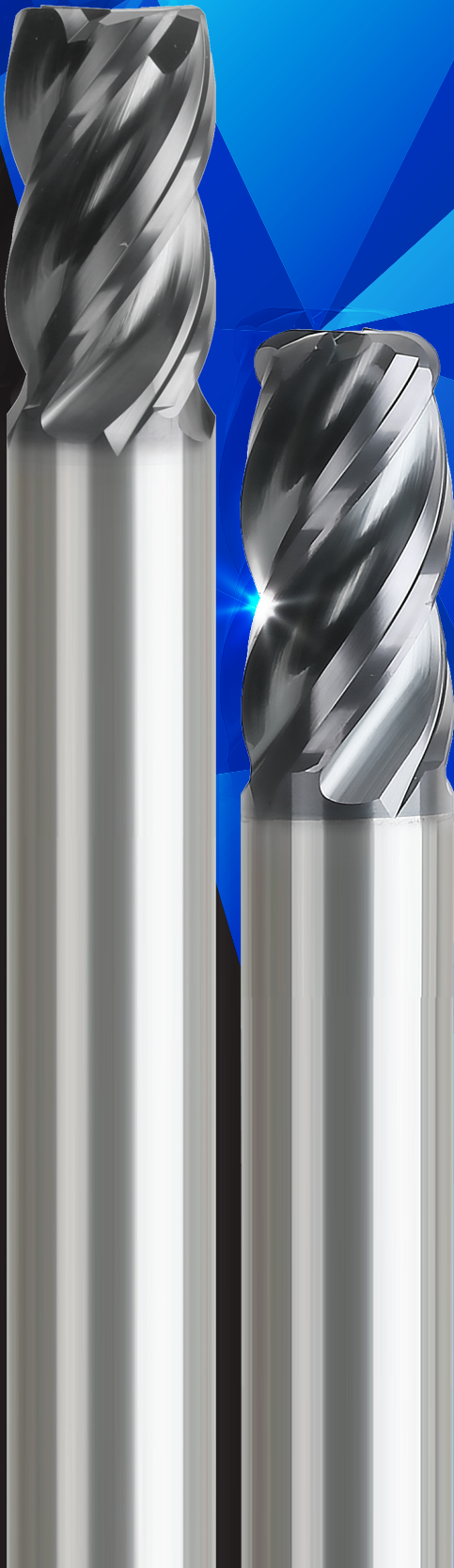




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V-STAR

A LIMITED LINE OF METRIC VARIABLE HELIX UNEQUAL INDEX END MILLS



Excellent performance for difficult to cut Steels
Stainless Steel, Exotic Materials and Cast Iron

Improved work surface and tool life with
variable helix and newest flute shape design



V-STAR SERIES

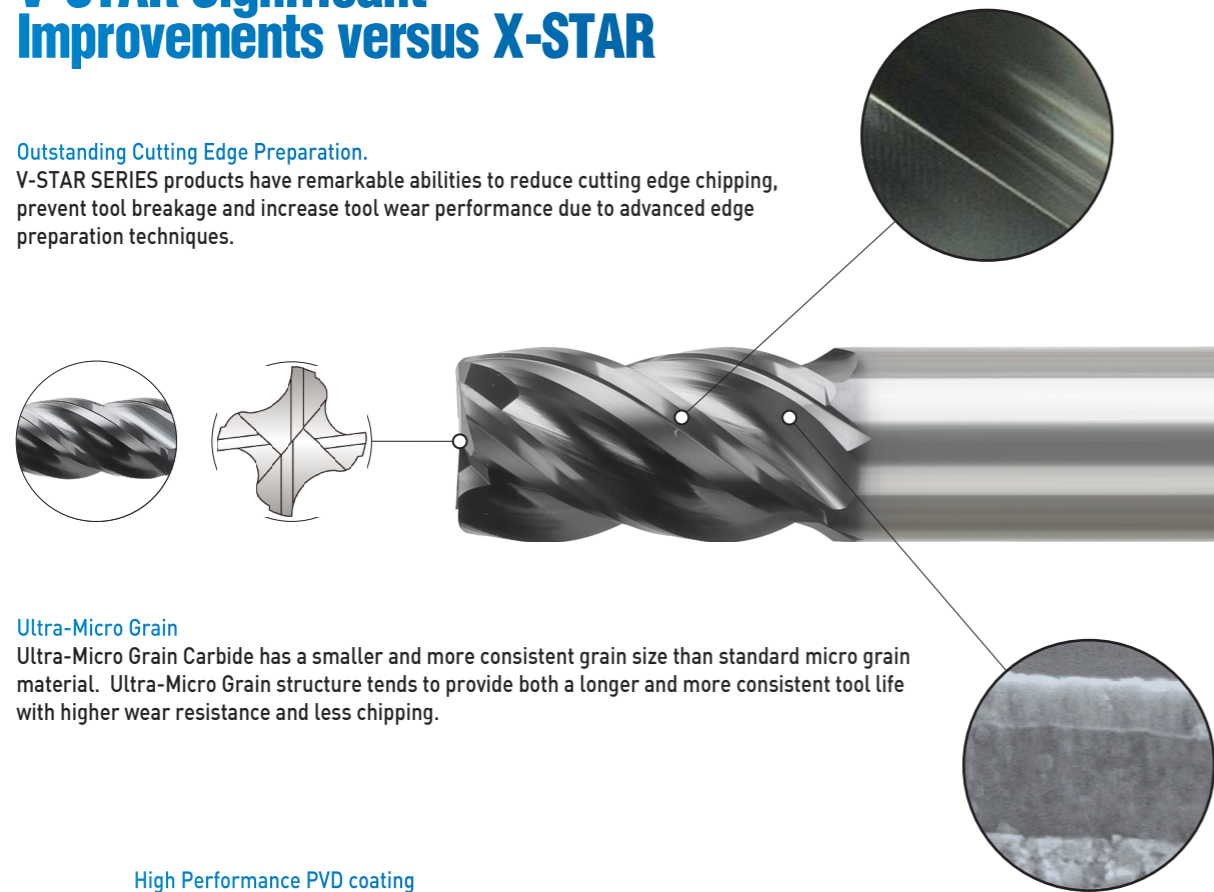
V-STAR SERIES

01

V-STAR Significant Improvements versus X-STAR

Outstanding Cutting Edge Preparation.

V-STAR SERIES products have remarkable abilities to reduce cutting edge chipping, prevent tool breakage and increase tool wear performance due to advanced edge preparation techniques.



Ultra-Micro Grain

Ultra-Micro Grain Carbide has a smaller and more consistent grain size than standard micro grain material. Ultra-Micro Grain structure tends to provide both a longer and more consistent tool life with higher wear resistance and less chipping.

High Performance PVD coating

AlCr based high quality coating provides superior wear resistance, longer tool life and outstanding prevention to high temperature oxidation of tools.

Variable Helix and Unequal Index

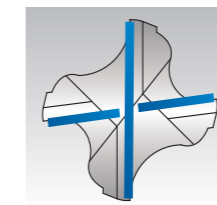
High quality flute surface finishing allows for cutting without chattering and optimized helix angle which provides excellent anti-vibration of tools and a smooth workpiece surface finish.

02

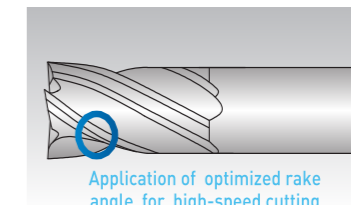
Special Feature

V-STAR Series

- Stable high-speed milling through tool geometry - variable helix and optimized rake angle
- High quality workpiece surface finish due minimization of vibration
- Excellent chip emission with minimization of the attrition



End face shape



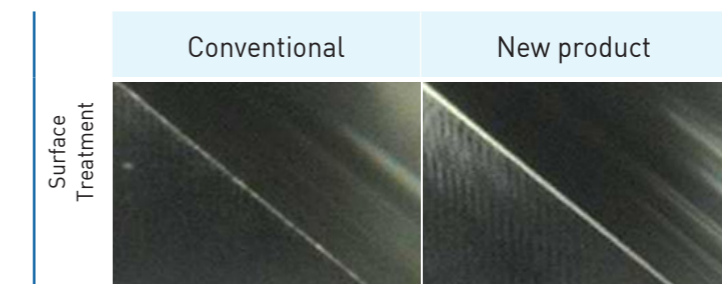
Side cutting edge

03

Improvement Points

V-STAR Series

- The most significant improvement points are covered in 01 above.
- Because of geometry and coating micro chips on the flutes is minimized creating better work piece surface finish and longer tool life.

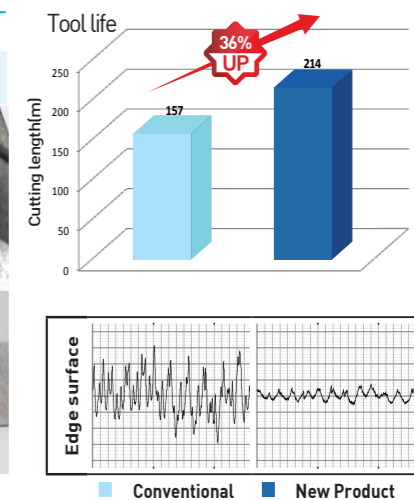


04

Case Study

V-STAR Series

SUS304 / RPM 2,546 / Feed 611 / Ap 15.0, Ae 1.0



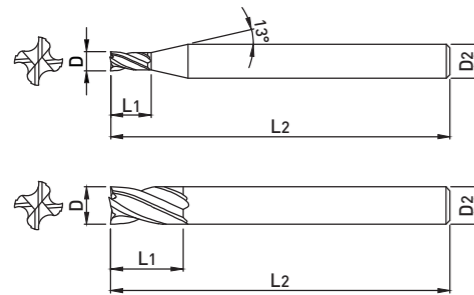
V-STAR SERIES

V-STAR SERIES



VXE504

4 FLUTES SQUARE END HELIX ENDMILL



- Excellent performance for difficult to cut Steels, Stainless Steel, Exotic Materials and Cast Iron
- Improved work surface and tool life with variable helix and newest flute shape design
- Stable high-speed milling through tool geometry - variable helix and optimized rake angle

EDP No	D	L ₁	L ₂	D ₂
VXE504 010	1	2.5	50	6
VXE504 012	1.2	3	50	6
VXE504 015	1.5	4	50	6
VXE504 020	2	6	50	6
VXE504 025	2.5	7	50	6
VXE504 030	3	8	55	6
VXE504 030 10	3	10	60	6
VXE504 035	3.5	10	55	6
VXE504 040	4	10	55	6
VXE504 040 12	4	12	60	6
VXE504 045	4.5	12	55	6
VXE504 050	5	15	55	6
VXE504 055	5.5	15	60	6
VXE504 060	6	15	60	6
VXE504 060 20	6	20	65	6
VXE504 065	6.5	15	60	8
VXE504 070	7	20	80	8
VXE504 080	8	20	70	8
VXE504 080 25	8	25	70	8
VXE504 080 30	8	30	80	8
VXE504 085	8.5	20	70	10
VXE504 090	9	25	80	10
VXE504 100	10	25	75	10
VXE504 100 35	10	35	85	10
VXE504 120	12	30	80	12
VXE504 120 40	12	40	90	12
VXE504 140	14	35	90	16
VXE504 160	16	42	100	16
VXE504 180	18	45	100	16
VXE504 200	20	48	100	20

■ Applicable Working Material

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

○:General Application ◎:The most suitable Application

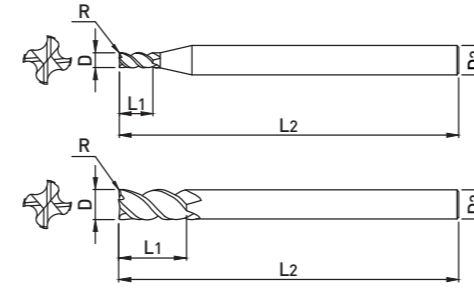
■ Tolerance

	D	D ₂
All	0 ~ -0.03mm	h6



VXR504

4 FLUTES RADIUS END HELIX ENDMILL



- Excellent performance for difficult to cut Steels, Stainless Steel, Exotic Materials and Cast Iron
- Improved work surface and tool life with variable helix and newest flute shape design
- Stable high-speed milling through tool geometry - variable helix and optimized rake angle

EDP No	D	R	L ₁	L ₂	D ₂
VXR504 010	1	0.1	2.5	50	6
VXR504 010 02	1	0.2	2.5	50	6
VXR504 012	1.2	0.1	3	50	6
VXR504 015	1.5	0.1	4	50	6
VXR504 015 02	1.5	0.2	4	50	6
VXR504 020	2	0.1	6	50	6
VXR504 020 02	2	0.2	6	50	6
VXR504 025	2.5	0.2	7	50	6
VXR504 030	3	0.2	8	55	6
VXR504 030 03	3	0.3	8	55	6
VXR504 030 05	3	0.5	8	55	6
VXR504 040	4	0.2	10	55	6
VXR504 040 03	4	0.3	10	55	6
VXR504 040 05	4	0.5	10	55	6
VXR504 050	5	0.2	15	55	6
VXR504 050 03	5	0.3	15	55	6
VXR504 050 05	5	0.5	15	55	6
VXR504 060	6	0.3	15	60	6
VXR504 060 05	6	0.5	15	60	6
VXR504 060 10	6	1	15	60	6
VXR504 080	8	0.3	20	70	8
VXR504 080 05	8	0.5	20	70	8
VXR504 080 10	8	1	20	70	8
VXR504 100	10	0.3	25	75	10
VXR504 100 05	10	0.5	25	75	10
VXR504 100 10	10	1	25	75	10
VXR504 100 15	10	1.5	25	75	10
VXR504 100 20	10	2	25	75	10
VXR504 100 30	10	3	25	75	10
VXR504 120	12	0.5	30	80	12
VXR504 120 10	12	1	30	80	12
VXR504 120 15	12	1.5	30	80	12
VXR504 120 20	12	2	30	80	12
VXR504 120 30	12	3	30	80	12
VXR504 120 40	12	4	30	80	12
VXR504 140	14	0.5	35	90	16
VXR504 140 10	14	1	35	90	16
VXR504 160	16	0.5	42	100	16
VXR504 160 10	16	1	42	100	16
VXR504 180	18	0.5	45	100	16
VXR504 200	20	0.5	48	100	20
VXR504 200 10	20	1	48	100	20

■ Applicable Working Material

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

○:General Application ◎:The most suitable Application

■ Tolerance

	D	D ₂
All	0 ~ -0.03mm	h6

Technical Information

4 FLUTES RADIUS SQUARE

ISO Hardness (BHN)	Work Materials	Speed and Feed Recommendations			Diameter			
		Type of Cut	Ap x D1	Ae x D1	Parameters	3.0	4.0	5.0
P<300	CARBON STEELS 10**, 11**, 12**, 12L**, 15**	Side cutting	1.5	0.5	SFM(Vc)	152(122-182)		
					RPM	16128	12096	9677
					Fz	0.005	0.008	0.011
		Slotting Cutting	1	1	SFM(Vc)	152(122-182)		
					RPM	16128	12096	9677
					Fz	0.005	0.008	0.011
300<P<300	ALLOY STEELS 41**, 43**, 51**, 86**	Side cutting	1.5	0.5	SFM(Vc)	107(86-128)		
					RPM	11353	8515	6812
					Fz	0.005	0.008	0.011
		Slotting Cutting	1	1	SFM(Vc)	107(86-128)		
					RPM	11353	8515	6812
					Fz	0.005	0.008	0.011
P<380	TOOL STEELS A2, D2, H13, P20, T15	Side cutting	1.5	0.5	SFM(Vc)	64(52-76)		
					RPM	6791	5093	4074
					Fz	0.003	0.006	0.008
		Slotting Cutting	1	1	SFM(Vc)	64(52-76)		
					RPM	6791	5093	4074
					Fz	0.003	0.006	0.008
K<260	CAST IRON GRAY, ALLEABLE, DUCTILE	Side cutting	1.5	0.5	SFM(Vc)	112(90-134)		
					RPM	11884	8913	7130
					Fz	0.006	0.01	0.014
		Slotting Cutting	1	1	SFM(Vc)	112(90-134)		
					RPM	11884	8913	7130
					Fz	0.006	0.01	0.014

Diameter								
6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
152(122-182)			168(135-201)					
8064	6048	5348	4456	3820	3342	2971	2674	2139
0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064
516	653	813	838	749	709	701	695	548
152(122-182)			168(135-201)					
8064	6048	5348	4456	3820	3342	2971	2674	2139
0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064
516	653	813	838	749	709	701	695	548
107(86-128)			117(94-140)					
5677	4257	3724	3104	2660	2328	2069	1862	1490
0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064
363	460	566	583	521	493	488	484	381
107(86-128)			117(94-140)					
5677	4257	3724	3104	2660	2328	2069	1862	1490
0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064
363	460	566	583	521	493	488	484	381
64(52-76)			70(56-84)					
3395	2546	2228	1857	1592	1393	1238	1114	891
0.011	0.019	0.027	0.032	0.034	0.037	0.041	0.045	0.045
149	194	241	238	216	206	203	201	160
64(52-76)			70(56-84)					
3395	2546	2228	1857	1592	1393	1238	1114	891
0.011	0.019	0.027	0.032	0.034	0.037	0.041	0.045	0.045
149	194	241	238	216	206	203	201	160
112(90-134)			123(99-147)					
5942	4456	3915	3263	2797	2447	2175	1958	1566
0.02	0.034	0.048	0.058	0.061	0.065	0.073	0.081	0.079
475	606	752	757	682	636	635	634	495
112(90-134)			123(99-147)					
5942	4456	3915	3263	2797	2447	2175	1958	1566
0.02	0.034	0.048	0.058	0.061	0.065	0.073	0.081	0.079
475	606	752	757	682	636	635	634	495

RPM = rev./min. FEED = in./min.
SFM = ft./min. Fz = in./tooth

Technical Information

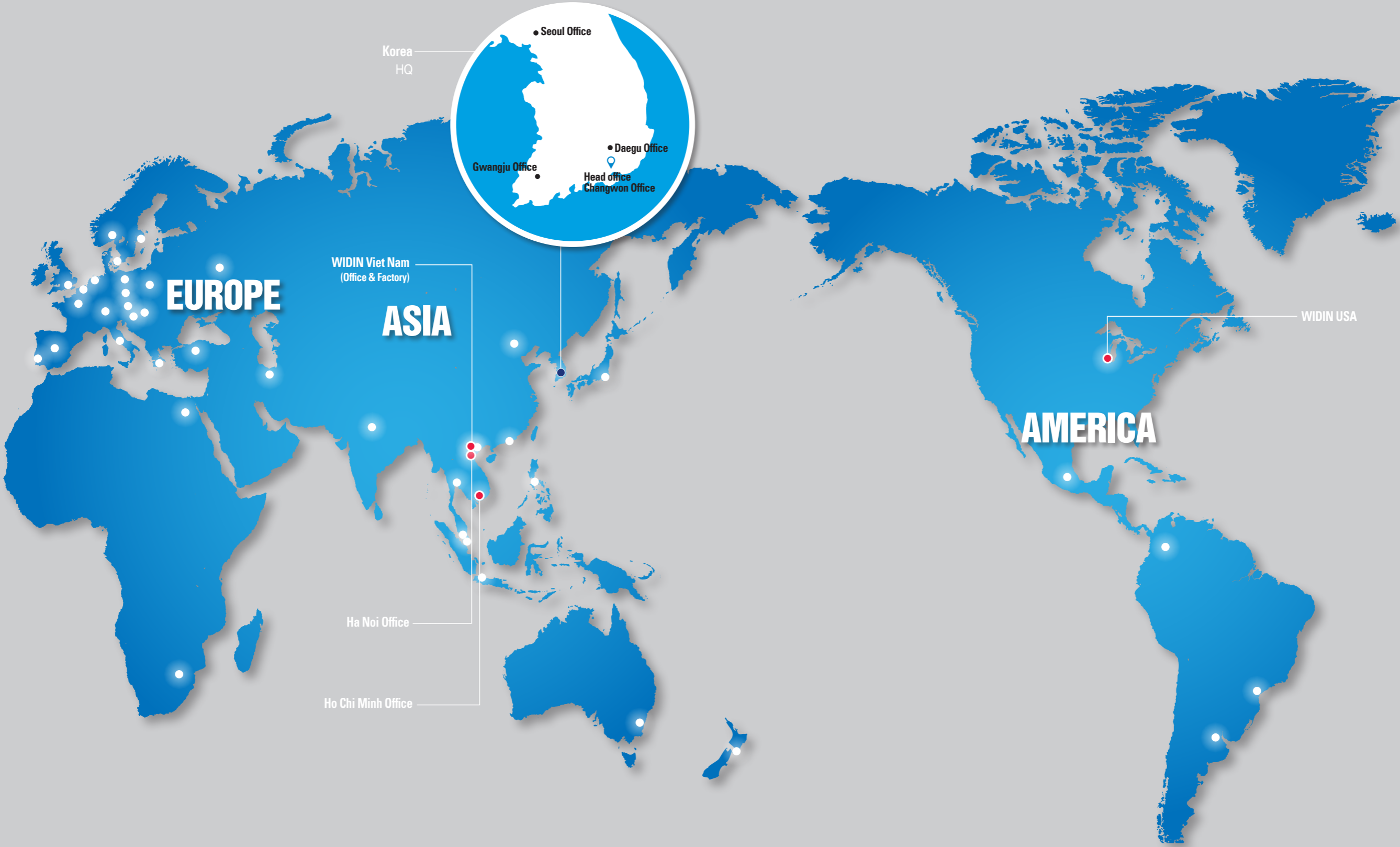
4 FLUTES RADIUS SQUARE

ISO Hardness (BHN)	Work Materials	Speed and Feed Recommendations				Diameter		
		Type of Cut	Ap x D1	Ae x D1	Parameters	3.0	4.0	5.0
M	STAINLESS STEELS 300 304, 316, 304L, 316L	Side cutting	1.5	0.5	SFM(Vc)	115(92-138)		
					RPM	12202	9151	7321
					Fz	0.005	0.008	0.013
					FEED	244	293	381
		Slotting Cutting	1	1	SFM(Vc)	115(92-138)		
					RPM	12202	9151	7321
M	STAINLESS STEELS 400 416, 420F, 430F, 440F	Side cutting	1.5	0.5	SFM(Vc)	161(129-193)		
					RPM	17083	12812	10250
					Fz	0.004	0.006	0.009
					FEED	273	307	369
		Slotting Cutting	1	1	SFM(Vc)	161(129-193)		
					RPM	17083	12812	10250
M	STAINLESS STEELS (PH) !7-PH, 15-5PH, 13-8PH	Side cutting	1.5	0.5	SFM(Vc)	104(84-124)		
					RPM	11035	8276	6621
					Fz	0.005	0.008	0.013
					FEED	221	265	344
		Slotting Cutting	1	1	SFM(Vc)	104(84-124)		
					RPM	11035	8276	6621
S	TITANIUM TiAl4V, Ti5Al5V5Mo, Ti7Al4Mo	Side cutting	1	0.35	SFM(Vc)	81(65-97)		
					RPM	8594	6446	5157
					Fz	0.004	0.007	0.011
					FEED	138	180	227
		Slotting Cutting	0.5	1	SFM(Vc)	81(65-97)		
					RPM	8594	6446	5157
S	HIGH-TEMPERATURE ALLOY INCONEL, HASTALLOY, RENE	Side cutting	1	0.25	SFM(Vc)	31(25-37)		
					RPM	3289	2467	1974
					Fz	0.005	0.007	0.012
					FEED	66	69	95
		Slotting Cutting	0.5	1	SFM(Vc)	31(25-37)		
					RPM	3289	2467	1974

Diameter								
6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
115(92-138)								
6101	4576	3661	3050	2615	2288	2034	1830	1464
0.018	0.028	0.048	0.056	0.06	0.063	0.070	0.077	0.078
439	512	703	683	628	577	569	564	457
115(92-138)								
6101	4576	3661	3050	2615	2288	2034	1830	1464
0.018	0.028	0.048	0.056	0.06	0.063	0.070	0.077	0.078
439	512	703	683	628	577	569	564	457
161(129-193)								
8541	6406	5125	4271	3661	3203	2847	2562	2050
0.013	0.022	0.034	0.04	0.043	0.045	0.050	0.055	0.055
444	564	697	683	630	577	569	564	451
161(129-193)								
8541	6406	5125	4271	3661	3203	2847	2562	2050
0.013	0.022	0.034	0.04	0.043	0.045	0.050	0.055	0.055
444	564	697	683	630	577	569	564	451
104(84-124)								
5517	4138	3310	2759	2365	2069	1839	1655	1324
0.018	0.028	0.048	0.055	0.059	0.062	0.069	0.077	0.078
397	463	636	607	558	513	508	510	413
104(84-124)								
5517	4138	3310	2759	2365	2069	1839	1655	1324
0.018	0.028	0.048	0.055	0.059	0.062	0.069	0.077	0.078
397	463	636	607	558	513	508	510	413
81(65-97)								
4297	3223	2578	2149	1842	1611	1432	1289	1031
0.016	0.025	0.043	0.050	0.053	0.056	0.062	0.069	0.070
275	322	443	430	390	361	355	356	289
81(65-97)								
4297	3223	2578	2149	1842	1611	1432	1289	1031
0.016	0.025	0.043	0.050	0.053	0.056	0.062	0.069	0.070
275	322	443	430	390	361	355	356	289
31(25-37)								
1645	1233	987	822	705	617	548	493	395
0.018	0.031	0.047	0.055	0.061	0.064	0.069	0.077	0.079
118	153	186	181	172	158	151	152	125
31(25-37)								
1645	1233	987	822	705	617	548	493	395
0.018	0.031	0.047	0.055	0.061	0.064	0.069	0.077	0.079
118	153	186	181	172	158	151	152	125

RPM = rev./min. FEED = in./min.
SFM = ft./min. Fz = in./tooth

GLOBAL NETWORK



2020.05



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