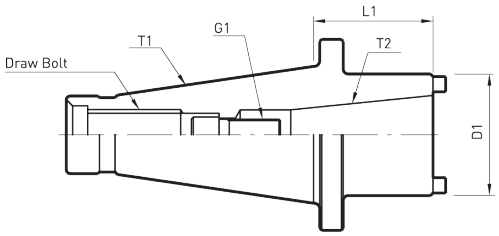


DIN2080 NT-CPI

mm

CODE NO.		D1	L1	DRAW BOLT	
				INCH	METRIC
NT50	CPI47.625	47.625	38	1"-8UNC	M24X3.0
	CPI60	60			

▶ TAPER SLEEVE ADAPTER

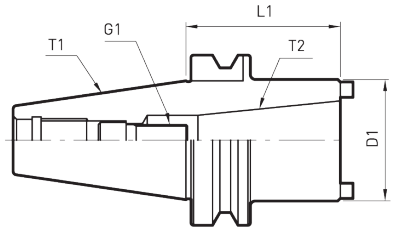


MAS403 BT-TSA

mm

CODE NO.		T1	T2	D1	L1	G1	WEIGHT (kg)
BT50	TSA40M-75	BT50	ISO40	70	75	M16X2	4.6
	TSA40U-75					5/8-11UNC	

▶ TAPER SLEEVE ADAPTER



DIN2080 NT-TSA

mm

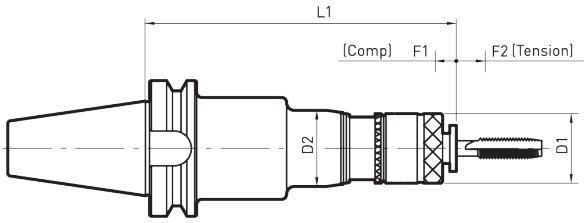
CODE NO.		T1	T2	D1	L1	G1
NT50	TSA40U-75	NT50	ISO40	70	75	5/8-11UNC
	TSA40M-75					M16X2

NOTE

- Please make designate the Draw Bolt dimension between Inch and Metric.
- Unless any notifying, NT40 and NT50 will be supplied with Inch Draw bolt.

TAPPING CHUCK

TAPPING CHUCK



MAS403 BT-TC

mm

CODE NO.		TAPPING RANGE M	TAPPING RANGE U	TAPPING RANGE P	D1	D2	L1	F1	F2	WEIGHT (kg)	COLLET
BT30	TC0312-130	2-12	1/4-1/2	1/8	32	45	130	6.5	12	1.5	SES1
BT40	TC0312-135						135			1.8	
	TC0822-160	8-22	5/16-7/8	1/8-1/2	50	62	160	14.5	13	2.6	SES2
BT50	TC0312-150	2-12	1/4-1/2	1/8	32	45	150	6.5	12	4.2	SES1
	TC0312-210						210			5.3	
	TC0822-175	8-22	5/16-7/8	1/8-1/2	50	62	175	14.5	13	5.4	SES2
	TC0822-225						225			6.5	
	TC1638-240	16-38	5/8-13/8	1/4-11/8	72	88	240	20	20	7.8	SES3

Taper : AT3

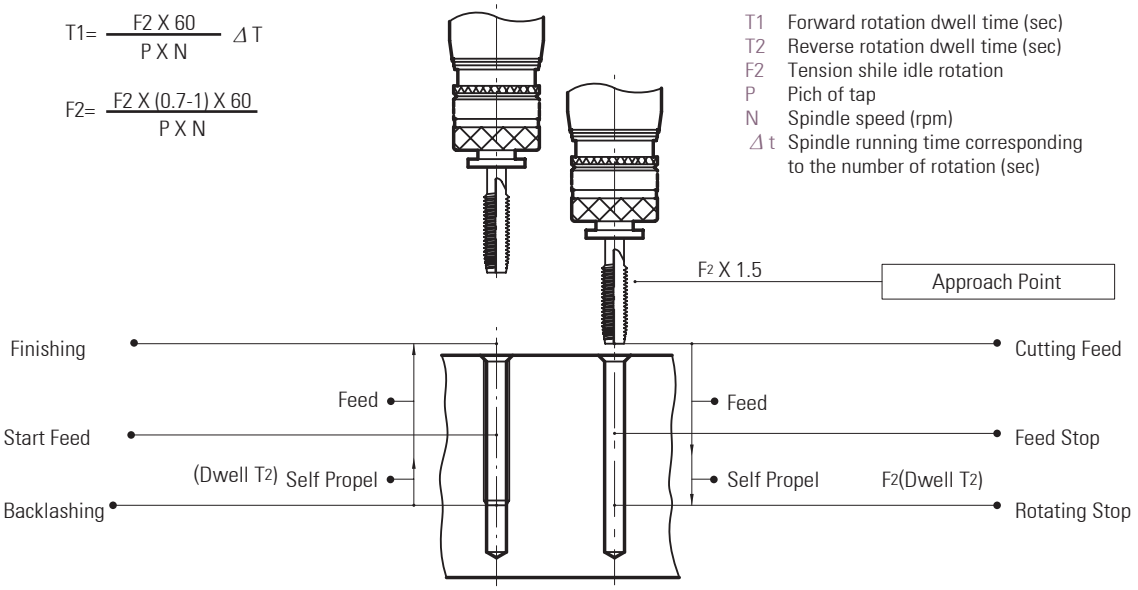
- It is floating toward Axial so that absorb a tolerance of pitch and spindle rotating and it will prevent a broken tool.
- Easy and Quick change Tap with one touch type Tap collet.

Operating of Taping Chuck

$$T1 = \frac{F2 \times 60}{P \times N} \Delta T$$

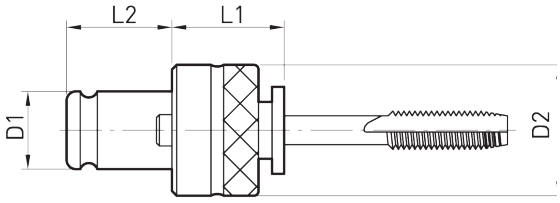
$$F2 = \frac{F2 \times (0.7\text{-}1) \times 60}{P \times N}$$

T1 Forward rotation dwell time (sec)
T2 Reverse rotation dwell time (sec)
F2 Tension shile idle rotation
P Pich of tap
N Spindle speed (rpm)
Δt Spindle running time corresponding to the number of rotation (sec)



TAPPING CHUCK

▶ TAP COLLET



SES

mm

CODE NO.	TAPPING RANGE			D1	D2	L1	L1	CHUCK CODE
	M	U	P					
SES-1	2-12	1/4-1/2	1/8	19	32	25	21.5	TC0312
SES-2	8-25	5/16-7/8	1/8-1/2	31	50	33	35.5	TC0822
SES-3	16-38	5/8-13/8	1/4-11/8	48	72	45	55.5	TC1638

- Tension and Compression
- Prevention come out a tap from the chuck by Ball Clamping.

WAY to SELECT TAP COLLET

SCOPE of TAP COLLET (SES)	TAP SIZE			
	METRIC	UNC	SHANK Ø	SHANK ⊠
SES1	M2		3	2.5
	M3	NO5,6	4	3.2
	M4 M4.5		5	4
	M5 M5.5		5.5	4.5
	M6	U1/4	6	
		U5/16	6.1	5
	M8 M7		6.2	
	M10 M9	U3/8	7	5.5
	M11	U7/16	8	6
	M12		8.5	6.5
SES2		U1/2	9	7
	M14 M15	U9/16	10.5	8
		U5/8	12	9
	M16		12.5	10
	M17		13	
	M18	U3/4	14	11
	M20		15	12
	M22	U7/8	17	13
SES3	M24 M25		19	15
	M27 M26	U1	20	
	M28		21	17
		U11/8	22	
	M30		23	17
	M32	U11/4	24	19
	M33		25	
	M35 M34	U13/8	26	21
	M36 M38		28	

SCOPE of TAP COLLET (SES)		TAP SIZE			
		PT	PF	SHANK Ø	SHANK ⊠
SES2	SES1	1/8	1/8	8	6
		1/4	1/4	11	9
		3/8	3/8	14	11
		1/2	1/2	18	14
SES3			5/8	19	15
		3/4	3/4	23	17
			7/8	24	19
		1	1	26	21
			11/8	28	

NOTE

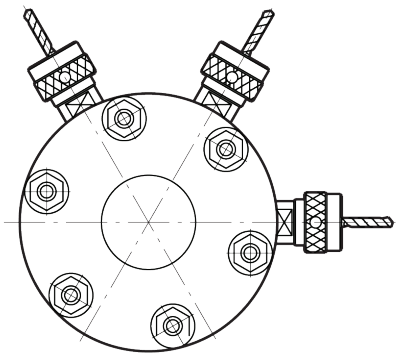
- Tap Shank is JIS(or KS) standard
- M : Metric threads
  UNC : Unified coarse threads
  PT : Pipe taper threds
  PF : pipe straight threads

TAPPING CHUCK

▶ STRAIGHT SHANK TAPPING CHUCK

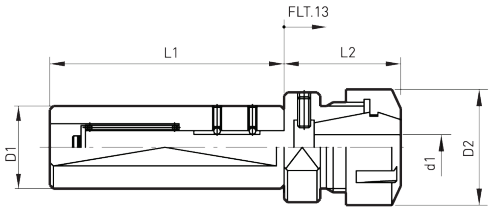
Function of Floating

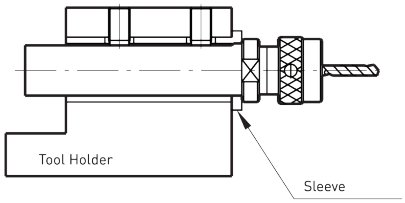
- In order to prevent of tool when tapping process, our chuck have function of floating.



Suitability for small thread cutting

- It is able to tapping from M3 tap size.





N-TC

mm

CODE NO.		d1	D1	D2	L1	L2	NUT	COLLET
N32	TC13	3-13	32	35	100	45	DN13	ER20
	TC20	3.20	32	52	100	58	DN20	ER32

NOTE

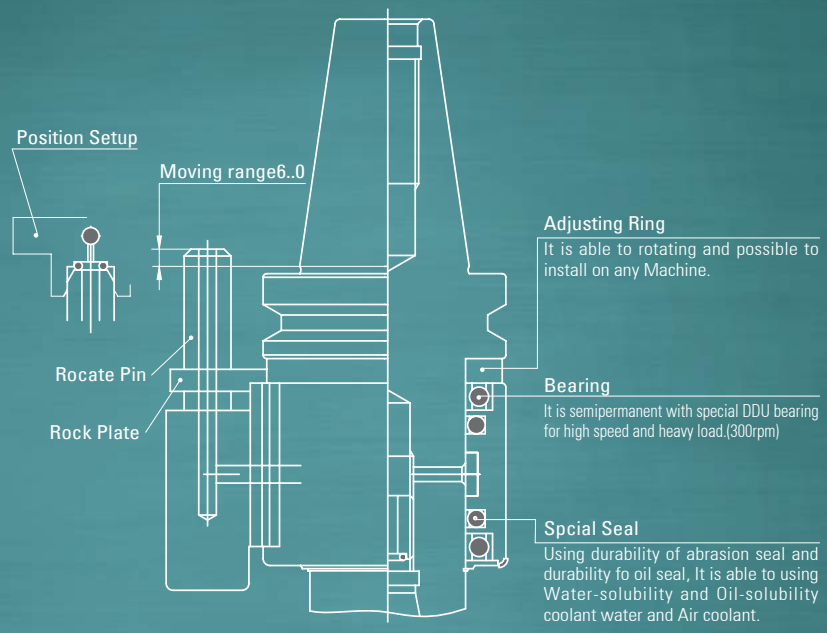
- TC13 size are able to use locking bolt from M8
- TC20 size are able to use locking bolt from M16

Comparison chart between ER collet and Tap

mm

COLLET		TAP	
ER20	ER32	METRIC	INCH
Ø4	Ø4	M3	
Ø5	Ø5	M4, M5	
Ø6	Ø6	M6	U1/4
Ø7	Ø7	M7, M8, M9, M10	U5/16, U3/8
Ø9	Ø9	M11, M12	U7/16, U1/2
Ø12	Ø12	M14, M15	
Ø13	Ø13	M16, M17	U9/16, U5/8
	Ø15	M18, M20	U3/4
	Ø19	M22, M24, M25	U7/8
	Ø20	M26, M27	U1

OIL HOLE HOLDER SYSTEM



Increasing Ffficiency

Increasing workability due to chip discharge with coolnat-water.

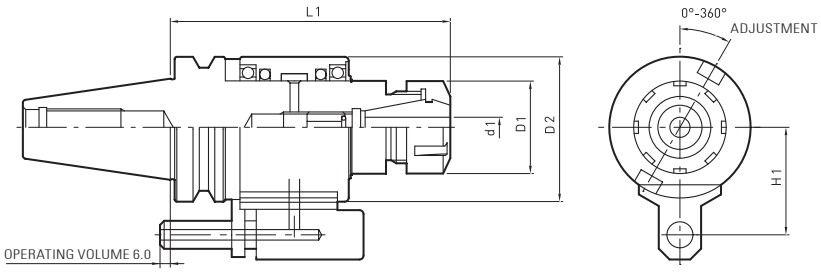
Tool life Improvement

Tool life imprevement by cooling a tool with coolant-water.

Variety of Application

Heavy cutting, Deep hole machining.

OIL HOLE HOLDER



MAS403 BT-OHDC

mm

CODE NO.		D1 MIN	D1 MAX	D1	D2	L1	H1	WEIGH (kg)	COLLET
BT40	OHDC10-165	1.0	10	28	9.0	165	65	5.1	ER16
	OHDC20-165	2.0	20	50				5.0	ER32
	OHDC26-170	3.0	26	63		170		4.9	ER40
BT50	OHDC10-175	1.0	10	28	105	175	80	7.8	ER16
	OHDC20-165	2.0	20	50					ER32
	OHDC26-180	3.0	26	63	105	180	80	7.7	ER40
	OHDC34-180	5.0	34	78				7.8	ER50

Taper : AT3

RPM

- In case fo using Coolant water : Max. 3000 rpm
- In case fo using Air coolant : Max. 1500rpm

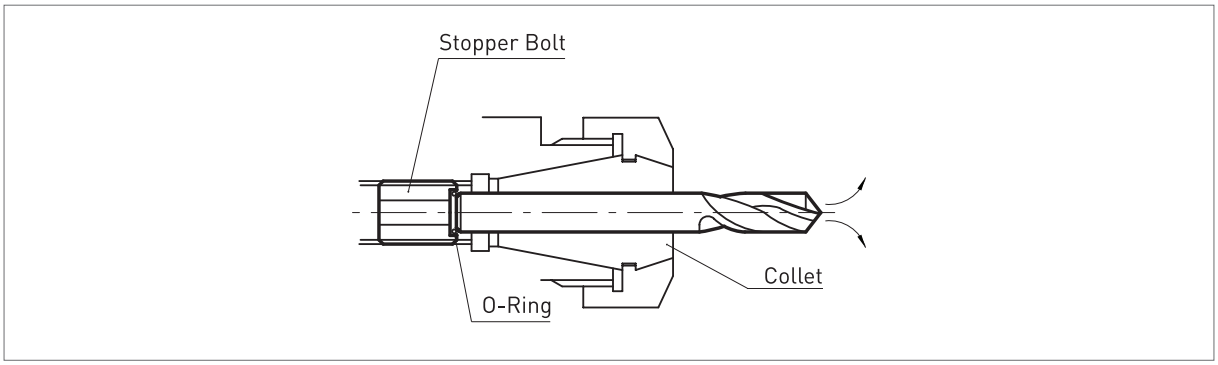
Available Pressure

MAX 20kg/cm

Using Tool : Coolant type

Oil Hole Type

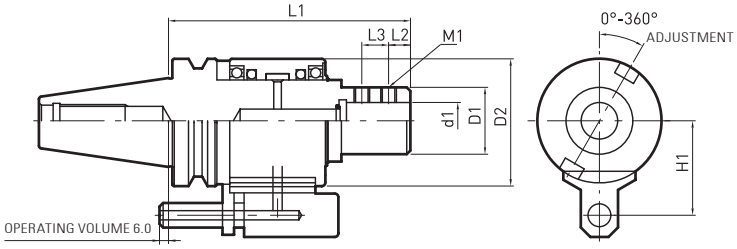
- Straight Shank Insert Drill
- Straight Shank Carbide Drill
- Straight Shank HHS Drill



NOTE

- Do not operating the main spindle without Coolant water or Air cooiant.
  It will cause a shortening tool life and holder life.
- Please tighten the shank toward the O-ring of Shopper bolt.
  If did not tighten the shank, the coolant water can be leakage and it cause come down a cooling efficiency or chip discharge.

OIL HOLE HOLDER



MAS403 BT-OHSL

mm

CODE NO.		d1	D1	D2	L1	H1	L2	L3	M1	WEIGH (kg)
BT40	OHSL16-160	16	48	90	160	65		25	M12X1.5	5.0
	OHSL20-160	20								4.9
	OHSL25-175	25			175		20	15		4.8
	OHSL32-175	32	50							5.9
BT50	OHSL16-170	16	48	105	175	80		25	M12X1.5	7.7
	OHSL20-170	20								
	OHSL25-180	25	55		180		20	15		7.6
	OHSL32-180	32	60							7.7
	OHSL40-180	40	65				25			8.8

RPM

- In case fo using Coolant water : Max. 3000 rpm
- In case fo using Air coolant : Max. 1500rpm

Available Pressure

MAX 20kg/cm

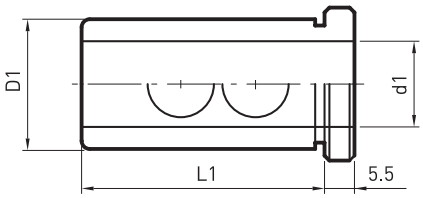
Using Tool : Coolant type

Oil Hole Type

- Straight Shank Insert Drill
- Straight Shank Carbide Drill
- Straight Shank HHS Drill

NOTE

- Do not operating the main spindle without Coolant water or Air cooiant. It will cause a shortening tool life and holder life.
- Please tighten the shank toward the O-ring of Shopper bolt. If did not tighten the shank, the coolant water can be leakage and it cause come down a cooling efficiency or chip discharge.



SLEEVE OSL

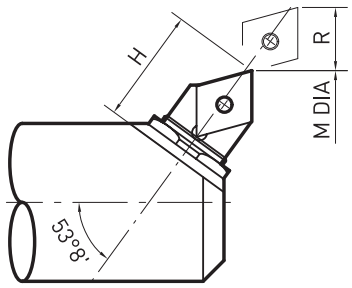
CODE NO.		d1	D1	L1
OSL25	16	16	25	48
	20	20		
OSL32	16	25	32	52
	20	32		
	25	16		
OSL40	16	20	40	62
	20	25		
	25	32		
	32	40		

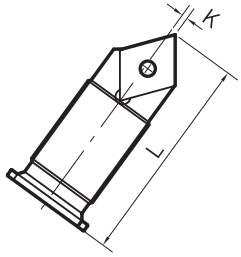
MICRO
BORING BAR

BORING SYSTEM

▶ MICRO BORING UNIT

TR.M





80° DIANMOND INSERT (SLANTED TYPE)

mm

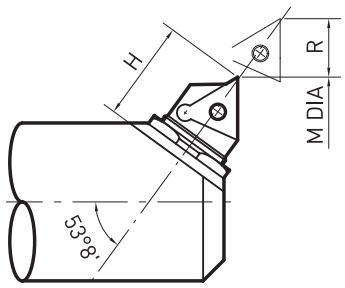
ORDER NO.	M (Min. Bore)	R	H	K	L	INSERT	SCREW	WRENCH
G2B-2CC	18.3	2.0	8.7	0.4	16.2	CCGT 040102	S2045 L6	WR-2 T6

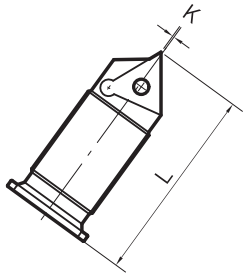
TOP ADJUST WAY

- Adjusting boring dimension(range) on the front side.

Adjusting method of boring dimension(range)

- Loosen the Retaining Bolt and turn the Adjusting Dial and then closing the tool body to required boring range.
- Fully close the Retaining Bolt and loosen this bolt by 1/2 turn. Turn the Adjusting Dial on front side.





TRIANGLE INSERT (SLANTED TYPE)

mm

ORDER NO.	M (Min. Bore)	R	H	K	L	INSERT	SCREW	WRENCH
G3A-2TC	26.2	5.1	13.0	0.2	25.4	TCGT060204	S1845L5	WR-2.5 T6
G3B-2TC	23.0	1.9	13.0	0.2	21.4			WR-2.5 T6
G5A-2TC	41.3	10.3	15.9	-1.2	39.7	TCMT110204	S2555L6	WR-4 T8
G5B-2TC	35.7	5.6	15.9	-1.2	33.3			WR-4 T8
G7A-2TC	58.7	12.7	25.4	1.6	55.6	TCMT16T304	S4095L6	WR-6T 15
G10A-2TC	78.6	22.2	31.8	0.8	76.2			WR-8T 15

Brazed Type Unit

- It have high stability when counter boring.

M TYPE

mm

ORDER NO.				M	R	H	K	L		Insert Red.
UNIT	BRAZED		INSERT	Min. Bore	Total Adj. Range	Min. Height	Tool Pt. Offset	Insert TYPE	Brazed TYPE	Used As Datum
M1B2	F	E	-	13.5	1.2	6.4	0.4	-	2.0	0.2
M1A2				16.0	3.2					

NOTE

- F type : For an Iron foundry E type : For Herdened steel

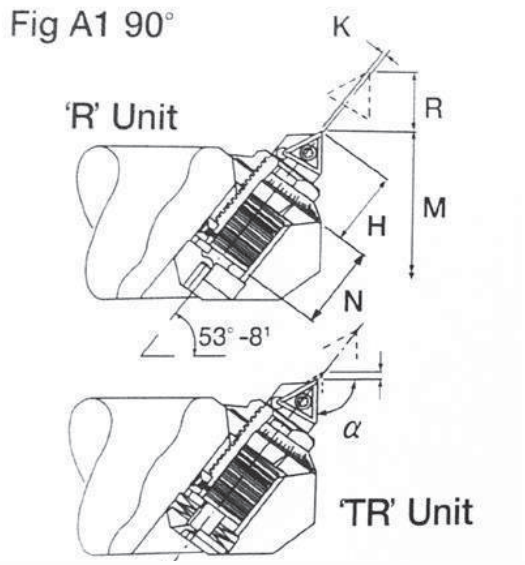
BORING SYSTEM

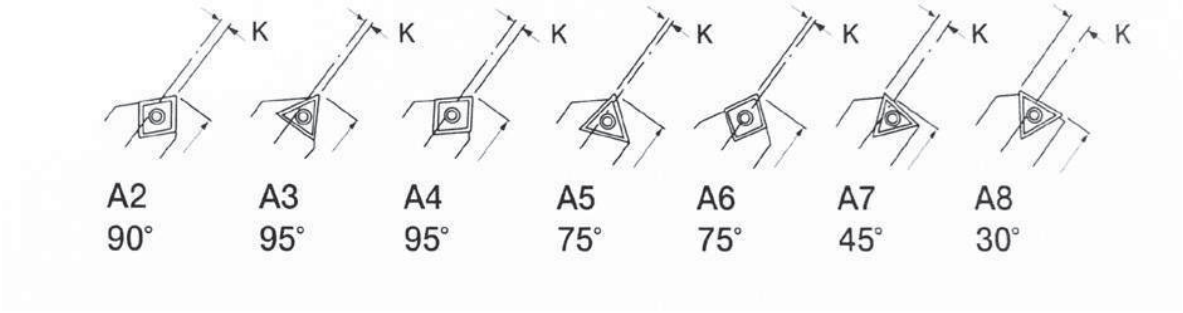
▶ MICRO BORIN UNIT

RIGIBORE 'R' & 'TR'

'R' for roughing & semi-finishing
'TR' for fine -finishing

Right Hand Units Shown
Left Hand Units(LH) are mirror Image
Adjustment = 0.01mm/.0004ins
on radius division



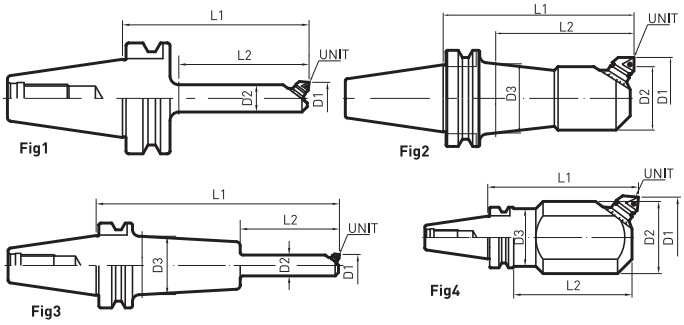


mm

UNIT SIZE	FIG A1 a'	INSERT	CODE	M MIN BORE POSSIBLE	R TOTAL RADLAL ADJUSTMENT	N	H MIN HEIGHT	K TOOL POINT OFFSET
				MIN~MAX mm	mm	mm	mm	mm
2	A1 90'	TC_06TI(02)	R2A2	20.9~25.4	4.5	4.5	9.4	1.35
			R2B2	18.2~20.2	2.0	2.0		
			R2B2S	15.87~16.62	0.75	0.75		
3		TC_0902(04)	R3A2	28~35.3	7.3	7.3	13.45	0.8
			R3B2	25~29	4.0	4.0		
5		TC_1102(04)	TR5A2	41.5~52.2	10.7	10.7	16.95	2.3
			TR5B2	36.5~42.1	5.6	5.6		
7		TC_16T3(08)	TR7A2	61.5~74.3	12.8	12.8	25.55	-0.4
10			TR10A2	81.5~104.5	23.0	23.0	31.7	

BORING SYSTEM

▶ MICRO BORING BAR



MAS403 BT-BCA

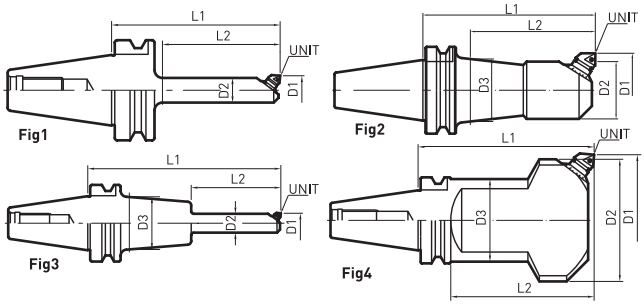
mm

CODE NO.		D MIN	D MAX	L1	L2	D2	D3	WEIGH (kg)	UNIT	INSERT	FIG
BT30	BCA13.5-75	13.5	15.9	75	48	13	-	1.2	M1B2F-40	-	3
	BCA14.5-75	14.5	16.9	75	48	14	-	1.2	M1B2E-40	-	
	BCA16.5-90	16.5	21.9	90	63	15.5	-	1.3	M1A2F-40	-	
	BCA19-90	19	23	90	63	17	17.5	1.3	G2B-2CC	CCGT040102	3
	BCA23-105	23	29	105	78	20	-	1.4	G3B-2TC	TCGT060204	1
	BCA29-120	29	41	120	95	25	28	1.5	G3A-2TC	TCGT060204	3
	BCA38-120	38	49	120	95	36	37	1.7	G5B-2TC	TCMT110204	
	BCA46-120	46	66	120	98	38	40	1.7	G5A-2TC	TCMT110204	2
BT40	BCA13.5-105	13.5	15.9	105	65	13	-	1.5	M1B2F-40	-	3
	BCA13.5-180	13.5	15.9	180	65	13	44	2.0	M1B2F-40	-	
	BCA14.5-105	14.5	16.9	105	65	14	-	1.5	M1B2E-40	-	
	BCA14.5-180	14.5	16.9	180	65	14	44	2.0	M1B2E-40	-	
	BCA16.5-105	16.5	21.9	105	73	15.5	-	1.5	M1A2F-40	-	3
	BCA16.5-180	16.5	21.9	180	73	15.5	44	2.0	M1A2F-40	-	
	BCA19-120	19.0	23	120	86	17	-	1.5	G2B-2CC	CCGT040102	3
	BCA19-180	19.0	23	180	86	17	44	2.0			
	BCA23-135	23.0	29	135	92	20	-	1.5	G3B-2TC	TCGT060204	1
	BCA23-195	23.0	29	195	102	20	50	2.0			3
	BCA29-150	29.0	41	150	108	25	28	1.5	G3A-2TC	TCGT060204	2
	BCA29-195	29.0	41	195	113	25	50	2.0			3
	BCA38-150	38.0	49	150	115	36	37	1.7	G5B-2TC	TCMT110204	2
	BCA38-195	38.0	49	195	155	36	50	2.2			
	BCA46-150	46.0	66	150	118	38	40	2.1	G5A-2TC	TCMT110204	
	BCA46-210	46.0	66	210	165	38	50	2.8			
	BCA62-165	62.0	87	165	135	51	50	3.0	G7A-2TC	TCMT16T304	
	BCA62-225	62.0	87	225	198	51	62	4.5			
	BCA83-150	83.0	108	150	123	63	61	3.5	G7A-2TC	TCMT16T304	
	BCA83-225	83.0	108	225	198	63	61	6.0			
	BCA98-150	98.0	142	150	123	75	60	5.0	G10A-2TC	TCMT16T304	4

Taper : AT3

BORING SYSTEM

▶ MICRO BORING BAR



MAS403 BT-BCA

mm

CODE NO.		D1 min	D1 max	L1	L2	D2	D3	WEIGH (kg)	UNIT	INSERT	FIG
BT50	BCA13.5-120	13.5	15.9	120	67	13	35	4.0	M1B2F-40	-	3
	BCA13.5-195	13.5	15.9	195	67	13	50	5.0			3
	BCA14.5-120	14.5	16.9	120	68	14	35	4.0	M1B2E-40		3
	BCA14.5-195	14.5	16.9	195	68	14	50	5.0			3
	BCA16.5-120	16.5	21.9	120	73	15.5	40	4.0	M1B2F-40	-	3
	BCA16.5-195	16.5	21.9	195	73	15.5	55	5.0			3
	BCA19-135	19	23	135	81	17.5	18	4.0	G2B-2TC	CCGT040102	3
	BCA19-210	19	23	210	81	17.5	55	4.5			3
	BCA23-135	23	29	135	92	20	-	4.0	G3B-2TC	TCGT060204	1
	BCA23-210	23	29	210	102	20	55	5.0			3
	BCA29-150	29	41	150	112	25	28	4.5	G3A-2TC	TCGT060204	3
	BCA29-225	29	41	225	112	25	55	5.5			3
	BCA38-165	38	49	165	122	36	37	4.5	G5B-2TC	TCMT110204	2
	BCA38-225	38	49	225	167	36	36	5.0			2
	BCA46-165	46	66	165	122	38	45	5.0	G5A-2TC	TCMT110204	2
	BCA46-225	46	66	225	182	38	45	5.5			2
	BCA46-255	46	66	255	202	38	46	6.0			2
	BCA62-180	62	87	180	137	51	59	6.0	G7A-2TC	TCMT16T304	2
	BCA62-240	62	87	240	181	51	59	7.0			2
	BCA62-330	62	87	330	277	51	59	8.5			2
	BCA83-165	83	108	165	122	63	76	6.5			2
	BCA83-240	83	108	240	197	63	76	9.0			2
	BCA83-345	83	108	345	293	63	76	12.0			2
	BCA98-165	98	142	165	122	83	79	8.5	G10A-2TC	TCMT16T304	2
	BCA98-240	98	142	240	200	83	92	11.5			2
	BCA98-345	98	142	345	305	83	92	17.0			2
	BCA132-210	132	176	210	172	110	96	12.0			4
	BCA132-315	132	176	315	277	110	96	18.5			4
	BCA166-225	166	210	225	187	145	96	13.0			4
	BCA166-315	166	210	315	277	145	96	18.5			4
	BCA200-210	200	244	210	172	178	98	20.0			4

Taper : AT3

BORING SYSTEM

▶ MICRO BORING BAR _Straight type

K20:60
K32, K42:100

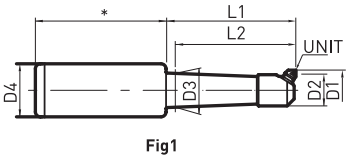


Fig1

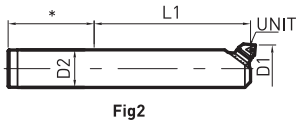


Fig2

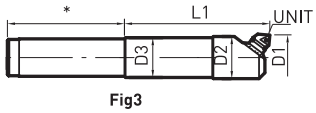
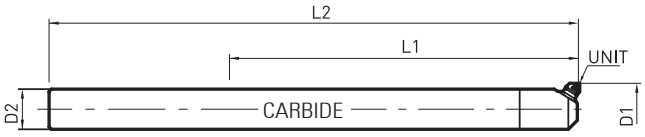


Fig3



K-BCA

mm

CODE NO.		D		L1	L2	D2	D3	UNIT	INSERT	FIG
		MIN	MAX							
K20	BCA13.5-75	13.5	15.9	75	67	13.0	13.0	M1B2F040	-	3
	BCA14.5-75	14.5	16.9			14.0	14.0	M1B2E-40		
	BCA16.5-90	16.5	18.0	90	89	15.5	16	M1A2F-40		
	BCA19-90	19.0	23		85	17	17.5	G2B-2CC	CCGT040102	
	BCA23-120	23.0	29	120	-	20.0	19	G3B-2TC	TCGT060204	2
	BCA29-120	29.0	41			27.0	26.0	G3A-2TC	TCGT060204	3
K32	BCA13.5-75	13.5	15.9	75	67	13.0	13.0	M1B2F040	-	3
	BCA14.5-75	14.5	16.9			14.0	14.0	M1B2E-40		
	BCA16.5-90	16.5	18.0	90	88	15.5	16.0	M1A2F-40		
	BCA19-90	19.0	23		80	17.5	18.0	G2B-2CC	CCGT040102	
	BCA23-120	23.0	29	120	105	20	19	G3B-2TC	TCGT060204	2
	BCA29-120	29.0	41		-	27	26	G3A-2TC		3
	BCA38-120	38.0	49		-	36	34	G5B-2TC	TCMT110204	3
	BCA46-120	46.0	66			38.0	36	G5A-2TC		
	BCA62-120	62.0	87			51.0	40	G7A-2TC	TCMT16T304	
K42	BCA13.5-75	13.5	15.9	75	67	13.0	13.0	M1B2F040	-	3
	BCA14.5-75	14.5	16.9			14.0	14.0	M1B2E-40		
	BCA16.5-90	16.5	18.0	90	87	15.5	20	M1A2F-40		
	BCA19-90	19.0	23		86	17.5	18.0	G2B-2CC	CCGT040102	
	BCA23-120	23.0	29	120	105	20	19	G3B-2TC	TCGT060204	2
	BCA29-120	29.0	41		-	27	26	G3A-2TC		3
	BCA38-120	38.0	49		-	36	34	G5B-2TC	TCMT110204	
	BCA46-120	46.0	66			38.0	36	G5A-2TC		
	BCA62-120	62.0	87		-	51.0	40	G7A-2TC	TCMT16T304	

BORING SYSTEM

▶ SQUARE BORING BAR

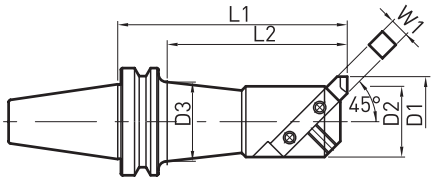


Fig1

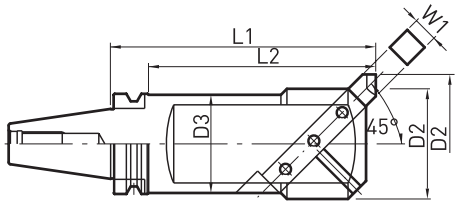


Fig2

MAS403 BT-BSA

mm

CODE NO.		D1 min	D1 max	L1	L2	D2	D3	W1	WEIGH (kg)	FIG
BT40	BSA25-135	25	38	135	105	20	23	8	1.4	1
	BSA30-150	30	42	150	120	24	27			
	BSA38-165	38	52	165	135	30	34	10	1.7	
	BSA42-165	42	56			34	38		1.8	
	BSA50-165	50	65	165	135	40	45	13	2.3	
	BSA50-210			210	180				3.1	
	BSA62-180	62	90	180	151	50	57	16	3.4	
	BSA62-225			225	196				4.6	
	BSA72-180	72	110	180	153	60	60	19	3.9	
	BSA72-225			225	198				5.0	
	BSA90-180	90	125	180	153	75	60	19	5.2	
	BSA90-225			225	198				6.2	
BT50	BSA25-135	25	38	135	92	20	23	8	4.2	1
	BSA30-165	30	42	165	122	24	27		4.4	
	BSA38-180	38	52	180	137	30	34	10	4.8	
	BSA42-210	42	56	210	167	34	38		5.0	
	BSA50-180	50	65	180	137	40	45	13	5.4	
	BSA50-240			240	197				5.7	
	BSA62-195	62	90	195	152	50	57	16	6.2	
	BSA62-270			270	227				7.6	
	BSA72-195	72	110	195	152	60	67	19	7.0	
	BSA72-285			285	242				9.3	
	BSA90-210	90	125	210	167	75	81		9.2	
	BSA90-300			300	257				12.3	
	BSA105-195	105	160	195	154	90	90	25	10.7	
	BSA105-285			285	244		94		15.0	
	BSA130-255	130	190	255	217	110	98		14.5	2

Taper : AT3

NOTE

- Square Bolt is out of our product range and we do not selling Square Bolt.

BORING SYSTEM

▶ SQUARE BORING BAR

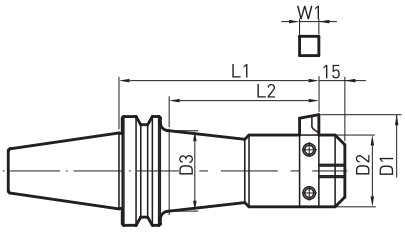


Fig1

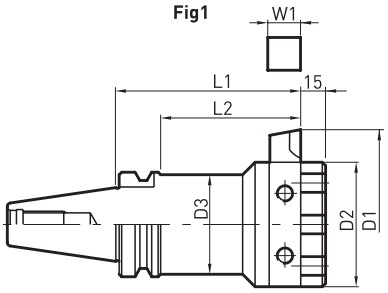


Fig2

MAS403 BT-BSB

mm

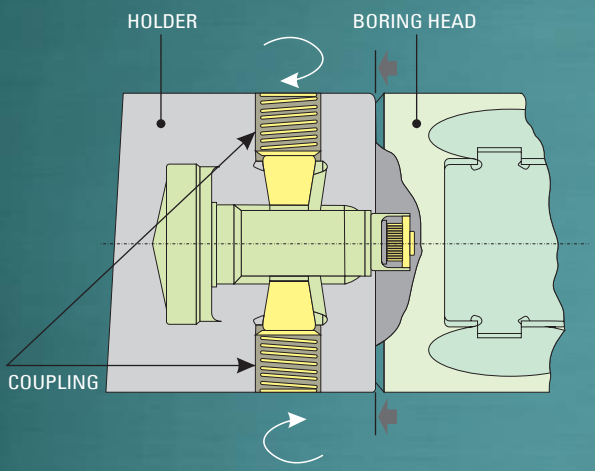
CODE NO.		D		L1	L2	D2	D3	W1	WEIGH (kg)	FIG
		MIN	MAX							
BT40	BSB25-135	25	52	135	103	20	22	8	1.6	1
	BSB38-165	38	70	165	133	32	33	10	1.9	
	BSB50-165	50	90	165	135	40	44	13	2.5	
	BSB50-210	50	90	210	180	40	44	13	3.3	
	BSB62-180	62	115	180	152	50	56	16	3.6	
	BSB62-225	62	115	225	197	50	56	16	4.8	
	BSB72-180	72	135	180	153	60	60	19	4.1	
	BSB72-225	72	135	225	198	60	60	19	5.2	
	BSB90-180	90	150	180	153	75	60	19	5.4	2
	BSB90-225	90	150	225	198	75	60	19	6.4	
BT50	BSB25-135	25	52	135	92	20	22	8	4.4	1
	BSB38-180	38	70	180	137	30	33	10	5.0	
	BSB50-180	50	90	180	137	40	44	13	5.6	
	BSB50-240	50	90	240	197	40	44	13	5.9	
	BSB62-195	62	115	195	152	50	56	16	6.4	
	BSB62-270	62	115	270	227	50	56	16	7.8	
	BSB72-195	72	135	195	152	60	66	19	7.2	
	BSB72-285	72	135	285	242	60	66	19	9.5	
	BSB90-210	90	150	210	167	75	80	19	9.4	
	BSB90-300	90	150	300	257	75	80	19	12.5	
	BSB105-195	105	190	195	155	90	94	25	10.9	
	BSB105-285	105	190	285	245	90	94	25	15.2	
	BSB130-255	130	260	255	217	110	98	25	14.7	2

Taper : AT3

NOTE

- Square Bolt is out of our product range and we do not selling Square Bolt.

MODULAR BORING SYSTEM



Clamp System

- A Locking system of Jeil's boring system combine the boring head with basic holder so that improving boring accuracy without vibration.

Strong Boring Head

- Our boring head keep strongness 80~90kg/mm by using special raw-materil and it is proper to heavy cutting boring by Dovetail design.

Simple and Accurate Adjustment

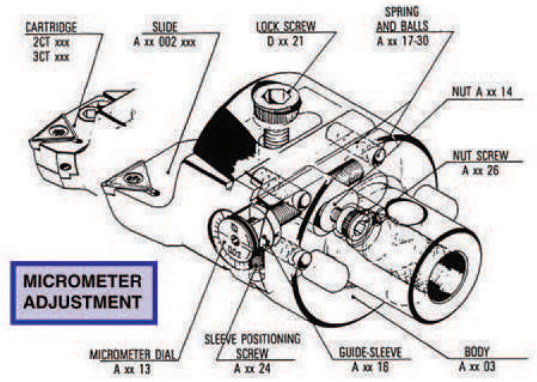
- Accuracy adjusting of tolerance of insert nose R by single blade so that it minimize a resistance which effect to the the boring head when machining.

BORING HEAD MODULAR SYSTEM

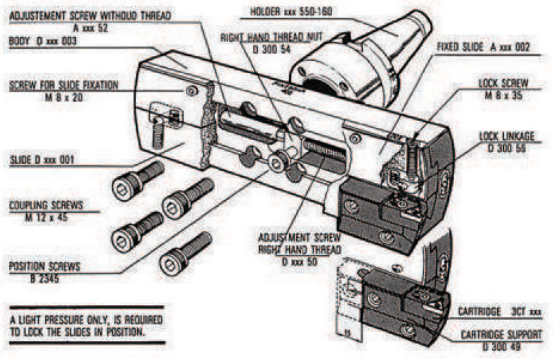
▸ BORING HEAD A1'SSY

Explanatory Diagram of Boring Head

• FINISHING BORING HEAD



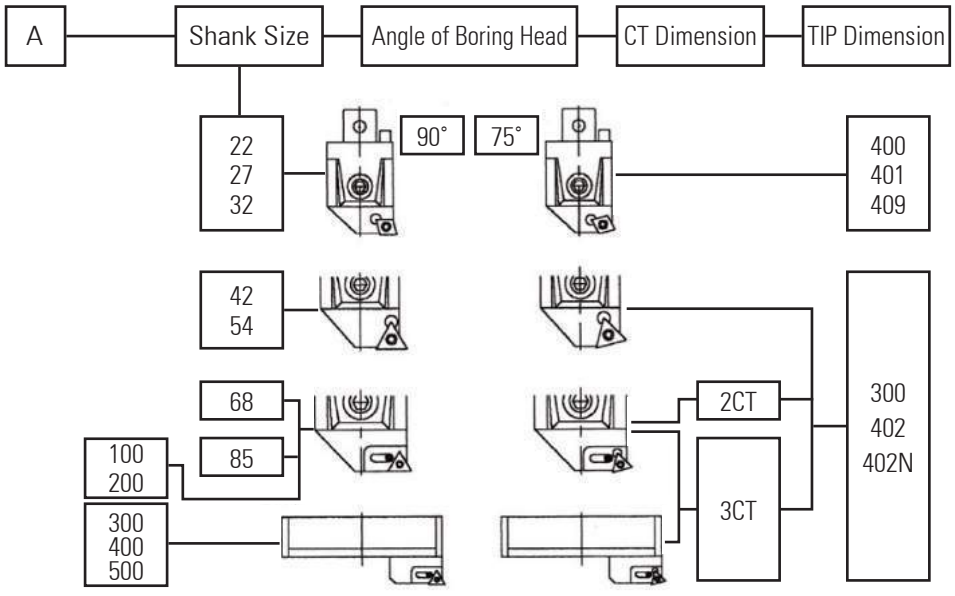
• RARGE SIZE FINISHING BORING HEAD



▸ BORING HEAD SELECTION

Explanatory Diagram of Boring Head selection

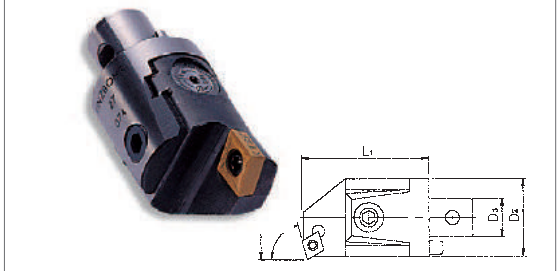
• FINISHING BORING HEAD



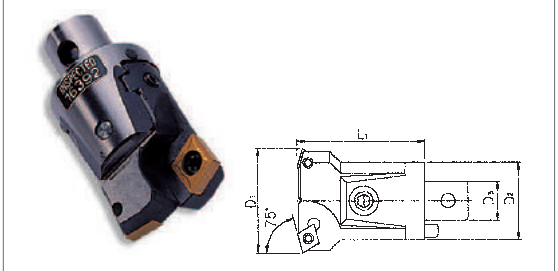
BORING HEAD MODULAR SYSTEM

▶ BORING HEAD

A FINISHING BORING HEAD

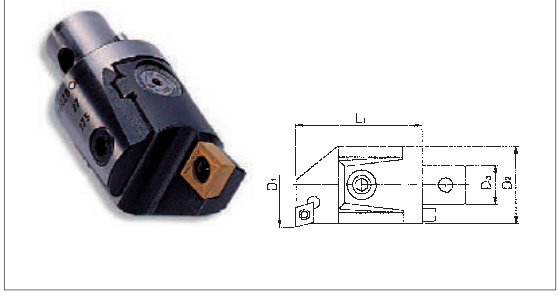


D ROUGHING BORING HEAD

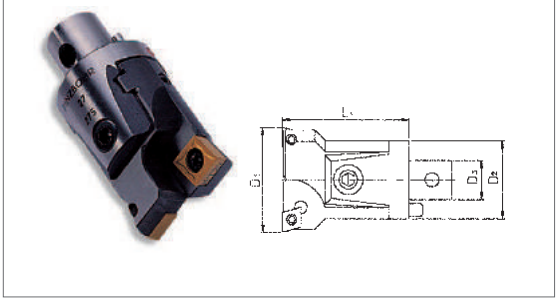


CODE NO.	D_1		D_2	D_3	L_1	Kg	INSERT	INSERT SCREW
	MIN	MAX						
A2275 400	24	30	22	12	34	0.08	CC..0602..	M2.5X5.6
A2275 409	29	40	27	15	42	0.18	CC..09T3..	M4X10
A3275 409	39	50	32	20	45	0.25	CC..09T3..	M4X10
D2275 400	24	30	22	12	34	0.10	CC..0602..	M2.5X5.6
D2275 409	29	40	27	15	42	0.18	CC..09T3..	M4X10
D3275 409	39	50	32	20	45	0.26	CC..09T3..	M4X10

A FINISHING BORING HEAD



D ROUGHING BORING HEAD

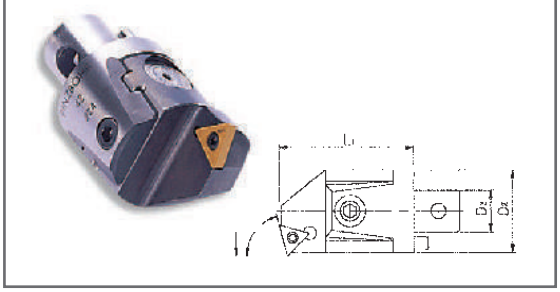


CODE NO.	D_1		D_2	D_3	L_1	Kg	INSERT	INSERT SCREW
	MIN	MAX						
A2290 400	24	30	22	12	34	0.08	CC..0602..	M2.5X5.6
A2790 409	29	40	27	15	42	0.18	CC..09T3..	M4X10
A3290 409	39	50	32	20	45	0.25	CC..09T3..	M4X10
D2290 400	24	30	22	12	34	0.10	CC..0602..	M2.5X5.6
D2790 409	29	40	27	15	42	0.18	CC..09T3..	M4X10
D3290 409	39	50	32	20	45	0.26	CC..09T3..	M4X10

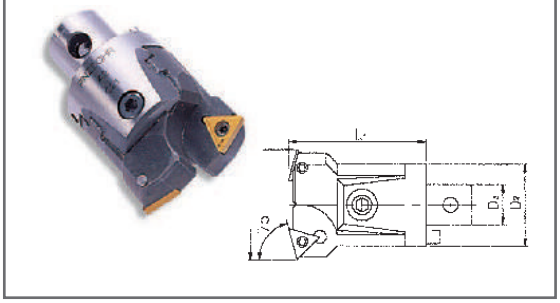
BORING HEAD MODULAR SYSTEM

▸ BORING HEAD

A FINISHING BORING HEAD

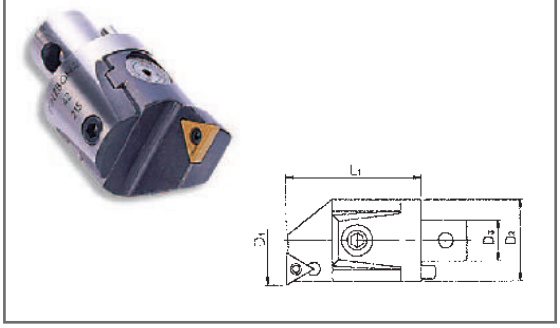


D ROUGHING BORING HEAD

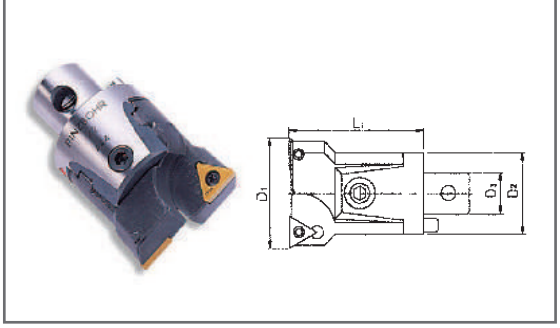


CODE NO.	D_1		D_2	D_3	L_1	Kg	INSERT	INSERT SCREW
	MIN	MAX						
A4275 300	49	65	42	24	56	0.58	TC..16T3..	M4X10
A5475 300	63	82	54	28	66	1.05	TC..16T3..	M4X10
A4275 300	49	65	42	24	56	0.6	TC..16T3..	M4X10
D4275 402	49	65	42	24	56	0.6	CC..1204..	M5X13.1
D5475 300	63	82	54	28	66	1.1	TC..16T3..	M4X10
D5475 402	63	82	54	28	66	1.1	CC..1204..	M5X13.1

A FINISHING BORING HEAD



D ROUGHING BORING HEAD

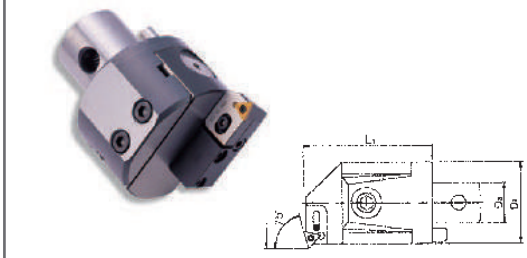


CODE NO.	D_1		D_2	D_3	L_1	Kg	INSERT	INSERT SCREW
	MIN	MAX						
A4290 300	49	65	42	24	56	0.58	TC..16T3..	M4X10
A5490 300	63	82	54	28	66	1.05	TC..16T3..	M4X10
A4290 300	49	65	42	24	56	0.6	TC..16T3..	M4X10
D4290 402	49	65	42	24	56	0.6	CC..1204..	M5X13.1
D5490 300	63	82	54	28	66	1.1	TC..16T3..	M4X10
D5490 402	63	82	54	28	66	1.1	CC..1204..	M5X13.1

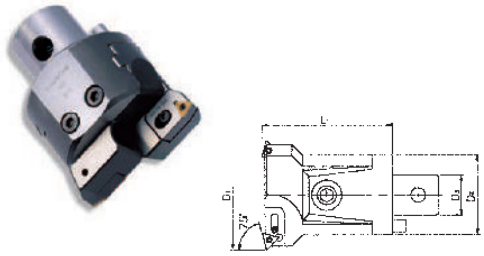
BORING HEAD MODULAR SYSTEM

▸ BORING HEAD

A FINISHING BORING HEAD

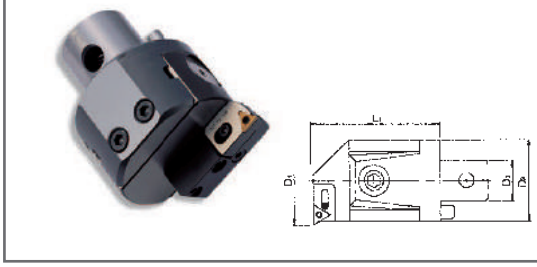


D ROUGHING BORING HEAD

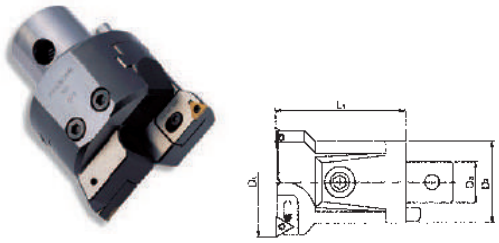


CODE NO.	D_1		D_2	D_3	L_1	Kg	INSERT	CARTRIDGES
	MIN	MAX						
A6875 2CT 300	80	102	68	36	86	2.18	TC..16T3..	2CT 75 300
A8575 3CT 300	100	125	85	50	100	4.2	TC..16T3..	3CT 75 300
A10075 3CT 300	125	160	100	60	100	6.6		
A20075 3CT 300	160	220	145	60	100	8.96		
D6875 2CT...	80	102	68	36	86	2.3	TC..16T3.. CC..1204..	2CT 75 300 2CT 75 402
D8575 3CT...	100	125	85	50	100	4.3	TC..16T3.. CC..1204..	3CT 75 300 3CT 75 402
D10075 3CT...	125	160	100	60	100	6.8		
D20075 3CT...	160	220	145	60	100	9.0		

A FINISHING BORING HEAD



D ROUGHING BORING HEAD

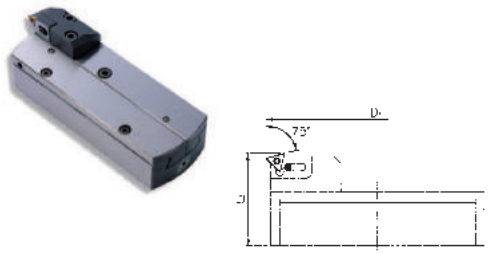


CODE NO.	D_1		D_2	D_3	L_1	Kg	INSERT	CARTRIDGES
	MIN	MAX						
A6890 2CT...	80	102	68	36	86	2.18	TC..16T3.. CC..1204..	2CT 90 300 2CT 90 402
A8590 3CT...	100	125	85	50	100	4.2	TC..16T3.. CC..1204..	3CT 90 300 3CT 90 402
A10090 3CT...	125	160	100	60	100	6.6		
A20090 3CT...	160	220	145	60	100	8.96		
D6890 2CT...	80	102	68	36	86	2.3	TC..16T3.. CC..1204..	2CT 90 300 2CT 90 402
D8590 3CT...	100	125	85	50	100	4.3	TC..16T3.. CC..1204..	3CT 90 300 3CT 90 402
D10090 3CT...	125	160	100	60	100	6.8		
D20090 3CT...	160	220	145	60	100	9.0		

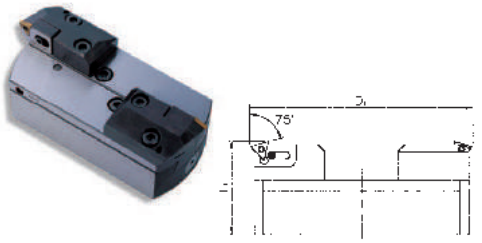
BORING HEAD MODULAR SYSTEM

▶ RARGE SIZE BORING HEAD

A FINISHING BORING HEAD

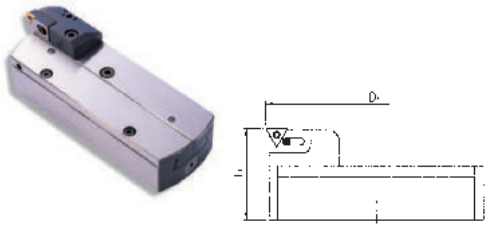


D ROUGHING BORING HEAD

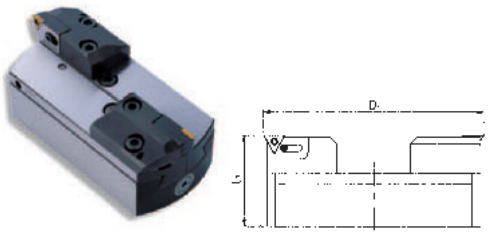


CODE NO.	D_1		L_1	Kg	INSERT	CARTRIDGES
	MIN	MAX				
A30075 3CT 300	220	320	90	9.3	TC..16T3..	3CT 75 300
A40075 3CT 300	290	400	90	12.85		
A50075 3CT 300	370	500	90	16.25		
D30075 3CT...	220	320	90	10.1	TC..16T3.. CC..1204..	3CT 75 300 3CT 75 402
D40075 3CT...	290	400	90	13.75		
D50075 3CT...	370	500	90	16.95		

A FINISHING BORING HEAD



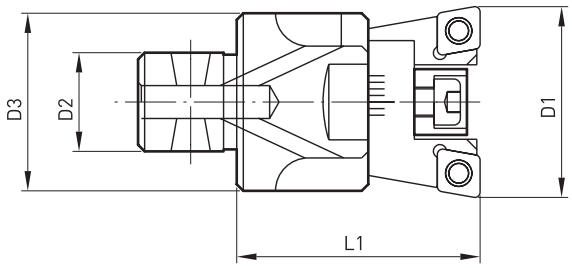
D ROUGHING BORING HEAD



CODE NO.	D_1		L_1	Kg	INSERT	CARTRIDGES
	MIN	MAX				
A30090 3CT...	220	320	90	9.3	TC..16T3.. CC..1204..	3CT 90 300 3CT 90 402
A40090 3CT...	290	400	90	12.85		
A50090 3CT...	370	500	90	16.25		
D30090 3CT...	220	320	90	10.1	TC..16T3.. CC..1204..	3CT 90 300 3CT 90 402
D40090 3CT...	290	400	90	13.75		
D50090 3CT...	370	500	90	16.95		

BORING HEAD MODULAR SYSTEM

▶ ROUGHING BORING HEAD



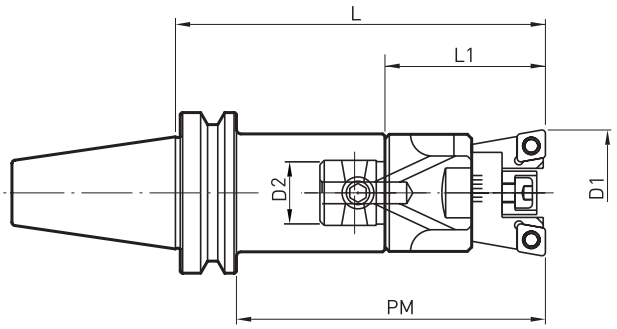
RBH (ROUGHING BORING HEAD)

mm

CODE NO.	D1		D2	D3	L1	Kg	INSERT	BASIC HOLDER
	MIN	MAX						
RBH29	29	38	15	27	37	0.07	CC..0602..	BH2715
RBH38	38	48	20	32	40	0.16	CC..0602..	BH3220
RBH48	48	60	24	42	54	0.23	CC..09T3..	BH4224
RBH60	60	75	28	54	67	0.40	CC..1204..	BH5428
RBH75	75	100	36	68	70	0.76	CC..1204..	BH6836
RBH100	100	130	50	85	75	1.80	CC..1204..	BH8550
RBH130	130	180	60	100	86	5.5	CC..1204..	BH10060

BORING HEAD MODULAR SYSTEM

▶ ROUGHING BORING HEAD



MAS403 BT-RBH

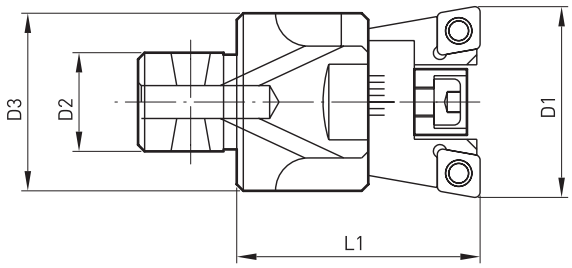
mm

CODE NO.		D1 MIN	D1 MAX	PM	L	L1	BASIC HOLDER	WEIGHT (Kg)
BT40	RBH29-142	29	38	115	142	37	BT40-27-130	1.60
	RBH38-152	38	48	125	152	40	BT40-32-130	1.70
	RBH48-185	48	60	158	185	54	BT40-42-160	2.40
	RBH60-188	60	75	161	188	67	BT40-54-160	2.90
	RBH75-211	75	100	184	211	70	BT40-68-200	4.00
BT30	RBH29-133	29	38	95	133	37	BT50-27-100	4.50
	RBH29-163			125	163		BT50-27-130	4.60
	RBH38-163	38	48	125	163	40	BT50-32-130	4.70
	RBH38-193			155	193		BT50-32-160	4.90
	RBH48-196	48	60	158	196	54	BT50-42-160	5.50
	RBH48-236			198	236		BT50-42-200	6.00
	RBH60-199	60	75	161	199	67	BT50-54-160	6.20
	RBH60-239			201	239		BT50-54-200	6.90
	RBH75-222	75	100	184	222	70	BT50-68-200	7.60
	RBH75-282			244	282		BT50-68-260	9.00
	RBH100-213	100	130	175	213	75	BT50-85-200	14.40
	RBH100-273			235	273		BT50-85-260	16.00
	RBH130-284	130	180	246	284	86	BT50-100-260	13.00
	RBH130-344			306	344		BT50-100-320	18.00

Taper : AT3

BORING HEAD MODULAR SYSTEM

▶ BASIC HOLDER



BH

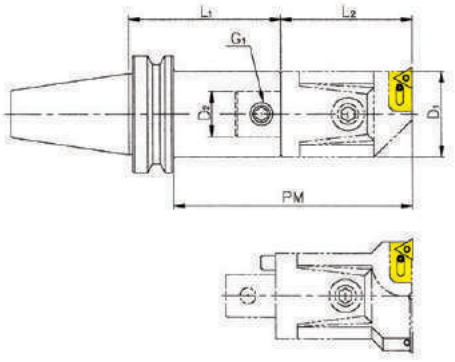
mm

CODE NO.		D_1	D_2	PM	L_1	L_2	WEIGHT (Kg)	G_1 (ARBOR SCREW)
BT30	22 100	22	12	100	88	34	0.58	22 - 68
	27 55	27	15	55	35	42	0.45	27 - 610
	27 100	27	15	100	80	42	0.64	27 - 610
	32 60	32	20	60	37	45	0.45	32 - 810
	32 100	32	20	100	77	45	0.69	32 - 810
BT40	22 50	22	12	50	43	34	1.20	22 - 68
	22 100	22	12	80	73	34	1.30	22 - 68
	22 80	22	12	100	93	34	1.40	22 - 68
	27 55	27	15	55	40	42	1.20	27 - 610
	27 100	27	15	100	85	42	1.45	27 - 610
	27 130	27	15	130	105	42	1.60	27 - 610
	32 60	32	20	60	42	45	1.20	32 - 810
	32 100	32	20	100	82	45	1.47	32 - 810
	32 130	32	20	130	112	45	1.70	32 - 810
	42 75	42	24	75	46	56	1.30	42 - 1014
	42 160	42	24	160	131	56	2.25	42 - 1014
	42 200	42	24	200	171	56	2.75	42 - 1014
	54 90	54	28	90	51	66	1.80	54 - 1220
	54 160	54	28	160	121	66	2.80	54 - 1220
	54 200	54	28	200	161	66	3.55	54 - 1220
	68 160	68	36	160	101	86	2.80	68 - 1624
	68 200	68	36	200	141	86	3.90	68 - 1624

Taper : AT3

BORING HEAD MODULAR SYSTEM

▶ BASIC HOLDER



BH

mm

CODE NO.		D_1	D_2	PM	L_1	L_2	WEIGHT (Kg)	G_1 (ARBOR SCREW)
BT50	22 80	22	12	80	84	34	4.20	22 - 68
	22 100	22	12	100	104	34	4.35	22 - 68
	27 55	27	15	55	51	42	4.05	27 - 610
	27 100	27	15	100	96	42	4.40	27 - 610
	27 130	27	15	130	126	42	4.50	27 - 610
	32 60	32	20	60	53	45	3.95	32 - 810
	32 130	32	20	130	123	45	4.60	32 - 810
	32 160	32	20	160	153	45	4.80	32 - 810
	42 75	42	24	75	57	56	4.15	42 - 1014
	42 160	42	24	160	142	56	5.20	42 - 1014
	42 200	42	24	200	182	56	5.80	42 - 1014
	54 90	54	28	90	62	66	4.80	54 - 1220
	54 160	54	28	160	132	66	5.80	54 - 1220
	54 200	54	28	200	172	66	6.50	54 - 1220
	68 115	68	36	115	67	86	4.45	68 - 1624
	68 200	68	36	200	152	86	7.20	68 - 1624
	68 260	68	36	260	212	86	8.85	68 - 1624
	85 200	85	50	200	138	100	7.85	85 - 1630
	85 260	85	50	260	198	100	10.65	85 - 1630
	85 320	85	50	320	258	100	13.40	85 - 1630
	•100 170	100	60	170	108	100	6.15	100 - 2035
	•100 260	100	60	260	198	100	12.85	100 - 2035
	•100 320	100	60	320	258	100	16.50	100 - 2035

Taper : AT3

NOTE

- •Marks are for below 200mm boring head

BORING HEAD MODULAR SYSTEM

▶ BASIC HOLDER

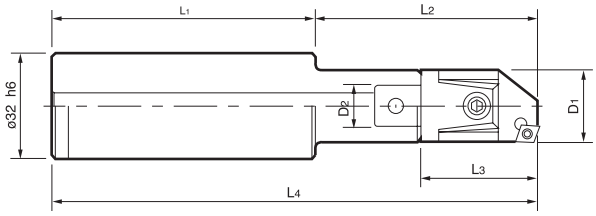


Fig 1

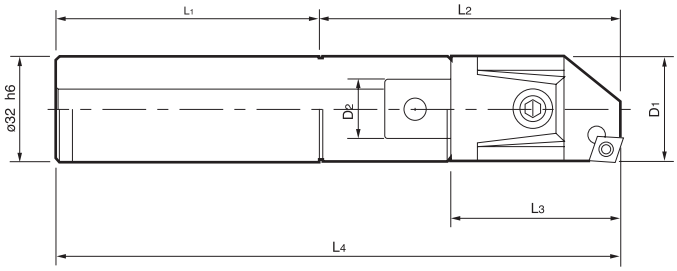


Fig 2

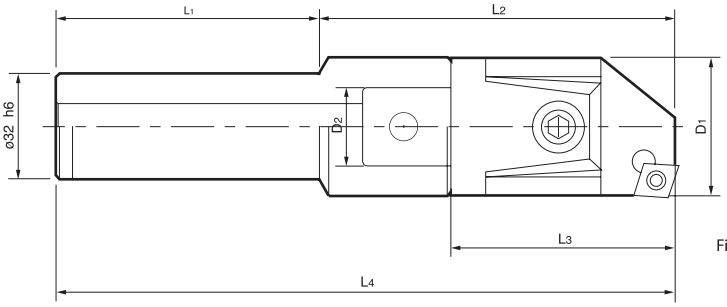


Fig 3

K-32

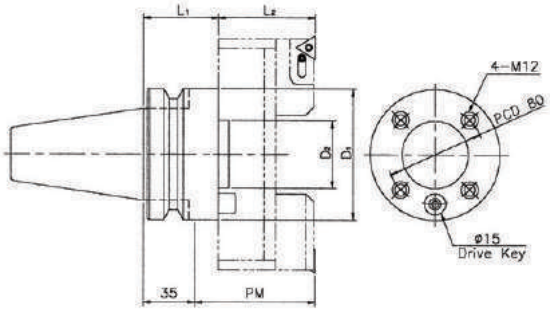
mm

CODE NO.		D_1	D_2	L_1	L_2	L_3	L_4	SCREW	Fig
K32	22 66	22	12	80	66	34	146	22 - 68	1
	27 81	27	15		81	42	161	27 - 610	1
	32 85	32	20		85	45	165	32 - 810	2
	42 96	42	24		96	56	176	42 - 1014	3
	54 106	54	28		106	66	186	54 - 1220	3

BORING HEAD MODULAR SYSTEM

▶ LARGE SIZE ARBOR

A300. 400. 500

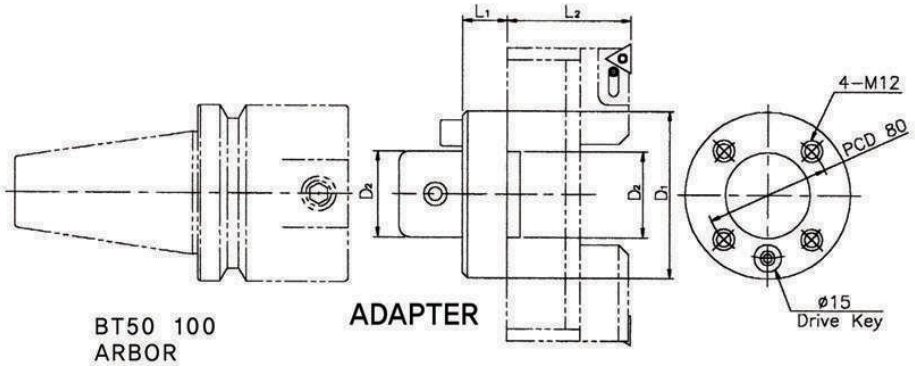


DIRECT TYPE

mm

CODE NO.	D1	D2	PM	L1	L2	WEIGHT (Kg)	HEAD SCREW
BT50 160	100	60	125	70	90	6.25	M12X45

▶ LARGE SIZE ADAPTER



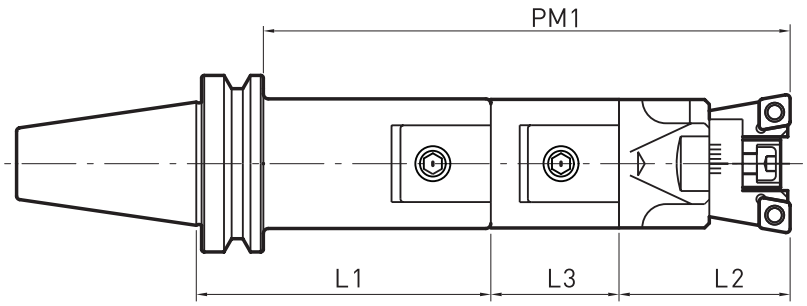
ADOPTER-ATTACHED TYPE

mm

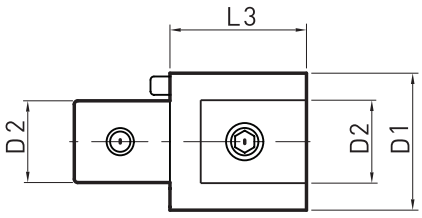
CODE NO.	D1	D2	L1	L2	WEIGHT (Kg)	HEAD SCREW
ADT100-50	100	60	50	90	4.6	M12X45

BORING HEAD MODULAR SYSTEM

▶ EXTENSION PIECE



ARBOR **EXTENSION PIECE** **HEAD**



P

㎜

CODE NO.	D1	D2	L3	WEIGHT (Kg)	SCREW
P 22 20	22	12	20	0.095	22-68
P 22 30			30	0.140	
P 27 30	27	15	30	0.180	27-610
P 27 45			45	0.250	
P 32 35	32	20	35	0.260	32-810
P 32 52			52	0.375	
P 42 40	42	24	40	0.480	42-1014
P 42 60			60	0.700	
P 54 50	54	28	50	0.950	54-1220
P 54 75			75	1.400	
P 68 60	68	36	60	1.800	68-1624
P 68 90			90	2.600	
P 85 70	85	50	70	3.050	85-1630
P 85 105			105	4.450	
P 100 80	100	60	80	4.600	100-2035
P 100 120			120	7.100	

How to extend the length of boring arbor

- PM1 = (L1-BT FLANGE thickness) + L3 + L2
- Pinzbohr's boring head cab be extend a langth with extension bar(piece)

Thickness of BT flange

- BT30 = 22
- BT40 = 27
- BT50= 38

DRILL TAPER HOLDER FOR DRILLING MACHINE, TAPPING MACHINE, RADIAL MACHINE, LARGE BORE BORING MACHINE

DRILL TAPPER

▶DRILL TAPPER CHUCK (Set)

Contents of Set

㎜

CODE NO.		TAP COLLET	Adaptor	Drill Holder
SDT24	3 4	T24-M6, M8, M10, M12, M16, M20, M24	J24-6	D24-MT2
SDT33	4 5	T33-M10, M12, M14, M16, M20, M24, M30	J33-6	D33-MT3
SDT52	5 6	T52-M20, M24, M30, M36, M42, M45, M48	J52-6	D52-MT4

NOTE

- In order to selection of Cutter Home, please let us know the model and company of Machine at ordering step.

Tapping range of Drill

㎜

CODE NO.		MT.NO	TAPPING RANGE			Drill Holder
			METRIC	INCH	PIPE	
SDT24	3	3	M4 - M24	U 3/16 - U 7/8	P 1/8 - P 1/2	Ø32
	4	4				
SDT33	4	4	M8 - M3+M35	U 5/16 - U 11/4	P 1/8 - P1	Ø50
	5	5				
SDT52	5	5	M20 - M60	U 7/8 - U2	P 1/2 - P1 3/4	Ø75
	6	6				

DRILL TAPPER

▶ DRILL TAPPER CHUCK

DT-MT

mm

CODE NO.		MT.NO	TAPPING RANGE			DRILLING BORE
			METRIC	INCH	PIPE	
DT24	3	3	M4 - M24	U 3/16 - U 7/8	P 1/8 - P 1/2	Ø32
	4	4				
DT33	4	4	M8 - M34,M35	U 5/16 - U 11/4	P 1/8 - P1	Ø50
	5	5				
DT52	5	5	M20 - M60	U 7/8 - U2	P 1/2 - P1 3/4	Ø75
	6	6				

NOTE

- In order to selection of Cutter Home, please let us know the model and company of Machine at ordering step.

▶ DRILL TAPPER COLLET

T-M, T-U, T-P

mm

CODE NO.	STANDARD SIZE		Application Drill Holder
T24	METRIC	M4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 27	DT24
	INCH	U3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8, 1	
	PIPE	P 1/8, 1/4, 3/8, 1/2	
T33	METRIC	M8, 10, 12, 14, 16, 18, 20, 22, 24, 27, 30, 33, 34	DT33
	INCH	U 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8, 1, 1/8, 1/4	
	PIPE	P1/8, 1/4, 3/8, 1/2, 3/4, 1	
T52	METRIC	M20, 22, 24, 27, 30, 33, 36, 39, 42, 45, 48, 52, 60	DT52
	INCH	U 7/8, 1, 1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 3/4, 1 7/8, 2	
	PIPE	P 1/2, 3/4, 1, 1 1/4, 1 1/2, 1 3/4	

DRILL TAPPER

▶ DRILL TAPPER DRILL CHUCK

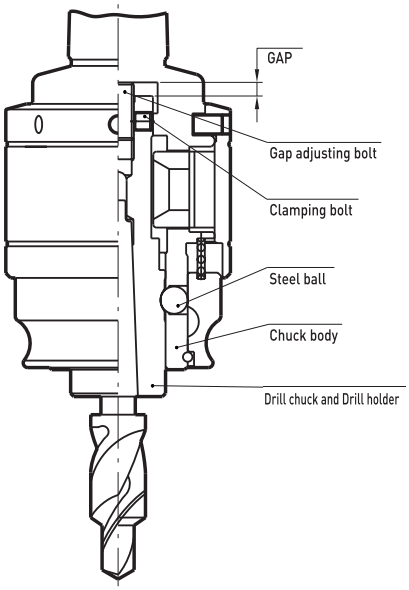
DT-MT

CODE NO.		JT.NO	DRILLING BORE	APPLICATION DRILL HOLDER
J24	6	6	1-13	DT24
J33				DT33
J52				DT52

▶ DRILL TAPPER DRILL CHUCK

D-MT

CODE NO.		DRILLING BORE	APPLICATION DRILL HOLDER
D24	MT1, MT2, MT3	2.0-32	DT24
D33	MT1, MT2, MT3, MT4	2.0-50	DT33
D52	MT2, MT3, MT4, MT5	14.1-75	DT52



How to operating Drill Chuck and Drill Holder

1. Insert the Drill chuck or Drill holder into the body and then adjusting the Gap adjusting bolt till set the steel ball on position.
2. After clamping the Clamping bolt, and check that the steel ball has been fixed on position by slowly rotating the Drill chuck or Drill holder.

ACCESSORIES

▶ TOOL SETTING STAND

TSS

Prevent Main Spindle

- Prevent the Holder taper(shank) when clamping the PS bolt and setting-up a tool so that prevent the main spindle after assembling a toolholders into the main spindle.

Easy Clamping

- Easy clamping of P/S bolt by Rachet handle.

Perfect Vise

- Easy setting-up a tool by complete holding a toolholders.

CODE NO.	APPLICATION HOLDER
TSS 40	BT 40
TSS 50	BT 50

- Clamping P/S bolt by human power

- Fixing the holder by turning Cap handle

- Closing and turn the rachet handle

- Setting-up a tool

ACCESSORIES

▶ HSK TOOL SETTING STAND

DIN69893 HSK-TSS

CODE NO.	APPLICATION DRILL HOLDER
TSS-BT30 (HIGH-SPEED)	BT 30 [For without Head Home]
TSS-BT30-2	BT 30
TSS-BT40-2	BT 40
TSS-BT50-2	BT 50
TSS-HSK40	HSK40
TSS-HSK50	HSK50
TSS-HSK63	HSK63
TSS-HSK100	HSK100

▶ BT TOOL SETTING STAND

MAS403 BT-TSS

CODE NO.	APPLICATION DRILL HOLDER	TYPE
TSS-BT30AL	BT30	A
TSS-BT40AL	BT40	
TSS-BT50AL	BT50	
TSS-HSK 40	HSK 40	B
TSS-HSK 50	HSK 50	
TSS-HSK 63	HSK 63	
TSS-HSK 100	HSK 100	

ACCESSORIES

▶ TOUCH SENSOR

mm

CODE NO.	Shank (Diameter)	Ball (Diameter)	Stylus length	Shank length
TP-20	20	10	38	115
TP-32	32			

TP

Optoelectronic detecting sensor

- When detected, It makes 'Bi-bi'sound with red-lamp
- The sensor is suitable for various machines such as machining center, milling machine, drilling machine, boring machine
- If the sheel ball of Stylus exceeds to detecting point, the spring will operate to prevent damage
- Battery AG13X2Pcs is used

※ Direction Z would not be floating. So, when Z-axis has detected, only available to touch X, Y-axis to avoid damage

▶ BASE MASTER

ZOP-50

Indicator Z axis Gauge

- Be used at setting a zero point of height and length as a necessary for NC machine(Applicable for general machine tools including machining center of Vertical, Horizontal type).

  The way of Indicator is easy to decipher and measure very precisely.
- Base Height 50mm
- Degree of precision 0.01mm

HP-100

Indicator Z axis Gauge

- Since the material of product has formed SKS3FH, there is no transformation to be a forging product more than HRc60
- Fully inserted Daniel gauge internally to prevent a breakage from external impact
- Base Height 100mm
- Degree of precision 0.01mm

▶ MAGNETIC BASE MASTER

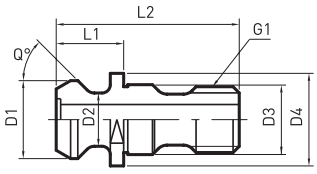
ZDI-50/ZDI-100

Indicator Z axis Gauge

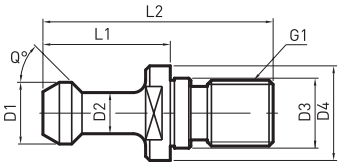
- Be used at setting a zero point of height and length as a necessary for NC machine(Applicable for general machine tools including machining center of Vertical, Horizontal type). The way of Indicator is easy to decipher and measure very precisely.
- Base Height 50mm
- Degree of precision 0.01mm

ACCESSORIES

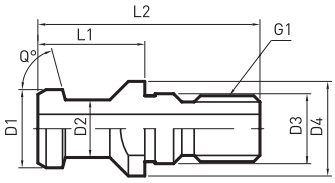
▶ PULL STUD BOLT



(ISO7388, PS-G TYPE)



(P TYPE)



(DIN69872 TYPE)

NOTE

- Other size can be supplied based on order made.

PS

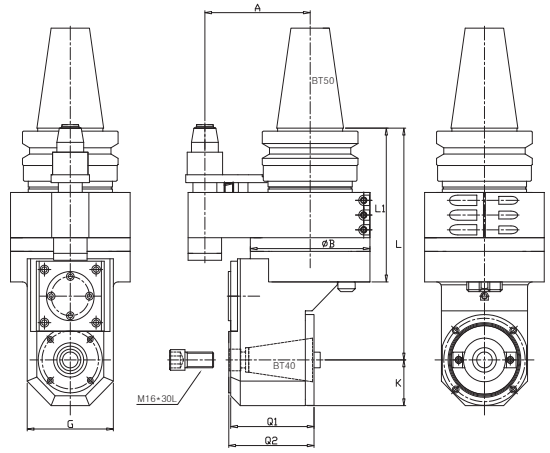
mm

CODE NO.		D1	D2	D3	D4	L1	L2	Q°	G1
P30T	1	11	7	12.5	16.5	23.0	43.0	45°	M12
	2							60°	
	3							90°	
P40T	1	15	10	17	23.0	35.0	60.0	45°	M16
	2							60°	
	3							90°	
P50T	1	23	17	25	38.0	45.0	85.0	45°	M24
	2							60°	
	3							90°	
HP40T(PSG)	51	19	12.5	17	22.0	19.1	44.1	45°	M16
HP50T(PSG)	41	29	20.8	25	37.0	25.2	65.2	45°	M24
SK40(DIN69872)	309	19	14.0	17	23.0	26.0	54.0	75°	M16
SK50(DIN69872)	512	28	21.0	25	36.0	34.0	74.0	75°	M24
JIS(6339)	1	19	14	17	23	29	54	75°	M16

ANGLE HEAD

WAN 50-40

"Arbor type of Angle Head for high efficiency and precision machining!"



CODE

Classification	Code	Code Description		
		Fixed	Parameter value	Parameter value
ANGLE HEAD	WAN 50-40	WAN	50	40
			BT50 for Machine Side	BT40 for Tool Side
UNIVERSAL HEAD	WUN A-B	WUN	A	B
			Taper of Machine Side	Taper of Tool Side
BORING HEAD	WBO	WBO	-	-
			-	-
TILTING HEAD	WTI A-B	WTI	A	B
			Taper of Machine Side	Taper of Tool Side

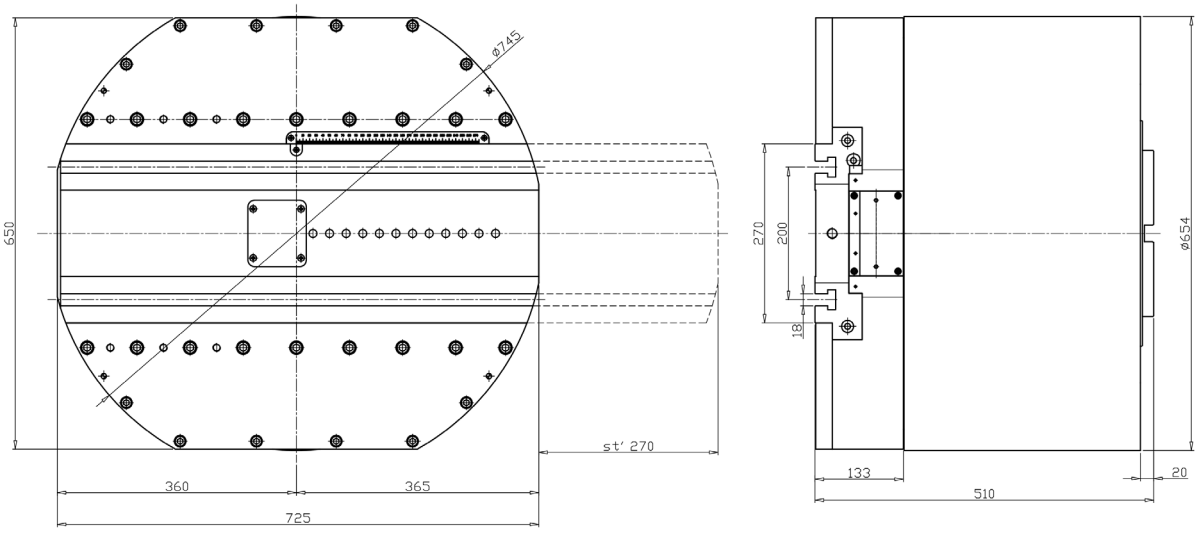
SIZE

WAN 50-40	L	L1	K	G	Q1	Q2	ØB	A	Tool	W(kg)
	236	156.5	46.5	90	87	89	125	110	BT40	15

ANGLE HEAD

CNC FACING HEAD 750

- Product which can make machining in Vertical Lathe proceed in Boring Machine.
- Saving machining time, machining cost. Variable machining works.
- Best Performance with Precision process and round work.
- Easy to use and Up to date automatic control function.



PRODUCT LIST

- Angle Head
- Boring Head
- Facing Head
- Special customized product

SPINDLE SPEEDER

▶ ROTATING TOOL HOLDER

AXIAL ROTATING TOOL HOLDER

- Special design for Low-noise & High-rigidity.
- Use thermal material to minimize variation of accuracy.
- Every precision spindle spends long-hours on a special test bench.

Division	Item				
Shank	BMT45	BMT55	BMT65	BMT75	BMT85
ER, ET Collet Size	20	25	32	40	50
Drill Size	1~13	1~16	2~20	3~26	10~34

SPINDLE SPEEDER

▶ ROTATING TOOL HOLDER

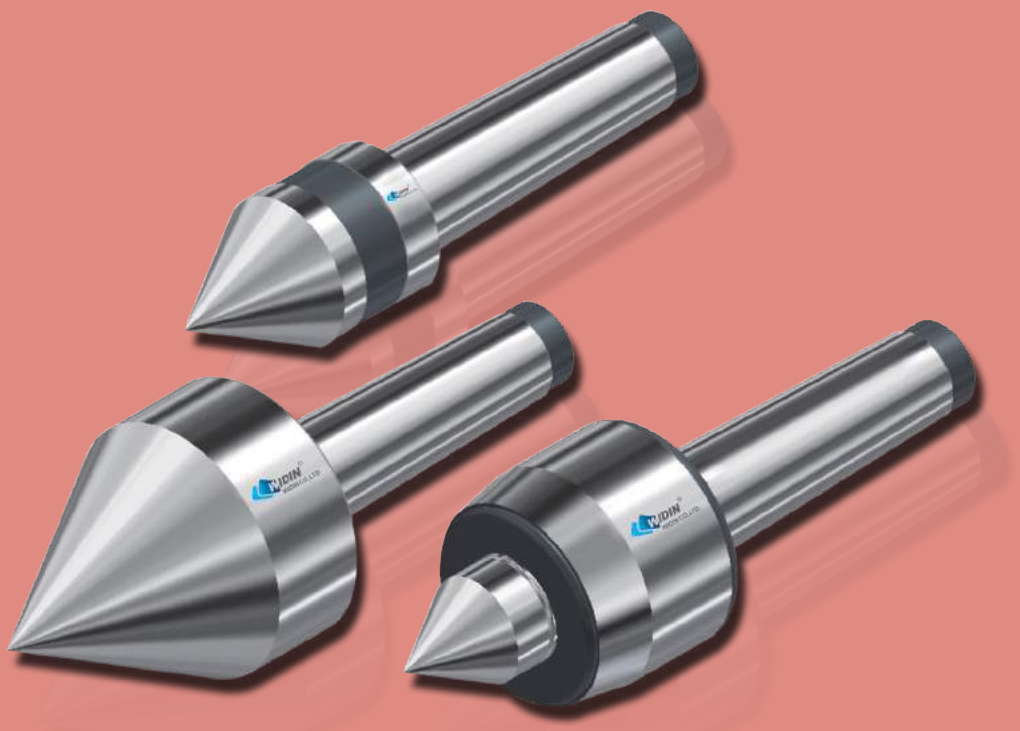
RADIAL ROTATING TOOL HOLDER

- Use special bevel gear for Low-noise & Low-vibration.
- Special design of high-rigidity bearing structure.
- All of our productions are designed & manufactured by customer demand.

Division	Item				
Shank	BMT45	BMT55	BMT65	BMT75	BMT85
ER, ET Collet Size	20	25	32	40	50
Drill Size	1~13	1~16	2~20	3~26	10~34

8

LIVE CENTER SERIES >



WIDIN®

LIVE CENTER SERIES

WIDIN

Appearance	Type	Page
	NC TYPE	898
	NCB TYPE	898
	NCC TYPE	898
	NCBC TYPE	899
	NCN TYPE	899
	NCBN TYPE	899
	NCCN TYPE	900
	NCBCN TYPE	900
	NCP TYPE	901
	NCPB TYPE	901
	NCPC TYPE	901
	NCPBC TYPE	902
	NCPN TYPE	902
	NCPBN TYPE	902
	NCPCN TYPE	903
	NCPBCN TYPE	903
	NK TYPE	904
	NKB TYPE	904
	NKC TYPE	904
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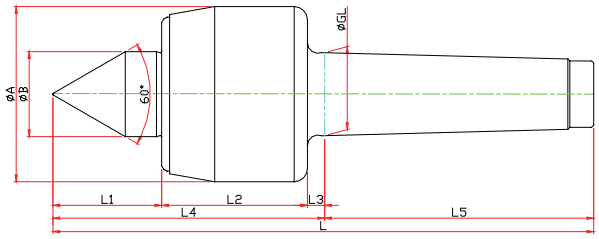
	NKN TYPE	905
	NKBN TYPE	905
	NKCN TYPE	906
	NKBCN TYPE	906
	NKD TYPE	907
	GR TYPE	907
	SM TYPE	908
	SMB TYPE	908
	SMC TYPE	908
	SMBC TYPE	909
	SMN TYPE	909
	SMBN TYPE	909
	SMCN TYPE	910
	SMBCN TYPE	910

Appearance	Type	Page
	SMP TYPE	911
	SMPB TYPE	911
	SMPC TYPE	911
	SMPBC TYPE	912
	SMPN TYPE	912
	SMPBN TYPE	912
	SMPCN TYPE	913
	SMPBCN TYPE	913
	D50 TYPE	914
	D50B TYPE	914
	D50C TYPE	914
	D50BC TYPE	915
	HD TYPE	916
	HDC TYPE	916
	HDS TYPE	916
	HDSC TYPE	917
	HDSTH TYPE	917
	PT-60 TYPE	918
	PT-80 TYPE	918
	LM-A TYPE	919
	LM-C TYPE	919
	LM-AN TYPE	920
	LM-CN TYPE	920
	LM-H TYPE	921
	LM-HC TYPE	921
	LM-HN TYPE	922
	LM-HCN TYPE	922
	LM-FN TYPE	923
	LM-#80 TYPE	923

NC TYPE

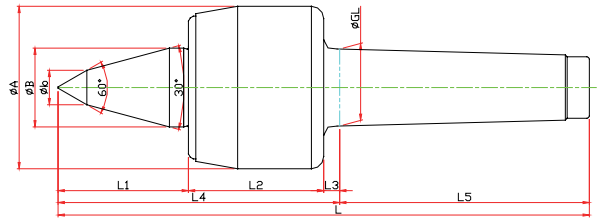
▶ NC-TYPE



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC–3NC	010003	NO.3	23.825	50	22	27	45	5	77	81	158	630	4800	0.003
LC–4NC	010004	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	204	1100	3800	0.003
LC–5NC	010005	NO.5	44.399	82	40	50	65	6.5	121.5	129.5	251	1600	3400	0.005
LC–6NC	010006	NO.6	63.384	105	45	54	80	8	142	182	324	2100	3000	0.005

▶ NCB-TYPE

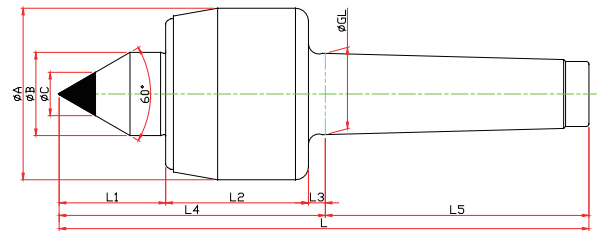
※ SHAFT EXTENTION(Minimize the bite-interference)



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	L			
LC–3NCB	011003	NO.3	23.825	50	22	10	47	45	5	97	81	178	630	4800	0.003
LC–4NCB	011004	NO.4	31.267	66	32	14	53	55	6.5	114.5	101.5	216	1100	3800	0.003
LC–5NCB	011005	NO.5	44.399	82	40	16	65	65	6.5	129.5	129.5	266	1600	3400	0.005
LC–6NCB	011006	NO.6	63.384	105	45	18	78	80	8	182	182	348	2100	3000	0.005

▶ NCC-TYPE

※ Carbide Type

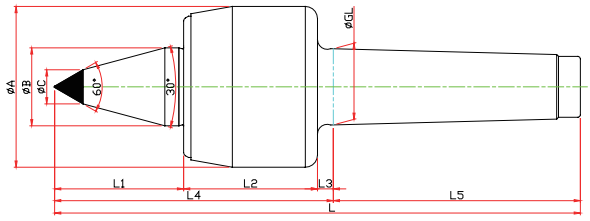


Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC–3NCC	010103	NO.3	23.825	50	22	27	45	5	77	81	10	158	630	4800	0.003
LC–4NCC	010104	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	14	204	1100	3800	0.003
LC–5NCC	010105	NO.5	44.399	82	40	50	65	6.5	121.5	129.5	18	251	1600	3400	0.005
LC–6NCC	010106	NO.6	63.384	105	45	54	80	8	142	182	25	324	2100	3000	0.005

NC TYPE

▶ NCBC-TYPE

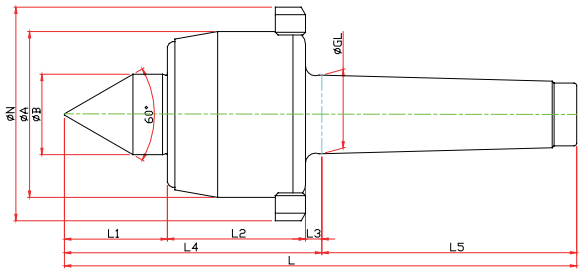
※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide Type



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC–3NCBC	011102	NO.3	23.825	50	22	47	45	5	97	81	10	178	630	4800	0.003
LC–4NCBC	011103	NO.4	31.267	66	32	53	55	6.5	114.5	101.5	14	216	1100	3800	0.003
LC–5NCBC	011104	NO.5	44.399	82	40	65	65	6.5	136.5	129.5	16	266	1600	3400	0.005
LC–6NCBC	011105	NO.6	63.384	105	45	78	80	8	166	182	18	348	2100	3000	0.005

▶ NCN-TYPE

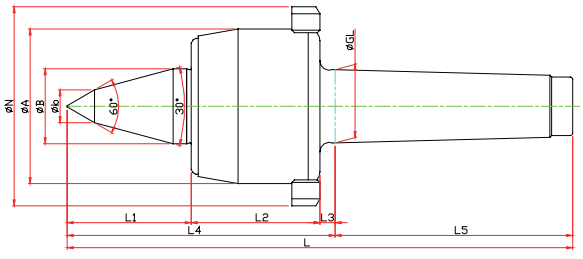
※ Nut Type



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	N	L			
LC–3NCN	010013	NO.3	23.825	50	22	27	45	5	77	81	70	158	630	4800	0.003
LC–4NCN	010014	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	85	204	1100	3800	0.003
LC–5NCN	010015	NO.5	44.399	82	40	50	65	6.5	121.5	129.5	105	251	1600	3400	0.005
LC–6NCN	010016	NO.6	63.384	105	45	54	80	8	142	182	130	324	2100	3000	0.005

▶ NCBN-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)
※ Nut Type

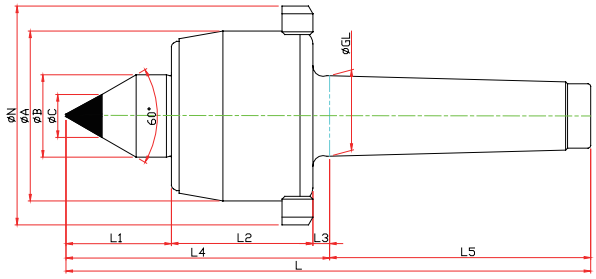


Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	N	L			
LC–3NCBN	011013	NO.3	23.825	50	22	10	47	45	5	97	81	70	178	630	4800	0.003
LC–4NCBN	011014	NO.4	31.267	66	32	14	53	55	6.5	114.5	101.5	85	216	1100	3800	0.003
LC–5NCBN	011015	NO.5	44.399	82	40	16	65	65	6.5	136.5	129.5	105	266	1600	3400	0.005
LC–6NCBN	011016	NO.6	63.384	105	45	18	78	80	8	166	182	130	348	2100	3000	0.005

NC TYPE

▶ NCCN-TYPE

※ Nut, Carbide Type Type

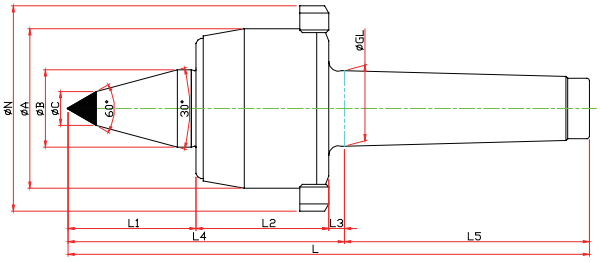


Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	N	L			
LC–3NCCN	010113	NO.3	23.825	50	22	27	45	5	77	81	10	70	158	630	4800	0.003
LC–4NCCN	010114	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	14	85	204	1100	3800	0.003
LC–5NCCN	010115	NO.5	44.399	82	40	50	65	6.5	121.5	129.5	18	105	251	1600	3400	0.005
LC–6NCCN	010116	NO.6	63.384	105	45	54	80	8	142	182	25	130	324	2100	3000	0.005

▶ NCBCN-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)

※ Nut, Carbide Type Type

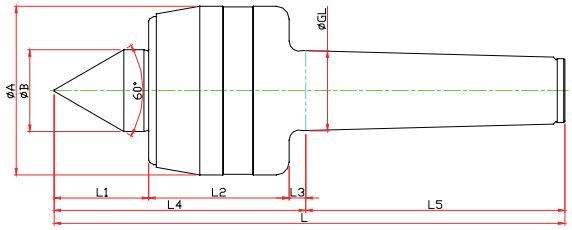


Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	N	L			
LC–3NCBCN	011113	NO.3	23.825	50	22	47	45	5	97	81	10	70	178	630	4800	0.003
LC–4NCBCN	011114	NO.4	31.267	66	32	53	55	6.5	114.5	101.5	14	85	216	1100	3800	0.003
LC–5NCBCN	011115	NO.5	44.399	82	40	65	65	6.5	136.5	129.5	16	105	266	1600	3400	0.005
LC–6NCBCN	011116	NO.6	63.384	105	45	78	80	8	166	182	18	130	348	2100	3000	0.005

▶ NC-SPECIAL

NCP TYPE

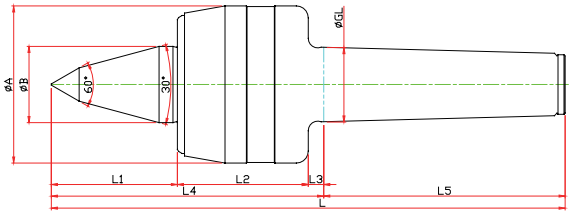
▶ NCP-TYPE



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC–3NCP	030003	NO.3	23.825	50	22	27	45	5	77	81	158	800	4800	0.003
LC–4NCP	030004	NO.4	31.267	66	32	37	55	6.5	98.5	101.5	200	1300	3800	0.003
LC–5NCP	030005	NO.5	44.399	82	40	45	65	6.5	116.5	129.5	246	1900	3400	0.005
LC–6NCP	030006	NO.6	63.384	100	45	65	80	8	153	182	335	2500	3000	0.005

▶ NCPB-TYPE

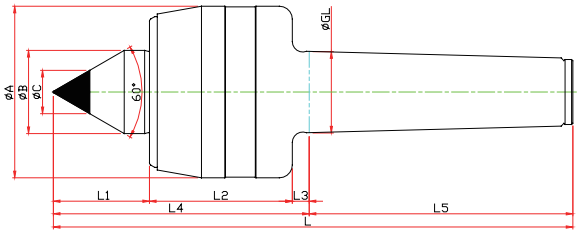
※ SHAFT EXTENTION(Minimize the bite-interference)



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	L			
LC–3NCPB	031003	NO.3	23.825	50	22	10	27	45	5	97	81	178	800	4800	0.003
LC–4NCPB	031004	NO.4	31.267	66	32	14	37	55	6.5	114.5	101.5	216	1300	3800	0.003
LC–5NCPB	031005	NO.5	44.399	82	40	16	45	65	6.5	136.5	129.5	266	1900	3400	0.005
LC–6NCPB	031006	NO.6	63.384	100	45	18	65	80	8	166	182	348	2500	3000	0.005

▶ NCPC-TYPE

※ Carbide Type

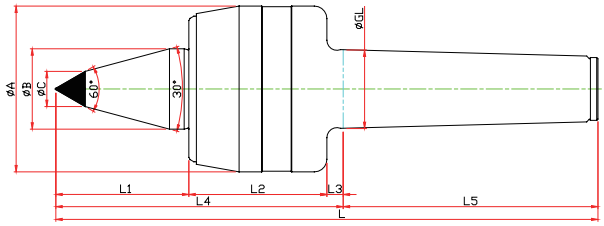


Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC–3NCPC	030103	NO.3	23.825	50	22	27	45	5	77	81	10	158	800	4800	0.003
LC–4NCPC	030104	NO.4	31.267	66	32	37	55	6.5	98.5	101.5	14	200	1300	3800	0.003
LC–5NCPC	030105	NO.5	44.399	82	40	45	65	6.5	116.5	129.5	18	246	1900	3400	0.005
LC–6NCPC	030106	NO.6	63.384	100	45	65	80	8	153	182	25	335	2500	3000	0.005

NCP TYPE

▶ NCPBC-TYPE

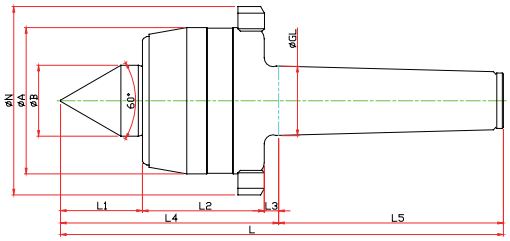
※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide Type



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC–3NCPBC	031103	NO.3	23.825	50	22	27	45	5	97	81	10	178	800	4800	0.003
LC–4NCPBC	031104	NO.4	31.267	66	32	37	55	6.5	114.5	101.5	14	216	1300	3800	0.003
LC–5NCPBC	031105	NO.5	44.399	82	40	45	65	6.5	136.5	129.5	16	266	1900	3400	0.005
LC–6NCPBC	031106	NO.6	63.384	100	45	65	80	8	166	182	18	348	2500	3000	0.005

▶ NCPN-TYPE

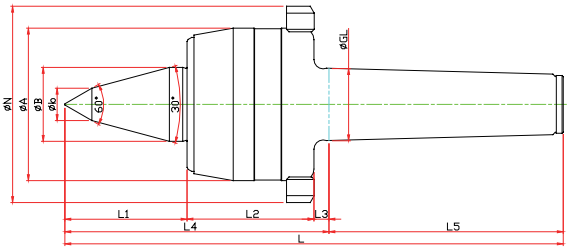
※ Nut Type



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	N	L			
LC–3NCPN	030013	NO.3	23.825	50	22	27	45	5	77	81	70	158	800	4800	0.003
LC–4NCPN	030014	NO.4	31.267	66	32	37	55	6.5	98.5	101.5	85	200	1300	3800	0.003
LC–5NCPN	030015	NO.5	44.399	82	40	45	65	6.5	116.5	129.5	105	246	1900	3400	0.005
LC–6NCPN	030016	NO.6	63.384	100	45	65	80	8	153	182	130	335	2500	3000	0.005

▶ NCPBN-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)
※ Nut Type

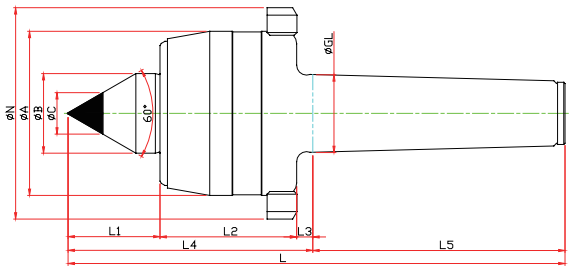


Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	N	L			
LC–3NCPBN	031013	NO.3	23.825	50	22	10	47	45	5	97	81	70	178	800	4800	0.003
LC–4NCPBN	031014	NO.4	31.267	66	32	14	53	55	6.5	114.5	101.5	85	216	1300	3800	0.003
LC–5NCPBN	031015	NO.5	44.399	82	40	16	65	65	6.5	136.5	129.5	105	266	1900	3400	0.005
LC–6NCPBN	031016	NO.6	63.384	100	45	18	78	80	8	166	182	130	348	2500	3000	0.005

NCP TYPE

▶ NCPCN-TYPE

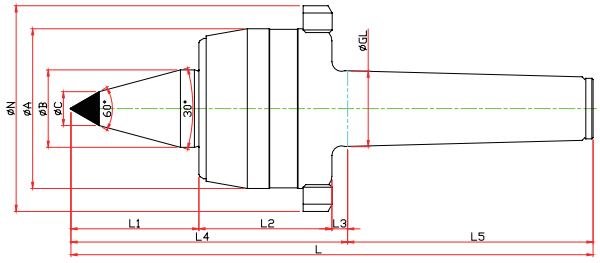
※ Nut, Carbide Type Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	N	L			
LC-3NCPCN	030113	NO.3	23.825	50	22	27	45	5	77	81	10	70	158	800	4800	0.003
LC-4NCPCN	030114	NO.4	31.267	66	32	37	55	6.5	98.5	101.5	14	85	200	1300	3800	0.003
LC-5NCPCN	030115	NO.5	44.399	82	40	45	65	6.5	116.5	129.5	18	105	246	1900	3400	0.005
LC-6NCPCN	030116	NO.6	63.384	100	45	65	80	8	153	182	25	130	335	2500	3000	0.005

▶ NCPBCN-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)
※ Nut, Carbide Type Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	N	L			
LC-3NCPBCN	031113	NO.3	23.825	50	22	47	45	5	97	81	10	70	178	800	4800	0.003
LC-4NCPBCN	031114	NO.4	31.267	66	32	53	55	6.5	114.5	101.5	14	85	216	1300	3800	0.003
LC-5NCPBCN	031115	NO.5	44.399	82	40	65	65	6.5	136.5	129.5	16	105	266	1900	3400	0.005
LC-6NCPBCN	031116	NO.6	63.384	100	45	78	80	8	166	182	25	130	348	2500	3000	0.005

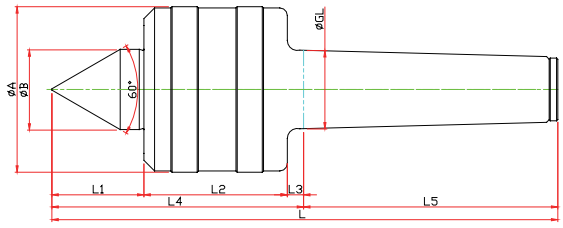
▶ NCP SPECIAL

※ Customized-special production for user's condition

LC-NK · NKD TYPE

▶ NK-TYPE

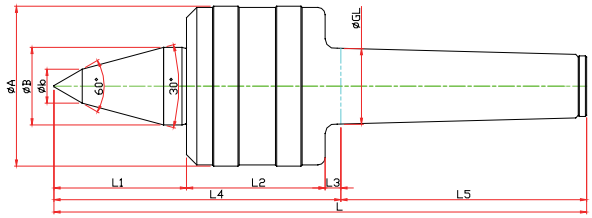
※ Center for heavy duty and Semi High Speed



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC-3NK	020003	NO.3	23.825	52	22	29	42	5	76	80	156	1900	5000	0.003
LC-4NK	020004	NO.4	31.267	66	32	37	57	6.5	100.5	101.5	202	2700	3800	0.003
LC-5NK	020005	NO.5	44.399	80	40	45.5	57	6.5	109	129.5	238.5	3200	3400	0.005
LC-6NK	020006	NO.6	63.348	132	65	65	100	8	173	182	355	10000	1800	0.005
LC-7NK	020007	NO.7	83.058	168	72	84	128	10	222	250	427	17200	1200	0.005

▶ NKB-TYPE

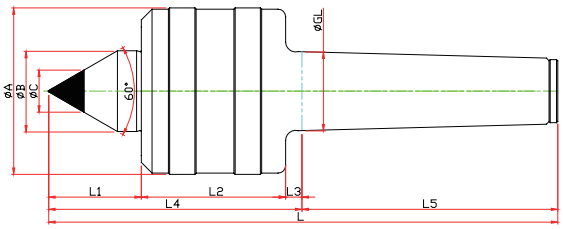
※ SHAFT EXTENTION(Minimize the bite-interference)



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	L			
LC-3NKB	021003	NO.3	23.825	52	22	10	48	42	5	95	80	175	1900	5000	0.003
LC-4NKB	021004	NO.4	31.267	66	32	14	53	57	6.5	116.5	101.5	218	2700	3800	0.003
LC-5NKB	021005	NO.5	44.399	80	40	18	65.5	57	6.5	129	129.5	258.5	3200	3400	0.005
LC-6NKB	021006	NO.6	63.348	132	65	25	78	100	8	186	182	368	10000	1800	0.005

▶ NKC-TYPE

※ Carbide Type

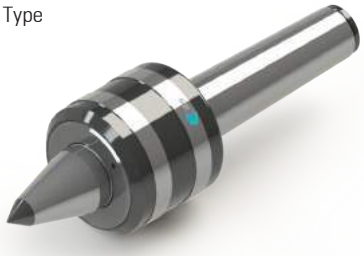


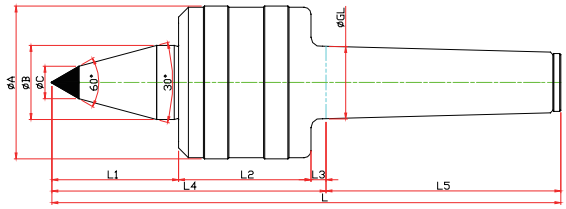
Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC-3NKC	020103	NO.3	23.825	52	22	29	42	5	76	80	10	156	1900	5000	0.003
LC-4NKC	020104	NO.4	31.267	66	32	37	57	6.5	100.5	101.5	14	202	2700	3800	0.003
LC-5NKC	020105	NO.5	44.399	80	40	45.5	57	6.5	109	129.5	18	238.5	3200	3400	0.005
LC-6NKC	020106	NO.6	63.348	132	65	65	100	8	173	182	25	355	10000	1800	0.005

LC-NK · NKD TYPE

▶ NKBC-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide Type

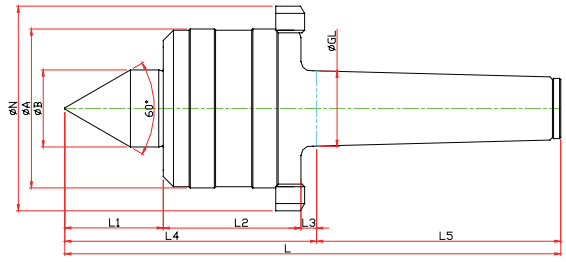




Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC–3NKBC	021103	NO.3	23.825	52	22	48	42	5	95	80	10	175	1900	5000	0.003
LC–4NKBC	021104	NO.4	31.267	66	32	53	57	6.5	116.5	101.5	14	218	2700	3800	0.003
LC–5NKBC	021105	NO.5	44.399	80	40	65.5	57	6.5	129	129.5	18	258.5	3200	3400	0.005
LC–6NKBC	021106	NO.6	63.348	132	65	78	100	8	186	182	25	368	10000	1800	0.005

▶ NKN-TYPE

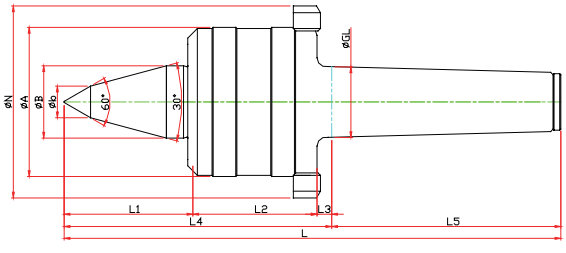
※ Nut Type



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	N	L			
LC–3NKN	020013	NO.3	23.825	52	22	29	42	5	76	80	70	156	1900	5000	0.003
LC–4NKN	020014	NO.4	31.267	66	32	37	57	6.5	100.5	101.5	85	202	2700	3800	0.003
LC–5NKN	020015	NO.5	44.399	80	40	45.5	57	6.5	109	129.5	98	238.5	3200	3400	0.005
LC–6NKN	020016	NO.6	63.348	132	65	65	100	8	173	182	165	355	10000	1800	0.005
LC–7NKN	020017	NO.7	83.058	168	72	84	128	10	222	250	210	427	17200	1200	0.005

▶ NKBN-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)
※ Nut Type

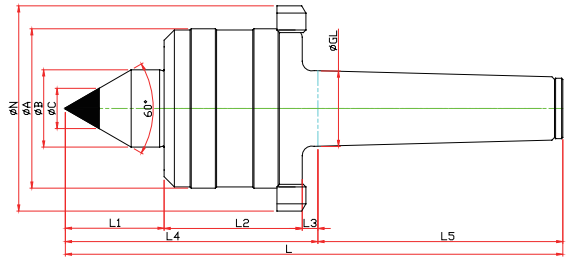


Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	N	L			
LC–3NKBN	021013	NO.3	23.825	52	22	10	48	42	5	95	80	70	175	1900	5000	0.003
LC–4NKBN	021014	NO.4	31.267	66	32	14	53	57	6.5	116.5	101.5	85	218	2700	3800	0.003
LC–5NKBN	021015	NO.5	44.399	80	40	18	65.5	57	6.5	129	129.5	98	258.5	3200	3400	0.005
LC–6NKBN	021016	NO.6	63.348	132	65	25	78	100	8	186	182	165	368	10000	1800	0.005

LC-NK · NKD TYPE

▶ NKCN-TYPE

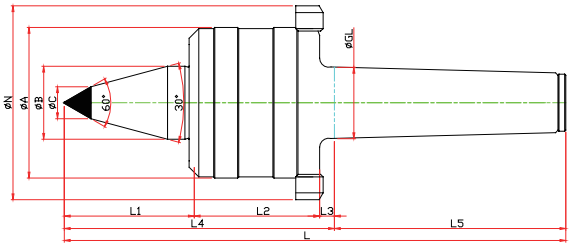
※ Carbide, Nut Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	N	L			
LC–3NKCN	020113	NO.3	23.825	52	22	29	42	5	76	80	10	70	156	1900	5000	0.003
LC–4NKCN	020114	NO.4	31.267	66	32	37	57	6.5	100.5	101.5	14	85	202	2700	3800	0.003
LC–5NKCN	020115	NO.5	44.399	80	40	45.5	57	6.5	109	129.5	18	98	238.5	3200	3400	0.005
LC–6NKCN	020116	NO.6	63.348	132	65	65	100	8	173	182	25	165	355	10000	1800	0.005

▶ NKBCN-TYPE

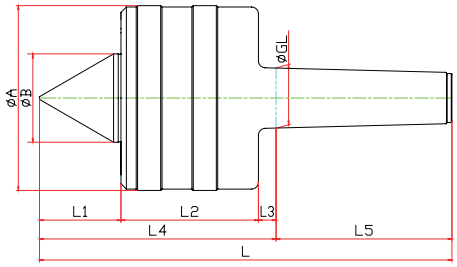
※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide, Nut Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	N	L			
LC–3NKBCN	021113	NO.3	23.825	52	22	48	42	5	95	80	10	70	175	1900	5000	0.003
LC–4NKBCN	021114	NO.4	31.267	66	32	53	57	6.5	116.5	101.5	14	85	218	2700	3800	0.003
LC–5NKBCN	021115	NO.5	44.399	80	40	65.5	57	6.5	129	129.5	18	98	258.5	3200	3400	0.005
LC–6NKBCN	021116	NO.6	63.348	132	65	78	100	8	186	182	25	165	368	10000	1800	0.005

LC-NK · NKD TYPE

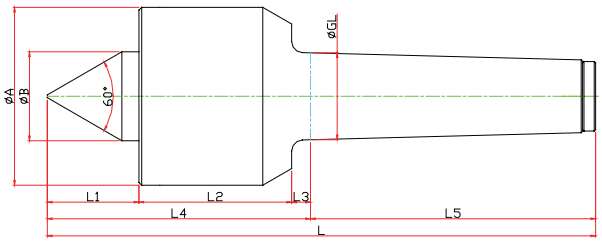
▶ NKD-TYPE



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC–5NKD	090005	NO.5	44.399	136	65	60	101	13	174	129.5	303.5	13000	3400	0.005
LC–6NKD	090006	NO.6	63.348	148	70	80	110.5	15	205.5	181	387.5	16000	1800	0.005
LC–7NKD	090007	NO.7	83.058	200	95	90	141	20	251	250	501	22000	1200	0.005

GR · SM TYPE

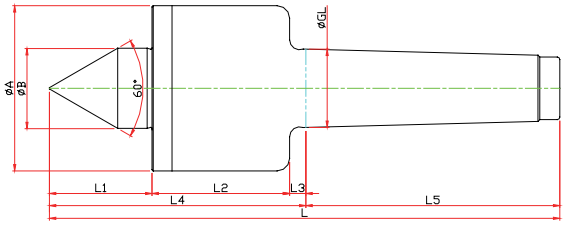
▶ GR-TYPE



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC–4GR	080004	NO.4	31.267	71	40	45	59.5	6.5	111	101.5	212.5	1300	7000	0.002
LC–5GR	080005	NO.5	44.399	88	50	45	66	6.5	117.5	129.5	247	3500	4500	0.002
LC–6GR	080006	NO.6	63.348	114	52	55	92	8	155	182	337	5000	3400	0.002
LC–7GR	080007	NO.7	83.058	200	98	78	132	10	200	250	470	20000	1900	0.002

GR · SM TYPE

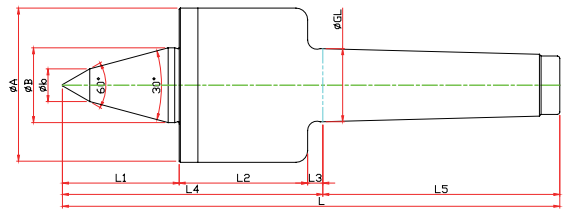
▶ SM-TYPE



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC–3SM	040003	NO.3	23.825	52	22	30	51	5	86	81	167	330	12000	0.003
LC–4SM	040004	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	204	1100	10000	0.003
LC–5SM	040005	NO.5	44.399	82	40	51	75	6.5	132.5	129.5	262	2200	8000	0.005

▶ SMB-TYPE

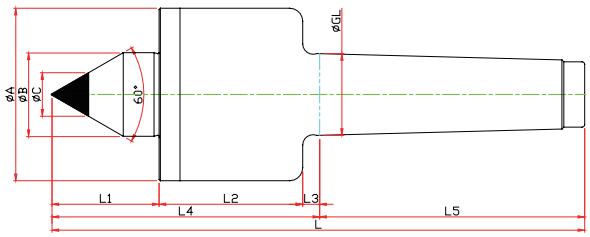
※ SHAFT EXTENTION(Minimize the bite-interference)



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	L			
LC–3SMB	041003	NO.3	23.825	52	22	10	40	51	5	96	81	177	330	12000	0.003
LC–4SMB	041004	NO.4	31.267	66	32	14	50	55	6.5	111.5	101.5	213	1100	10000	0.003
LC–5SMB	041005	NO.5	44.399	82	40	16	65	75	6.5	146.5	129.5	276	2200	8000	0.005

▶ SMC-TYPE

※ Carbide Type

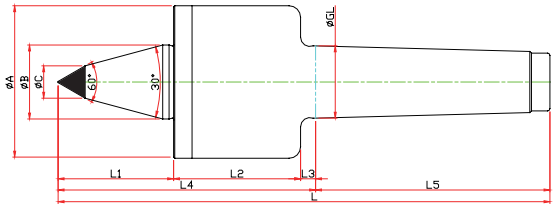


Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC–3SMC	040103	NO.3	23.825	52	22	30	51	5	86	81	10	167	330	12000	0.003
LC–4SMC	040104	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	14	204	1100	10000	0.003
LC–5SMC	040105	NO.5	44.399	82	40	51	75	6.5	132.5	129.5	18	262	2200	8000	0.005

LC-NK · NKD TYPE

▶ SMBC-TYPE

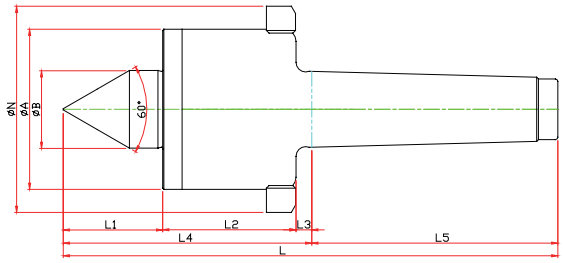
※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide, Nut Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	C	L			
LC-3SMBC	041103	NO.3	23.825	52	22	10	40	51	5	96	81	10	177	330	12000	0.003
LC-4SMBC	041104	NO.4	31.267	66	32	14	50	55	6.5	111.5	101.5	14	213	1100	10000	0.003
LC-5SMBC	041105	NO.5	44.399	82	40	16	65	75	6.5	146.55	129.5	16	276	2200	8000	0.005

▶ SMN-TYPE

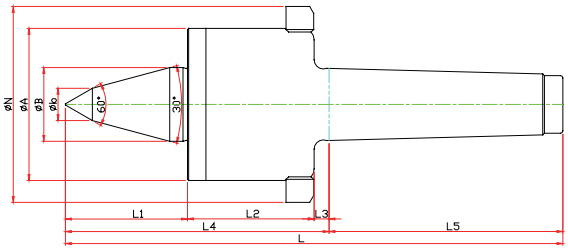
※ Nut Type



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	N	L			
LC-3SMN	040013	NO.3	23.825	52	22	30	51	5	86	81	70	167	330	12000	0.003
LC-4SMN	040014	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	85	204	1100	10000	0.003
LC-5SMN	040015	NO.5	44.399	82	40	51	75	6.5	132.5	129.5	105	262	2200	8000	0.005

▶ SMBN-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)
※ Nut Type

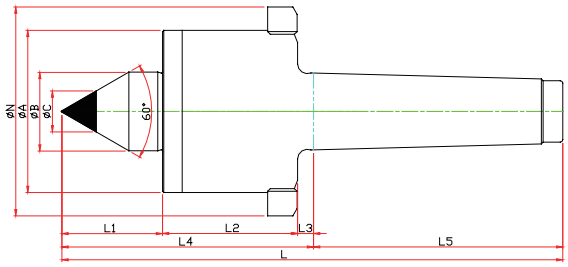


Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	N	L			
LC-3SMBN	041013	NO.3	23.825	52	22	10	40	51	5	96	81	70	177	330	12000	0.003
LC-4SMBN	041014	NO.4	31.267	66	32	14	50	55	6.5	111.5	101.5	85	213	1100	10000	0.003
LC-5SMBN	041015	NO.5	44.399	82	40	16	65	75	6.5	146.5	129.5	105	276	2200	8000	0.005

GR · SM TYPE

▶ SMCN-TYPE

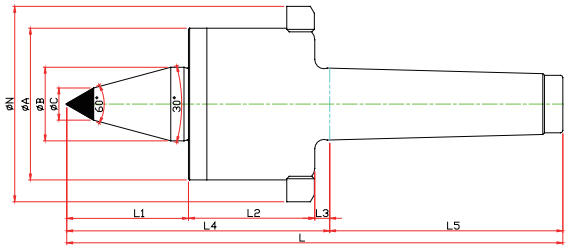
※ Carbide, Nut Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	C	D	E	F	G	N	T	L			
LC–3SMCN	040113	NO.3	23.825	52	22	30	51	5	86	81	70	10	167	300	12000	0.003
LC–4SMCN	040114	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	85	14	204	1100	10000	0.003
LC–5SMCN	040115	NO.5	44.399	82	40	51	75	6.5	132.5	129.5	105	16	262	2200	8000	0.005

▶ SMBCN-TYPE

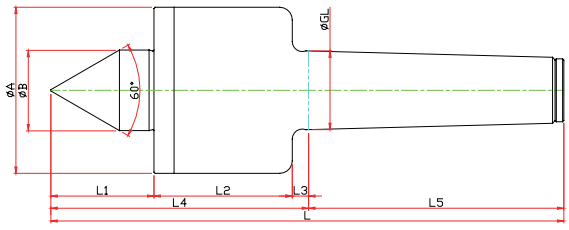
※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide, Nut Type



Model	Order Number	Morse Taper	Dimension												Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	C	N	L			
LC–3SMBCN	041113	NO.3	23.825	52	22	10	40	51	5	96	81	10	70	177	330	12000	0.003
LC–4SMBCN	041114	NO.4	31.267	66	32	14	50	55	6.5	111.5	101.5	14	85	213	1100	10000	0.003
LC–5SMBCN	041115	NO.5	44.399	82	40	16	65	75	6.5	146.5	129.5	16	105	276	2200	8000	0.005

SMP TYPE

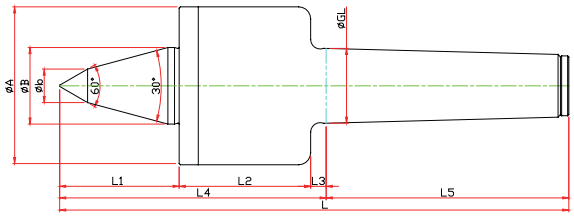
▶ SMP-TYPE



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC-3SMP	050003	NO.3	23.825	52	22	30	51	5	86	81	167	330	12000	0.003
LC-4SMP	050004	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	204	1100	10000	0.003
LC-5SMP	050005	NO.5	44.399	82	40	51	75	6.5	132.5	129.5	262	2200	8000	0.005

▶ SMPB-TYPE

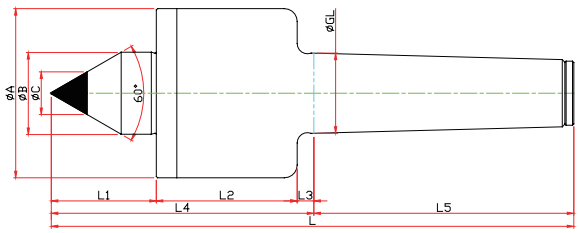
※ SHAFT EXTENTION(Minimize the bite-interference)



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	L			
LC-3SMPB	051003	NO.3	23.825	52	22	10	40	51	5	96	81	177	330	12000	0.003
LC-4SMPB	051004	NO.4	31.267	66	32	14	50	55	6.5	111.5	101.5	213	1100	10000	0.003
LC-5SMPB	051005	NO.5	44.399	82	40	16	65	75	6.5	146.5	129.5	276	2200	8000	0.005

▶ SMPC-TYPE

※ Carbide Type

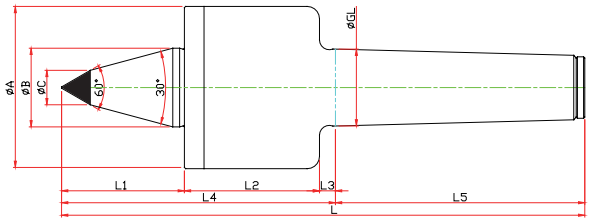


Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC-3SMPC	050103	NO.3	23.825	52	22	30	51	5	86	81	10	167	330	12000	0.003
LC-4SMPC	050104	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	14	204	1100	10000	0.003
LC-5SMPC	050105	NO.5	44.399	82	40	51	75	6.5	132.5	129.5	18	262	2200	8000	0.005

SMP TYPE

▶ SMPBC-TYPE

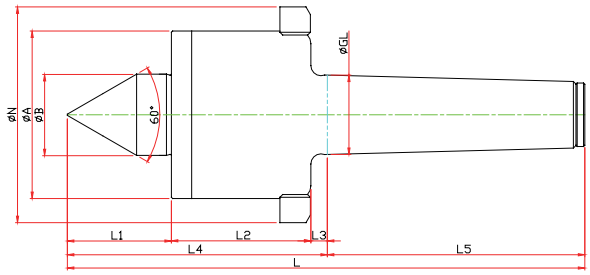
※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	C	L			
LC–3SMPBC	051103	NO.3	23.825	52	22	10	40	51	5	96	81	10	177	330	12000	0.003
LC–4SMPBC	051104	NO.4	31.267	66	32	14	50	55	6.5	111.5	101.5	14	213	1100	10000	0.003
LC–5SMPBC	051105	NO.5	44.399	82	40	16	65	75	6.5	146.5	129.5	18	276	2200	8000	0.005

▶ SMPN-TYPE

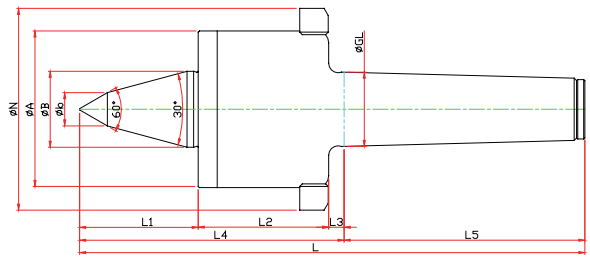
※ Nut Type



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	N	L			
LC–3SMPN	050013	NO.3	23.825	52	22	30	51	5	86	81	70	167	330	12000	0.003
LC–4SMPN	050014	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	85	204	1100	10000	0.003
LC–5SMPN	050015	NO.5	44.399	82	40	51	75	6.5	132.5	129.5	105	262	2200	8000	0.005

▶ SMPBN-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)
※ Nut Type

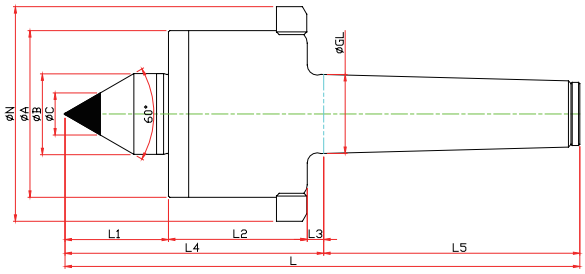


Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	N	L			
LC–3SMPBN	051013	NO.3	23.825	52	22	10	40	51	5	96	81	70	177	330	12000	0.003
LC–4SMPBN	051014	NO.4	31.267	66	32	14	50	55	6.5	111.5	101.5	85	213	1100	10000	0.003
LC–5SMPBN	051015	NO.5	44.399	82	40	16	65	75	6.5	146.5	129.5	105	276	2200	8000	0.005

SMP TYPE

▶ SMPCN-TYPE

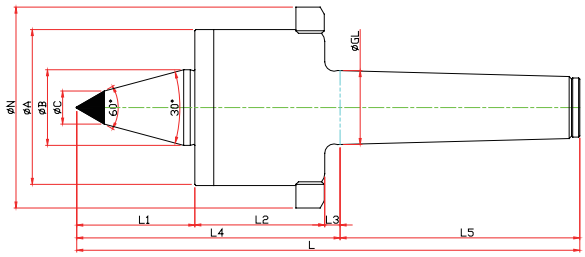
※ Carbide, Nut Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	N	L			
LC–3SMPCN	050113	NO.3	23.825	52	22	30	51	5	86	81	10	70	167	330	12000	0.003
LC–4SMPCN	050114	NO.4	31.267	66	32	41	55	6.5	102.5	101.5	14	85	204	1100	10000	0.003
LC–5SMPCN	050115	NO.5	44.399	82	40	51	75	6.5	132.5	129.5	18	105	262	2200	8000	0.005

▶ SMPBCN-TYPE

※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide, Nut Type



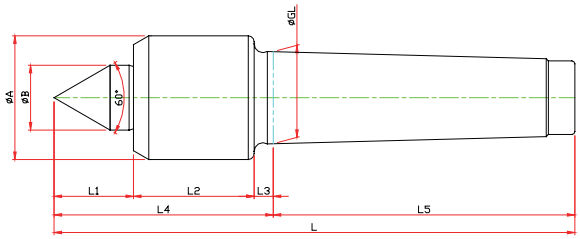
Model	Order Number	Morse Taper	Dimension												Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	C	N	L			
LC–3SMPBCN	051113	NO.3	23.825	52	22	10	40	51	5	96	81	10	70	177	330	12000	0.003
LC–4SMPBCN	051114	NO.4	31.267	66	32	14	50	55	6.5	111.5	101.5	14	85	213	1100	10000	0.003
LC–5SMPBCN	051115	NO.5	44.399	82	40	16	65	75	6.5	146.5	129.5	16	105	276	2200	8000	0.005

▶ SMP SPECIAL

※ Customized-special production for user's condition

D50 TYPE

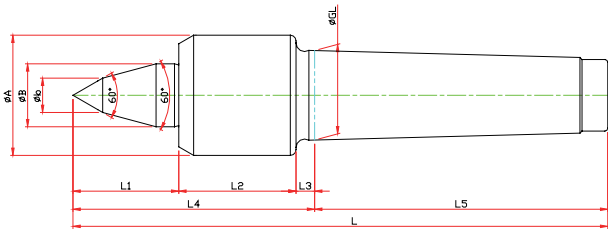
▶ D50-TYPE



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC–3D50	080350	NO.3	23.825	34	22	21	38	5	64	81	145	400	4800	0.003
LC–4D50	080450	NO.4	31.267	42	22	27	41	6.5	74.5	102.5	177	800	3800	0.003
LC–5D50	080550	NO.5	44.399	58	32	35	60	6.5	101.5	129.5	231	1600	3400	0.005

▶ D50B-TYPE

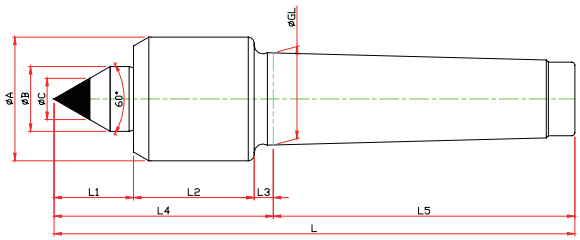
※ SHAFT EXTENTION(Minimize the bite-interference)



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	L			
LC–3D50B	082350	NO.3	23.825	34	22	10	25	38	5	72	81	153	400	4800	0.003
LC–4D50B	082450	NO.4	31.267	42	22	12	36	41	6.5	83.5	102.5	186.5	800	3800	0.003
LC–5D50B	082550	NO.5	44.399	58	32	16	53	60	6.5	119.5	129.5	249	1600	3400	0.005

▶ D50C-TYPE

※ Carbide Type

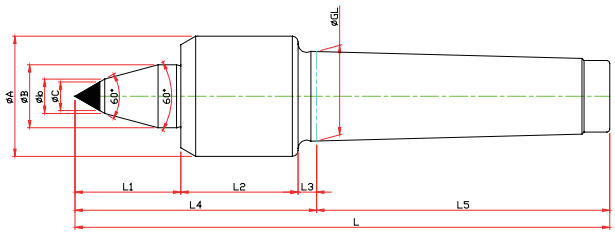


Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC–3D50C	081350	NO.3	23.825	34	22	21	38	5	64	81	10	145	400	4800	0.003
LC–4D50C	081450	NO.4	31.267	42	22	27	41	6.5	74.5	102.5	14	177	800	3800	0.003
LC–5D50C	081550	NO.5	44.399	58	32	60	60	6.5	101.5	129.5	18	231	1600	3400	0.005

D50 TYPE

▶ D50BC-TYPE

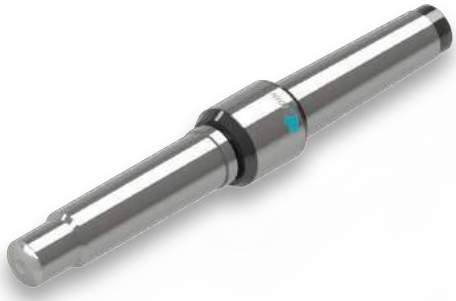
※ SHAFT EXTENTION(Minimize the bite-interference)
※ Carbide Type



Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	C	L			
LC–3D50BC	083350	NO.3	23.825	34	22	10	25	38	5	72	81	8	153	400	4800	0.003
LC–4D50BC	083450	NO.4	31.267	42	22	12	36	41	6.5	83.5	102.5	10	186.5	800	3800	0.003
LC–5D50BC	083550	NO.5	44.399	58	32	16	53	60	6.5	119.5	129.5	14	249	1600	3400	0.005

▶ D50 SPECIAL

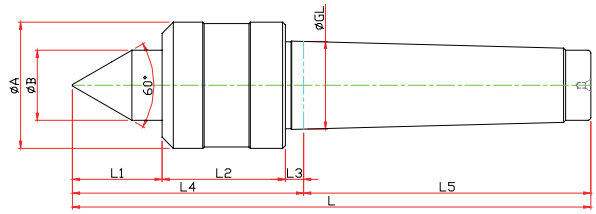
※ Customized-special production for user's condition



HD TYPE

▶ HD-TYPE

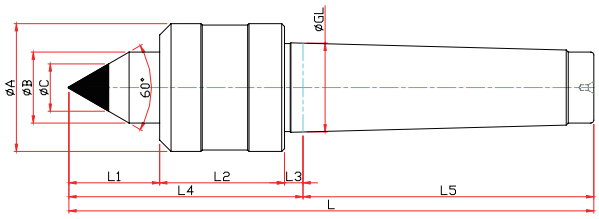
※ Economical live center



Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC-1HD	070001	NO.1	12.065	34	15	21	37	3.5	61.5	53.5	115	120	5000	0.003
LC-2HD	070002	NO.2	17.780	40	18	24	37	5	66	64	130	140	4000	0.003
LC-3HD	070003	NO.3	23.825	45	25	32	44	5	81	81	162	190	3800	0.003
LC-4HD	070004	NO.4	31.267	45	25	32	44	6.5	82.5	102.5	185	190	3800	0.003
LC-5HD	070005	NO.5	44.399	78	38	47	66	6.5	119.5	129.5	249	350	2000	0.005
LC-6HD	070006	NO.6	63.384	102	55	62	82	8	152	182	334	1200	2000	0.005

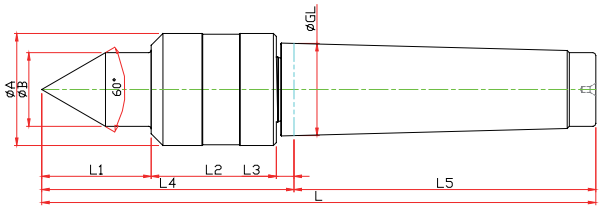
▶ HDC-TYPE

※ Carbide Type



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC-3HDC	071003	NO.3	23.825	25	45	32	44	5	81	81	10	162	190	3800	0.003
LC-4HDC	071004	NO.4	31.267	25	45	32	44	6.5	82.5	102.5	14	185	190	3800	0.003
LC-5HDC	071005	NO.5	44.399	38	78	47	66	6.5	119.5	129.5	18	249	350	2000	0.005
LC-6HDC	071006	NO.6	63.384	55	102	62	82	8	152	182	25	334	1200	2000	0.005

▶ HDS-TYPE

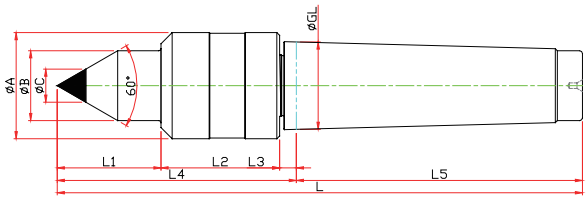


Model	Order Number	Morse Taper	Dimension									Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	L			
LC-2HDS	070012	NO.2	17.780	34	15	25	40	5	70	64	134	70	4500	0.003
LC-3HDS	070013	NO.3	23.825	36	18	27.5	40.5	5	73	81	154	80	4500	0.003
LC-4HDS	070014	NO.4	31.267	38	22	32	42.5	6	80.5	102.5	183	80	4500	0.003
LC-5HDS	070015	NO.5	44.399	64	30	47	56.5	10	113.5	129.5	243	230	2000	0.005
LC-6HDS	070016	NO.6	63.384	86	42	60	66.5	10	136.5	182	318.5	600	1500	0.005

HD TYPE

▶ HDSC-TYPE

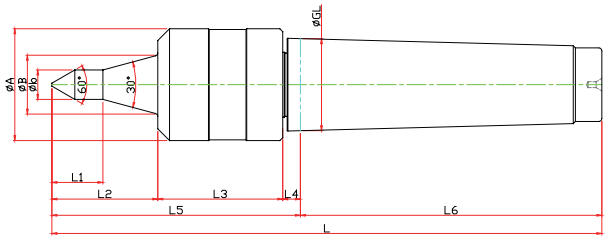
※ Economical live center
※ Suitable for lathe
※ Optimal RPM(below 3,800)



Model	Order Number	Morse Taper	Dimension										Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L5	C	L			
LC–3HDSC	071012	NO.3	23.825	36	18	27.5	40.5	5	73	81	10	154	80	4500	0.003
LC–4HDSC	071013	NO.4	31.267	38	22	32	42.5	6	80.5	102.5	14	183	80	4500	0.003
LC–5HDSC	071014	NO.5	44.399	64	30	47	56.5	10	113.5	129.5	18	243	230	2000	0.005
LC–6HDSC	071015	NO.6	63.384	86	42	60	66.5	10	136.5	182	30	318.5	600	1500	0.005

▶ HDSTH-TYPE

※ The type of thread milling
※ triplexed bearing fit
※ Structure resistant to coolant
※ Optimal RPM(below 3,800)



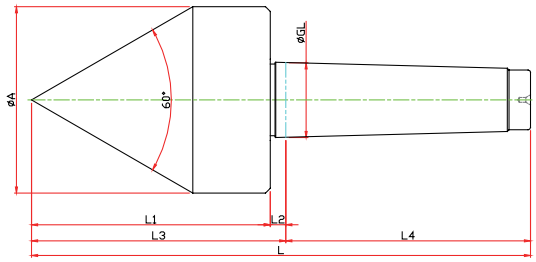
Model	Order Number	Morse Taper	Dimension											Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	b	L1	L2	L3	L4	L5	L6	L			
LC–3HDSTH–06	073011	NO.3	23.825	36	18	6	12.6	35	40.5	5	80.5	81	161.5	55	3800	0.003
LC–3HDSTH–08	073012					8	16.3									
LC–3HDSTH–10	073013					10	20.1									
LC–3HDSTH–12	073014					12	23.8									
LC–4HDSTH–06	074011	NO.4	31.267	38	20	6	10.1	36.2	40.5	6	84.5	102.5	187	65		
LC–4HDSTH–08	074012					8	13.9									
LC–4HDSTH–10	074013					10	17.6									
LC–4HDSTH–12	074014					12	21.3									
LC–5HDSTH–06	075011	NO.5	44.399	64	24	6	13.4	47	56.5	10	113.5	129.5	243	150		
LC–5HDSTH–08	075012					8	17.1									
LC–5HDSTH–10	075013					10	20.8									
LC–4HDSTH–12	075014					12	24.6									

▶ HD SPECIAL

PT TYPE

▶ PT-60 TYPE

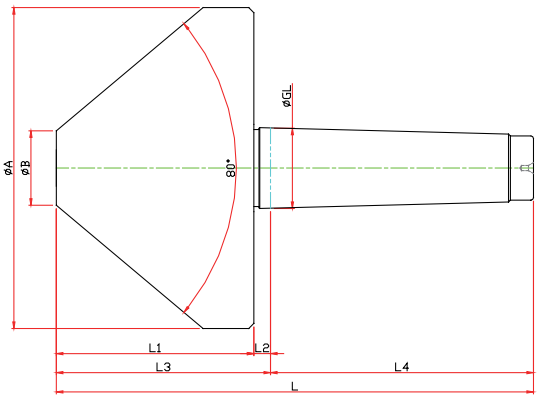
※ For PIPE machining
※ Optimal RPM(below 3,800)



Model	Order Number	Morse Taper	Dimension							Weight MAX.	R.P.M MAX.	Run Out
			GL	A	L1	L2	L3	L4	L			
LC-2PT-60	066002	NO.2	17.780	44	66	5	71	64	135	70	4500	0.003
LC-3PT-60	066003	NO.3	23.825	56	78.5	5	83.5	81	164.5	80	4500	0.003
LC-4PT-60	066004	NO.4	31.267	78	100	6.5	106.5	101.5	208	80	4500	0.003
LC-5PT-60	066005	NO.5	44.399	98	125	6.5	131.5	129.5	261	230	2000	0.005
LC-6PT-60	066006	NO.6	63.384	118	154	8	162	182	344	600	1500	0.005

▶ PT-80 TYPE

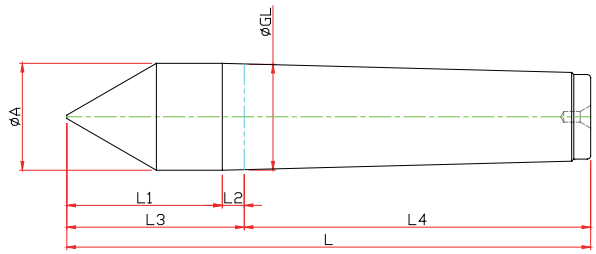
※ For PIPE machining
※ Optimal RPM(below 3,800)



Model	Order Number	Morse Taper	Dimension								Weight MAX.	R.P.M MAX.	Run Out
			GL	A	B	L1	L2	L3	L4	L			
LC-3PT-80	068003	NO.3	23.825	95	20	66	5	65	81	146	190	3800	0.003
LC-4PT-80	068004	NO.4	31.267	125	29	77	6.5	83.5	102.5	185	190	3800	0.003
LC-5PT-80	068005	NO.5	44.399	150	32	90	6.5	96.5	129.5	226	350	2000	0.005
LC-6PT-80	068006	NO.6	63.384	200	38	120	8	128	182	310	1200	1500	0.005

LM CENTER

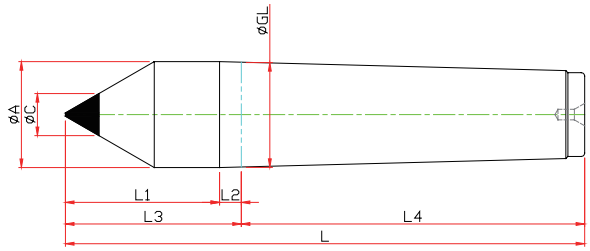
▶ LM-A TYPE



Model	Order Number	Morse Taper	Dimension							Run Out
			GL	A	L1	L2	L3	L4	L	
LM–1A	110001	NO.1	12.065	12.2	25	3.5	28.5	53.5	82	0.003
LM–2A	110002	NO.2	17.780	18	31	5	36	64	100	0.003
LM–3A	110003	NO.3	23.825	24	39	5	44	81	125	0.003
LM–4A	110004	NO.4	31.267	31.6	46	6.5	52.5	102.5	155	0.003
LM–5A	110005	NO.5	44.399	44.7	64	6.5	70.5	129.5	200	0.003
LM–6A	110006	NO.6	63.348	63.8	80	8	88	182	270	0.005
LM–7A	110007	NO.7	83.058	83.6	105	10	115	250	365	0.005

▶ LM-C TYPE

※ Carbide Type

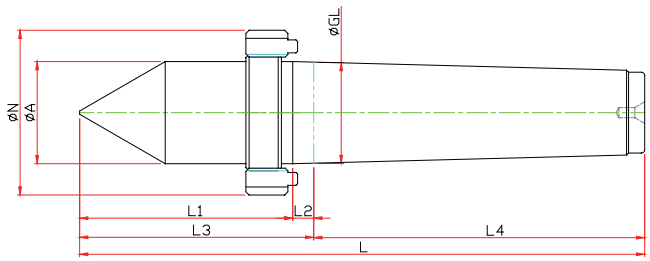


Model	Order Number	Morse Taper	Dimension								Run Out
			GL	A	L1	L2	L3	L4	C	L	
LM–1C	110101	NO.1	12.065	12.2	25	3.5	28.5	53.5	7	82	0.003
LM–2C	110102	NO.2	17.780	18	31	5	36	64	7	100	0.003
LM–3C	110103	NO.3	23.825	24	39	5	44	81	10	125	0.003
LM–4C	110104	NO.4	31.267	31.6	46	6.5	52.5	102.5	14	155	0.003
LM–5C	110105	NO.5	44.399	44.7	64	6.5	70.5	129.5	18	200	0.003
LM–6C	110106	NO.6	63.348	63.8	80	8	88	182	25	270	0.005
LM–7C	110107	NO.7	83.058	83.6	105	10	115	250	30	365	0.005

LM CENTER

▶ LM-AN TYPE

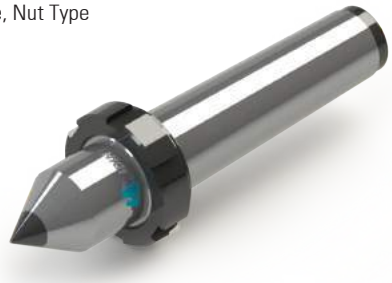
※ Nut Type

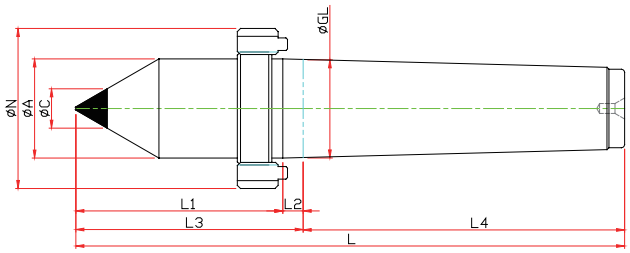


Model	Order Number	Morse Taper	Dimension								Run Out
			GL	A	L1	L2	L3	L4	N	L	
LM-1AN	110011	NO.1	12.065	12.2	31.5	5	36.5	53.5	M16	90	0.003
LM-2AN	110012	NO.2	17.780	18	41.5	6.5	48	64	M22	112	0.003
LM-3AN	110013	NO.3	23.825	24	49.5	7.5	57	81	M27	138	0.003
LM-4AN	110014	NO.4	31.267	31.6	62.5	10	72.5	102.5	M36	175	0.003
LM-5AN	110015	NO.5	44.399	44.7	77	11	88	129.6	M48	217.5	0.003
LM-6AN	110016	NO.6	63.348	63.8	96.5	11.5	108	182	M68	290	0.005
LM-7AN	110017	NO.7	83.058	83.6	108.5	11.5	120	250	M90	370	0.005

▶ LM-CN TYPE

※ Carbide, Nut Type





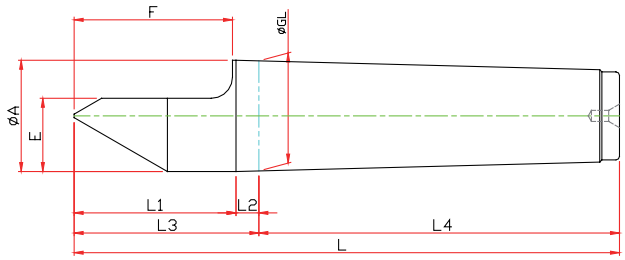
Model	Order Number	Morse Taper	Dimension									Run Out
			GL	A	L1	L2	L3	L4	C	N	L	
LM-1CN	110111	NO.1	12.065	12	31.5	5	36.5	53.5	7	M16	90	0.003
LM-2CN	110112	NO.2	17.780	18	41.5	6.5	48	64	7	M22	112	0.003
LM-3CN	110113	NO.3	23.825	24	49.5	7.5	57	81	10	M27	138	0.003
LM-4CN	110114	NO.4	31.267	32	62.5	10	72.5	102.5	14	M36	175	0.003
LM-5CN	110115	NO.5	44.399	45	77	11	88	129.5	18	M48	217.5	0.003
LM-6CN	110116	NO.6	63.348	64	96.5	11.5	108	182	18	M68	290	0.005

▶ LM SPECIAL

※ Customized-special production for user's condition

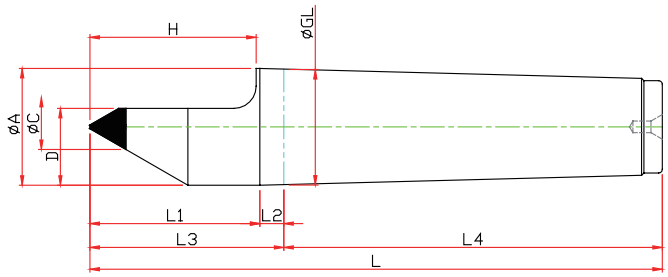
LM-H CENTER

▶ LM-H TYPE



Model	Order Number	Morse Taper	Dimension									Run Out
			GL	A	L1	L2	L3	L4	E	F	L	
LM-1H	110001	NO.1	12.065	12.2	25	3.5	28.5	53.5	7.6	22	82	0.003
LM-2H	110002	NO.2	17.780	18	31	5	36	64	11	30	100	0.003
LM-3H	110003	NO.3	23.825	24	39	5	44	81	15	38	125	0.003
LM-4H	110004	NO.4	31.267	31.6	46	6.5	52.5	102.5	21	45	155	0.003
LM-5H	110005	NO.5	44.399	44.7	64	6.5	70.5	129.5	27.4	63	200	0.003
LM-6H	110006	NO.6	63.348	63.8	80	8	88	182	38.9	79	270	0.005

▶ LM-HC TYPE

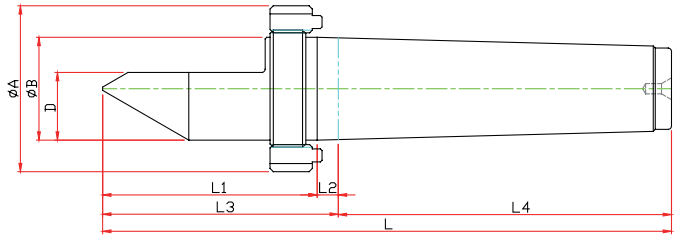


Model	Order Number	Morse Taper	Dimension										Run Out
			GL	A	L1	L2	L3	L4	C	D	H	L	
LM-1HC	210101	NO.1	12.065	12.2	25	3.5	28.5	53.5	7	7.6	22	82	0.003
LM-2HC	210102	NO.2	17.780	18	31	5	36	64	7	11	30	100	0.003
LM-3HC	210103	NO.3	23.825	24	39	5	44	81	10	15	38	125	0.003
LM-4HC	210104	NO.4	31.267	31.6	46	6.5	52.5	102.5	14	21	45	125	0.003
LM-5HC	210105	NO.5	44.399	44.7	64	6.5	70.5	129.5	18	27.4	63	200	0.003
LM-6HC	210106	NO.6	63.348	63.8	80	8	88	182	25	38.9	79	270	0.005

LM-H CENTER

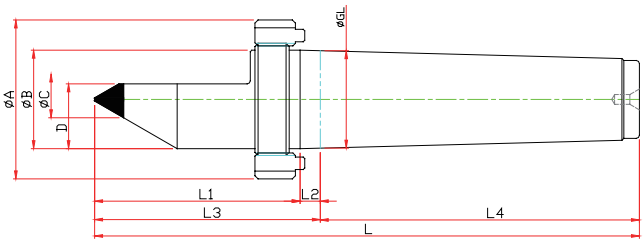
▶ LM-HN TYPE

※ Nut Type



Model	Order Number	Morse Taper	Dimension										Run Out
			GL	A	L1	L2	L3	L4	D	E	N	L	
LM–1HN	210011	NO.1	12.065	12	31.5	5	36.5	53.5	7.6	22	M16	90	0.003
LM–2HN	210012	NO.2	17.780	18	41.5	6.5	48	64	11	30	M22	112	0.003
LM–3HN	210013	NO.3	23.825	24	49.5	7.5	57	81	15	38	M27	138	0.003
LM–4HN	210014	NO.4	31.267	32	62.5	10	72.5	102.5	21	50	M36	175	0.003
LM–5HN	210015	NO.5	44.399	45	77	11	88	129.5	29.4	63	M48	217.5	0.003
LM–6HN	210016	NO.6	63.348	64	96.5	11.5	108	182	42	79	M68	290	0.005

▶ LM-HCN TYPE



Model	Order Number	Morse Taper	Dimension											Run Out
			GL	A	L1	L2	L3	L4	C	D	E	N	L	
LM–1HCN	210111	NO.1	12.065	12	31.5	5	36.5	53.5	7	7.6	22	M16	90	0.003
LM–2HCN	210112	NO.2	17.780	18	41.5	6.5	48	64	7	11	30	M22	112	0.003
LM–3HCN	210113	NO.3	23.825	24	49.5	7.5	57	81	10	15	38	M27	138	0.003
LM–4HCN	210114	NO.4	31.267	32	62.5	10	72.5	102.5	14	21	50	M36	175	0.003
LM–5HCN	210115	NO.5	44.399	45	77	11	88	129.5	18	29.4	63	M48	217.5	0.003
LM–6HCN	210116	NO.6	63.348	64	96.5	11.5	108	182	18	42	79	M68	290	0.005

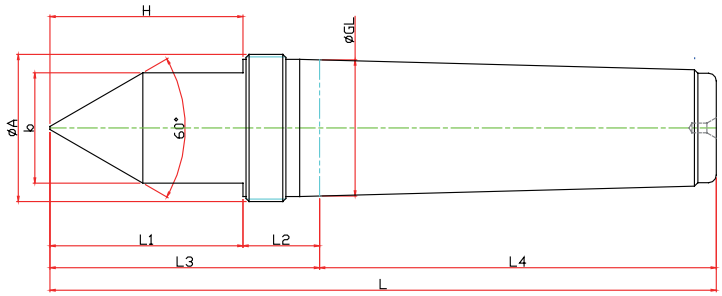
▶ LM-H SPECIAL

※ Customized-special production for user's condition

LM-FN TYPE

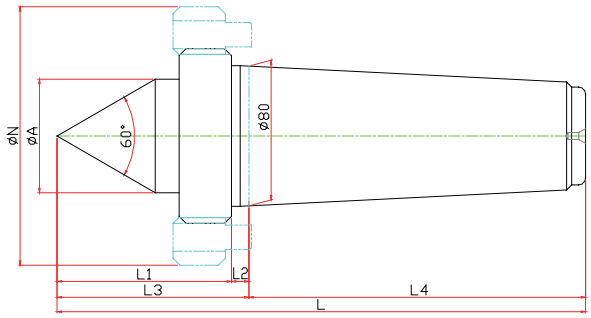
▶ LM-FN TYPE

※ Spanner Type



Model	Order Number	Morse Taper	Dimension									Run Out
			GL	A	b	L1	L2	L3	L4	E	L	
LM–1FN	120011	NO.1	12.065	12.2	10	25	3.5	28.5	53.5	22	82	0.003
LM–2FN	120012	NO.2	17.780	18	14	31	5	36	64	30	100	0.003
LM–3FN	120013	NO.3	23.825	24	19	39	5	44	81	38	125	0.003
LM–4FN	120014	NO.4	31.267	31.6	27	46	6.5	52.5	102.5	50	155	0.003
LM–5FN	120015	NO.5	44.399	44.7	36	64	6.5	70.5	129.5	53	200	0.003

▶ LM-#80 TYPE



Model	Order Number	Morse Taper	Dimension									Run Out
			GL	A	b	L1	L2	L3	L4	E	L	
#80–60	260010	1/10 TAPER	80	65	148	70	30	10	110	193	303	0.005
#80–75	275010	1/10 TAPER	80	65	148	70	30	10	110	193	303	0.005

9

TECHNICAL DATA >

9

TAP's Technical Data 926

Endmill's Technical Data 930

Drill's Technical Data 1033

Centering Tools & Reamers Technical Data 1039

Tool Holder Technical Data 1044

WH Limits

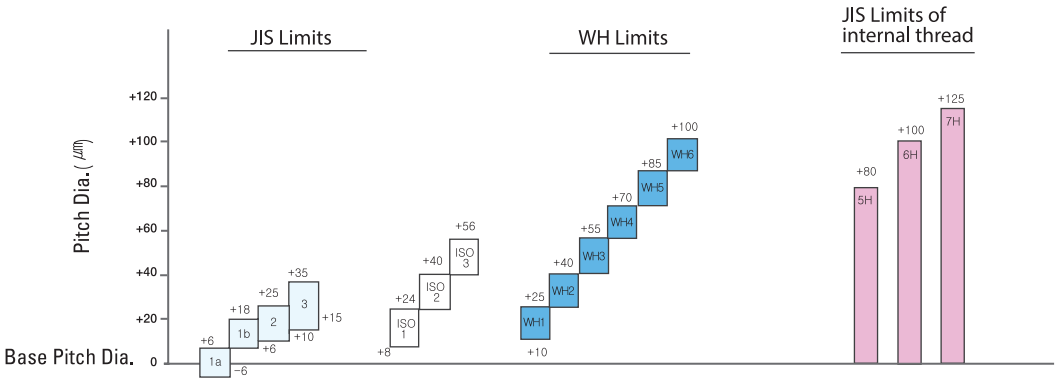
WH Limits

WIDIN applies an unique WH limits system in order to fulfill the degree of an internal screw and provides users the best tools for suitable working and operating conditions.

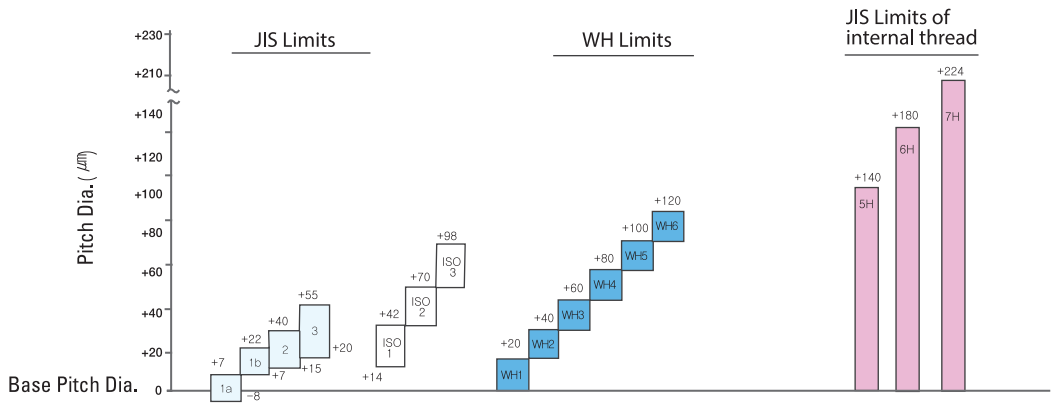
1. {p≤ 0.6(T.P.I≥40)}
   Upper Limits : 0.010 + 0.015 x n
   Lower Limits : Upper Limits - 0.015
   Unit :mm (n=WH)

2. {p≤ 0.7(T.P.I≤36)}
   Upper Limits : 0.020 x n
   Lower Limits : Upper Limits -0.020
   Unit:mm (n=WH)

Example M3×0.5



Example M10×1.5

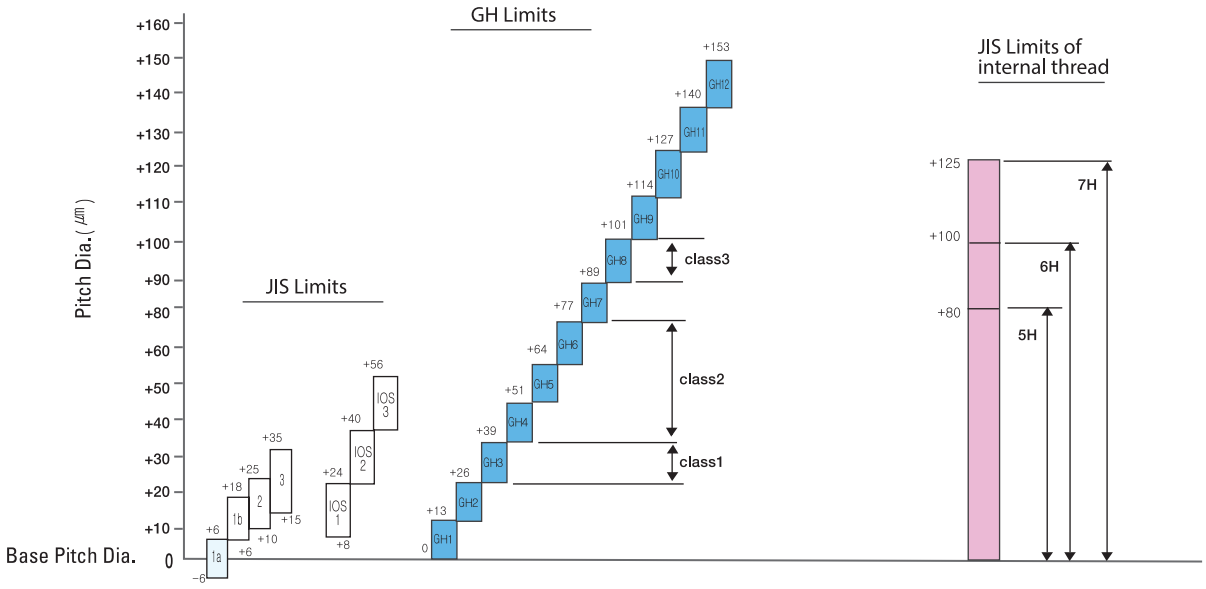


GH Limits

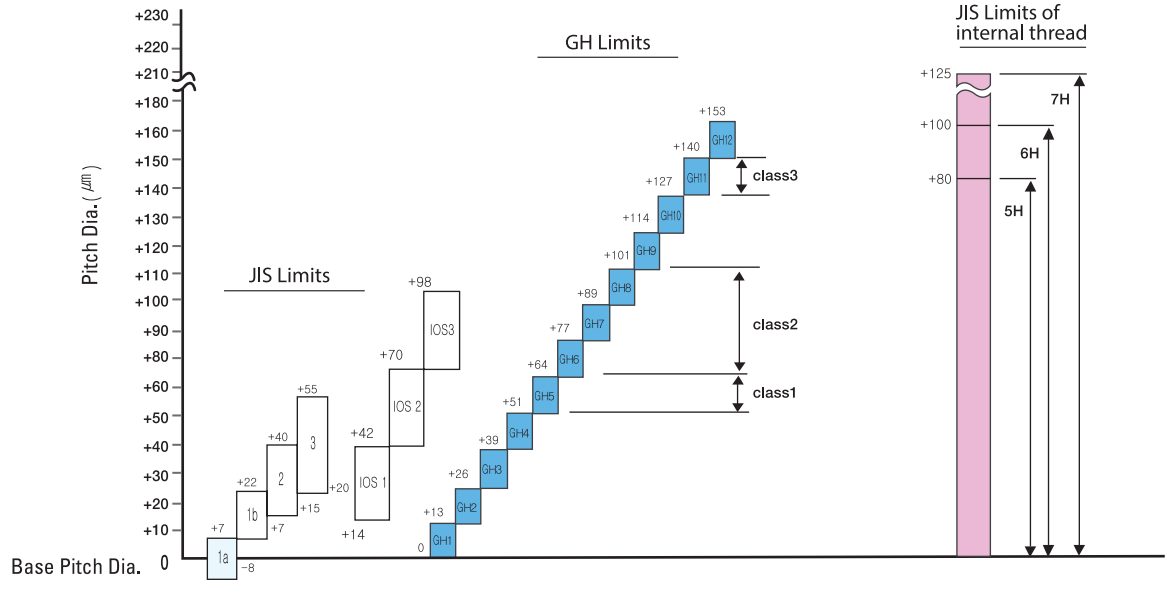
GH Limits

WIDIN applies the strick tap pitch diameter limits because Fluteless taps need to be managed by the rigid diameter of a bottom hole(unlike other normal taps) for it to be able to make precise tapping process of an internal screw by Plastic working.
WIDIN adopts the limits tolerance of 12.7㎛(0.0005) increments.

Example M3×0.5



Example M10×1.5



Recommended tapping speeds and lubricants

Tapping speeds depend on very important factors such as material and type of tap, chamfer length, dimension of holes, work materials and fluids.
Users need to check every aspect before applying it.
Morever, lubricant, cooling and abrasion resistance are three important factors affecting cutting fluids.
Therefore, users should provide enough fluids during the tapping process.

Recommended tapping speeds and lubricants

Work Material		Speed(m/min)							Lubricants			
		Straight Fluted Tap	Spiral Fluted Tap	Sprial Pointed Tap	Tungsten Carbide Tap	Fluteless Tap	HighSpeed Synchro Tap	Pipe Thread Tap	Non Water-soluble	Water-soluble	Semi-dry	dry
Low Carbon Steels	C ~0.25%	8~13	8~13	15~25	–	8~13	27~32	3~6	◎	○	△	△
Medium Carbon Steels	CO,25~ 0.45%	7~12	7~12	10~15	–	7~10	27~32	3~6	◎	○	△	△
High Carbon Steels	C 0.45%~	6~9	6~9	8~13	–	5~8	22~27	2~5	◎	○	△	△
Alloy Steels	SCM	7~12	7~12	10~15	–	5~8	22~27	2~5	◎	△	△	△
Hardened Steels	25~45 HRc	3~5 (4~8)	3~5 (4~8)	4~6 (6~10)	–	–	15~20	2~5	◎	△	–	–
Stainless Steels	SUS	4~7	5~8	8~13	–	5~10	–	3~6	◎	○	–	–
Precipitation HardenedSteels	SUS630 SUS631	3~5	3~5	4~6	–	–	–	2~5	◎	–	–	–
Tool Steels	SKD	6~9	6~9	7~10	–	–	–	2~5	◎	–	–	–
Cast Steels	SC	6~11	6~11	10~15	–	–	17~22	2~5	◎	○	–	–
Cast Iron	FC	10~15	–	–	10~20	–	–	2~5	◎	○	○	○
Ductile Cast Iron	FCD	7~12	7~12	10~20	10~20	–	–	4~8	◎	○	○	–
Copper	Cu	6~9	6~11	7~12	10~20	7~12	27~32	2~5	○	○	–	–
Brass, Brass Casting	Bs, Bsc	10~15	10~20	15~25	15~25	7~12	27~32	5~10	○	○	○	○
Bronze, Bronze Casting	PB, PBC	6~11	6~11	10~20	10~20	7~12	–	6~11	○	○	–	–
Aluminum	AL	10~20	10~20	15~25	–	10~20	100~300	5~10	◎	○	△	–
Aluminum AlloyCasting	AC, ADC	10~15	10~15	15~20	10~20	10~25	80~300	10~15	◎	○	△	–
Magnesium Alloy Casting	MC	7~12	7~12	10~15	10~20	–	–	10~15	◎	○	○	–
Zinc AlloyCasting	ZDC	1~12	7~12	10~15	10~20	7~12	27~100	10~15	◎	○	△	–
Thermo SettingPlastic	Bakelite, Phenol Epoxy	10~20	–	–	15~25	–	–	5~10	–	○	○	○
Thermo Plastic	Vinyl Chloride Nylon	10~20	10~15	10~20	10~20	–	27~32	5~10	–	○	○	○

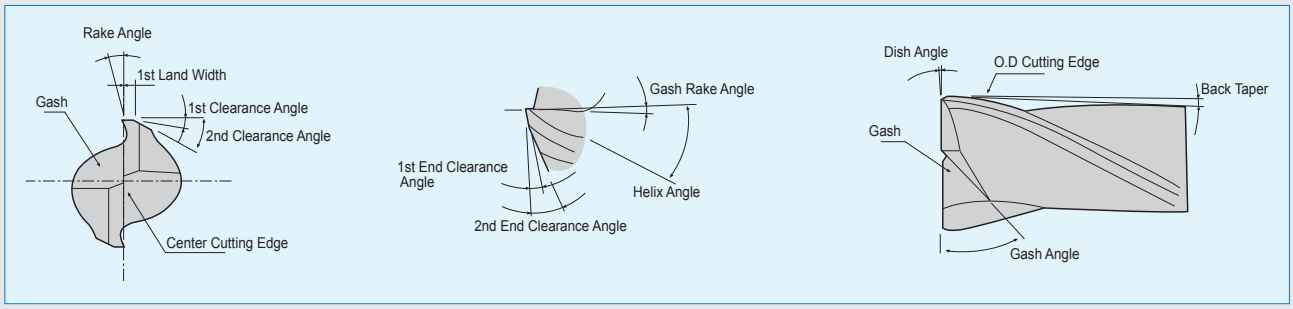
◎: Ideal / ○:Good / △: Applicable / - : Not Applicable

Drill hole Size for Metric Screw Threads in Accordance with 2nd Class of Limits

Straight Tap, Spiral Tap

Thread Size	Drill Size(mm)	mm	
		Min	Max
M3 X 0.5	2.50	2.459	2.599
M4 X 0.7	3.30	3.242	3.422
M5 X 0.8	4.20	4.134	4.334
M6 X 1.0	5.00	4.917	5.153
M8 X 1.25	6.80	6.647	6.912
M10 X 1.25	8.80	8.647	8.912
M10 X 1.5	8.50	8.376	8.676
M12 X 1.0	11.00	10.917	11.153
M12 X 1.25	10.80	10.647	10.912
M12 X 1.5	10.50	10.376	10.676
M12 X 1.75	10.30	10.106	10.441
M14 X 1.5	12.50	12.376	12.676
M14 X 2.0	12.00	11.835	12.21
M16 X 1.5	14.50	14.376	14.676
M16 X 2.0	14.00	13.835	14.21
M18 X 1.5	16.50	16.376	16.676
M18 X 2.5	15.50	15.294	15.744
M20 X 1.5	18.50	18.376	18.676
M20 X 2.5	17.50	17.294	17.744

[Nomenclature of End Mill]



[Application range of Grade]

WORKPIECE	GRADE
Carbon Steel, Alloy Steel, Tool Steel, Metal Mold Steel	· Micro Grain Carbide · P30
Cast Iron, Ductile	· Micro Grain Carbide · K10~K20
Heat Treatment Steel(HRc 40-60)	· Ultrafinest Carbide
Aluminium, Nonferrous Meterial	· Micro Grain Carbide · K10

[Formula of End Milling]

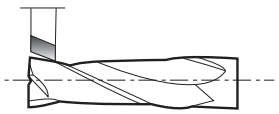
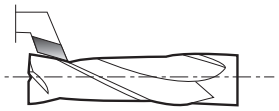
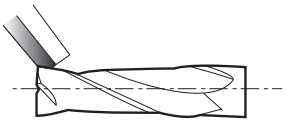
1) Cutting Speed $V = \frac{\pi \times D \times N}{1000}$ (m/min)	V : Cutting Speed (m/min) D : Diameter of End Mill (mm) N : End Mill revolution (RPM)
2) Feed per tooth $fz = \frac{F}{Z \times N}$ (mm/tooth)	fz : Feed per tooth (mm/tooth) Z : No. of teeth N : End Mill revolution (RPM)
3) Table Feed rate $F = fz \times Z \times N$	F : Feed rate (mm/min) fz : Feed per tooth (mm/tooth) Z : No. of teeth N : End Mill revolution (RPM)
4) Cutting Time $Tc = \frac{L}{F}$	Tc: Cutting Time (min) F : Table feed rate (mm/ min) L : Length of cut (workpiece Length+Diameter of Endmill+ α)

[For Regrinding]

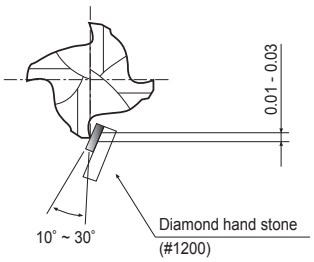
1. Regrinding range

APPLICATION RANGE	CUTTER Dia.	AMOUNT OF FLANK WEAR
Finish Machining	~ ø10 ø 11 ~ ø30 ø 31 ~ ø50	0.05 ~ 0.1 0.1 ~ 0.25 0.2 ~ 0.35
Rough Machining	~ ø10 ø 11 ~ ø30 ø 31 ~ ø50	0.08 ~ 0.15 0.15 ~ 0.35 0.3 ~ 0.45

2. Regrinding Method of Relief

		**(1) Concave method** • In case when precise outer diameter dimension is required. • In case of aluminium machining.
		**(2) Flat method** • Excellent machinability - Applicable to ball end mill and taper end mill. • Secondary clearance angle work is required. - When Diameter is large.
		**(3) Eccentric method** • Excellent toughness and surface roughness. • Secondary clearance angle work is not required.

3. Honing



1) Recommend honing for machining mold metal and high hardness workpiece.
-The amount of honing shall be less than that of feed per blade.

2) When using end mill without honing, machine for 10 to 30 seconds at feed rate of less than 0.01 mm/blade and then machine at normal feed rate.

3) Honing is not required for machining aluminium and non-ferrous metal.

[Trouble Shooting for End Milling]

Trouble Shooting for End Milling

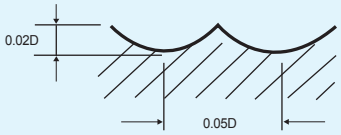
Problems	Cause	Solution	Cutting Conditions					Tool shape						Grade		The Others			
			Cutting Speed	Feed Rate	Depth of Cut	Coolant	Up & Down Cut	Relief Angle	Lead Angle	Cutting Length	Numbers of Teeth	Honing	Chip Pocket	Toughness	Hardness	Mechanical Rigidity	Mechanical Chattering	Workpiece Setting	Overhang
Cutting edge breakage	Excessive wear on periphery	• Improper cutting conditions	▼	▲		◉									▲				
	Chipping	• Improper cutting conditions • Generation of built-up edge • Improper tool grade		▼			▼	▼				◉		▲			▼	▲	▼
	Breakage while cutting	• Improper cutting conditions • Excessive cutting load • Excessive overhang		▼	▼					▼			▲			▲		▲	▼
Poor surface finish		• Generation of built-up edge	▲	▲		◉			▲			◉							
		• generation of chattering	▼			○	▼			▼						▲	◉	▲	▼
		• Surface Squarence		▼	▼		▲		▲	▼									▼
Oversize or undersize		• Improper cutting conditions • Improper choice of endmill type	▲	▼			▼			▼	▲					▲	▼		▼
Poor chip control		• Excessive cutting rate • Improper chip Pocket • Improper cutting conditions		▼	▼						▼		▲						

▲ : Increase ▼ : Decrease ○ : Application ◉ : Proper application

[DA702, ZB702A, DA703, DA734 series]

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1/64 X 1/32	50,000	188.98	50,000	165.35	45,000	149.61	40,000	118.11	35,000	102.36	35,000	90.55
R1/32 X 1/16	49,700	224.41	47,800	188.98	40,000	157.48	35,000	124.02	32,000	110.24	28,500	90.55
R3/64 X 3/32	49,700	224.41	47,800	188.98	40,000	157.48	35,000	124.02	32,000	110.24	28,500	90.55
R1/16 X 1/8	33,100	236.22	31,800	208.66	26,500	157.48	23,500	124.02	21,000	110.24	19,000	90.55
R3/32 X 3/16	18,600	228.35	17,800	192.91	15,000	147.64	13,500	120.08	11,500	100.39	10,500	82.68
R1/8 X 1/4	13,900	190.94	13,400	161.42	11,000	122.05	10,000	98.43	8,800	84.65	8,000	68.90
R5/32 X 5/16	11,100	165.35	10,700	137.80	9,000	106.30	8,000	84.65	7,000	72.83	6,500	61.02
R3/16 X 3/8	9,300	145.67	8,900	122.05	7,500	94.49	6,600	74.80	5,800	64.96	5,300	54.33
R1/4 X 1/2	6,950	116.14	6,680	98.43	5,600	74.80	5,000	61.02	4,400	49.21	4,000	41.34

RPM = rev. / min.
FEED = inch / min.



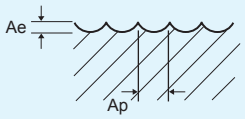
※ The FEED for long & extra long types, should be reduced by around 50%

[DA412 series] ▶ High Speed Cutting

WORKPIECE	HARDENED STEELS							
HARDNESS	HRc45 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
STRENGTH	1500 ~ 1750N/mm²		1750 ~ 2000N/mm²		2000 ~ 2080N/mm²		2080N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1/16 X 1/8	12,700	43.30	12,300	41.30	11,800	39.40	8,400	26.00
R3/32 X 3/16	9,400	43.30	9,050	41.30	8,600	37.40	5,600	26.80
R1/8 X 1/4	8,600	45.30	8,250	43.30	7,850	37.40	4,850	27.60
R5/32 X 5/16	7,000	41.30	6,700	39.40	6,350	37.40	3,800	25.60
R3/16 X 3/8	6,050	39.40	5,800	37.80	5,450	35.40	3,200	24.40
R1/4 X 1/2	5,450	39.40	5,200	37.80	4,900	35.40	2,750	24.40
R5/16 X 5/8	4,350	34.30	4,150	32.70	3,900	32.30	2,150	10.40
R3/8 X 3/4	3,500	27.20	3,300	25.60	3,150	24.80	1,700	8.70
R1/2 X 1	2,800	27.20	2,650	25.60	2,520	24.80	1,360	8.70

RPM = rev. / min.
FEED = inch / min.

Ae: D1/8=.006
D3/16~D5/16=.010
D3/8~D1=.012
Ap: 0.1 X D

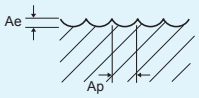


[DA412 series] ▶ High Speed Cutting

WORKPIECE	HARDENED STEELS					
HARDNESS	HRc45 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60	
STRENGTH	1500 ~ 1750N/mm²		1750 ~ 2000N/mm²		2000 ~ 2080N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/16 X 1/8	12,700	68.90	12,300	65.70	11,800	39.90
R3/32 X 3/16	9,400	65.00	9,050	61.80	8,600	29.50
R1/8 X 1/4	8,600	68.90	8,250	65.70	7,850	27.60
R5/32 X 5/16	7,000	61.00	6,700	57.50	6,350	25.60
R3/16 X 3/8	6,050	57.10	5,800	53.50	5,450	24.40
R1/4 X 1/2	5,450	55.90	5,200	52.40	4,900	24.00
R5/16 X 5/8	4,350	48.40	4,150	44.50	3,900	10.40
R3/8 X 3/4	3,500	39.40	3,300	35.40	3,150	8.70
R1/2 X 1	2,800	39.40	2,640	35.40	2,520	8.70

RPM = rev. / min.
FEED = inch / min.

Ae: D1/8=.006
D3/16~D5/16=.010
D3/8~D1=.012
Ap: 0.05 X D

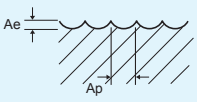


[DA512, DA302 series] ▶ General Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc40		HRc45 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/64 X 1/32	15,760	9.80	12,720	7.80	5,800	3.80
R1/32 X1/16	15,760	13.80	12,140	1.60	5,320	4.70
R3/64 X 3/32	14,400	29.50	10,700	19.30	4,680	5.90
R1/16 X 1/8	13,100	26.70	10,000	18.10	4,520	5.90
R3/32 X 3/16	9,140	32.30	7,300	22.80	3,680	7.10
R1/8 X 1/4	7,780	33.00	6,300	24.80	3,160	7.50
R5/32 X 5/16	5,260	37.50	4,420	26.00	2,100	7.50
R3/16 X 3/8	4,620	40.10	3,780	28.00	1,780	7.50
R1/4 X 1/2	3,780	35.40	2,940	26.00	1,360	7.50
R5/16 X 5/8	2,740	36.20	2,320	26.00	1,160	7.50
R3/8 X 3/4	2,100	33.00	1,900	25.00	840	7.50

RPM = rev. / min.
FEED = inch / min.

Ae: D1/32~D1/4=.008inch
D5/16~D3/4=.012inch
Ap: 0.2 X D



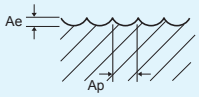
Ae: D1/32~D1/4=.008inch
D5/16~D3/4=.012inch
Ap: 0.1 X D

[DA512, DA302 series] ▶ High Speed Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS	
HARDNESS	~ HRc45		HRc45 ~ HRc65	
STRENGTH	~ 1500N/mm²		1500N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED
R1/64 X 1/32	25,000	25.60	12,720	15.70
R1/32 X1/16	23,000	27.50	12,140	16.90
R3/64 X 3/32	21,000	34.60	10,700	19.30
R1/16 X 1/8	21,000	39.40	10,000	20.50
R3/32 X 3/16	21,000	70.90	7,300	23.60
R1/8 X 1/4	21,000	90.90	6,300	24.80
R5/32 X 5/16	15,760	111.80	4,420	29.10
R3/16 X 3/8	13,660	120.00	3,780	33.00
R1/4 X 1/2	10,500	103.50	2,940	33.00
R5/16 X 5/8	8,200	103.50	2,320	28.00
R3/8 X 3/4	6,300	99.00	1,900	20.80

RPM = rev. / min.
FEED = inch / min.

Ae: D1/32~D1/4=.008 inch
D5/16~D3/4=.012 inch
Ap: 0.05 X D

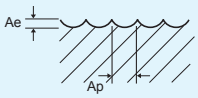


[DA514 series] ▶ General Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc40		HRc45 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/16 X 1/8	13,100	40.10	10,000	27.00	4,520	8.85
R3/32 X 3/16	9,140	48.50	7,300	34.00	3,680	10.50
R1/8 X 1/4	7,780	49.50	6,300	37.00	3,160	11.25
R5/32 X 5/16	5,260	56.00	4,420	39.00	2,100	11.25
R3/16 X 3/8	4,620	60.00	3,780	42.00	1,780	11.25
R1/4 X 1/2	3,780	53.00	2,940	39.00	1,360	11.25
R5/16 X 5/8	2,740	54.50	2,320	38.50	1,160	11.25

RPM = rev. / min.
FEED = inch / min.

Ae: D1/8~D1/4=.008 inch
D5/16~D5/8=.012 inch
Ap: 0.02 X D



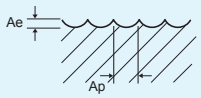
Ae: D1/8~D1/4=.008 inch
D5/16~D5/8=.012 inch
Ap: 0.1 X D

[DA514 series] ▶ High Speed Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS	
HARDNESS	~ HRc45		HRc45 ~ HRc65	
STRENGTH	~ 1500N/mm²		~ 1500N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED
R1/16 X 1/8	21,000	59.00	17,000	30.50
R3/32 X 3/16	21,000	106.25	12,000	35.50
R1/8 X 1/4	21,000	136.50	10,500	37.00
R5/32 X 5/16	15,760	167.50	7,800	43.50
R3/16 X 3/8	13,660	180.00	6,300	49.50
R1/4 X 1/2	10,500	155.50	5,260	49.50
R5/16 X 5/8	8,200	155.50	3,780	42.00

RPM = rev. / min.
FEED = inch / min.

Ae: D1/8~D1/4=.008 inch
D5/16~D5/8=.012 inch
Ap: 0.05 X D

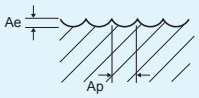


[DA522 series] ▶ General Cutting

WORKPIECE	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	HRc30 ~ HRc40		HRc45 ~ HRc50		HRc50 ~ HRc55	
STRENGTH	1000 ~ 1250N/mm²		1500 ~ 1750N/mm²		1750N/mm² ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/16 X 1/8	10,000	18.10	12,700	43.30	12,300	41.30
R3/32 X3/16	7,300	22.80	9,400	43.30	9,050	41.30
R1/8 X 1/4	6,300	24.80	8,600	45.30	8,250	43.30
R5/32 X 5/16	4,420	26.00	7,000	41.30	6,700	39.40
R3/16 X 3/8	3,780	28.00	6,050	39.40	5,800	37.80
R1/4 X 1/2	2,940	26.00	5,450	39.40	5,200	37.80
R5/16 X 5/8	2,320	26.00	4,350	34.30	4,150	32.70
R3/8 X 3/4	1,900	25.00	3,500	27.20	3,300	25.60
R1/2 X 1	1,520	25.00	2,800	27.20	2,650	25.60

RPM = rev. / min.
FEED = inch / min.

Ae: D1/8~D1/4=.008
D5/16~D1=.012
Ap: 0.2 X D



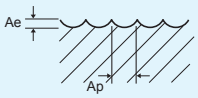
Ae: D1/8=.006
D3/16~D5/16=.010
D3/8~D1=.012
Ap: 0.1 X D

[DA522 series] ▶ High Speed Cutting

WORKPIECE	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	HRc30 ~ HRc40		HRc45 ~ HRc50		HRc50 ~ HRc55	
STRENGTH	1000 ~ 1250N/mm²		1500 ~ 1750N/mm²		1750N/mm² ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/16 X 1/8	21,000	39.40	12,700	68.90	12,300	65.70
R3/32 X3/16	21,000	70.90	9,400	65.00	9,050	61.80
R1/8 X 1/4	21,000	90.90	8,600	69.00	8,250	65.70
R5/32 X 5/16	15,760	111.80	7,000	61.00	6,700	57.50
R3/16 X 3/8	13,660	120.10	6,050	57.10	5,800	53.50
R1/4 X 1/2	10,500	103.50	5,450	55.90	5,200	52.40
R5/16 X 5/8	8,200	103.50	4,350	48.40	4,150	44.50
R3/8 X 3/4	6,300	99.20	3,500	39.40	3,300	35.40
R1/2 X 1	5,040	99.20	2,800	39.40	2,650	35.40

RPM = rev. / min.
FEED = inch / min.

Ae: D1/8~D1/4=.008
D5/16~D1=.012
Ap: 0.05 X D



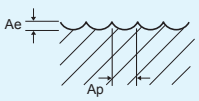
Ae: D1/8=.006
D3/16~D5/16=.010
D3/8~D1=.012
Ap: 0.05 X D

[MD502 series] ▶ High Speed Cutting

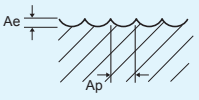
WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS	
HARDNESS	HRc30 ~ HRc45		HRc45 ~ HRc55	
STRENGTH	1000 ~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED
R.012X.024	30,000	23.60	30,000	11.80
R.0155X.031	27,000	25.60	27,000	15.00
R.020X.040	25,000	25.60	25,000	15.70
R.0235X.047	24,000	26.40	24,000	16.50
R.031X.062	23,000	27.60	23,000	16.90

RPM = rev. / min.
FEED = inch / min.

D 〈 .040
Ae: 0.05 X D
Ap: 0.15 X D
D≧ .040
Ae: 0.075 X D
Ap: 0.15 X D



D 〈 .040
Ae: 0.05 X D
Ap: 0.1 X D
D≧ .040
Ae: 0.05 X D
Ap: 0.15 X D

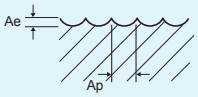


[DA542 series] ▶ General Cutting

WORKPIECE	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	HRc30 ~ HRc40		HRc45 ~ HRc50		HRc50 ~ HRc55	
STRENGTH	1000 ~ 1250N/mm²		1250 ~ 1750N/mm²		1750N/mm² ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/32 X1/16	97,000	8.30	13,800	19.90	13,600	17.90
R1/16 X 1/8	8,000	14.60	10,200	34.60	9,800	33.50
R3/32 X 3/16	5,840	18.10	7,500	34.60	7,200	33.50
R1/8 X 1/4	5,040	19.70	6,900	36.20	6,500	34.60
R5/32 X 5/16	3,540	20.90	5,600	33.10	5,300	31.50
R3/16 X 3/8	3,020	22.40	4,850	31.50	4,650	30.30
R1/4 X 1/2	2,350	20.90	4,350	31.50	4,150	30.30

RPM = rev. / min.
FEED = inch / min.

Ae: D1/16~D1/4=.008
D5/16~D1/2=.012
Ap: 0.2 X D



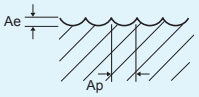
Ae: D1/16~D1/8=0.05 X D
D3/16~D5/16=.010
D3/8~D1/2=.012
Ap: 0.1 X D

[DA542 series] ▶ High Speed Cutting

WORKPIECE	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	HRc45		HRc45 ~ HRc50		HRc50 ~ HRc55	
STRENGTH	1500N/mm²		1250 ~ 1750N/mm²		1750N/mm² ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R1/32 X1/16	18,400	21.90	13,800	28.90	13,600	30.10
R1/16 X 1/8	16,800	31.50	10,200	55.10	9,800	51.20
R3/32 X 3/16	16,800	56.70	7,500	52.00	7,200	49.20
R1/8 X 1/4	16,800	72.80	6,900	55.10	6,500	53.10
R5/32 X 5/16	12,600	89.40	5,600	49.20	5,300	45.30
R3/16 X 3/8	10,930	96.10	4,850	45.30	4,650	43.30
R1/4 X 1/2	8,400	82.70	4,350	44.50	4,150	41.30

RPM = rev. / min.
FEED = inch / min.

Ae: D1/16~D1/4=.008
D5/16~D1/2=.012
Ap: 0.05 X D



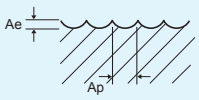
Ae: D1/16~D1/8=0.05 X D
D3/16~D5/16=.010
D3/8~D1/2=.012
Ap: 0.05 X D

[DA552 series] ▶ General Cutting

WORKPIECE	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	HRc30 ~ HRc40		HRc45 ~ HRc50		HRc50 ~ HRc55	
STRENGTH	1000 ~ 1250N/mm²		1250 ~ 1750N/mm²		1750N/mm² ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R3/32 X3/16	4670	14.50	6000	27.70	5760	26.80
R1/8 X 1/4	4030	15.80	5520	29.00	5200	27.70
R5/32 X 5/16	2830	16.70	4480	26.50	4240	25.20
R3/16 X 3/8	2420	17.90	3880	25.20	3720	24.20
R1/4 X 1/2	1880	16.70	3480	25.20	3320	24.20

RPM = rev. / min.
FEED = inch / min.

Ae: D3/16~D1/4=.008
D5/16~D1/2=.012
Ap: 0.2 X D



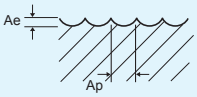
Ae: D3/16~D5/16=.010
D3/8~D1/2=.012
Ap: 0.1 X D

[DA552 series] ▶ High Speed Cutting

WORKPIECE	ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	~ HRc45		HRc45 ~ HRc50		HRc50 ~ HRc55	
STRENGTH	~ 1500N/mm²		1250 ~ 1750N/mm²		1750N/mm² ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
R3/32 X3/16	13,440	45.40	6,000	41.60	5,760	39.40
R1/8 X 1/4	13,440	58.20	5,520	44.10	5,200	42.50
R5/32 X 5/16	10,080	71.50	4,480	39.40	4,240	36.20
R3/16 X 3/8	8,740	76.90	3,880	36.30	3,720	34.60
R1/4 X 1/2	6,720	66.20	3,480	35.60	3,320	33.00

RPM = rev. / min.
FEED = inch / min.

Ae: D3/16~D1/4=.008
D5/16~D1/2=.012
Ap: 0.5 X D

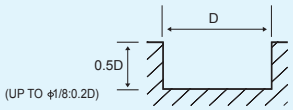


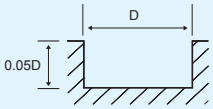
Ae: D3/16~D5/16=.010
D3/8~D1/2=.012
Ap: 0.05 X D

[ZA302, ZA502 series]

WORKPIECE	CARBON STEELS ALLOY STEELS·CAST IRON		ALLOY STEELS TOOL STEELS		STAINLESS STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc45				HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²				1500 ~ 2000N/mm²		2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/16	11,560	11,560	7,560	4.70	6,300	3.55	5,040	1.40		
1/8	8,920	8,920	5,560	5.50	4,620	4.70	3,360	1.55	1,900	1.55
3/16	6,300	6,300	3,780	7.50	3,160	6.30	2,320	1.95	1,260	1.55
1/4	5,560	5,560	3,360	8.65	2,840	7.10	2,000	2.15	1,100	1.55
5/16	4,200	4,200	2,520	7.85	2,100	7.10	1,680	2.95	840	1.55
3/8	3,260	3,260	2,000	6.30	1,680	6.30	1,360	2.35	680	1.40
1/2	2,740	2,740	1,680	5.10	1,360	5.10	1,160	2.15	560	1.40
5/8	2,200	2,200	1,360	4.30	1,060	4.30	900	1.55	440	0.80
3/4	1,680	1,680	1,060	3.15	840	3.15	680	1.20	320	0.80
1	1,360	1,360	840	2.75	680	2.35	540	0.80	260	0.60

RPM = rev. / min.
FEED = inch / min.

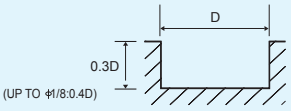


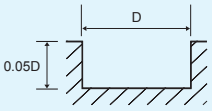


[ZA522 series] ▶ General Cutting

WORKPIECE	CARBON STEELS ALLOY STEELS·CAST IRON		ALLOY STEELS TOOL STEEL		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
STRENGTH	~ 1000N/mm²		1000~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
1/8	4,410	7.8	3,570	2.4	2,200	1.2
3/16	3,050	4.1	2,420	3.3	1,580	1.6
1/4	2,630	4.9	2,100	4.1	1,370	2.0
5/16	2,000	5.3	1,580	4.1	1,050	2.0
3/8	1,680	5.3	1,370	4.1	840	2.0
1/2	1,370	4.1	1,160	3.7	700	1.6
5/8	1,160	3.7	890	3.0	560	1.4
3/4	840	2.8	680	2.0	420	1.0
1	610	2.0	540	1.6	330	0.7

RPM = rev. / min.
FEED = inch / min.



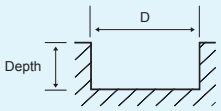


[MZ502 series] ▶ High Speed Cutting

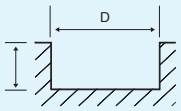
WORKPIECE	ALLOY STEELS TOOL STEELS		HARDENED STEELS	
HARDNESS	HRc30 ~ HRc45		HRc45 ~ HRc55	
STRENGTH	1000 ~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED
.016	30,000	23.60	23,000	3.90
.031	27,000	25.60	18,000	5.10
.040	25,000	25.60	15,000	5.90
.047	24,000	26.40	12,000	5.90
.062	23,000	27.60	9,000	5.50

RPM = rev. / min.
FEED = inch / min.

D < .040
Depth=0.15 X D
D ≧ .040
Depth=0.25 X D



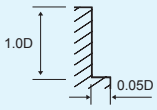
D < .040
Depth=0.02 X D
D ≧ .040
Depth=0.05 X D

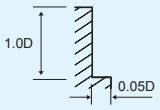


[ZA304, ZA504 series]

WORKPIECE	CARBON STEELS ALLOY STEELS·CAST IRON		ALLOY STEELS TOOL STEELS		STAINLESS STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc45				HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²				1500 ~ 2000N/mm²		2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/16	11,560	11.00	7,560	6.70	6,300	5.50	5,040	1.95		
1/8	8,920	12.60	5,560	7.85	4,620	6.70	3,360	2.35	1,900	2.35
3/16	6,300	23.60	3,780	14.15	3,160	11.80	2,320	2.75	1,260	2.35
1/4	5,560	26.00	3,360	16.15	2,840	13.00	2,000	3.15	1,100	2.35
5/16	4,200	27.95	2,520	14.95	2,100	13.80	1,680	4.30	840	2.35
3/8	3,260	24.00	2,000	11.80	1,680	11.80	1,360	3.55	680	1.95
1/2	2,740	20.50	1,680	9.85	1,360	9.45	1,160	3.15	560	1.95
5/8	2,200	16.15	1,360	7.85	1,060	7.85	900	2.35	440	1.20
3/4	1,680	12.60	1,060	6.30	840	5.90	680	1.55	320	1.20
1	1,360	9.85	840	5.10	680	4.70	540	1.20	260	0.80

RPM = rev. / min.
FEED = inch / min.

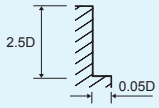


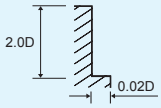


[ZA524 series] ▶ General Cutting

WORKPIECE	CARBON STEELS ALLOY STEELS·CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²		2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/8	4,410	4.5	3,570	3.9	2,200	2.2	1,890	1.2
3/16	3,050	7.1	2,420	5.5	1,580	2.8	1,260	1.6
1/4	2,630	8.5	2,100	7.1	1,370	3.5	1,160	2.0
5/16	2,000	9.1	1,580	7.1	1,050	3.5	840	2.0
3/8	1,680	9.1	1,370	7.1	840	3.5	670	2.0
1/2	1,370	7.1	1,160	6.3	700	2.8	560	1.6
5/8	1,160	6.3	890	4.9	560	2.4	440	1.4
3/4	840	4.5	680	3.5	420	1.8	340	1.0
1	670	4.5	540	3.5	340	1.8	270	1.0

RPM = rev. / min.
FEED = inch / min.

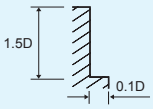


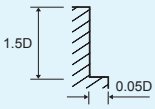


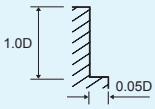
[ZA506 & 8 series] ▶ General Cutting

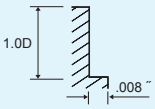
WORKPIECE	CARBON STEELS ALLOY STEELS·CAST IRON		ALLOY STEELS TOOL STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc50		HRc50 ~ HRc55		HRc60 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1750N/mm²		1750 ~ 2080N/mm²		2080N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	5,560	79.00	3,880	54.00	1,580	8.25	1,100	5.10
5/16	4,200	79.00	2,940	54.00	1,160	8.25	840	5.10
3/8	3,360	79.00	2,320	54.00	1,000	8.25	680	5.10
1/2	2,840	66.00	2,000	46.00	840	7.10	560	4.35
5/8	2,100	50.00	1,480	35.00	640	5.10	420	2.75
3/4	1,680	40.00	1,160	27.00	500	4.35	320	2.35
1	1,260	25.00	870	17.50	375	3.00	240	1.54

RPM = rev. / min.
FEED = inch / min.





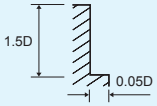


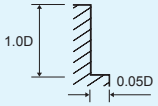


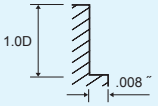
[ZA506 & 8 series] ▶ High Speed Cutting

WORKPIECE	CARBON STEELS TOOL STEELS		HARDENED STEELS			
HARDNESS	~ HRc50		HRc50 ~ HRc60		HRc60 ~	
STRENGTH	1750N/mm²		1750~ 2080N/mm²		2080N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
1/8	16,800	240.00	8,400	120.00	4,200	58.00
3/16	12,600	240.00	6,300	120.00	3,160	58.00
1/4	9,980	235.00	5,040	120.00	2,520	58.00
5/16	8,400	199.00	4,200	100.00	2,100	50.00
3/8	6,300	149.00	3,160	75.00	1,580	37.00
1/2	5,040	120.00	2,520	58.00	1,260	30.00
5/8	3,790	75.00	1,890	38.00	950	19.00

RPM = rev. / min.
FEED = inch / min.



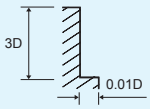


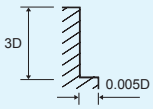


[ZA526 & 8 series] ▶ High Speed Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS·CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc60		HRc60 ~ HRc65	
STRENGTH	~ 1250N/mm²		1250 ~ 1750N/mm²		1750 ~ 2080N/mm²		2080N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	2,230	19.00	1,670	14.00	1,390	10.00	1,110	8.00
5/16	1,670	18.00	1,250	13.00	1,050	9.50	840	7.00
3/8	1,330	17.00	1,000	12.00	840	9.00	680	6.30
1/2	1,110	16.00	840	11.00	690	8.50	560	6.00
5/8	840	13.00	630	9.00	530	6.50	420	5.00
3/4	670	11.00	500	8.00	420	6.00	320	4.70
1	540	9.50	400	6.50	340	5.00	270	3.70

RPM = rev. / min.
FEED = inch / min.

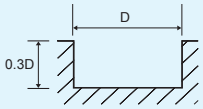


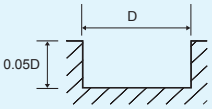


[ZR502A, ZR522A, ZR532A series] ▶ General Cutting

WORKPIECE	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc38		HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1200N/mm²		1400 ~ 2000N/mm²		2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	2,630	4.90	2,100	4.20	1,370	2.00	1,160	1.40
5/16	2,000	5.30	1,580	4.20	1,050	2.00	840	1.40
3/8	1,680	5.30	1,370	4.20	840	2.00	670	1.40
1/2	1,370	4.20	1,160	3.80	700	1.50	550	1.00

RPM = rev. / min.
FEED = inch / min.

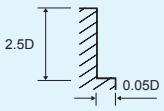


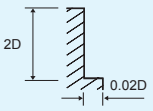


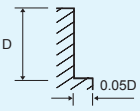
[ZR504A, ZR524A, ZR534A series] ▶ General Cutting

WORKPIECE	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1750N/mm²		1750 ~ 2000N/mm²		2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	2,630	8.50	2,100	7.10	1,370	3.30	1,160	2.00
5/16	2,000	9.00	1,580	7.10	1,050	3.30	840	2.00
3/8	1,680	9.00	1,370	7.10	840	3.30	670	2.00
1/2	1,370	7.10	1,160	6.30	700	2.80	550	1.50

RPM = rev. / min.
FEED = inch / min.



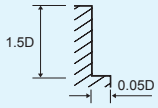


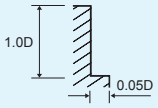


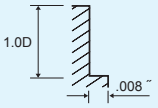
[ZR506(8)A series] ▶ High Speed Cutting

WORKPIECE	CARBON STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS TOOL STEEELS		HARDENED STEELS	
HARDNESS	~ HRc50		HRc50 ~ HRc60		HRc60 ~ HRc65	
STRENGTH	1750N/mm²		1750N/mm²		2080N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED
1/4	16,800	240.00	8,400	120.00	4,200	58.00
5/16	12,600	240.00	6,300	120.00	3,200	58.00
3/8	10,000	235.00	5,000	120.00	2,500	58.00
1/2	8,400	200.00	4,200	100.00	2,100	50.00
5/8	6,300	150.00	3,150	75.00	1,600	37.00
3/4	5,000	120.00	2,500	58.00	1,260	30.00

RPM = rev. / min.
FEED = inch / min.



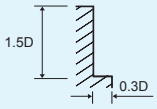


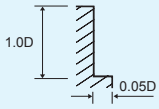


[FA50 series] ▶ General Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS				HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc38		HRc38 ~ HRc45		HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1200N/mm²		1200 ~ 1400N/mm²		1400 ~ 2000N/mm²		2000N/mm²	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/4	15,600	91.35	12,400	33.10	8,400	22.45	3,400	10.25	2,400	7.50
5/16	11,600	91.35	9,200	33.10	6,300	22.45	2,400	9.50	1,800	7.10
3/8	9,200	91.35	7,600	33.10	5,100	22.45	2,000	11.40	1,300	7.50
1/2	8,000	94.50	6,000	31.50	4,200	22.45	1,680	10.25	1,200	7.50
5/8	6,000	94.50	4,800	29.90	3,300	20.05	1,200	6.30	800	4.35
3/4	5,200	91.35	4,400	28.35	2,700	16.55	1,100	5.90	700	3.95
1	4,800	85.05	3,600	22.05	2,400	14.15	1,000	5.90	660	3.95

RPM = rev. / min.
FEED = inch / min.

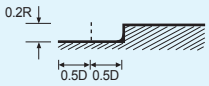


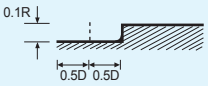


[ZSPM ...-.. series, Fractional] ▶ GENERAL SPEED M/C

WORKPIECE	HARDENED STEELS									
HARDNESS	~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
D X R(Fractional)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/8	9,070	243	6,550	155	4,320	103	2,710	43	1,800	23
3/16	6,680	232	4,830	152	3,360	106	2,140	45	1,470	23
1/4	5,450	283	3,850	182	2,740	130	1,740	69	1,270	30
5/16	4,350	300	3,050	193	2,200	138	1,400	73	995	31
3/8	3,670	316	2,570	200	1,840	145	1,160	76	840	33
1/2	2,740	284	1,940	182	1,370	130	870	69	630	30

RPM = rev. / min.
FEED = inch / min.

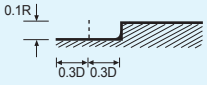


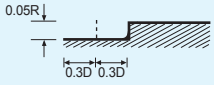


[ZSPM ...-.. series, Fractional] ▶ HIGH SPEED M/C

WORKPIECE	HARDENED STEELS									
HARDNESS	~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
D X R(Fractional)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/8	20,800	590	16,000	370	11,800	298	8,970	170	6,520	9
3/16	14,280	578	10,900	394	9,250	304	6,720	180	4,700	96
1/4	12,700	685	9,870	508	8,460	405	6,000	236	4,230	133
5/16	10,000	728	8,000	551	6,800	433	4,800	264	3,400	160
3/8	8,400	768	6,720	579	5,670	453	4,000	280	2,850	157
1/2	6,230	687	5,000	520	4,250	408	3,020	260	2,120	134

RPM = rev. / min.
FEED = inch / min.

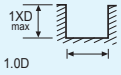


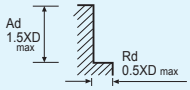


[X-STAR series, Fractional]

WORKPIECE	LOW CARBON STEELS				MED ALLOY STEELS		MOLD&DIE STEELS		CAST IRON-GRAY		CAST IRON-DUCTILE	
HARDNESS	~HB175		~HB275		~HB275		~HB275		~HB200		~HB300	
D(Fractional)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/8	15,585	12	12,835	10	10,695	8	5,500	4	14,515	11	7,335	5
3/16	10,360	20	8,560	17	7,150	14	3,670	8	9,690	19	4,880	9
1/4	7,795	24	6,420	20	5,350	17	2,750	8	7,260	23	3,665	11
5/16	6,235	29	5,135	24	4,280	20	2,200	10	5,805	27	2,935	14
3/8	5,195	39	4,280	32	3,565	27	1,835	13	4,840	36	2,445	18
7/16	4,455	38	3,665	31	3,055	26	1,570	13	4,145	35	2,095	18
1/2	3,895	37	3,210	30	2,675	25	1,375	13	3,630	34	1,835	17
9/16	3,465	35	2,850	29	2,375	24	1,220	12	3,225	32	1,630	16
5/8	3,115	33	2,565	27	2,140	23	1,100	11	2,905	31	1,465	15
3/4	2,600	31	2,140	25	1,785	21	915	11	2,420	29	1,220	14
1	1,950	25	1,605	21	1,335	17	690	9	1,815	24	915	12

RPM = rev. / min.
FEED = inch / min.



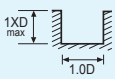


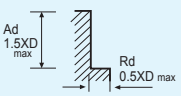
※ Use a rigid and precise machines and holders.
※ Use a suitable cutting oil.

[X-STAR series, Fractional]

WORKPIECE	CAST IRONMALLEABLE		STAINLESS 300 SERIES		STAINLESS 400 SERIES		STAINLESS PH SERIES		TITANIUM ALLOYS		HIGH TEMP ALLOYS	
HARDNESS	~HB300		~HB275		~HB185		~HB325		~HB295		~HB300	
D(Fractional)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1/8	4,585	4	9,170	7	12,835	10	7,640	5	9,170	9	2,445	2
3/16	3,070	6	6,080	12	8,550	17	5,080	10	6,080	14	1,600	3
1/4	2,290	7	4,585	14	6,420	22	3,820	12	4,585	16	1,220	3
5/16	1,835	8	3,665	16	5,135	25	3,055	14	3,665	18	980	4
3/8	1,530	11	3,055	16	4,280	25	2,545	14	3,055	18	815	4
7/16	1,310	11	2,620	16	3,665	25	2,185	14	2,620	18	700	4
1/2	1,145	11	2,290	16	3,210	25	1,910	14	2,290	18	610	4
9/16	1,020	10	2,035	20	2,850	29	1,700	17	2,035	20	545	6
5/8	915	9	1,835	16	2,565	25	1,530	14	1,835	18	490	4
3/4	765	9	1,520	15	2,410	22	1,275	12	1,520	16	400	4
1	575	7	1,145	15	1,605	22	955	12	1,145	16	305	3

RPM = rev. / min.
FEED = inch / min.



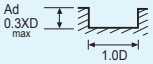


※ Use a rigid and precise machines and holders.
※ Use a suitable cutting oil.

[X-STAR series, Fractional] ▶ Slotting

WORKPIECE	HARDENED STEELS	
HARDNESS	HRc30~45	
D(Fractional)	RPM	FEED
1/8	6,573	16
3/16	4,382	16
1/4	3,287	17
5/16	2,629	17
3/8	2,191	17
7/16	1,878	17
1/2	1,643	16
9/16	1,461	16
5/8	1,315	16
3/4	1,096	17
1	822	16

RPM = rev. / min.
FEED = inch / min.

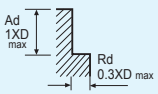


※ Use a rigid and precise machines and holders.
※ Use a suitable cutting oil.

[X-STAR series, Fractional] ▶ Side Cutting

WORKPIECE	HARDENED STEELS	
HARDNESS	HRc30~45	
D(Fractional)	RPM	FEED
1/8	6,573	16
3/16	4,382	16
1/4	3,287	17
5/16	2,629	17
3/8	2,191	17
7/16	1,878	17
1/2	1,643	16
9/16	1,461	16
5/8	1,315	16
3/4	1,096	17
1	822	16

RPM = rev. / min.
FEED = inch / min.

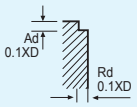


※ Use a rigid and precise machines and holders.
※ Use a suitable cutting oil.

[X-STAR series, Fractional] ▶ High Speed Cutting

WORKPIECE	HARDENED STEELS	
HARDNESS	HRc30~45	
D(Fractional)	RPM	FEED
1/8	17,121	75
3/16	11,414	78
1/4	8,561	75
5/16	6,848	77
3/8	5,707	75
7/16	4,892	76
1/2	4,280	75
9/16	3,805	75
5/8	3,424	75
3/4	2,854	75
1	2,140	73

RPM = rev. / min.
FEED = inch / min.

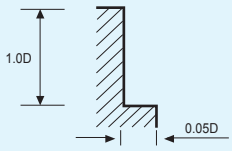


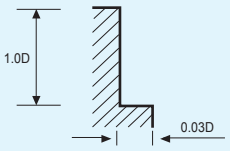
※ Use a rigid and precise machines and holders.
※ Use a suitable cutting oil.

[ZE716A, ZR706A series]

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30~ HRc40		HRc40~ HRc50		HRc50~ HRc55		HRc55~ HRc60		HRc60~ HRc65		HRc65~ HRc70	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6(1/4)	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8(5/16)	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10(3/8)	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12(1/2)	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16(5/8)	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20(3/4)	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

RPM = rev. / min.
FEED = inch / min.

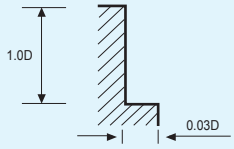




[ZE712A series] ▶ Side Cutting

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30~ HRc40		HRc40~ HRc50		HRc50~ HRc55		HRc55~ HRc60		HRc60~ HRc65		HRc65~ HRc70	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2(1/16)	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3(1/8)	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1000	8,800	625	7,200	385	5,600	240	4,750	170
5(3/16)	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6(1/4)	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8(5/16)	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10(3/8)	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12(1/2)	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

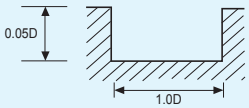
RPM = rev. / min.
FEED = inch / min.

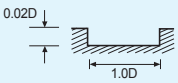


[ZE712A series] ▶ Slotting

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30~ HRc40		HRc40~ HRc50		HRc50~ HRc55		HRc55~ HRc60		HRc60~ HRc65		HRc65~ HRc70	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
0.2	50,000	130	45,000	115	40,000	95	33,000	310	16,000	190	12,500	125
0.3	50,000	190	45,000	140	40,000	115	33,000	370	11,000	230	9,500	165
0.4	50,000	235	45,000	180	40,000	140	33,000	370	7,500	230	6,400	165
0.5	50,000	370	45,000	280	40,000	220	33,000	385	5,600	240	4,750	170
0.6	50,000	470	45,000	360	40,000	285	30,000	410	5,100	260	4,450	190
0.8	50,000	600	40,000	440	30,000	295	25,000	400	4,200	255	3,700	185
0.9	49,000	655	39,000	520	27,800	330	22,700	365	3,200	235	2,800	170
1	48,000	750	38,000	570	25,500	360	20,500	340	2,550	220	2,200	160
2(1/16)	33,300	850	26,000	680	17,500	420	14,500	340	2,100	220	1,860	160
3(1/8)	21,800	850	17,300	680	11,500	420	9,500	300	1,600	190	1,400	140
4	16,700	880	13,200	700	8,800	440	7,200	275	1,300	175	1,100	125
5(3/16)	15,700	1,000	12,500	805	8,300	500	6,400	0	0	0	0	0
6(1/4)	13,100	950	10,350	770	6,900	480	5,300	0	0	0	0	0
8(5/16)	9,880	930	7,800	720	5,200	445	4,000	0	0	0	0	0
10(3/8)	7,800	850	6,150	680	4,100	415	3,200	0	0	0	0	0
12(1/2)	6,650	850	5,250	680	3,500	415	2,650	0	0	0	0	0
16	4,900	730	3,900	580	2,600	365	2,000	0	0	0	0	0
20	3,900	660	3,100	525	2,050	335	1,600	0	0	0	0	0

RPM = rev. / min.
FEED = inch / min.

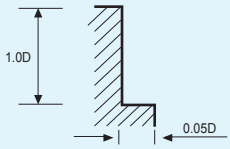


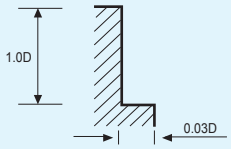


[ZE714A series] ▶ Side Cutting

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30~ HRc40		HRc40~ HRc50		HRc50~ HRc55		HRc55~ HRc60		HRc60~ HRc65		HRc65~ HRc70	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2(1/16)	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3(1/8)	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5(3/16)	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6(1/4)	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8(5/16)	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10(3/8)	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12(1/2)	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

RPM = rev. / min.
FEED = inch / min.

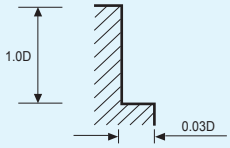




[ZS204A series] ▶ Side Cutting

WORKPIECE	HARDENED STEELS									
HARDNESS	HRc40~ HRc50		HRc50~ HRc55		HRc55~ HRc60		HRc60~ HRc65		HRc65~ HRc70	
DIAMETER(inch)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4(3/16)	17,200	1,690	11,440	1,140	9,360	700	7,280	430	6,170	310
6(1/4)	13,450	1,820	8,970	1,230	6,890	720	5,460	450	4,810	330
8(5/16)	9,100	1,750	6,760	1,170	5,200	670	4,160	420	3,640	310
10(3/8)	8,000	1,630	5,330	1,090	4,160	620	3,320	400	2,860	280
12(1/2)	6,830	1,630	4,550	1,010	3,450	580	2,730	370	2,420	260

RPM = rev. / min.
FEED = inch / min.



[ZSTNB series]

WORKPIECE					Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
R (mm)	Mill Dia (mm)	Neck Length (mm)	Neck Angle (°)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
0.1	0.2	1	0.4	0.017	40,000	800	28,000	504	26,000	416	26,000	364
		1.5	0.4	0.009	40,000	800	28,000	504	26,000	416	26,000	364
		2	0.9	0.007	32,000	461	22,400	323	20,800	266	20,800	233
		2.5	0.9	0.004	26,000	333	18,200	204	16,900	189	16,900	162
0.15	0.3	2	0.4	0.025	40,000	1,200	28,000	756	26,000	624	26,000	546
		3	0.9	0.013	32,000	691	22,400	484	20,800	399	20,800	349
		4	0.9	0.010	26,000	499	18,200	306	16,900	284	16,900	243
0.2	0.4	2	0.4	0.035	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		3	0.4	0.020	40,000	1,600	28,000	1,008	26,000	832	26,000	728
		4	0.4	0.007	32,000	922	22,400	645	20,800	532	20,800	466
		4	0.9	0.009	32,000	922	22,400	645	20,800	532	20,800	466
		5	0.4	0.006	26,000	666	18,200	408	16,900	379	16,900	324
		5	0.9	0.007	26,000	666	18,200	408	16,900	379	16,900	324
0.25	0.5	4	0.4	0.040	40,000	2,000	28,000	1,260	26,000	1,040	26,000	910
		8	0.9	0.010	26,000	728	18,200	446	16,900	414	16,900	355
		12	0.9	0.005	22,400	627	15,680	384	14,560	357	14,560	306
0.27	0.54	2	0.4	0.050	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		4	0.4	0.037	40,000	2,160	28,000	1,361	26,000	1,123	26,000	983
		5	0.4	0.031	40,000	1,512	28,000	1,176	26,000	1,040	26,000	832
		6	0.4	0.025	26,000	1,244	18,200	871	16,900	676	16,900	629
		6.5	0.4	0.020	26,000	1,011	18,200	619	16,900	575	16,900	493
		7	0.4	0.015	26,000	899	18,200	585	16,900	543	16,900	465
0.3	0.6	2	0.4	0.055	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		4	0.4	0.035	40,000	2,400	28,000	1,512	26,000	1,248	26,000	1,092
		6	0.4	0.018	32,000	1,382	22,400	968	20,800	799	20,800	699
		6	0.9	0.020	32,000	1,382	22,400	968	20,800	799	20,800	699
		8	0.9	0.020	26,000	998	18,200	612	16,900	568	16,900	487
		10	0.4	0.013	26,000	874	18,200	535	16,900	497	16,900	426
		10	0.9	0.015	26,000	874	18,200	535	16,900	497	16,900	426
		12	0.9	0.010	26,000	874	18,200	535	16,900	497	16,900	426
		15	0.4	0.005	22,400	753	15,680	461	14,560	367	14,560	367
		15	0.9	0.006	22,400	753	15,680	461	14,560	367	14,560	367

[ZSTNB series]

WORKPIECE					Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
R (mm)	Mill Dia (mm)	Neck Length (mm)	NeckAngle (°)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
0.4	0.8	4	0.4	0.062	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		6	0.4	0.045	32,000	2,560	22,400	1,613	20,800	1,331	20,800	1,165
		8	0.9	0.026	25,600	1,475	17,920	1,032	16,640	852	16,640	745
		12	0.9	0.020	20,800	1,065	14,560	699	13,520	606	13,520	519
		16	0.9	0.018	20,800	932	14,560	612	13,520	530	13,520	454
0.45	0.9	4	0.4	0.063	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		8	0.4	0.050	28,300	2,547	19,810	1,605	18,395	1,324	18,395	1,159
		12	0.4	0.037	18,400	1,325	12,880	811	11,960	753	11,960	646
		16	0.4	0.024	18,400	1,325	12,880	811	11,960	753	11,960	646
		18	0.4	0.018	18,400	1,325	12,880	811	11,960	753	11,960	646
		20	0.4	0.015	15,850	1,141	11,095	699	10,303	649	10,303	556
		22	0.4	0.012	15,850	1,141	11,095	699	10,303	649	10,303	556
		24	0.4	0.009	14,150	1,019	9,905	624	9,198	579	9,198	497
0.5	1	6	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		8	0.4	0.055	25,600	2,560	17,920	1,613	16,640	1,331	16,640	1,165
		10	0.4	0.032	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		10	0.9	0.035	20,800	1,872	14,560	1,310	13,520	1,082	13,520	946
		15	0.9	0.028	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.4	0.018	16,640	1,331	11,648	874	10,816	757	10,816	649
		20	0.9	0.020	16,640	1,331	11,648	874	10,816	757	10,816	649
		25	0.9	0.017	14,560	1,165	10,192	764	9,464	662	9,464	568
		30	0.4	0.015	12,480	874	8,736	568	8,112	487	8,112	406
		30	0.9	0.017	12,480	874	8,736	568	8,112	487	8,112	406
		35	0.9	0.010	10,400	728	7,280	473	6,760	406	6,760	338
		40	0.9	0.009	10,000	700	7,000	455	6,500	390	6,500	325
		50	0.9	0.007	9,500	665	6,650	432	6,175	371	6,175	309
		60	0.9	0.005	9,000	630	6,300	410	5,850	351	5,850	293
		70	0.9	0.003	8,500	595	5,950	387	5,525	332	5,525	276
0.75	1.5	8	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		10	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		12	0.4	0.070	16,960	2,544	11,872	1,603	11,024	1,323	11,024	1,158
		15	0.9	0.045	13,568	1,832	9,498	1,282	8,819	1,058	8,819	926
		20	0.9	0.040	11,024	1,323	7,717	810	7,166	752	7,166	645
		30	0.9	0.028	11,024	1,323	7,717	810	7,166	752	7,166	645

[ZSTNB series]

WORKPIECE					Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
R (mm)	Mill Dia (mm)	Neck Length (mm)	Neck Angle (°)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
0.9	1.8	4	0.4	0.120	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		8	0.4	0.100	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		12	0.4	0.080	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		16	0.4	0.071	14,200	2,556	9,940	1,610	9,230	1,329	9,230	1,163
		20	0.4	0.062	9,230	1,329	6,461	814	6,000	756	6,000	648
		24	0.4	0.053	9,230	1,329	6,461	814	6,000	756	6,000	648
		28	0.4	0.044	9,230	1,329	6,461	814	6,000	756	6,000	648
		32	0.4	0.036	9,230	1,329	6,461	814	6,000	756	6,000	648
		36	0.4	0.028	9,230	1,329	6,461	814	6,000	756	6,000	648
		38	0.4	0.020	8,000	1,152	5,600	706	5,200	655	5,200	562
		40	0.4	0.015	8,000	1,152	5,600	706	5,200	655	5,200	562
1	2	8	0.4	0.150	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		12	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		16	0.4	0.090	15,200	3,040	10,640	1,915	9,880	1,581	9,880	1,383
		20	0.4	0.060	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		20	0.9	0.070	12,160	2,189	8,512	1,532	7,904	1,265	7,904	1,107
		25	0.9	0.070	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.4	0.040	9,880	1,581	6,916	968	6,442	899	6,422	771
		30	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		35	0.9	0.045	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.4	0.030	9,880	1,581	6,916	968	6,442	899	6,422	771
		40	0.9	0.035	9,880	1,581	6,916	968	6,442	899	6,422	771
		50	0.9	0.170	8,512	1,192	5,958	775	5,533	664	5,533	553
		60	0.9	0.009	7,235	1,013	5,065	658	4,703	564	4,703	470
		70	0.9	0.005	6,150	861	4,305	560	3,997	480	3,997	400
1.5	3	8	0.4	0.320	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		16	0.4	0.220	12,720	3,816	8,904	2,404	8,268	1,984	8,268	1,736
		20	0.4	0.150	12,720	3,434	8,904	2,137	8,268	1,736	8,268	1,488
		30	0.4	0.080	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		30	0.9	0.090	10,176	2,748	7,123	1,496	6,614	1,389	6,614	1,191
		40	0.4	0.060	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		40	0.9	0.070	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		50	0.9	0.050	8,268	1,984	5,788	1,215	5,374	1,129	5,374	967
		60	0.9	0.030	7,123	1,710	4,986	1,047	4,630	972	4,630	833
		70	0.9	0.020	6,233	1,496	4,363	916	4,051	851	4,051	729

[ZSTNB series]

WORKPIECE					Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
R (mm)	Mill Dia (mm)	Neck Length (mm)	Neck Angle (°)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
2	4	20	1	0.32	11,900	2,860	9,000	2,050	7,800	1,680	7,800	1,590
		30	1	0.23	11,900	2,570	9,000	1,850	7,800	1,520	7,800	1,430
		40	1	0.14	9,500	1,940	7,200	1,400	6,200	1,140	6,200	1,080
		50	1	0.11	7,800	1,590	5,800	1,120	5,000	920	5,000	870
		60	1	0.07	7,800	1,590	5,800	1,120	5,000	920	5,000	870
2.5	5	30	1	0.34	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		40	1	0.25	9,500	2,140	7,200	1,540	6,200	1,260	6,200	1,190
		60	1	0.15	6,200	1,320	4,700	950	4,000	770	4,000	720
3	6	30	1	0.45	8,000	2,000	6,000	1,430	5,200	1,170	5,200	1,110
		40	1	0.40	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		50	1	0.32	8,000	1,800	6,000	1,280	5,200	1,050	5,200	990
		60	1	0.22	6,400	1,360	4,800	970	4,100	780	4,100	740
		70	1	0.18	5,200	1,110	3,900	790	3,400	650	3,400	610
		80	1	0.14	5,200	1,110	3,900	790	3,400	650	3,400	610
4	8	50	1	0.50	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		60	1	0.43	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		70	1	0.33	6,000	1,460	4,500	1,040	3,900	850	3,900	810
		80	1	0.25	4,800	1,100	3,600	780	3,100	640	3,100	600
5	10	60	1	0.70	4,800	1,300	3,600	920	3,100	750	3,100	710
		75	1	0.50	4,800	1,300	3,600	920	3,100	750	3,100	710

※ Please adjust the cutting depth index according to the cutting depth factors of above table.

※ For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.

ex) ZSTNB2040-20-10, HRC 55, Rib processing

Cutting depth : 0.32(standard cutting depth) X 0.65 X 0.8 = 0.17mm

※ In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.

※ If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

[ZSTNR series]

WORKPIECE				Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	R (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
0.2	0.05	2	0.007	39,660	887	33,660	754	29,700	591	27,720	483
0.4	0.05	4	0.009	30,096	899	25,582	764	22,572	599	21,067	489
		5	0.007	26,752	710	22,739	528	20,064	466	18,726	373
	0.1	4	0.009	31,680	946	26,928	804	23,760	631	22,176	515
		5	0.007	28,160	747	23,936	556	21,120	490	19,712	392
0.5	0.1	5	0.013	30,413	1,090	25,851	753	22,810	562	21,289	453
		8	0.008	24,330	678	20,681	468	18,248	350	17,031	282
		10	0.007	18,248	509	15,511	351	13,686	262	12,773	211
0.6	0.1	12	0.010	20,377	791	17,320	546	15,282	408	14,264	329
		15	0.006	16,727	649	14,218	448	12,545	335	11,709	270
0.8	0.2	6	0.045	31,680	1,084	26,928	921	23,760	723	22,176	590
		12	0.020	28,160	943	23,936	695	21,120	613	19,712	490
1	0.2	8	0.040	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		10	0.035	28,512	1,596	24,235	1,357	21,384	1,064	19,958	869
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		20	0.020	19,008	828	16,157	653	14,256	532	13,306	414
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		35	0.010	15,840	690	13,464	544	11,880	443	11,088	345
	0.3	8	0.040	28,512	1,463	24,235	1,244	21,384	976	19,958	797
		15	0.028	25,344	1,261	21,542	938	19,008	828	17,741	662
		25	0.017	15,840	690	13,464	544	11,880	443	11,088	345
		30	0.017	15,840	690	13,464	544	11,880	443	11,088	345
1.5	0.2	10	0.050	21,683	1,079	18,431	803	16,262	708	15,178	567
		15	0.045	19,712	981	16,755	730	14,784	644	13,798	515
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268
	0.3	10	0.050	21,683	1,079	18,431	803	16,262	708	15,178	567
		20	0.042	17,347	863	14,745	642	13,010	567	12,143	453
		25	0.032	14,784	644	12,566	508	11,088	414	10,349	322
		30	0.028	12,320	536	10,472	423	9,240	345	8,624	268

[ZSTNR series]

WORKPIECE				Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	R (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
2	0.2	30	0.045	13,440	1,254	11,424	933	10,080	823	9,408	658
		40	0.035	10,080	823	8,568	650	7,560	529	7,056	412
		50	0.017	8,400	686	7,140	541	6,300	441	5,880	343
	0.3	12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		20	0.054	18,144	1,452	15,422	1,141	13,608	953	12,701	838
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
	0.5	8	0.170	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		12	0.088	22,680	1,814	19,278	1,427	17,010	1,191	15,876	1,048
		16	0.088	19,278	1,542	16,386	1,213	14,459	1,012	13,495	891
		20	0.054	18,114	1,452	15,422	1,141	13,608	953	12,701	838
		25	0.054	15,876	1,270	13,495	999	11,907	833	11,113	733
		30	0.045	13,440	1,393	11,424	1,036	10,080	914	9,408	732
		40	0.035	10,080	914	8,568	722	7,560	588	7,056	457
		50	0.017	8,400	762	7,140	601	6,300	490	5,880	381
3	0.2	40	0.070	10,240	956	8,704	711	7,680	627	7,168	502
		50	0.050	7,680	627	6,528	495	5,760	403	5,376	314
		60	0.030	6,400	523	5,440	412	4,800	336	4,480	261
	0.3	40	0.070	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.050	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.030	6,400	581	5,440	458	4,800	373	4,480	290
	0.5	40	0.070	10,240	1,062	8,704	790	7,680	697	7,168	557
		50	0.050	7,680	697	6,528	550	5,760	448	5,376	348
		60	0.030	6,400	581	5,440	458	4,800	373	4,480	290

※ Please adjust the cutting depth index according to the cutting depth factors of above table.

※ In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.

※ If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

[ZSLNR series]

WORKPIECE				Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	R (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
0.2	0.05	0.5	0.020	50,000	258	50,000	205	50,000	180	50,000	160
		1	0.014	50,000	258	50,000	205	50,000	180	50,000	160
		1.5	0.008	50,000	240	45,900	202	45,900	170	45,900	153
		2	0.008	42,000	202	36,700	176	36,700	162	36,700	147
0.3	0.05	1	0.021	50,000	585	50,000	456	50,000	336	50,000	320
		1.5	0.016	50,000	585	45,000	456	45,000	336	45,000	320
		2	0.012	45,000	530	45,000	420	45,000	300	45,000	290
		2.5	0.010	40,000	471	40,000	373	40,000	267	40,000	258
		3	0.008	35,000	412	35,000	326	30,000	200	30,000	194
0.4	0.05	1	0.025	50,000	580	50,000	461	40,000	320	36,000	270
		1.5	0.020	50,000	580	50,000	461	40,000	320	36,000	270
		2	0.016	45,000	520	45,000	410	36,000	290	34,000	240
		2.5	0.015	40,500	480	40,500	370	33,400	270	30,600	220
		3	0.014	40,000	410	40,000	330	32,800	240	25,600	200
		3.5	0.012	36,000	380	36,000	300	29,400	200	22,920	180
		4	0.008	30,000	320	30,000	250	21,600	160	19,200	150
	0.1	2	0.028	45,000	520	45,000	410	36,000	290	34,000	240
		3	0.016	40,000	410	40,000	330	32,800	240	25,600	200
		4	0.010	30,000	320	30,000	250	21,600	160	19,200	150
0.5	0.05	1	0.030	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.023	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.017	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.017	40,000	820	32,000	378	24,000	279	20,000	234
		5	0.011	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.008	28,800	480	19,400	260	18,000	250	15,000	200
	0.1	1	0.035	50,000	898	40,000	464	30,000	378	28,000	315
		2	0.030	50,000	898	40,000	464	30,000	378	28,000	315
		3	0.020	45,000	810	36,000	414	27,000	315	24,500	261
		4	0.020	40,000	720	32,000	378	24,000	279	20,000	234
		5	0.013	28,800	540	19,400	280	18,000	250	15,000	200
		6	0.013	28,800	480	19,400	260	18,000	250	15,000	200
0.6	0.1	2	0.035	50,000	1,159	37,830	600	28,200	390	23,000	320
		4	0.024	40,000	830	27,800	440	23,600	280	21,000	230
		6	0.015	24,000	490	18,000	300	17,800	240	15,000	210
		8	0.013	24,000	466	18,000	285	17,800	228	15,000	200
		10	0.009	24,000	451	18,000	276	17,800	221	15,000	193

[ZSLNR series]

WORKPIECE				Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	R (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
0.8	0.1	4	0.032	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.019	38,700	800	25,000	461	18,000	288	18,000	256
		8	0.015	29,025	600	20,000	369	16,200	259	16,200	230
		12	0.012	29,025	570	20,000	350	16,200	246	16,200	219
	0.2	4	0.056	48,000	1,102	28,000	518	20,000	320	20,000	288
		6	0.032	38,700	800	25,000	461	18,000	288	18,000	256
1	0.1	4	0.038	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.024	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.024	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.015	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.015	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.009	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.006	13,608	399	11,567	315	10,206	257	9,526	200
	0.2	4	0.070	32,400	1,359	27,540	1,039	24,300	815	22,680	666
		6	0.040	26,244	990	22,307	842	19,683	660	18,371	539
		8	0.040	23,328	880	19,829	748	17,496	587	16,330	479
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		12	0.025	18,144	609	15,422	453	13,608	399	12,701	320
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.010	13,608	399	11,567	315	10,206	257	9,526	200
	0.3	6	0.040	26,244	990	22,307	842	19,683	660	18,371	539
		10	0.025	20,412	770	17,350	655	15,309	514	14,288	419
		16	0.015	18,144	533	15,422	420	13,608	342	12,701	266
		20	0.010	13,608	399	11,567	315	10,206	257	9,526	200
1.5	0.1	4	0.042	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.036	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.036	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.023	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.018	14,112	568	11,995	423	10,584	373	9,878	298
	0.2	4	0.070	24,930	1,130	20,956	868	18,711	678	17,364	556
		8	0.060	22,680	1,027	19,278	873	17,010	685	15,876	559
		12	0.060	18,144	822	15,422	698	13,608	548	12,701	447
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.030	14,112	568	11,995	423	10,584	373	9,878	298
	0.3	8	0.060	22,680	1,027	19,278	873	17,010	685	15,876	559
		15	0.038	14,112	568	11,995	423	10,584	373	9,878	298
		20	0.030	14,112	568	11,995	423	10,584	373	9,878	298

[ZSLNR series]

WORKPIECE				Carbon Steels, Alloy Steels (180~250HB)		Pre-harden Steels (HRc35~45)		Hardened Steels (HRc45~55)		Hardened Steels (HRc55~65)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	R (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)	n (min^{-1})	Vf (mm/min)
2	0.2	6	0.080	20,790	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.070	18,900	1,486	16,065	1,263	14,175	892	13,230	728
		12	0.040	15,309	1,083	13,013	921	11,482	722	10,716	590
		16	0.040	13,608	963	11,567	818	10,206	642	9,526	524
		20	0.035	11,907	843	10,121	716	8,930	562	8,335	459
		25	0.025	11,907	843	10,121	716	8,930	562	8,335	459
		30	0.017	11,312	800	9,615	680	8,484	534	7,918	436
	0.3	8	0.090	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.060	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.037	11,907	936	10,121	796	8,930	624	8,335	510
	0.5	6	0.017	20,709	1,635	17,672	1,389	15,593	981	14,553	801
		8	0.014	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		12	0.080	15,309	1,204	13,013	1,023	11,482	802	10,716	655
		16	0.080	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.050	11,907	936	10,121	796	8,930	624	8,335	510
		25	0.050	11,907	936	10,121	796	8,930	624	8,335	510
		30	0.030	11,312	889	9,615	756	8,484	593	7,918	484
	0.8	8	0.200	18,900	1,651	16,065	1,403	14,175	991	13,230	809
		16	0.100	13,608	1,070	11,567	909	10,206	713	9,526	583
		20	0.060	11,907	936	10,121	796	8,930	624	8,335	510
3	0.2	8	0.090	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		12	0.070	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		16	0.050	14,400	1,415	12,240	1,203	10,800	849	10,080	693
		20	0.050	11,664	1,146	9,914	974	8,748	764	8,165	624
		30	0.040	9,072	1,146	7,711	974	6,804	764	6,350	624
		35	0.035	9,072	1,146	7,711	974	6,804	764	6,350	624
	0.3	8	0.130	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.075	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.075	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.060	9,072	1,274	7,711	1,083	6,804	849	6,350	693
	0.5	8	0.180	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		12	0.130	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		16	0.100	14,400	1,572	12,240	1,337	10,800	943	10,080	771
		20	0.100	11,664	1,274	9,914	1,083	8,748	849	8,165	693
		30	0.080	9,072	1,274	7,711	1,083	6,804	849	6,350	693
		35	0.065	9,072	1,274	7,711	1,083	6,804	849	6,350	693

※ Please adjust the cutting depth index according to the cutting depth factors of above table.

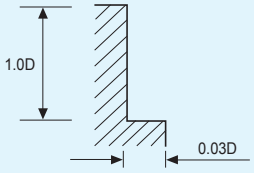
※ In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.

※ If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

[ZS1(2)04, ZS204 series] ▶ Side Cutting

WORKPIECE	HARDENED STEELS									
HARDNESS	HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4	17,200	1,690	11,440	1,140	9,360	700	7,280	430	6,170	310
6	13,450	1,820	8,970	1,230	6,890	720	5,460	450	4,810	330
8	9,100	1,750	6,760	1,170	5,200	670	4,160	420	3,640	310
10	8,000	1,630	5,330	1,090	4,160	620	3,320	400	2,860	280
12	6,830	1,630	4,550	1,010	3,450	580	2,730	370	2,420	260

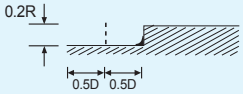
RPM = rev. / min.
FEED = mm / min.

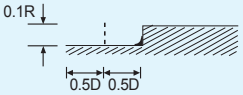


[ZSPM4...-.. series]

WORKPIECE	HARDENED STEELS									
HARDNESS	~HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
D X R(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3 X R0.5	9,550	6,500	6,900	4,150	4,550	2,750	2,850	1,150	1,900	610
4 X R0.5	7,950	7,000	5,750	4,600	4,000	3,200	2,550	1,350	1,750	700
6 X R0.5	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
6 X R1.0	5,800	7,650	4,100	4,900	2,900	3,500	1,850	1,850	1,350	795
8 X R1.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
8 X R2.0	4,350	7,650	3,050	4,900	2,200	3,500	1,400	1,850	995	795
10 X R1.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
10 X R2.0	3,500	7,650	2,450	4,900	1,750	3,500	1,100	1,850	795	795
12 X R2.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795
12 X R3.0	2,900	7,650	2,050	4,900	1,450	3,500	925	1,850	665	795

RPM = rev. / min.
FEED = mm / min.

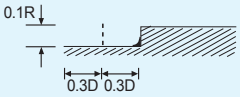


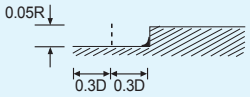


[ZSPM4...-.. series] ▶ High Speed Cutting

WORKPIECE	HARDENED STEELS									
HARDNESS	~HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65	
D X R(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3 X R0.5	22,000	16,000	17,000	10,000	12,500	8,000	9,500	4,600	6,900	2,500
4 X R0.5	17,000	17,500	13,000	12,000	11,000	9,200	8,000	5,500	5,600	2,900
6 X R0.5	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
6 X R1.0	13,500	18,500	10,500	13,800	9,000	11,000	6,400	6,400	4,500	3,600
8 X R1.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
8 X R2.0	10,000	18,500	8,000	14,000	6,800	11,000	4,800	6,700	3,400	4,100
10 X R1.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
10 X R2.0	8,000	18,500	6,400	14,000	5,400	11,000	3,800	6,800	2,700	3,800
12 X R2.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600
12 X R3.0	6,600	18,500	5,300	14,000	4,500	11,000	3,200	7,000	2,250	3,600

RPM = rev. / min.
FEED = mm / min.

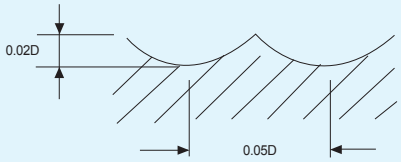




[DB702, DB712 series]

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc 65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
0.2	50,000	1,200	50,000	1,050	45,000	960	40,000	770	35,000	674	31,500	570
0.3	50,000	1,500	50,000	1,350	45,000	1,200	40,000	965	35,000	840	31,500	700
0.4	50,000	1,900	50,000	1,700	45,000	1,500	40,000	1,200	35,000	1,050	31,500	890
0.5	50,000	2,400	50,000	2,100	45,000	1,900	40,000	1,500	35,000	1,300	31,500	1,100
0.6	50,000	2,900	50,000	2,500	45,000	2,200	40,000	1,800	35,000	1,600	31,500	1,400
0.8	50,000	3,900	50,000	3,300	45,000	3,000	40,000	2,400	35,000	2,100	31,500	1,800
1	50,000	4,800	50,000	4,200	45,000	3,800	40,000	3,000	35,000	2,600	35,000	2,300
1.5	50,000	5,400	48,000	4,500	43,000	4,000	37,000	3,100	33,000	2,700	29,700	2,300
2	49,700	5,700	47,800	4800	40,000	4,000	35,000	3,150	32,000	2,800	28,500	2,300
3	33,100	6,000	31,800	5300	26,500	4,000	23,500	3,150	21,000	2,800	19,000	2,300
4	24,900	6,000	23,900	5300	20,000	4,000	17,500	3,150	16,000	2,800	14,500	2,300
5	18,600	5,800	17,800	4900	15,000	3,750	13,500	3,050	11,500	2,550	10,500	2,100
6	13,900	4,850	13,400	4100	11,000	3,100	10,000	2,500	8,800	2,150	8,000	1,750
8	11,100	4,200	10,700	3,500	9,000	2,700	8,000	2,150	7,000	1,850	6,500	1,550
10	9,300	3,700	8,900	3,100	7,500	2,400	6,600	1,900	5,800	1,650	5,300	1,380
12	6,950	2,950	6,680	2,500	5,600	1,900	5,000	1,550	4,400	1,250	4,000	1,050

RPM = rev. / min.
FEED = mm / min.



[DB703 series]

WORKPIECE	HARDENED STEELS											
HARDNESS	HRc30~ HRc40		HRc40~ HRc50		HRc50~ HRc55		HRc55~ HRc60		HRc60~ HRc65		HRc65~ HRc70	
D X R(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
2.5	57,000	7,100	55,000	6,000	46,000	5,000	40,300	3,900	36,800	3,500	32,800	2,900
3	38,000	7,500	36,600	6,600	30,500	5,000	27,000	3,900	24,200	3,500	21,900	2,900
4	28,500	7,500	27,500	6,600	23,000	5,000	20,100	3,900	18,400	3,500	16,700	2,900
5	21,500	7,300	20,500	6,100	17,300	4,700	15,500	3,800	13,200	3,200	12,100	2,600
6	16,000	6,100	15,400	5,100	12,700	3,900	11,500	3,100	10,100	2,700	9,200	2,200
8	12,700	5,300	12,300	4,400	10,400	3,400	9,200	2,700	8,100	2,300	7,500	1,900
10	10,700	4,600	10,200	3,900	8,600	3,000	7,600	2,400	6,700	2,100	6,100	1,700
1	8,000	3,700	7,700	3,100	6,400	2,400	5,800	1,900	5,100	1,600	4,600	1,300

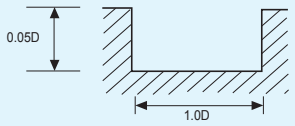
[DB734 series]

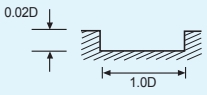
WORKPIECE	HARDENED STEELS											
HARDNESS	HRc30~ HRc40		HRc40~ HRc50		HRc50~ HRc55		HRc55~ HRc60		HRc60~ HRc65		HRc65~ HRc70	
D X R(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
2.5	62,100	8,600	59,800	7,200	50,000	6,000	43,800	4,700	40,000	4,200	35,600	3,500
3	41,400	9,000	39,800	8,000	33,100	6,000	29,400	4,700	26,300	4,200	23,800	3,500
4	31,100	9,000	29,900	8,000	25,000	6,000	21,900	4,700	20,000	4,200	18,100	3,500
5	23,300	8,700	22,300	7,400	18,800	5,600	16,900	4,600	14,400	3,800	13,100	3,200
6	17,400	7,300	16,800	6,200	13,800	4,700	12,500	3,800	11,000	3,200	10,000	2,600
8	13,900	6,300	13,400	5,300	11,300	4,100	10,000	3,200	8,800	2,800	8,100	2,300
10	11,600	5,600	11,100	4,700	9,400	3,600	8,300	2,900	7,300	2,500	6,600	2,100

[ZE702, ZE712 series] ▶ Slotting

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
0.2	50,000	130	45,000	115	40,000	95	33,000	60	33,000	45	26,400	30
0.3	50,000	190	45,000	140	40,000	115	33,000	70	25,000	50	20,000	35
0.4	50,000	235	45,000	180	40,000	140	33,000	90	25,000	55	20,000	40
0.5	50,000	370	45,000	280	40,000	220	33,000	140	25,000	85	20,000	60
0.6	50,000	470	45,000	360	40,000	285	30,000	160	25,000	105	20,000	75
0.8	50,000	600	40,000	440	30,000	295	25,000	185	19,000	110	15,200	80
0.9	49,000	655	39,000	520	27,800	330	22,700	205	17,500	125	14,000	90
1	48,000	750	38,000	570	25,500	360	20,500	215	16,000	135	12,500	85
2	33,300	850	26,000	680	17,500	420	14,500	260	11,000	160	9,500	115
3	21,800	850	17,300	680	11,500	420	9,500	260	7,500	160	6,400	115
4	16,700	880	13,200	700	8,800	440	7,200	270	5,600	170	4,750	118
5	15,700	1,000	12,500	805	8,300	500	6,400	285	5,100	180	4,450	132
6	13,100	950	10,350	770	6,900	480	5,300	280	4,200	180	3,700	130
8	9,880	930	7,800	720	5,200	445	4,000	255	3,200	165	2,800	120
10	7,800	850	6,150	680	4,100	415	3,200	240	2,550	155	2,200	112
12	6,650	850	5,250	680	3,500	415	2,650	240	2,100	155	1,860	112
16	4,900	730	3,900	580	2,600	365	2,000	210	1,600	135	1,400	95
20	3,900	660	3,100	525	2,050	335	1,600	195	1,300	125	1,100	85

RPM = rev. / min.
FEED = mm / min.

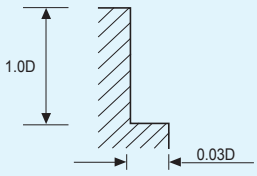




[ZE702, ZE712 series] ▶ Side Cutting

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,050	38,000	820	25,500	510	20,500	310	16,000	190	12,500	125
2	33,300	1,200	26,000	970	17,500	600	14,500	370	11,000	230	9,500	165
3	21,800	1,200	17,300	970	11,500	600	9,500	370	7,500	230	6,400	165
4	16,700	1,250	13,200	1,000	8,800	625	7,200	385	5,600	240	4,750	170
5	15,700	1,450	12,500	1,150	8,300	710	6,400	410	5,100	260	4,450	190
6	13,100	1,350	10,350	1,100	6,900	690	5,300	400	4,200	255	3,700	185
8	9,880	1,320	7,800	1,030	5,200	635	4,000	365	3,200	235	2,800	170
10	7,800	1,200	6,150	970	4,100	590	3,200	340	2,550	220	2,200	160
12	6,650	1,200	5,250	970	3,500	590	2,650	340	2,100	220	1,860	160
16	4,900	1,050	3,900	840	2,600	520	2,000	300	1,600	190	1,400	140
20	3,900	950	3,100	750	2,050	475	1,600	275	1,300	175	1,100	125

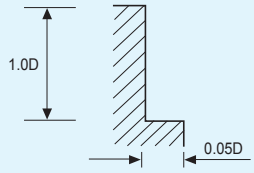
RPM = rev. / min.
FEED = mm / min.

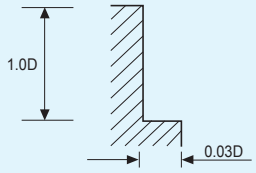


[ZE704, ZE714, ZE724 series] ▶ Side Cutting

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	48,000	1,480	38,000	1,050	25,500	710	20,500	430	16,000	270	12,500	175
2	33,300	1,750	26,000	1,250	17,500	840	14,500	520	11,000	320	9,500	230
3	21,800	1,750	17,300	1,250	11,500	840	9,500	520	7,500	320	6,400	230
4	16,700	1,800	13,200	1,300	8,800	880	7,200	540	5,600	335	4,750	240
5	15,700	2,000	12,500	1,500	8,300	1,000	6,400	580	5,100	370	4,450	270
6	13,100	1,950	10,350	1,400	6,900	950	5,300	560	4,200	350	3,700	260
8	9,880	1,880	7,800	1,350	5,200	900	4,000	520	3,200	330	2,800	240
10	7,800	1,750	6,150	1,260	4,100	840	3,200	480	2,550	310	2,200	220
12	6,650	1,750	5,250	1,260	3,500	840	2,650	480	2,100	300	1,860	220
16	4,900	1,500	3,900	1,100	2,600	730	2,000	420	1,600	270	1,400	200
20	3,900	1,300	3,100	970	2,050	650	1,600	380	1,300	250	1,100	180

RPM = rev. / min.
FEED = mm / min.

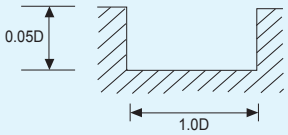


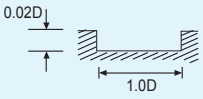


[ZR702, ZR732 series] ▶ Slotting

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	33,300	680	26,000	544	17,500	336	14,500	208	11,000	128	9,500	92
3	21,800	680	17,300	544	11,500	336	9,500	208	7,500	128	6,400	92
4	16,700	704	13,200	560	8,800	352	7,200	216	5,600	136	4,750	94
5	15,700	800	12,500	644	8,300	400	6,400	228	5,100	144	4,450	106
6	13,100	760	10,350	616	6,900	384	5,300	224	4,200	144	3,700	104
8	9,880	744	7,800	576	5,200	356	4,000	204	3,200	132	2,800	96
10	7,800	680	6,150	544	4,100	332	3,200	192	2,550	124	2,200	90
12	6,650	680	5,250	544	3,500	332	2,650	192	2,100	124	1,860	90
16	4,900	584	3,900	464	2,600	292	2,000	168	1,600	108	1,400	78
20	3,900	528	3,100	420	2,050	268	1,600	168	1,300	100	1,100	70

RPM = rev. / min.
FEED = mm / min.

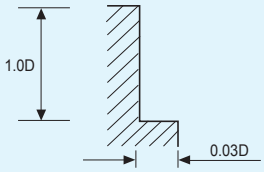




[ZR702, ZR732 series] ▶ Side Cutting

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	33,300	960	26,000	776	17,500	480	14,500	296	11,000	184	9,500	132
3	21,800	960	17,300	776	11,500	480	9,500	296	7,500	184	6,400	132
4	16,700	1,000	13,200	800	8,800	500	7,200	308	5,600	192	4,750	136
5	15,700	1,160	12,500	920	8,300	568	6,400	328	5,100	208	4,450	152
6	13,100	1,080	10,350	880	6,900	552	5,300	320	4,200	204	3,700	148
8	9,880	1,056	7,800	824	5,200	508	4,000	292	3,200	188	2,800	136
10	7,800	960	6,150	776	4,100	472	3,200	272	2,550	176	2,200	128
12	6,650	960	5,250	776	3,500	472	2,650	272	2,100	176	1,860	128
16	4,900	840	3,900	672	2,600	416	2,000	240	1,600	152	1,400	112
20	3,900	760	3,100	600	2,050	380	1,600	220	1,300	140	1,100	100

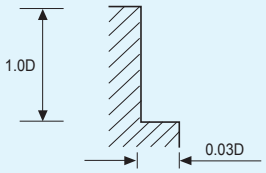
RPM = rev. / min.
FEED = mm / min.



[ZR704, ZR714, ZR724, ZR734 series]

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	21,800	1,400	17,300	1,000	11,500	672	9,500	416	7,500	256	6,400	184
4	16,700	1,440	13,200	1,040	8,800	704	7,200	432	5,600	268	4,750	192
5	15,700	1,600	12,500	1,200	8,300	800	6,400	464	5,100	296	4,450	216
6	13,100	1,560	10,350	1,120	6,900	760	5,300	448	4,200	280	3,700	208
8	9,880	1,504	7,800	1,080	5,200	720	4,000	416	3,200	264	2,800	192
10	7,800	1,400	6,150	1,008	4,100	672	3,200	384	2,550	248	2,200	176
12	6,650	1,400	5,250	1,008	3,500	672	2,650	384	2,100	240	1,860	176
16	4,900	1,200	3,900	880	2,600	584	2,000	336	1,600	216	1,400	160
20	3,900	1,040	3,100	776	2,050	520	1,600	304	1,300	200	1,100	144

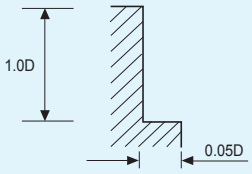
RPM = rev. / min.
FEED = mm / min.

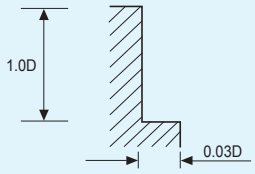


[ZR706, ZR736, ZE716, ZE726 series]

WORKPIECE	HARDENED STEELS HEAT RESISTANT STEELS		HARDENED STEELS									
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc50 ~ HRc 55		HRc55 ~ HRc60		HRc60 ~ HRc65		HRc65 ~ HRc70	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	24,800	5,350	23,500	4,900	16,000	4,900	13,500	3,300	10,500	2,100	8,000	1,450
8	20,000	5,500	19,000	5,000	12,000	4,600	10,000	3,100	8,000	2,000	6,000	1,400
10	16,000	4,900	15,500	4,500	9,500	4,100	8,000	2,900	6,400	1,800	4,800	1,300
12	13,000	4,500	12,500	4,100	8,000	3,800	6,600	2,500	5,300	1,600	4,000	1,150
16	10,000	4,000	9,700	3,700	6,000	3,400	5,000	2,300	4,000	1,250	3,000	870
20	8,000	3,350	7,800	3,400	4,800	3,200	4,000	2,100	3,200	1,020	2,400	690

RPM = rev. / min.
FEED = mm / min.

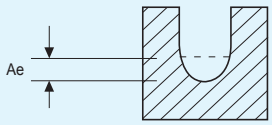




[ZSLNB series]

WORKPIECE	ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS			HARDENED STEELS			COPPER		
HARDNESS	HRc30 ~ HRc45			HRc45 ~ HRc55			HRc55 ~ HRc65					
DIAMETER(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)
0.5	34,100~49,500	600~870	0.007~0.028	31,900~35,200	490~540	0.005~0.023	31,900~35,200	440~480	0.005~0.021	49,000~50,000	1,100~1,400	0.010~0.042
0.6	28,600~40,700	590~850	0.007~0.034	26,400~29,700	480~540	0.006~0.028	26,400~29,700	400~480	0.006~0.025	42,000~50,000	1,100~1,700	0.011~0.050
0.8	22,000~30,800	640~890	0.016~0.064	19,800~22,000	490~550	0.013~0.052	19,800~22,000	440~500	0.012~0.048	31,000~50,000	1,100~2,250	0.024~0.096
1.0	17,600~24,200	600~850	0.008~0.080	15,400~17,600	470~540	0.007~0.065	15,400~17,600	440~500	0.006~0.060	24,000~49,500	1,100~2,200	0.012~0.120
1.2	14,300~18,700	590~780	0.024~0.032	12,000~14,000	480~540	0.020~0.026	12,000~14,000	420~480	0.018~0.024	28,500~38,500	1,480~1,950	0.036~0.048
1.5	11,000~14,300	580~760	0.031~0.048	10,000~11,500	480~540	0.025~0.039	10,000~11,500	420~480	0.023~0.036	17,000~28,500	1,100~1,950	0.046~0.072
2.0	8,500~11,000	590~800	0.024~0.160	7,900~8,800	470~530	0.020~0.130	7,900~8,800	440~480	0.018~0.120	12,600~24,000	1,100~2,150	0.036~0.240
3.0	5,700~8,200	730~1,000	0.064~0.24	5,300~5,800	590~650	0.052~0.195	5,300~5,800	550~620	0.048~0.120	11,900~17,000	1,850~2,700	0.096~0.360
4.0	4,300~6,200	680~990	0.080~0.320	3,950~4,400	550~620	0.065~0.260	3,850~4,400	530~570	0.060~0.240	6,600~12,500	1,260~2,500	0.120~0.480

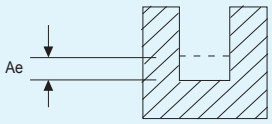
RPM = rev. / min.
FEED = mm / min.



[ZSLNS20, ZSLNS40 series]

WORKPIECE	ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS			HARDENED STEELS			COPPER		
HARDNESS	HRc30 ~ HRc45			HRc45 ~ HRc55			HRc55 ~ HRc65					
DIAMETER(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)	RPM	FEED	Ae(mm)
0.4	34,100~50,000	350~590	0.005~0.028	30,500~35,200	295~340	0.003~0.020	18,300~24,600	120~200	0.002~0.012	48,000~50,000	790~920	0.008~0.048
0.5	25,650~33,000	370~470	0.006~0.035	23,750~26,000	285~315	0.004~0.025	14,200~18,000	115~130	0.003~0.015	44,000~50,000	800~1,150	0.010~0.060
0.6	20,900~35,200	330~560	0.007~0.030	19,900~22,000	260~290	0.005~0.021	11,900~15,500	100~120	0.003~0.013	37,500~50,000	770~1,250	0.011~0.051
0.8	16,150~26,400	360~590	0.009~0.040	15,200~16,700	280~310	0.006~0.028	9,000~11,700	110~125	0.004~0.017	28,500~47,000	770~1,300	0.015~0.068
1.0	12,300~18,700	350~540	0.011~0.028	10,500~11,500	250~280	0.008~0.020	6,300~8,050	100~115	0.005~0.012	22,500~34,000	810~1,300	0.018~0.048
1.2	10,450~17,600	350~590	0.025~0.070	9,100~10,000	250~280	0.015~0.042	5,400~7,000	100~115	0.009~0.026	22,500~31,500	950~1,350	0.036~0.101
1.5	9,100~17,600	430~830	0.017~0.077	7,000~8,000	250~280	0.012~0.055	4,300~5,500	100~115	0.007~0.033	14,500~25,000	770~1,320	0.028~0.132
2.0	6,350~10,550	340~570	0.021~0.140	6,100~6,700	270~300	0.015~0.100	3,600~4,700	100~120	0.009~0.060	11,500~18,500	770~1,250	0.036~0.240
3.0	4,300~7,050	550~900	0.056~0.210	3,990~4,600	445~515	0.040~0.150	2,400~3,200	105~310	0.024~0.090	9,000~13,000	1,400~2,110	0.096~0.360
4.0	3,200~5,300	400~675	0.074~0.280	3,000~3,400	335~380	0.053~0.200	1,800~2,400	75~230	0.032~0.120	6,750~9,750	1,050~1,575	0.128~0.480

RPM = rev. / min.
FEED = mm / min.

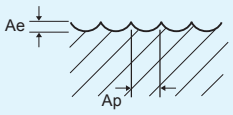


[DB412 series]

WORKPIECE	HARDENED STEELS							
HARDNESS	HRc45 ~ HRc50		HRc50 ~ HRc55		HRc55 ~ HRc60		HRc60 ~ HRc70	
STRENGTH	1500 ~ 1750N/mm²		1750 ~ 2000N/mm²		2000 ~ 2080N/mm²		2080N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	20,000	460	20,000	400	20,000	350	20,000	240
1.5	16,300	640	16,100	580	16,000	570	14,200	360
2	14,500	800	14,200	740	13,850	760	11,300	465
2.5	13,400	950	13,000	890	12,600	920	9,600	560
3	12,700	1,100	12,300	1,050	11,800	1,000	8,400	660
4	10,600	1,100	10,300	1,050	9,800	1,000	6,650	650
5	9,400	1,100	9,050	1,050	8,600	950	5,600	680
6	8,600	1,150	8,250	1,100	7,850	950	4,850	700
8	7,000	1,050	6,700	1,000	6,350	950	3,800	650
10	6,050	1,000	5,800	960	5,450	900	3,200	620
12	5,450	1,000	5,200	960	4,900	900	2,750	610

RPM = rev. / min.
FEED = mm / min.

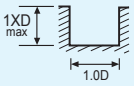
Ae: D1~D4=0.05XD
D5~D8=0.025mm
D10~D20=0.30mm
Ap: D1~D20=0.1 X D

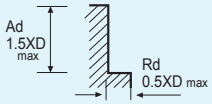


[X-STAR series]

WORKPIECE	LOW CARBON STEELS				MED ALLOY STEELS		MOLD&DIE STEELS		CAST IRON-GRAY		CAST IRON-DUCTILE	
HARDNESS	~HB175		~HB275		~HB275		~HB275		~HB200		~HB300	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	16,500	335	13,585	276	11,320	230	5,820	118	15,360	300	7,765	158
4	12,340	326	10,190	326	8,520	340	4,380	175	11,550	462	5,810	232
5	9,895	502	8,150	413	6,790	345	3,490	177	9,215	468	4,655	236
6	8,250	586	6,795	483	5,660	403	2,910	207	7,680	546	3,880	276
8	6,185	754	5,095	620	4,245	517	2,185	266	5,760	702	2,910	354
10	4,950	955	4,075	786	3,395	656	1,745	337	4,610	889	2,330	449
12	4,125	963	3,395	793	2,830	661	1,455	340	3,840	897	1,940	453
14	3,535	890	2,910	733	2,425	592	1,250	314	3,290	829	1,665	419
16	3,095	817	2,545	672	2,125	561	1,090	288	2,880	761	1,455	384
18	2,750	809	2,265	667	1,885	556	970	285	2,560	754	1,295	381
20	2,475	804	2,040	662	1,700	552	875	283	2,305	749	1,165	378
25	1,975	631	1,630	521	1,360	435	700	230	1,850	600	930	300

RPM = rev. / min.
FEED = mm / min.





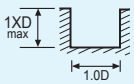
※ Use a rigid and precise machines and holders.

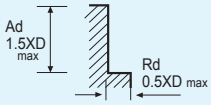
※ Use a suitable cutting oil.

[X-STAR series]

WORKPIECE	CAST IRONMALLEABLE		STAINLESS 300 SERIES		STAINLESS 400 SERIES		STAINLESS PH SERIES		TITANIUM ALLOYS		HIGH TEMP ALLOYS	
HARDNESS	~HB300		~HB275		~HB185		~HB325		~HB295		~HB300	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	4,850	95	9,705	175	13,585	250	8,085	125	9,705	225	2,590	50
4	3,660	146	7,245	290	10,190	407	6,050	242	7,245	290	1,910	76
5	2,910	147	5,820	300	8,150	430	4,850	250	5,820	355	1,550	75
6	2,425	173	4,850	355	6,795	560	4,045	300	4,850	405	1,295	75
8	1,820	221	3,640	405	5,095	635	3,030	355	3,640	455	970	100
10	1,455	280	2,910	405	4,075	635	2,425	355	2,910	455	775	100
12	1,215	283	2,425	405	3,395	635	2,020	355	2,425	455	645	100
14	1,040	262	2,080	405	2,910	635	1,735	355	2,080	455	555	100
16	910	240	1,820	405	2,545	635	1,515	355	1,820	455	485	100
18	810	238	1,615	380	2,265	560	1,350	300	1,615	405	430	100
20	730	236	1,455	380	2,040	560	1,215	300	1,455	405	390	100
25	585	187	1,160	370	1,630	560	970	300	1,160	405	305	73

RPM = rev. / min.
FEED = mm / min.





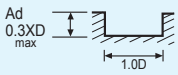
※ Use a rigid and precise machines and holders.

※ Use a suitable cutting oil.

[X-STAR series] ▶ High Speed Cutting

WORKPIECE	HARDENED STEELS	
HARDNESS	HRc30~45	
DIAMETER(mm)	RPM	FEED
3	6,900	552
4	5,175	414
5	4,140	331
6	3,450	414
8	2,588	414
10	2,070	414
12	1,725	414
14	1,479	414
16	1,294	414
18	1,150	368
20	1,035	414
25	828	397

RPM = rev. / min.
FEED = mm / min.



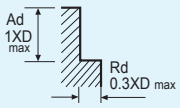
※ Use a rigid and precise machines and holders.

※ Use a suitable cutting oil.

[X-STAR series] ▶ Side Cutting

WORKPIECE	HARDENED STEELS	
HARDNESS	HRc30~45	
DIAMETER(mm)	RPM	FEED
3	8,493	679
4	6,369	510
5	5,096	611
6	4,246	849
8	3,185	764
10	2,548	713
12	2,123	764
14	1,820	728
16	1,592	701
18	1,415	679
20	1,274	662
25	1,019	611

RPM = rev. / min.
FEED = mm / min.



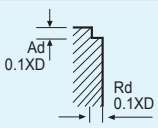
※ Use a rigid and precise machines and holders.

※ Use a suitable cutting oil.

[X-STAR series] ▶ High Speed Cutting

WORKPIECE	HARDENED STEELS	
HARDNESS	HRc30~45	
DIAMETER(mm)	RPM	FEED
3	18,047	2,166
4	13,535	1,624
5	10,828	1,732
6	9,023	2,166
8	6,768	1,895
10	5,414	1,732
12	4,512	1,985
14	3,867	1,856
16	3,384	1,895
18	3,008	1,805
20	2,707	1,841
25	2,166	1,646

RPM = rev. / min.
FEED = mm / min.



※ Use a rigid and precise machines and holders.

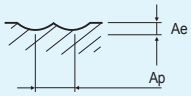
※ Use a suitable cutting oil.

[DB312, 342, 402, 502, 512, 522, 54(5)2 series] ▶ General Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc40		HRc40 ~ HRc55	
STRENGTH	~ 1000N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	16,500	290	13,300	230	6,100	105
1.5	16,500	405	12,700	310	5,590	140
2	15,100	865	11,200	565	4,900	175
2.5	15,100	865	11,200	565	4,900	175
3	13,800	780	10,500	530	4,750	175
4	11,000	850	8,800	610	4,410	205
5	9,600	945	7,600	665	3,860	205
6	8,900	1,150	7,200	955	3,340	220
8	7,500	1,500	6,050	1,060	2,590	255
10	6,700	1,750	5,300	1,170	2,140	260
12	6,150	2,000	4,900	1,280	1,840	280
16	5,000	1,950	3,900	1,220	1,420	280
20	4,350	1,900	3,400	1,200	1,170	290

RPM = rev. / min.
FEED = mm / min.

Ae : D1~D6=0.2mm
D8~D20=0.3mm
Ap : 0.2XD



Ae : D1~D6=0.2mm
D8~D20=0.3mm
Ap : 0.1XD

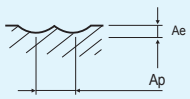
※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

[DB312, 342, 402, 502, 512, 522, 54(5)2 series] ▶ High Speed Cutting

WORKPIECE	NON-ALLOYED STEELS · ALLOY STEELS · CAST IRONN		ALLOY STEELS ·HEAT RESISTANT STEELS	
HARDNESS	~ HRc45		HRc30 ~ HRc40	
STRENGTH	~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED
1	26,000	1,500	26,000	920
1.5	24,000	1,600	24,000	990
2	22,000	1,700	22,000	1,080
2.5	22,000	2,000	20,000	1,130
3	22,000	2,300	17,800	1,200
4	22,000	3,350	14,300	1,300
5	22,000	4,150	12,600	1,380
6	22,000	4,600	11,000	1,440
8	17,500	4,600	8,800	1,440
10	14,700	4,450	7,350	1,380
12	12,800	4,450	6,400	1,330
16	10,000	4,000	5,000	1,150
20	8,350	3,650	4,150	1,060

RPM = rev. / min.
FEED = mm / min.

Ae : D1~D6=0.2mm
D8~D20=0.3mm
Ap : 0.2XD



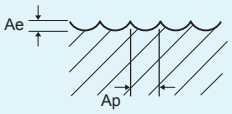
※ Please reduce cutting speed around 20~30% from the above table or DB522 series.

[DB514 series] ▶ General Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc40		HRc45 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	13,100	1,020	10,000	690	4,520	220
4	10,500	1,110	8,400	800	4,200	270
5	9,140	1,230	7,300	870	3,680	270
6	7,780	1,260	6,300	950	3,160	280
8	5,260	1,430	4,420	990	2,100	280
10	4,620	1,530	3,780	1,070	1,780	280
12	3,780	1,350	2,940	990	1,360	280
16	2,740	1,380	2,320	980	1,160	280
20	2,100	1,260	1,900	950	840	280

RPM = rev. / min.
FEED = mm / min.

Ae: D1~D6=0.2mm
D8~D20=0.3mm
Ap: 0.2 X D



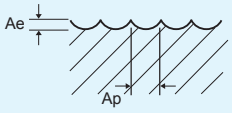
Ae: D1~D6=0.2mm
D8~D20=0.3mm
Ap: 0.1 X D

[DB514 series] ▶ High Speed Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS	
HARDNESS	~ HRc45		HRc45 ~ HRc65	
STRENGTH	~ 1500N/mm²		~ 1500N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED
3	21,000	1,500	17,000	780
4	21,000	2,210	13,660	870
5	21,000	2,700	12,000	900
6	21,000	3,470	10,500	940
8	15,760	4,260	7,880	1,110
10	13,660	4,580	6,300	1,260
12	10,500	3,950	5,260	1,260
16	8,200	3,950	3,780	1,060
20	6,300	3,780	2,940	790

RPM = rev. / min.
FEED = mm / min.

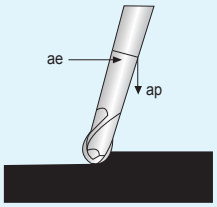
Ae: D1~D6=0.2mm
D8~D20=0.3mm
Ap: 0.05 X D



[DB532 series] ▶ General Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc40		HRc45 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	35,000	2,800	33,000	2,600	12,000	900
4	26,000	2,300	25,000	2,200	9,000	800
5	21,000	2,100	20,000	2,000	7,000	700
6	17,000	1,900	16,000	1,800	6,000	650
8	13,000	1,700	12,000	1,600	4,500	550
10	10,500	1,450	10,000	1,400	3,500	500
12	9,000	1,400	8,000	1,300	3,000	450
16	6,000	1,200	5,500	1,100	2,000	400

RPM = rev. / min.
FEED = mm / min.

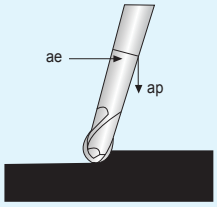


ae = 0.05 x d1
ap = 0.02 x d1

[DB532 series] ▶ High Speed Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc40		HRc45 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	47,000	3,700	44,000	3,500	17,000	1,400
4	35,000	3,200	33,000	3,000	13,000	1,200
5	28,000	2,800	27,000	2,600	10,000	1,100
6	23,000	2,600	22,000	2,400	8,000	950
8	18,000	2,300	17,000	2,100	6,000	850
10	14,000	2,000	13,000	1,900	5,000	750
12	12,000	1,800	11,000	1,800	4,000	700
16	9,000	1,600	8,000	1,500	3,300	600

RPM = rev. / min.
FEED = mm / min.

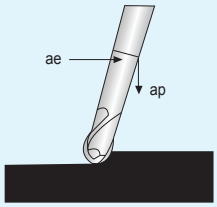


ae = 0.05 x d1
ap = 0.02 x d1

[DB534 series] ▶ General Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc40		HRc45 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
5	21,000	4,000	20,000	4,000	7,000	1,400
6	17,000	4,000	16,000	3,500	6,000	1,300
8	13,000	3,500	12,000	3,000	4,500	1,100
10	10,500	3,000	10,000	2,500	3,500	1,000
12	9,000	2,800	8,000	2,500	3,000	950
16	6,000	2,800	5,500	2,200	2,000	800

RPM = rev. / min.
FEED = mm / min.

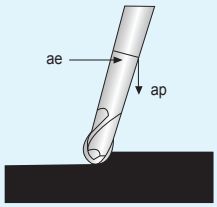


ae = 0.05 x d1
ap = 0.02 x d1

[DB534 series] ▶ High Speed Cutting

WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc40		HRc45 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1250N/mm²		1500N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
5	28,000	5,600	27,000	5,300	11,000	2,100
6	23,000	5,100	22,000	4,900	9,000	1,900
8	18,000	4,600	17,000	4,300	7,000	1,700
10	14,000	3,900	13,000	3,700	5,000	1,400
12	12,000	3,700	11,000	3,500	4,500	1,300
16	9,000	3,100	8,000	3,000	3,300	1,100

RPM = rev. / min.
FEED = mm / min.

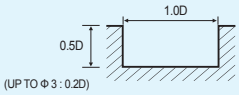


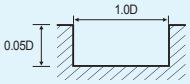
ae = 0.05 x d1
ap = 0.02 x d1

[ZE302, ZE322, ZE402, ZE502, ZE522, ZE512 series] ▶ General Cutting

WORKPIECE	ALLOY STEELS·HEAT RESISTANT STEELS		HARDENED STEELS		STAINLESS STEELS	
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50			
STRENGTH	1000 ~ 1250N/mm²		1250 ~ 1750N/mm²			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2	9,700	220	6,350	135	5,300	105
3	7,500	240	4,670	160	3,880	135
4	6,350	345	3,880	205	3,250	175
5	5,300	370	3,170	220	2,650	185
6	4,670	405	2,830	255	2,380	205
8	3,530	435	2,120	230	1,760	205
10	2,730	380	1,680	185	1,420	185
12	2,310	320	1,420	150	1,140	150
16	1,850	255	1,140	125	890	125
20	1,420	195	890	90	705	90
25	1,150	150	705	80	580	70

RPM = rev. / min.
FEED = mm / min.



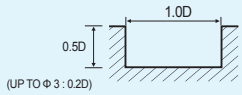


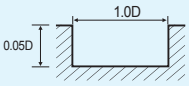
※ Please reduce cutting speed around 20~30% from the above table or ZE522, ZE322 series.

[ZE302, ZE322, ZE402, ZE502, ZE522, ZE512 series] ▶ High Speed Cutting

WORKPIECE	ALLOY STEELS·HEAT RESISTANT STEELS		HARDENED STEELS				STAINLESS STEELS	
HARDNESS	HRc30 ~ HRc40		HRc40 ~ HRc50		HRc40 ~ HRc55			
STRENGTH	1000 ~ 1250N/mm²		1250 ~ 1750N/mm²		1750 ~ 2000N/mm²			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	18,000	665	11,800	415	8,700	175	9,800	345
3	11,000	655	6,800	435	5,600	185	6,200	370
4	10,300	725	6,300	430	4,300	185	5,300	370
5	9,350	715	5,570	420	3,700	185	4,620	355
6	8,200	750	4,930	470	3,250	185	4,100	390
8	6,300	770	3,780	410	2,470	185	3,120	355
10	4,830	750	2,940	360	2,000	160	2,470	310
12	4,100	750	2,520	345	1,680	160	2,100	300
16	3,260	715	2,000	355	1,890	150	1,940	290
20	2,520	665	1,580	310	1,680	150	1,630	275
25	2,000	635	1,260	340	1,570	150	1,420	290

RPM = rev. / min.
FEED = mm / min.

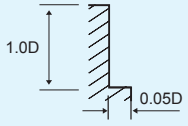




[ZE503 series] ▶ Side Cutting

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS·CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc45				HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²				1500 ~ 2000N/mm²		2000N/mm²~	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	5,560	500	3,360	310	2,840	250	2,000	60	1,100	45
8	4,200	530	2,520	290	2,100	265	1,680	80	840	45
10	3,260	460	2,000	230	1,680	230	1,360	70	680	35
12	2,740	390	1,680	190	1,360	180	1,160	60	560	35
16	2,200	310	1,360	150	1,060	150	900	45	440	20
18	1,940	280	1,210	135	950	130	790	35	380	20
20	1,680	240	1,060	120	840	115	680	30	320	20

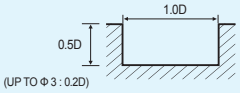
RPM = rev. / min.
FEED = mm / min.

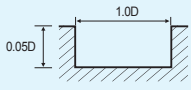


[ZE503 series] ▶ Slotting

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS·CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc45				HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²				1500 ~ 2000N/mm²		2000N/mm²~	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	5,560	310	3,360	200	2,840	160	2,000	50	1,100	35
8	4,200	340	2,520	180	2,100	160	1,680	65	840	35
10	3,260	300	2,000	140	1,680	145	1,360	55	680	30
12	2,740	250	1,680	120	1,360	120	1160	50	560	30
16	2,200	200	1,360	100	1,060	100	900	35	440	20
18	1,940	175	1,210	85	950	85	790	30	380	20
20	1,680	150	1,060	70	840	70	680	25	320	20

RPM = rev. / min.
FEED = mm / min.

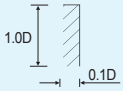


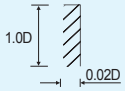


[ZE304, ZE324, ZE404, ZE504, ZE524, ZE534, ZE514 series] ▶ General Cutting

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS				STAINLESS STEELS	
HARDNESS	~HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55			
STRENGTH	~1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	12,100	320	7,900	195	2,700	47	6,600	160
3	9,400	370	5,840	230	2,000	58	4,850	195
4	7,900	655	4,850	405	1,500	58	4,070	320
5	6,600	690	3,970	415	1,300	58	3,320	345
6	5,830	760	3,530	470	1,150	58	2,980	380
8	4,410	815	2,650	435	880	58	2,200	405
10	3,420	700	2,100	345	720	46	1,760	345
12	2,880	600	1,760	290	590	46	1,430	275
16	2,310	470	1,430	230	460	29	1,150	230
20	1,760	370	1,110	185	340	29	880	175
25	1,430	290	880	150	270	23	715	140

RPM = rev. / min.
FEED = mm / min.



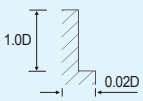


※ Please reduce cutting speed around 20~30% from the above table or ZE524 & ZE324 series.

[ZE304, ZE324, ZE404, ZE504, ZE524, ZE534, ZE514 series] ▶ High Speed CuttingCutting

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		HARDENED STEELS				STAINLESS STEELS	
HARDNESS	~HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55			
STRENGTH	~1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	31,400	1,230	23,500	520	12,600	275	21,600	465
3	19,300	1,210	13,600	735	8,900	390	13,500	660
4	18,100	1,330	12,600	865	7,090	465	11,800	775
5	16,400	1,310	11,100	1,010	6,040	530	10,300	910
6	14,400	1,380	9,900	1,100	5,300	580	9,100	990
8	11,000	1,430	7,600	1,090	3,990	575	6,900	980
10	8,500	1,380	5,880	1,110	3,150	580	5,420	1,000
12	7,200	1,380	5,040	1,090	2,620	575	4,600	985
16	5,700	1,320	3,990	1,010	2,000	535	3,590	910
20	4,400	1,270	3,150	930	1,580	490	2,840	840
25	3,500	1,170	2,520	755	1,260	390	2,270	680

RPM = rev. / min.
FEED = mm / min.



[TPRB4, TPRE4 series]

WORKPIECE	MILD STEEL, CARBON STEEL, CAST IRON SS400, S55C, FC250 (~750N/mm^2)			CARBON STEEL, TOOL STEELS SCM,SKT,SKS,SKD (~30HRc)			HIGH HARDENED STEELS, PREHARDENED STEELS(FREE-MACHINING) SKT, SKD, NAK55, HPM1 (30~38HRc)		
DIAMETER(mm)	SPEED (min-1)	FEED (mm/min)	ap	SPEED (min^{-1})	FEED (mm/min)	ap	SPEED (min^{-1})	FEED (mm/min)	ap
0.5	31,500	630	0.01~0.025	31,500	565	0.01~0.025	31,500	475	0.01~0.025
0.6	31,500	755	0.012~0.03	31,500	680	0.012~0.03	29,500	530	0.012~0.03
0.7	29,000	940	0.014~0.035	27,000	680	0.014~0.035	25,000	530	0.014~0.035
0.8	25,000	935	0.016~0.04	23,500	680	0.016~0.04	22,000	530	0.016~0.04
0.9	22,500	935	0.018~0.045	21,000	680	0.018~0.045	19,500	530	0.018~0.045
1.0	20,000	930	0.02~0.05	19,000	680	0.02~0.05	17,500	530	0.02~0.05
1.2	16,500	930	0.024~0.06	15,500	680	0.024~0.06	14,500	530	0.024~0.06
1.5	13,500	930	0.03~0.075	12,500	680	0.03~0.075	11,500	530	0.03~0.075
1.6	12,500	930	0.032~0.08	11,500	680	0.032~0.08	11,000	530	0.032~0.08
1.8	11,000	930	0.036~0.09	10,500	680	0.036~0.09	9,900	530	0.036~0.09
2.0	10,000	930	0.04~0.1	9,500	680	0.04~0.1	8,900	530	0.04~0.1
2.5	8,100	930	0.05~0.125	7,600	680	0.05~0.125	7,100	530	0.05~0.125
3.0	6,750	930	0.06~0.15	6,350	680	0.06~0.15	5,900	530	0.06~0.15

WORKPIECE	MILD STEEL, CARBON STEELS, CAST IRON SS400, S55C, FC250 (~750N/mm^2)			ALLOY STEELS, TOOL STEELS SCM,SKT,SKS,SKD (~30HRc)		
DIAMETER(mm)	SPEED (min^{-1})	FEED (mm/min)	ap	SPEED (min^{-1})	FEED (mm/min)	ap
0.5	31,500	440	0.01~0.025	19,000	250	0.005~0.01
0.6	26,500	445	0.012~0.03	15,500	260	0.006~0.012
0.7	22,500	445	0.014~0.035	13,500	260	0.007~0.014
0.8	19,500	445	0.016~0.04	11,500	260	0.008~0.016
0.9	17,500	445	0.018~0.045	10,500	260	0.009~0.018
1.0	15,500	445	0.02~0.05	9,500	260	0.01~0.02
1.2	13,000	445	0.024~0.06	7,950	260	0.012~0.024
1.5	10,500	445	0.03~0.075	6,350	260	0.015~0.03
1.6	9,900	445	0.032~0.08	5,950	260	0.016~0.032
1.8	8,800	445	0.036~0.09	5,300	260	0.018~0.036
2.0	7,950	445	0.04~0.1	4,750	260	0.02~0.04
2.5	6,350	445	0.05~0.125	3,800	260	0.025~0.05
3.0	5,300	445	0.06~0.15	3,150	260	0.03~0.06

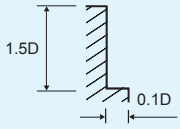
[TE503, TB503, TB504 series]

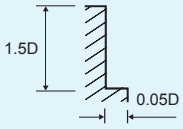
WORK PIECE	CAST IRON FC, FCD		MILD STEEL · CARBON STEEL SS400, S55C (~750N/mm^2)		ALLOY STEEL, TOOL STEELS SCM, SKT, SKS, SKD (~30HRc)		PREHARDENED STEELS (FREE-MACHINING) SKT, SKD, NAK55, HPM1 (30~38HRc)		STAINLESS STEELS, HARDENED STEELS SUS304, SKD (38~45HRc)		HARDENED STEELS (45~55HRc)	
DIAMETER (mm)	SPEED (min^{-1})	FEED (mm/min)	SPEED (min^{-1})	FEED (mm/min)	SPEED (min^{-1})	FEED (mm/min)	SPEED (min^{-1})	FEED (mm/min)	SPEED (min^{-1})	FEED (mm/min)	SPEED (min^{-1})	FEED (mm/min)
1.0	20,125	231.25	17,825	193.75	17,825	162.5	14,950	112.5	13,800	112.5	12,075	50
1.5	13,225	231.25	12,075	193.75	12,075	162.5	10,235	112.5	9,487.5	112.5	8,050	50
2.0	10,235	237.5	9,142.5	193.75	9,142.5	162.5	76,475	112.5	7,130	112.5	6,037.5	50
2.5	8,165	237.5	7,130	181.25	7,130	156.25	6,095	112.5	5,692.5	112.5	4,830	50
3.0	6,785	237.5	5,922.5	181.25	5,922.5	156.25	5,117.5	112.5	4,715	112.5	4,025	50
4.0	5,562.5	237.5	4,457.5	181.25	4,457.5	156.25	3,795	112.5	3,565	106.25	2,990	50
5.0	4,437.5	237.5	3,565	181.25	3,565	156.25	3,047.5	112.5	2,817.5	106.25	2,415	50
6.0	3,392.5	237.5	2,990	181.25	2,990	156.25	2,530	112.5	2,357.5	106.25	2,012.5	50
8.0	2,530	231.25	2,242.5	181.25	2,242.5	156.25	1,897.5	112.5	1,782.5	106.25	1,495	50
10	2,012.5	218.75	1,782.5	181.25	1,782.5	150	1,495	112.5	1,380	106.25	1,207.5	50

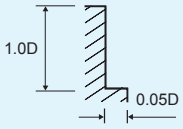
[ZE506, ZE516 series] ▶ General Cutting

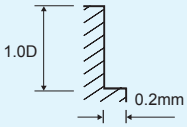
WORKPIECE	NON-ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS, HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc50		HRc50 ~ HRc60		HRc60 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1750N/mm²		1750 ~ 2080N/mm²		2080N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	5,560	2,000	3,880	1,370	1,580	210	1,100	130
8	4,200	2,000	2,940	1,370	1,160	210	840	130
10	3,360	2,000	2,320	1,370	1,000	210	680	130
12	2,840	1,680	2,000	1,160	840	180	560	110
16	2,100	1,260	1,480	880	640	130	420	70
20	1,680	1,010	1,160	690	500	110	320	60
25	1,500	900	1,100	600	430	90	260	50

RPM = rev. / min.
FEED = mm / min.





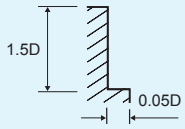


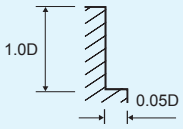


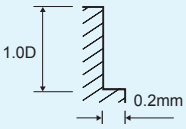
[ZE506, ZE516 series] ▶ High Speed Cutting

WORKPIECE	HIGH TEMP ALLOYS HARDENED STEELS		HARDENED STEELS			
HARDNESS	~ HRc50		HRc50 ~ HRc60		HRc60 ~ HRc65	
STRENGTH	1750N/mm²		1750~2080N/mm²		2080N/mm²~	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	16,800	6,090	8,400	3,050	4,200	1,470
8	12,600	6,090	6,300	3,050	3,160	1,470
10	9,980	5,990	5,040	3,050	2,520	1,470
12	8,400	5,040	4,200	2,520	2,100	1,260
16	6,300	3,780	3,160	1,890	1,580	950
20	5,040	3,050	2,520	1,470	1,260	760
25	4,500	2,750	2,200	1,300	1,120	670

RPM = rev. / min.
FEED = mm / min.



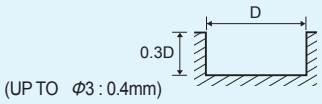




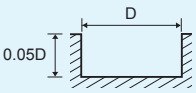
[ZM502, ZM522 series]

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
STRENGTH	~ 1000N/mm²		1000~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2	6,300	60	5,040	50	3,150	25
3	4,410	70	3,570	60	2,200	30
4	3,570	85	2,840	70	1,790	35
5	3,050	105	2,420	85	1,580	40
6	2,630	125	2,100	105	1,370	50
8	2,000	135	1,580	105	1,050	50
10	1,680	135	1,370	105	840	50
12	1,370	105	1,160	95	700	40
16	1,160	95	890	75	560	35
20	840	70	680	50	420	25

RPM = rev. / min.
FEED = mm / min.



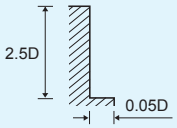
(UP TO Φ3 : 0.4mm)

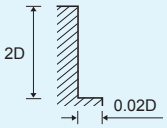


[ZM504, ZM524 series]

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²		2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	6,300	100	5,040	80	3,150	45		
3	4,410	115	3,570	100	2,200	55	1,890	30
4	3,570	140	2,840	115	1,790	60	1,470	35
5	3,050	180	2,420	140	1,580	70	1,260	40
6	2,630	215	2,100	180	1,370	90	1,160	50
8	2,000	230	1,580	180	1,050	90	840	50
10	1,680	230	1,370	180	840	90	670	50
12	1,370	180	1,160	160	700	70	560	40
16	1,160	160	890	125	560	60	440	35
20	840	115	680	90	420	45	340	25

RPM = rev. / min.
FEED = mm / min.

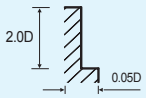


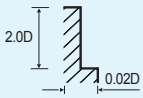


[ZR322, ZR502, ZR512, ZR522 series] ▶ Side Cutting

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6,950	195	4,500	150	3,300	100
4	5,600	240	3,600	170	2,700	105
5	4,800	250	3,050	210	2,350	125
6	4,150	250	2,650	210	2,050	125
8	3,150	265	2,000	210	1,600	125
10	2,150	265	1,700	210	1,250	125
12	1,800	210	1,500	185	1,050	105
16	1,800	185	1,100	140	840	90
20	1,300	130	860	105	625	65

RPM = rev. / min.
FEED = mm / min.

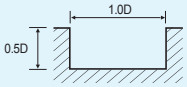




[ZR322, ZR502, ZR512, ZR522 series] ▶ Slotting

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6,950	160	4,500	80	3,300	55
4	5,600	195	3,600	100	2,700	60
5	4,800	240	3,050	115	2,350	75
6	4,150	290	2,650	145	2,050	90
8	3,150	210	2,000	145	1,600	90
10	2,150	250	1,700	140	1,250	90
12	1,800	200	1,500	135	1,050	75
16	1,800	215	1,100	100	840	60
20	1,300	160	860	70	625	45

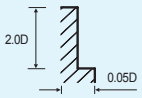
RPM = rev. / min.
FEED = mm / min.

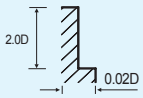


[ZR324, ZR504, ZR514, ZR524 series]

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	6,950	195	4,500	150	3,300	100
4	5,600	240	3,600	170	2,700	105
5	4,800	250	3,050	210	2,350	125
6	4,150	250	2,650	210	2,050	125
8	3,150	265	2,000	210	1,600	125
10	2,150	265	1,700	210	1,250	125
12	1,800	210	1,500	185	1,050	105
16	1,880	185	1,100	140	840	90
20	1,300	130	860	105	625	65

RPM = rev. / min.
FEED = mm / min.

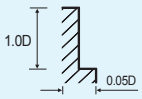




[ZR304H, ZR324H series]

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		HARDENED STEELS	
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc55	
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²		1500 ~ 2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6	7,000	910	4,200	560	3,000	140
8	5,300	980	3,200	530	2,500	190
10	4,100	840	2,500	410	2,050	165
12	3,500	730	2,100	340	1,700	140

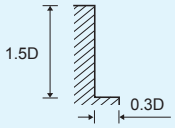
RPM=rev. / min.
FEED=mm / min.

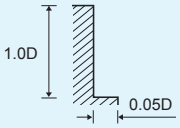


[ZF60, ZF61 series]

WORKPIECE	NON-ALLOY STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		HARDENED STEELS			
HARDNESS	~ HRc30		HRc30 ~ HRc38		HRc38 ~ HRc45		HRc45 ~ HRc55		HRc55 ~ HRc65	
STRENGTH	~ 1000N/mm²		1000 ~ 1200N/mm²		1200 ~ 1400N/mm²		1400 ~ 2000N/mm²		2000N/mm²~	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	15,600	2,320	12,400	840	8,400	570	3,400	260	2,400	190
8	11,600	2,320	9,200	840	6,300	570	2,400	240	1,800	180
10	9,200	2,320	7,600	840	5,100	570	2,000	290	1,300	190
12	8,000	2,400	6,000	800	4,200	570	1,680	260	1,200	190
14	6,800	2,400	5,200	840	3,600	570	1,400	200	900	130
16	6,000	2,400	4,800	760	3,300	510	1,200	160	800	110
18	5,200	2,320	4,400	720	2,700	420	1,100	150	700	100
20	4,800	2,160	3,600	560	2,400	360	1,000	150	660	100
25	4,300	2,150	3,200	620	2,160	410	900	160	600	100

RPM = rev. / min.
FEED = mm / min.

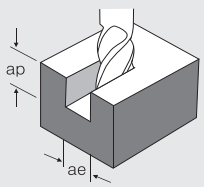


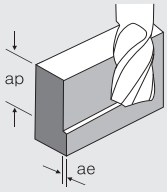


[PK503 series]

WORKPIECE		ALLOY STEELS·HIGH CARBON STEELS				PREHARDENED STEELS·TOOL STEELS HRc30 ~ 40			
(V)m/min		130 ~ 150				100 ~ 120			
DIAMETER(mm)		(r.p.m.)	fz			(r.p.m.)	fz		
			Slot	Side Cutting	Slot		Slot	Side Cutting	Slot
6		7,400	0.030	0.045	0.018	5,800	0.025	0.030	0.012
8		5,600	0.035	0.062	0.025	4,400	0.030	0.045	0.018
10		4.600	0.045	0.075	0.030	3,500	0.040	0.048	0.019
12		3,700	0.050	0.087	0.035	3,000	0.045	0.052	0.020
14		3,200	0.055	0.090	0.036	2,500	0.053	0.056	0.022
16		2,800	0.055	0.090	0.036	2,200	0.060	0.060	0.024
20		2,200	0.080	0.095	0.038	1,800	0.066	0.066	0.026
	ap		1.0D	1.0D	0.5D		1.0D	1.0D	0.5D
	ae		1.0D	0.5D	1.0D		1.0D	0.3D	1.0D

WORKPIECE		SUS304·316·PREHARDENED STEELS HRc40 ~ 45				TITANIUM ALLOY			
(V)m/min		50 ~ 70				30 ~ 50			
DIAMETER(mm)		(r.p.m.)	fz			(r.p.m.)	fz		
			Slot	Side Cutting	Slot		Slot	Side Cutting	Slot
6		3,200	0.020	0.030	0.012	2,100	0.017	0.020	0.008
8		2,400	0.030	0.040	0.016	1,600	0.025	0.025	0.010
10		1,900	0.040	0.055	0.022	1,300	0.035	0.040	0.016
12		1,600	0.045	0.065	0.026	1,100	0.040	0.050	0.020
14		1,360	0.048	0.070	0.028	900	0.043	0.053	0.021
16		1,200	0.050	0.075	0.030	800	0.045	0.055	0.022
20		1,000	0.052	0.083	0.033	600	0.050	0.057	0.023
	ap		0.5D	1.0D	0.5D		0.5D	1.0D	0.5D
	ae		1.0D	0.5D	1.0D		1.0D	0.3D	1.0D

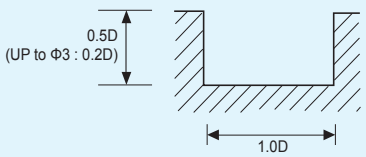


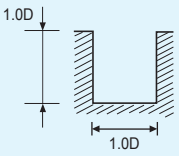


[TX202, 222, 302 ...series]

WORKPIECE	NON - ALLOYED STEELS ALLOY STEELS TOOLS STEELS		ALLOY STEELS HEAT RESISANT STEELS		STAINLESS STEELS		CAST IRON		ALUMINUM ALLOYS		COPPER, BRASS NON-FERROUS METALS	
HARDNESS	~ HRc30		HRc30 ~ HRc45									
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²									
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	14,300	105	8,500	65	7,150	50	18,700	205	44,000	330	24,700	200
1.5	9,350	150	5,550	85	5,600	80	12,100	205	27,500	385	20,300	300
2	7,850	160	5,150	100	4,300	80	9,350	220	22,000	460	16,500	340
3	6,100	180	3,800	120	3,150	100	6,050	220	15,400	460	11,000	340
4	5,150	255	3,150	155	2,650	130	4,600	220	11,000	460	8,800	340
5	4,300	270	2,550	160	2,150	135	3,650	220	9,150	460	6,800	340
6	3,800	300	2,300	190	1,950	155	2,950	255	7,600	485	5,700	375
8	2,850	325	1,700	170	1,450	155	2,200	275	5,700	485	4,400	375
10	2,200	280	1,350	135	1,150	135	1,850	285	4,600	485	3,400	375
12	1,850	240	1,150	110	950	110	1,450	295	3,750	485	2,850	375
14	1,700	215	1,050	100	850	100	1,300	310	3,300	485	2,400	375
16	1,500	185	950	95	700	95	1,100	320	2,850	485	2,200	375
20	1,150	145	700	70	550	70	900	340	2,200	485	1,700	375

RPM=rev. / min.
FEED=mm / min.



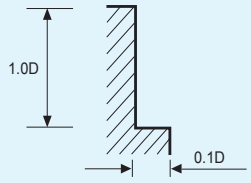


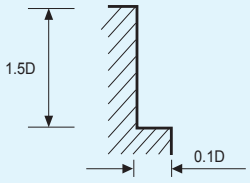
※ The FEED for long & extra long types, should be reduced by around 50%

[TX204, 224, 304 ...series]

WORKPIECE	NON-ALLOYED STEELS ALLOY STEEL CAST IRONN		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		CAST IRON		ALUMINUM ALLOYS		COPPER, BRASS NON-FERROUS METALS	
HARDNESS	~ HRc30		HRc 30 ~ HRc45									
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²									
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	17,600	150	10,250	85	8,650	75	18,700	620	44,000	1,050	24,700	605
1.5	11,800	215	7,050	115	7,050	120	12,100	620	27500	1,160	20,300	910
2	9,850	240	6,450	145	5,350	120	9,350	640	22000	1,320	16,500	1,035
3	7,600	270	4,750	170	3,950	145	6,050	640	15400	1,320	11,000	1,035
4	6,450	485	3,950	300	3,300	240	4,600	640	11000	1,320	8,800	1,035
5	5,350	510	3,200	305	2,700	255	3,650	640	9150	1,320	6,800	1,035
6	4,750	560	2,850	350	2,400	280	2,950	770	7600	1,430	5,700	1,100
8	3,550	605	2,150	325	1,800	300	2,200	815	5700	1,430	4,400	1,100
10	2,750	520	1,700	255	1,450	255	1,850	860	4600	1,430	3,400	1,100
12	2,350	440	1,450	215	1,150	205	1,450	900	3750	1,430	2,850	1,100
14	2,100	395	1,300	195	1,050	190	1,300	945	3300	1,430	2,400	1,100
16	1,850	350	1,150	170	950	170	1,100	970	2850	1,430	2,200	1,100
20	1,450	270	900	135	700	130	900	1,035	2200	1,430	1,700	1,100

RPM = rev. / min.
FEED = mm / min.





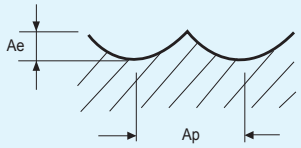
※ The FEED for long & extra long types, should be reduced by around 50%

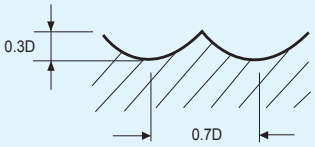
[TXB202, 222, 232, 302 ...series]

WORKPIECE	CARBON STEELS·ALLOY STEELS·TOOLS STEELS				HIGH HARDENED STEELS		CAST IRON		ALUMINUM ALLOYS	
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc50					
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²		1500N/mm²					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	12,350	640	9,150	415	4,000	125	10,500	220	30,800	395
3	11,400	575	8,550	390	3,800	125	7,050	230	20,500	395
4	8,950	630	7,150	450	3,600	150	5,150	285	15,400	395
5	7,800	700	6,200	490	3,100	150	4,150	330	12,100	470
6	7,250	870	5,900	705	2,700	160	3,400	360	10,300	470
8	6,100	1,090	4,900	785	2,050	190	2,500	460	7,900	540
10	5,450	1,330	4,350	870	1,750	190	2,050	460	6,150	540
12	4,990	1,500	3,950	950	1,500	210	1,750	460	5,150	630
14	4,530	1,495	3,600	925	1,300	210	1,400	460	4,300	630
16	4,085	1,470	3,200	905	1,150	210	1,300	460	3,850	540
18	3,800	1,425	3,000	890	1,050	210	1,100	460	3,400	540
20	3,550	1,425	2,800	885	950	210	1,050	420	2,950	540

RPM = rev. / min.
FEED = mm / min.

Ae : D1~D6=0.2mm
D8~D20=0.3mm
Ap : 0.2D





※ The FEED for long & extra long types, should be reduced by around 50%

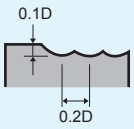
[TXB304, TXB204 ...series]

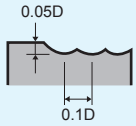
WORKPIECE	ALLOY STEELS TOOLS STEELS				HARDENED STEELS		CAST IRON		ALUMINUM ALLOYS	
HARDNESS	~ HRc30		HRc30 ~ HRc45		HRc45 ~ HRc50					
STRENGTH	~ 1000N/mm2		1000 ~ 1500N/mm2		1500N/mm2					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	15,400	1,000	11,400	600	5,000	200	13,100	300	38,500	600
3	14,300	900	10,700	600	4,800	200	8,800	300	25,600	600
4	11,200	900	8,900	700	4,500	200	6,400	400	19,300	600
5	9,800	1,100	7,800	700	3,900	200	5,200	500	15,100	700
6	9,100	1,300	7,400	1,100	3,400	200	4,300	500	12,900	700
8	7,600	1,600	6,100	1,200	2,600	300	3,100	700	9,900	800
10	6,800	2,000	5,400	1,300	2,200	300	2,600	700	7,700	800
12	6,200	2,300	4,900	1,400	1,900	300	2,200	700	6,400	900
14	5,700	2,200	4,500	1,400	1,600	300	1,800	700	5,400	900
16	5,100	2,200	4,000	1,400	1,400	300	1,600	700	4,800	800
18	4,800	2,100	3,800	1,300	1,300	300	1,400	700	4,300	800
20	4,400	2,100	3,500	1,300	1,200	300	1,300	600	3,700	800

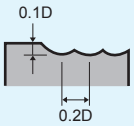
[DS502 ...series]

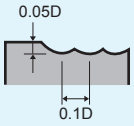
WORKPIECE	CARBON STEELS, CAST IRON		ALLOY STEELS PREHARDENED STEELS		HARDENED STEELS				STAINLESS STEELS		NICKEL ALLOY TITANIUM ALLOY	
HARDNESS	150~250HB		25~35HRC		35~45HRC		45~55HRC		SUS304, 316			
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	19,100	770	12,800	370	10,200	270	8,900	190	8,900	210	6,400	120
4	10,800	1,100	7,200	550	5,700	400	5,000	280	5,000	310	3,600	180
6	7,700	1,300	5,200	660	4,100	480	3,600	330	3,600	380	2,600	210
8	6,000	1,400	4,000	700	3,200	510	2,800	360	2,800	400	2,000	230
10	4,800	1,400	3,200	700	2,600	520	2,300	370	2,300	410	1,600	230
12	4,000	1,400	2,700	710	2,200	530	1,900	370	1,900	410	1,400	240

RPM = rev. / min.
FEED = mm / min.





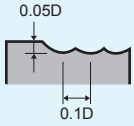


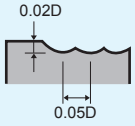


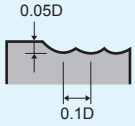
[DS502 ...series]

WORKPIECE	CARBON STEELS, CAST IRON		ALLOY STEELS PREHARDENED STEELS		HARDENED STEELS				STAINLESS STEELS	
HARDNESS	150~250HB		25~35HRc		35~45HRc		45~55HRc		SUS304, 316	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	51,000	2,100	39,800	1,300	35,700	960	23,700	640	35,700	960
4	25,500	2,700	19,900	1,700	17,900	1,300	11,900	830	17,900	1,300
6	17,000	3,000	13,300	1,900	11,900	1,400	7,900	920	11,900	1,400
8	12,800	3,100	10,000	2,000	9,000	1,500	6,000	960	9,000	1,500
10	10,200	3,100	8,000	2,000	7,200	1,500	4,800	960	7,200	1,500
12	8500	3,100	6,700	2,000	6,000	1,500	4,000	960	6,000	1,500

RPM = rev. / min.
FEED = mm / min.



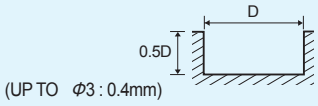




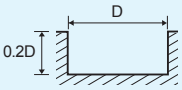
[SM503 series] ▶ Slotting

WORKPIECE	CARBON STEELS·ALLOY STEELS·TOOLS STEELS						CAST IRON		STAINLESS STEELS		COPPER ALLOYS		TITANIUM ALLOYS		INCONEL	
HARDNESS	~HRc20		HRc20 ~ HRc30		HRc30 ~ HRc45											
STRENGTH	1000N/mm²		800 ~ 1000N/mm²		1500 ~ 1500N/mm²											
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	10,080	950	7,750	740	5,550	395	6,700	520	5,550	320	8,300	360	5,550	395	2,200	100
4	7,550	1,400	5,850	1,100	4,200	595	5,050	550	4,200	320	6,200	400	4,200	595	1,650	105
6	5,050	1,650	3,850	1,250	2,800	700	3,350	660	2,800	370	4,100	440	2,800	700	1,150	130
8	3,750	1,700	2,950	1,330	2,100	710	2,500	665	2,100	375	3,100	500	2,100	710	850	120
10	3,050	1,650	2,300	1,250	1,650	655	2,000	630	1,650	355	2,500	530	1,650	665	650	120
12	2,500	1,500	2,000	1,200	1,350	605	1,650	570	1,350	320	2,000	550	1,350	605	555	110

RPM = rev. / min.
FEED = mm / min.



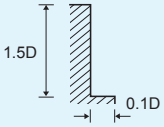
(UP TO Φ3 : 0.4mm)

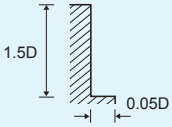


[SM503 series] ▶ Side Cutting

WORKPIECE	CARBON STEELS·ALLOY STEELS·TOOLS STEELS						CAST IRON		STAINLESS STEELS		COPPER ALLOYS		TITANIUM ALLOYS		INCONEL	
HARDNESS	~HRc20		HRc20 ~ HRc30		HRc30 ~ HRc45											
STRENGTH	1000N/mm²		800 ~ 1000N/mm²		1500 ~ 1500N/mm²											
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	10,080	1,080	7,750	850	5,550	450	6,700	605	5,550	365	8,300	390	5,550	450	2,200	110
4	7,550	1,630	5,850	1,260	4,200	680	5050	630	4,200	365	6,200	440	4,200	680	1,650	125
6	5,050	1,910	3,850	1,470	2,800	810	3,350	755	2,800	430	4,100	490	2,800	810	1,150	150
8	3,750	1,950	2,950	1,500	2,100	810	2,500	770	2,100	430	3,100	550	2,100	810	850	140
10	3,050	1,890	2,300	1,400	1,650	775	2,000	720	1,650	415	2,500	570	1,650	775	650	140
12	2,500	1,700	2,000	1,340	1,350	700	1,650	665	1,350	365	2,000	620	1,350	700	555	125

RPM = rev. / min.
FEED = mm / min.

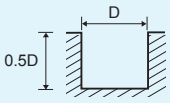




[SM504 series]

WORKPIECE	ALLOY STEELS · CAST IRON		STAINLESS STEELS 300 SERIES TITANIUM		STAINLESS STEELS 400 SERIES	
HARDNESS	~HB230					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	13,500	275	6,690	105	9,350	145
4	10,100	370	5,050	135	7,000	185
5	8,090	410	4,050	165	5,600	230
6	6,750	480	3,350	190	4,700	265
8	5,050	620	2,500	250	3,500	340
10	4,050	780	2,050	320	2,800	430
12	3,370	750	1,680	310	2,350	435
14	2,890	670	1,400	280	2,000	405
16	2,500	630	1,250	265	1,750	370
18	2,250	630	1,100	260	1,550	365
20	2,000	620	1,000	260	1,400	365

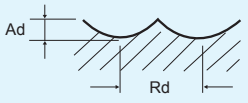
RPM = rev. / min.
FEED = mm / min.



[BC502 series]

WORKPIECE		UNALLOYED COPPER			
R	DIAMETER(mm)	RPM	FEED	Rd	Ad
0.5	1	41,000	1,660	0.040	0.063
0.75	1.5	27,000	1,830	0.068	0.087
1	2	20,000	1,780	0.089	0.112
1.25	2.5	16,000	1,840	0.115	0.090
1.5	3	13,000	2,220	0.171	0.168
2	4	10,000	2,080	0.208	0.200
2.5	5	8,300	1,990	0.240	0.200
3	6	6,900	1,940	0.281	0.250
4	8	5,720	1,000	0.175	0.400
5	10	4,550	700	0.154	0.500
6	12	3,770	600	0.159	0.600

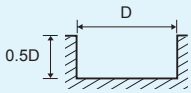
RPM = rev. / min.
FEED = mm / min.

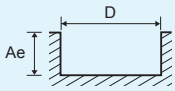


[ZF62 series] ▶ Slotting

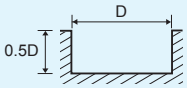
WORKPIECE	NON - ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		INCONEL	
HARDNESS	~ HRc30		HRc30 ~ HRc45					
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	16,380	2,680	13,020	970	8,820	670	3,000	285
8	12,180	2,680	9,660	970	6,615	670	2,250	270
10	9,660	2,680	7,980	970	5,355	660	1,625	285
12	8,400	2,770	6,300	925	4,410	660	1,500	285
16	6,300	2,770	5,040	880	3,465	590	1,000	165
20	5,040	2,495	3,780	650	2,520	415	825	150

RPM = rev. / min.
FEED = mm / min.





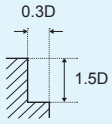
Ae : Φ4 ~ Φ10 = 0.25 x D
Φ12 ~ Φ16 = 0.15 x D
Φ18 ~ Φ20 = 0.10 x D

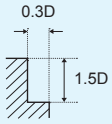


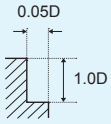
[ZF62 series] ▶ Side Cutting

WORKPIECE	NON - ALLOYED STEELS ALLOY STEELS · CAST IRON		ALLOY STEELS HEAT RESISTANT STEELS		STAINLESS STEELS		INCONEL	
HARDNESS	~ HRc30		HRc30 ~ HRc45					
STRENGTH	~ 1000N/mm²		1000 ~ 1500N/mm²					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6	16,380	2,680	13,020	970	8,820	670	3,000	285
8	12,180	2,680	9,660	970	6,615	670	2,250	270
10	9,660	2,680	7,980	970	5,355	660	1,625	285
12	8,400	2,770	6,300	925	4,410	660	1,500	285
16	6,300	2,770	5,040	880	3,465	590	1,000	165
20	5,040	2,495	3,780	650	2,520	415	825	150

RPM = rev. / min.
FEED = mm / min.



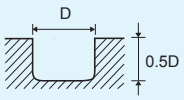


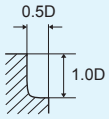


[RC502 series]

WORKPIECE	UNALLOYED COPPER			
DIAMETER(mm)	RPM	FEED	RPM	FEED
3	44,500	2,350	50,000	3,700
4	33,400	2,100	50,000	4,700
6	22,300	2,100	33,400	4,900
8	16,700	2,100	25,000	4,700
10	13,370	2,100	20,000	4,800
12	11,100	2,100	16,700	4,700

RPM = rev. / min.
FEED = mm / min.

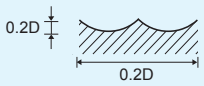




[G series]

WORKPIECE	GRAPHITE	
DIAMETER(mm)	RPM	FEED
0.5	16,000	480
0.75	16,000	640
1	16,000	800
1.5	16,000	1,450
2	16,000	2,100
3	15,000	2,950
4	13,000	3,000
5	11,500	3,050
6	10,500	3,150
8	8,555	2,960

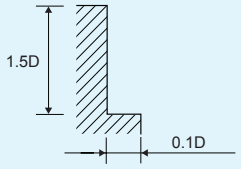
RPM = rev. / min.
FEED = mm / min.



[GE series]

WORKPIECE	GRAPHITE	
DIAMETER(mm)	RPM	FEED
0.4	40,000	200
0.6	40,000	350
0.8	40,000	550
1.0	40,000	700
2.0	25,000	800
3.0	20,000	800
4.0	18,000	950
5.0	14,000	1,200
6.0	11,000	1,400
8.0	8,000	1,300
10.0	6,500	1,200
12.0	5,500	1,200

RPM = rev. / min.
FEED = mm / min.

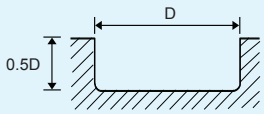


※ Please reduce cutting speed 50% from the above table when using long and extra long type

[WGR502 series]

WORKPIECE	GRAPHITE	
DIAMETER(mm)	RPM	FEED
0.4	40,000	640
0.6	40,000	640
0.8	40,000	800
1.0	40,000	960
1.2	40,000	1,200
1.5	40,000	1,440
2.0	40,000	1,600
3.0	27,000	1,900
4.0	20,000	2,300
5.0	16,000	2,300
6.0	14,000	2,300

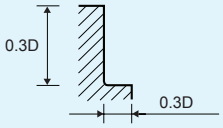
RPM = rev. / min.
FEED = mm / min.



[WGR504 series]

WORKPIECE	GRAPHITE	
DIAMETER(mm)	RPM	FEED
4.0	40,000	3,500
6.0	40,000	5,600
8.0	32,000	5,600
10.0	26,000	5,700
12.0	21,000	5,450
16.0	15,800	5,450
20.0	12,800	5,500

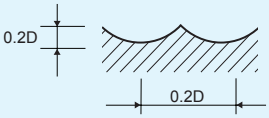
RPM = rev. / min.
FEED = mm / min.



[WGB504 series]

WORKPIECE	GRAPHITE	
DIAMETER(mm)	RPM	FEED
1.0	20,000	700
2.0	16,000	1,200
3.0	16,000	2,000
4.0	16,000	3,100
5.0	15,000	3,800
6.0	15,000	4,400
8.0	13,000	4,500
10.0	12,000	4,600
12.0	10,000	4,700
16.0	7,500	3,800
20.0	6,000	3,500

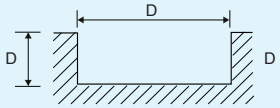
RPM = rev. / min.
FEED = mm / min.



[WROU series] ▶ Slotting

WORKPIECE	CFRP, AFRP	GFRP	CARBON, GRAPHITE	PLASTIC	PROCESSED CERAMIC, PROCESSED GLASS
DIAMETER(mm)	FEED				
1.6	0.030	0.030	0.040	0.040	0.015
3	0.060	0.060	0.075	0.075	0.030
6	0.120	0.120	0.150	0.150	0.060
10	0.230	0.230	0.290	0.290	0.115
12	0.305	0.305	0.380	0.380	0.150
CUTTING SPEED	120	100	145	245	10

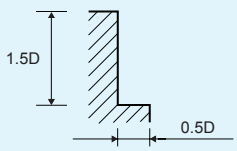
RPM = rev. / min.
FEED = mm / min.



[WROU series] ▶ Side Cutting

WORKPIECE	CFRP, AFRP	GFRP	CARBON, GRAPHITE	PLASTIC	PROCESSED CERAMIC, PROCESSED GLASS
DIAMETER(mm)	FEED				
1.6	0.030	0.030	0.040	0.040	0.015
3	0.060	0.060	0.075	0.075	0.030
6	0.120	0.120	0.150	0.150	0.060
10	0.230	0.230	0.290	0.290	0.115
12	0.305	0.305	0.380	0.380	0.150
CUTTING SPEED	150	120	185	305	15

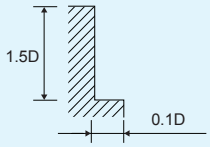
RPM = rev. / min.
FEED = mm / min.



[WGE504 series]

WORKPIECE	GRAPHITE	
DIAMETER(mm)	RPM	FEED
3.0	20,000	1,600
4.0	18,000	1,900
5.0	14,000	2,400
6.0	11,000	2,800
8.0	8,000	2,600
10.0	6,500	2,400
12.0	5,500	2,400
16.0	4,200	2,450
20.0	3,300	2,400

RPM = rev. / min.
FEED = mm / min.

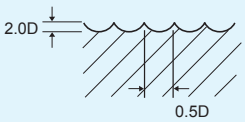


※ Please reduce cutting speed 50% from the above table when using long and extra long type

[WAB312 series]

WORKPIECE	ALUMINUM ALLOY		COPPER ALLOY	
DIAMETER(mm)	RPM	FEED	RPM	FEED
6	18,000	1,750	5,500	440
8	14,000	2,000	4,200	500
10	14,000	2,350	4,200	580
12	14,000	3,000	4,200	750
16	11,000	2,700	3,300	670
20	8,000	2,200	2,200	600

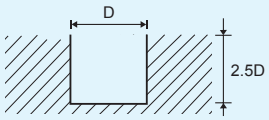
RPM = rev. / min.
FEED = mm / min.



[WAE301 series] ▶ Slotting, General Cutting

WORKPIECE	ACRYLIC		ALLOY STEELS	
DIAMETER(mm)	RPM	FEED	RPM	FEED
1.0	32,000	2,000	23,000	1,300
2.0	32,000	2,200	23,000	1,500
3.0	25,000	2,400	18,000	1,700
4.0	20,000	2,400	15,000	1,800
5.0	15,000	2,200	12,000	1,800
6.0	13,500	2,300	10,000	1,800
8.0	10,000	2,400	7,800	1,900
10.0	8,000	2,400	6,000	2,000
12.0	7,000	2,200	5,000	1,900

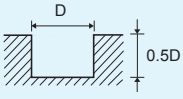
RPM = rev. / min.
FEED = mm / min.



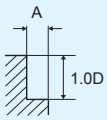
[WAE302 series] ▶ Slotting, Side Cutting

WORKPIECE	ALLOY STEELS · CAST IRON		ALUMINUM ALLOYS	
HARDNESS	~HB230			
DIAMETER(mm)	RPM	FEED	RPM	FEED
1.0	16,870	505	16,870	845
1.5	13,150	525	13,150	790
2.0	11,300	565	11,300	790
2.5	10,565	635	10,565	845
3.0	10,000	700	10,000	900
4.0	10,000	900	10,000	1,100
5.0	10,000	1,000	10,000	1,300
6.0	10,000	1,200	10,000	1,500
7.0	8,850	1,240	8,850	1,505
8.0	8,000	1,400	8,000	1,800
9.0	8,000	1,550	8,000	1,680
10.0	8,000	1,700	8,000	2,100
12.0	8,000	2,100	8,000	2,600
14.0	6,000	1,800	6,000	2,200
16.0	6,000	1,900	6,000	2,400
18.0	4,000	1,400	4,000	1,800
20.0	4,000	1,600	4,000	1,900

RPM = rev. / min.
FEED = mm / min.



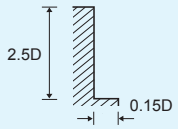
A : Φ3 ~ Φ10 = 0.25 x D
Φ12 ~ Φ20 = 0.5 x D



[WAE30(2)3, WAE323, WAR303 series] ▶ Side Cutting, General Cutting

WORKPIECE	ALUMINIUM · NONFERROUS METALS	
DIAMETER(mm)	RPM	FEED
3	7,000	455
4	7,000	546
5	7,000	651
6	7,000	756
8	5,600	861
10	5,600	1,050
12	5,600	882
14	4,200	1106
16	4,200	1,211
18	2,800	910
20	2,800	956

RPM = rev. / min.
FEED = mm / min.

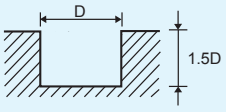


※ Please reduce cutting speed around 20~30% from the above table or AE323 series.

[WAE30(2)3, WAE323, WAR303 series] ▶ Slotting, General Cutting

WORKPIECE	ALUMINIUM · NONFERROUS METALS	
DIAMETER(mm)	RPM	FEED
3	7,000	350
4	7,000	441
5	7,000	504
6	7,000	606
8	5,600	700
10	5,600	854
12	5,600	1,050
14	4,200	903
16	4,200	945
18	2,800	700
20	2,800	805

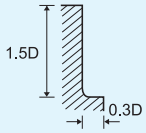
RPM = rev. / min.
FEED = mm / min.



[WAR302 series] ▶ Side Cutting, General Cutting

WORKPIECE	ALUMINUM ALLOY (<Si 4%)		ALUMINUM ALLOY (<Si 8%)		ALUMINUM ALLOY (DIE CASTING)		ALUMINUM ALLOY (Cu)	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4	24,000	4,800	19,900	3,980	16,000	3,200	12,000	2,400
6	16,000	3,840	13,200	3,160	10,600	2,544	8,000	1,920
8	12,000	3,600	9,900	2,970	8,000	2,400	6,000	1,800
10	9,500	3,420	8,000	2,880	6,300	2,260	4,800	1,720
12	8,000	3,200	6,600	2,640	5,300	2,120	4,000	1,600
14	6,800	2,990	5,600	2,460	4,500	1,980	3,400	1,490
16	6,000	3,000	5,000	2,500	4,000	2,000	3,000	1,500
18	5,300	2,600	4,400	2,200	3,500	1,750	2,600	1,300
20	4,800	2,400	4,000	2,000	3,200	1,600	2,400	1,200

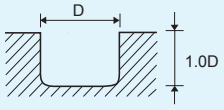
RPM = rev. / min.
FEED = mm / min.



[WAR302 series] ▶ Slotting, General Cutting

WORKPIECE	ALUMINUM ALLOY (<Si 4%)		ALUMINUM ALLOY (<Si 8%)		ALUMINUM ALLOY (DIE CASTING)		ALUMINUM ALLOY (Cu)	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
4	24,000	3,840	19,900	2,980	16,000	2,240	12,000	1,440
6	16,000	3,072	13,200	2,370	10,600	1,780	8,000	1,150
8	12,000	2,880	9,900	2,230	8,000	1,680	6,000	1,080
10	9,500	2,730	8,000	2,160	6,300	1,580	4,800	1,030
12	8,000	2,560	6,600	1,980	5,300	1,480	4,000	960
14	6,800	2,390	5,600	1,845	4,500	1,380	3,400	890
16	6,000	2,400	5,000	1,870	4,000	1,400	3,000	900
18	5,300	2,080	4,400	1,650	3,500	1,220	2,600	780
20	4,800	1,920	4,000	1,500	3,200	1,260	2,400	720

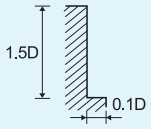
RPM = rev. / min.
FEED = mm / min.

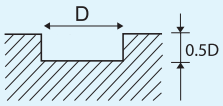


[WAR502 series] ▶ Side Cutting, Slotting, General Cutting

WORKPIECE	ALUMINUM ALLOY (A7075)		ALUMINUM ALLOY CASTING (Si13%)		MAGNESIUM ALLOY ·COPPER ALLOYS	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	32,000	220	32,000	220	23,000	220
1.2	32,000	230	32,000	230	19,000	220
1.4	32,000	260	32,000	260	16,500	220
1.5	32,000	280	32,000	280	15,500	220
1.6	32,000	320	32,000	320	14,500	220
1.8	32,000	360	32,000	360	13,000	220
2	32,000	420	32,000	420	11,500	220
2.5	25,000	600	25,000	600	9,500	250
3	21,000	700	21,000	700	7,950	250
4	15,500	725	15,500	725	5,950	280
5	12,500	760	12,500	760	4,750	295
6	10,500	830	10,500	830	3,950	310
8	7,950	890	7,950	890	2,950	300
10	6,350	995	6,350	995	2,350	365
12	5,300	1,050	5,300	1,050	1,950	390

RPM = rev. / min.
FEED = mm / min.

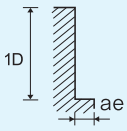




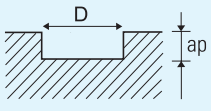
[WAR502 series] ▶ Side Cutting, Slotting, High Speed CuttingCutting

WORKPIECE	ALUMINUM ALLOY (A7075)		ALUMINUM ALLOY CASTING (Si13%)		MAGNESIUM ALLOY ·COPPER ALLOYS	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1	50,000	1,000	50,000	950	42,000	700
1.2	50,000	1,200	50,000	1,150	36,000	700
1.4	50,000	1,400	50,000	1,250	31,000	700
1.5	50,000	1,600	48,000	1,250	29,500	700
1.6	50,000	1,700	45,000	1,250	28,000	700
1.8	50,000	1,850	41,000	1,250	26,500	750
2	50,000	2,000	38,000	1,250	24,000	750
2.5	48,000	2,100	31,000	1,250	20,000	750
3	40,000	2,100	26,000	1,250	17,000	750
4	33,000	2,250	20,000	1,350	14,000	800
5	31,000	2,800	19,200	1,650	12,500	950
6	26,000	2,800	15,900	1,700	10,500	1,000
8	19,500	2,900	12,000	1,800	7,900	1,000
10	15,500	3,200	9,600	1,900	6,350	1,100
12	13,000	3,200	8,000	1,900	5,300	1,100

RPM = rev. / min.
FEED = mm / min.



	ae
Alumunm Alloy, Alumunm Alloy Casting	0.15D
Magnsium Alloy, Copper Alloy	0.1D

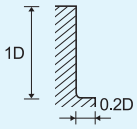


	ap
Alumunm Alloy, Alumunm Alloy Casting	0.15D
Magnsium Alloy, Copper Alloy	0.1D

[WAR503 series] ▶ Side Cutting, General Cutting

WORKPIECE	ALUMINUM ALLOY (A7075)		ALUMINUM ALLOY CASTING (Si13%)		MAGNESIUM ALLOY ·COPPER ALLOYS	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	21,000	1,100	21,000	1,100	7,950	325
4	15,500	1,250	15,500	1,250	5,950	365
5	12,500	1,300	12,500	1,275	4,750	385
6	10,500	1,400	10,500	1,400	3,950	400
8	7,950	1,500	7,950	1,500	2,950	460
10	6,350	1,700	6,350	1,700	2,350	475
12	5,300	1,750	5,300	1,750	1,950	510
16	3,950	1,750	3,950	1,750	1,450	510
20	3,150	1,750	3,150	1,750	1,150	510

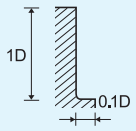
RPM = rev. / min.
FEED = mm / min.



[WAR503 series] ▶Side Cutting, High Speed CuttingCutting

WORKPIECE	ALUMINUM ALLOY (A7075)		ALUMINUM ALLOY CASTING (Si13%)		MAGNESIUM ALLOY ·COPPER ALLOYS	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	40,000	2,100	24,000	1,250	17,000	625
4	32,000	2,250	19,200	1,550	14,300	800
5	32,000	3,250	19,200	1,950	12,700	925
6	26,500	3,500	15,900	2,150	10,600	960
8	20,000	3,750	12,000	2,250	8,000	1,130
10	16,000	4,300	9,600	2,580	6,350	1,150
12	13,300	4,400	8,000	2,650	5,300	1,250
16	10,000	4,400	6,000	2,650	4,000	1,250
20	8,000	4,400	4,800	2,650	3,200	1,250

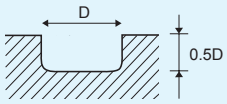
RPM = rev. / min.
FEED = mm / min.



[WAR503 series] ▶ Slotting, General Cutting

WORKPIECE	ALUMUNUM ALLOY (A7075)		ALUMINUM ALLOY CASTING (Si13%)		MAGNESIUM ALLOY, COPPER ALLOY (AZ91·AZ80A·C1100)	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3	21,000	770	2,100	770	7,950	325
4	15,500	810	15,500	810	5,950	375
5	12,500	860	12,500	860	4,750	385
6	10,500	950	10,500	950	3,950	400
8	8,000	1,000	8,000	1,000	2,950	460
10	6,350	1,150	6,350	1,150	2,350	475
12	5,300	1,200	5,300	1,200	1,950	510
16	3,950	1,200	3,950	1,200	1,450	510
20	3,150	1,200	3,150	1,200	1,150	510

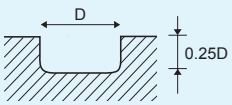
RPM = rev. / min.
FEED = mm / min.



[WAR503 series] ▶ Slotting, High Speed CuttingCutting

WORKPIECE	ALUMUNUM ALLOY (A7075)		ALUMINUM ALLOY CASTING (Si13%)	
DIAMETER(mm)	RPM	FEED	RPM	FEED
3	40,000	1,450	24,000	880
4	32,000	1,700	19,200	1,000
5	32,000	2,200	19,200	1,350
6	26,500	2,400	15,900	1,450
8	20,000	2,500	12,000	1,500
10	16,000	2,800	9,600	1,700
12	13,300	2,950	8,000	1,800
16	10,000	3,000	6,000	1,800
20	8,000	3,000	4,800	1,800

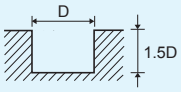
RPM = rev. / min.
FEED = mm / min.

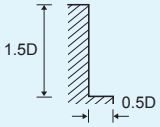


[WAF303 series] ▶ Slotting

WORKPIECE	ALUMINUM, NONFERROUS METALS			
DIAMETER(mm)	RPM	FEED	RPM	FEED
6	10,500	800	13,500	1,050
8	8,000	700	10,500	900
10	6,500	750	8,500	950
12	5,250	800	6,800	1,050
16	4,000	800	5,200	1,050
20	3,200	800	4,200	1,050

RPM = rev. / min.
FEED = mm / min.





[E302, E322 series]

	Side Cutting				Slotting			
	DepthofCut : 1.5D WIDTH : 0.1D				DepthofCut : 0.5D WIDTH : 1D			
	CARBON STEELS · ALLOY STEELS · TOOLS STEELS		ALLOY STEELS · TOOLS STEELS		CARBON STEELS · ALLOY STEELS · TOOLS STEELS		ALLOY STEELS · TOOLS STEELS	
HARDNESS	~ HB225		HB225~325		~ HB225		HB225~325	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	5,300	60	4,300	50	4,300	40	3,500	20
2	4,500	80	3,800	60	3,800	50	3,100	30
3	3,700	80	3,200	60	3,200	50	2,650	30
4	2,750	110	2,400	60	2,400	50	2,000	30
6	1,850	110	1,600	60	1,600	50	1,320	30
8	1,400	110	1,200	90	1,200	60	1,000	40
10	1,100	110	950	90	950	60	800	40
12	930	110	800	90	800	60	660	40
16	700	110	600	90	600	60	500	40
20	560	110	480	90	480	60	400	40
25	450	110	380	90	380	60	320	40

※ Please reduce cutting speed around 20~30% from the above table or E322 series.

[E304, E324 series]

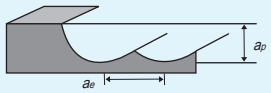
	Side Cutting				Slotting			
	DepthofCut : 1.5D WIDTH : 0.1D				DepthofCut : 0.5D WIDTH : 1D			
	CARBON STEELS · ALLOY STEELS · TOOLS STEELS		ALLOY STEELS · TOOLS STEELS		CARBON STEELS · ALLOY STEELS · TOOLS STEELS		ALLOY STEELS · TOOLS STEELS	
HARDNESS	~ HB225		HB225~325		~ HB225		HB225~325	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1	6,630	90	5,380	75	5,380	60	4,380	30
2	5,630	120	4,750	90	4,750	75	3,880	45
3	4,630	120	4,000	90	4,000	75	3,310	45
4	3,440	165	3,000	90	3,000	75	2,500	45
6	2,310	165	2,000	90	2,000	75	1,650	45
8	1,750	165	1,500	135	1,500	90	1,250	60
10	1,380	165	1,190	135	1,190	90	1,000	60
12	1,160	165	1,000	135	1,000	90	830	60
16	880	165	750	135	750	90	630	60
20	700	165	600	135	600	90	500	60
25	560	165	480	135	480	90	400	60

※ Please reduce cutting speed around 20~30% from the above table or E324 series.

[B302, BL422 series]

WORKPIECE	CARBON STEELS · ALLOY STEELS · TOOLS STEELS		ALLOY STEELS · TOOLS STEELS	
HARDNESS	~ HB225		HB225~325	
DIAMETER(mm)	RPM	FEED	RPM	FEED
R0.5	31,800	572	27,900	502
R1	31,800	1,910	27,900	1,670
R2	15,900	1,910	13,900	1,670
R3	10,600	1,910	9,280	1,670
R4	7,960	1,910	6,960	1,670
R5	6,370	1,780	5,570	1,560
R6	5,310	1,590	4,640	1,390
R8	4,000	1,300	3,500	1,050
R10	3,200	1,000	2,800	840
R12.5	2,400	800	2,100	650

RPM = rev. / min.
FEED = mm / min.



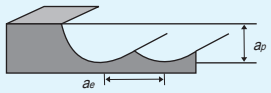
R	ap	ae
R≦1.0	0.05 x up to R	0.2 x up to R
1.0< R	0.1 x up to R	0.2 x up to R

※ Please reduce cutting speed around 20~30% from the above table or BL422 series.

[B304 series]

WORKPIECE	CARBON STEELS · ALLOY STEELS · TOOLS STEELS		ALLOY STEELS · TOOLS STEELS	
HARDNESS	~ HB225		HB225~325	
DIAMETER(mm)	RPM	FEED	RPM	FEED
R0.5	39,750	718.25	34,875	6,275
R1	39,750	2,387.5	34,875	2,087.5
R2	19,875	2,387.5	17,375	2,087.5
R3	13,250	2,387.5	11,600	2,087.5
R4	9,950	2,387.5	8,700	2,087.5
R5	7,962.5	2,225	6,962.5	1,950
R6	6,637.5	1,987.5	5,800	1,737.5
R8	5,000	1,625	4,375	1,312.5
R10	4,000	1,250	3,500	1050
R12.5	3,000	1,000	2,625	812.5

RPM = rev. / min.
FEED = mm / min.



R	ap	ae
R≦1.0	0.05 x up to R	0.2 x up to R
1.0< R	0.1 x up to R	0.2 x up to R

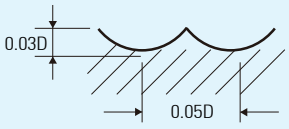
[WHPB902 series]

WORKPIECE	ALLOY STEEL, CARBON STEEL		PREHARDENED STEELS		HARDENED STEELS	
HARDNESS	~HRc35		~HRc35~ HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.1	40,000	550	40,000	500	33,000	400
0.2	30,000	720	30,000	630	27,000	575
0.3	30,000	900	30,000	810	27,000	720
0.4	30,000	1,140	30,000	1,020	27,000	900
0.5	30,000	1,440	30,000	1,260	27,000	1,140
0.6	30,000	1,740	30,000	1,500	27,000	1,320
0.8	30,000	2,340	30,000	1,980	27,000	1,800
1.0	30,000	2,880	30,000	2520	27,000	2,280
1.2	30,000	3,060	28,800	2,580	25,800	2,310
1.5	30,000	3,240	28,800	2,700	25,800	2,400
2.0	29,820	3,420	28,680	2,880	24,000	2,400
3.0	19,860	3,600	19,080	3,180	15,900	2,400
4.0	14,940	3,600	14,340	3,180	12,000	2,400
5.0	11,160	3,480	10,680	2,940	9,000	2,250
6.0	8,340	2,910	8,040	2,460	6,600	1,860
8.0	6,660	2,520	6,420	2,100	5,400	1,620
10.0	5,580	2,220	5,340	1,860	4,500	1,440
12.0	4,170	1,770	4,008	1,500	3,360	1,440
16.0	3,340	1,590	3,210	1,320	2,700	1,020
20.0	2,670	1,410	2,580	1,170	2,160	900
25.0	2,130	1,150	2,060	950	1,730	730

[WB502 series]

WORKPIECE	ALLOY STEEL, CARBON STEEL (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.1	40,000	550	40,000	500	33,000	400
0.2	30,000	720	30,000	630	27,000	575
0.3	30,000	900	30,000	810	27,000	720
0.4	30,000	1,140	30,000	1,020	27,000	900
0.5	30,000	1,440	30,000	1,260	27,000	1,140
0.6	30,000	1,740	30,000	1,500	27,000	1,320
0.8	30,000	2,340	30,000	1,980	27,000	1,800
1.0	30,000	2,880	30,000	2,520	27,000	2,280
1.2	30,000	3,060	28,800	2,580	25,800	2,310
1.5	30,000	3,240	28,800	2,700	25,800	2,400
2.0	29,820	3,420	28,680	2,880	24,000	2,400
3.0	19,860	3,600	19,080	3,180	15,900	2,400
4.0	14,940	3,600	14,340	3,180	12,000	2,400
5.0	11,160	3,480	10,680	2,940	9,000	2,250
6.0	8,340	2,910	8,040	2,460	6,600	1,860
8.0	6,660	2,520	6,420	2,100	5,400	1,620
10.0	5,580	2,220	5,340	1,860	4,500	1,440
12.0	4,170	1,770	4,008	1,500	3,360	1,140
16.0	3,340	1,590	3,210	1,320	2,700	1,020
20.0	2,670	1,410	2,580	1,170	2,160	900
25.0	2,130	1,150	2,060	950	1,730	730

RPM = rev. / min.
FEED = mm / min.



[WB512 series]

WORKPIECE		ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)			PREHARDENED STEELS (NAK, CENA, KP4)			HARDENED STEELS (SKD, SKT, STAVAX)		
HARDNESS		~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH		~1100N/mm^2			1100~1500N/mm^2			1500~2000N/mm^2		
DIAMETER(mm)	Effective Length	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
0.1	0.2	50,000	240	0.009	50,000	215	0.007	50,000	190	0.005
0.1	0.3	50,000	240	0.009	50,000	215	0.007	50,000	190	0.005
0.1	0.5	50,000	240	0.006	50,000	215	0.005	50,000	190	0.004
0.1	1	45,000	195	0.002	45,000	175	0.002	45,000	155	0.001
0.2	0.5	50,000	335	0.018	50,000	310	0.014	43,200	260	0.010
0.2	1	50,000	335	0.013	50,000	310	0.010	43,200	260	0.007
0.2	1.5	45,000	270	0.007	45,000	250	0.006	38,880	210	0.004
0.2	2	45,000	270	0.005	45,000	250	0.004	38,880	210	0.003
0.2	3	45,000	270	0.003	45,000	250	0.003	38,880	210	0.002
0.3	1	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
0.3	1.5	50,000	475	0.019	50,000	430	0.015	42,800	365	0.011
0.3	2	45,000	385	0.011	45,000	350	0.008	38,520	295	0.006
0.3	2.5	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
0.3	3	45,000	385	0.007	45,000	350	0.005	38,520	295	0.004
0.3	4	40,000	305	0.004	40,000	275	0.003	34,240	235	0.002
0.3	5	30,000	200	0.003	30,000	180	0.002	25,680	155	0.002
0.4	1	41,000	490	0.036	38,800	425	0.028	34,200	340	0.020
0.4	1.5	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
0.4	2	41,000	490	0.025	38,800	425	0.020	34,200	340	0.014
0.4	2.5	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
0.4	3	36,900	395	0.014	34,920	345	0.011	30,780	275	0.008
0.4	4	36,900	395	0.009	34,920	345	0.007	30,780	275	0.005
0.4	5	32,800	315	0.009	31,040	270	0.007	27,360	220	0.005
0.4	6	32,800	315	0.005	31,040	270	0.004	27,360	220	0.003
0.4	8	24,600	205	0.004	23,280	180	0.003	20,520	145	0.002
0.4	10	12,300	90	0.004	11,640	75	0.003	10,260	60	0.002
0.5	1	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
0.5	1.5	34,200	685	0.045	32,300	580	0.035	28,500	515	0.025
0.5	2	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
0.5	2.5	34,200	685	0.032	32,300	580	0.025	28,500	515	0.018
0.5	3	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
0.5	4	30,780	555	0.018	29,070	470	0.014	25,650	415	0.010
0.5	5	30,780	555	0.011	29,070	470	0.009	25,650	415	0.006
0.5	6	27,360	440	0.011	25,840	370	0.009	22,800	330	0.006
0.5	8	20,520	290	0.007	19,380	245	0.005	17,100	215	0.004
0.5	10	20,520	290	0.005	19,380	245	0.004	17,100	215	0.003
0.5	12	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
0.5	14	10,260	125	0.005	9,690	105	0.004	8,550	95	0.003
0.5	16	3,420	35	0.005	3,230	30	0.004	2,850	25	0.003
0.6	1	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	2	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	3	34,200	1,025	0.038	32,300	840	0.029	28,500	685	0.021
0.6	4	30,780	830	0.022	29,070	680	0.017	25,650	555	0.012
0.6	5	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008
0.6	6	30,780	830	0.014	29,070	680	0.011	25,650	555	0.008
0.6	8	27,360	655	0.008	25,840	540	0.006	22,800	440	0.005
0.6	10	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
0.6	12	20,520	430	0.005	19,380	355	0.004	17,100	290	0.003
0.6	14	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.6	16	10,260	185	0.005	9,690	150	0.004	8,550	125	0.003
0.7	2	34,200	1,130	0.063	32,300	930	0.049	28,500	765	0.035
0.7	4	30,780	915	0.025	29,070	755	0.020	25,650	620	0.014
0.7	6	30,780	915	0.016	29,070	755	0.012	25,650	620	0.009

RPM = rev. / min.
FEED = mm / min.

[WB512 series]

WORKPIECE		ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)			PREHARDENED STEELS (NAK, CENA, KP4)			HARDENED STEELS (SKD, SKT, STAVAX)		
HARDNESS		~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH		~1100N/mm^2			1100~1500N/mm^2			1500~2000N/mm^2		
DIAMETER(mm)	Effective Length	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
0.7	8	27,360	725	0.016	25,840	595	0.012	22,800	490	0.009
0.7	10	27,360	725	0.009	25,840	595	0.007	22,800	490	0.005
0.7	12	20,520	475	0.006	19,380	390	0.005	17,100	320	0.004
0.8	2	34,200	1,230	0.072	32,300	1,035	0.056	28,500	855	0.040
0.8	3	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
0.8	4	34,200	1,230	0.050	32,300	1,035	0.039	28,500	855	0.028
0.8	5	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
0.8	6	30,780	995	0.029	29,070	840	0.022	25,650	695	0.016
0.8	8	30,780	995	0.018	29,070	840	0.014	25,650	695	0.010
0.8	10	27,360	785	0.018	25,840	660	0.014	22,800	545	0.010
0.8	12	27,360	785	0.011	25,840	660	0.008	22,800	545	0.006
0.8	14	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
0.8	16	20,520	515	0.007	19,380	435	0.006	17,100	360	0.004
0.8	20	10,260	220	0.007	9,690	185	0.006	8,550	155	0.004
0.9	4	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
0.9	6	29,250	1,120	0.032	27,630	935	0.025	24,390	775	0.018
0.9	8	29,250	1,120	0.020	27,630	935	0.016	24,390	775	0.011
0.9	10	26,000	885	0.020	24,560	740	0.016	21,680	610	0.011
1.0	2	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
1.0	3	30,800	1,540	0.090	29,100	1,310	0.070	25,700	1,075	0.050
1.0	4	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
1.0	5	30,800	1,540	0.063	29,100	1,310	0.049	25,700	1,075	0.035
1.0	6	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	7	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	8	27,720	1,245	0.036	26,190	1,060	0.028	23,130	870	0.020
1.0	10	27,720	1,245	0.023	26,190	1,060	0.018	23,130	870	0.013
1.0	12	24,640	985	0.023	23,280	840	0.018	20,560	690	0.013
1.0	14	24,640	985	0.014	23,280	840	0.011	20,560	690	0.008
1.0	16	18,480	645	0.014	17,460	550	0.011	15,420	450	0.008
1.0	18	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
1.0	20	18,480	645	0.009	17,460	550	0.007	15,420	450	0.005
1.0	22	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	26	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	30	9,240	275	0.009	8,730	235	0.007	7,710	195	0.005
1.0	40	3,080	75	0.009	2,910	65	0.007	2,570	55	0.005
1.0	50	3,080	75	0.006	2,910	65	0.005	2,570	55	0.003
1.2	4	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
1.2	6	26,300	1,375	0.076	24,800	1,150	0.059	21,900	950	0.042
1.2	8	23,670	1,115	0.043	22,320	930	0.034	19,710	770	0.024
1.2	10	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
1.2	12	23,670	1,115	0.027	22,320	930	0.021	19,710	770	0.015
1.2	16	21,040	880	0.016	19,840	735	0.013	17,520	610	0.009
1.2	20	15,780	580	0.011	14,880	485	0.008	13,140	400	0.006
1.2	26	7,890	245	0.011	7,440	205	0.008	6,570	170	0.006
1.4	6	21,500	1,295	0.088	20,300	1,100	0.069	18,000	935	0.049
1.4	8	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
1.4	10	19,350	1,050	0.050	18,270	890	0.039	16,200	755	0.028
1.4	16	17,200	830	0.032	16,240	705	0.025	14,400	600	0.018
1.5	4	23,900	1,580	0.135	22,600	1,355	0.105	20,000	1,075	0.075
1.5	5	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	6	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	7	23,900	1,580	0.095	22,600	1,355	0.074	20,000	1,075	0.053
1.5	8	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030

RPM=rev./min.
FEED=mm/min.

[WB512 series]

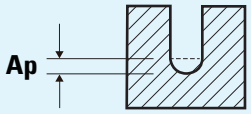
WORKPIECE		ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)			PREHARDENED STEELS (NAK, CENA, KP4)			HARDENED STEELS (SKD, SKT, STAVAX)		
HARDNESS		~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH		~1100N/mm^2			1100~1500N/mm^2			1500~2000N/mm^2		
DIAMETER(mm)	Effective Length	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
1.5	10	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
1.5	12	21,510	1,280	0.054	20,340	1,100	0.042	18,000	870	0.030
1.5	14	21,510	1,280	0.034	20,340	1,100	0.026	18,000	870	0.019
1.5	16	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
1.5	18	19,120	1,010	0.034	18,080	865	0.026	16,000	690	0.019
1.5	20	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
1.5	22	19,120	1,010	0.020	18,080	865	0.016	16,000	690	0.011
1.5	26	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
1.5	30	14,340	665	0.014	13,560	570	0.011	12,000	450	0.008
1.5	35	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
1.5	40	7,170	285	0.010	6,780	245	0.008	6,000	195	0.005
1.6	4	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	6	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	8	22,200	1,555	0.101	21,000	1,300	0.078	18,500	1,110	0.056
1.6	10	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
1.6	12	19,980	1,260	0.058	18,900	1,055	0.045	16,650	900	0.032
1.6	16	19,980	1,260	0.036	18,900	1,055	0.028	16,650	900	0.020
1.6	20	17,760	995	0.036	16,800	830	0.028	14,800	710	0.020
1.8	4	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	6	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	8	22,200	1,780	0.113	21,000	1,470	0.088	18,500	1,225	0.063
1.8	10	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
1.8	12	19,980	1,440	0.065	18,900	1,190	0.050	16,650	990	0.036
1.8	16	19,980	1,440	0.041	18,900	1,190	0.032	16,650	990	0.023
1.8	20	17,760	1,140	0.041	16,800	940	0.032	14,800	785	0.023
2.0	6	18,000	1,795	0.180	17,000	1,525	0.140	15,000	1,285	0.100
2.0	8	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070
2.0	10	18,000	1,795	0.126	17,000	1,525	0.098	15,000	1,285	0.070
2.0	12	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	14	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	16	16,200	1,455	0.072	15,300	1,235	0.056	13,500	1,040	0.040
2.0	18	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
2.0	20	16,200	1,455	0.045	15,300	1,235	0.035	13,500	1,040	0.025
2.0	22	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
2.0	26	14,400	1,150	0.045	13,600	975	0.035	12,000	820	0.025
2.0	30	14,400	1,150	0.027	13,600	975	0.021	12,000	820	0.015
2.0	35	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
2.0	40	10,800	755	0.018	10,200	640	0.014	9,000	540	0.010
2.0	45	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.0	50	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.0	60	5,400	325	0.018	5,100	275	0.014	4,500	230	0.010
2.5	8	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	10	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	12	15,800	1,925	0.158	14,900	1,605	0.123	13,200	1,305	0.088
2.5	16	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
2.5	20	14,220	1,560	0.090	13,410	1,300	0.070	11,880	1,055	0.050
2.5	22	14,220	1,560	0.056	13,410	1,300	0.044	11,880	1,055	0.031
2.5	26	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
2.5	30	12,640	1,230	0.056	11,920	1,025	0.044	10,560	835	0.031
2.5	35	12,640	1,230	0.034	11,920	1,025	0.026	10,560	835	0.019
2.5	40	9,480	810	0.034	8,940	675	0.026	7,920	550	0.019
2.5	45	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013
2.5	50	9,480	810	0.023	8,940	675	0.018	7,920	550	0.013

RPM=rev./min.
FEED=mm/min.

[WB512 series]

WORKPIECE		ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)			PREHARDENED STEELS (NAK, CENA, KP4)			HARDENED STEELS (SKD, SKT, STAVAX)		
HARDNESS		~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH		~1100N/mm^2			1100~1500N/mm^2			1500~2000N/mm^2		
DIAMETER(mm)	Effective Length	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
3.0	6	13,700	2,050	0.270	12,900	1,730	0.210	11,400	1,435	0.150
3.0	8	13,700	2,050	0.270	12,900	1,730	0.210	11,400	1,435	0.150
3.0	10	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	12	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	14	13,700	2,050	0.189	12,900	1,730	0.147	11,400	1,435	0.105
3.0	16	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.060
3.0	18	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.060
3.0	20	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.060
3.0	22	12,330	1,660	0.108	11,610	1,400	0.084	10,260	1,160	0.060
3.0	26	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
3.0	30	12,330	1,660	0.068	11,610	1,400	0.053	10,260	1,160	0.038
3.0	35	10,960	1,310	0.068	10,320	1,105	0.053	9,120	920	0.038
3.0	40	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
3.0	45	10,960	1,310	0.041	10,320	1,105	0.032	9,120	920	0.023
3.0	50	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
3.0	60	8,220	860	0.027	7,740	725	0.021	6,840	605	0.015
4.0	8	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
4.0	10	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
4.0	12	9,800	1,965	0.360	9,300	1,670	0.280	8,200	1,395	0.200
4.0	14	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	16	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	18	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	20	9,800	1,965	0.252	9,300	1,670	0.196	8,200	1,395	0.140
4.0	22	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	26	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	30	8,820	1,590	0.144	8,370	1,355	0.112	7,380	1,130	0.080
4.0	35	8,820	1,590	0.090	8,370	1,355	0.070	7,380	1,130	0.050
4.0	40	8,820	1,590	0.090	8,370	1,355	0.070	7,380	1,130	0.050
4.0	45	7,840	1,260	0.090	7,440	1,070	0.070	6,560	895	0.050
4.0	50	7,840	1,260	0.090	7,440	1,070	0.070	6,560	895	0.050
4.0	60	7,840	1,260	0.054	7,440	1,070	0.042	6,560	895	0.030
5.0	15	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
5.0	20	7,700	1,845	0.315	7,300	1,455	0.245	6,400	1,285	0.175
5.0	26	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	30	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	35	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	40	6,930	1,495	0.180	6,570	1,180	0.140	5,760	1,040	0.100
5.0	50	6,930	1,495	0.113	6,570	1,180	0.088	5,760	1,040	0.063
5.0	60	6,160	1,180	0.113	5,840	930	0.088	5,120	820	0.063
6.0	20	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
6.0	30	6,500	1,900	0.378	6,200	1,600	0.294	5,500	1,330	0.210
8.0	25	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
8.0	30	4,850	1,800	0.504	4,600	1,500	0.392	4,000	1,280	0.280
10.0	30	3,850	1,650	0.900	3,680	1,400	0.700	3,200	1,200	0.500
10.0	40	3,850	1,650	0.630	3,680	1,400	0.490	3,200	1,200	0.350
12.0	32	3,200	1,520	1.080	3,050	1,300	0.840	2,650	1,100	0.600
12.0	45	3,200	1,520	0.756	3,050	1,300	0.588	2,650	1,100	0.420

RPM = rev. / min.
FEED = mm / min.

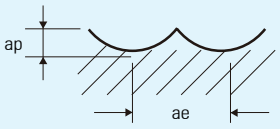


[WB542 series]

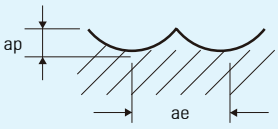
• Normal Speed

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.1	16,500	80	25500	185	25500	160
0.2	16,500	90	25500	220	25500	200
0.3	15,300	112	24000	260	24000	220
0.4	15,300	112	24000	260	24000	220
0.5	13,300	128	20800	300	20800	250
0.6	11,200	144	17600	330	17600	280
0.8	11,200	144	17600	330	17600	280
1.0	10,180	160	16000	370	16000	320
1.5	9,500	220	13000	500	12800	400
2.0	9,250	260	11500	640	11300	590
3.0	8,000	370	10200	880	9800	850
4.0	6,720	420	8500	880	8200	850
5.0	5,840	460	7500	880	7200	850
6.0	5,500	660	6900	920	6500	880
8.0	4,600	740	5600	840	5300	800
10.0	4,070	820	4850	800	4650	770
12.0	3,700	890	4350	800	4150	770

RPM = rev. / min.
FEED = mm / min.



ap : D1~D6=0.2mm
D8~D12=0.3mm
ae : 0.2×D



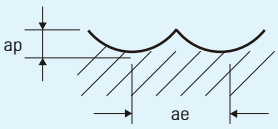
ap : D1~D4=0.05×D
D5~D8=0.25mm
D10~D12=0.3mm
ae : 0.1×D

[WB542 series]

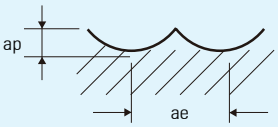
• High Speed

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.1	32,000	520	25,600	310	25,600	275
0.2	32,000	620	25,600	370	25,600	330
0.3	30,000	730	24,000	430	24,000	385
0.4	30,000	730	24,000	430	24,000	385
0.5	26,000	830	20,800	500	20,800	440
0.6	22,000	940	17,600	560	17,600	500
0.8	22,000	940	17,600	560	17,600	500
1.0	20,000	1,040	16,000	620	16,000	550
1.5	18,500	1,100	13,500	720	13,000	700
2.0	16,800	1,200	11,500	850	11,300	980
3.0	16,800	1,600	10,200	1,400	9,800	1,300
4.0	16,800	2,350	8,500	1,350	8,200	1,300
5.0	16,800	2,880	7,500	1,320	7,200	1,250
6.0	16,800	3,200	6,900	1,400	6,500	1,350
8.0	13,400	3,200	5,600	1,250	5,300	1,150
10.0	11,200	3,100	4,850	1,150	4,650	1,100
12.0	9,800	3,100	4,350	1,130	4,150	1,050

RPM = rev. / min.
FEED = mm / min.



ap : D1~D6=0.2mm
D8~D12=0.3mm
ae : 0.05×D

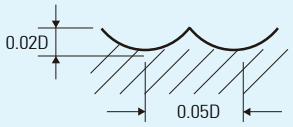


ap : D1~D4=0.05×D
D5~D8=0.25mm
D10~D12=0.3mm
ae : 0.05×D

[WB522 series]

WORKPIECE	NON-FERROUS METALS (ACRYLIC, PLASTIC, ABS)	
DIAMETER(mm)	RPM	FEED
1.0	42,000	280
1.5	28,000	280
2.0	21,000	280
3.0	14,000	280
4.0	10,500	280
5.0	8,400	330
6.0	7,000	330
8.0	5,250	370
10.0	4,200	370
12.0	3,500	430
16.0	2,650	320
20.0	2,100	250

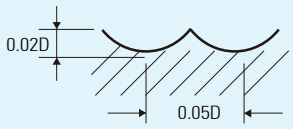
RPM = rev. / min.
FEED = mm / min.



[WB532 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3.0	35,000	2,800	33,000	2,600	12,000	900
4.0	26,000	2,300	25,000	2,200	9,000	800
5.0	21,000	2,100	20,000	2,000	7,000	700
6.0	17,000	1,900	16,000	1,800	6,000	650
8.0	13,000	1,700	12,000	1,600	4,500	550
10.0	10,500	1,450	10,000	1,400	3,500	500
12.0	9,000	1,400	8,000	1,300	3,000	450

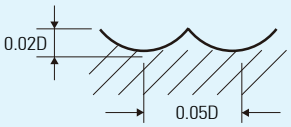
RPM = rev. / min.
FEED = mm / min.



[WSB502 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3.0	13,500	1,700	13,200	1,620	12,500	860
4.0	10,600	1,700	10,300	1,620	9,800	860
5.0	9,400	1,650	9,050	1,570	8,600	860
6.0	8,600	1,750	8,250	1,670	7,850	865
8.0	7,000	1,550	6,700	1,460	6,350	890
10.0	6,050	1,450	5,800	1,360	5,450	870
12.0	5,450	1,420	5,200	1,330	4,900	785
16.0	4,300	1,200	4,000	1,100	3,700	650
20.0	3,600	1,050	3,200	900	3,000	550

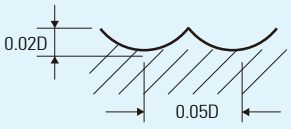
RPM = rev. / min.
FEED = mm / min.



[WB503 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1.0	50,000	4,150	44,000	3,000	33,000	2100
1.5	40,000	5,100	35,000	3,660	36,400	2600
2.0	33,000	5,890	29,000	4,150	21,700	3000
3.0	25,000	6,930	22,000	4,880	16,500	3490
4.0	21,670	6,930	18,120	4,880	13,400	3490
5.0	18,000	6,520	15,100	4,880	11,160	3320
6.0	16,200	7,710	13,680	5,590	10,980	4050
8.0	12,150	6,610	10,170	4,720	8,280	3580
10.0	9,720	5,870	8,190	4,130	6,620	3100
12.0	8,150	5,490	4,130	3,830	5,520	2870

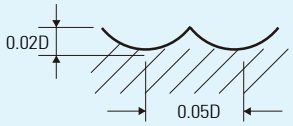
RPM = rev. / min.
FEED = mm / min.



[WB504 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1.0	48,000	3,300	35,000	2,350	32,000	2,200
1.5	38,400	4,100	28,000	2,900	25,600	2,700
2.0	31,680	4,600	23,100	3,300	21,000	3,100
3.0	24,000	5,430	17,500	3,880	16,000	3,650
4.0	20,130	5,430	14,880	3,880	14,220	3,650
5.0	16,780	5,430	12,400	3,690	11,670	3,470
6.0	15,200	6,220	12,200	4,500	11,100	3,830
8.0	11,300	5,250	9,200	3,980	8,320	3,350
10.0	9,100	4,590	7,350	3,450	6,660	2,870
12.0	7,590	4,260	6,130	3,190	5,530	2,400

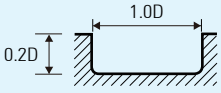
RPM = rev. / min.
FEED = mm / min.

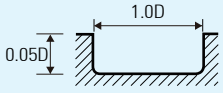


[WR502 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.2	44,000	145	28,800	60	17,600	40
0.3	41,000	170	27,000	70	16,500	45
0.4	41,000	170	27,000	70	16,500	45
0.5	36,000	190	23,400	80	14,300	50
0.6	30,000	210	19,800	90	12,100	55
0.8	30,000	210	19,800	90	12,100	55
1.0	27,600	240	18,000	100	11,000	60
1.5	22,000	250	13,500	110	8,500	60
2.0	18,000	260	11,560	120	7,200	70
2.5	15,000	270	9,500	130	6,100	70
3.0	13,240	280	8,560	140	5,280	70
4.0	10,720	340	6,820	170	4,300	80
5.0	9,160	420	5,800	200	3,800	100
6.0	7,900	500	5,040	250	3,280	120
8.0	6,000	540	3,800	250	2,520	120
10.0	5,040	540	3,280	250	2,020	120
12.0	4,120	420	2,780	230	1,680	100
16.0	3,100	360	2,100	170	1,280	80
20.0	2,520	280	1,640	120	1,000	60

RPM = rev. / min.
FEED = mm / min.

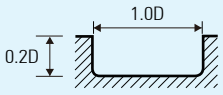


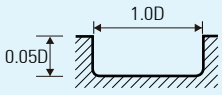


[WR514, WR542 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
0.2	50,000	170	34,500	75	21,150	45
0.3	50,000	200	32,000	85	20,000	50
0.4	50,000	200	32,000	85	20,000	50
0.5	43,000	220	28,000	95	17,100	60
0.6	36,400	250	24,000	110	14,500	65
0.8	36,400	250	24,000	110	14,500	65
1.0	33,100	280	21,600	120	13,200	70
1.5	26,400	300	16,200	130	10,200	70
2.0	21,600	310	13,800	140	8,640	80
2.5	18,000	320	11,400	150	7,320	80
3.0	15,900	330	10,300	160	6,300	80
4.0	12,800	400	8,200	200	5,150	95
5.0	11,000	500	7,000	240	4,560	120
6.0	9,500	600	6,000	300	3,930	140
8.0	7,200	640	4,550	300	3,020	140
10.0	6,000	640	4,000	300	2,420	140
12.0	5,000	500	3,340	270	2,000	120
16.0	3,720	450	2,520	210	1,540	95
20.0	3,000	330	1,950	140	1,200	70

RPM = rev. / min.
FEED = mm / min.

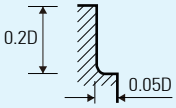


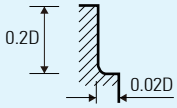


[WXR504 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1.0	27,600	300	18,000	220	11,000	120
1.5	22,000	310	13,500	230	8,500	120
2.0	18,000	320	11,560	240	7,200	130
2.5	15,000	330	9,500	250	6,100	130
3.0	13,240	340	8,560	260	5,280	130
4.0	10,720	420	6,820	300	4,300	140
5.0	9,160	430	5,800	360	3,800	170
6.0	7,900	430	5,040	360	3,280	170
8.0	6,000	460	3,800	360	2,520	170
10.0	5,040	460	3,280	360	2,020	170
12.0	4,120	360	2,780	320	1,680	140
16.0	3,100	280	2,100	230	1,280	115
20.0	2,520	230	1,640	180	1,000	90

RPM = rev. / min.
FEED = mm / min.



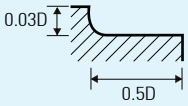


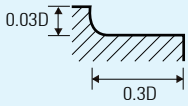
[WDR503 series]

• Normal Speed

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	5,100	3,500	5,500	3,750	3,850	2,700
8.0	3,800	3,400	4,150	3,700	2,850	2,550
10.0	3,800	3,750	3,600	3,500	2,700	2,700
12.0	3,200	4,200	3,250	4,250	2,250	2,300
16.0	2,400	3,100	2,250	2,900	1,700	1,750
20.0	1,900	2,500	1,800	2,350	1,350	1,400

RPM = rev. / min.
FEED = mm / min.

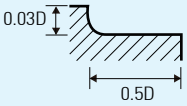


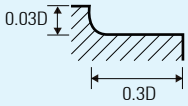


• High Speed

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	8,300	5,700	7,650	5,250	6,400	4,550
8.0	6,200	5,550	5,750	5,100	5,250	4,700
10.0	5,750	5,650	5,000	4,900	4,200	4,250
12.0	4,800	6,300	4,150	5,450	3,500	3,650
16.0	3,600	4,700	3,100	4,050	2,650	2,700
20.0	2,900	3,750	2,500	3,250	2,100	2,150

RPM = rev. / min.
FEED = mm / min.

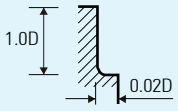




[WXR514, WR544 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1.0	33,100	360	21,600	260	13,200	140
1.5	26,400	370	16,200	270	10,200	140
2.0	21,600	380	13,800	280	8,640	150
2.5	18,000	390	11,400	300	7,320	150
3.0	15,900	400	10,300	310	6,300	150
4.0	12,800	500	8,200	360	5,150	160
5.0	11,000	510	7,000	430	4,560	200
6.0	9,500	510	6,000	430	3,930	200
8.0	7,200	550	4,550	430	3,020	200
10.0	6,000	550	4,000	430	2,420	200
12.0	5,000	430	3,340	380	2,000	160
16.0	3,720	330	2,520	280	1,540	135
20.0	3,000	270	1,950	210	1,200	100

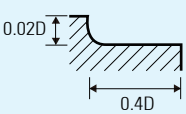
RPM = rev. / min.
FEED = mm / min.

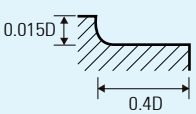


[WSPM4 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1.0	49000	7650	40000	6500	35000	5750
1.5	37000	8550	30000	7200	27000	6400
2.0	29700	9000	24300	7560	21600	6750
3.0	19800	9900	16200	8100	14400	7650
4.0	15300	10800	12600	8550	10800	7920
6.0	9900	11700	8100	9900	7200	8640
8.0	7380	11700	6300	9900	5400	8640
10.0	5850	10800	4950	9000	4320	8550
12.0	4950	10800	4140	9000	3690	8100
16.0	3690	9000	3060	7920	2700	7020
20.0	2970	7200	2430	6300	2160	5670

RPM = rev. / min.
FEED = mm / min.

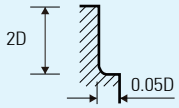


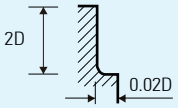


[WR504, WR512 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
3.0	4,410	115	3,570	100	2,200	55
4.0	3,570	140	2,840	115	1,790	60
5.0	3,050	180	2,420	140	1,580	70
6.0	2,630	215	2,100	180	1,370	85
8.0	2,000	230	1,580	180	1,050	85
10.0	1,680	230	1,370	180	840	85
12.0	1,370	180	1,160	160	700	70
16.0	1,160	160	890	125	560	60
20.0	840	115	680	90	420	45

RPM = rev. / min.
FEED = mm / min.

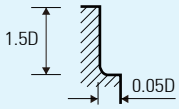


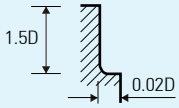


[WR506 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	14,880	3,210	14,100	2,940	9,600	2,940
8.0	12,000	3,300	11,400	3,000	7,200	2,760
10.0	9,600	2,940	9,300	2,700	5,700	2,460
12.0	7,800	2,700	7,500	2,460	4,800	2,280
16.0	6,000	2,400	5,820	2,220	3,600	2,040
20.0	4,800	2,010	4,680	2,040	2,880	1,920

RPM = rev. / min.
FEED = mm / min.

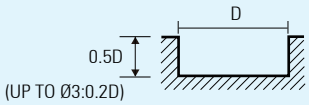




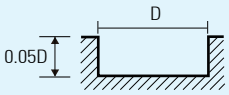
[WME502, WE502 S4, WE502 S3, WE502 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		STAINLESS STEELS (SUS)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45				HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²				1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	11,560	190	7,560	120	6,300	90	5,040	35
3.0	8,920	210	5,560	140	4,620	120	3,360	40
4.0	7,560	300	4,620	180	3,880	150	2,940	40
5.0	6,300	320	3,780	190	3,160	160	2,320	50
6.0	5,560	350	3,360	220	2,840	180	2,000	55
8.0	4,200	380	2,520	200	2,100	180	1,680	75
10.0	3,260	330	2,000	160	1,680	160	1,360	60
12.0	2,740	280	1,680	130	1,360	130	1,160	55
16.0	2,200	220	1,360	110	1,060	110	900	40
20.0	1,680	170	1,060	80	840	80	680	30
25.0	1,360	130	840	70	680	60	540	20

RPM = rev. / min.
FEED = mm / min.



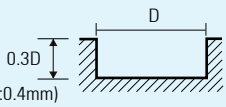
(UP TO Ø3:0.2D)



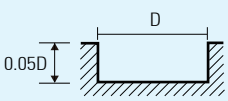
[WE522 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm²		1100~1500N/mm²		1500~2000N/mm²	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	6,300	60	5,040	50	3,150	25
3.0	4,410	70	3,570	60	2,200	30
4.0	3,570	85	2,840	70	1,790	35
5.0	3,050	105	2,420	85	1,580	40
6.0	2,630	125	2,100	105	1,370	50
8.0	2,000	135	1,580	105	1,050	50
10.0	1,680	135	1,370	105	840	50
12.0	1,370	105	1,160	95	700	40
16.0	1,160	95	890	75	560	35
20.0	840	70	680	50	420	25

RPM = rev. / min.
FEED = mm / min.



(UP TO Ø3:0.4mm)



[WE512 series]

WORKPIECE		Alloy Steels Carbon Steels (SCM, SNCM, S45C)			Prehardened Steels (NAK, CENA, KP4)			Hardened Steels (SKD, SKT, STAVAX)		
HARDNESS		~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
DIAMETER (mm)	Effective Length	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
0.1	0.3	50,000	315	0.009	46,200	230	0.007	40,600	170	0.005
0.1	0.5	50,000	315	0.006	46,200	230	0.005	40,600	170	0.004
0.1	1	45,000	255	0.002	41,580	185	0.002	36,540	140	0.001
0.2	0.5	38,500	380	0.018	36,300	270	0.014	32,100	200	0.010
0.2	1	38,500	380	0.013	36,300	270	0.010	32,100	200	0.007
0.2	1.5	34,650	310	0.007	32,670	220	0.006	28,890	160	0.004
0.2	2	34,650	310	0.005	32,670	220	0.004	28,890	160	0.003
0.3	1	34,200	390	0.019	32,300	270	0.015	28,500	230	0.011
0.3	1.5	34,200	390	0.019	32,300	270	0.015	25,800	230	0.011
0.3	2	30,780	315	0.011	29,070	220	0.008	25,650	185	0.006
0.3	2.5	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
0.3	3	30,780	315	0.007	29,070	220	0.005	25,650	185	0.004
0.3	4	27,360	250	0.004	25,840	175	0.003	22,800	145	0.002
0.3	5	20,520	165	0.003	19,380	115	0.002	17,100	95	0.002
0.4	1	27,400	540	0.036	25,800	380	0.028	22,800	280	0.020
0.4	1.5	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
0.4	2	27,400	540	0.025	25,800	380	0.020	22,800	280	0.014
0.4	2.5	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
0.4	3	24,660	435	0.014	23,220	310	0.011	20,520	225	0.008
0.4	4	24,660	435	0.009	23,220	310	0.007	20,520	225	0.005
0.4	5	21,920	345	0.009	20,640	245	0.007	18,240	180	0.005
0.4	6	21,920	345	0.005	20,640	245	0.004	18,240	180	0.003
0.4	8	16,440	225	0.004	15,480	160	0.003	13,680	120	0.002
0.4	10	8,220	95	0.004	7,740	70	0.003	6,840	50	0.002
0.5	1	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
0.5	1.5	27,400	540	0.045	25,800	425	0.035	22,800	285	0.025
0.5	2	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
0.5	2.5	27,400	540	0.032	25,800	425	0.025	22,800	285	0.018
0.5	3	24,660	435	0.018	23,220	345	0.014	20,520	230	0.010
0.5	4	24,660	435	0.018	23,220	345	0.014	20,520	230	0.010
0.5	5	24,660	435	0.011	23,220	345	0.009	20,520	230	0.006
0.5	6	21,920	345	0.011	20,640	270	0.009	18,240	180	0.006
0.5	8	16,440	225	0.007	15,480	180	0.005	13,680	120	0.004
0.5	10	16,440	225	0.005	15,480	180	0.004	13,680	120	0.003
0.5	12	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
0.5	14	8,220	95	0.005	7,740	75	0.004	6,840	50	0.003
0.5	16	2,740	25	0.005	2,580	20	0.004	2,280	15	0.003
0.6	2	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
0.6	3	27,400	775	0.038	25,800	545	0.029	22,800	405	0.021
0.6	4	24,660	630	0.022	23,220	440	0.017	20,520	330	0.012
0.6	5	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
0.6	6	24,660	630	0.014	23,220	440	0.011	20,520	330	0.008
0.6	8	21,920	495	0.008	20,640	350	0.006	18,240	260	0.005
0.6	10	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
0.6	12	16,440	325	0.005	15,480	230	0.004	13,680	170	0.003
0.6	14	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.6	16	8,220	140	0.005	7,740	100	0.004	6,840	75	0.003
0.7	2	27,400	775	0.063	25,800	545	0.049	22,800	405	0.035
0.7	4	24,660	630	0.025	23,220	440	0.020	20,520	330	0.014
0.7	6	24,660	630	0.016	23,220	440	0.012	20,520	330	0.009
0.7	8	21,920	495	0.016	20,640	350	0.012	18,240	260	0.009
0.7	10	21,920	495	0.009	20,640	350	0.007	18,240	260	0.005
0.7	12	16,440	325	0.009	15,480	230	0.005	13,680	170	0.004

RPM = rev. / min.
FEED = mm / min.

[WE512 series]

WORKPIECE		ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)			PREHARDENED STEELS (NAK, CENA, KP4)			HARDENED STEELS (SKD, SKT, STAVAX)		
HARDNESS		~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
DIAMETER (mm)	Effective Length	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
0.8	2	27,400	775	0.072	25,800	605	0.056	22,800	450	0.040
0.8	3	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
0.8	4	27,400	775	0.050	25,800	605	0.039	22,800	450	0.028
0.8	5	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
0.8	6	24,660	630	0.029	23,220	490	0.022	20,520	365	0.016
0.8	8	24,660	630	0.018	23,220	490	0.014	20,520	365	0.010
0.8	10	21,920	495	0.018	20,640	385	0.014	18,240	290	0.010
0.8	12	21,920	495	0.011	20,640	385	0.008	18,240	290	0.006
0.8	14	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
0.8	16	16,440	325	0.007	15,480	255	0.006	13,680	190	0.004
0.8	20	8,220	140	0.007	7,740	110	0.006	6,840	80	0.004
0.9	6	22,140	575	0.032	20,970	440	0.025	18,450	330	0.018
0.9	8	22,140	575	0.020	20,970	440	0.016	18,450	330	0.011
0.9	10	19,680	455	0.020	18,640	350	0.016	16,400	260	0.011
1.0	2	24,600	1,045	0.090	23,300	890	0.070	20,500	665	0.050
1.0	3	24,600	1,045	0.090	23,300	890	0.070	20,500	665	0.050
1.0	4	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
1.0	5	24,600	1,045	0.063	23,300	890	0.049	20,500	665	0.035
1.0	6	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	7	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	8	22,140	845	0.036	20,970	720	0.028	18,450	540	0.020
1.0	10	22,140	845	0.023	20,970	720	0.018	18,450	540	0.013
1.0	12	19,680	670	0.023	18,640	570	0.018	16,400	425	0.013
1.0	14	19,680	670	0.014	18,640	570	0.011	16,400	425	0.008
1.0	16	14,760	440	0.014	13,980	375	0.011	12,300	280	0.008
1.0	18	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
1.0	20	14,760	440	0.009	13,980	375	0.007	12,300	280	0.005
1.0	22	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	26	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	30	7,380	190	0.009	6,990	160	0.007	6,150	120	0.005
1.0	40	2,460	50	0.009	2,330	45	0.007	2,050	35	0.005
1.0	50	2,460	50	0.006	2,330	45	0.005	2,050	35	0.003
1.2	4	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
1.2	6	21,900	930	0.076	20,700	720	0.059	18,200	485	0.042
1.2	8	19,710	755	0.043	18,630	585	0.034	16,380	395	0.024
1.2	10	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
1.2	12	19,710	755	0.027	18,630	585	0.021	16,380	395	0.015
1.2	14	17,520	595	0.027	16,560	460	0.021	14,560	310	0.015
1.2	16	17,520	595	0.016	16,560	460	0.013	14,560	310	0.009
1.2	20	13,140	390	0.011	12,420	300	0.008	10,920	205	0.006
1.2	26	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.2	30	6,570	165	0.011	6,210	130	0.008	5,460	85	0.006
1.4	6	19,200	815	0.088	18,100	570	0.069	16,000	425	0.049
1.4	8	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
1.4	10	17,280	660	0.050	16,290	460	0.039	14,400	345	0.028
1.4	14	17,280	660	0.032	16,290	460	0.025	14,400	345	0.018
1.4	16	15,360	520	0.032	14,480	365	0.025	12,800	270	0.018
1.4	20	15,360	520	0.019	14,480	365	0.015	12,800	270	0.011
1.5	4	19,200	905	0.135	18,100	635	0.105	16,000	475	0.075
1.5	5	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	6	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	7	19,200	905	0.095	18,100	635	0.074	16,000	475	0.053
1.5	8	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030

RPM = rev. / min.
FEED = mm / min.

[WE512 series]

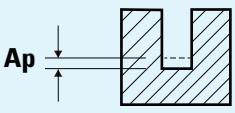
WORKPIECE		ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)			PREHARDENED STEELS (NAK, CENA, KP4)			HARDENED STEELS (SKD, SKT, STAVAX)		
HARDNESS		~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
DIAMETER (mm)	Effective Length	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
1.5	10	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
1.5	12	17,280	735	0.054	16,290	515	0.042	14,400	385	0.030
1.5	14	17,280	735	0.034	16,290	515	0.026	14,400	385	0.019
1.5	16	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
1.5	18	15,360	580	0.034	14,480	405	0.026	12,800	305	0.019
1.5	20	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
1.5	22	15,360	580	0.020	14,480	405	0.016	12,800	305	0.011
1.5	26	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.5	30	11,520	380	0.014	10,860	265	0.011	9,600	200	0.008
1.6	8	17,800	840	0.101	16,800	655	0.078	14,800	490	0.056
1.6	10	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
1.6	12	16,020	680	0.058	15,120	530	0.045	13,320	395	0.032
1.6	16	16,020	680	0.036	15,120	530	0.028	13,320	395	0.020
1.6	20	14,240	540	0.036	13,440	420	0.028	11,840	315	0.020
1.8	8	17,800	840	0.113	16,800	655	0.088	14,800	490	0.063
1.8	10	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
1.8	12	16,020	680	0.065	15,120	530	0.050	13,320	395	0.036
1.8	16	16,020	680	0.041	15,120	530	0.032	13,320	395	0.023
1.8	20	14,240	540	0.041	13,440	420	0.032	11,840	315	0.023
2.0	6	14,400	820	0.180	13,600	620	0.140	12,000	475	0.100
2.0	8	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
2.0	10	14,400	820	0.126	13,600	620	0.098	12,000	475	0.070
2.0	12	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	14	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	16	12,960	665	0.072	12,240	500	0.056	10,800	385	0.040
2.0	18	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
2.0	20	12,960	665	0.045	12,240	500	0.035	10,800	385	0.025
2.0	22	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
2.0	26	11,520	525	0.045	10,880	395	0.035	9,600	305	0.025
2.0	30	11,520	525	0.027	10,880	395	0.021	9,600	305	0.015
2.0	35	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
2.0	40	8,640	345	0.018	8,160	260	0.014	7,200	200	0.010
2.0	45	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.0	50	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.0	60	4,320	150	0.018	4,080	110	0.014	3,600	85	0.010
2.5	8	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	10	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	12	12,300	970	0.158	11,600	680	0.123	10,300	510	0.088
2.5	14	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	16	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	18	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	20	11,070	785	0.090	10,440	550	0.070	9,270	415	0.050
2.5	22	11,070	785	0.056	10,440	550	0.044	9,270	415	0.031
2.5	26	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
2.5	30	9,840	620	0.056	9,280	435	0.044	8,240	325	0.031
2.5	35	9,840	620	0.034	9,280	435	0.026	8,240	325	0.019
2.5	40	7,380	405	0.034	6,960	285	0.026	6,180	215	0.019
2.5	45	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
2.5	50	7,380	405	0.023	6,960	285	0.018	6,180	215	0.013
3.0	6	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
3.0	8	10,900	860	0.270	10,300	605	0.210	6,600	450	0.150
3.0	10	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
3.0	12	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105

RPM = rev. / min.
FEED = mm / min.

[WE512 series]

WORKPIECE		ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)			PREHARDENED STEELS (NAK, CENA, KP4)			HARDENED STEELS (SKD, SKT, STAVAX)		
HARDNESS		~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH		~1100N/mm²			1100~1500N/mm²			1500~2000N/mm²		
DIAMETER (mm)	Effective Length	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
3.0	14	10,900	860	0.189	10,300	605	0.147	6,600	450	0.105
3.0	16	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	18	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	20	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	22	9,810	695	0.108	9,270	490	0.084	5,940	365	0.060
3.0	26	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
3.0	30	9,810	695	0.068	9,270	490	0.053	5,940	365	0.038
3.0	35	8,720	550	0.068	8,240	385	0.053	5,280	290	0.038
3.0	40	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
3.0	45	8,720	550	0.041	8,240	385	0.032	5,280	290	0.023
3.0	50	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
3.0	60	6,540	360	0.027	6,180	255	0.021	3,960	190	0.015
4.0	8	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	10	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	12	8,000	1,300	0.360	7,600	1,160	0.280	6,700	770	0.200
4.0	14	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	16	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	18	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	20	8,000	1,300	0.252	7,600	1,160	0.196	6,700	770	0.140
4.0	22	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	26	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	30	7,200	1,055	0.144	6,840	940	0.112	6,030	625	0.080
4.0	35	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
4.0	40	7,200	1,055	0.090	6,840	940	0.070	6,030	625	0.050
4.0	45	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
4.0	50	6,400	830	0.090	6,080	740	0.070	5,360	495	0.050
4.0	60	6,400	830	0.054	6,080	740	0.042	5,360	495	0.030
5.0	16	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
5.0	20	6,400	1,155	0.315	6,100	900	0.245	5,400	605	0.175
5.0	26	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	30	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	35	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	40	5,760	935	0.180	5,490	730	0.140	4,860	490	0.100
5.0	50	5,760	935	0.113	5,490	730	0.088	4,860	490	0.063
5.0	60	5,120	740	0.113	4,880	575	0.088	4,320	385	0.063
6.0	15	5,300	1,055	0.540	5,000	820	0.420	4,400	550	0.300
6.0	20	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
6.0	30	5,300	1,055	0.378	5,000	820	0.294	4,400	550	0.210
6.0	32	4,770	855	0.216	4,500	665	0.168	3,960	445	0.120
8.0	25	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
8.0	30	4,000	950	0.504	3,800	750	0.392	3,300	500	0.280
8.0	42	3,600	770	0.288	3,400	605	0.224	2,950	405	0.160
10.0	30	3,200	900	0.900	3,050	680	0.700	2,630	400	0.500
10.0	35	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
10.0	45	3,200	900	0.630	3,050	680	0.490	2,630	400	0.350
12.0	35	2,650	800	1.080	2,520	600	0.840	2,180	350	0.600
12.0	40	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420
12.0	50	2,650	800	0.756	2,520	600	0.588	2,180	350	0.420

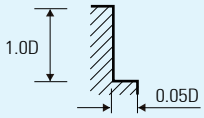
RPM = rev. / min.
FEED = mm / min.



[WME504, WXE504 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		STAINLESS STEELS (SUS)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45				HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2				1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	11,560	280	7,560	170	6,300	140	5,040	50
3.0	8,920	320	5,560	200	4,620	170	3,360	60
4.0	7,560	570	4,620	350	3,880	280	2,940	60
5.0	6,300	600	3,780	360	3,160	300	2,320	70
6.0	5,560	660	3,360	410	2,840	330	2,000	80
8.0	4,200	710	2,520	380	2,100	350	1,680	110
10.0	3,260	610	2,000	300	1,680	300	1,360	90
12.0	2,740	520	1,680	250	1,360	240	1,160	80
16.0	2,200	410	1,360	200	1,100	300	900	60
20.0	1,680	320	1,060	160	840	150	680	40
25.0	1,360	250	840	130	680	120	540	30

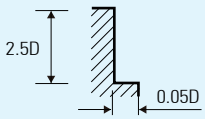
RPM = rev. / min.
FEED = mm / min.

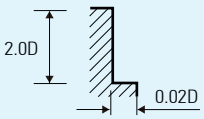


[WE524 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	6,300	100	5,040	80	3,150	45
3.0	4,410	115	3,570	100	2,200	55
4.0	3,570	140	2,840	115	1,790	60
5.0	3,050	180	2,420	140	1,580	70
6.0	2,630	215	2,100	180	1,370	90
8.0	2,000	230	1,580	180	1,050	90
10.0	1,680	230	1,370	180	840	90
12.0	1,370	180	1,160	160	700	70
16.0	1,160	160	890	125	560	60
20.0	840	115	680	90	420	45

RPM = rev. / min.
FEED = mm / min.

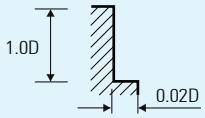




[WE514 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		STAINLESS STEELS (SUS)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45				HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2				1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
1.0	22,000	310	13,500	180	10,750	140	8,500	50
1.5	17,000	320	10,700	190	8,500	150	6,500	50
2.0	13,900	330	9,070	200	7,560	165	6,000	60
2.5	12,000	350	7,600	220	6,000	180	4,500	60
3.0	10,700	380	6,670	240	5,110	200	4,030	70
4.0	9,070	680	5,540	420	4,650	330	3,530	70
5.0	7,560	720	4,530	430	3,800	360	2,780	85
6.0	6,670	790	4,030	490	3,400	390	2,400	95
8.0	5,040	850	3,020	450	2,520	420	2,010	130
10.0	3,910	730	2,400	360	2,010	360	1,630	105
12.0	3,300	620	2,010	300	1,630	280	1,400	95

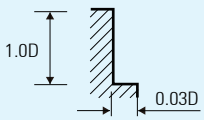
RPM = rev. / min.
FEED = mm / min.



[WE504...H series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1.0	45,000	750	37,000	560	23,000	300
2.0	23,500	800	18,000	540	12,000	360
3.0	15,750	810	12,600	580	8,280	380
4.0	12,150	830	9,540	600	6,345	400
6.0	9,450	900	7,470	640	4,950	440
8.0	7,110	860	5,625	620	3,780	410
10.0	5,580	800	4,410	570	2,925	380
12.0	4,770	800	3,780	570	2,520	380
16.0	3,600	810	2,900	570	2,000	400
20.0	3,000	810	2,300	570	1,600	400

RPM = rev. / min.
FEED = mm / min.

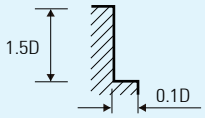


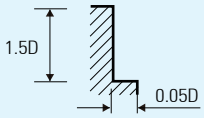
[WE506 series]

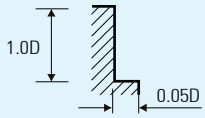
• Normal Speed

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	5,560	2,000	3,880	1,370	1,580	210
8.0	4,200	2,000	2,940	1,370	1,160	210
10.0	3,360	2,000	2,320	1,370	1,000	210
12.0	2,840	1,680	2,000	1,160	840	180
16.0	2,100	1,260	1,480	880	640	130
20.0	1,680	1,010	1,160	690	500	110
25.0	1,500	90	1,100	600	430	90

RPM = rev. / min.
FEED = mm / min.



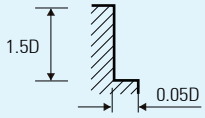


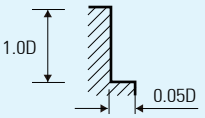


• High Speed

WORKPIECE	PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	HRc35~HRc45		HRc45~HRc55	
STRENGTH	1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED
6.0	16,800	6,090	8,400	3,050
8.0	12,600	6,090	6,300	3,050
10.0	9,980	5,990	5,040	3,050
12.0	8,400	5,040	4,200	2,520
16.0	6,300	3,780	3,160	1,890
20.0	5,040	3,050	2,520	1,470
25.0	4,500	2,700	2,200	1,300

RPM = rev. / min.
FEED = mm / min.

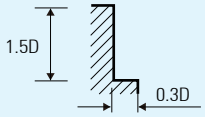


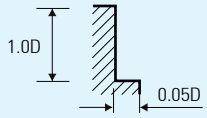


[WF61 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)		HARDENED STEELS (SKD, SKT, STAVAX)	
HARDNESS	~HRc35		HRc35~HRc45		HRc45~HRc55	
STRENGTH	~1100N/mm^2		1100~1500N/mm^2		1500~2000N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	12,400	840	8,400	570	3,400	260
8.0	9,200	840	6,300	570	2,400	240
10.0	7,600	840	5,100	570	2,000	290
12.0	6,000	800	4,200	570	1,680	260
14.0	5,200	840	3,600	570	1,400	200
16.0	4,800	760	3,300	510	1,200	160
18.0	4,400	720	2,700	420	1,100	150
20.0	3,600	560	2,400	360	1,000	150
25.0	3,200	620	2,160	410	900	160

RPM = rev. / min.
FEED = mm / min.

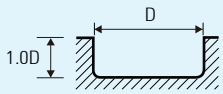


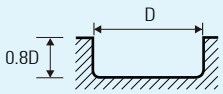


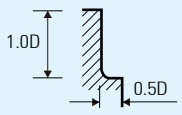
[WF60 series]

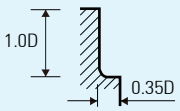
WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, S45C, S50C)		ALLOY STEELS CARBON STEELS PREHARDENED STEELS (SCM, SKD, NAK, KP4		ALLOY STEELS CARBON STEELS [SCM, S45C, S50C]		ALLOY STEELS CARBON STEELS PREHARDENED STEELS [SCM, SKD, NAK, KP4]	
HARDNESS	~HRc25		HRc25~HRc40		~HRc25		HRc25~HRc40	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8.0	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10.0	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12.0	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
16.0	4,500	1,500	4,100	1,050	6,000	2,450	5,400	1,750
20.0	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500

RPM = rev. / min.
FEED = mm / min.





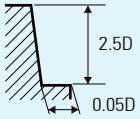




[WTE502 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)	
HARDNESS	~ HRc35		HRc35 ~ HRc45	
STRENGTH	~ 1100N/mm^2		1100 ~ 1500N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED
0.3	45,000	135	35,000	105
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1.0	14,850	149	11,250	113
2.0	7,560	153	5,670	113
3.0	3,969	108	3,213	90
4.0	3,213	126	2,556	104
6.0	2,367	189	1,890	153
8.0	1,800	225	1,422	162
10.0	1,440	225	1,170	167

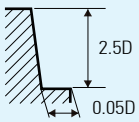
RPM = rev. / min.
FEED = mm / min.



[WTE504, WTE514 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)	
HARDNESS	~ HRc35		HRc35 ~ HRc45	
STRENGTH	~ 1100N/mm^2		1100 ~ 1500N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED
3.0	3,969	216	3,213	180
4.0	3,213	252	2,556	207
6.0	2,367	378	1,890	306
8.0	1,800	450	1,422	324
10.0	1,440	450	1,170	333

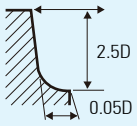
RPM = rev. / min.
FEED = mm / min.



[WTB502 series]

WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)		PREHARDENED STEELS (NAK, CENA, KP4)	
HARDNESS	~ HRc35		HRc35 ~ HRc45	
STRENGTH	~ 1100N/mm^2		1100 ~ 1500N/mm^2	
DIAMETER(mm)	RPM	FEED	RPM	FEED
0.4	36,000	144	27,900	113
0.6	25,200	144	18,900	113
0.8	18,000	144	13,950	108
1.0	14,850	149	11,250	113
2.0	7,560	153	5,670	113
3.0	3,969	108	3,213	90
4.0	3,213	126	2,556	104

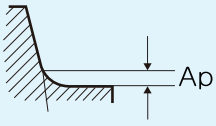
RPM = rev. / min.
FEED = mm / min.



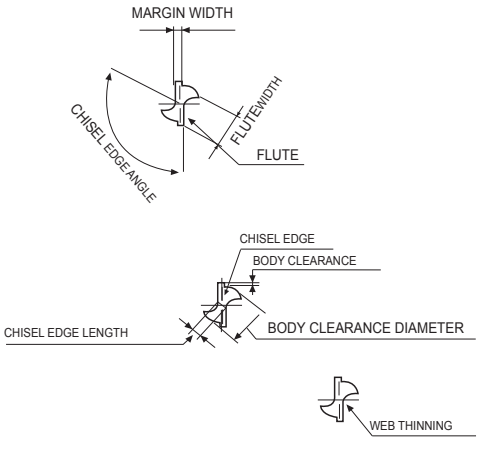
[WTR504 series]

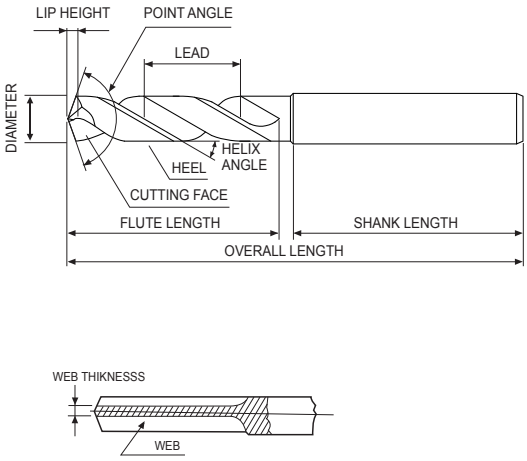
WORKPIECE	ALLOY STEELS CARBON STEELS (SCM, SNCM, S45C)			PREHARDENED STEELS (NAK, CENA, KP4)			HARDENED STEELS (SKD, SKT, STAVAX)		
HARDNESS	~HRc35			HRc35~HRc45			HRc45~HRc55		
STRENGTH	~1100N/mm^2			1100~1500N/mm^2			1500~2000N/mm^2		
DIAMETER(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
0.4	40,000	630	0.008~0.016	32,000	450	0.008~0.012	22,000	270	0.004~0.008
0.6	30,000	630	0.012~0.024	23,000	450	0.012~0.018	15,000	270	0.006~0.012
0.8	22,500	630	0.016~0.032	17,000	450	0.016~0.024	11,500	270	0.008~0.016
1.0	18,000	630	0.020~0.040	13,500	450	0.020~0.030	9,000	270	0.010~0.020
1.2	14,400	630	0.025~0.050	11,700	450	0.025~0.040	7,200	270	0.012~0.025
1.5	11,700	630	0.030~0.060	9,000	450	0.030~0.050	5,850	270	0.015~0.030
2.0	9,000	630	0.040~0.080	7,200	450	0.040~0.060	4,500	270	0.020~0.040

RPM = rev. / min.
FEED = mm / min.



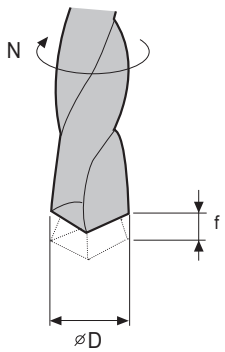
[Nomenclature of Drill]





[Working of Main Angle]

POINT ANGLE	HELIX ANGLE	LIP RELIEF ANGLE
70° 118° 140°	10° 38° 40°	7° 10° 12° 15°
Large ⟶ Torque ⟶ Small Small ⟶ Thrust ⟶ Large	Bad ⟶ Cutting Capacity ⟶ Good Good ⟶ Chip Ejection ⟶ Bad Large ⟶ Rigidity of tool ⟶ Small	Small ⟶ Tool Wear ⟶ Large Small ⟶ Vibration ⟶ Large



●Cutting Speed

$$V = \frac{\pi \times D \times N}{1000} \text{ (m/min)}$$

- V : Cutting Speed (m/min)
- D : Diameter of drill (mm)
- N : Revolution (rpm)
- π : (3.14)

●Feed

$$f = \frac{S}{N} \text{ (m/rev)}$$

- f : Feed (mm/rev)
- S : Depth of cut per min (mm/min)
- N : Revolution (rpm)

●Helix Angle

$$\delta^{\circ} = \text{Tan}^{-1}\left(\frac{\pi D}{L}\right)$$

- δ : Helix angle
- D : Diameter of drill (mm)
- L : lead (mm)
- π : (3.14)

[HPI503, 505, 508 series]

WORKPIECE	NON-ALLOY STEELS		ALLOY STEELS		SOFT CAST IRON		STRONG CAST IRON	
STRENGTH	＜700N/㎟		＜1000N/㎟		＜HB240, GG25		＜HB300, GG40	
DIAMETER(mm)	RPM	FEED (mm/rev)	RPM	FEED (mm/rev)	RPM	FEED (mm/rev)	RPM	FEED (mm/rev)
1.0	16,250	0.05	14,800	0.05	26,600	0.05	17,300	0.05
2.0	16,250	0.07	14,800	0.07	26,600	0.07	17,300	0.07
3.0	16,000	0.16	14,500	0.16	26,000	0.16	17,000	0.16
4.0	12,000	0.17	11,000	0.17	20,000	0.17	13,000	0.17
5.0	9,550	0.18	8,600	0.18	16,000	0.18	10,000	0.18
6.0	8,000	0.20	7,200	0.20	13,000	0.20	8,500	0.20
7.0	6,800	0.22	6,100	0.22	11,500	0.22	7,300	0.22
8.0	6,000	0.24	5,400	0.24	9,900	0.24	6,400	0.24
9.0	5,300	0.27	4,800	0.27	8,800	0.27	5,700	0.27
10.0	4,800	0.30	4,300	0.30	8,000	0.30	5,100	0.30
12.0	4,000	0.33	3,600	0.33	6,600	0.33	4,250	0.33
14.0	3,400	0.36	3,050	0.36	5,700	0.36	3,650	0.36
16.0	3,000	0.39	2,700	0.39	5,000	0.39	3,200	0.39
18.0	2,650	0.42	2,400	0.42	4,400	0.42	2,850	0.42
20.0	2,400	0.45	2,150	0.45	4,000	0.45	2,550	0.45

[PDS, PDM series] ▶ Power Drill

V : m/min, f : mm/rev

WORKPIECE			MILD STEEL·ALLOY STEEL·CARBON STEEL		ALLOY STEEL FORGED STEEL		HIGH HARDENED STEELS		STAINLESS STEEL		DUCTILE CAST IRON		CAST IRON	
HARDNESS			≤HRc25		HRc25 ~ HRc35		HRc35 ~ HRc45							
TYPE	Dia.	COD	V	f	V	f	V	f	V	f	V	f	V	f
SOLID TYPE	ø3~5	PDS030~050	40~70	0.15~0.25	35~55	0.10~0.20	15~25	0.05~0.15	15~25	0.05~0.15	35~70	0.15~0.25	45~75	0.15~0.30
	ø5~8	PDS051~080	50~75	0.20~0.30	45~60	0.15~0.25	15~30	0.10~0.20	15~30	0.10~0.20	45~75	0.20~0.35	55~85	0.20~0.40
	ø8~10	PDS081~100	50~75	0.25~0.35	45~60	0.15~0.30	20~35	0.10~0.20	15~30	0.10~0.20	45~75	0.25~0.40	55~85	0.20~0.40
	ø10~12	PDS101~120	50~75	0.25~0.35	45~60	0.15~0.30	20~35	0.10~0.25	15~30	0.10~0.25	45~75	0.25~0.40	55~85	0.20~0.45
	ø12~14	PDS121~140	55~80	0.25~0.40	50~70	0.20~0.35	20~35	0.10~0.25	15~30	0.10~0.25	50~80	0.25~0.45	60~90	0.25~0.50
	ø14~20	PDS141~200	55~80	0.30~0.45	50~70	0.20~0.35	20~35	0.10~0.30	15~30	0.10~0.25	50~80	0.25~0.50	60~100	0.25~0.55

[PDSI, PDMI series] ▶ Oil Hole Power Drill

V : m/min, f : mm/rev

WORKPIECE	MILD STEEL·ALLOY STEEL·CARBON STEEL		ALLOY STEEL FORGED STEEL		HIGH HARDENED STEELS		STAINLESS STEEL		DUCTILE CAST IRON		CAST IRON	
HARDNESS	≤HRc25		HRc25 ~ HRc35		HRc35 ~ HRc45							
Dia.	V	f	V	f	V	f	V	f	V	f	V	f
7~8	80~110	0.15~0.25	70~100	0.15~0.25	50~80	0.10~0.20	30~60	0.10~0.20	50~80	0.15~0.25	80~120	0.15~0.30
8~10	90~120	0.20~0.30	80~110	0.15~0.30	60~90	0.15~0.25	30~70	0.10~0.20	60~90	0.20~0.30	100~130	0.25~0.35
10~12	100~130	0.25~0.35	90~120	0.20~0.30	70~100	0.20~0.30	30~70	0.10~0.20	70~100	0.25~0.35	110~140	0.25~0.35
12~16	110~140	0.25~0.35	100~130	0.25~0.35	80~100	0.20~0.30	40~70	0.15~0.25	80~110	0.30~0.40	120~150	0.30~0.40
16~20	120~150	0.25~0.40	110~140	0.25~0.35	90~110	0.20~0.30	40~70	0.15~0.30	90~120	0.30~0.40	130~160	0.30~0.40

[SSD, SSDL series]

WORKPIECE	TOOLSTEELS, ALLOYSTEELS SKD,SCM		ALUMINUMROLLED, ALUMINUMALLOY(AL,AC)		BRASS, BRONZE Bs,PB		EPOXY, RESIN	
DIAMETER (mm)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)
3	4000~7000	0.02	10000~12000	0.03	7000~10000	0.02	9000~12000	0.08
5	2400~4200	0.03	6000~8000	0.05	4200~6000	0.04	5400~7200	0.08
8	1500~2600	0.05	3700~5000	0.08	2600~3700	0.08	3400~4500	0.09
12	1000~1700	0.06	2500~3200	0.12	1700~2500	0.12	2200~3000	0.11

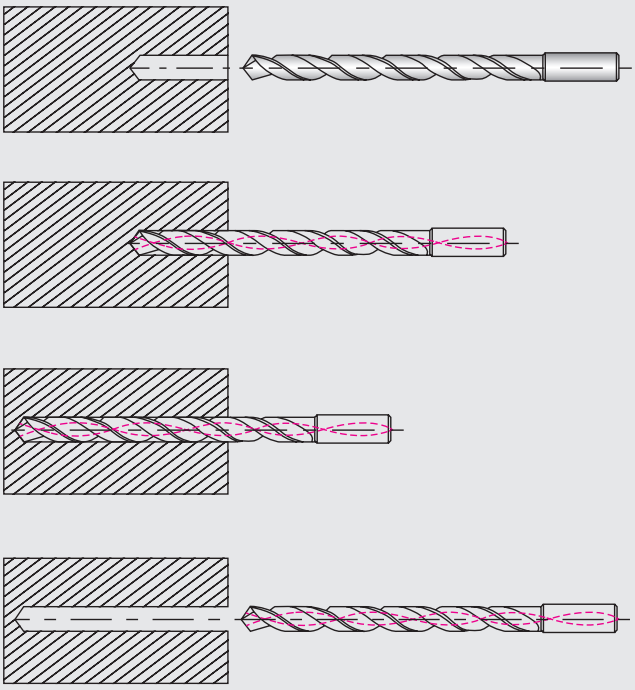
[PF50, P50 series]

WORKPIECE	CARBON STEEL(C<0.3%) ALLOY STEEL / SS400 SCM ~710N/mm2		CARBON STEEL(C≥0.3%) ALLOY STEEL / S50C SCM ~1.060N/mm2		SUJ2·SUS440		SKD61 HRc34~43		HRc43~48		SKD11 HRc48~53		CAST IRON FC 250~350		DUCTILE FC 400~500	
V	80~125m/min		80~125m/min		63~80m/min		40~63m/min		32~45m/min		25~36m/min		80~125m/min		63~90m/min	
DIAMETER (mm)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)
2	12,000	0.06-0.08	12,000	0.06-0.08	11,000	0.06-0.08	8,000	0.06-0.08	6,000	0.05-0.07	4,500	0.03-0.06	15,000	0.06-0.08	11,000	0.06-0.08
3	9,600	0.09-0.12	9,600	0.09-0.12	7,500	0.09-0.12	5,300	0.09-0.12	4,000	0.07-0.11	3,200	0.05-0.09	10,000	0.09-0.12	7,600	0.09-0.12
4	8,000	0.10-0.15	8,000	0.10-0.15	5,650	0.10-0.15	4,000	0.10-0.15	3,000	0.08-0.13	2,600	0.06-0.10	8,000	0.10-0.15	6,000	0.10-0.15
5	6,400	0.12-0.18	6,400	0.12-0.18	4,550	0.12-0.18	3,300	0.12-0.18	2,400	0.10-0.15	2,000	0.8-0.12	6,400	0.12-0.18	4,800	0.12-0.18
6	5,300	0.14-0.20	5,300	0.14-0.20	3,800	0.14-0.20	2,750	0.14-0.20	2,000	0.12-0.18	1,700	0.09-0.15	5,300	0.14-0.20	4,000	0.14-0.20
8	4,000	0.16-0.24	4,000	0.16-0.24	2,850	0.16-0.24	2,100	0.16-0.24	1,500	0.14-0.22	1,300	0.12-0.20	4,000	0.16-0.24	3,000	0.16-0.24
10	3,200	0.18-0.27	3,200	0.18-0.27	2,250	0.18-0.27	1,700	0.18-0.27	1,200	0.15-0.25	1,000	0.13-0.23	3,200	0.18-0.27	2,400	0.18-0.27
12	2,650	0.20-0.30	2,650	0.20-0.30	1,900	0.20-0.30	1,400	0.20-0.30	1,000	0.17-0.26	850	0.14-0.24	2,700	0.20-0.30	2,000	0.20-0.30
14	2,300	0.22-0.35	2,300	0.22-0.35	1,600	0.22-0.35	1,200	0.22-0.35	860	0.18-0.30	730	0.15-0.26	2,300	0.22-0.35	1,700	0.22-0.35
16	2,000	0.25-0.36	2,000	0.25-0.36	1,400	0.25-0.36	1,050	0.25-0.36	760	0.20-0.32	640	0.16-0.26	2,000	0.25-0.36	1,500	0.25-0.36
18	1,800	0.28-0.38	1,800	0.28-0.38	1,250	0.28-0.38	920	0.28-0.38	670	0.23-0.33	570	0.18-0.28	1,800	0.28-0.38	1,350	0.28-0.38
20	1,600	0.30-0.40	1,600	0.30-0.40	1,150	0.30-0.40	850	0.30-0.40	600	0.25-0.35	500	0.20-0.30	1,600	0.30-0.40	1,200	0.30-0.40

[SF50, PI50 series]

WORKPIECE	CARBON STEEL(C<0.3%) ALLOY STEEL / SS400 SCM ~710N/mm2		CARBON STEEL(C≥0.3%) ALLOY STEEL / S50C SCM ~1.060N/mm2		SUJ2·SUS440		SKD61 HRc34~43		HRc43~48		SKD11 HRc48~53		CAST IRON FC 250~350		DUCTILE FC 400~500	
V	80~150m/min		80~150m/min		63~100m/min		40~70m/min		32~50m/min		25~40m/min		80~150m/min		63~100m/min	
DIAMETER (mm)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)
3	12,000	0.09-0.12	13,000	0.09-0.12	7,600	0.09-0.12	6,400	0.09-0.12	5,300	0.07-0.11	3,800	0.05-0.09	12,000	0.09-0.12	8,500	0.09-0.12
4	9,500	0.10-0.15	10,000	0.10-0.15	5,700	0.10-0.15	4,800	0.10-0.15	4,000	0.08-0.13	2,950	0.06-0.10	9,000	0.10-0.15	6,350	0.10-0.15
5	7,600	0.12-0.18	8,000	0.12-0.18	4,600	0.12-0.18	3,800	0.12-0.18	3,200	0.10-0.15	2,300	0.8-0.12	7,600	0.12-0.18	5,100	0.12-0.18
6	6,400	0.14-0.20	6,600	0.14-0.20	3,800	0.14-0.20	3,200	0.14-0.20	2,650	0.12-0.18	1,900	0.09-0.15	6,400	0.14-0.20	4,250	0.14-0.20
8	4,800	0.16-0.24	5,000	0.16-0.24	2,900	0.16-0.24	2,400	0.16-0.24	2,000	0.14-0.22	1,450	0.12-0.20	4,800	0.16-0.24	3,200	0.16-0.24
10	3,800	0.18-0.27	4,000	0.18-0.27	2,300	0.18-0.27	1,900	0.18-0.27	1,600	0.15-0.25	1,150	0.13-0.23	3,800	0.18-0.27	2,550	0.18-0.27
12	3,200	0.20-0.30	3,300	0.20-0.30	1,900	0.20-0.30	1,600	0.20-0.30	1,300	0.17-0.26	950	0.14-0.24	3,200	0.20-0.30	2,100	0.20-0.30
14	2,700	0.22-0.35	2,800	0.22-0.35	1,600	0.22-0.35	1,350	0.22-0.35	1,150	0.18-0.30	800	0.15-0.26	2,700	0.22-0.35	1,800	0.22-0.35
16	2,400	0.25-0.36	2,500	0.25-0.36	1,400	0.25-0.36	1,200	0.25-0.36	1,000	0.20-0.32	700	0.16-0.26	2,400	0.25-0.36	1,600	0.25-0.36
18	2,100	0.28-0.38	2,200	0.28-0.38	1,300	0.28-0.38	1,100	0.28-0.38	900	0.23-0.33	650	0.18-0.28	2,100	0.28-0.38	1,400	0.28-0.38
20	1,900	0.30-0.40	2,000	0.30-0.40	1,150	0.30-0.40	1,000	0.30-0.40	800	0.25-0.35	600	0.20-0.30	1,900	0.30-0.40	1,250	0.30-0.40

[SF510, SF520 series]



1. Guide Drilling should be done as Diameter+0.1mm between 3×D and 5×D
2. For Main Drilling, proceed with low RPM at Guide Drilling segment. (RPM 300, FEED 400mm/min)
3. Just before the end of Guide Drilling segment, reduce feed to zero and increase the RPM according to Recommended Cutting Condition chart (See Below)
4. After then, proceed main drilling by increasing feed without step drilling.
5. When coming out from Guide Drilling start point after drilling, RPM should be reduced as 300 and feed should be 1000 mm/min.
6. When coming out from Guide Drilling segment to the outside, the feed should be decreased as 50%

WORKPIECE	CARBON STEELS ALLOY STEEL ~1060 N/mm²		CAST IRON 250~350 N/mm²		DUCTILE CAST IRON 400~500 N/mm²	
Drilling Speed	63~125 m/min		63~125 m/min		60~80 m/min	
Drilling Diameter	Speed (min^{-1})	Feed Rate (mm/rev)	Speed (min^{-1})	Feed Rate (mm/rev)	Speed (min^{-1})	Feed Rate (mm/rev)
3	7,500	0.06 ~ 0.12	7,500	0.06 ~ 0.12	7,500	0.06 ~ 0.12
4	6,400	0.08 ~ 0.16	6,400	0.08 ~ 0.16	5,600	0.08 ~ 0.16
5	5,800	0.10 ~ 0.20	5,800	0.10 ~ 0.20	4,500	0.10 ~ 0.20
6	4,800	0.12 ~ 0.24	4,800	0.12 ~ 0.24	3,800	0.12 ~ 0.24
8	3,600	0.16 ~ 0.28	3,600	0.16 ~ 0.28	2,800	0.16 ~ 0.28
10	2,900	0.20 ~ 0.35	2,900	0.20 ~ 0.35	2,300	0.20 ~ 0.35
12	2,900	0.24 ~ 0.42	2,400	0.24 ~ 0.42	1,900	0.24 ~ 0.42
14	2,050	0.28 ~ 0.46	2,050	0.28 ~ 0.46	1,600	0.28 ~ 0.46

N = R.P.M
S = mm/rev

[SSTD series]

WORKPIECE	TOOLSTEELS, ALLOYSTEELS		ALUMINUMROLLED, ALUMINUMALLOY(AL,AC)		BRASS, BRONZE Bs,PB		EPOXY, RESIN	
DIAMETER (mm)	RPM	FEED (mm/rev)	RPM	FEED (mm/rev)	RPM	FEED (mm/rev)	RPM	FEED (mm/rev)
3	4,000~7,000	0.02	10,000~12,000	0.03	7,000~10,000	0.02	9,000~12,000	0.08
5	2,400~4,200	0.03	6,000~8,000	0.05	4,200~6,000	0.04	5,400~7,200	0.08
8	1,500~2,600	0.05	3,700~5,000	0.08	2,600~3,700	0.08	3,400~4,500	0.09
12	1,000~1,700	0.06	2,500~3,200	0.12	1,700~2,500	0.12	2,200~3,000	0.11

[PX50 series]

WORKPIECE	CARBON STEEL(C<0.3%) ALLOY STEEL / SS400 SCM ~710N/mm2		CARBON STEEL(C≥0.3%) ALLOY STEEL / S50C SCM ~1.060N/mm2		SUJ2·SUS440		SKD61 HRc34~43		HRc43~48		SKD11 HRc48~53		CAST IRON FC 250~350		DUCTILE FC 400~500	
V	80~125m/min		80~125m/min		63~80m/min		40~63m/min		32~45m/min		25~36m/min		80~125m/min		63~90m/min	
DIAMETER (mm)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)
2	12,000	0.06-0.08	12,000	0.06-0.08	11,000	0.06-0.08	8,000	0.06-0.08	6,000	0.05-0.07	4,500	0.03-0.06	15,000	0.06-0.08	11,000	0.06-0.08
3	9,600	0.09-0.12	9,600	0.09-0.12	7,500	0.09-0.12	5,300	0.09-0.12	4,000	0.07-0.11	3,200	0.05-0.09	10,000	0.09-0.12	7,600	0.09-0.12
4	8,000	0.10-0.15	8,000	0.10-0.15	5,650	0.10-0.15	4,000	0.10-0.15	3,000	0.08-0.13	2,600	0.06-0.10	8,000	0.10-0.15	6,000	0.10-0.15
5	6,400	0.12-0.18	6,400	0.12-0.18	4,550	0.12-0.18	3,300	0.12-0.18	2,400	0.10-0.15	2,000	0.8-0.12	6,400	0.12-0.18	4,800	0.12-0.18
6	5,300	0.14-0.20	5,300	0.14-0.20	3,800	0.14-0.20	2,750	0.14-0.20	2,000	0.12-0.18	1,700	0.09-0.15	5,300	0.14-0.20	4,000	0.14-0.20
8	4,000	0.16-0.24	4,000	0.16-0.24	2,850	0.16-0.24	2,100	0.16-0.24	1,500	0.14-0.22	1,300	0.12-0.20	4,000	0.16-0.24	3,000	0.16-0.24
10	3,200	0.18-0.27	3,200	0.18-0.27	2,250	0.18-0.27	1,700	0.18-0.27	1,200	0.15-0.25	1,000	0.13-0.23	3,200	0.18-0.27	2,400	0.18-0.27
12	2,650	0.20-0.30	2,650	0.20-0.30	1,900	0.20-0.30	1,400	0.20-0.30	1,000	0.17-0.26	850	0.14-0.24	2,700	0.20-0.30	2,000	0.20-0.30
14	2,300	0.22-0.35	2,300	0.22-0.35	1,600	0.22-0.35	1,200	0.22-0.35	860	0.18-0.30	730	0.15-0.26	2,300	0.22-0.35	1,700	0.22-0.35
16	2,000	0.25-0.36	2,000	0.25-0.36	1,400	0.25-0.36	1,050	0.25-0.36	760	0.20-0.32	640	0.16-0.26	2,000	0.25-0.36	1,500	0.25-0.36
18	1,800	0.28-0.38	1,800	0.28-0.38	1,250	0.28-0.38	920	0.28-0.38	670	0.23-0.33	570	0.18-0.28	1,800	0.28-0.38	1,350	0.28-0.38
20	1,600	0.30-0.40	1,600	0.30-0.40	1,150	0.30-0.40	850	0.30-0.40	600	0.25-0.35	500	0.20-0.30	1,600	0.30-0.40	1,200	0.30-0.40

[PXI50 series]

WORKPIECE	CARBON STEEL(C<0.3%) ALLOY STEEL / SS400 SCM ~710N/mm2		CARBON STEEL(C≥0.3%) ALLOY STEEL / S50C SCM ~1.060N/mm2		SUJ2·SUS440		SKD61 HRc34~43		HRc43~48		SKD11 HRc48~53		CAST IRON FC 250~350		DUCTILE FC 400~500	
V	80~150m/min		80~150m/min		63~100m/min		40~70m/min		32~50m/min		25~40m/min		80~150m/min		63~100m/min	
DIAMETER (mm)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)
3	12,000	0.09-0.12	13,000	0.09-0.12	7,600	0.09-0.12	6,400	0.09-0.12	5,300	0.07-0.11	3,800	0.05-0.09	12,000	0.09-0.12	8,500	0.09-0.12
4	9,500	0.10-0.15	10,000	0.10-0.15	5,700	0.10-0.15	4,800	0.10-0.15	4,000	0.08-0.13	2,950	0.06-0.10	9,000	0.10-0.15	6,350	0.10-0.15
5	7,600	0.12-0.18	8,000	0.12-0.18	4,600	0.12-0.18	3,800	0.12-0.18	3,200	0.10-0.15	2,300	0.8-0.12	7,600	0.12-0.18	5,100	0.12-0.18
6	6,400	0.14-0.20	6,600	0.14-0.20	3,800	0.14-0.20	3,200	0.14-0.20	2,650	0.12-0.18	1,900	0.09-0.15	6,400	0.14-0.20	4,250	0.14-0.20
8	4,800	0.16-0.24	5,000	0.16-0.24	2,900	0.16-0.24	2,400	0.16-0.24	2,000	0.14-0.22	1,450	0.12-0.20	4,800	0.16-0.24	3,200	0.16-0.24
10	3,800	0.18-0.27	4,000	0.18-0.27	2,300	0.18-0.27	1,900	0.18-0.27	1,600	0.15-0.25	1,150	0.13-0.23	3,800	0.18-0.27	2,550	0.18-0.27
12	3,200	0.20-0.30	3,300	0.20-0.30	1,900	0.20-0.30	1,600	0.20-0.30	1,300	0.17-0.26	950	0.14-0.24	3,200	0.20-0.30	2,100	0.20-0.30
14	2,700	0.22-0.35	2,800	0.22-0.35	1,600	0.22-0.35	1,350	0.22-0.35	1,150	0.18-0.30	800	0.15-0.26	2,700	0.22-0.35	1,800	0.22-0.35
16	2,400	0.25-0.36	2,500	0.25-0.36	1,400	0.25-0.36	1,200	0.25-0.36	1,000	0.20-0.32	700	0.16-0.26	2,400	0.25-0.36	1,600	0.25-0.36
18	2,100	0.28-0.38	2,200	0.28-0.38	1,300	0.28-0.38	1,100	0.28-0.38	900	0.23-0.33	650	0.18-0.28	2,100	0.28-0.38	1,400	0.28-0.38
20	1,900	0.30-0.40	2,000	0.30-0.40	1,150	0.30-0.40	1,000	0.30-0.40	800	0.25-0.35	600	0.20-0.30	1,900	0.30-0.40	1,250	0.30-0.40

[Technical Solutions about general problems to use drill]

Problems and Circumstances	Cause	Technical Countermeasures
Not drill into workpiece	· No enough Lip Relief · Thick Web	Re-grinding of Lip Relief Get the Web thinner
Chipping-off on margin part	large jig-bushing	Use the right sized bushing on drill
Balance of cutting flutes	To overheat on drill during the operation	Reduce feed rate Supply enoungh cutting oil
Chipped-off on cutting flutes	· Large relief angle · High feed rate	· Adjust Lip Relief · Reduce feed rate
Damage on tang	Incomplete adhesiveness between soket and shaft	Remove foreign substance and replace it to new one when it is worn out
Damage on a drill during a processing of brass	· Wrong choice of shape of drill · Clogged-up with chips in groove	Choose suitable drill for material
crack on center of drill	· Lack of number of flutes · Huge feed rate	· Re-grinding with proper relief angle · Reduce feed rate
Getting hole size larger	· Difference between point angle and cutting flutes · Loose main spindle	· Choose good qualitative drill · Adjust spindle within measure
Damage on edge	· High feed rate · foreign substance on workpiece · Lack of cutting oil supply on drill tip · wear on drill	· Grind tip of drill suitable for workpiece · Reduce feed rate · Regrind it on early stage
Irregular size of chip	inappropriate grind on edge of flute or using only one side of flute	· Need a exact re-grinding · Choose good qualitative drill
Roughness of hole	· blunt edge of flute or inappropriate grinding excessive feed rate · No supply cutting oil on tip of drill · excessive feed rate · Not firmly hold fixture	· Regrind flute edge angle · Suppy plenty of appropriate cutting oil · Reduce feed rate · Hold fixture firmly

[CDS series]

WORKPIECE	DIE STEEL	ALLOYSTEELS		STAINLESS STEELS
HARDNESS	＜700N/㎟	~HRc23	~HRc32	
V	30~50 m/min	30~50 m/min	20~40 m/min	15~25 m/min
DIAMETER (mm)	FEED (mm/rev)	FEED (mm/rev)	FEED (mm/rev)	FEED (mm/rev)
1.0	0.01~0.03	0.01~0.03	0.01~0.03	0.01~0.03
2.0	0.01~0.035	0.01~0.035	0.01~0.035	0.01~0.035
3.0	0.015~0.05	0.015~0.05	0.015~0.05	0.015~0.05
4.0	0.02~0.06	0.02~0.06	0.02~0.06	0.02~0.06
5.0	0.03~0.07	0.03~0.07	0.03~0.07	0.03~0.07
6.0	0.04~0.07	0.04~0.07	0.04~0.07	0.04~0.07

[LDS series]

WORKPIECE	S15C ·SS400 ~500N/mm²		S45C		SCM440		SKD61 28HRc		SKD61 34HRc		FC250		AC4D	
V	63~80m/min		40~63m/min		32~50m/min		20~28m/min		16~22m/min		63~100m/min		80~160m/min	
DIAMETER (mm)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)	RPM (mm^{-1})	FEED (mm/rev)
3	7,500	0.04~0.08	5,500	0.04~0.08	4,500	0.04~0.08	2,500	0.04~0.08	1,500	0.04~0.08	8,000	0.05~0.09	12,000	0.10~0.22
4	5,700	0.05~0.10	4,100	0.05~0.10	3,300	0.05~0.10	1,900	0.05~0.10	1,100	0.05~0.1	6,500	0.07~0.12	9,500	0.12~0.25
6	3,800	0.06~0.12	2,700	0.06~0.12	2,300	0.06~0.12	1,250	0.06~0.12	750	0.06~0.12	4,300	0.12~0.18	6,400	0.14~0.28
8	2,800	0.08~0.15	2,000	0.08~0.15	1,700	0.08~0.15	950	0.08~0.15	550	0.08~0.15	3,200	0.13~0.20	4,800	0.18~0.32
10	2,300	0.10~0.18	1,700	0.10~0.18	1,400	0.10~0.18	750	0.10~0.18	450	0.1~0.18	2,600	0.17~0.25	3,800	0.22~0.36
12	1,900	0.12~0.21	1,400	0.12~0.21	1,200	0.12~0.21	650	0.12~0.21	370	0.12~0.21	2,200	0.21~0.30	3,200	0.25~0.40
16	1,400	0.16~0.28	1,000	0.16~0.28	900	0.16~0.28	500	0.16~0.28	280	0.16~0.28	1,600	0.24~0.32	2,400	0.32~0.48
20	1,150	0.20~0.34	820	0.20~0.34	700	0.20~0.34	400	0.20~0.34	220	0.2~0.34	1,300	0.26~0.40	1,900	0.40~0.60
25	900	0.25~0.45	650	0.25~0.45	560	0.25~0.45	300	0.25~0.45	180	0.25~0.45	1,000	0.30~0.50	1,500	0.50~0.75

[CES series]

WORKPIECE	CARBON STEELS, ALLOY STEELS						STAINLESS STEEL, TITANIUM STEEL		ALUMINUM	
HARDNESS	~HRc20		HRc20~ HRc30		HRc30~ HRc40					
STRENGTH	500~800N/mm²		800~1000N/mm²		1000~1300N/mm²					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	5,900	60	4,000	30	3,300	25	2,400	20	14,000	220
4	4,800	60	3,300	30	2,800	25	2,000	20	11,800	230
5	3,800	60	2,500	30	2,200	25	1,760	20	9,500	240
6	3,000	60	2,000	30	1,800	30	1,400	20	7,700	250
8	2,300	65	1,540	35	1,300	35	1,100	20	5,800	260
10	2,000	65	1,300	35	1,200	35	1,000	20	5,000	260
12	1,760	65	1,000	40	1,000	35	540	20	4,400	260
16	1,400	65	900	40	770	35	660	25	3,300	270
20	1,100	65	700	40	600	35	440	25	2,600	270

[CEM series]

WORKPIECE	CARBON STEELS, ALLOY STEELS						STAINLESS STEEL, TITANIUM STEEL		ALUMINUM	
HARDNESS	~HRc20		HRc20~ HRc30		HRc30~ HRc40					
STRENGTH	500~800N/mm²		800~1000N/mm²		1000~1300N/mm²					
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
3	5,900	95	3,900	65	3,300	50	2,400	40	14,000	230
4	4,800	95	3,200	65	2,800	50	2,000	40	12,000	240
5	3,800	100	2,500	65	2,200	55	1,760	45	9,500	250
6	3,000	110	2,000	70	1,800	60	1,400	50	7,700	300
8	2,300	115	1,540	75	1,300	65	1,100	55	5,800	350
10	2,000	120	1,300	80	1,200	65	1,000	55	5,100	380
12	1,760	130	1,100	90	1,000	70	840	60	4,400	400
16	1,400	140	900	90	770	70	660	60	3,000	330
20	1,100	140	700	90	600	70	440	60	2,640	340

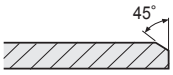
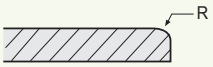
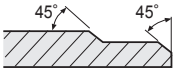
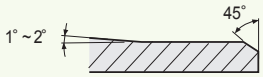
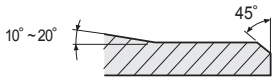
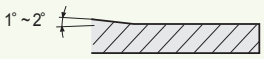
[CRC series]

WORKPIECE	CARBON STEELS S54C ~ S55C		ALLOY STEELS, TOOLS STEELS SKD / SUS / SCM		HARDENED STEELS NAK / HPM	
HARDNESS					HRc35~ HRc45	
DIAMETER(mm)	RPM	FEED	RPM	FEED	RPM	FEED
1.9	3,200	60	2,300	50	2,500	40
2.9	2,500	60	1,800	50	1,800	40
3.9	1,850	60	1,400	50	1,400	40
4.9	1,600	60	1,100	50	1,200	40
5.9	1,400	60	900	50	1,000	40

[Recommendation of Cutting Conditions in Reamer]

WORKPIECE			DIAMETER(mm)	CUTTING CONDITIONS	
MATERIAL	TENSILE STRENGTH(Kg/mm2)	HARDNESS(HB)		V (m/min)	f (mm/rev)
CARBON STEELS, ALLOY STEELS	~ 100		~10 10~25 25~40	8 ~ 12	0.15 ~ 0.25 0.20 ~ 0.40 0.30 ~ 0.50
	100 ~ 140		~10 10~25 25~40	6 ~ 10	0.12 ~ 0.20 0.15 ~ 0.30 0.20 ~ 0.40
STEEL CASTINGS	40 ~ 50		~10 10~25 25~40	8 ~ 12	0.15 ~ 0.25 0.20 ~ 0.40 0.30 ~ 0.50
	50 ~ 70		~10 10~25 25~40	6 ~ 10	0.12 ~ 0.20 0.15 ~ 0.30 0.20 ~ 0.40
CAST IRON		~ 200	~10 10~25 25~40	8 ~ 15	0.20 ~ 0.30 0.30 ~ 0.50 0.40 ~ 0.70
		200 ~	~10 10~25 25~40	6 ~ 12	0.15 ~ 0.25 0.20 ~ 0.40 0.30 ~ 0.50
ALUMINUM ALLOY			~10	15 ~ 25	0.20 ~ 0.30 0.30 ~ 0.50 0.40 ~ 0.70
			10~25 25~40	20 ~30	

[The Effect of Chamfer]

TWIST DIRECTION	CHARACTERISTICS
	If the work piece is caught by sharp blade edge, dent occurs on the machined surface. It is applied to chucking reamer, etc.
	Guide edge was rounded. The ground surface is excellent but round machining is difficult and it may deteriorate the machined surface.
	It is 2 blade-type. Chip is produced in 2 stages and it provides good results. But regrinding is difficult.
	The guide part of second stage of cutting edge is 1~2°. Cutting edge blade is long and life is limited. It provides good results on finish machining
	The guide part of second stage is 10~20. It is very economical as the length of blade is short and utilized length is long
	It is used for finish machining. It is applied to hand reamer.

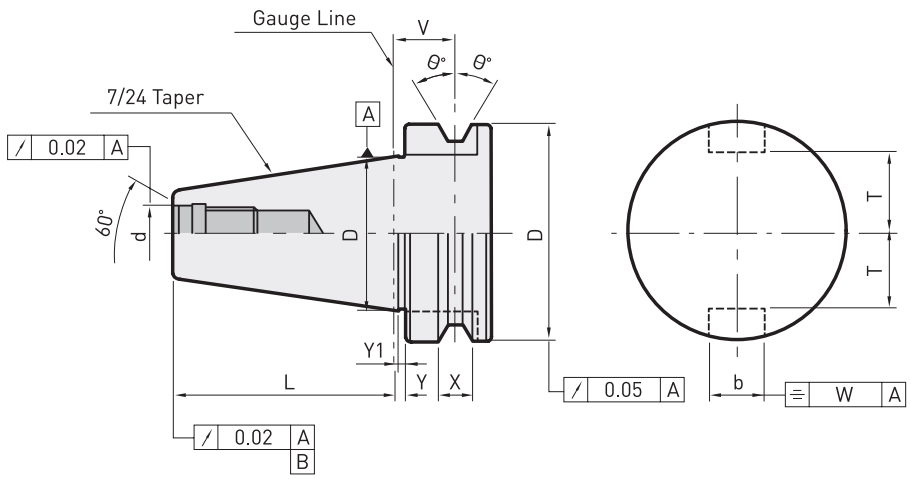
[The Effect of Twist Angle]

TWIST DIRECTION	CHARACTERISTICS
Straight blade (twist angle is 0°)	• Surface is generally poor except cast iron.
Right twist blade	• Excellent machinability and easy to discharge chip • Applicable work piece range is wide. • Excellent for high hardness work piece
Left twist blade	• Excellent surface roughness for work piece of aluminium alloys, copper, and copper alloys • It is good for machining soft materials

[Trouble Shooting of Reaming]

TROUBLE	PLAN	MEASURES
Enlarged Hole	Increase burnishing effects	• Decrease chamfer angle • Decrease back taper • Use S.CI type cutting oil • Increase margin width • Grind 2 stages chamfer • Check reamer diameter
	Suppress the occurrence of built-up-edge	• Increase margin width • Grind 2 stages chamfer • Change heat treatment conditions and microstructure of workpiece • Increase cutting oil supply • Increase cutting speed and reduce feed rate
	Reduce the unbalance of cutting force	• The cutting edge difference shall be less than 0.005mm • Increase cutting speed • Reduce the deviation of main axis and basic Diameter • Check wear conditions of bush and replace it • Change water soluble cutting oil to non-water soluble oil
Shrinked Hole	Reduce finish effects	• Increase the clearance angle of cutting edge • Decrease margin width • Increase cutting speed • Increase back taper
Poor roundness	Reduce Chattering	• Increase the strength of machine • Change to left helix reamer • Increase back taper • Increase feed rate • Reduce the tolerance of bush • Increase margin width • Decrease cutting speed
Poor surface roughness	Increase burnishing	• Use left helix • Grind with 2 stage chamfer • Decrease chamfer angle
	Remove deposit	• Increase rake angle • Reduce feed rate • Increase cutting speed
	Remove chattering	• The cutting edge difference shall be less than 0.005mm • Increase cutting speed • Align main axis center and basic diameter center • Change water soluble cutting oil to non-water soluble oil
	Remove chip interference	• Change shape of flute type • Increase the depth of flute

[BT-SHANK]



MAS403

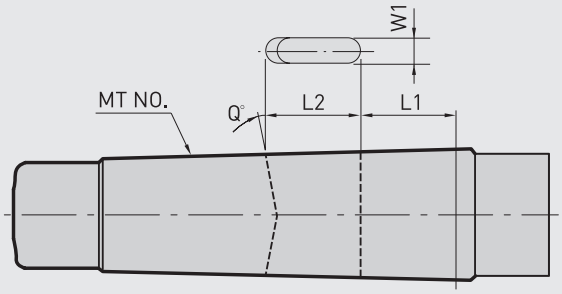
NO	Categories of Examination		Allowable Value	Remarks
1	Adhesiveness ratio of Taper		More than 75%	More than 95%[WIDIN]
2	Taper angle allowable difference		AT3	Follow JIS AT3 of B0614
3	RUNOUT of 'D' on Taper		TIR0.05	
4	RUNOUT of 'd' on Taper		TIR0.02	
5	RUNOUT of 'B' on Taper		TIR0.02	
6	Eccentric about center of 'b'		BT30-45:0.06	Allowable value of laterality
			BT50-60:0.1	
7	Tolerance of 'L'		±0.2	
8	Tolerance of 'd'		H8	
9	Tolerance of 'd'		H12	
10	Tolerance of 't'		-0.2	
11	Tolerance of 'D'		h8	
12	Tolerance of 'V'		±0.1	
13	Tolerance of 'x'		+0.1	
14	Tolerance of Ø		-15°	Ø=30°
15	Tolerance of 'y'		±0.4	
16	Tolerance of 'y1'		-0.4	
17	Concentricity on nut of Taper		TIR0.2	Measure from 35mm needle
18	The degree of screw		6H	According to JIS B209
19	Standard intensity of illumination	Taper	1.6S	WIDIN = 0.8S
		Grinder	3.2S	
		Others	▽▽	
20	Flaw, Crack, Rust, Burr			Check by visual confirmation
21	Exterior			Anti-corrosion treatment other than grinding surface
22	carving			
23	Quality of material		SMC415	
24	Heat treatment		Depth : 0.8 ~ 1.0	Prevention of carburizing on screw
			HRC 55-62	Hardness of carburizing surface

[COTTER HOME]

· During the process of Middle-sized cutting, large-sized face mill or endmill, tapping, drill, the tools may have a possibility to fall out from the toolholder

· cotter groove is prevent to fall out of tools

· Due to discrepancy of cotter groove size by each company Please let us know the manufacturer and L1, L2, W1 of cotter groove



MT

Assumed Taper No.	Manufacturer	Summary notation	L_1	L_2	W_1	Q	Model
MT4	Yoshida	Y	15	15.5	8.2	5°	YR130
			18	15	8.2	5°	YRD1000
			9	21	8.2	5°	YD3-65
	Ooya	O	5	18	8.2	5°	R2000
			9	11	8.2	5°	RA2-1300
			10	10	8.2	5°	RE1250A
	Kurama	K	26.3	29.5	12.2	5°	
MT5	Aoyama	A	44	40	13	5°	ATB-3
	Okuma	B	27	41	12.4	5°	
	Ikegai	I	52	35	13.2	5°	
	Kurashiki	K	53	35	13.2	5°	
	Nomura	N	27	38	12.2	8°	AFB-4
	Shinada	S	37	37	16	0°	
	Toshiba	T	50	35	13	0°	
	Yoshida	Y	25	20	20	5°	YRD700
			9	33.5	8	5°	YDD700
	Ooya	O	15	25	12.2	5°	RE3-2000
			14	20	12.2	5°	RE-2500
MT6	Hyundai WIA	K	54	41.3	16.2	0°	
	Daewoo heavy industries & machinery	D	52	45	16.2	5°	
	Aoyama	A	50	38	19.3	5°	
	Okuma	B	37	48.5	16.4	5°	DRB3000
	Ikegai	I	52	45	16.2	5°	
	Kurashiki	K	54	41	16.3	5°	
	Nomura	N	27	42	16.2	8°	
	Shinada	S	54.5	47.5	19.3	0°	
	Toshiba	T	54	40	16.2	0°	

[Boring's Technical Data]

WORKPIECE	BORING DIAMETER	Finishing A Type			Rough grinding D Type		
		V(m/min)	(mm/rev)	V(m/min)	V(m/min)	(mm/rev)	V(m/min)
CARBON STEELS (S45C, S50C)	24-30	110-140	0.05-0.15	0.05-0.30	100-130	0.15-0.25	4.2
	29-40	115-150	0.05-0.15	0.05-0.30	105-140	0.15-0.30	5.7
	39-50	115-150	0.05-0.15	0.06-0.35	105-150	0.20-0.30	5.7
	49-102	115-150	0.15-0.20	0.06-0.35	105-150	0.25-0.35	6.3
	100-220	115-150	0.15-0.20	0.07-0.50	105-150	0.30-0.40	6.3
	220-500	100-130	0.15-0.20	0.07-0.50	105-150	0.30-0.40	6.3
ALLOY STEELS (SCM, SNCM)	24-30	110-140	0.05-0.15	0.05-0.30	90-120	0.15-0.25	4.2
	29-40	110-150	0.05-0.15	0.05-0.30	100-130	0.15-0.30	5.7
	39-50	110-150	0.05-0.15	0.06-0.35	100-130	0.20-0.30	5.7
	49-102	110-150	0.05-0.20	0.06-0.35	100-130	0.25-0.35	6.3
	100-220	110-150	0.05-0.20	0.07-0.50	100-130	0.30-0.40	6.3
	220-500	110-150	0.05-0.20	0.07-0.50	100-130	0.30-0.40	6.3
STAINLESS STEEL (SUS)	24-30	70-100	0.07-0.15	0.12-0.35	60-90	0.12-0.20	4.2
	29-40	80-110	0.07-0.15	0.12-0.35	70-100	0.15-0.25	5.7
	39-50	80-110	0.07-0.15	0.20-0.50	70-100	0.15-0.25	5.7
	49-102	80-110	0.10-0.20	0.20-0.50	70-100	0.20-0.30	6.3
	100-220	80-110	0.12-0.20	0.25-0.75	70-100	0.25-0.35	6.3
	220-500	80-110	0.12-0.20	0.25-0.75	70-100	0.25-0.35	6.3
CAST STEELS (FC)	24-30	75-100	0.07-0.15	0.12-0.35	60-110	0.20-0.30	4.2
	29-40	80-115	0.07-0.15	0.12-0.35	60-110	0.25-0.35	5.7
	39-50	80-115	0.07-0.15	0.20-0.50	60-110	0.25-0.35	5.7
	49-102	80-115	0.12-0.20	0.20-0.50	60-110	0.30-0.40	6.3
	100-220	80-115	0.12-0.20	0.25-0.75	60-110	0.30-0.45	6.3
	220-500	80-115	0.12-0.20	0.25-0.75	60-110	0.30-0.45	6.3
ALUMINUM ALLOY STEELS (AC)	24-30	150-300	0.05-0.15	0.12-0.35	120-300	0.20-0.30	4.2
	29-40	150-360	0.10-0.20	0.12-0.35	150-370	0.25-0.35	5.7
	39-50	150-360	0.10-0.20	0.20-0.50	150-370	0.25-0.35	5.7
	49-102	150-360	0.10-0.20	0.20-0.50	150-370	0.30-0.40	6.3
	100-220	150-360	0.10-0.25	0.25-0.75	150-370	0.30-0.45	6.3
	220-500	150-360	0.10-0.25	0.25-0.75	150-370	0.30-0.45	6.3
SPECIAL STEEL (SKD61)	24-30	30-40	0.75-0.15	0.12-0.35	25-35	0.12-0.20	4.2
	29-40	40-45	0.07-0.15	0.12-0.35	30-40	0.15-0.25	5.7
	39-50	40-45	0.07-0.15	0.20-0.50	30-40	0.15-0.25	5.7
	49-102	40-45	0.10-0.20	0.20-0.50	30-40	0.20-0.30	6.3
	100-220	40-45	0.10-0.20	0.25-0.75	30-40	0.25-0.35	6.3
	220-500	40-45	0.10-0.20	0.25-0.75	30-40	0.25-0.35	6.3

[Drill's Technical Data]

WORKPIECE / CUTTING CONDITIONS / DIAMETER(Ø)	CARBON STEELS (S45C, S50C) SPEED 22-30mm/min		ALLOY STEELS (SCN, SNC, SNCM) SPEED 20-25mm/min		SPECIAL STEEL, QUENCHED AND TEMPERED STEEL(SKD11) SPEED 8-12mm/min		CAST IRON (FC25) SPEED 32-40mm/min		ALUMINUM CASTING (AC4A, ADC) SPEED 63-100min	
	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev
1	8,000	0.03-0.05	7,000	0.03-0.05	3,200	0.03-0.05	11,500	0.04-0.06	20,000	0.06-0.09
2	4,000	0.06-0.09	3,500	0.06-0.09	1,600	0.06-0.09	5,700	0.08-0.11	10,000	0.12-0.18
3	2,800	0.10-0.13	2,400	0.10-0.13	1,060	0.10-0.13	3,850	0.11-0.16	10,000	0.20-0.28
4	2,100	0.11-0.15	1,800	0.11-0.15	800	0.11-0.15	2,900	0.13-0.19	7,500	0.24-0.34
5	1,600	0.12-0.18	1,400	0.12-0.18	630	0.12-0.18	2,260	0.16-0.22	6,300	0.28-0.40
6	1,320	0.13-0.19	1,180	0.13-0.19	530	0.13-0.19	1,900	0.19-0.26	5,000	0.34-0.48
8	1,000	0.17-0.24	900	0.17-0.24	400	0.17-0.24	1,400	0.21-0.30	4,000	0.38-0.53
10	800	0.20-0.28	710	0.20-0.28	320	0.20-0.28	1,120	0.25-0.36	3,150	0.45-0.63
12	670	0.24-0.34	600	0.24-0.34	270	0.24-0.34	950	0.30-0.42	2,650	0.53-0.75
13	610	0.26-0.36	540	0.26-0.36	240	0.26-0.36	880	0.33-0.44	2,400	0.56-0.79
14	570	0.28-0.39	500	0.28-0.39	230	0.28-0.39	820	0.31-0.42	2,250	0.57-0.81
16	500	0.30-0.43	440	0.30-0.43	200	0.30-0.43	720	0.34-0.46	1,950	0.61-0.85
18	440	0.34-0.49	390	0.34-0.49	180	0.34-0.49	640	0.36-0.50	1,750	0.63-0.90
20	400	0.36-0.50	350	0.36-0.50	160	0.36-0.50	570	0.40-0.56	1,550	0.68-0.98
22	360	0.40-0.55	320	0.40-0.55	150	0.40-0.55	520	0.42-0.59	1,400	0.73-1,06
24	330	0.41-0.60	290	0.41-0.60	135	0.41-0.60	480	0.46-0.65	1,300	0.77-1.13
26	310	0.42-0.65	270	0.42-0.65	120	0.42-0.65	440	0.47-0.68	1,200	0.81-1.20
28	290	0.45-0.70	250	0.45-0.70	110	0.45-0.70	410	0.50-0.73	1,100	0.84-1.26
30	270	0.48-0.75	230	0.48-0.75	105	0.48-0.75	380	0.54-0.78	1,000	0.87-1.32
32	250	0.51-0.80	220	0.51-0.80	100	0.51-0.80	360	0.58-0.83	950	0.90-1.38

[Endmill Cutting Condition]

Recommended Cutting Condition of General 2 flute endmill(groove processing)

WORKPIECE	CARBON STEELS (Tensile strength up to 50kgf/㎟) COPPER ALLOYS, CAST IRON(soft)		MEDIUM CARBON STEELS (Tensile strength up to 50-75kgf/㎟) COPPER ALLOYS, CAST IRON(soft)		HIGH CARBON STEELS (Tensile strength up to 75-100kgf/㎟) COPPER ALLOYS, CAST IRON(soft)		SPECIAL STEEL QUENCHED AND TEMPERED STEEL		ALUMINUM ALUMINUM ALLOYS PLASTIC	
DIAMETER(Ø)	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev
1	9,000	71	7,500	53	5,600	36	4,000	20	14,000	100
2	5,600	90	4,500	65	2,800	36	2,000	20	12,500	160
3	4,500	100	3,360	75	2,000	36	1,400	20	11,200	250
4	3,150	125	2,360	85	1,400	40	1,000	25	8,000	290
5	2,500	140	1,900	95	1,120	45	800	28	6,300	315
6	2,240	150	1,700	100	1,000	48	710	28	5,600	315
8	1,600	180	1,180	118	710	56	500	34	4,000	387
10	1,250	200	950	132	560	63	400	38	3,150	400
12	1,000	190	750	118	450	60	315	38	2,500	375
14	900	180	670	118	400	60	280	40	2,240	355
16	800	170	600	112	355	60	250	40	2,000	345
18	710	165	530	106	315	56	224	40	1,800	345
20	630	160	475	95	280	56	200	40	1,600	315
22	560	150	425	85	250	50	180	36	1,400	300
24	500	140	375	75	224	45	160	32	1,250	280
25	500	140	375	75	224	45	160	32	1,250	280
26	500	140	375	75	224	45	160	32	1,250	280
28	450	125	335	65	200	40	140	28	1,120	265
30	450	125	335	65	200	40	140	28	1,120	265
32	400	120	300	60	180	36	125	25	1,000	236
35	355	105	265	53	160	32	112	22	900	224
36	355	105	265	53	160	32	112	22	900	224
40	315	100	236	48	140	28	100	20	800	200
45	280	90	212	42	125	25	90	18	710	180
50	280	80	190	38	112	22	80	18	130	160

NOTE

- This table is written with a bases of the information that a cutting value of general 2flute is 1/2D and general 4flute is 1/4D.
- Reduce the feed rate by 20-50 % when the depth of cut exceeds the above.
- Use high hardened machine and chuck
- Select suitable cutting oil on workpiece

[Endmill Cutting Condition]

Recommended working condition of general 2flutes endmill(side cutting)

WORKPIECE / CUTTING CONDITIONS / DIAMETER (Ø)	CARBON STEELS (Tensile strength up to 50kgf/㎟) COPPER ALLOYS, CAST IRON(soft)		MEDIUM CARBON STEELS (Tensile strength up to 50-75kgf/㎟) COPPER ALLOYS, CAST IRON(soft)		HIGH CARBON STEELS (Tensile strength up to 75-100kgf/㎟) COPPER ALLOYS, CAST IRON(soft)		SPECIAL STEEL QUENCHED AND TEMPERED STEEL		ALUMINUM ALUMINUM ALLOYS PLASTIC	
	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev	rpm	mm/rev
3	5,300	250	4,000	190	2,650	95	1,600	45	18,000	800
4	3,750	300	2,800	224	1,900	106	1,120	53	12,500	900
5	3,000	335	2,240	250	1,500	118	900	60	10,000	1,000
6	2,650	355	2,000	265	1,320	125	800	63	9,000	1,000
8	1,900	425	1,400	315	950	150	560	75	6,300	1,180
10	1,500	475	1,120	355	750	170	450	85	5,000	1,250
12	1,180	450	900	330	600	160	355	85	4,000	1,180
14	1,060	425	800	315	530	160	315	90	3,550	1,120
16	950	400	710	300	475	160	280	90	3.150	1,060
18	850	400	630	280	425	150	250	90	2.800	1,060
20	750	375	560	250	375	150	200	80	2,500	1,000
22	670	355	500	224	335	132	180	71	2,000	850
24	600	335	450	200	300	118	160	63	1,800	800
25	600	335	450	200	300	118	160	63	1,800	800
26	600	335	450	200	300	118	160	63	1,800	800
28	530	300	400	180	265	106	140	56	1,600	750
30	530	300	400	180	265	106	140	56	1,600	750
32	475	260	355	160	236	95	125	50	1,250	670
35	425	250	315	140	212	85	112	45	1,250	630
36	425	250	415	140	212	85	112	45	1,250	630
40	375	236	280	125	190	75	100	40	1,120	530
45	335	250	250	140	170	85	90	45	1,000	630
50	300	240	224	125	150	75	80	40	900	560

NOTE

- This table is written by a base with the information that general 4 flute cutting depth is 0.1D X Cutting width(1.5D) Reduce the feed rate by 1/2 of general 2 flute endmill
- Use 1.3 - 1.5 times of rotations using thready cutting
- Use high hardened machine and chuck
- Select suitable cutting oil on workpiece

[Reamer's Technical Data]

WORKPIECE	TENSILE STRENGTH or HARDNESS(kg/㎟)	SPEED (m/min)	Feed per diameter of Reamer								Angle of inclination (°)	Angle of chamfer (°)
			Ø5	Ø10	Ø15	Ø20	Ø25	Ø30	Ø35	Ø40		
STEEL	<70	12-20	0.07	0.09	0.13	0.16	0.20	0.25	0.30	0.35	0	15-45
	70-100	10-15	0.05	0.08	0.13	0.15	0.21	0.26	0.28	0.30	0	15-45
HARDENED STEELS	100-150	6-12	0.05	0.08	0.13	0.15	0.21	0.26	0.28	0.30	0	15-45
CASTING	<220HB	8-15	0.10	0.12	0.17	0.20	0.30	0.40	0.45	0.50	0(5)	15-45
	>220HB	6-10	0.07	0.10	0.14	0.18	0.26	0.32	0.36	0.40	0(5)	15-45
MALLEABLE CAST IRON	<220HB	6-12	0.07	0.10	0.14	0.18	0.26	0.32	0.36	0.40	0	15-45
COPPER	60-80HB	15-20	0.12	0.15	0.18	0.22	0.30	0.35	0.37	0.40	5	45
BRASS	50-120HB	10-15	0.12	0.15	0.18	0.22	0.30	0.35	0.37	0.40	5	15-45
BRONZE CASTING	60-100HB	8-15	0.12	0.15	0.18	0.22	0.30	0.35	0.37	0.40	5	15-45
ALUMINUM ALLOYS	90-120HB	20-30	0.15	0.18	0.23	0.28	0.35	0.45	0.50	0.50	8	30

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Diameter of Reamer	Machining allowance
0.8-1.2	0.05
1.2-1.6	0.10
1.6-3.0	0.15
3.0-6.0	0.20
6.0-18.0	0.30
18.0-30.0	0.40
30.0-100.0	0.50

Note to use Reamer

- Do not reversely pull out
  It induce damage on flute and illuminance degradation
- Supply enough cutting oil to drain chips smoothly

※Get large feed rate with low cutting speed to upgrade illuminance
e.g.) Approximately 0.5mm for 10mm

[Tap's Technical Data]

WORK PIECE / CUTTING CONDITIONS / Size of Taps	LOW CARBON STEELS (up to S20C)	MEDIUM CARBON STEELS (S20-40C) SCM, FCD	HIGH CARBON STEELS (up to S20C) SKD COPPER	HARDENED STEELS (HRC25-45)	STAINLESS STEELS	CAST STEELS, BRONZE, BRONZE CASTING	CAST IRON BRASS, BRASS CASTING ALUMINUM ALLOYCASTING
	SPEED 8-13m/min	SPEED 7-12m/min	SPEED 6-9m/min	SPEED 3-5m/min	SPEED 4-7m/min	SPEED 6-11m/min	SPEED 10-15m/min
	rpm						
M3	850-1,380	740-1,270	640-960	320-530	420-740	640-1,170	1,060-1,590
M4	640-1,040	560-960	480-720	230-400	320-560	480-880	800-1,190
M5	510-830	450-760	380-570	190-320	260-450	380-700	640-960
M6	420-690	370-640	320-480	160-270	210-370	320-580	530-800
M8	320-520	280-480	240-360	120-200	160-280	240-440	400-600
M10	260-410	230-380	190-290	95-160	130-220	190-350	320-480
M12	210-350	190-320	160-240	80-130	110-190	160-590	270-400
M16	160-260	140-240	120-180	60-99	80-140	120-220	200-300
M20	130-210	110-190	95-140	40-80	64-110	90-180	160-240
M24	110-170	93-160	80-120	40-66	53-93	80-150	130-200
M30	85-140	74-130	64-95	32-53	42-74	64-120	110-160
M33	77-130	68-120	58-87	29-48	39-68	58-110	96-150
M36	71-120	62-110	53-80	27-44	35-62	53-97	88-130
M39	65-110	57-98	49-73	24-41	33-57	49-90	82-120
M48	53-86	46-80	40-60	20-33	27-46	40-73	66-99
M52	50-80	43-73	37-55	18-31	24-43	37-67	61-92

NOTE

- Reference point is SKH hand tap
- Refer to the following details to select cutting speed.
  Cutting speed of tap and RPM is largely effected by raw material, pitch, types, diameter of drill, forming depth, workpiece and cutting oil.
  Therefore, Please pay due attention to the conditions of use when referring to the table above.

[Trouble Shooting for twist Drill]

TROUBLE	CAUSES	SOLUTIONS
Chipping on cutting flute	· Sharpness of edge · Sharpness of relief angle and Thinning	· Honing(or enhance the amount of honing) · Reduce the relief angle with a change of material of tip having high toughness · Dull a thinning angle
	· Too high cutting speed	· Reduce the cutting speed · Use cutting oil
	· Occurrence of components of toughness(B,U,E)	· Enhance angle of inclination(30°) · Enhance cutting speed · Use Coating, Cermet material
	· Occurrence of vibration and chattering	· Use machine and drill having high hardness · Fix workpiece firmly · Reduce cutting speed
Wear and damage in outside part	· Too high cutting speed than the material of tip	· Reduce the cutting speed · Use cutting oil · Change point angle · Use suitable tip material
	· Intermittent cutting	· Change in shape of material
Damage at the cutting point	· Faulty of surface on workpiece	· Use Guide Bush · Reduce the feed rate at the cutting point · Make the surface of workpiece better
	· Poor natural condition and abrasiveness	· Grind by machine · Change in Thinning type
	· Lack of hardness on machine and workpiece	· Use machine having high hardness · Improve the way to fix the workpiece
	· the cutting condition is high	· Reduce cutting speed and feed rate
Damage in the processing	· twisted drill hole	· Use Guide Bush and Reduce Guide Clearance · Enhance the hardness of drill · Make tip of drill better and change thinning type having centrality
	· obstruction of chip	· Step feeding · Reduce feed rate · Use cutting oil
ETC.	· Faulty of drill chucking · No back tapers on diameter of drill	· Make chucking better · Adjust time and amount of re-grinding

[Trouble shooting Reamer]

TROUBLE	CAUSES	SOLUTIONS
Poor illumination of cutting surface and excessive amount of expansion	**inappropriate cutting condition** excessive cutting speed excessive feed rate	· Reduce cutting speed · Reduce feed rate
· Poor illumination of surface · Excessive · Defective (out of roundness) · Defective cylindricity Bent Hole	**Defective machine** Defective Low hardness of raw material's clamp Inappropriate choice of tool holder	· Adjust Vibration of spindle, Bush clearance, Elements of Bush · Enhance the hardness of clamp · Avoid to use quick change holder without Guide Bush
	Defective tool High vibration of cutting edge Defective degree of setting Excessive protrusion of tool Low hardness of tool	· Enhance of the degree of vibration · Remove damages completely (especially outside of tip) after re-grinding · Enhance the dgree of Runout after setting (scratch on shank...) · Change the shape of tools enhancing hardness
	Problems on cutting oil Incorrect selection of emulsion Deterioration of emulsion, degradation of performance by decomposition	· Reduce the dilution rate.(thicken 10 to 20 times) · Use High lubricated emulsion · Change to new cutting oil · Enhance amount of supply and reach the effective cutting edge simultaneously
	Problems on workpiece Eccentricity Work on incline	· Enlarge drill angle · Reduce drill angle · Reduce feed rate
Damage	**Inappropriate working condition** **Defective Chisel part due to excessive feed rate** Chip blockage due to excessive feed rate Lack of penetration of cutting oil due to excessive the number of rotation	· Reduce feed rate · Reduce the number of rotation · circumstance: blockage of chip and wear out outside of tip
	Problems of re-grinding Degrading hardness of chisel part due to inappropriate Thinning Occurrence of increasing Burnishing Torque or wear-out main part of tip after re-grinding	· Proper grinding · Remove all damages during re-grinding
	Problems on machinery	· Repair of electrical systems · Improve the method of clamp of raw material
	Problem on cutting oil	· Replace cutting oil

[Solutions of Burnishing Drill]

TROUBLE	CAUSES	SOLUTIONS
Expansion of hole	Enhance effect of burning	· Reduce Chamfer angle · Enhance marginal gap · Reduce Back Taper · Grind 2 step chamfer · Check Fitness of Diameter of Reamer
	Control an occurrence of Buit-up edge	· Reduce a marginal gap · Grind 2 step Chamfer · Change the heat treatment condition of workpiece · Reduce feed rate and Enhance cutting speed · Enhance the supply of cutting oil amount
	Reduce the unbalance of cutting power	· Make tolerance of cutting edge within 5/1000 · Increase cutting speed · Reduce spindle and Alignment of basic diameter · Check a status of wear-out of Bush and replace if it is needed · Replace water-soluble oil to water insoluble
Reduction of hole	Reduce finish effect	· Enlarge relief angle of cutting edge · Reduce marginal gap · Enlarge Back Taper · Increase cutting speed
Defective roundness	Reduce chattering	· Enhance hardness of machine · Reduce tolerance of Bush · Change to Left Helix Reamer · Enlarge Marginal gap · Enlarge Back Taper · Reduce cutting speed · Increase feed rate
Poor illumination of machined surfaces	Enlarge burnishing	· Change Left Helix Reamer · Reduce Chamfer angle · Grind as 2step chamfer
	Remove deposition	· Enlarge Rake angle · Increase cutting speed · Reduce feed
	Remove chattering	· Make tolerance of cutting edge within 5/1000 · Increase cutting speed · Fit spindle and Alignment of basic diameter
	Remove interference of chips	· Change Flute type · Make depth of flute deeper

[Solution of Endmill Trouble]

TROUBLE	CAUSES	SOLUTIONS
Tool Breakage	When related to work material	· Reduce the feed rate · Reduce the amount of rock out · Minimize the cutting length
	When in normal operation	· Reduce the feed rate · Change the tool on time(control the wear) · Change Chuck and Collet · Reduce the amount of rock out · Put honing on cutting edge · Use less no. of cutting flutes (4F⟶2F)
	When changing the feed direction	· Reduce the feed rate before change the direction · Change chuck and collet
Breakage on cutting edge	Breakage on Corner	· Put chamfer with hand lapper · Change from 'Down Cut' to 'Up Cut'
	Breakage on end edge on cutting length	· Change from 'Down Cut' to 'Up Cut' · Reduce the cutting speed
	Chipping	· Put honing on cutting edge · Reduce the cutting speed · Increase the feed rate when there is beep sound while machining
	Exaggerated Chipping	· Reduce the feed rate · Use less no. of cutting flutes (4F⟶2F) · Put honing on cutting edge (solid E/M) · Reduce the cutting speed · change the condition from 'wet working' to 'dry working' (brazed E/M) · Change from 'wet working' to 'dry working' by blowing air · Maintain appropriate cutting speed
Excessive wear generated		· Reduce the cutting speed · Change from 'Down Cut' to 'Up Cut' · Increase the feed speed
Poor illumination of machined surfaces	Constant surface roughness	· Decrease the feed speed · Use more no. of cutting flutes (2F⟶4F)
	When there is Built-up edge	· Increase the cutting speed · Work in wet condition · Put minute honing on cutting edge · Change from 'Down Cut' to 'Up Cut'
	When there is horizontal stripe on the surface	· Put minute honing on cutting edge · Use insoluble cutting oil · Change from 'Down cut' to 'Up cut'
Chattering Occurred		· Increase the feed speed · Change the cutting speed · Reduce the amount of rock out · Use 2F for roughing, use 4F for finishing · Change from 'Down cut' to 'Up cut'

[Solution of Lathe Turning Trouble]

Types of trouble		Selection of tool material grade	Selection of tool's shape	Selection of cutting condition	Workpiece
ABRASIOB	Mechanical abrasion	Select high wear-resistant materials which are same material types of workpiece	· Enlarge relief angle · Enlarge sub cutting depth angle · Enlarge cutting nose radius · Less honing	· Lower cutting speed · Use moderate feed rate · Use moderate cutting fluid	Hard material Carbon Cermet Glass
	Thermal abrasion		Moderate relief angle, sub cutting depth angle and cutting nose radius	· Lower cutting speed · Lower feed rate · Use cutting fluid (Check the material)	Hard material
	Deposition spread abrasion		Enlarge rake angle	· Lower cutting speed · Lower feed rate · Use lubricative cutting fluid	Sort of steel material
	Exudate separation abrasion		· Select the best suitable material for rake angle. · Enlarge sub cutting depth angle · Less honing	· Raise cutting speed · Raise feed rate · Use moderate cutting fluid	Ni heat resisting alloy Co hear resisting alloy Stainless High strength steel
	Chemical abrasion	Use ceramic, cermet materials	Enlarge relief angle somewhat	· Lower cutting speed · Lower feed rate · Machine without coolant or use cutting fluid with less extreme-pressure additives	General material
Heat crack		Use ceramic, cermet materials	select less thermo-genesis shape of tool nose radius angle, tool nose radius	· Lower cutting speed · Lower feed rate · Cutting without cutting fluid	Sort of steel material
Plastic deformation		Use high compressive strength material	· Enlarge relief angle, rake angle tool nose radius · Lower main cutting depth angle and less honing	· Lower cutting speed, feed rate and cutting depth. · Use fluid with high cooling effect	Hard material
Chipping		Use high ductile grade	· Lessen tool nose radius angle · Enlarge relief angle, rake angle tool nose radius · Enlarge honing	· Use moderate cutting speed · Lower feed rate	General material
Flaking		Select high wear-resistant materials	· Lessen relief angle · Enlarge corner angle · Enlarge honing	· Lower feed rate · Lessen amount of cutting depth · Use cutting fluid (Check the material)	· General material · Hard material
DEFECT	Defect due to mechanical repeats	Use high toughness assortment	Lessen tool nose radius angle, tool nose radius and honing	· Use moderate cutting speed · Lower feed rate · Use moderate amount of cutting depth	General material
	Thermal defect	Use high toughness assortment	· Make a shape which has low heat release on tool nose radius angle, tool nose radius · Reduce honing	· Lower cutting speed and feed rate · Lower feed rate · Machine without cutting fluid	General material
	Thermal defect	Use assortment having good wear resistance		· Reduce cutting speed and feed rate · Reduce amount of cutting depth · Use suitable cutting oil	· Hard material · General material
	Pressure Separation defect	Use high toughness assortment	· Reduce angle of inclination · Enlarge main angle of depth of cut · Enlarge honing	· Enhance cutting speed · Enhance feed rate · Use high lubricative cutting oil	· Ni heat resisting alloy · Co hear resisting alloy · Stainless · High strength steel
	Defect of plastic deformation	· Use good assortment with high wear resistance · Cermet assortment is inappropriate	· Adjust relief angle, the angle of inclination properly · Reduce main angle of depth of cut · Reduce toughness radius · Reduce honing	· Reduce cutting speed · Reduce feed rate · Use suitable cutting oil · No use on ceramic	· Hard material · General material
	Defect of cutting flute and illumination	Use high toughness assortment	· Pay attention to grinding tool · Lower grain size of diamond stoneware · Pay attention to the grinding direction of built up edge	· Reduce cutting speed · Reduce feed rate · Reduce insertion volume	General material
	Defect due to change in grinding and brazing	· Use high toughness assortment · Not possible to use Cermet	· Consider the ratio of tip sink and thickness · Grind carefully · Cool down slowly when it braze · Use large shank		General material

[Cutting Speed & Torque]

CUTTING SPEED

$$V = \frac{3.14 \times D \times N}{1000} \text{ (mm/rev)}$$

- V : cutting speed (mm/min)
- D : drill diameter (mm)
- N : revolutions per minute (r.p.m)

FEED RATE

$$F = \frac{S}{N} \text{ (mm/min)}$$

- f : feed rate (mm/rev)
- S : cutting depth per minute (mm/min)
- N : revolutions per minute (r.p.m)

CUTTING TORQUE & THRUST

$$Md = Kd2 \times (0.0631 + 1.686 \times f) \text{ (kg/cm)}$$
$$T = 57.95KDf0.85\text{(kg)}$$

- Md : cutting torque (kg/cm)
- K : cutting thrust (kg)
- D : drill diameter (mm)
- f : feed rate (mm/rev)
- T : material modulus

WORKPIECE	STRENGTH kg/㎟	HARDNESS (HB)	CUTTING THRUST (K)
CAST IRON	21	177	1.00
MEEHANITE CAST IRON	28	198	1.39
CAST IRON-GRAY	35	224	1.88
1020Steel(Carbon steel C 0.2%)	55	160	2.22
1112Steel(Free cutting steel C 0.12, S 0.2%)	62	183	1.42
1335Steel(Mn 1.75%)	63	197	1.45
3115Steel(Ni 1.25, Cr 0.6, Mn 0.5)	53	163	1.56
3120Steel(Ni 1.25, Cr 0.6, Mn 0.7)	69	174	2.02
3140Steel	88	241	2.32
4115Steel(Cr 0.5, Mo 0.11, Mn 0.8)	63	167	1.62
4130Steel(Cr 0.95, Mo 0.2, Mn 0.5)	77	229	2.10
4140Steel(Cr 0.95, Mo 0.2, Mn 0.85)	94	269	2.41
4615Steel(Ni 1.8, Mo 0.25, Mn 0.5)	75	212	2.12
4820Steel(Ni 3.5, Mo 0.25, Mn 0.6)	140	390	3.44
5150Steel(Cr 0.8, Mn 0.8)	95	277	2.46
6115Steel(Cr 0.6, Mo 0.6, V 0.12)	58	174	2.08
6120Steel(Cr 0.8, Mn 0.8, V 0.1)	80	255	2.22
6130Steel	79	260	2.20

[Cutting Speed & Required Power]

CUTTING SPEED

$$V = \frac{3.14 \times D \times N}{1000} \quad (mm/rev)$$

- V : cutting speed (mm/min)
- D : drill diameter (mm)
- N : revolutions per minute (r.p.m)

FEED RATE

$$F = f \times Z \times N \ (mm/min)$$

$$f = \frac{S}{N} \quad (mm/min)$$

- F : table r.p.m (mm/min)
- S : feed rate per tooth (mm/tooth)
- Z : flute
- N : revolutions per minute (r.p.m)

REQUIRED POWER

$$W = \frac{S}{60 \times 102 \times \eta} \quad (km)$$

$$Hp = \frac{w}{0.75} \quad (km)$$

$$Q = \frac{L \times f \times V \times L \times Z}{1000} = \frac{D \times f \times V \times L \times Z}{3.14 \times D}$$

- W : required power (Kw)
- Hp : horse power
- Q : quantity of emission (cm3/min)
- L : cutting width (mm)
- F : table r.p.m (mm/min)
- d : cutting depth (mm)
- Ks : specific cutting force (kg/mm2)
- η : the modulus of a machine (0.5 - 0.75)

WORKPIECE	STRENGTH (kg/㎟) HARDNESS	SPECIFIC CUTTING FORCE PER FEED RATE(kg/㎟)				
		0.1(㎜/FLUTE)	0.2(㎜/FLUTE)	0.3(㎜/FLUTE)	0.4(㎜/FLUTE)	0.6(㎜/FLUTE)
MILD STEEL	52	220	195	182	170	158
MEDIUM STEEL	62	198	180	173	160	157
HIGH STEEL	72	252	220	204	185	174
TOOL STEELS	67	198	180	173	170	160
TOOL STEELS	77	203	180	175	170	158
CHROME MANGANESE STEEL	77	230	200	188	175	166
CHROME MANGANESE STEEL	63	275	230	206	180	178
CHROME MOLYBDENUM STEEL	73	254	225	214	200	180
CHROME MOLYBDENUM STEEL	60	218	200	186	180	167
NICKEL CHROME MOLYBDENUM STEEL	94	200	180	168	160	150
NICKEL CHROME MOLYBDENUM STEEL	HB 352	210	180	176	170	153
CAST STEELS	52	280	250	232	220	204
CAST IRON	HRC 46	300	270	250	240	220
MEEHANITE CAST IRON	36	218	200	175	160	147
CAST IRON-GRAY	HB 200	175	140	124	105	97
BRASS	50	115	95	80	70	63
Light alloy(Al-Mg)	16	58	48	40	35	32
Light alloy(Al-Si)	20	70	60		45	39

[Cutting Speed & Torque]

CUTTING SPEED

$$V = \frac{3.14 \times D \times N}{1000} \quad (mm/min)$$

calculating cutting speed at r.p.m 1

$$N = \frac{1000 \times V}{3.14 \times D}$$

- N : revolutions per minute (r.p.m)
- V : cutting speed (mm/min)
- D : diameter of work piece (mm)

CUTTING TORQUE & THRUST

$$W = \frac{Q \times ks}{60 \times 102 \times \eta} = \frac{D \times f \times d \times ks}{60 \times 102 \times \eta}$$

$$Hp = \frac{w}{0.75}$$

- W : revolutions per minute (Kw)
- Q : volume of Chip (cm)
- V : feed rate (mm/min)
- f : cutting depth (mm/rev)
- d : cutting depth (mm)
- η : the modulus of a machine (0.5 - 0.85)
- Hp : horse power
- Ks : specific cutting force of work piece (kg/cm)

SPECIFIC CUTTING FORCE

WORKPIECE	STRENGTH (kg/㎟) HARDNESS	SPECIFIC CUTTING FORCE PER FEED RATE(kg/㎟)				
		0.1(㎜/FLUTE)	0.2(㎜/FLUTE)	0.3(㎜/FLUTE)	0.4(㎜/FLUTE)	0.6(㎜/FLUTE)
MILD STEEL	52	361	310	272	250	228
MEDIUM STEEL	62	308	270	257	245	230
HIGH STEEL	72	450	360	325	295	264
TOOL STEELS	67	304	280	263	250	240
TOOL STEELS	77	315	285	262	245	234
CHROME MANGANESE STEEL	77	383	325	290	265	240
CHROME MANGANESE STEEL	63	451	390	324	290	263
CHROME MOLYBDENUM STEEL	73	340	390	340	315	285
CHROME MOLYBDENUM STEEL	60	361	320	288	270	250
NICKEL CHROME MOLYBDENUM STEEL	94	307	265	235	220	198
NICKEL CHROME MOLYBDENUM STEEL	HB352	331	290	258	240	220
CAST IRON	HRC46	319	280	260	245	227
MEEHANITE CAST IRON	36	230	193	173	160	145
CAST IRON-GRAY	HB200	211	180	160	140	133

CUTTING FORCE

P = A X Ks

- A : cutting dimensions (㎟)
- P : cutting force (kg)
- Ks : specific cutting force (kg/㎟)

A = d X f

- A : cutting dimensions (㎟)
- d : cutting depth (kg)
- f : feed rate (kg/mm/rev)

[Drill Diameter for Tapping]

METRIC COARSE SCREW THREAD(mm)

mm

THREAD SIZE	GRADE 1	GRADE 2	GRADE 3
M2X0.4	1.65	1.65	
M2.2X0.45	1.81	1.83	
M2.5X0.45	2.11	2.13	
M3X0.5	2.57	2.59	2.62
M3.5X0.5	2.95	3.01	3.05
M4X0.7	3.36	3.39	3.43
M4.5X0.75	3.81	3.85	3.89
M5X0.8	4.25	4.31	4.35
M6X1.0	5.08	5.13	5.19
M7X1.0	6.08	6.13	6.19
M8X1.25	6.85	6.85	6.92
M9X1.25	7.85	7.85	7.92
M10X1.5	8.45	8.62	8.70
M11X1.5	9.54	9.62	9.70
M12X1.75	10.3	10.4	10.5
M14X2.0	12.1	12.2	12.3
M16X2.0	14.1	14.2	14.3
M18X2.5	15.6	15.7	15.8
M20X2.5	17.6	17.7	17.8
M22X2.5	19.6	19.7	19.8
M24X3.0	21.1	21.2	21.2
M27X3.0	24.1	24.2	24.2
M30X3.5	29.6	26.6	26.8
M33X3.5	29.6	29.6	29.8
M36X4.0	32.1	32.1	32.3
M39X4.0	35.1	35.1	35.3
M42X4.5	37.6	37.6	37.9
M45X4.5	40.6	40.6	40.9
M48X5.0	43.1	43.1	43.4
M52X5.0	47.1	47.1	47.4
M56X5.5	50.6	50.6	50.9
M60X5.5	54.6	54.6	54.9
M64X6.0	57.8	57.2	58.5
M68X6.0	61.8	61.2	62.5

UNIFIED NATIONAL COARSE(UNC)

mm

THREAD SIZE	3B	2B	1B
NO. 1-64 UNC	1.57	1.75	
NO. 2-56 UNC	1.86	1.86	
NO. 3-48 UNC	2.14	2.14	
NO. 4-40 UNC	2.36	2.36	
NO. 5-40 UNC	2.69	2.69	
NO. 6-32 UNC	2.86	2.86	
NO. 8-32 UNC	3.52	3.52	
NO. 10-24 UNC	3.91	3.91	
NO. 12-24 UNC	4.51	4.57	
1/4-20 UNC	5.25	5.25	5.25
5/16-18 UNC	6.64	6.72	6.72
3/8-16 UNC	8.06	8.15	8.15
7/16-14 UNC	9.40	9.50	9.50
1/2-13 UNC	10.8	11.0	11.0
9/16-12 UNC	12.3	12.3	12.3
5/8-24 UNC	13.6	13.8	13.8
3/4-11 UNC	16.6	16.8	16.8
7/8-10 UNC	19.5	19.6	19.6
1-9 UNC	22.3	22.5	22.5
1 1/8-8 UNC	25.0	25.2	25.2
1 1/4-7 UNC	28.2	28.4	28.4
1 3/8-7 UNC	30.8	31.0	31.0
1 1/2-6 UNC	34.0	34.2	34.2
1 3/4-6 UNC	39.5	39.8	39.8
2-5 UNC	45.3	45.3	45.3
2 1/4-4 1/2 UNC	51.7	51.7	51.7
2 1/2-4 1/2 UNC	57.3	57.3	57.3
2 3/4-4 UNC	63.7	63.7	63.7
3-4 UNC	70.0	70.0	70.0
3 1/4-4UNC	76.4	76.4	76.4
3 1/2-4UNC	82.7	82.7	82.7
3 3/4-4UNC	89.1	89.1	89.1
4-4 UNC	95.4	95.4	95.1

PIPE THREAD

mm

THREAD SIZE	PF	WITH REAMER	WITHOUT REAMER	PF
1/6-28	6.79	6.11	6.23	6.49
1/8-28	8.80	8.11	8.24	8.50
1/4-19	11.8	10.8	10.9	11.3
1/8-19	15.3	14.2	14.2	14.9
1/2-14	19.1	17.7	18.0	18.5
5/8-14	21.1			
3/4-14	24.6	23.1	23.3	24.0
7/8-14	28.3			
1-11	30.9	29.1	29.4	31.1
1 1/8-1	35.5			
1 1/4-1	39.5	37.5	38.0	38.8
1 1/2-1	45.4	43.4	43.8	44.5
1 3/4-1	51.4			
2-11	57.2	54.9	55.4	56.5
2 1/4-1	63.3			72.0
2 1/2-1	72.8	70.2	70.7	84.7

NATIONAL PIPE THREAD

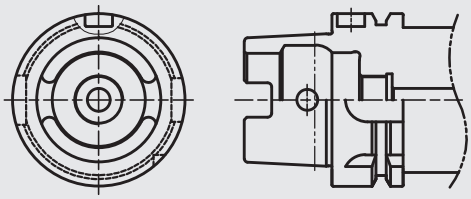
mm

THREAD SIZE	NPT		NPS	NPTF		NPSF
	WITH REAMER	WITHOUT REAMER		WITH REAMER	WITHOUT REAMER	
1/6-27	6.10	6.25	6.35	5.94	6.15	6.25
1/8-27	8.33	8.43	8.74	8.33	8.43	8.25
1/4-18	10.72	11.11	11.13	10.72	11.11	11.11
3/8-18	14.29	14.29	14.68	14.29	14.29	14.68
1/2-14	17.46	17.86	18.26	17.46	17.86	17.86
3/4-14	22.62	22.02	22.42	22.62	23.02	23.42
1-11 1/2	28.58	28.97	29.36	38.58	28.97	29.37
1 1/4-11 1/2	37.31	37.70	38.10	37.31	37.70	
1 1/2-11 1/2	43.66	44.05	44.45	43.26	43.66	
2-11 1/2	55.56	55.96	56.36	55.17	55.56	
2 1/2-8	65.88	66.68	67.45	65.48	66.28	

[DIN69893 HSK Tooling System]

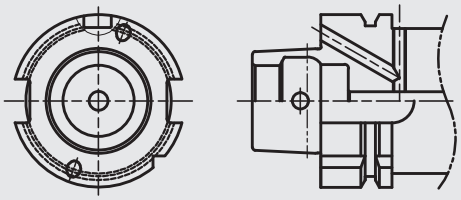
DIN69893-1, ISO 12164-1 : 2001

DIN69893 HSK Tooling System A Type



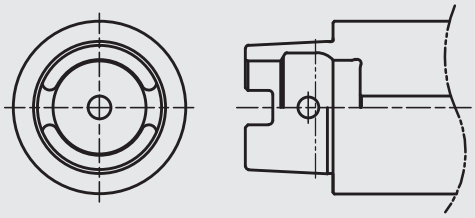
- Applucation : For Machining Centers.
- Torque transmission with drive keys on the taper.
- 2U–grooves for ATC, Positioning notch.

DIN69893 HSK Tooling System B Type



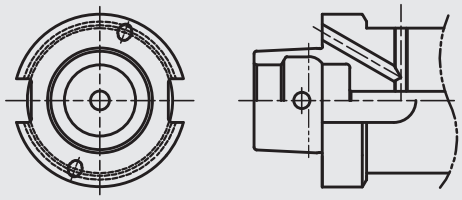
- Applucation : For Machining Centers, milling machines lathes.
- Flange through collant feed or through coolant feed by coolant tube.
- Torque transmission by U–groove on the flange
- Positioning notch

DIN69893 HSK Tooling System C Type



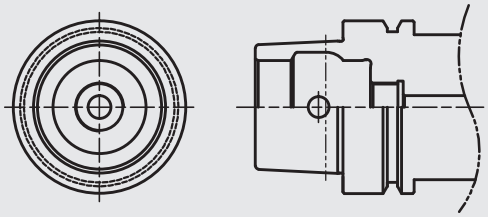
- Applucation : Transfer lines and special purpose machines without ATC.
- Torque transmission with drive keys on the taper.

DIN69893 HSK Tooling System D Type



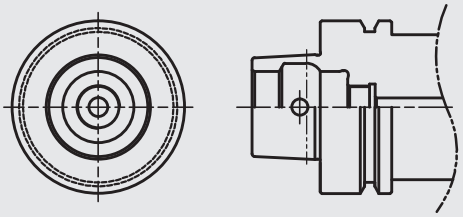
- Applucation : Transfer lines and special purpose machines without ATC.
- Large flange diameter
- Flange through coolant feed.
- Torque transmission by U–groove on the flange.

DIN69893 HSK Tooling System E Type



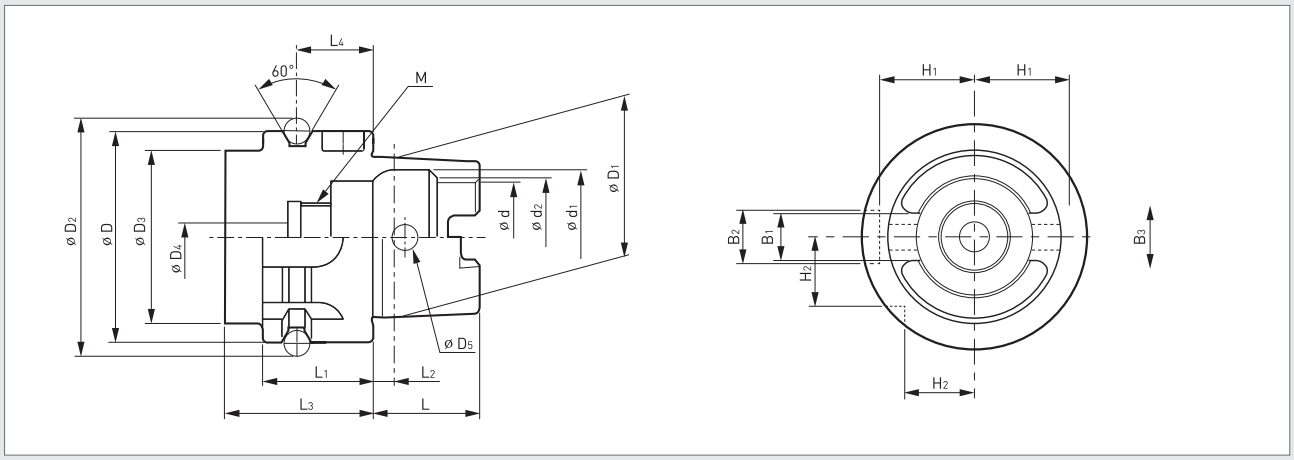
- Applucation : High speed machining centers and wood miling machines.
- Torque transmission by friction
- Complete symmetrical shape without drive keys.

DIN69893 HSK Tooling System F Type



- Applucation : High speed machining centers and wood miling machines.
- Large flange diameter.

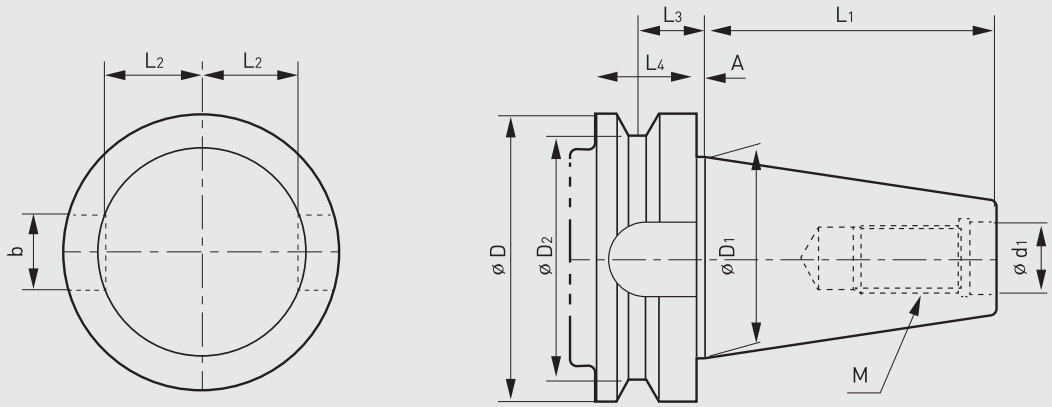
[HSK Shank DIN 69893-1, ISO 12164-1 : 2001]



TAPER	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4
HSK 40A	40	30	45.00	34	5.0	4.6	20	20	4.0	35	16
HSK 50A	50	38	59.30	42	6.8	6.0	25	26	5.0	42	18
HSK 63A	63	48	72.30	53	8.4	7.5	32	26	6.3	42	18
HSK 100A	100	75	109.75	85	12.0	12.0	50	29	10.0	45	20

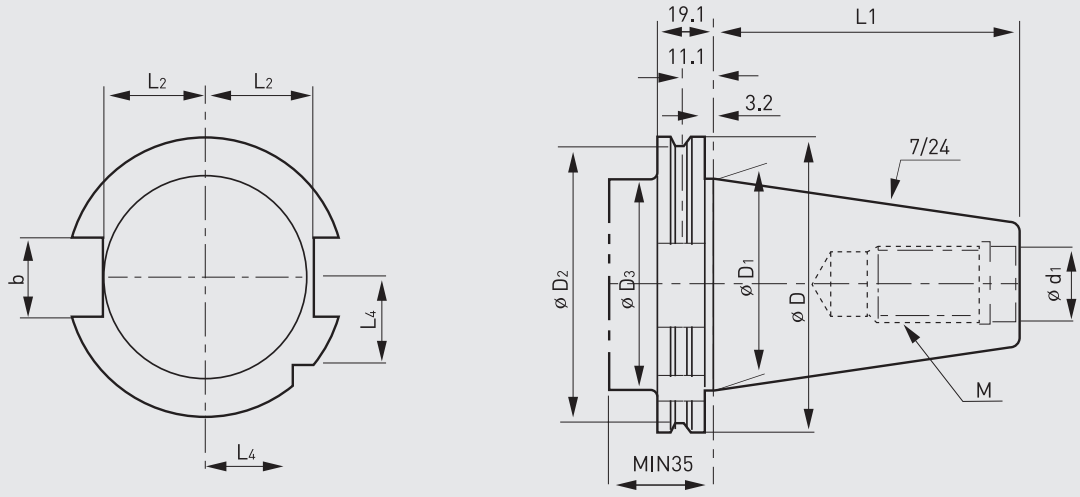
TAPER	D	D1	D2	B1	B2	B3	H1	H2	M
HSK 40A	21	25.5	23	8.05	11	9	17.0	12.0	M12 1.0
HSK 50A	26	32.0	29	10.54	14	12	21.0	15.5	M16 1.0
HSK 63A	34	40.0	37	12.54	18	16	26.5	20.0	M18 1.0
HSK 100A	53	63.0	58	20.02	22	20	44.0	31.5	M24 1.5

[Bottle Grip Taper MAS403-BT]



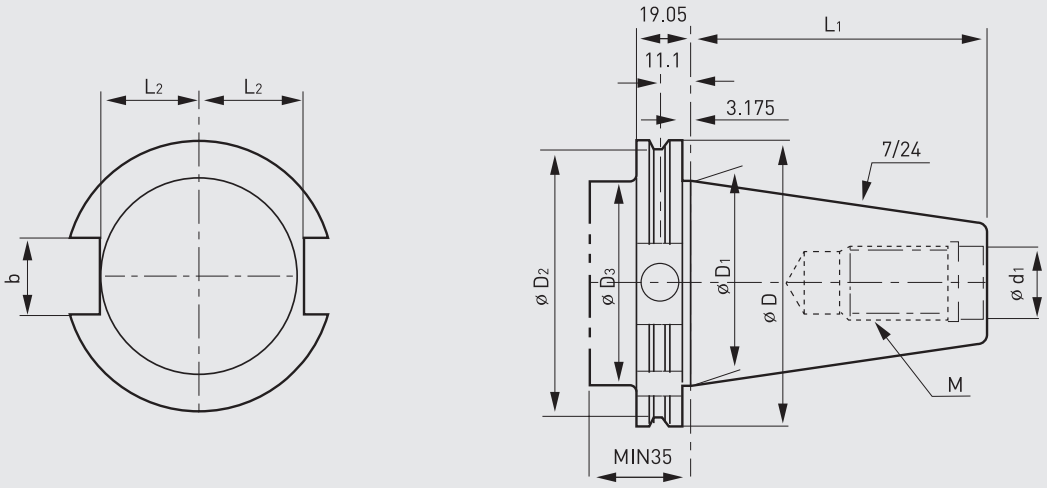
TAPER	D	D1	D2	d1	L1	L2	L3	L4	A	B	M
BT30	46	31.75	38	12.5	48.4	13.6	13.6	20	2	16.1	M12 1.75
BT40	63	44.45	53	17	65.4	16.6	16.6	25	2	16.1	M16 2
BT50	100	69.85	85	25	101.8	23.2	23.2	35	3	25.7	M24 3
BT60	155	107.95	135	31	161.8	28.2	28.2	45	3	25.7	M30 3.5

[DIN 69871-1 A/B, 7388/1 : 1983(E)]



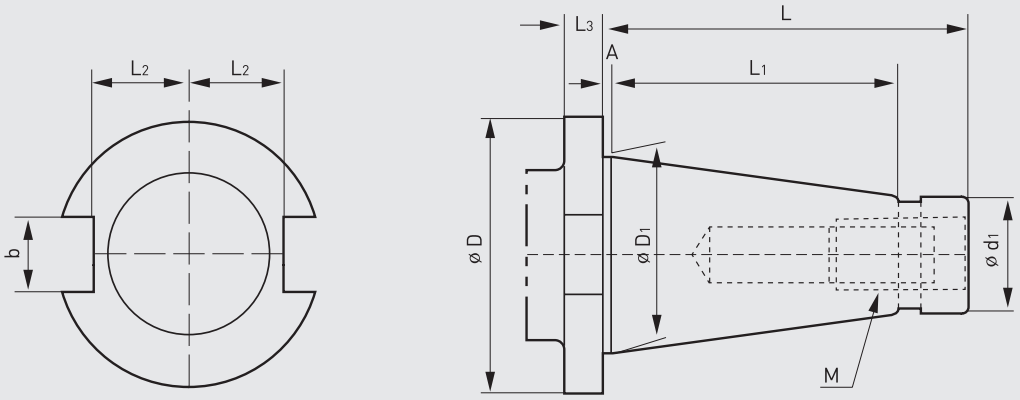
TAPER	D	D1	D2	d1	L1	L2	L3	L4	A	B	M
SK30	50	31.75	44.3	45	13	47.8	16.4	19	15	16.1	M12 1.75
SK40	63.55	44.45	56.25	50	17	68.4	22.8	25	18.5	16.1	M16 2.0
SK50	97.5	69.85	91.25	80	25	101.75	35.5	37.7	30	25.7	M24 3.0

[CAT Shank (ANSI/ASME B5.50-1985]



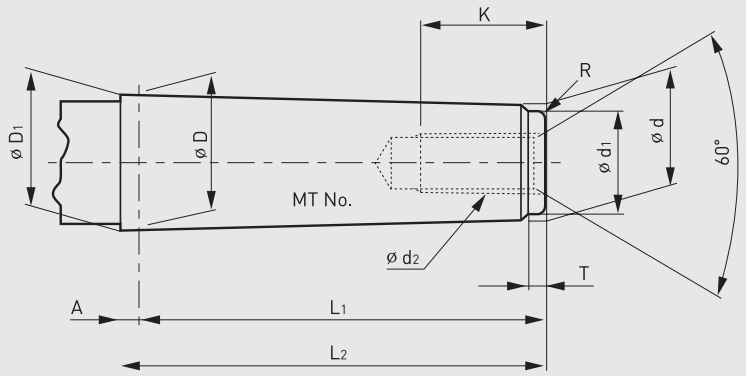
TAPER	D	D1	D2	D3	d1	L1	L2	L3	B	M
CAT30	50	31.75	44.3	31.75	13	47.625	16.25	18.67	16.1	UNC1/2-13
CAT40	63.55	44.45	56.25	44.45	17	68.25	22.60	25	16.1	UNC5/8-11
CAT50	97.5	69.85	91.25	70.1	25	101.6	35.3	37.7	25.7	UNC1-18
CAT60	155	107.95	135.26	32	161.8	161.93	54	59.3	25.7	UNC C1,1/4-7

[DIN 2080, JIS B 6101, ISO 297 : 1988(E)]



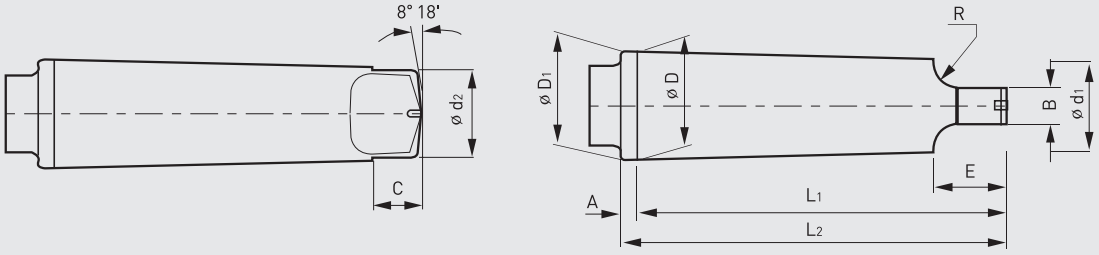
TAPER	D	D1	d1	L	L1	L2	L3	A	B	M
NT30	46	31.75	17.4	68.4	48.4	16.2	10	1.6	16.1	1/2-13UNC
NT40	63	44.45	25.3	93.4	65.4	22.5	10	1.6	16.1	UNC5/8-11
NT50	100	69.85	39.6	126.8	101.8	35.3	12	3.2	25.7	UNC1-18
NT60	155	107.95	60.2	206.8	161.8	60	15	3.2	25.7	UNC C1, 1/4-7

[Morse Taper - Screw Type]



TAPER	TAPER	TAPER ANGLE	D	A	D1	d	L1	L2	d1	d2	K	T	R
MT0	1/19.212	1°29'27"	9.045	3	9.201	6.442	5	53	6.4	-	-	4	0.2
MT1	1/20.047	1°25'43"	12.065	3.5	12.065	9.396	53.5	57	9.4	M6	16	5	0.2
MT2	1/20.020	1°25'50"	17.780	5	17.780	14.583	6	69	14.6	M10	24	5	0.2
MT3	1/19.922	1°26'16"	23.825	5	23.825	19.759	8	86	19.8	M12	28	7	0.6
MT4	1/19.254	1°29'15"	31.267	6.5	31.267	25.943	102.5	109	25.9	M16	32	9	1
MT5	1/19.002	1°30'26"	44.399	6.5	44.399	37.584	129.5	136	37.6	M20	40	9	2.5
MT6	1/19.180	1°29'36"	63.348	8	63.348	53.859	18	190	53.9	M24	50	12	4
MT7	1/19.231	1°29'22"	83.058	10	83.058	70.058	25	260	70.0	M33	80	18.5	5

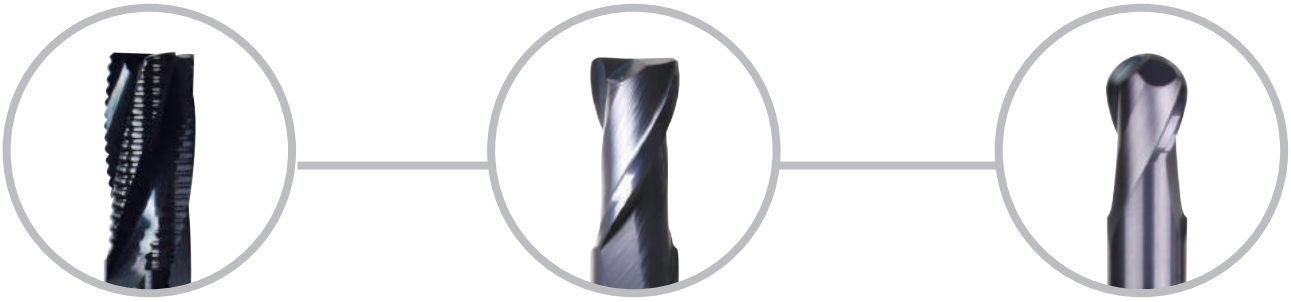
[List of Taper Morse Taper tang Type]



TAPER	TAPER	TAPER ANGLE	D	A	D1	d1	L1	L2	d2	B	C	E	R	r
MT0	1/19.212	1°29'27"	9.045	3	9.201	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4	1
MT1	1/20.047	1°25'43"	12.065	3.5	12.065	8.972	62.0	65.5	8.7	5.2	8.5	13.5	5	1.2
MT2	1/20.020	1°25'50"	17.780	5	17.780	14.034	75.0	80.0	13.5	6.3	10	1	6	1.6
MT3	1/19.922	1°26'16"	23.825	5	23.825	19.107	94.0	99.0	18.5	7.9	13	2	7	2
MT4	1/19.254	1°29'15"	31.267	6.5	31.267	25.164	117.5	124.0	24.5	11.9	16	2	8	2.5
MT5	1/19.002	1°30'26"	44.399	6.5	44.399	36.531	149.5	156.0	35.7	15.9	19	2	1	3
MT6	1/19.180	1°29'36"	63.348	8	63.348	52.399	210.0	218.0	51.0	19.0	27	4	1	4
MT7	1/19.231	1°29'22"	83.058	10	83.058	68.186	286.0	296.0	66.8	28.6	35	5	1	5

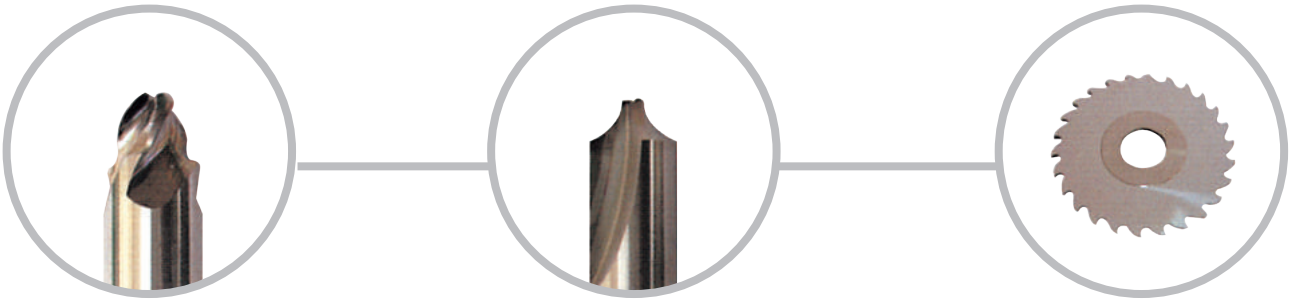
[Available product to re-grind]

2FLUTE ENDMILL | 4FLUTE ENDMILL | 6FLUTE ENDMILL



ROUGHING ENDMILL | CORNER RADIUS ENDMILL | 2 FLUTE BALL ENDMILL

4FLUTE BALL ENDMILL | DRILL | STEP DFILL



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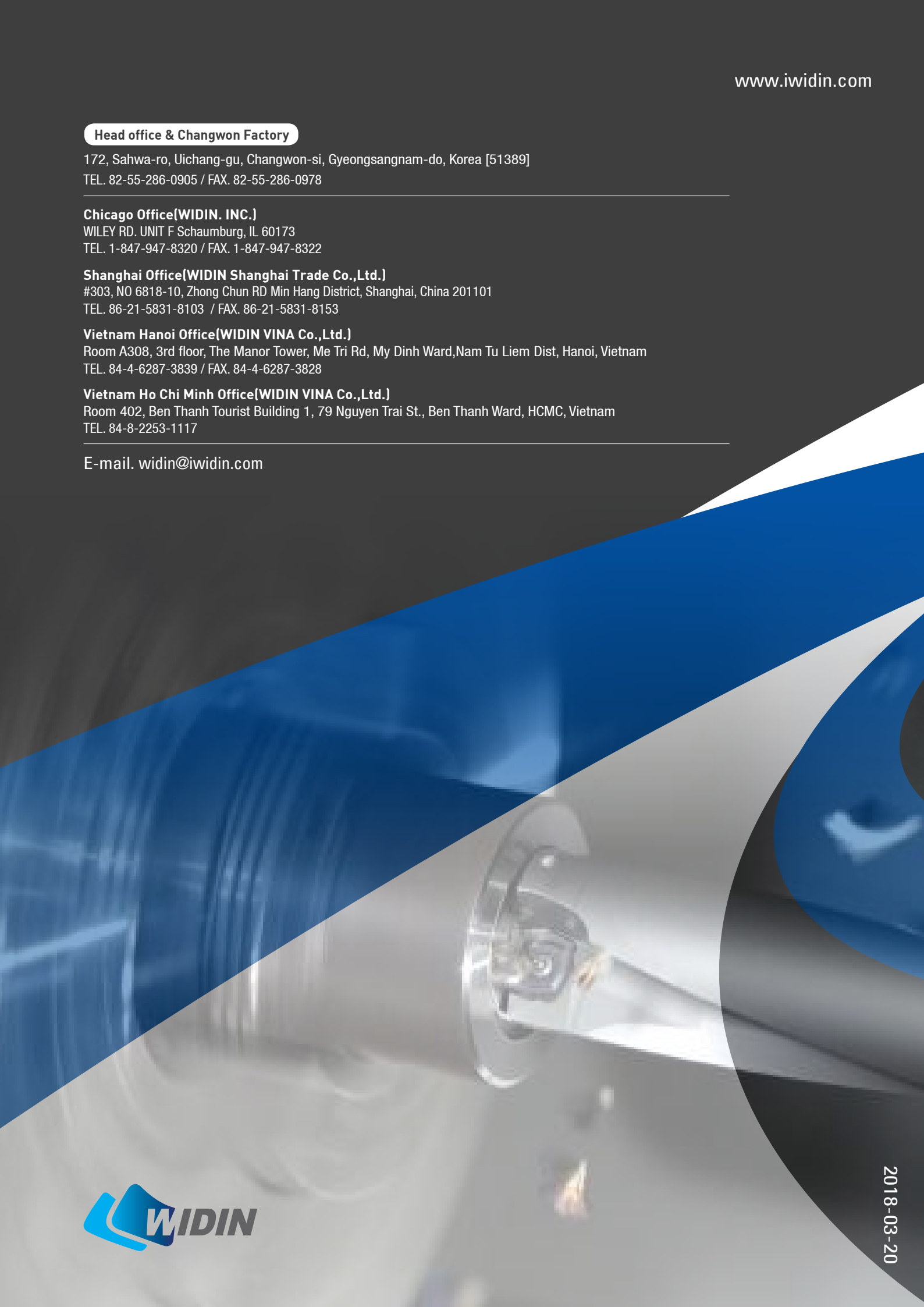

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