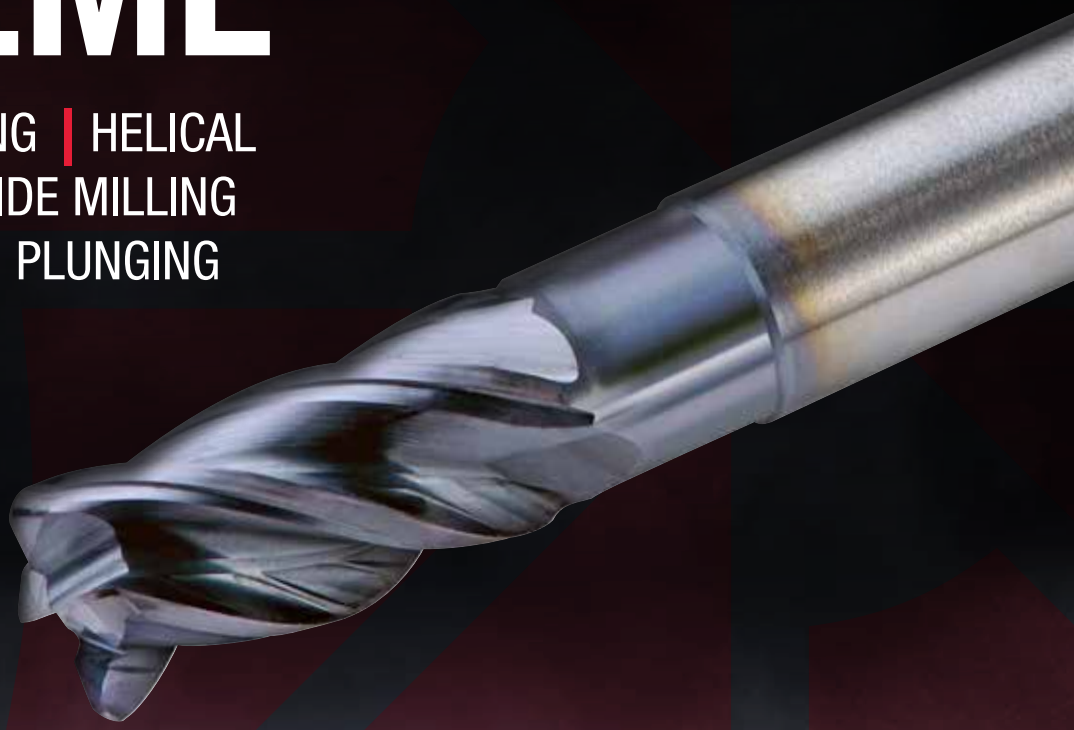
WIDIA

VariMill™ XTREME™

SLOTTING | RAMPING | HELICAL
INTERPOLATION | SIDE MILLING
DYNAMIC MILLING | PLUNGING

2021 INCH



HANITA™

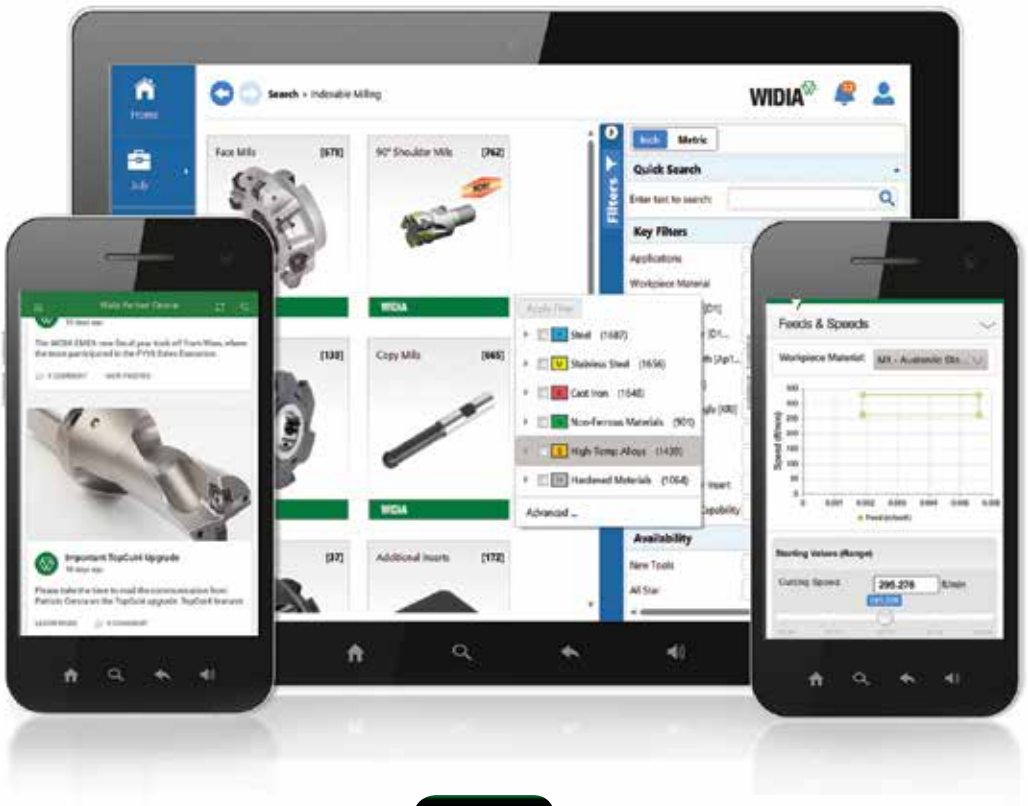
THE ORIGINAL VARIMILL™ VARIABLE-PITCHED GEOMETRY REVOLUTIONIZED THE INDUSTRY

THE NEW TWISTED END FACE GEOMETRY WILL DOMINATE ANY CNC MACHINE

HANITA™

WIDIA™ Digital Solutions

Tools and Resources at Your Fingertips



WIDIA Machining Central

PRODUCT DATA

- Tooling Dimensional Data
- Feeds and Speeds
- Inventory Availability
- ...and More!

DOWNLOAD THE **WIDIA MOBILE APPS** TODAY!

Download on the App Store GET IT ON Google Play

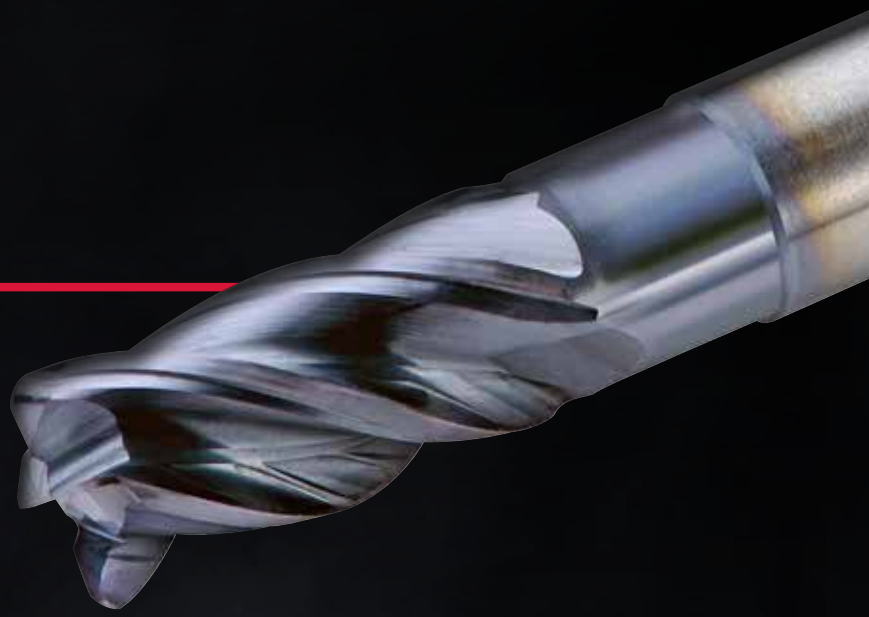
WIDIA.COM

facebook.com/WIDIAProductGrp youtube.com/WIDIASolutions twitter.com/WIDIAProductGrp

WIDIA™

VariMill™ XTREME™

High-Performance Solid End Milling



Materials

P M K S H

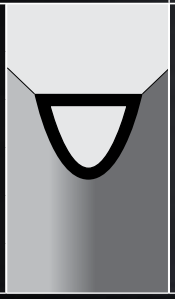
Applications

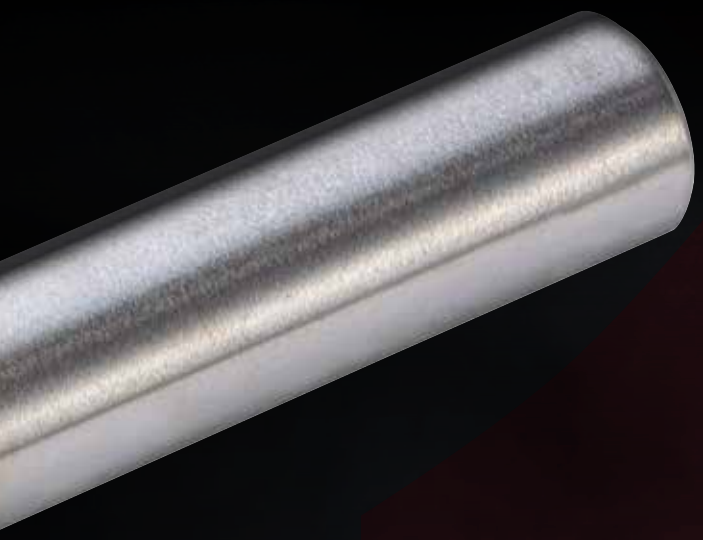
- Slotting
- Side Milling/ Shoulder Milling
- Ramping
- Helical Interpolation
- Plunge Milling
- Trochoidal Milling
- Drilling

WS15PE Grade

4-flute solid carbide end mill, sharp edges, chamfers and corner radii designs available.

wear resistance ⟷ toughness

Coating	Grade Description		05	10	15	20	25	30	35	40	45
WS15PE 	PVD-coated carbide grade with optimized chemistry and process for increased wear resistance. State-of-the-art, post-coat treatment reduces friction and helps manage heat when cutting super alloys.	P									
		M									
		K									
		S									
		H									



Built-in features to enable aggressive versatility.

Twisted End Face to improve edge stability, which enables aggressive ramping angles and helical capability.

Non-Linear Chip Gashes for improved chip evacuation, enabling the ramping function and z-axis machining.

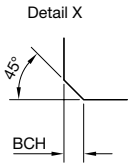
Four Asymmetrical Divided Flutes with Variable Helix Angle to reduce vibrations.

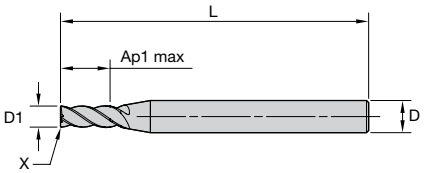
Parabolic Core for increased tool stability and reduced deflection.

HANITA™

SOLID END MILLING

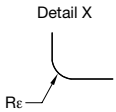
SERIES 4X0E • CHAMFERED • 4 FLUTES • CYLINDRICAL SHANK • METRIC

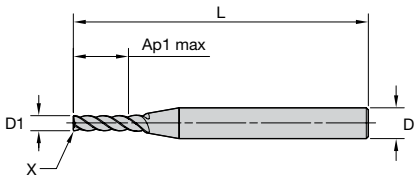




grade WS15PE AlTiN						
order #	catalog #	D1	D	length of cut Ap1 max	length L	BCH
6829315	4X0EM04002CST	4,0	6	8,00	57	0,10
6829320	4X0EM05002CST	5,0	6	10,00	57	0,10
6829695	4X0EM06002CST	6,0	6	12,00	57	0,10
6829881	4X0EM08003CAT	8,0	8	16,00	63	0,20
6829888	4X0EM10004CAT	10,0	10	20,00	72	0,20
6830075	4X0EM12005CCT	12,0	12	24,00	83	0,30

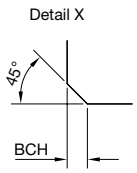
SERIES 4X0E • RADIUSED • 4 FLUTES • CYLINDRICAL SHANK • METRIC

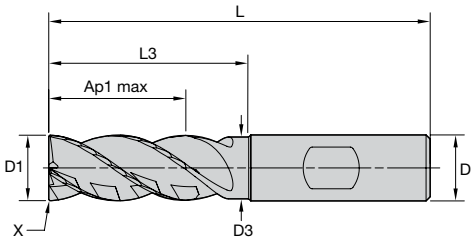




grade WS15PE AlTiN						
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε
6829314	4X0EM03002RAT	3,0	6	9,50	57	0,20
6830480	4X0EM25008RKT	25,0	25	50,00	121	1,50
6830671	4X0EM25008RPT	25,0	25	50,00	121	3,00

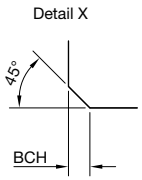
SERIES 4XNE • CHAMFERED • 4 FLUTES • NECKED • WELDON® SHANK • METRIC

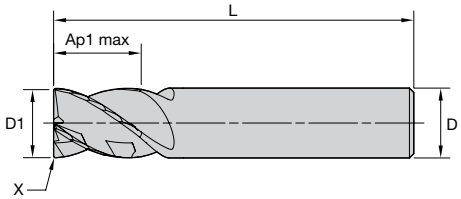




order #	catalog #	D1	D	D3	length of cut Ap1 max	L3	length L	BCH
grade WS15PE AlTiN								
6829319	4XNEM04002CSW	4,0	6	3,76	12,00	16,00	57	0,10
6829694	4XNEM05002CSW	5,0	6	4,70	13,00	18,00	57	0,10
6829700	4XNEM06002CSW	6,0	6	5,64	13,00	21,00	57	0,10
6829887	4XNEM08003CAW	8,0	8	7,52	16,00	27,00	63	0,20
6830074	4XNEM10004CAW	10,0	10	9,40	22,00	32,00	72	0,20
6830282	4XNEM12005CCW	12,0	12	11,28	26,00	36,00	83	0,30
6830285	4XNEM16006CCW	16,0	16	15,04	32,00	48,00	92	0,30
6830473	4XNEM20007CCW	20,0	20	18,80	40,00	60,00	115	0,30

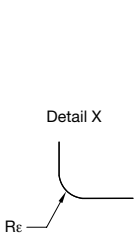
SERIES 4XNE • CHAMFERED • 4 FLUTES • CYLINDRICAL SHANK • METRIC

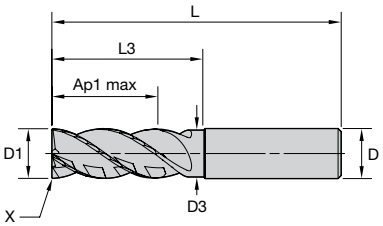




order #	catalog #	D1	D	length of cut Ap1 max	length L	BCH
grade WS15PE AlTiN						
6830283	4X0EM16006CCT	16,0	16	18,00	82	0,30

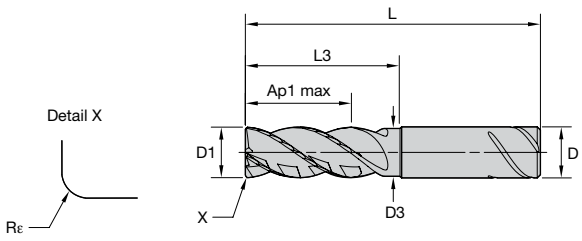
SERIES 4XNE • RADIUSED • 4 FLUTES • NECKED • CYLINDRICAL SHANK • METRIC





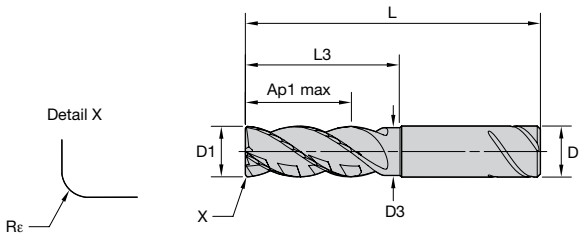
grade WS15PE AlTiN								
order #	catalog #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε
6829317	4XNEM04002RAT	4,0	6	3,76	8,00	12,00	57	0,20
6829318	4XNEM04002RET	4,0	6	3,76	8,00	12,00	57	0,50
6829692	4XNEM05002RAT	5,0	6	4,70	10,00	15,00	57	0,20
6829693	4XNEM05002RET	5,0	6	4,70	10,00	15,00	57	0,50
6829697	4XNEM06002RAT	6,0	6	5,64	12,00	18,00	57	0,20
6829698	4XNEM06002RET	6,0	6	5,64	12,00	18,00	57	0,50
6829699	4XNEM06002RJT	6,0	6	5,64	12,00	18,00	57	1,00
6829883	4XNEM08003RAT	8,0	8	7,52	16,00	24,00	63	0,20
6829884	4XNEM08003RET	8,0	8	7,52	16,00	24,00	63	0,50
6829885	4XNEM08003RJT	8,0	8	7,52	16,00	24,00	63	1,00
6829886	4XNEM08003RKT	8,0	8	7,52	16,00	24,00	63	1,50
6829890	4XNEM10004RCT	10,0	10	9,40	20,00	30,00	72	0,30
6830071	4XNEM10004RET	10,0	10	9,40	20,00	30,00	72	0,50
6830072	4XNEM10004RJT	10,0	10	9,40	20,00	30,00	72	1,00
6830073	4XNEM10004RKT	10,0	10	9,40	20,00	30,00	72	1,50
6830077	4XNEM12005RET	12,0	12	11,28	24,00	36,00	83	0,50
6830079	4XNEM12005RKT	12,0	12	11,28	24,00	36,00	83	1,50
6830080	4XNEM12005RMT	12,0	12	11,28	24,00	36,00	83	2,00
6830281	4XNEM12005RPT	12,0	12	11,28	24,00	36,00	83	3,00
6830286	4XNEM16006RET	16,0	16	15,04	32,00	48,00	92	0,50
6830288	4XNEM16006RKT	16,0	16	15,04	32,00	48,00	92	1,50
6830289	4XNEM16006RPT	16,0	16	15,04	32,00	48,00	92	3,00
6830471	4XNEM16006RQT	16,0	16	15,04	32,00	48,00	92	4,00
6830474	4XNEM20007RET	20,0	20	18,80	40,00	60,00	115	0,50
6830476	4XNEM20007RKT	20,0	20	18,80	40,00	60,00	115	1,50
6830477	4XNEM20007RPT	20,0	20	18,80	40,00	60,00	115	3,00
6830478	4XNEM20007RRT	20,0	20	18,80	40,00	60,00	115	5,00

SERIES 4XNE • RADIUSED • 4 FLUTES • NECKED • SAFE-LOCK™ SHANK • METRIC



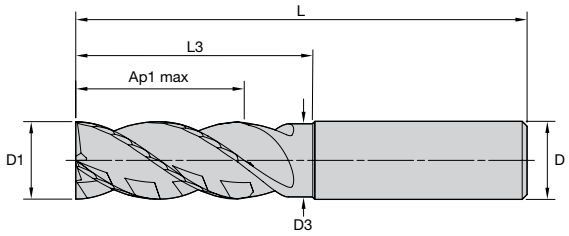
grade WS15PE AlTiN order #	catalog #	D1	D	D3	length of cut Ap1 max	L3	length L	Rε
6830078	4XNEM12005RJV	12,0	12	11,28	24,00	36,00	83	1,00
6830287	4XNEM16006RJV	16,0	16	15,04	32,00	48,00	92	1,00
6830475	4XNEM20007RJV	20,0	20	18,80	40,00	60,00	115	1,00

SERIES 4X0E • RADIUSED • 4 FLUTES • SAFE-LOCK™ SHANK • METRIC



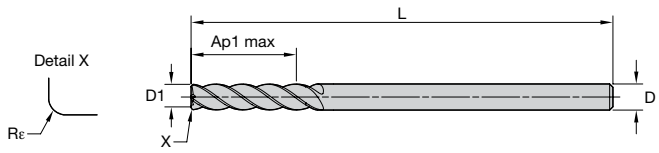
grade WS15PE AlTiN order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε
6830479	4X0EM25018RJV	25,0	25	50,00	135	1,00

SERIES 4XNE • SQUARE END • 4 FLUTES • NECKED • CYLINDRICAL SHANK • METRIC



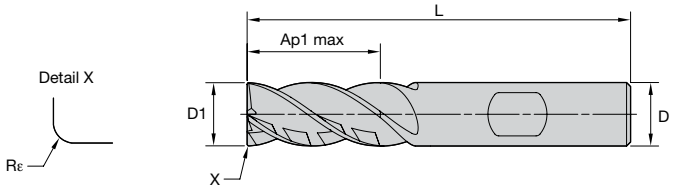
grade WS15PE AlTiN							
order #	catalog #	D1	D	D3	length of cut Ap1 max	L3	length L
6829316	4XNEM04002SZT	4,0	6	3,76	8,00	12,00	57
6829691	4XNEM05002SZT	5,0	6	4,70	10,00	15,00	57
6829696	4XNEM06002SZT	6,0	6	5,64	12,00	18,00	57
6829882	4XNEM08003SZT	8,0	8	7,52	16,00	24,00	63
6829889	4XNEM10004SZT	10,0	10	9,40	20,00	30,00	72
6830076	4XNEM12005SZT	12,0	12	11,28	24,00	36,00	83
6830284	4XNEM16006SZT	16,0	16	15,04	32,00	48,00	92
6830472	4XNEM20007SZT	20,0	20	18,80	40,00	60,00	115

SERIES 4X0E • RADIUSED • 4 FLUTES • CYLINDRICAL SHANK • INCH



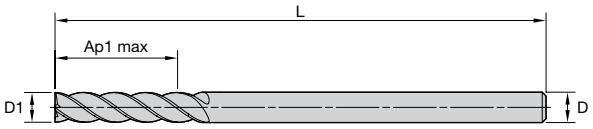
grade WS15PE AlTiN							
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε	ZU
6827747	4X0EE03001RAT	1/8	1/8	1/2	2	.015	4
6828401	4X0EE05000RAT	3/16	3/16	5/8	2 1/4	.015	4
6828402	4X0EE05000RBT	3/16	3/16	5/8	2 1/4	.030	4
6828406	4X0EE07002RAT	1/4	1/4	3/4	2 1/2	.015	4
6828407	4X0EE07002RBT	1/4	1/4	3/4	2 1/2	.030	4
6828601	4X0EE08003RAT	5/16	5/16	3/4	2 1/2	.015	4
6828603	4X0EE08003RBT	5/16	5/16	3/4	2 1/2	.030	4
6828610	4X0EE10004RAT	3/8	3/8	7/8	2 1/2	.015	4
6828771	4X0EE10004RBT	3/8	3/8	7/8	2 1/2	.030	4

SERIES 4X0E • RADIUSED • 4 FLUTES • WELDON® SHANK • INCH



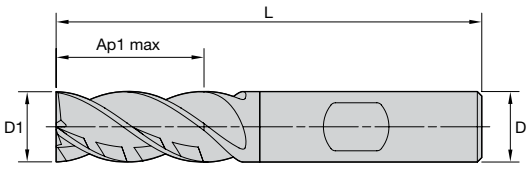
grade WS15PE AlTiN							
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε	ZU
6828776	4X0EE13005RAW	1/2	1/2	1	3	.015	4
6828778	4X0EE13015RAW	1/2	1/2	1 1/4	3 1/4	.015	4
6828779	4X0EE13015RBW	1/2	1/2	1 1/4	3 1/4	.030	4
6828780	4X0EE13015RCW	1/2	1/2	1 1/4	3 1/4	.060	4
6828971	4X0EE13015REW	1/2	1/2	1 1/4	3 1/4	.120	4
6828975	4X0EE16006RAW	5/8	5/8	1 1/4	3 1/2	.015	4
6828978	4X0EE19007RAW	3/4	3/4	1 1/2	4	.015	4
6828979	4X0EE19007RBW	3/4	3/4	1 1/2	4	.030	4
6829168	4X0EE25008RAW	1	1	1 1/2	4 1/2	.015	4
6829169	4X0EE25008RBW	1	1	1 1/2	4 1/2	.030	4

SERIES 4X0E • SQUARE END • 4 FLUTES • CYLINDRICAL SHANK • INCH



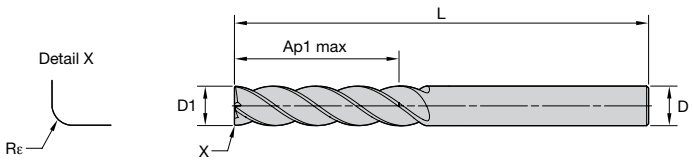
grade WS15PE AlTiN						
order #	catalog #	D1	D	length of cut Ap1 max	length L	ZU
6827746	4X0EE03001SZT	1/8	1/8	1/2	2	4
6827750	4X0EE05000SZT	3/16	3/16	5/8	2 1/4	4
6828405	4X0EE07002SZT	1/4	1/4	3/4	2 1/2	4
6828410	4X0EE08003SZT	5/16	5/16	3/4	2 1/2	4
6828609	4X0EE10004SZT	3/8	3/8	7/8	2 1/2	4

SERIES 4X0E • SQUARE END • 4 FLUTES • WELDON® SHANK • INCH



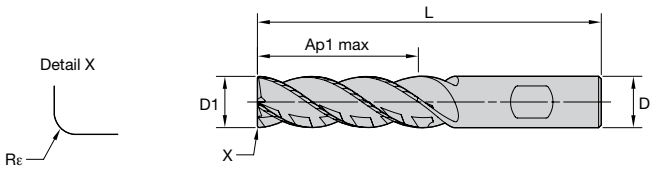
grade WS15PE AlTiN						
order #	catalog #	D1	D	length of cut Ap1 max	length L	ZU
6828775	4X0EE13005SZW	1/2	1/2	1	3	4
6828777	4X0EE13015SZW	1/2	1/2	1 1/4	3 1/4	4
6828974	4X0EE16006SZW	5/8	5/8	1 1/4	3 1/2	4
6828977	4X0EE19007SZW	3/4	3/4	1 1/2	4	4
6829167	4X0EE25008SZW	1	1	1 1/2	4 1/2	4

SERIES 4X1E • RADIUSED • 4 FLUTES • CYLINDRICAL SHANK • INCH



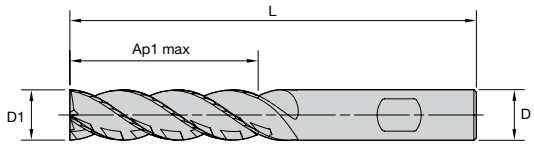
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε	ZU
grade WS15PE AlTiN							
6828605	4X1EE08003RAT	5/16	5/16	1.25	3 1/4	.015	4
6828606	4X1EE08003RBT	5/16	5/16	1.25	3 1/4	.030	4

SERIES 4X1E • RADIUSED • 4 FLUTES • WELDON® SHANK • INCH



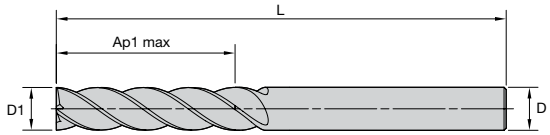
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε	ZU
grade WS15PE AlTiN							
6828973	4X1EE13005RBW	1/2	1/2	2	4	.030	4
6829161	4X1EE19007RAW	3/4	3/4	2 1/4	5	.015	4
6829164	4X1EE19007RBW	3/4	3/4	2 1/4	5	.030	4
6829312	4X1EE25008RAW	1	1	2 1/4	5	.015	4
6829313	4X1EE25008RBW	1	1	2 1/4	5	.030	4

SERIES 4X1E • SQUARE END • 4 FLUTES • WELDON® SHANK • INCH



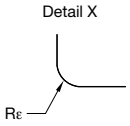
order #	catalog #	D1	D	length of cut Ap1 max	length L	ZU
	grade WS15PE AlTiN					
6828972	4X1EE13005SZW	1/2	1/2	2	4	4
6828976	4X1EE16006SZW	5/8	5/8	2 1/4	5	4
6828980	4X1EE19007SZW	3/4	3/4	2 1/4	5	4
6829311	4X1EE25008SZW	1	1	2 1/4	5	4

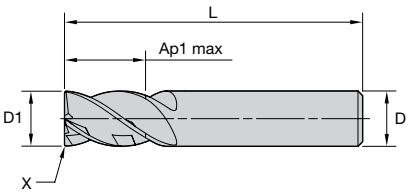
SERIES 4X1E • SQUARE END • 4FLUTES • CYLINDRICAL SHANK • INCH



order #	catalog #	D1	D	length of cut Ap1 max	length L	ZU
	grade WS15PE AlTiN					
6828604	4X1EE08003SZT	5/16	5/16	1.25	3 1/4	4

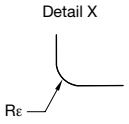
SERIES 4X4E • RADIUSED • 4 FLUTES • CYLINDRICAL SHANK • INCH

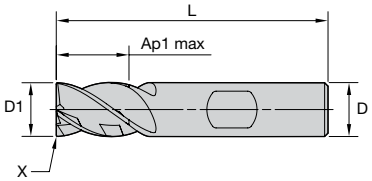




order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε	ZU
grade WS15PE AlTiN							
6827745	4X4EE03001RAT	1/8	1/8	1/4	1 1/2	.015	4
6827749	4X4EE05000RAT	3/16	3/16	5/16	1 1/2	.015	4
6828404	4X4EE07002RAT	1/4	1/4	3/8	2	.015	4
6828409	4X4EE08003RAT	5/16	5/16	1/2	2	.015	4
6828608	4X4EE10004RAT	3/8	3/8	1/2	2	.015	4

SERIES 4X4E • RADIUSED • 4 FLUTES • WELDON® SHANK • INCH

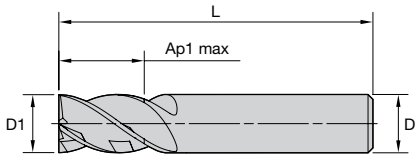




order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε	ZU
grade WS15PE AlTiN							
6828773	4X4EE13005RAW	1/2	1/2	5/8	2 1/2	.015	4
6828774	4X4EE13005RBW	1/2	1/2	5/8	2 1/2	.030	4
6828772	4X4EE13005SZW	1/2	1/2	5/8	2 1/2	—	4

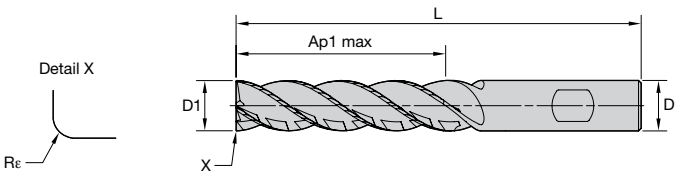
HANITA

SERIES 4X4E • SQUARE END • 4 FLUTES • CYLINDRICAL SHANK • INCH



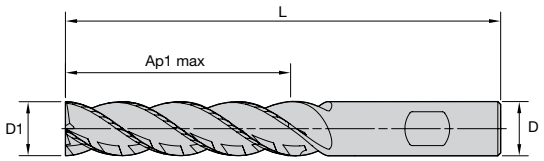
grade WS15PE AlTiN						
order #	catalog #	D1	D	length of cut Ap1 max	length L	ZU
6827744	4X4EE03001SZT	1/8	1/8	1/4	1 1/2	4
6827748	4X4EE05000SZT	3/16	3/16	5/16	1 1/2	4
6828403	4X4EE07002SZT	1/4	1/4	3/8	2	4
6828408	4X4EE08003SZT	5/16	5/16	1/2	2	4
6828607	4X4EE10004SZT	3/8	3/8	1/2	2	4

SERIES 4X6E • RADIUSED • 4 FLUTES • WELDON® SHANK • INCH



grade WS15PE AlTiN							
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε	ZU
6829166	4X6EE19007RAW	3/4	3/4	3	6	.015	4

SERIES 4X6E • SQUARE END • 4 FLUTES • WELDON® SHANK • INCH

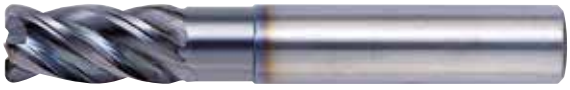


order #	catalog #	grade WS15PE AlTiN D1	D	length of cut Ap1 max	length L	ZU
6829165	4X6EE19007SZW	3/4	3/4	3	6	4
6829170	4X6EE25018SZW	1	1	2	5	4

VARIMILL™ XTREME™ • SIDE MILLING AND SLOTTING • APPLICATION DATA • METRIC

Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE Cutting Speed — vc m/min min	Start	max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D1	0,5 x D1	1,25 x D1	150	175	200	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	1	1,5 x D1	0,5 x D1	1,25 x D1	150	175	200	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	2	1,5 x D1	0,5 x D1	1,25 x D1	140	165	190	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	3	1,5 x D1	0,5 x D1	1,25 x D1	120	140	160	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	4	1,5 x D1	0,5 x D1	1,25 x D1	90	120	150	fz	0,018	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	5	1,5 x D1	0,5 x D1	1,25 x D1	60	80	100	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	6	1,5 x D1	0,5 x D1	1,25 x D1	50	65	75	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
M	1	1,5 x D1	0,5 x D1	1,25 x D1	90	100	115	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	2	1,5 x D1	0,5 x D1	1,25 x D1	60	70	80	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	3	1,5 x D1	0,5 x D1	1,0 x D1	60	65	70	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
K	1	1,5 x D1	0,5 x D1	1,0 x D1	120	135	150	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	2	1,5 x D1	0,5 x D1	1,0 x D1	110	125	140	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	3	1,5 x D1	0,5 x D1	1,0 x D1	110	120	130	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
S	1	1,5 x D1	0,5 x D1	0,75 x D1	50	70	90	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	2	1,5 x D1	0,5 x D1	0,75 x D1	50	65	80	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	3	1,5 x D1	0,5 x D1	0,5 x D1	25	30	40	fz	0,010	0,014	0,018	0,021	0,029	0,035	0,041	0,046	0,051	0,055	0,059	0,067
	4	1,5 x D1	0,5 x D1	1,25 x D1	50	55	60	fz	0,013	0,017	0,023	0,028	0,040	0,049	0,057	0,064	0,071	0,076	0,082	0,092
H	1	1,5 x D1	0,5 x D1	1,0 x D1	80	110	140	fz	0,018	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	2	1,5 x D1	0,5 x D1	1,0 x D1	70	90	120	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078

VARIMILL™ XTREME™ • SIDE MILLING AND SLOTTING • APPLICATION DATA • INCH



Material Group		Side Milling (A) and Slotting (B) A ap	A ae	B ap	WS15PE Cutting Speed — vc m/min min	Start	max	Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%. D1 — Diameter in	1/8	5/32	3/16	1/4	9/32	5/16	3/8	1/2	5/8	3/4	1
P	0	1.5 x D1	0.5 x D1	1.25 x D1	490	580	660	IPT	.0009	.0012	.0016	.0019	.0022	.0026	.0031	.0036	.0044	.0049	.0054
	1	1.5 x D1	0.5 x D1	1.25 x D1	490	580	660	IPT	.0009	.0012	.0016	.0019	.0022	.0026	.0031	.0036	.0044	.0049	.0054
	2	1.5 x D1	0.5 x D1	1.25 x D1	460	540	620	IPT	.0009	.0012	.0016	.0019	.0022	.0026	.0031	.0036	.0044	.0049	.0054
	3	1.5 x D1	0.5 x D1	1.25 x D1	390	450	520	IPT	.0007	.0010	.0013	.0016	.0019	.0022	.0026	.0030	.0038	.0044	.0049
	4	1.5 x D1	0.5 x D1	1.25 x D1	300	400	490	IPT	.0007	.0009	.0012	.0014	.0017	.0019	.0023	.0027	.0033	.0038	.0042
	5	1.5 x D1	0.5 x D1	1.25 x D1	200	260	330	IPT	.0006	.0008	.0011	.0013	.0015	.0017	.0021	.0024	.0030	.0035	.0039
	6	1.5 x D1	0.5 x D1	1.25 x D1	160	200	250	IPT	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0025	.0028	.0031
M	1	1.5 x D1	0.5 x D1	1.25 x D1	300	340	380	IPT	.0007	.0010	.0013	.0016	.0019	.0022	.0026	.0030	.0038	.0044	.0049
	2	1.5 x D1	0.5 x D1	1.25 x D1	200	230	260	IPT	.0006	.0008	.0011	.0013	.0015	.0017	.0021	.0024	.0030	.0035	.0039
	3	1.5 x D1	0.5 x D1	1.0 x D1	200	210	230	IPT	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0025	.0028	.0031
K	1	1.5 x D1	0.5 x D1	1.0 x D1	390	440	490	IPT	.0009	.0012	.0016	.0019	.0022	.0026	.0031	.0036	.0044	.0049	.0054
	2	1.5 x D1	0.5 x D1	1.0 x D1	360	410	460	IPT	.0007	.0010	.0013	.0016	.0019	.0022	.0026	.0030	.0038	.0044	.0049
	3	1.5 x D1	0.5 x D1	1.0 x D1	360	390	430	IPT	.0006	.0008	.0011	.0013	.0015	.0017	.0021	.0024	.0030	.0035	.0039
S	1	1.5 x D1	0.5 x D1	0.75 x D1	160	230	300	IPT	.0007	.0010	.0013	.0016	.0019	.0022	.0026	.0030	.0038	.0044	.0049
	2	1.5 x D1	0.5 x D1	0.75 x D1	160	210	260	IPT	.0006	.0008	.0011	.0013	.0015	.0017	.0021	.0024	.0030	.0035	.0039
	3	1.5 x D1	0.5 x D1	0.5 x D1	80	100	130	IPT	.0004	.0006	.0007	.0008	.0010	.0011	.0014	.0016	.0020	.0023	.0027
	4	1.5 x D1	0.5 x D1	1.25 x D1	160	180	200	IPT	.0005	.0007	.0009	.0011	.0014	.0016	.0019	.0022	.0028	.0032	.0036
H	1	1.5 x D1	0.5 x D1	1.0 x D1	260	360	460	IPT	.0007	.0009	.0012	.0014	.0017	.0019	.0023	.0027	.0033	.0038	.0042
	2	1.5 x D1	0.5 x D1	1.0 x D1	230	310	390	IPT	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0025	.0028	.0031

NOTE: See page 21 for more information on VARIMILL™ XTREME™ adjustment factors for feed calculations.

VARIMILL™ XTREME™ • RAMPING • APPLICATION DATA • METRIC

Material Group		Helical Interpolation/ Ramping 0°–15°	WS15PE			Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping — fz x 2											
			Cutting Speed — vc m/min			Diameter — D1 [Ømin – Ømax]											
						mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
		Max Depth	min	Start	max	min–max	3,5–5.7	4,6–7,6	5,8–9,5	6,9–11,4	9,2–15,2	11,5–19,0	13,8–22,8	16,1–26,6	18,4–30,4	20,7–34,2	23,0–38,0	28,8–47,5
P	0	1,25 x D1	150	175	200	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	1	1,25 x D1	150	175	200	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	2	1,25 x D1	140	165	190	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	3	1,25 x D1	120	140	160	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	4	1,25 x D1	90	120	150	fz	0,018	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	5	1,25 x D1	60	80	100	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	6	1,25 x D1	50	65	75	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
M	1	1,25 x D1	90	100	115	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	2	1,25 x D1	60	70	80	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	3	1,0 x D1	60	65	70	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078
K	1	1,0 x D1	120	135	150	fz	0,023	0,031	0,040	0,048	0,066	0,079	0,091	0,102	0,111	0,119	0,125	0,136
	2	1,0 x D1	110	125	140	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	3	1,0 x D1	110	120	130	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
S	1	0,75 x D1	50	70	90	fz	0,019	0,026	0,033	0,040	0,055	0,067	0,077	0,087	0,096	0,104	0,111	0,125
	2	0,75 x D1	50	65	80	fz	0,016	0,021	0,027	0,032	0,044	0,053	0,062	0,070	0,077	0,083	0,089	0,100
	3	0,5 x D1	25	30	40	fz	0,010	0,014	0,018	0,021	0,029	0,035	0,041	0,046	0,051	0,055	0,059	0,067
	4	1,25 x D1	50	55	60	fz	0,013	0,017	0,023	0,028	0,040	0,049	0,057	0,064	0,071	0,076	0,082	0,092
H	1	1,0 x D1	80	110	140	fz	0,018	0,024	0,030	0,036	0,049	0,059	0,069	0,077	0,084	0,091	0,097	0,107
	2	1,0 x D1	70	90	120	fz	0,013	0,018	0,022	0,027	0,037	0,044	0,051	0,057	0,063	0,067	0,071	0,078

Material Group		Helical Interpolation/ Ramping 15°–30°	WS15PE			Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping — fz x 2											
			Cutting Speed — vc m/min			Diameter — D1 [Ømin – Ømax]											
						mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
		Max Depth	min	Start	max	min–max	3,5–5.7	4,6–7,6	5,8–9,5	6,9–11,4	9,2–15,2	11,5–19,0	13,8–22,8	16,1–26,6	18,4–30,4	20,7–34,2	23,0–38,0	28,8–47,5
P	0	1,25 x D1	150	165	175	fz	0,017	0,023	0,030	0,036	0,050	0,059	0,068	0,076	0,083	0,089	0,094	0,102
	1	1,25 x D1	150	165	175	fz	0,017	0,023	0,030	0,036	0,050	0,059	0,068	0,076	0,083	0,089	0,094	0,102
	2	1,25 x D1	140	155	165	fz	0,017	0,023	0,030	0,036	0,050	0,059	0,068	0,076	0,083	0,089	0,094	0,102
	3	1,25 x D1	120	130	140	fz	0,014	0,019	0,025	0,030	0,041	0,050	0,058	0,065	0,072	0,078	0,083	0,094
	4	1,25 x D1	90	105	120	fz	0,013	0,018	0,022	0,027	0,037	0,045	0,051	0,058	0,063	0,068	0,073	0,080
	5	1,25 x D1	60	70	80	fz	0,012	0,016	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	6	1,25 x D1	50	55	65	fz	0,010	0,013	0,017	0,020	0,028	0,033	0,038	0,043	0,047	0,050	0,053	0,059
M	1	1,25 x D1	90	95	100	fz	0,014	0,019	0,025	0,030	0,041	0,050	0,058	0,065	0,072	0,078	0,083	0,094
	2	1,25 x D1	60	65	70	fz	0,012	0,016	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	3	1,0 x D1	60	62	65	fz	0,010	0,013	0,017	0,020	0,028	0,033	0,038	0,043	0,047	0,050	0,053	0,059
K	1	1,0 x D1	120	130	135	fz	0,017	0,023	0,030	0,036	0,050	0,059	0,068	0,076	0,083	0,089	0,094	0,102
	2	1,0 x D1	110	120	125	fz	0,014	0,019	0,025	0,030	0,041	0,050	0,058	0,065	0,072	0,078	0,083	0,094
	3	1,0 x D1	110	115	120	fz	0,012	0,016	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
S	1	0,75 x D1	50	60	70	fz	0,014	0,019	0,025	0,030	0,041	0,050	0,058	0,065	0,072	0,078	0,083	0,094
	2	0,75 x D1	50	55	65	fz	0,012	0,016	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	3	0,5 x D1	25	27	30	fz	0,008	0,010	0,013	0,016	0,022	0,026	0,031	0,035	0,038	0,042	0,045	0,051
	4	1,25 x D1	50	52	55	fz	0,009	0,013	0,017	0,021	0,030	0,037	0,043	0,048	0,053	0,057	0,061	0,069
H	1	1,0 x D1	80	95	110	fz	0,013	0,018	0,022	0,027	0,037	0,045	0,051	0,058	0,063	0,068	0,073	0,080
	2	1,0 x D1	70	80	90	fz	0,010	0,013	0,017	0,020	0,028	0,033	0,038	0,043	0,047	0,050	0,053	0,059

VARIMILL™ XTREME™ • RAMPING • APPLICATION DATA • METRIC

Material Group		Max Depth	Helical Interpolation/ Ramping 30°–45°														
			WS15PE			Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping — fz x 2											
			Cutting Speed — vc m/min			Diameter — D1 [Ømin – Ømax]											
						mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
						min–max	3,5–5.7	4,6–7,6	5,8–9,5	6,9–11,4	9,2–15,2	11,5–19,0	13,8–22,8	16,1–26,6	18,4–30,4	20,7–34,2	23,0–38,0	28,8–47,5
			min	Start	max													
P	0	1,25 x D1	140	150	165	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,055	0,061	0,067	0,071	0,075	0,082
	1	1,25 x D1	140	150	165	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,055	0,061	0,067	0,071	0,075	0,082
	2	1,25 x D1	140	150	165	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,055	0,061	0,067	0,071	0,075	0,082
	3	1,25 x D1	105	115	120	fz	0,011	0,015	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	4	1,25 x D1	90	100	110	fz	0,011	0,014	0,018	0,022	0,030	0,036	0,041	0,046	0,051	0,055	0,058	0,064
	5	1,25 x D1	70	75	80	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,053	0,060
	6	1,25 x D1	55	60	65	fz	0,008	0,011	0,013	0,016	0,022	0,027	0,031	0,034	0,038	0,040	0,043	0,047
M	1	1,25 x D1	75	85	90	fz	0,011	0,015	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	2	1,25 x D1	50	55	60	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,053	0,060
	3	1,0 x D1	45	50	55	fz	0,008	0,011	0,013	0,016	0,022	0,027	0,031	0,034	0,038	0,040	0,043	0,047
K	1	1,0 x D1	110	120	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,055	0,061	0,067	0,071	0,075	0,082
	2	1,0 x D1	100	110	120	fz	0,011	0,015	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	3	1,0 x D1	90	100	110	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,053	0,060
S	1	0,75 x D1	80	85	90	fz	0,011	0,015	0,020	0,024	0,033	0,040	0,046	0,052	0,058	0,062	0,067	0,075
	2	0,75 x D1	55	60	65	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,053	0,060
	3	0,5 x D1	20	25	28	fz	0,006	0,008	0,011	0,013	0,017	0,021	0,025	0,028	0,031	0,033	0,036	0,040
	4	1,25 x D1	35	40	45	fz	0,008	0,010	0,014	0,017	0,024	0,029	0,034	0,038	0,042	0,046	0,049	0,055
H	1	1,0 x D1	75	80	85	fz	0,011	0,014	0,018	0,022	0,030	0,036	0,041	0,046	0,051	0,055	0,058	0,064
	2	1,0 x D1	65	70	75	fz	0,008	0,011	0,013	0,016	0,022	0,027	0,031	0,034	0,038	0,040	0,043	0,047

VARIMILL™ XTREME™ • RAMPING • APPLICATION DATA • INCH

Material Group		Max Depth	Helical Interpolation/ Ramping 0°–15°														
			WS15PE			Recommended feed per tooth (fz = ipt) for Helical Interpolation and Ramping — fz x 2											
			Cutting Speed — vc m/min			Diameter — D1 [Ømin – Ømax]											
						mm	1/8	5/32	3/16	1/4	9/32	5/16	3/8	1/2	5/8	3/4	1
						min–max	.144–.238	.180–.297	.216–.356	.288–.475	.323–.534	.359–.594	.431–.713	.575–.950	.719–1.188	.863–1.425	1.150–1.900
			min	Start	max												
P	0	1.25 x D1	490	580	660	IPT	.0009	.0012	.0016	.0019	.0023	.0026	.0031	.0036	.0044	.0049	.0054
	1	1.25 x D1	490	580	660	IPT	.0009	.0012	.0016	.0019	.0023	.0026	.0031	.0036	.0044	.0049	.0054
	2	1.25 x D1	460	540	620	IPT	.0009	.0012	.0016	.0019	.0023	.0026	.0031	.0036	.0044	.0049	.0054
	3	1.25 x D1	390	450	520	IPT	.0007	.0010	.0013	.0016	.0019	.0022	.0026	.0030	.0038	.0044	.0049
	4	1.25 x D1	300	400	490	IPT	.0007	.0009	.0012	.0014	.0017	.0019	.0023	.0027	.0033	.0038	.0042
	5	1.25 x D1	200	260	330	IPT	.0006	.0008	.0011	.0013	.0015	.0017	.0021	.0024	.0030	.0035	.0039
	6	1.25 x D1	160	200	250	IPT	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0025	.0028	.0031
M	1	1.25 x D1	300	340	380	IPT	.0007	.0010	.0013	.0016	.0019	.0022	.0026	.0030	.0038	.0044	.0049
	2	1.25 x D1	200	230	260	IPT	.0006	.0008	.0011	.0013	.0015	.0017	.0021	.0024	.0030	.0035	.0039
	3	1.0 x D1	200	210	230	IPT	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0025	.0028	.0031
K	1	1.0 x D1	390	440	490	IPT	.0009	.0012	.0016	.0019	.0023	.0026	.0031	.0036	.0044	.0049	.0054
	2	1.0 x D1	360	410	460	IPT	.0007	.0010	.0013	.0016	.0019	.0022	.0026	.0030	.0038	.0044	.0049
	3	1.0 x D1	360	390	430	IPT	.0006	.0008	.0011	.0013	.0015	.0017	.0021	.0024	.0030	.0035	.0039
S	1	0.75 x D1	160	230	300	IPT	.0007	.0010	.0013	.0016	.0019	.0022	.0026	.0030	.0038	.0044	.0049
	2	0.75 x D1	160	210	260	IPT	.0006	.0008	.0011	.0013	.0015	.0017	.0021	.0024	.0030	.0035	.0039
	3	0.5 x D1	80	100	130	IPT	.0004	.0006	.0007	.0008	.0010	.0011	.0014	.0016	.0020	.0023	.0027
	4	1.25 x D1	160	180	200	IPT	.0005	.0007	.0009	.0011	.0014	.0016	.0019	.0022	.0028	.0032	.0036
H	1	1.0 x D1	260	360	460	IPT	.0007	.0009	.0012	.0014	.0017	.0019	.0023	.0027	.0033	.0038	.0042
	2	1.0 x D1	230	310	390	IPT	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0025	.0028	.0031

HANITA

VARIMILL™ XTREME™ • RAMPING • APPLICATION DATA • INCH

Material Group		Helical Interpolation/ Ramping 15°–30°	WS15PE Cutting Speed — vc m/min			Recommended feed per tooth (fz = ipt) for Helical Interpolation and Ramping — fz x 2 Diameter — D1 [Ømin – Ømax]											
		Max Depth	min	Start	max	mm min–max	1/8 .144–.238	5/32 .180–.297	3/16 .216–.356	1/4 .288–.475	9/32 .323–.534	5/16 .359–.594	3/8 .431–.713	1/2 .575–.950	5/8 .719–1.188	3/4 .863–1.425	1 1.150–1.900
P	0	1.25 x D1	490	530	580	IPT	.0007	.0009	.0012	.0014	.0017	.0020	.0023	.0027	.0033	.0037	.0041
	1	1.25 x D1	490	530	580	IPT	.0007	.0009	.0012	.0014	.0017	.0020	.0023	.0027	.0033	.0037	.0041
	2	1.25 x D1	460	500	540	IPT	.0007	.0009	.0012	.0014	.0017	.0020	.0023	.0027	.0033	.0037	.0041
	3	1.25 x D1	390	420	450	IPT	.0005	.0008	.0010	.0012	.0014	.0017	.0020	.0023	.0029	.0033	.0037
	4	1.25 x D1	300	350	400	IPT	.0005	.0007	.0009	.0011	.0013	.0014	.0017	.0020	.0025	.0029	.0032
	5	1.25 x D1	200	235	260	IPT	.0005	.0006	.0008	.0010	.0011	.0013	.0016	.0018	.0023	.0026	.0029
	6	1.25 x D1	160	180	200	IPT	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0019	.0021	.0023
M	1	1.25 x D1	300	320	340	IPT	.0005	.0008	.0010	.0012	.0014	.0017	.0020	.0023	.0029	.0033	.0037
	2	1.25 x D1	200	215	230	IPT	.0005	.0006	.0008	.0010	.0011	.0013	.0016	.0018	.0023	.0026	.0029
	3	1.0 x D1	200	105	210	IPT	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0019	.0021	.0023
K	1	1.0 x D1	390	415	440	IPT	.0007	.0009	.0012	.0014	.0017	.0020	.0023	.0027	.0033	.0037	.0041
	2	1.0 x D1	360	380	410	IPT	.0005	.0008	.0010	.0012	.0014	.0017	.0020	.0023	.0029	.0033	.0037
	3	1.0 x D1	360	375	390	IPT	.0005	.0006	.0008	.0010	.0011	.0013	.0016	.0018	.0023	.0026	.0029
S	1	0.75 x D1	160	190	230	IPT	.0005	.0008	.0010	.0012	.0014	.0017	.0020	.0023	.0029	.0033	.0037
	2	0.75 x D1	160	180	210	IPT	.0005	.0006	.0008	.0010	.0011	.0013	.0016	.0018	.0023	.0026	.0029
	3	0.5 x D1	80	90	100	IPT	.0003	.0005	.0005	.0006	.0008	.0008	.0011	.0012	.0015	.0017	.002
	4	1.25 x D1	160	170	180	IPT	.0004	.0005	.0007	.0008	.0011	.0012	.0014	.0017	.0021	.0024	.0027
H	1	1.0 x D1	260	310	360	IPT	.0005	.0007	.0009	.0011	.0013	.0014	.0017	.0020	.0025	.0029	.0032
	2	1.0 x D1	230	270	310	IPT	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0019	.0021	.0023

Material Group		Helical Interpolation/ Ramping 30°–45°	WS15PE Cutting Speed — vc m/min			Recommended feed per tooth (fz = ipt) for Helical Interpolation and Ramping — fz x 2 Diameter — D1 [Ømin – Ømax]											
		Max Depth	min	Start	max	mm min–max	1/8 .144–.238	5/32 .180–.297	3/16 .216–.356	1/4 .288–.475	9/32 .323–.534	5/16 .359–.594	3/8 .431–.713	1/2 .575–.950	5/8 .719–1.188	3/4 .863–1.425	1 1.150–1.900
P	0	1.25 x D1	420	450	495	IPT	.0005	.0007	.0010	.0011	.0014	.0016	.0019	.0022	.0026	.0029	.0032
	1	1.25 x D1	420	450	495	IPT	.0005	.0007	.0010	.0011	.0014	.0016	.0019	.0022	.0026	.0029	.0032
	2	1.25 x D1	420	450	495	IPT	.0005	.0007	.0010	.0011	.0014	.0016	.0019	.0022	.0026	.0029	.0032
	3	1.25 x D1	315	345	360	IPT	.0004	.0006	.0008	.0010	.0011	.0013	.0016	.0018	.0023	.0026	.0029
	4	1.25 x D1	270	300	330	IPT	.0004	.0005	.0007	.0008	.0010	.0011	.0014	.0016	.0020	.0023	.0025
	5	1.25 x D1	210	225	240	IPT	.0004	.0005	.0007	.0008	.0009	.0010	.0013	.0014	.0018	.0021	.0023
	6	1.25 x D1	165	180	195	IPT	.0003	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0015	.0017	.0019
M	1	1.25 x D1	225	255	270	IPT	.0004	.0006	.0008	.0010	.0011	.0013	.0016	.0018	.0023	.0026	.0029
	2	1.25 x D1	150	165	180	IPT	.0004	.0005	.0007	.0008	.0009	.0010	.0013	.0014	.0018	.0021	.0023
	3	1.0 x D1	135	150	165	IPT	.0003	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0015	.0017	.0019
K	1	1.0 x D1	330	360	390	IPT	.0005	.0007	.0010	.0011	.0014	.0016	.0019	.0022	.0026	.0029	.0032
	2	1.0 x D1	300	330	360	IPT	.0004	.0006	.0008	.0010	.0011	.0013	.0016	.0018	.0023	.0026	.0029
	3	1.0 x D1	270	300	330	IPT	.0004	.0005	.0007	.0008	.0009	.0010	.0013	.0014	.0018	.0021	.0023
S	1	0.75 x D1	240	255	270	IPT	.0004	.0006	.0008	.0010	.0011	.0013	.0016	.0018	.0023	.0026	.0029
	2	0.75 x D1	165	180	195	IPT	.0004	.0005	.0007	.0008	.0009	.0010	.0013	.0014	.0018	.0021	.0023
	3	0.5 x D1	60	75	84	IPT	.0002	.0004	.0004	.0005	.0006	.0007	.0008	.0010	.0012	.0014	.0016
	4	1.25 x D1	105	120	135	IPT	.0003	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0017	.0019	.0022
H	1	1.0 x D1	225	240	255	IPT	.0004	.0005	.0007	.0008	.0010	.0011	.0014	.0016	.0020	.0023	.0025
	2	1.0 x D1	195	210	225	IPT	.0003	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0015	.0017	.0019

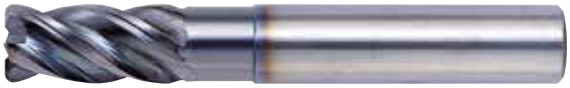
VARIMILL™ XTREME™ • PLUNGING/DRILLING • APPLICATION DATA • METRIC



Material Group		Plunging/Drilling			WS15PE Cutting Speed — vc m/min			Recommended feed per revolution (fn =mm/rev) for Plunging and Drilling												
								D1 — Diameter												
		Max Depth	Applicable	Coolant	min	Start	max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
P	0	1,5 x D	●	Preferred	140	150	165	fn	0,033	0,040	0,045	0,055	0,065	0,080	0,095	0,110	0,120	0,140	0,160	0,180
	1	1,5 x D	●	Required	140	150	165	fn	0,033	0,040	0,045	0,055	0,065	0,080	0,095	0,110	0,120	0,140	0,160	0,180
	2	1,5 x D	●	Required	140	150	165	fn	0,033	0,040	0,045	0,055	0,065	0,080	0,095	0,110	0,120	0,140	0,160	0,180
	3	1 x D	●	Required	105	115	120	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	4	1 x D	●	Required	90	100	110	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	5	0,5 x D	●	Required	70	75	80	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
	6	0,5 x D	●	Required	55	60	65	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
M	1	0,75 x D	●	Required	75	85	90	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	2	0,5 x D	●	Required	50	55	60	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
	3	0,5 x D	●	Required	45	50	55	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
K	1	1,5 x D	●	Preferred	110	120	130	fn	0,033	0,040	0,045	0,055	0,065	0,080	0,095	0,110	0,120	0,140	0,160	0,180
	2	1 x D	●	Required	100	110	120	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	3	1 x D	●	Required	90	100	110	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
S	1	0,3 x D	○	Required	80	85	90	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	2	0,1 x D	○	Required	55	60	65	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
	3	0,1 x D	○	Required	20	25	28	fn	0,010	0,012	0,015	0,018	0,022	0,028	0,033	0,040	0,045	0,050	0,060	0,070
	4	0,2 x D	○	Required	35	40	45	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100
H	1	0,3 x D	○	Required	75	80	85	fn	0,020	0,028	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,125	0,150
	2	0,2 x D	○	Required	65	70	75	fn	0,014	0,018	0,020	0,025	0,035	0,040	0,050	0,055	0,065	0,075	0,085	0,100

VARIMILL™ XTREME™ • PLUNGING/DRILLING • APPLICATION DATA • INCH





Material Group		Plunging/Drilling			WS15PE Cutting Speed — vc m/min			Recommended feed per revolution (fn =mm/rev) for Plunging and Drilling												
								D1 — Diameter												
		Max Depth	Applicable	Coolant	min	Start	max	in	1/8	5/32	3/16	1/4	9/32	5/16	3/8	1/2	5/8	3/4	1	
P	0	1.5 x D	●	Preferred	420	450	495	IPR	.0013	.0016	.0450	.0022	.0024	.0026	.0031	.0037	.0047	.0063	.0071	
	1	1.5 x D	●	Required	420	450	495	IPR	.0013	.0016	.0450	.0022	.0024	.0026	.0031	.0037	.0047	.0063	.0071	
	2	1.5 x D	●	Required	420	450	495	IPR	.0013	.0016	.0450	.0022	.0024	.0026	.0031	.0037	.0047	.0063	.0071	
	3	1 x D	●	Required	315	345	360	IPR	.0008	.0011	.0330	.0016	.0018	.0020	.0024	.0028	.0039	.0049	.0059	
	4	1 x D	●	Required	270	300	330	IPR	.0008	.0011	.0330	.0016	.0018	.0020	.0024	.0028	.0039	.0049	.0059	
	5	0.5 x D	●	Required	210	225	240	IPR	.0006	.0007	.0200	.0010	.0012	.0014	.0016	.0020	.0026	.0033	.0039	
	6	0.5 x D	●	Required	165	180	195	IPR	.0006	.0007	.0200	.0010	.0012	.0014	.0016	.0020	.0026	.0033	.0039	
M	1	0.75 x D	●	Required	225	255	270	IPR	.0008	.0011	.0330	.0016	.0018	.0020	.0024	.0028	.00239	.0049	.0059	
	2	0.5 x D	●	Required	150	165	180	IPR	.0006	.0007	.0200	.0010	.0012	.0014	.0016	.0020	.0026	.0033	.0039	
	3	0.5 x D	●	Required	135	150	165	IPR	.0006	.0007	.0200	.0010	.0012	.0014	.0016	.0020	.0026	.0033	.0039	
K	1	1.5 x D	●	Preferred	330	360	390	IPR	.0013	.0016	.0450	.0022	.0024	.0026	.0031	.0037	.0047	.0063	.0071	
	2	1 x D	●	Required	300	330	360	IPR	.0008	.0011	.0330	.0016	.0018	.0020	.0024	.0028	.0039	.0049	.0059	
	3	1 x D	●	Required	270	300	330	IPR	.0008	.0011	.0330	.0016	.0018	.0020	.0024	.0028	.0039	.0049	.0059	
S	1	0.3 x D	○	Required	240	255	270	IPR	.0008	.0011	.0330	.0016	.0018	.0020	.0024	.0028	.0039	.0049	.0059	
	2	0.1 x D	○	Required	165	180	195	IPR	.0006	.0007	.0200	.0010	.0012	.0014	.0016	.0020	.0026	.0033	.0039	
	3	0.1 x D	○	Required	60	75	84	IPR	.0004	.0005	.0150	.0007	.0008	.0009	.0011	.0013	.0018	.0024	.0028	
	4	0.2 x D	○	Required	105	120	135	IPR	.0006	.0007	.0200	.0010	.0012	.0014	.0016	.0020	.0026	.0033	.0039	
H	1	0.3 x D	○	Required	225	240	255	IPR	.0008	.0011	.0330	.0016	.0018	.0020	.0024	.0028	.0039	.0049	.0059	
	2	0.2 x D	○	Required	195	210	225	IPR	.0006	.0007	.0200	.0010	.0012	.0014	.0016	.0020	.0026	.0033	.0039	

HANITA

VARIMILL™ XTREME™ • ADJUSTMENT FACTOR TABLE FOR FEED CALCULATION

To calculate application-specific cutting data, please use KV coefficient table to the right for adaptation of cutting speed and KFz for feed, respectively.

*Vc new = Vc * Kv*
*Fz new = IPT * KFz*

Calculation example:
Application: D = 20mm; M2 material group;
Ae = 2mm
Cutting data recommendation: Vc = 80 m/min;
fz = 0,089 mm/th
Adjustment coefficients: Ae = 2mm equals 10,0%;
Kv = 1,35; KFz = 1,7

Final cutting data recommendation:
*Vc new = 80 * 1,35 = 108 m/min*
*Fz new = 0,089 * 1,7 = 0,15 mm/min*

Metric

	Ae/D	2%	4%	5%	8%	10%	20%	30%	40%	50%
Speed factor	Kv	2	1,5	1,45	1,4	1,35	1,25	1,2	1	1
Feed factor	KFz	2,4	2,3	2,2	2	1,7	1,25	1,02	1	1

Inch

	Ae/D	2%	4%	5%	8%	10%	20%	30%	40%	50%
Speed factor	Kv	2	1.5	1.45	1.4	1.35	1.25	1.2	1	1
Feed factor	KFz	2.4	2.3	2.2	2	1.7	1.25	1.02	1	1

ALL-STAR

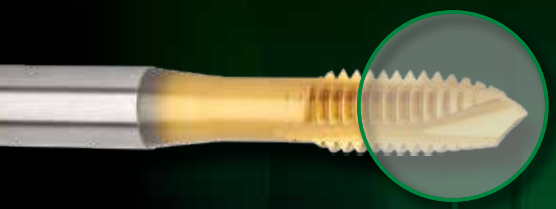
visit widia.com

THE ALL-STAR PROGRAM PROVIDES PROVEN SOLUTIONS THAT ARE EASY TO FIND AND ALWAYS AVAILABLE.

Proven Solutions | Easy to Find | Always Available

Holemaking

Indexable Milling



Tapping

Turning

Solid End Milling

WIDIA™

Find your Local Hanita™ and WIDIA™ Authorized Distributor

Hanita brand solid end milling solutions are available through WIDIA authorized distributor partners. Our distributors know us, and more importantly, they know you. They know better than anyone in the industry how to put the global power of WIDIA to work for you — in your industry, in your region, and for your business.

DISTRIBUTORS

Find your Local Authorized Distributor by accessing our distributor finder at **widia.com**.

IMPORTANT SAFETY INSTRUCTIONS: READ BEFORE USING THE TOOLS IN THIS CATALOG

METALCUTTING SAFETY

Projectile and Fragmentation Hazards

Modern metalcutting operations involve high spindle and cutter speeds and high temperatures and cutting forces. Hot metal chips may fly off the workpiece during metalcutting. Although cutting tools are designed and manufactured to withstand high cutting forces and temperatures, they can sometimes fragment, particularly if they are subjected to over-stress, severe impact, or other abuse.

To avoid injury:

- Always wear appropriate personal protective equipment, including safety goggles, when operating metalcutting machines or working nearby.
- Always make sure all machine guards are in place.

Breathing and Skin Contact Hazards

Grinding carbide or other advanced cutting tool materials produces dust or mist containing metallic particles. Breathing this dust or mist — especially over an extended period — can cause temporary or permanent lung disease or make existing medical conditions worse. Contact with this dust or mist can irritate eyes, skin, and mucous membranes and may make existing skin conditions worse.

To avoid injury:

- Always wear breathing protection and safety goggles when grinding.
- Provide ventilation control and collect and properly dispose of dust, mist, or sludge from grinding.
- Avoid skin contact with dust or mist.

For more information, read the applicable Material Safety Data Sheet provided by WIDIA and consult General Industry Safety and Health Regulations, Part 1910, Title 29 of the Code of Federal Regulations.

These safety instructions are general guidelines. Many variables affect machining operations. It is impossible to cover every specific situation. The technical information included in this catalog and recommendations on machining practices may not apply to your particular operation.

For more information, consult the WIDIA Metalcutting Safety booklet, available free from WIDIA at +1 724 539 5747 or fax +1 724 539 5439. For specific product safety and environmental questions, contact our Corporate Environmental Health and Safety Office at +1 724 539 5066 or fax +1 724 539 5372.

HANITA™

WIDIA

VariMill™ XTREME™

WORLD HEADQUARTERS
WIDIA Products Group
Kennametal Inc.
1600 Technology Way
Latrobe, PA 15650 USA
Tel: 1 800 979 4342
w-na.service@widia.com

EUROPEAN HEADQUARTERS
WIDIA Products Group
Kennametal Europe GmbH
Rheingoldstrasse 50
CH 8212 Neuhausen am Rheinfall
Switzerland
Tel: +41 52 6750 100
w-ch.service@widia.com

ASIA-PACIFIC HEADQUARTERS
WIDIA Products Group
Kennametal (Singapore) Pte. Ltd.
3A International Business Park
Unit #01-02/03/05, ICON@IBP
Singapore 609935
Tel: +65 6265 9222
w-sg.service@widia.com

INDIA HEADQUARTERS
WIDIA Products Group
REGD OFFICE: WIDIA India Tooling Pvt Ltd
CIN: U28110KA2018PTC119396
Survey No 11 Nagasandra
Adjacent to Nagasandra Metro Station
Bengaluru - Pune National Highway
Bengaluru - 560073 India
Tel: +91 80 2839 4321
w-in.service@widia.com

HANITA™