

RELIABLE CUTTING TOOLS FOR EVERY MACHINE SHOP



WIDIA™ Slim Line

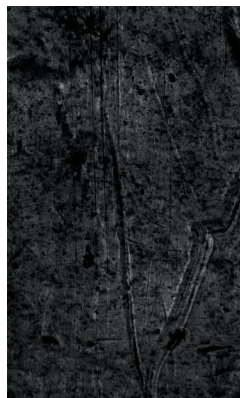
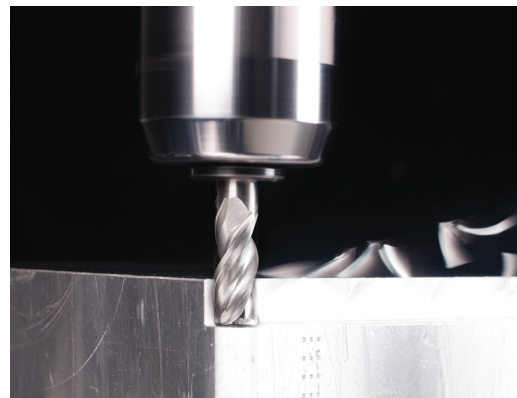
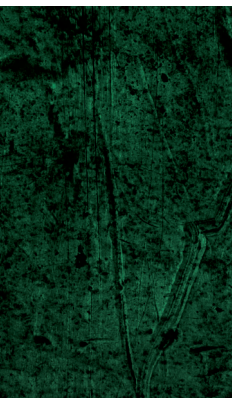
ISSUE 8

Distributed by:



For more than 95 years, the WIDIA™ brand has delivered high-quality milling, turning, holmaking, tapping, and systems tooling to metalcutting customers across the globe. Customers experience reliability from selection to post-delivery support through product availability, digital connectivity, and an accessible network of authorized distribution partners.

For more information regarding the WIDIA brand or products, visit **widia.com** or connect with us on Instagram, Facebook, LinkedIn, and YouTube.



WIDIA is a brand for machinists, mechanical engineers, and machine shop owners who are depending on a reliable tool to keep their shop running through the night.

The brand offers a full portfolio of standard milling, drilling, holmaking tools, technical information, and support to everyday consumers.

WIDIA tools are sold through distribution partners. Find a distributor in your area by using the distributor finder on **widia.com**.



Hanita™ solutions are developed for customers who have a passion for performance. Hanita delivers not only the tool for the job but the experience to develop a solution for the customer.

The Hanita brand offers a comprehensive range of custom and standard end mills spanning a broad range of diameters and lengths, all boasting unparalleled metal removal rates through innovative geometries.

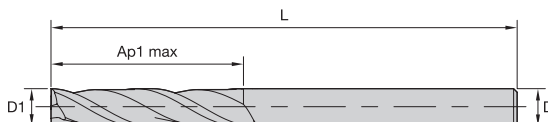
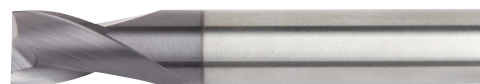
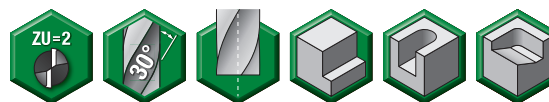
Hanita solutions are sold primarily through WIDIA channel partners, alongside WIDIA.

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General Purpose Solid Carbide End Mills • Roughing/Finishing

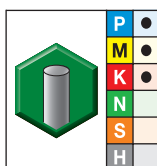
- Centre cutting.
- Sharp corners.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

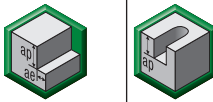
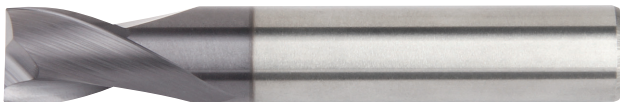
D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3-6	-0,020/-0,038	> 3-6	0/0,008
> 6-10	-0,025/-0,047	> 6-10	0/0,009
> 10-18	-0,032/-0,059	> 10-18	0/0,011
> 18-30	-0,040/-0,073	> 18-30	0/0,013

Series 4002 4012 • VariMill™ GP



grade TiAlN TiAlN		£	D1	D	length of cut Ap1 max	length L
order #	catalog #					
5873489	40020300T009	7.98	3,0	3	9,50	38
5873490	40020300T019	11.38	3,0	3	19,00	63
5873491	40120300T025	11.80	3,0	3	25,00	75
6092621	40020400T012S	10.55	4,0	4	12,00	50
6092622	40020400T019S	11.38	4,0	4	19,00	63
6092623	40120400T031S	13.24	4,0	4	31,00	75
6092627	40020500T014S	11.38	5,0	5	14,00	50
6092628	40020500T020S	12.08	5,0	5	20,00	63
6092631	40120500T031S	17.77	5,0	5	31,00	100
6092633	40020600T016S	12.08	6,0	6	16,00	50
6092634	40020600T028S	17.41	6,0	6	28,00	76
6092636	40120600T038S	17.41	6,0	6	38,00	100
6092638	40020800T020S	14.73	8,0	8	20,00	63
6092639	40020800T028S	20.77	8,0	8	28,00	76
6092640	40120800T041S	23.23	8,0	8	41,00	100
6092643	40021000T022S	21.49	10,0	10	22,00	72
6092644	40021000T032S	27.00	10,0	10	32,00	89
6092645	40121000T045S	32.07	10,0	10	45,00	100
6092647	40021200T025S	28.24	12,0	12	25,00	76
6092650	40121200T075S	43.42	12,0	12	75,00	150
6092648	40021200T045S	37.66	12,0	12	45,00	100
6092657	40021600T032S	50.40	16,0	16	32,00	89
6092658	40021600T056S	52.61	16,0	16	56,00	110
6092659	40121600T075S	62.30	16,0	16	75,00	150
6092683	40022000T038S	74.49	20,0	20	38,00	104
6092684	40022000T056S	90.27	20,0	20	56,00	125
6092685	40122000T075S	94.70	20,0	20	75,00	150

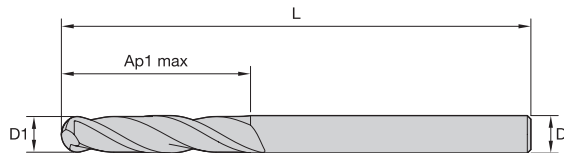
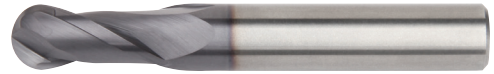
■ Application Data • Series 4002 4012 • TiAlN • VariMill™ GP

Material Group																						
		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.														
		A		B	Cutting Speed — vc m/min			D1 — Diameter														
ap		ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0		
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

General Purpose Solid Carbide End Mills • Roughing/Finishing

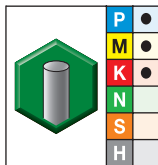
- Centre cutting.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

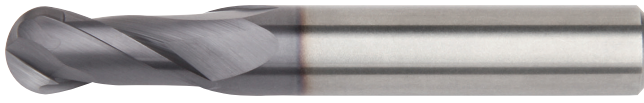
D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3-6	-0,020/-0,038	> 3-6	0/0,008
> 6-10	-0,025/-0,047	> 6-10	0/0,009
> 10-18	-0,032/-0,059	> 10-18	0/0,011
> 18-30	-0,040/-0,073	> 18-30	0/0,013

■ Series 4001 4011 4021 • VariMill™ GP



grade TiAlN TiAlN		£	D1	D	length of cut Ap1 max	length L
order #	catalog #					
5880391	40010300T009	11.60	3,0	3	9,50	38
5880393	40010400T012	12.84	4,0	4	12,00	50
5880395	40110400T019	14.51	4,0	4	19,00	63
5880396	40210400T031	17.69	4,0	4	31,00	75
6209446	40010500T014	12.84	5,0	5	14,00	50
6209447	40110500T020	17.77	5,0	5	20,00	63
5880398	40010600T020	14.43	6,0	6	20,00	63
5880399	40110600T028	18.33	6,0	6	28,00	76
5880400	40210600T038	19.35	6,0	6	38,00	100
5880401	40010800T020	17.53	8,0	8	20,00	63
5880402	40110800T028	21.51	8,0	8	28,00	76
5880403	40210800T040	25.80	8,0	8	40,00	100
5880404	40011000T022	25.17	10,0	10	22,00	76
5880405	40111000T032	34.51	10,0	10	32,00	89
5880406	40211000T045	35.61	10,0	10	45,00	100
5880407	40011200T025	37.00	12,0	12	25,00	75
5880408	40111200T045	41.81	12,0	12	45,00	100
5880409	40211200T075	49.34	12,0	12	75,00	150
5880411	40011600T032	52.61	16,0	16	32,00	89
6209448	40111600T056	62.03	16,0	16	56,00	110
6209449	40211600T075	69.23	16,0	16	75,00	150

■ Application Data • Series 4001 4011 4021 • TiAlN • VariMill™ GP

Material Group																			
	Side Milling (A)		TiAlN		Recommended feed per tooth (fz = mm/th) for side milling (A).														
	A		Cutting Speed – vc m/min		D1 – Diameter														
	ap	ae	min	–	max	mm	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

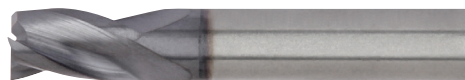
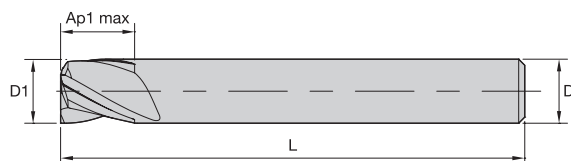
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

General Purpose Solid Carbide End Mills • Roughing/Finishing

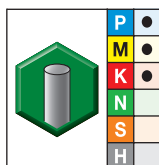
- Centre cutting.
- Sharp corners.



End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3-6	-0,020/-0,038	> 3-6	0/0,008
> 6-10	-0,025/-0,047	> 6-10	0/0,009
> 10-18	-0,032/-0,059	> 10-18	0/0,011
> 18-30	-0,040/-0,073	> 18-30	0/0,013

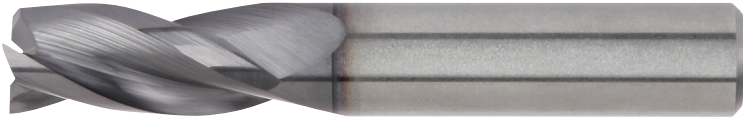
■ Series 4003 4013 • VariMill™ GP



grade TiAlN
TiAlN

order #	catalog #	£	D1	D	length of cut Ap1 max	length L
6144060	40030300T009S	7.98	3,0	3	9,50	38
6145199	40130300T019S	11.38	3,0	6	19,00	63
6144551	40030400T012S	10.55	4,0	4	12,00	50
6145200	40130400T019S	11.38	4,0	4	19,00	63
6144552	40030500T014S	11.38	5,0	6	14,00	50
6145231	40130500T020S	12.08	5,0	6	20,00	63
6144553	40030600T016S	12.08	6,0	6	16,00	50
6145232	40130600T028S	17.41	6,0	6	28,00	75
6144554	40030800T019S	14.73	8,0	8	19,00	63
6145233	40130800T028S	20.77	8,0	8	28,00	75
6144555	40031000T022S	26.55	10,0	10	22,00	76
6145234	40131000T032S	27.00	10,0	10	32,00	89
6144556	40031200T025S	28.24	12,0	12	25,00	75
6145235	40131200T045S	37.66	12,0	12	45,00	100
6144557	40031600T032S	50.40	16,0	16	32,00	89
6145238	40131600T056S	52.61	16,0	16	56,00	110

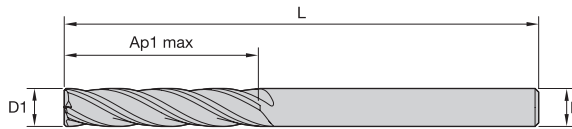
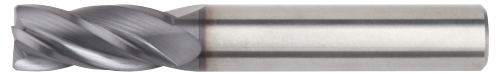
■ Application Data • Series 4003 4013 • VariMill™ GP TiAlN

Material Group																				
	Side Milling (A)		TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A).														
	A		Cutting Speed — vc m/min			D1 — Diameter														
	ap	ae	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	
P	0	Ap1 max	0,1 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	150	–	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	140	–	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	120	–	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	90	–	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	90	–	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	60	–	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	120	–	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	110	–	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters > 12mm.

General Purpose Solid Carbide End Mills • Roughing/Finishing

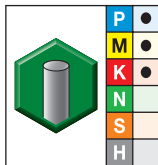
- Centre cutting.
- Sharp corners.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

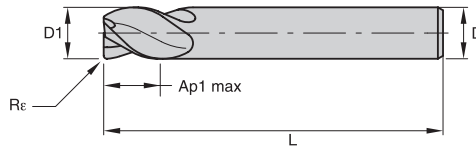
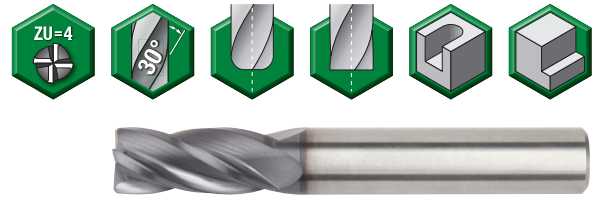
D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3-6	-0,020/-0,038	> 3-6	0/0,008
> 6-10	-0,025/-0,047	> 6-10	0/0,009
> 10-18	-0,032/-0,059	> 10-18	0/0,011
> 18-30	-0,040/-0,073	> 18-30	0/0,013

■ Series 4004 4014 4024 • VariMill™ GP



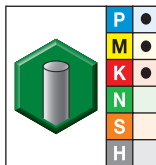
grade TiAlN TiAlN		£	D1	D	length of cut Ap1 max	length L
order #	catalog #					
5826020	40040300T009	7.98	3,0	3	9,50	38
5826021	40140300T019	11.38	3,0	3	19,00	63
5826022	40240300T025	11.80	3,0	3	25,00	75
6085576	40040400T011S	10.55	4,0	4	11,00	50
6085577	40140400T019S	11.38	4,0	4	19,00	63
6085578	40240400T031S	13.24	4,0	4	31,00	75
6085580	40040500T013S	11.38	5,0	5	13,00	50
6085581	40040500T020S	12.08	5,0	5	20,00	63
6085582	40140500T030S	15.68	5,0	5	30,00	75
6085583	40240500T031S	17.77	5,0	5	31,00	100
6085584	40040600T016S	12.08	6,0	6	16,00	50
6085585	40140600T028S	17.41	6,0	6	28,00	75
6085586	40240600T038S	17.41	6,0	6	38,00	100
6200965	40040800T021S	14.73	8,0	8	20,00	63
6085589	40140800T028S	20.77	8,0	8	28,00	75
6085590	40240800T041S	23.23	8,0	8	41,00	100
6085592	40041000T022S	21.49	10,0	10	22,00	72
6085593	40141000T032S	27.00	10,0	10	32,00	89
6085594	40241000T045S	32.07	10,0	10	45,00	100
6085595	40041200T025S	32.23	12,0	12	25,00	89
6085596	40141200T045S	37.66	12,0	12	45,00	100
6085597	40241200T075S	43.42	12,0	12	75,00	150
6085601	40041600T032S	50.40	16,0	16	32,00	92
6085602	40141600T056S	52.61	16,0	16	56,00	110
6085603	40241600T075S	62.30	16,0	16	75,00	150
6085607	40042000T038S	74.49	20,0	20	38,00	104
6085608	40142000T056S	90.27	20,0	20	56,00	125
6085609	40242000T075S	94.70	20,0	20	75,00	150

General Purpose Solid Carbide End Mills • Roughing/Finishing



End Mill Tolerances			
D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3-6	-0,020/-0,038	> 3-6	0/0,008
> 6-10	-0,025/-0,047	> 6-10	0/0,009
> 10-18	-0,032/-0,059	> 10-18	0/0,011
> 18-30	-0,040/-0,073	> 18-30	0/0,013

■ Series 4004 4014 4024 Series • VariMill™ GP Radius

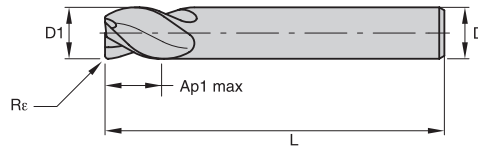
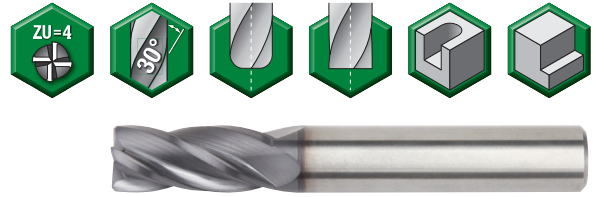


grade TiAlN TiAlN		£	D1	D	length of cut Ap1 max	length L	Rε
order #	catalog #						
6337590	40040200T006R050	8.62	2,0	3	6,30	38	0,50
6337731	40040300T009R050	8.62	3,0	3	9,50	38	0,50
6337892	40140300T019R050	12.27	3,0	3	19,00	63	0,50
6338335	40240300T025R050	12.74	3,0	3	25,00	75	0,50
6337732	40040300T009R100	8.62	3,0	3	9,50	38	1,00
6337733	40040400T011R050	11.41	4,0	4	11,00	50	0,50
6337893	40140400T019R050	12.27	4,0	4	19,00	63	0,50
6338336	40240400T031R050	14.31	4,0	4	31,00	75	0,50
6337734	40040400T011R100	11.41	4,0	4	11,00	50	1,00
6337894	40140400T019R100	12.27	4,0	4	19,00	63	1,00
6338337	40240400T031R100	14.31	4,0	4	31,00	75	1,00
6337735	40040500T013R050	12.27	5,0	5	13,00	50	0,50
6337895	40140500T030R050	16.92	5,0	5	30,00	75	0,50
6337896	40140500T030R100	16.92	5,0	5	30,00	75	1,00
6337736	40040600T016R050	13.05	6,0	6	16,00	50	0,50
6337897	40140600T028R050	18.83	6,0	6	28,00	75	0,50
6338338	40240600T038R050	18.83	6,0	6	38,00	100	0,50
6337737	40040600T016R100	13.05	6,0	6	16,00	50	1,00
6337898	40140600T028R100	18.83	6,0	6	28,00	75	1,00
6338339	40240600T038R100	20.04	6,0	6	38,00	100	1,00
6337738	40040800T020R050	15.87	8,0	8	20,00	50	0,50
6337899	40140800T028R050	22.43	8,0	8	28,00	75	0,50
6338340	40240800T041R050	25.09	8,0	8	41,00	100	0,50
6337739	40040800T020R100	15.87	8,0	8	20,00	50	1,00
6337900	40140800T028R100	22.43	8,0	8	28,00	75	1,00
6338341	40240800T041R100	25.09	8,0	8	41,00	100	1,00
6337740	40041000T022R050	23.21	10,0	10	22,00	72	0,50
6337911	40141000T032R050	29.18	10,0	10	32,00	89	0,50

(continued)

General Purpose Solid Carbide End Mills • Roughing/Finishing

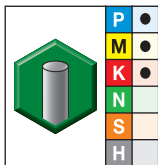
(Series 4004 4014 4024 Series • VariMill GP Radius — continued)



End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3-6	-0,020/-0,038	> 3-6	0/0,008
> 6-10	-0,025/-0,047	> 6-10	0/0,009
> 10-18	-0,032/-0,059	> 10-18	0/0,011
> 18-30	-0,040/-0,073	> 18-30	0/0,013

■ Series 4004 4014 4024 Series • VariMill™ GP Radius

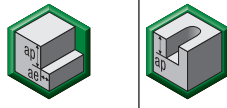
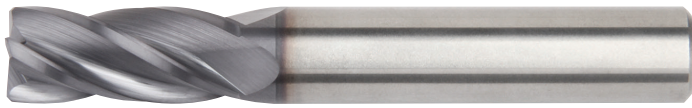


grade TiAlN TiAlN		£	D1	D	length of cut Ap1 max	length L	Rε
order #	catalog #						
6338342	40241000T045R050	34.56	10,0	10	45,00	100	0,50
6337741	40041000T022R100	23.21	10,0	10	22,00	72	1,00
6337912	40141000T032R100	29.18	10,0	10	32,00	89	1,00
6338343	40241000T045R100	34.56	10,0	10	45,00	100	1,00
6337742	40041200T025R050	33.84	12,0	12	25,00	89	0,50
6337913	40141200T045R050	39.54	12,0	12	45,00	100	0,50
6338344	40241200T075R050	45.64	12,0	12	75,00	150	0,50
6337743	40041200T025R100	33.84	12,0	12	25,00	89	1,00
6337914	40141200T045R100	39.54	12,0	12	45,00	100	1,00
6338345	40241200T075R100	45.64	12,0	12	75,00	150	1,00
6337744	40041600T032R050	52.89	16,0	16	32,00	92	0,50
6337915	40141600T056R050	55.10	16,0	16	56,00	110	0,50
6338346	40241600T075R050	65.63	16,0	16	75,00	150	0,50
6337745	40041600T032R100	52.89	16,0	16	32,00	92	1,00
6337916	40141600T056R100	55.10	16,0	16	56,00	110	1,00
6338347	40241600T075R100	65.63	16,0	16	75,00	150	1,00
6338349	40242000T075R050	99.13	20,0	20	75,00	150	0,50

NOTE: Refer to NOVO™ for the complete GP end mill offering.

General Purpose Solid Carbide End Mills • Roughing/Finishing

■ Application Data • Series 4004 4014 4024 • TiAlN • VariMill™ GP

Material Group																					
		Side Milling (A) and Slotting (B)		TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.														
		A		B	Cutting Speed — vc m/min			D1 — Diameter													
		ap	ae	ap	min		max	mm	1,0	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,1 x D	0,5 x D	150	—	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,1 x D	0,5 x D	150	—	200	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	140	—	190	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,1 x D	0,5 x D	120	—	160	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,1 x D	0,5 x D	90	—	150	fz	0,005	0,010	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
M	1	Ap1 max	0,1 x D	0,5 x D	90	—	115	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,1 x D	0,5 x D	60	—	80	fz	0,005	0,009	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	1	Ap1 max	0,1 x D	0,5 x D	120	—	150	fz	0,007	0,014	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,1 x D	0,5 x D	110	—	140	fz	0,006	0,011	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101

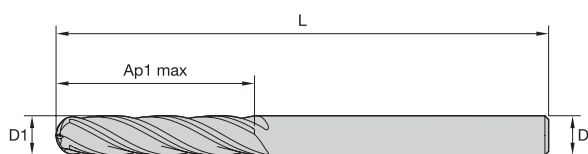
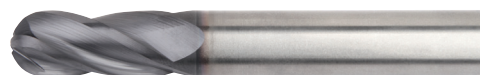
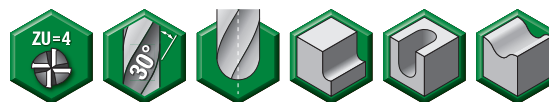
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

General Purpose Solid Carbide End Mills • Roughing/Finishing

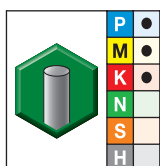
- Centre cutting.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/0,006
> 3-6	-0,020/-0,038	> 3-6	0/0,008
> 6-10	-0,025/-0,047	> 6-10	0/0,009
> 10-18	-0,032/-0,059	> 10-18	0/0,011
> 18-30	-0,040/-0,073	> 18-30	0/0,013

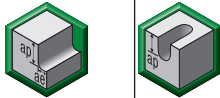
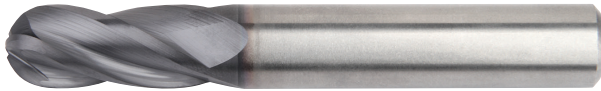
■ Series 4000 4010 • VariMill™ GP



grade TiAlN TiAlN		£	D1	D	length of cut Ap1 max	length L
order #	catalog #					
6231685	40000300T009	11.60	3,0	3	9,50	38
5825556	40000300T020	14.09	3,0	3	20,00	75
5825557	40000400T014	12.84	4,0	4	14,00	50
5825558	40100400T025	17.69	4,0	4	25,00	75
5825559	40000500T016	12.84	5,0	5	16,00	50
5825560	40100500T030	17.69	5,0	5	30,00	75
5825573	40000600T016	12.84	6,0	6	16,00	50
5825574	40100600T019	14.43	6,0	6	19,00	63
5825575	40100600T030	18.33	6,0	6	30,00	75
5825576	40000800T019	17.53	8,0	8	19,00	63
5825577	40100800T040	25.80	8,0	8	40,00	100
5825578	40001000T022	23.23	10,0	10	22,00	72
5825579	40101000T040	35.61	10,0	10	40,00	100
5825580	40001200T025	37.00	12,0	12	25,00	75
5825581	40101200T045	48.23	12,0	12	45,00	150
5825585	40001600T032	52.61	16,0	16	32,00	89
5825586	40101600T065	69.23	16,0	16	65,00	150

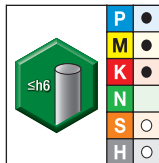
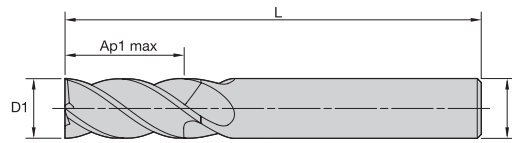
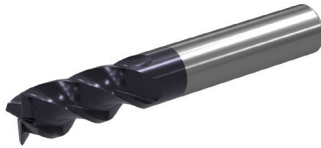
General Purpose Solid Carbide End Mills • Roughing/Finishing

■ Application Data • Series 4000 4010 • TiAlN • VariMill™ GP

Material Group																						
		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.														
		A		B	Cutting Speed — vc m/min				D1 — Diameter													
		ap	ae	ap	min		max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0			
P	0	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114			
	1	Ap1 max	0,1 x D	0,5 x D	150	–	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114			
	2	Ap1 max	0,1 x D	0,5 x D	140	–	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114			
	3	Ap1 max	0,1 x D	0,5 x D	120	–	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101			
	4	Ap1 max	0,1 x D	0,5 x D	90	–	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088			
M	1	Ap1 max	0,1 x D	0,5 x D	90	–	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101			
	2	Ap1 max	0,1 x D	0,5 x D	60	–	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081			
K	1	Ap1 max	0,1 x D	0,5 x D	120	–	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114			
	2	Ap1 max	0,1 x D	0,5 x D	110	–	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101			

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

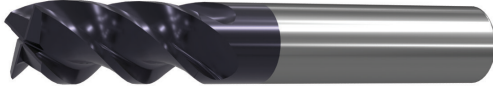
WCE4 • Series W401 • Sharp Edge • 4 Flute • Cylindrical Shank • Metric



● first choice
○ alternate choice

WU20PE		£					Z U
order #	catalog #		D1	D	length of cut Ap1 max	length L	
6945502	W401M03003SZT	13.99	3,0	6	8,00	57	4
6945503	W401M04003SZT	13.99	4,0	6	11,00	57	4
6945504	W401M05003SZT	13.99	5,0	6	13,00	57	4
6945505	W401M06003SZT	13.99	6,0	6	13,00	57	4
6945548	W401M08004SZT	18.08	8,0	8	19,00	63	4
6945549	W401M10005SZT	26.44	10,0	10	22,00	72	4
6945684	W401M12006SZT	37.58	12,0	12	26,00	83	4
6945685	W401M16008SZT	61.88	16,0	16	32,00	92	4
6945686	W401M20009SZT	91.50	20,0	20	38,00	104	4

Application Data • WCE Side Milling • Slotting • Metric

Material Group																				
		Side Milling	Slotting	WU20PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.													
				Cutting Speed — Vc m/min			mm	D1 — Diameter												
				min	Start	max		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	ap1max	0,4 x D1	1,0 x D1	150	175	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	ap1max	0,4 x D1	1,0 x D1	150	175	200	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	ap1max	0,4 x D1	1,0 x D1	140	165	190	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	ap1max	0,4 x D1	1,0 x D1	120	140	160	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	ap1max	0,4 x D1	0,75 x D1	90	120	150	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	ap1max	0,4 x D1	1,0 x D1	60	80	100	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
M	6	ap1max	0,4 x D1	0,75 x D1	50	65	75	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
	1	ap1max	0,4 x D1	1,0 x D1	90	100	115	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	ap1max	0,4 x D1	1,0 x D1	60	70	80	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
K	3	ap1max	0,4 x D1	1,0 x D1	60	65	70	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
	1	ap1max	0,4 x D1	1,0 x D1	120	135	150	fz	0,021	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	ap1max	0,4 x D1	1,0 x D1	110	125	140	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
S	3	ap1max	0,4 x D1	1,0 x D1	110	120	130	fz	0,014	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	1	ap1max	0,4 x D1	0,3 x D1	50	70	90	fz	0,017	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	ap1max	0,4 x D1	0,3 x D1	25	30	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	ap1max	0,4 x D1	1,0 x D1	25	30	40	fz	0,009	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
H	4	ap1max	0,4 x D1	1,0 x D1	50	55	60	fz	0,011	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
	1	ap1max	0,4 x D1	0,75 x D1	80	110	140	fz	0,016	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	ap1max	0,4 x D1	0,5 x D1	70	90	120	fz	0,012	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

WCE • 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.

$$V_{c \text{ new}} = V_c \cdot K_v$$

$$Fz_{\text{new}} = IPT \cdot K_{Fz}$$

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

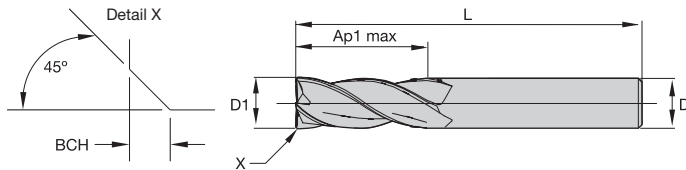
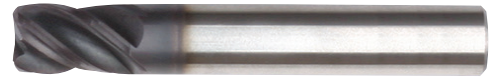
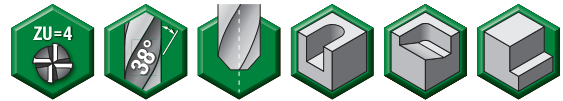
Fz new = 0,089 * 1,7 = 0,15 mm/min

Metric

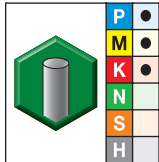
	Ae/D	2%	4%	5%	8%	10%	20%	30%	40%	50%
Speed factor	Kv	2	1,5	1,45	1,4	1,35	1,25	1,2	1	1
Feed factor	KFz	2,4	2,3	2,2	2	1,7	1,25	1,02	1	1

General Purpose Solid Carbide End Mills • Roughing/Finishing

- Centre cutting.
- HPC.
- Standard items listed. Additional styles and coatings made-to-order.



Series 423004 • NINA™



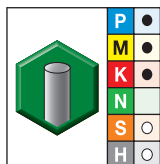
grade K30F-DCHP
AlTiN

order #	catalog #	£	D1	D	length of cut Ap1 max	length L	BCH
3657761	423004-000040	9.15	4,0	6	7,00	38	0,40
3657762	423004-000060	10.34	6,0	6	8,00	38	0,40
3657763	423004-000080	13.08	8,0	8	11,00	43	0,40
3657764	423004-000100	18.80	10,0	10	13,00	50	0,50
3657765	423004-000120	25.26	12,0	12	15,00	55	0,50

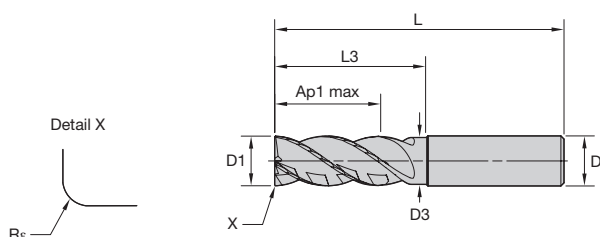
Application Data • Series 423004 • NINA

Material Group																
		Side Milling (A) and Slotting (B)			K30F-DCHP			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.								
					AlTiN											
		A		B	Cutting Speed — vc m/min				D1 — Diameter							
		ap	ae	ap	min	–	max	mm	4,0	5,0	6,0	8,0	10,0	12,0		
P	0	1 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083		
	1	1 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083		
	2	1 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083		
	3	1 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070		
	4	1 x D	0,5 x D	1 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062		
M	1	1 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070		
	2	1 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056		
K	1	1 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083		
	2	1 x D	0,5 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070		
	3	1 x D	0,5 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056		

VariMill XTREME • Series 4XNE • Radiused • 4 Flute • Necked • Cylindrical Shank • Metric



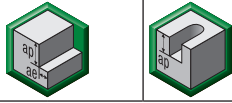
- first choice
○ alternate choice



WS15PE

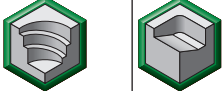
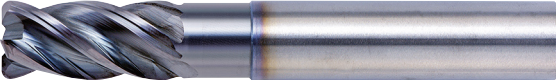
order #	catalog #	£	D1	D	D3	length of cut Ap1 max	L3	length L	Re	ZU
6829317	4XNEM04002RAT	28.35	4,0	6	3,76	8,00	12,00	57	0,20	4
6829318	4XNEM04002RET	28.35	4,0	6	3,76	8,00	12,00	57	0,50	4
6829692	4XNEM05002RAT	27.41	5,0	6	4,70	10,00	15,00	57	0,20	4
6829693	4XNEM05002RET	27.41	5,0	6	4,70	10,00	15,00	57	0,50	4
6829697	4XNEM06002RAT	28.35	6,0	6	5,64	12,00	18,00	57	0,20	4
6829698	4XNEM06002RET	28.35	6,0	6	5,64	12,00	18,00	57	0,50	4
6829699	4XNEM06002RJT	28.35	6,0	6	5,64	12,00	18,00	57	1,00	4
6829883	4XNEM08003RAT	36.64	8,0	8	7,52	16,00	24,00	63	0,20	4
6829884	4XNEM08003RET	36.64	8,0	8	7,52	16,00	24,00	63	0,50	4
6829885	4XNEM08003RJT	36.64	8,0	8	7,52	16,00	24,00	63	1,00	4
6829886	4XNEM08003RKT	36.64	8,0	8	7,52	16,00	24,00	63	1,50	4
6829890	4XNEM10004RCT	54.60	10,0	10	9,40	20,00	30,00	72	0,30	4
6830071	4XNEM10004RET	54.60	10,0	10	9,40	20,00	30,00	72	0,50	4
6830072	4XNEM10004RJT	54.60	10,0	10	9,40	20,00	30,00	72	1,00	4
6830073	4XNEM10004RKT	54.60	10,0	10	9,40	20,00	30,00	72	1,50	4
6830077	4XNEM12005RET	80.25	12,0	12	11,28	24,00	36,00	83	0,50	4
6830079	4XNEM12005RKT	80.25	12,0	12	11,28	24,00	36,00	83	1,50	4
6830080	4XNEM12005RMT	80.25	12,0	12	11,28	24,00	36,00	83	2,00	4
6830281	4XNEM12005RPT	80.25	12,0	12	11,28	24,00	36,00	83	3,00	4
6830286	4XNEM16006RET	122.63	16,0	16	15,04	32,00	48,00	92	0,50	4
6830288	4XNEM16006RKT	122.63	16,0	16	15,04	32,00	48,00	92	1,50	4
6830289	4XNEM16006RPT	122.63	16,0	16	15,04	32,00	48,00	92	3,00	4
6830471	4XNEM16006RQT	122.63	16,0	16	15,04	32,00	48,00	92	4,00	4
6830474	4XNEM20007RET	170.63	20,0	20	18,80	40,00	60,00	115	0,50	4
6830476	4XNEM20007RKT	170.63	20,0	20	18,80	40,00	60,00	115	1,50	4
6830477	4XNEM20007RPT	170.63	20,0	20	18,80	40,00	60,00	115	3,00	4
6830478	4XNEM20007RRT	170.63	20,0	20	18,80	40,00	60,00	115	5,00	4

VariMill XTREME • Side Milling and Slotting • Application Data • WS15PE • Metric

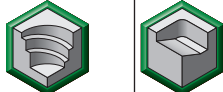
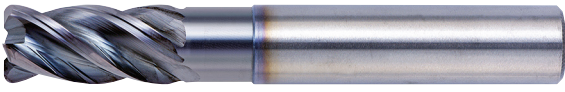
Material Group																							
	Side Milling (A) and Slotting (B)						Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.																
	A		B	WS15PE Cutting Speed — vc m/min			D1 — Diameter																
	ap	ae	ap	min	Start	max	mm	3,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0				
P	0	1,5 x 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			
M	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			
	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			
K	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			
	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			
S	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			
	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			
H	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			
	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			

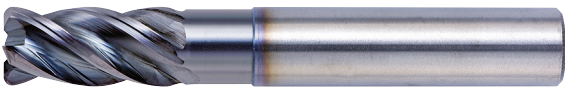
NOTE: See page 23 for more information on VariMill XTREME adjustment factors for feed calculations.

VariMill XTREME • Ramping • Application Data • WS15PE • 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]															
	Max Depth	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	1,25 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			
M	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			
	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			
K	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			
	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			
S	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			
	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			
H	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			
	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			

VariMill XTREME • Ramping • Application Data • WS15PE • Metric

Material Group		Max Depth	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]													
			min	Start	max	mm min– max	3,0 3,5– 5,7	4,0 4,6– 7,6	5,0 5,8– 9,5	6,0 6,9– 11,4	8,0 9,2– 15,2	10,0 11,5– 19,0	12,0 13,8– 22,8	14,0 16,1– 26,6	16,0 18,4– 30,4	18,0 20,7– 34,2	20,0 23,0– 38,0	25,0 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	
M	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	
	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	
K	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	
	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	
S	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	
	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	
H	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	
	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	

Material Group	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]														
	Max Depth	min	Start	max	mm min– max	3,0 3,5– 5,7	4,0 4,6– 7,6	5,0 5,8– 9,5	6,0 6,9– 11,4	8,0 9,2– 15,2	10,0 11,5– 19,0	12,0 13,8– 22,8	14,0 16,1– 26,6	16,0 18,4– 30,4	18,0 20,7– 34,2	20,0 23,0– 38,0	25,0 28,8– 47,5		
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 • Plunging/Drilling • Application Data • WS15PE • Metric

Material Group																					
	Plunging/Drilling						Recommended feed per revolution (fn =mm/rev) for plunging and drilling														
				WS15PE			D1 – Diameter														
				Cutting Speed – vc m/min																	
	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	
M	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	
	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	
K	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	
	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	
S	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	
	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	
H	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	
	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 • Adjustment Factor Table for Feed Calculation

Metric

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

$$Vc_{new} = Vc \cdot Kv$$

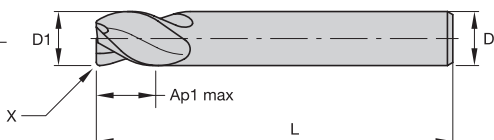
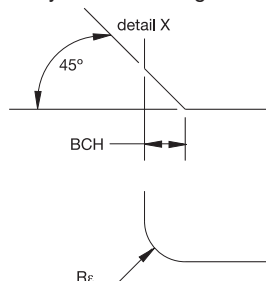
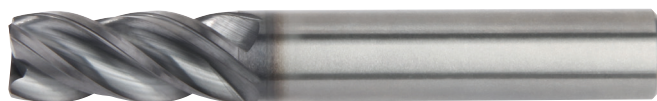
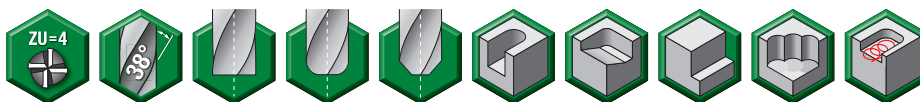
$$Fz_{new} = IPT \cdot KFz$$

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:
 $Vc_{new} = 80 \cdot 1,35 = 108 \text{ m/min}$
 $Fz_{new} = 0,089 \cdot 1,7 = 0,15 \text{ mm/min}$

	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

- Unequal flute spacing.
- Centre cutting.
- Single tool for both roughing and finishing operations requiring fewer setups.
- Standard items listed. Additional styles and coatings made-to-order.

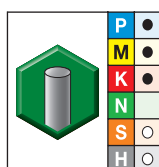


End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/-0,006
> 3-6	-0,020/-0,038	> 3-6	0/-0,008
> 6-10	-0,025/-0,047	> 6-10	0/-0,009
> 10-18	-0,032/-0,059	> 10-18	0/-0,011
> 18-30	-0,040/-0,073	> 18-30	0/-0,013

**WIDIA
VICTORY**

■ Series 4777 • VariMill I™ • Victory™ Grades



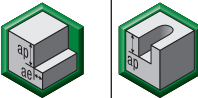
grade WP15PE
AlTiN

order #	catalog #	£	D1	D	length of cut Ap1 max	length L	Rε	BCH
5576751	477704002T	19.30	4,0	6	12,00	55	—	0,40
5576753	477704001T	20.64	4,0	6	12,00	55	0,20	—
5576754	4777040Z2T	22.22	4,0	6	12,00	55	—	—
5576755	477705002T	20.01	5,0	6	13,00	57	—	0,40
5576757	477705012T	20.64	5,0	6	13,00	57	0,20	—
5576758	4777050Z2T	22.22	5,0	6	13,00	57	—	—
5576759	477706002T	21.69	6,0	6	13,00	57	—	0,40
5576761	477706012T	20.64	6,0	6	13,00	57	0,20	—
5576762	4777060Z2T	22.22	6,0	6	13,00	57	—	—
5576767	477708003T	30.70	8,0	8	16,00	63	—	0,40
5576769	477708013T	31.34	8,0	8	16,00	63	0,20	—
5576770	4777080Z3T	29.78	8,0	8	16,00	63	—	—
5576775	477710004T	40.98	10,0	10	22,00	72	—	0,50
5576777	477710024T	45.04	10,0	10	22,00	72	0,30	—
5576778	4777100Z4T	42.95	10,0	10	22,00	72	—	—
5576790	477712005T	55.35	12,0	12	26,00	83	—	0,50
5576792	477712025T	60.09	12,0	12	26,00	83	0,30	—
5576793	4777120Z5T	59.61	12,0	12	26,00	83	—	—
5576796	477716006T	89.92	16,0	16	32,00	92	—	0,50
5576798	477716026T	97.98	16,0	16	32,00	92	0,30	—
5576799	4777160Z6T	95.02	16,0	16	32,00	92	—	—
5576812	477720007T	130.96	20,0	20	38,00	104	—	0,50
5576814	47772002T	145.12	20,0	20	38,00	104	0,30	—

High-Performance Solid Carbide End Mills • VariMill™

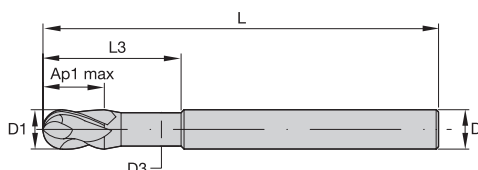
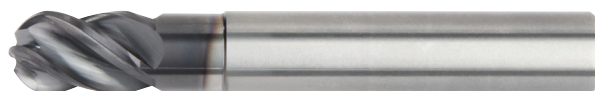
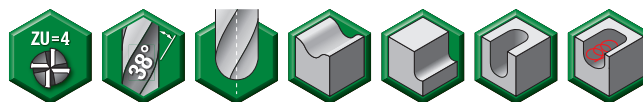
■ Application Data • Series 4777 • VariMill I™ • Victory™ Grades



Material Group																					
		Side Milling (A) and Slotting (B)			WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A), For slotting (B), reduce fz by 20%,													
								D1 — Diameter													
		A		B	Cutting Speed — vc m/min																
ap		ae	ap	min		max	mm	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	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124		
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124		
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124		
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114		
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098		
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091		
M	6	1,5 x D	0,5 x D	0,75 x D	50	–	75	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071		
	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114		
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091		
K	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071		
	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124		
	2	1,5 x D	0,5 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114		
S	3	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091		
	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114		
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061		
	3	1,5 x D	0,5 x D	1 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061		
H	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084		
	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098		

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

- Unequal flute spacing.
- Centre cutting.
- Single tool for both roughing and finishing operations requiring fewer setups.
- Standard items listed. Additional styles and coatings made-to-order.

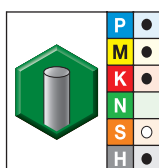


End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/-0,006
> 3-6	-0,020/-0,038	> 3-6	0/-0,008
> 6-10	-0,025/-0,047	> 6-10	0/-0,009
> 10-18	-0,032/-0,059	> 10-18	0/-0,011
> 18-30	-0,040/-0,073	> 18-30	0/-0,013



■ Series 47N0 • VariMill I™ • Ball Nose • Victory™ Grades



grade WP15PE
AlTiN

order #	catalog #	£	D1	D	D3	length of cut Ap1 max	L3	length L
5576818	47N005002T	22.91	5,0	6	4,70	9,00	15,00	57
5576819	47N006002T	24.02	6,0	6	5,64	10,00	15,00	57
5576820	47N008003T	36.26	8,0	8	7,52	12,00	20,00	63
5576821	47N010004T	49.67	10,0	10	9,40	14,00	25,00	72
5576822	47N012005T	63.36	12,0	12	11,28	16,00	30,00	83
5576823	47N016006T	104.65	16,0	16	15,04	22,00	38,00	92
5576824	47N020007T	179.43	20,0	20	18,80	26,00	50,00	104

High-Performance Solid Carbide End Mills • VariMill™

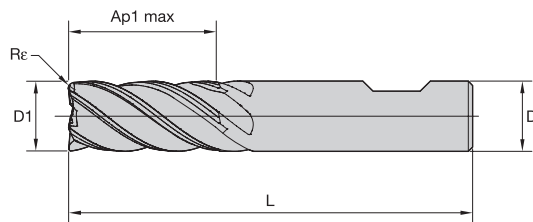
■ Application Data • Series 47N0 • With Neck • VariMill I™ • Victory™ Grades



Material Group																	
		Side Milling (A) and Slotting (B)			WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.									
		A		B	Cutting Speed – vc m/min			D1 – Diameter									
		ap	ae	ap	min		max	mm	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,25 x D	0,5 x D	1 x D	150	–	200	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1,25 x D	0,5 x D	1 x D	150	–	200	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,5 x D	1 x D	140	–	190	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1,25 x D	0,5 x D	1 x D	120	–	160	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1,25 x D	0,5 x D	0,75 x D	90	–	150	fz	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1,25 x D	0,5 x D	1 x D	60	–	100	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
M	6	1,25 x D	0,5 x D	0,75 x D	50	–	75	fz	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
	1	1,25 x D	0,5 x D	1 x D	90	–	115	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,25 x D	0,5 x D	1 x D	60	–	80	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	3	1,25 x D	0,5 x D	1 x D	60	–	70	fz	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
	1	1,25 x D	0,5 x D	1 x D	120	–	150	fz	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,25 x D	0,5 x D	1 x D	110	–	140	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
S	3	1,25 x D	0,5 x D	1 x D	110	–	130	fz	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	1	1 x D	0,3 x D	0,3 x D	50	–	90	fz	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1,25 x D	0,5 x D	1 x D	25	–	40	fz	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
H	4	1,25 x D	0,5 x D	1 x D	50	–	60	fz	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
	1	1,25 x D	0,5 x D	0,75 x D	80	–	140	fz	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
 Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

- Unequal flute spacing.
- Centre cutting.
- Single tool for both roughing and finishing operations requiring fewer setups.
- Slotting up to 1 x D.
- Standard items listed. Additional styles and coatings made-to-order.

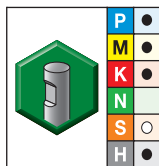


End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/-0,006
> 3-6	-0,020/-0,038	> 3-6	0/-0,008
> 6-10	-0,025/-0,047	> 6-10	0/-0,009
> 10-18	-0,032/-0,059	> 10-18	0/-0,011
> 18-30	-0,040/-0,073	> 18-30	0/-0,013



■ Series 577C • VariMill II™ • With Centre Cut • Victory™ Grades



grade WP15PE
AlTiN

order #	catalog #	£	D1	D	length of cut Ap1 max	length L	Re
5578867	577C04002W	26.84	4,0	6	11,00	55	0,25
5578991	577C05002W	27.09	5,0	6	13,00	57	0,25
5578993	577C06002W	29.24	6,0	6	13,00	57	0,40
5578998	577C08003W	39.09	8,0	8	19,00	63	0,50
5579024	577C10004W	49.68	10,0	10	22,00	72	0,50
5579027	577C12005W	65.86	12,0	12	26,00	83	0,75
5579043	577C16006W	110.17	16,0	16	32,00	92	0,75
5579048	577C20007W	160.37	20,0	20	38,00	104	0,75
5579061	577C25008W	244.22	25,0	25	45,00	121	0,75

High-Performance Solid Carbide End Mills • VariMill™

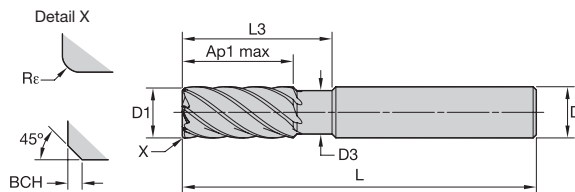
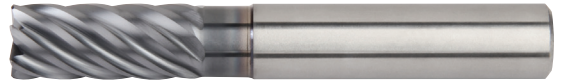
■ Application Data • Series 577C • VariMill II™ • Victory™ Grades



Material Group						Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.											
		Side Milling (A) and Slotting (B)		WP15PE													
		A		B	Cutting Speed — vc m/min		D1 — Diameter										
		ap	ae	ap	min	max	mm	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0	
P	0	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	3	1,5 x D	0,5 x D	1 x D	120	–	160	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	4	1,5 x D	0,5 x D	0,75 x D	90	–	150	fz	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	5	1,5 x D	0,5 x D	1 x D	60	–	100	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
M	1	1,5 x D	0,5 x D	1 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,5 x D	1 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1,5 x D	0,5 x D	1 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
K	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124
	2	1,5 x D	0,5 x D	1 x D	110	–	140	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	3	1,5 x D	0,5 x D	1 x D	110	–	130	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
S	1	1,5 x D	0,3 x D	0,3 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1,5 x D	0,3 x D	1 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1,5 x D	0,5 x D	1 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084
H	1	1,5 x D	0,5 x D	0,75 x D	80	–	140	fz	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098
	2	1,5 x D	0,2 x D	0,5 x D	70	–	120	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

- Unequal flute spacing.
- Centre cutting.
- Optimised for difficult-to-machine workpiece materials.
- Semi-finishing to finishing applications.
- High-speed machining capability.
- Standard items listed. Additional styles and coatings made-to-order.

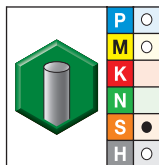


End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/-0,006
> 3-6	-0,020/-0,038	> 3-6	0/-0,008
> 6-10	-0,025/-0,047	> 6-10	0/-0,009
> 10-18	-0,032/-0,059	> 10-18	0/-0,011
> 18-30	-0,040/-0,073	> 18-30	0/-0,013



■ Series 77NE • VariMill III™ ER • With Neck • Victory™ Grades



WS15PE
AlTiN

order #	catalog #	£	D1	D	D3	length of cut Ap1 max	L3	length L	Re	BCH
5978039	77NE10004T	67.64	10,0	10	9,40	22,00	30,00	76	—	0,50
5978040	77NE10024T	70.71	10,0	10	9,40	22,00	30,00	76	0,50	—
5978096	77NE12005T	84.23	12,0	12	11,28	26,00	36,00	83	—	0,50
5978097	77NE12025T	92.55	12,0	12	11,28	26,00	36,00	83	0,50	—
5978104	77NE16006T	129.91	16,0	16	15,04	32,00	48,00	100	—	0,50
5978105	77NE16026T	136.59	16,0	16	15,04	32,00	48,00	100	0,50	—
5978112	77NE20007T	177.61	20,0	20	18,80	38,00	60,00	115	—	0,50
5978113	77NE20027T	186.48	20,0	20	18,80	38,00	60,00	115	0,50	—

High-Performance Solid Carbide End Mills • VariMill™

■ Application Data • Series 77NE • VariMill III™ ER • With Neck • Semi-Finishing • Victory™ Grades



Material Group												
		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).					
		A		Cutting Speed — vc m/min				D1 — Diameter				
		ap	ae	min		max	mm	10,0	12,0	16,0	18,0	20,0
P	4	Ap1 max	0,3 x D	90	–	150	fz	0,054	0,062	0,077	0,083	0,088
	5	Ap1 max	0,3 x D	60	–	100	fz	0,048	0,056	0,070	0,076	0,081
M	1	Ap1 max	0,3 x D	90	–	115	fz	0,061	0,070	0,087	0,095	0,101
	2	Ap1 max	0,3 x D	60	–	80	fz	0,048	0,056	0,070	0,076	0,081
	3	Ap1 max	0,3 x D	60	–	70	fz	0,040	0,047	0,057	0,061	0,065
S	1	Ap1 max	0,3 x D	50	–	90	fz	0,061	0,070	0,087	0,095	0,101
	2	Ap1 max	0,3 x D	25	–	40	fz	0,032	0,037	0,046	0,050	0,054
	3	Ap1 max	0,3 x D	25	–	40	fz	0,032	0,037	0,046	0,050	0,054
	4	Ap1 max	0,3 x D	50	–	60	fz	0,045	0,052	0,064	0,069	0,074
H	1	Ap1 max	0,3 x D	80	–	140	fz	0,054	0,062	0,077	0,083	0,088
	2	Ap1 max	0,3 x D	70	–	120	fz	0,040	0,047	0,057	0,061	0,065

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

■ Application Data • Series 77NE • VariMill III ER • With Neck • Finishing • Victory Grades



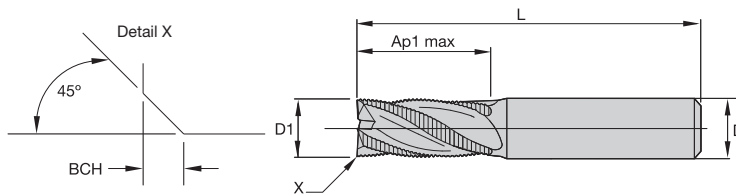
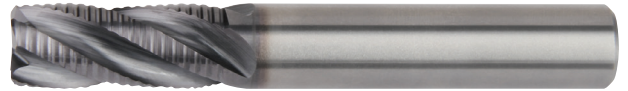
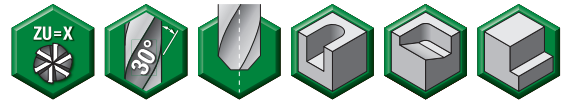
Material Group												
		Side Milling (A)		WS15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).					
		A		Cutting Speed — vc m/min				D1 — Diameter				
		ap	ae	min		max	mm	10,0	12,0	16,0	18,0	20,0
P	4	Ap1 max	0,06 x D	180	–	300	fz	0,065	0,075	0,092	0,099	0,106
	5	Ap1 max	0,06 x D	120	–	200	fz	0,058	0,067	0,084	0,091	0,097
M	1	Ap1 max	0,06 x D	180	–	230	fz	0,073	0,084	0,105	0,113	0,121
	2	Ap1 max	0,06 x D	120	–	160	fz	0,058	0,067	0,084	0,091	0,097
	3	Ap1 max	0,06 x D	120	–	140	fz	0,048	0,056	0,068	0,073	0,078
S	1	Ap1 max	0,06 x D	100	–	180	fz	0,073	0,084	0,105	0,113	0,121
	2	Ap1 max	0,06 x D	50	–	80	fz	0,038	0,045	0,056	0,060	0,065
	3	Ap1 max	0,06 x D	120	–	160	fz	0,058	0,067	0,084	0,091	0,097
	4	Ap1 max	0,06 x D	100	–	120	fz	0,053	0,062	0,077	0,083	0,089
H	1	Ap1 max	0,06 x D	160	–	280	fz	0,065	0,075	0,092	0,099	0,106
	2	Ap1 max	0,06 x D	140	–	240	fz	0,048	0,056	0,068	0,073	0,078

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

- Centre cutting.
- Flat shallow pitch.
- Standard items listed. Additional styles and coatings made-to-order.

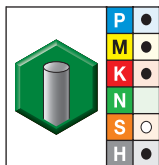


End Mill Tolerances

D1	tolerance d11	D	tolerance h6 + / -
≤ 3	-0,020/-0,080	≤ 3	0/-0,006
> 3-6	-0,030/-0,105	> 3-6	0/-0,008
> 6-10	-0,040/-0,130	> 6-10	0/-0,009
> 10-18	-0,050/-0,160	> 10-18	0/-0,011
> 18-30	-0,065/-0,195	> 18-30	0/-0,013



■ Series 4976 • Victory™ Grades



grade WP15PE
AlTiN

order #	catalog #	£	D1	D	length of cut Ap1 max	length L	BCH	ZU
5560708	497604002T	49.02	4,0	6	8,00	57	0,30	3
5560709	497605002T	49.02	5,0	6	13,00	57	0,30	3
5560710	497606002T	49.02	6,0	6	13,00	57	0,30	3
5560711	497608003T	53.51	8,0	8	16,00	63	0,30	3
5560712	497610004T	67.37	10,0	10	22,00	72	0,50	4
5560713	497612005T	78.28	12,0	12	26,00	83	0,50	4
5560715	497616006T	136.72	16,0	16	32,00	92	0,50	4
5560717	497620007T	200.39	20,0	20	38,00	104	0,50	4

High-Performance Solid Carbide End Mills • Roughing

■ Application Data • Series 4976 • Victory™ Grades

WIDIA
VICTORY

Material Group																				
		Side Milling (A) and Slotting (B)			WP15PE		Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.													
							D1 — Diameter													
		A		B		Cutting Speed — vc m/min														
ap		ae		ap		min		max	mm	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	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124	
	1	1,5 x D	0,5 x D	1 x D	150	–	200	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124	
	2	1,5 x D	0,5 x D	1 x D	140	–	190	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124	
	3	1,5 x D	0,4 x D	0,75 x D	120	–	160	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114	
	4	1,5 x D	0,4 x D	0,75 x D	90	–	150	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098	
M	5	1,5 x D	0,4 x D	0,75 x D	60	–	100	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091	
	1	1,5 x D	0,4 x D	0,75 x D	90	–	115	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114	
	2	1,5 x D	0,4 x D	0,75 x D	60	–	80	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091	
K	3	1,5 x D	0,4 x D	0,75 x D	60	–	70	fz	0,016	0,020	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071	
	1	1,5 x D	0,5 x D	1 x D	120	–	150	fz	0,028	0,036	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114	0,124	
	2	1,5 x D	0,4 x D	1 x D	110	–	140	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114	
S	3	1,5 x D	0,4 x D	1 x D	110	–	130	fz	0,019	0,024	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091	
	1	1,5 x D	0,3 x D	0,75 x D	50	–	90	fz	0,023	0,030	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114	
	2	1,5 x D	0,3 x D	0,3 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061	
	3	1,5 x D	0,4 x D	0,75 x D	25	–	40	fz	0,013	0,016	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061	
H	4	1,5 x D	0,3 x D	0,75 x D	50	–	60	fz	0,016	0,021	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084	
	1	1,5 x D	0,3 x D	0,3 x D	80	–	140	fz	0,021	0,027	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088	0,098	

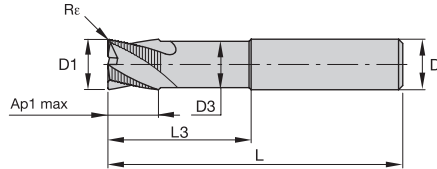
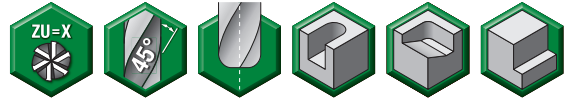
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

High-Performance Solid Carbide End Mills • Roughing

- Centre cutting.
- Flat shallow pitch.
- Unequal flute spacing.
- Standard items listed. Additional styles and coatings made-to-order.

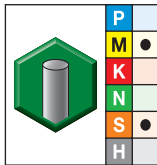


End Mill Tolerances

D1	tolerance d11	D	tolerance h6 + / -
≤ 3	-0,020/-0,080	≤ 3	0/-0,006
> 3-6	-0,030/-0,105	> 3-6	0/-0,008
> 6-10	-0,040/-0,130	> 6-10	0/-0,009
> 10-18	-0,050/-0,160	> 10-18	0/-0,011
> 18-30	-0,065/-0,195	> 18-30	0/-0,013



4U50 Series • Victory™ Grades



grade AITiN-MT AITiN		£	D1	D	D3	length of cut Ap1 max	L3	length L	Re	ZU
order #	catalog #									
6431403	4U50M060R2TC	43.14	6,0	6	5,64	6,00	18,00	57	0,30	4
6431404	4U50M080R3TC	50.39	8,0	8	7,52	8,00	24,00	63	0,30	4
6431405	4U50M100R4TE	64.08	10,0	10	9,40	10,00	30,00	72	0,50	4
6431406	4U50M120R5TE	74.15	12,0	12	11,28	12,00	36,00	83	0,50	4
6431407	4U50M160R6TE	107.69	16,0	16	15,04	16,00	48,00	92	0,50	6
6431408	4U50M200R7TG	149.96	20,0	20	18,80	20,00	60,00	104	1,00	6
6431409	4U50M250R8TG	202.63	25,0	25	23,50	25,00	75,00	121	1,00	6

Application Data • 4U50 Series



Material Group																	
		Side Milling (A) and Slotting (B)			AITiN-MT			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.									
		A		B	Cutting Speed — Vc m/min				D1 — Diameter								
		ap	ae	ap	min		max	mm	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
M	1	0,8 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	0,8 x D	0,4 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	0,8 x D	0,4 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	0,8 x D	0,4 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	0,8 x D	0,25 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	0,8 x D	0,4 x D	0,75 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	0,8 x D	0,3 x D	0,3 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

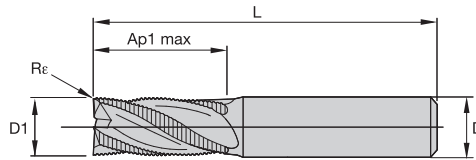
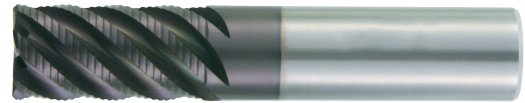
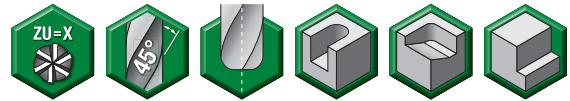
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters greater than 12mm.



High-Performance Solid Carbide End Mills • Roughing

- Centre cutting.
- Flat shallow pitch.
- Unequal flute spacing.
- Standard items listed. Additional styles and coatings made-to-order.

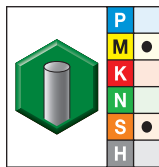


End Mill Tolerances

D1	tolerance d11	D	tolerance h6 + / -
≤ 3	-0,020/-0,080	≤ 3	0/-0,006
> 3-6	-0,030/-0,105	> 3-6	0/-0,008
> 6-10	-0,040/-0,130	> 6-10	0/-0,009
> 10-18	-0,050/-0,160	> 10-18	0/-0,011
> 18-30	-0,065/-0,195	> 18-30	0/-0,013



4U80 Series • Victory™ Grades



grade AlTiN-MT AlTiN		£	D1	D	length of cut Ap1 max	length L	Re	ZU
order #	catalog #							
6431246	4U80M060R2TC	45.36	6,0	6	13,00	57	0,30	4
6431247	4U80M080R3TC	53.14	8,0	8	16,00	63	0,30	4
6431248	4U80M100R4TE	66.16	10,0	10	22,00	72	0,50	4
6431249	4U80M120R5TE	77.83	12,0	12	26,00	83	0,50	4
6431250	4U80M160R6TE	114.06	16,0	16	32,00	92	0,50	6
6431401	4U80M200R7TG	158.34	20,0	20	38,00	104	1,00	6
6431402	4U80M250R8TG	213.36	25,0	25	45,00	121	1,00	6

Application Data • 4U80 Series



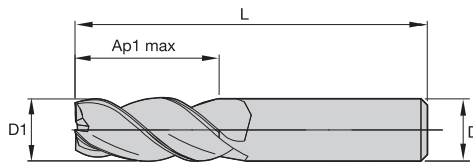
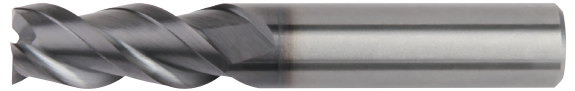
Material Group																	
		Side Milling (A) and Slotting (B)			AlTiN-MT			Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.									
		A		B	Cutting Speed — Vc m/min				D1 — Diameter								
		ap	ae	ap	min		max	mm	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0
M	1	1 x D	0,5 x D	0,75 x D	90	–	115	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1 x D	0,5 x D	0,75 x D	60	–	80	fz	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081	0,091
	3	1 x D	0,5 x D	0,75 x D	60	–	70	fz	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065	0,071
S	1	1 x D	0,3 x D	0,75 x D	50	–	90	fz	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101	0,114
	2	1 x D	0,3 x D	0,3 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	3	1 x D	0,4 x D	0,75 x D	25	–	40	fz	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054	0,061
	4	1 x D	0,4 x D	0,75 x D	50	–	60	fz	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074	0,084

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on diameters greater than 12mm.

- Centre cutting.
- Standard items listed. Additional styles and coatings made-to-order.
- Sharp corners.

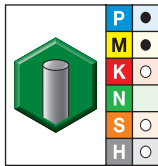


End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/-0,006
> 3-6	-0,020/-0,038	> 3-6	0/-0,008
> 6-10	-0,025/-0,047	> 6-10	0/-0,009
> 10-18	-0,032/-0,059	> 10-18	0/-0,011
> 18-30	-0,040/-0,073	> 18-30	0/-0,013



■ Series 4503 JJ • Victory™ Grades



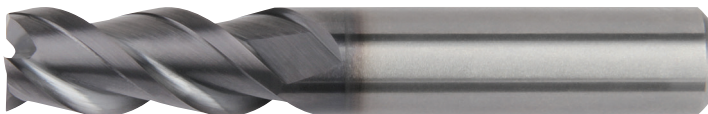
grade WP15PE
AlTiN

order #	catalog #	£	D1	D	length of cut Ap1 max	length L
5559170	450301001T	13.37	1,0	4	3,00	50
5559172	450302001T	13.81	2,0	4	3,00	50
5559175	450303002T	14.78	3,0	6	8,00	50
5559177	450304002T	16.89	4,0	6	12,00	50
5559179	450305002T	14.72	5,0	6	14,00	50
5559180	450306002T	13.91	6,0	6	16,00	50
5559181	450308003T	19.75	8,0	8	20,00	63
5559182	450310004T	34.40	10,0	10	22,00	76
5559183	450312005T	52.93	12,0	12	25,00	76
5559184	450316006T	82.39	16,0	16	32,00	89
5559185	450320007T	137.67	20,0	20	38,00	104

High-Performance Solid Carbide End Mills • Finishing

■ Application Data • Series 4503 JJ • Victory™ Grades

WIDIA
VICTORY

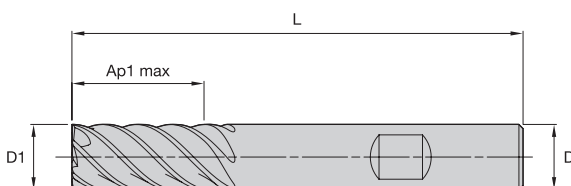
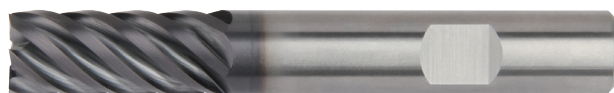
Material Group																							
		Side Milling (A) and Slotting (B)			WP15PE		Recommended feed per tooth (fz = mm/th) for side milling (A). For slotting (B), reduce fz by 20%.																
		A		B	Cutting Speed — vc m/min			D1 — Diameter															
ap	ae	ap	min	max	mm	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	6,0	8,0	10,0	12,0	16,0	18,0	20,0		
P	0	1,5 x D	0,3 x D	0,5 x D	150	– 200	fz	0,007	0,010	0,014	0,017	0,021	0,025	0,028	0,032	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	1	1,5 x D	0,3 x D	0,5 x D	150	– 200	fz	0,007	0,010	0,014	0,017	0,021	0,025	0,028	0,032	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	2	1,5 x D	0,3 x D	0,5 x D	140	– 190	fz	0,007	0,010	0,014	0,017	0,021	0,025	0,028	0,032	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	3	1,5 x D	0,3 x D	0,5 x D	120	– 160	fz	0,006	0,008	0,011	0,014	0,017	0,020	0,023	0,027	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	4	1,5 x D	0,3 x D	0,3 x D	90	– 150	fz	0,005	0,008	0,010	0,013	0,016	0,019	0,021	0,024	0,027	0,033	0,045	0,054	0,062	0,077	0,083	0,088
	5	1,5 x D	0,3 x D	0,5 x D	60	– 100	fz	0,005	0,007	0,009	0,012	0,014	0,017	0,019	0,022	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
M	6	1,5 x D	0,3 x D	0,3 x D	50	– 75	fz	0,004	0,006	0,008	0,010	0,012	0,014	0,016	0,018	0,020	0,025	0,034	0,040	0,047	0,057	0,061	0,065
	1	1,5 x D	0,3 x D	0,5 x D	90	– 115	fz	0,006	0,008	0,011	0,014	0,017	0,020	0,023	0,027	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	2	1,5 x D	0,3 x D	0,5 x D	60	– 80	fz	0,005	0,007	0,009	0,012	0,014	0,017	0,019	0,022	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
K	3	1,5 x D	0,3 x D	0,5 x D	60	– 70	fz	0,004	0,006	0,008	0,010	0,012	0,014	0,016	0,018	0,020	0,025	0,034	0,040	0,047	0,057	0,061	0,065
	1	1,5 x D	0,3 x D	0,5 x D	120	– 150	fz	0,007	0,010	0,014	0,017	0,021	0,025	0,028	0,032	0,036	0,044	0,060	0,072	0,083	0,101	0,108	0,114
	2	1,5 x D	0,3 x D	0,5 x D	110	– 140	fz	0,006	0,008	0,011	0,014	0,017	0,020	0,023	0,027	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
S	3	1,5 x D	0,3 x D	0,5 x D	110	– 130	fz	0,005	0,007	0,009	0,012	0,014	0,017	0,019	0,022	0,024	0,029	0,040	0,048	0,056	0,070	0,076	0,081
	1	1,5 x D	0,3 x D	0,3 x D	50	– 90	fz	0,006	0,008	0,011	0,014	0,017	0,020	0,023	0,027	0,030	0,036	0,050	0,061	0,070	0,087	0,095	0,101
	2	1,5 x D	0,3 x D	0,3 x D	25	– 40	fz	0,003	0,005	0,006	0,008	0,009	0,011	0,013	0,014	0,016	0,019	0,026	0,032	0,037	0,046	0,050	0,054
	3	1,5 x D	0,3 x D	0,5 x D	25	– 40	fz	0,005	0,007	0,009	0,012	0,009	0,017	0,013	0,022	0,016	0,019	0,026	0,032	0,037	0,046	0,050	0,054
H	4	1,5 x D	0,3 x D	0,5 x D	50	– 60	fz	0,003	0,005	0,007	0,009	0,011	0,014	0,016	0,018	0,021	0,026	0,037	0,045	0,052	0,064	0,069	0,074
	1	1,5 x D	0,3 x D	0,3 x D	80	– 140	fz	0,005	0,008	0,010	0,013	0,016	0,019	0,021	0,024	0,027	0,033	0,045	0,054	0,062	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.

Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

Above parameters are based on ideal conditions. For smaller taper machining centres, please adjust parameters accordingly on >12mm diameters.

- Centre cutting.
- Standard items listed. Additional styles and coatings made-to-order.

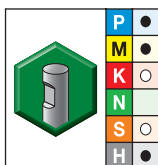


End Mill Tolerances

D1	tolerance e8	D	tolerance h6 + / -
≤ 3	-0,014/-0,028	≤ 3	0/-0,006
> 3-6	-0,020/-0,038	> 3-6	0/-0,008
> 6-10	-0,025/-0,047	> 6-10	0/-0,009
> 10-18	-0,032/-0,059	> 10-18	0/-0,011
> 18-30	-0,040/-0,073	> 18-30	0/-0,013



■ Series D507 D517 • Victory™ Grades



grade WP15PE
AlTiN

order #	catalog #	£	D1	D	length of cut Ap1 max	length L
5559100	D50706002W	18.91	6,0	6	10,00	54
5559108	D51706002W	20.62	6,0	6	13,00	57
5559101	D50708003W	25.98	8,0	8	12,00	58
5559109	D51708003W	26.33	8,0	8	19,00	63
5559102	D50710004W	33.74	10,0	10	14,00	66
5559110	D51710004W	43.15	10,0	10	22,00	72
5559103	D50712005W	40.71	12,0	12	16,00	73
5559111	D51712005W	52.24	12,0	12	26,00	83
5559105	D50716006W	76.18	16,0	16	22,00	82
5559113	D51716006W	99.65	16,0	16	32,00	92
5559107	D50720007W	114.66	20,0	20	26,00	92
5559115	D51720007W	136.18	20,0	20	38,00	104

High-Performance Solid Carbide End Mills • Finishing

■ Application Data • Series D507 • Victory™ Grades



Material Group																
		Side Milling (A)		WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).									
		A		Cutting Speed – vc m/min				D1 – Diameter								
		ap	ae	min		max	mm	4,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	1,0 x D	0,2 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	1,0 x D	0,2 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,0 x D	0,2 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	1,0 x D	0,1 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	1,0 x D	0,1 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	1,0 x D	0,1 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
M	6	1,0 x D	0,1 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
	1	1,0 x D	0,1 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,0 x D	0,1 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	3	1,0 x D	0,1 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
	1	1,0 x D	0,1 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	1,0 x D	0,1 x D	110	–	140	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
S	3	1,0 x D	0,1 x D	110	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	1	1,0 x D	0,1 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	1,0 x D	0,1 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	1,0 x D	0,15 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
H	4	1,0 x D	0,15 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
	1	1,0 x D	0,1 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

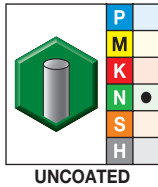
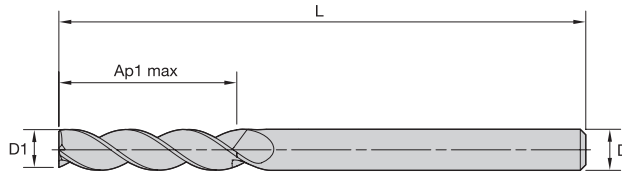
NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

■ Application Data • Series D517 • Victory Grades



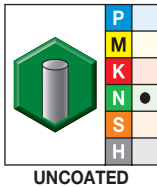
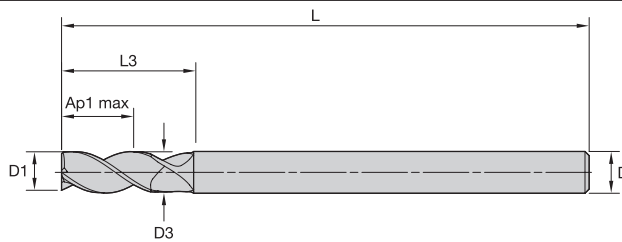
Material Group																
		Side Milling (A)		WP15PE			Recommended feed per tooth (fz = mm/th) for side milling (A).									
		A		Cutting Speed — vc m/min				D1 — Diameter								
		ap	ae	min		max	mm	4,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0
P	0	Ap1 max	0,05 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	1	Ap1 max	0,05 x D	150	–	200	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,05 x D	140	–	190	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	3	Ap1 max	0,05 x D	120	–	160	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	4	Ap1 max	0,05 x D	90	–	150	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088
	5	Ap1 max	0,05 x D	60	–	100	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
M	6	Ap1 max	0,05 x D	50	–	75	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
	1	Ap1 max	0,05 x D	90	–	115	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,05 x D	60	–	80	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
K	3	Ap1 max	0,05 x D	60	–	70	fz	0,016	0,025	0,034	0,040	0,047	0,052	0,057	0,061	0,065
	1	Ap1 max	0,05 x D	120	–	150	fz	0,028	0,044	0,060	0,072	0,083	0,092	0,101	0,108	0,114
	2	Ap1 max	0,05 x D	110	–	140	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
S	3	Ap1 max	0,05 x D	110	–	130	fz	0,019	0,029	0,040	0,048	0,056	0,063	0,070	0,076	0,081
	1	Ap1 max	0,04 x D	50	–	90	fz	0,023	0,036	0,050	0,061	0,070	0,079	0,087	0,095	0,101
	2	Ap1 max	0,04 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
	3	Ap1 max	0,05 x D	25	–	40	fz	0,013	0,019	0,026	0,032	0,037	0,042	0,046	0,050	0,054
H	4	Ap1 max	0,05 x D	50	–	60	fz	0,016	0,026	0,037	0,045	0,052	0,058	0,064	0,069	0,074
	1	Ap1 max	0,04 x D	80	–	140	fz	0,021	0,033	0,045	0,054	0,062	0,070	0,077	0,083	0,088

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
For better surface finish, reduce feed per tooth.

ALUFLASH • Series 3A09 • Square End • 3 Flute • Regular Length • Cylindrical Shank • Metric

- first choice
○ alternate choice

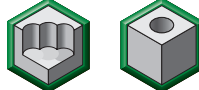
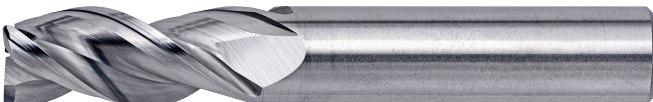
order #	catalog #	£	D1	D	length of cut Ap1 max	length L	Z U
6853511	3A09M03000SZT	16.50	3,0	3	12,00	38	3

ALUFLASH • Series 3AN9 • Square End • 3 Flute • Regular Length • Regular Neck • Cylindrical Shank • Metric

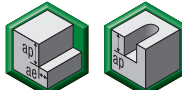
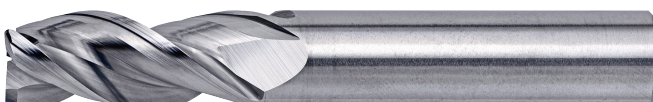
- first choice
○ alternate choice

order #	catalog #	£	D1	D	D3	length of cut Ap1 max	length L	L3	Z U
6853460	3AN9M04001SZT	21.83	4,0	4	3,76	8,00	50	12,00	3
6853462	3AN9M05002SZT	24.30	5,0	5	4,70	10,00	63	15,00	3
6853465	3AN9M06003SZT	24.56	6,0	6	5,64	13,00	63	18,00	3
6853469	3AN9M08004SZT	29.81	8,0	8	7,52	18,00	76	24,00	3
6853474	3AN9M10005SZT	41.78	10,0	10	9,40	22,00	76	30,00	3
6853479	3AN9M12006SZT	55.28	12,0	12	11,28	25,00	76	36,00	3
6853486	3AN9M16008SZT	80.63	16,0	16	15,04	32,00	89	48,00	3
6853494	3AN9M20009SZT	125.25	20,0	20	18,80	40,00	115	60,00	3

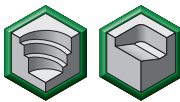
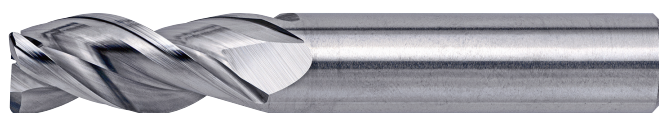
ALUFLASH • Plunging • Application Data • Metric

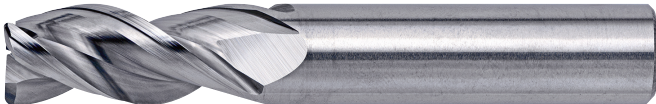
Material Group																				
	Plunging/Drilling			UNCOATED			Recommended feed per revolution (fn =mm/rev) for Plunging 3 flute end mills													
				Cutting Speed – Vc m/min			D1 – Diameter													
	Max Depth	Applicable	Coolant	min	Start	max	mm	2,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0	
N	1	1,5 x D	●	Required	120	260	400	fn	0,056	0,084	0,095	0,105	0,112	0,140	0,154	0,165	0,175	0,186	0,196	0,210
	2	1,5 x D	●	Required	120	250	280	fn	0,056	0,084	0,095	0,105	0,112	0,140	0,154	0,165	0,175	0,186	0,196	0,210
	3	1,5 x D	●	Required	100	200	260	fn	0,056	0,084	0,095	0,105	0,112	0,140	0,154	0,165	0,175	0,186	0,196	0,210
	4	1 x D	●	Required	60	150	260	fn	0,042	0,056	0,070	0,084	0,098	0,112	0,140	0,147	0,154	0,165	0,175	0,196
	5	1,5 x D	●	Required	60	200	400	fn	0,056	0,084	0,095	0,105	0,112	0,140	0,154	0,165	0,175	0,186	0,196	0,210

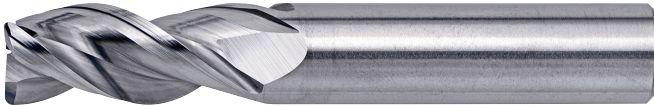
ALUFLASH • Side Milling and Slotting • Application Data • Metric

Material Group																				
	Side Milling (A) and Slotting (B)			UNCOATED			Recommended feed per tooth (fz = mm/z) for side milling (A). For slotting (B), reduce fz by 20%.													
	A		B	Cutting Speed — Vc m/min				D1 — Diameter												
	ap	ae	ap	min	Start	max	mm	2,0	4,0	5,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0	
N	1	Ap1 max	0,5 x D1	1 x D	500	600	2000	fz	0,022	0,044	0,055	0,066	0,088	0,110	0,132	0,153	0,176	0,198	0,220	0,275
	2	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0,020	0,040	0,048	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247
	3	Ap1 max	0,5 x D1	1 x D	500	600	1500	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
	4	Ap1 max	0,5 x D1	1 x D	400	450	750	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192
	5	Ap1 max	0,5 x D1	1 x D	250	400	1000	fz	0,020	0,040	0,050	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247

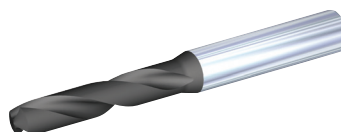
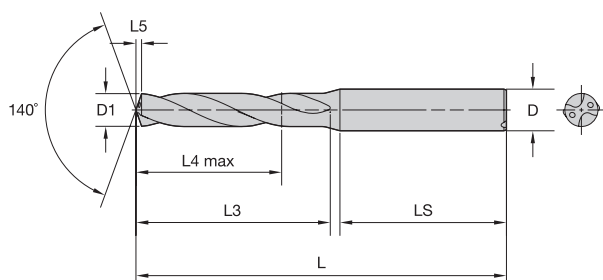
ALUFLASH • Ramping 3 Flute • Application Data • Metric

Material Group	Helical Interpolation / Ramping 0° - 15°																				
				Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping – fz x 1																	
		UNCOATED			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	mm	2,5-4,8	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				
N	1	1,25 x D1	500	600	2000	fz	0,022	0,044	0,055	0,066	0,088	0,110	0,132	0,153	0,176	0,198	0,220	0,275			
	2	1,25 x D1	500	600	1500	fz	0,020	0,040	0,048	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247			
	3	1,25 x D1	500	600	1500	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192			
	4	1,25 x D1	400	450	750	fz	0,015	0,031	0,038	0,046	0,062	0,077	0,092	0,107	0,123	0,138	0,154	0,192			
	5	1,25 x D1	250	400	1000	fz	0,020	0,040	0,050	0,059	0,079	0,099	0,119	0,138	0,158	0,178	0,198	0,247			

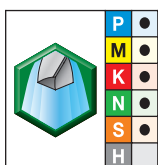
Material Group		Helical Interpolation / Ramping																											
		15° - 30°			UNCOATED			Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping – fz x 1																					
		Cutting Speed – Vc m/min			Diameter – D1 [Ømin-Ømax]																								
					mm	3,0	4,0	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	mm	2,5-4,8	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													
N	1	1,25 x D1	500	600	1600	fz	0,017	0,033	0,041	0,050	0,066	0,082	0,099	0,115	0,132	0,148	0,165	0,206											
	2	1,25 x D1	500	600	1200	fz	0,015	0,030	0,036	0,045	0,059	0,074	0,089	0,104	0,119	0,134	0,148	0,185											
	3	1,25 x D1	500	600	1200	fz	0,012	0,023	0,029	0,035	0,046	0,058	0,069	0,080	0,092	0,104	0,115	0,144											
	4	1,25 x D1	400	450	600	fz	0,012	0,023	0,029	0,035	0,046	0,058	0,069	0,080	0,092	0,104	0,115	0,144											
	5	1,25 x D1	250	400	800	fz	0,015	0,030	0,038	0,045	0,059	0,074	0,089	0,104	0,119	0,134	0,148	0,185											

Material Group		Max Depth	Helical Interpolation / Ramping																											
			30° - 45°			UNCOATED			Recommended feed per tooth (fz = mm/z) for Helical Interpolation and Ramping – fz x 1																					
			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															
			mm	2,5-4,8	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	25,0-47,5															
N	1	1,25 x D1	420	500	800	fz	0,013	0,026	0,033	0,040	0,053	0,066	0,079	0,092	0,106	0,119	0,132	0,165												
	2	1,25 x D1	420	500	800	fz	0,012	0,024	0,029	0,036	0,048	0,059	0,071	0,083	0,095	0,107	0,119	0,148												
	3	1,25 x D1	420	500	800	fz	0,009	0,018	0,023	0,028	0,037	0,046	0,055	0,064	0,074	0,083	0,092	0,115												
	4	1,25 x D1	340	380	450	fz	0,009	0,018	0,023	0,028	0,037	0,046	0,055	0,064	0,074	0,083	0,092	0,115												
	5	1,25 x D1	210	340	600	fz	0,012	0,024	0,030	0,036	0,048	0,059	0,071	0,083	0,095	0,107	0,119	0,148												

Solid Carbide Drills



■ VariDrill™ • VDS201A/VDS401A • 3 x D



VDS201A • WU25PD	£	VDS401A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS201A01000	20.35	—	—	1,000	.0394	5	0,1	58	28	4
VDS201A01016	20.70	—	—	1,016	.0400	5	0,1	58	28	4
VDS201A01041	20.70	—	—	1,041	.0410	5	0,2	58	28	4
VDS201A01067	20.70	—	—	1,067	.0420	5	0,2	58	28	4
VDS201A01092	20.70	—	—	1,092	.0430	5	0,2	58	28	4
VDS201A01100	20.70	—	—	1,100	.0433	5	0,2	58	28	4
VDS201A01181	20.70	—	—	1,181	.0465	5	0,2	58	28	4
VDS201A01191	20.70	—	—	1,191	.0469	5	0,2	58	28	4
VDS201A01200	20.70	—	—	1,200	.0472	5	0,2	58	28	4
VDS201A01300	20.70	—	—	1,300	.0512	5	0,2	58	28	4
VDS201A01321	20.70	—	—	1,321	.0520	5	0,2	58	28	4
VDS201A01397	20.70	—	—	1,397	.0550	5	0,2	58	28	4
VDS201A01400	20.70	—	—	1,400	.0551	5	0,2	58	28	4
VDS201A01500	20.70	VDS401A01500	27.95	1,500	.0591	6	0,2	58	28	4
VDS201A01600	20.70	VDS401A01600	27.95	1,600	.0630	6	0,2	58	28	4
VDS201A01700	20.70	VDS401A01700	27.95	1,700	.0669	6	0,3	58	28	4
VDS201A01800	20.70	VDS401A01800	27.95	1,800	.0709	6	0,3	58	28	4
VDS201A01900	20.70	VDS401A01900	27.95	1,900	.0748	6	0,3	58	28	4
VDS201A01984	20.70	VDS401A01984	27.95	1,984	.0781	10	0,3	58	28	4
VDS201A02000	20.70	VDS401A02000	27.95	2,000	.0787	10	0,3	58	28	4
VDS201A02100	21.10	VDS401A02100	28.40	2,100	.0827	10	0,3	58	28	4
VDS201A02200	21.10	VDS401A02200	28.40	2,200	.0866	10	0,3	58	28	4
VDS201A02300	21.10	VDS401A02300	28.40	2,300	.0906	10	0,4	58	28	4
VDS201A02383	21.10	VDS401A02383	28.40	2,383	.0938	12	0,4	58	28	4
VDS201A02400	21.10	VDS401A02400	28.40	2,400	.0945	12	0,4	58	28	4
VDS201A02439	21.10	VDS401A02439	28.40	2,439	.0960	12	0,4	58	28	4
VDS201A02489	21.10	VDS401A02489	28.40	2,489	.0980	12	0,4	58	28	4
VDS201A02500	21.10	VDS401A02500	28.40	2,500	.0984	12	0,4	58	28	4
VDS201A02578	21.10	VDS401A02578	28.40	2,578	.1015	12	0,4	58	28	4
VDS201A02600	21.10	VDS401A02600	28.40	2,600	.1024	12	0,4	58	28	4
VDS201A02642	21.10	VDS401A02642	28.40	2,642	.1040	12	0,4	58	28	4
VDS201A02700	21.10	VDS401A02700	28.40	2,700	.1063	12	0,4	58	28	4
VDS201A02705	21.10	VDS401A02705	28.40	2,705	.1065	12	0,4	58	28	4
VDS201A02779	21.10	VDS401A02779	28.40	2,779	.1094	12	0,4	58	28	4
VDS201A02800	21.10	VDS401A02800	28.40	2,800	.1102	12	0,5	58	28	4
VDS201A02820	21.10	VDS401A02820	28.40	2,820	.1110	12	0,5	58	28	4
VDS201A02870	21.10	VDS401A02870	28.40	2,870	.1130	12	0,5	58	28	4
VDS201A02900	21.10	VDS401A02900	28.40	2,900	.1142	12	0,5	58	28	4
VDS201A02947	21.10	VDS401A02947	28.40	2,947	.1160	12	0,5	58	28	4
VDS201A03000	21.10	VDS401A03000	28.40	3,000	.1181	14	0,5	62	36	6

(continued)

(VariDrill™ • VDS201A/VDS401A • 3 x D continued)

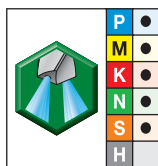


VDS201A • WU25PD	£	VDS401A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS201A03048	21.40	VDS401A03048	28.95	3,048	.1200	14	0,5	62	36	6
VDS201A03100	21.40	VDS401A03100	28.95	3,100	.1220	14	0,5	62	36	6
VDS201A03175	21.40	VDS401A03175	28.95	3,175	.1250	14	0,5	62	36	6
VDS201A03200	21.40	VDS401A03200	28.95	3,200	.1260	14	0,5	62	36	6
VDS201A03264	21.40	VDS401A03264	28.95	3,264	.1285	14	0,5	62	36	6
VDS201A03300	21.40	VDS401A03300	28.95	3,300	.1299	14	0,5	62	36	6
VDS201A03400	21.40	VDS401A03400	28.95	3,400	.1339	14	0,6	62	36	6
VDS201A03455	21.40	VDS401A03455	28.95	3,455	.1360	14	0,6	62	36	6
VDS201A03500	21.40	VDS401A03500	28.95	3,500	.1378	14	0,6	62	36	6
VDS201A03571	21.40	VDS401A03571	28.95	3,571	.1406	14	0,6	62	36	6
VDS201A03600	21.40	VDS401A03600	28.95	3,600	.1417	14	0,6	62	36	6
VDS201A03658	21.40	VDS401A03658	28.95	3,658	.1440	14	0,6	62	36	6
VDS201A03700	21.40	VDS401A03700	28.95	3,700	.1457	14	0,6	62	36	6
VDS201A03734	21.40	VDS401A03734	28.95	3,734	.1470	14	0,6	62	36	6
VDS201A03800	21.40	VDS401A03800	28.95	3,800	.1496	17	0,6	66	36	6
VDS201A03900	21.40	VDS401A03900	28.95	3,900	.1535	17	0,6	66	36	6
VDS201A03970	21.40	VDS401A03970	28.95	3,970	.1563	17	0,7	66	36	6
VDS201A04000	21.40	VDS401A04000	28.95	4,000	.1575	17	0,7	66	36	6
VDS201A04039	21.80	VDS401A04039	29.95	4,039	.1590	17	0,7	66	36	6
VDS201A04090	21.80	VDS401A04090	29.95	4,090	.1610	17	0,7	66	36	6
VDS201A04100	21.80	VDS401A04100	29.95	4,100	.1614	17	0,7	66	36	6
VDS201A04200	21.80	VDS401A04200	29.95	4,200	.1654	17	0,7	66	36	6
VDS201A04217	21.80	VDS401A04217	29.95	4,217	.1660	17	0,7	66	36	6
VDS201A04300	21.80	VDS401A04300	29.95	4,300	.1693	17	0,7	66	36	6
VDS201A04366	21.80	VDS401A04366	29.95	4,366	.1719	17	0,7	66	36	6
VDS201A04400	21.80	VDS401A04400	29.95	4,400	.1732	17	0,7	66	36	6
VDS201A04500	21.80	VDS401A04500	29.95	4,500	.1772	17	0,7	66	36	6
VDS201A04600	21.80	VDS401A04600	29.95	4,600	.1811	17	0,8	66	36	6
VDS201A04623	21.80	VDS401A04623	29.95	4,623	.1820	17	0,8	66	36	6
VDS201A04700	21.80	VDS401A04700	29.95	4,700	.1850	17	0,8	66	36	6
VDS201A04763	21.80	VDS401A04763	29.95	4,763	.1875	20	0,8	66	36	6
VDS201A04800	21.80	VDS401A04800	29.95	4,800	.1890	20	0,8	66	36	6
VDS201A04852	21.80	VDS401A04852	29.95	4,852	.1910	20	0,8	66	36	6
VDS201A04900	21.80	VDS401A04900	29.95	4,900	.1929	20	0,8	66	36	6
VDS201A05000	21.80	VDS401A05000	29.95	5,000	.1969	20	0,8	66	36	6
VDS201A05100	21.80	VDS401A05100	30.50	5,100	.2008	20	0,8	66	36	6
VDS201A05106	21.80	VDS401A05106	30.50	5,106	.2010	20	0,8	66	36	6
VDS201A05159	21.80	VDS401A05159	30.50	5,159	.2031	20	0,9	66	36	6
VDS201A05200	21.80	VDS401A05200	30.50	5,200	.2047	20	0,9	66	36	6
VDS201A05300	21.80	VDS401A05300	30.50	5,300	.2087	20	0,9	66	36	6
VDS201A05400	21.80	VDS401A05400	30.50	5,400	.2126	20	0,9	66	36	6
VDS201A05410	21.80	VDS401A05410	30.50	5,410	.2130	20	0,9	66	36	6
VDS201A05500	21.80	VDS401A05500	30.50	5,500	.2165	20	0,9	66	36	6
VDS201A05558	21.80	VDS401A05558	30.50	5,558	.2188	20	0,9	66	36	6

(continued)

Solid Carbide Drills

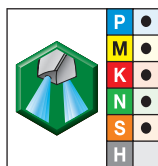
(VariDrill™ • VDS201A/VDS401A • 3 x D continued)



VDS201A • WU25PD	£	VDS401A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS201A05600	21.80	VDS401A05600	30.50	5,600	.2205	20	0,9	66	36	6
VDS201A05616	21.80	VDS401A05616	30.50	5,616	.2211	20	0,9	66	36	6
VDS201A05700	21.80	VDS401A05700	30.50	5,700	.2244	20	1,0	66	36	6
VDS201A05800	21.80	VDS401A05800	30.50	5,800	.2283	20	1,0	66	36	6
VDS201A05900	21.80	VDS401A05900	30.50	5,900	.2323	20	1,0	66	36	6
VDS201A05954	21.80	VDS401A05954	30.50	5,954	.2344	20	1,0	66	36	6
VDS201A06000	21.80	VDS401A06000	30.50	6,000	.2362	20	1,0	66	36	6
VDS201A06100	22.15	VDS401A06100	33.25	6,100	.2402	24	1,0	79	36	8
VDS201A06200	22.15	VDS401A06200	33.25	6,200	.2441	24	1,0	79	36	8
VDS201A06300	22.15	VDS401A06300	33.25	6,300	.2480	24	1,1	79	36	8
VDS201A06350	22.15	VDS401A06350	33.25	6,350	.2500	24	1,1	79	36	8
VDS201A06400	22.15	VDS401A06400	33.25	6,400	.2520	24	1,1	79	36	8
VDS201A06500	22.15	VDS401A06500	33.25	6,500	.2559	24	1,1	79	36	8
VDS201A06528	22.15	VDS401A06528	33.25	6,528	.2570	24	1,1	79	36	8
VDS201A06600	22.15	VDS401A06600	33.25	6,600	.2598	24	1,1	79	36	8
VDS201A06630	22.15	VDS401A06630	33.25	6,630	.2610	24	1,1	79	36	8
VDS201A06700	22.15	VDS401A06700	33.25	6,700	.2638	24	1,1	79	36	8
VDS201A06746	22.15	VDS401A06746	33.25	6,746	.2656	24	1,1	79	36	8
VDS201A06800	22.15	VDS401A06800	33.25	6,800	.2677	24	1,1	79	36	8
VDS201A06900	22.15	VDS401A06900	33.25	6,900	.2717	24	1,2	79	36	8
VDS201A07000	22.15	VDS401A07000	33.25	7,000	.2756	24	1,2	79	36	8
VDS201A07100	22.90	VDS401A07100	35.55	7,100	.2795	29	1,2	79	36	8
VDS201A07145	22.90	VDS401A07145	35.55	7,145	.2813	29	1,2	79	36	8
VDS201A07200	22.90	VDS401A07200	35.55	7,200	.2835	29	1,2	79	36	8
VDS201A07300	22.90	VDS401A07300	35.55	7,300	.2874	29	1,2	79	36	8
VDS201A07400	22.90	VDS401A07400	35.55	7,400	.2913	29	1,3	79	36	8
VDS201A07500	22.90	VDS401A07500	35.55	7,500	.2953	29	1,3	79	36	8
VDS201A07541	22.90	VDS401A07541	35.55	7,541	.2969	29	1,3	79	36	8
VDS201A07600	22.90	VDS401A07600	35.55	7,600	.2992	29	1,3	79	36	8
VDS201A07700	22.90	VDS401A07700	35.55	7,700	.3031	29	1,3	79	36	8
VDS201A07800	22.90	VDS401A07800	35.55	7,800	.3071	29	1,3	79	36	8
VDS201A07900	22.90	VDS401A07900	35.55	7,900	.3110	29	1,3	79	36	8
VDS201A07938	22.90	VDS401A07938	35.55	7,938	.3125	29	1,3	79	36	8
VDS201A08000	22.90	VDS401A08000	35.55	8,000	.3150	29	1,4	79	36	8
VDS201A08100	25.10	VDS401A08100	38.90	8,100	.3189	35	1,4	89	40	10
VDS201A08200	25.10	VDS401A08200	38.90	8,200	.3228	35	1,4	89	40	10
VDS201A08300	25.10	VDS401A08300	38.90	8,300	.3268	35	1,4	89	40	10
VDS201A08334	25.10	VDS401A08334	38.90	8,334	.3281	35	1,4	89	40	10
VDS201A08400	25.10	VDS401A08400	38.90	8,400	.3307	35	1,4	89	40	10
VDS201A08433	25.10	VDS401A08433	38.90	8,433	.3320	35	1,4	89	40	10
VDS201A08500	25.10	VDS401A08500	38.90	8,500	.3346	35	1,4	89	40	10
VDS201A08600	25.10	VDS401A08600	38.90	8,600	.3386	35	1,5	89	40	10
VDS201A08700	25.10	VDS401A08700	38.90	8,700	.3425	35	1,5	89	40	10
VDS201A08733	25.10	VDS401A08733	38.90	8,733	.3438	35	1,5	89	40	10
VDS201A08800	25.10	VDS401A08800	38.90	8,800	.3465	35	1,5	89	40	10
VDS201A08900	25.10	VDS401A08900	38.90	8,900	.3504	35	1,5	89	40	10

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(VariDrill™ • VDS201A/VDS401A • 3 x D continued)

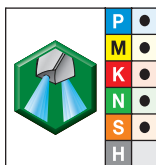


VDS201A • WU25PD	£	VDS401A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS201A09000	25.10	VDS401A09000	38.90	9,000	.3543	35	1,5	89	40	10
VDS201A09100	25.80	VDS401A09100	42.70	9,100	.3583	35	1,5	89	40	10
VDS201A09129	25.80	VDS401A09129	42.70	9,129	.3594	35	1,6	89	40	10
VDS201A09200	25.80	VDS401A09200	42.70	9,200	.3622	35	1,6	89	40	10
VDS201A09300	25.80	VDS401A09300	42.70	9,300	.3661	35	1,6	89	40	10
VDS201A09347	25.80	VDS401A09347	42.70	9,347	.3680	35	1,6	89	40	10
VDS201A09400	25.80	VDS401A09400	42.70	9,400	.3701	35	1,6	89	40	10
VDS201A09500	25.80	VDS401A09500	42.70	9,500	.3740	35	1,6	89	40	10
VDS201A09525	25.80	VDS401A09525	42.70	9,525	.3750	35	1,6	89	40	10
VDS201A09600	25.80	VDS401A09600	42.70	9,600	.3780	35	1,6	89	40	10
VDS201A09700	25.80	VDS401A09700	42.70	9,700	.3819	35	1,7	89	40	10
VDS201A09800	25.80	VDS401A09800	42.70	9,800	.3858	35	1,7	89	40	10
VDS201A09900	25.80	VDS401A09900	42.70	9,900	.3898	35	1,7	89	40	10
VDS201A09921	25.80	VDS401A09921	42.70	9,921	.3906	35	1,7	89	40	10
VDS201A10000	25.80	VDS401A10000	42.70	10,000	.3937	35	1,7	89	40	10
VDS201A10100	33.25	VDS401A10100	51.50	10,100	.3976	40	1,7	102	45	12
VDS201A10200	33.25	VDS401A10200	51.50	10,200	.4016	40	1,7	102	45	12
VDS201A10300	33.25	VDS401A10300	51.50	10,300	.4055	40	1,8	102	45	12
VDS201A10320	33.25	VDS401A10320	51.50	10,320	.4063	40	1,8	102	45	12
VDS201A10400	33.25	VDS401A10400	51.50	10,400	.4094	40	1,8	102	45	12
VDS201A10500	33.25	VDS401A10500	51.50	10,500	.4134	40	1,8	102	45	12
VDS201A10600	33.25	VDS401A10600	51.50	10,600	.4173	40	1,8	102	45	12
VDS201A10700	33.25	VDS401A10700	51.50	10,700	.4213	40	1,8	102	45	12
VDS201A10716	33.25	VDS401A10716	51.50	10,716	.4219	40	1,8	102	45	12
VDS201A10800	33.25	VDS401A10800	51.50	10,800	.4252	40	1,8	102	45	12
VDS201A10900	33.25	VDS401A10900	51.50	10,900	.4291	40	1,9	102	45	12
VDS201A11000	33.25	VDS401A11000	51.50	11,000	.4331	40	1,9	102	45	12
VDS201A11100	34.75	VDS401A11100	53.80	11,100	.4370	40	1,9	102	45	12
VDS201A11113	34.75	VDS401A11113	53.80	11,113	.4375	40	1,9	102	45	12
VDS201A11200	34.75	VDS401A11200	53.80	11,200	.4409	40	1,9	102	45	12
VDS201A11300	34.75	VDS401A11300	53.80	11,300	.4449	40	1,9	102	45	12
VDS201A11400	34.75	VDS401A11400	53.80	11,400	.4488	40	2,0	102	45	12
VDS201A11500	34.75	VDS401A11500	53.80	11,500	.4528	40	2,0	102	45	12
VDS201A11509	34.75	VDS401A11509	53.80	11,509	.4531	40	2,0	102	45	12
VDS201A11600	34.75	VDS401A11600	53.80	11,600	.4567	40	2,0	102	45	12
VDS201A11700	34.75	VDS401A11700	53.80	11,700	.4606	40	2,0	102	45	12
VDS201A11800	34.75	VDS401A11800	53.80	11,800	.4646	40	2,0	102	45	12
VDS201A11900	34.75	VDS401A11900	53.80	11,900	.4685	40	2,0	102	45	12
VDS201A11908	34.75	VDS401A11908	53.80	11,908	.4688	40	2,0	102	45	12
VDS201A12000	34.75	VDS401A12000	53.80	12,000	.4724	40	2,1	102	45	12
VDS201A12100	46.45	VDS401A12100	72.30	12,100	.4764	43	2,1	107	45	14
VDS201A12200	46.45	VDS401A12200	72.30	12,200	.4803	43	2,1	107	45	14
VDS201A12300	46.45	VDS401A12300	72.30	12,300	.4843	43	2,1	107	45	14
VDS201A12304	46.45	VDS401A12304	72.30	12,304	.4844	43	2,1	107	45	14
VDS201A12400	46.45	VDS401A12400	72.30	12,400	.4882	43	2,1	107	45	14
VDS201A12500	46.45	VDS401A12500	72.30	12,500	.4921	43	2,1	107	45	14

(continued)

Solid Carbide Drills

(VariDrill™ • VDS201A/VDS401A • 3 x D continued)



VDS201A • WU25PD	£	VDS401A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS201A12600	46.45	VDS401A12600	72.30	12,600	.4961	43	2,2	107	45	14
VDS201A12700	46.45	VDS401A12700	72.30	12,700	.5000	43	2,2	107	45	14
VDS201A12800	46.45	VDS401A12800	72.30	12,800	.5039	43	2,2	107	45	14
VDS201A12900	46.45	VDS401A12900	72.30	12,900	.5079	43	2,2	107	45	14
VDS201A13000	46.45	VDS401A13000	72.30	13,000	.5118	43	2,2	107	45	14
VDS201A13096	47.95	VDS401A13096	74.40	13,096	.5156	43	2,3	107	45	14
VDS201A13100	47.95	VDS401A13100	74.40	13,100	.5157	43	2,3	107	45	14
VDS201A13200	47.95	VDS401A13200	74.40	13,200	.5197	43	2,3	107	45	14
VDS201A13300	47.95	VDS401A13300	74.40	13,300	.5236	43	2,3	107	45	14
VDS201A13400	47.95	VDS401A13400	74.40	13,400	.5276	43	2,3	107	45	14
VDS201A13500	47.95	VDS401A13500	74.40	13,500	.5315	43	2,3	107	45	14
VDS201A13600	47.95	VDS401A13600	74.40	13,600	.5354	43	2,3	107	45	14
VDS201A13700	47.95	VDS401A13700	74.40	13,700	.5394	43	2,4	107	45	14
VDS201A13800	47.95	VDS401A13800	74.40	13,800	.5433	43	2,4	107	45	14
VDS201A13891	47.95	VDS401A13891	74.40	13,891	.5469	43	2,4	107	45	14
VDS201A13900	47.95	VDS401A13900	74.40	13,900	.5472	43	2,4	107	45	14
VDS201A14000	47.95	VDS401A14000	74.40	14,000	.5512	43	2,4	107	45	14
VDS201A14100	55.50	VDS401A14100	85.70	14,100	.5551	45	2,4	115	48	16
VDS201A14200	55.50	VDS401A14200	85.70	14,200	.5591	45	2,5	115	48	16
VDS201A14288	55.50	VDS401A14288	85.70	14,288	.5625	45	2,5	115	48	16
VDS201A14300	55.50	VDS401A14300	85.70	14,300	.5630	45	2,5	115	48	16
VDS201A14400	55.50	VDS401A14400	85.70	14,400	.5669	45	2,5	115	48	16
VDS201A14500	55.50	VDS401A14500	85.70	14,500	.5709	45	2,5	115	48	16
VDS201A14600	55.50	VDS401A14600	85.70	14,600	.5748	45	2,5	115	48	16
VDS201A14684	55.50	VDS401A14684	85.70	14,684	.5781	45	2,5	115	48	16
VDS201A14700	55.50	VDS401A14700	85.70	14,700	.5787	45	2,5	115	48	16
VDS201A14800	55.50	VDS401A14800	85.70	14,800	.5827	45	2,6	115	48	16
VDS201A14900	55.50	VDS401A14900	85.70	14,900	.5866	45	2,6	115	48	16
VDS201A15000	55.50	VDS401A15000	85.70	15,000	.5906	45	2,6	115	48	16
VDS201A15083	62.90	VDS401A15083	97.50	15,083	.5938	45	2,6	115	48	16
VDS201A15100	62.90	VDS401A15100	97.50	15,100	.5945	45	2,6	115	48	16
VDS201A15200	62.90	VDS401A15200	97.50	15,200	.5984	45	2,6	115	48	16
VDS201A15300	62.90	VDS401A15300	97.50	15,300	.6024	45	2,6	115	48	16
VDS201A15400	62.90	VDS401A15400	97.50	15,400	.6063	45	2,7	115	48	16
VDS201A15479	62.90	VDS401A15479	97.50	15,479	.6094	45	2,7	115	48	16
VDS201A15500	62.90	VDS401A15500	97.50	15,500	.6102	45	2,7	115	48	16
VDS201A15600	62.90	VDS401A15600	97.50	15,600	.6142	45	2,7	115	48	16
VDS201A15700	62.90	VDS401A15700	97.50	15,700	.6181	45	2,7	115	48	16
VDS201A15800	62.90	VDS401A15800	97.50	15,800	.6220	45	2,7	115	48	16
VDS201A15875	62.90	VDS401A15875	97.50	15,875	.6250	45	2,7	115	48	16
VDS201A15900	62.90	VDS401A15900	97.50	15,900	.6260	45	2,8	115	48	16
VDS201A16000	62.90	VDS401A16000	97.50	16,000	.6299	45	2,8	115	48	16
VDS201A16100	73.30	VDS401A16100	113.50	16,100	.6339	51	2,8	123	48	18
VDS201A16200	73.30	VDS401A16200	113.50	16,200	.6378	51	2,8	123	48	18
VDS201A16271	73.30	VDS401A16271	113.50	16,271	.6406	51	2,8	123	48	18
VDS201A16300	73.30	VDS401A16300	113.50	16,300	.6417	51	2,8	123	48	18

(continued)

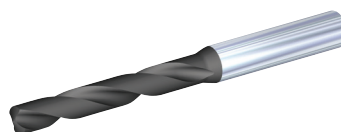
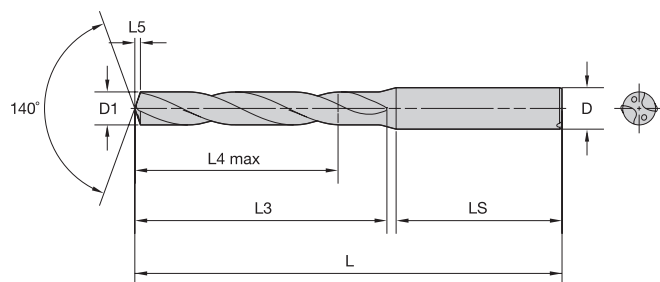
(VariDrill™ • VDS201A/VDS401A • 3 x D continued)



VDS201A • WU25PD		£	VDS401A • WU25PD		£	D1 diameter		L4 max	L5	L	LS	D
						mm	in					
VDS201A16400	73.30		VDS401A16400	113.50		16,400	.6457	51	2,8	123	48	18
VDS201A16500	73.30		VDS401A16500	113.50		16,500	.6496	51	2,9	123	48	18
VDS201A16600	73.30		VDS401A16600	113.50		16,600	.6535	51	2,9	123	48	18
VDS201A16670	73.30		VDS401A16670	113.50		16,670	.6563	51	2,9	123	48	18
VDS201A16700	73.30		VDS401A16700	113.50		16,700	.6575	51	2,9	123	48	18
VDS201A16800	73.30		VDS401A16800	113.50		16,800	.6614	51	2,9	123	48	18
VDS201A16900	73.30		VDS401A16900	113.50		16,900	.6654	51	2,9	123	48	18
VDS201A17000	73.30		VDS401A17000	113.50		17,000	.6693	51	2,9	123	48	18
VDS201A17100	88.10		VDS401A17100	136.50		17,100	.6732	51	3,0	123	48	18
VDS201A17200	88.10		VDS401A17200	136.50		17,200	.6772	51	3,0	123	48	18
VDS201A17300	88.10		VDS401A17300	136.50		17,300	.6811	51	3,0	123	48	18
VDS201A17400	88.10		VDS401A17400	136.50		17,400	.6850	51	3,0	123	48	18
VDS201A17463	88.10		VDS401A17463	136.50		17,463	.6875	51	3,0	123	48	18
VDS201A17500	88.10		VDS401A17500	136.50		17,500	.6890	51	3,0	123	48	18
VDS201A17600	88.10		VDS401A17600	136.50		17,600	.6929	51	3,1	123	48	18
VDS201A17700	88.10		VDS401A17700	136.50		17,700	.6969	51	3,1	123	48	18
VDS201A17800	88.10		VDS401A17800	136.50		17,800	.7008	51	3,1	123	48	18
VDS201A17859	88.10		VDS401A17859	136.50		17,859	.7031	51	3,1	123	48	18
VDS201A17900	88.10		VDS401A17900	136.50		17,900	.7047	51	3,1	123	48	18
VDS201A18000	88.10		VDS401A18000	136.50		18,000	.7087	51	3,1	123	48	18
VDS201A18100	95.70		VDS401A18100	148.00		18,100	.7126	55	3,1	131	50	20
VDS201A18200	95.70		VDS401A18200	148.00		18,200	.7165	55	3,2	131	50	20
VDS201A18258	95.70		VDS401A18258	148.00		18,258	.7188	55	3,2	131	50	20
VDS201A18300	95.70		VDS401A18300	148.00		18,300	.7205	55	3,2	131	50	20
VDS201A18400	95.70		VDS401A18400	148.00		18,400	.7244	55	3,2	131	50	20
VDS201A18500	95.70		VDS401A18500	148.00		18,500	.7283	55	3,2	131	50	20
VDS201A18600	95.70		VDS401A18600	148.00		18,600	.7323	55	3,2	131	50	20
VDS201A18654	95.70		VDS401A18654	148.00		18,654	.7344	55	3,2	131	50	20
VDS201A18700	95.70		VDS401A18700	148.00		18,700	.7362	55	3,2	131	50	20
VDS201A18800	95.70		VDS401A18800	148.00		18,800	.7402	55	3,3	131	50	20
VDS201A18900	95.70		VDS401A18900	148.00		18,900	.7441	55	3,3	131	50	20
VDS201A19000	95.70		VDS401A19000	148.00		19,000	.7480	55	3,3	131	50	20
VDS201A19050	103.00		VDS401A19050	159.00		19,050	.7500	55	3,3	131	50	20
VDS201A19100	103.00		VDS401A19100	159.00		19,100	.7520	55	3,3	131	50	20
VDS201A19200	103.00		VDS401A19200	159.00		19,200	.7559	55	3,3	131	50	20
VDS201A19300	103.00		VDS401A19300	159.00		19,300	.7598	55	3,4	131	50	20
VDS201A19400	103.00		VDS401A19400	159.00		19,400	.7638	55	3,4	131	50	20
VDS201A19500	103.00		VDS401A19500	159.00		19,500	.7677	55	3,4	131	50	20
VDS201A19600	103.00		VDS401A19600	159.00		19,600	.7717	55	3,4	131	50	20
VDS201A19700	103.00		VDS401A19700	159.00		19,700	.7756	55	3,4	131	50	20
VDS201A19800	103.00		VDS401A19800	159.00		19,800	.7795	55	3,4	131	50	20
VDS201A19900	103.00		VDS401A19900	159.00		19,900	.7835	55	3,5	131	50	20
VDS201A20000	103.00		VDS401A20000	159.00		20,000	.7874	55	3,5	131	50	20

NOTE: L4 max, L5, L, LS, and D table columns reflect millimetre measurements.

Solid Carbide Drills



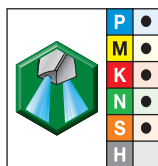
■ VariDrill™ • VDS202A/VDS402A • 5 x D



	£		£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS202A • WU25PD		VDS402A • WU25PD								
VDS202A01000	25.40	—	—	1,000	.0394	6	0,1	58	28	4
VDS202A01016	25.80	—	—	1,016	.0400	6	0,1	58	28	4
VDS202A01041	25.80	—	—	1,041	.0410	6	0,2	58	28	4
VDS202A01067	25.80	—	—	1,067	.0420	6	0,2	58	28	4
VDS202A01092	25.80	—	—	1,092	.0430	6	0,2	58	28	4
VDS202A01100	25.80	—	—	1,100	.0433	6	0,2	58	28	4
VDS202A01181	25.80	—	—	1,181	.0465	6	0,2	58	28	4
VDS202A01191	25.80	—	—	1,191	.0469	6	0,2	58	28	4
VDS202A01200	25.80	—	—	1,200	.0472	6	0,2	58	28	4
VDS202A01300	25.80	—	—	1,300	.0512	6	0,2	58	28	4
VDS202A01321	25.80	—	—	1,321	.0520	6	0,2	58	28	4
VDS202A01397	25.80	—	—	1,397	.0550	6	0,2	58	28	4
VDS202A01400	25.80	—	—	1,400	.0551	6	0,2	58	28	4
VDS202A01500	25.80	VDS402A01500	34.95	1,500	.0591	9	0,2	58	28	4
VDS202A01600	25.80	VDS402A01600	34.95	1,600	.0630	9	0,2	58	28	4
VDS202A01700	25.80	VDS402A01700	34.95	1,700	.0669	9	0,3	58	28	4
VDS202A01800	25.80	VDS402A01800	34.95	1,800	.0709	9	0,3	58	28	4
VDS202A01900	25.80	VDS402A01900	34.95	1,900	.0748	9	0,3	58	28	4
VDS202A01984	25.80	VDS402A01984	34.95	1,984	.0781	14	0,3	58	28	4
VDS202A02000	25.80	VDS402A02000	34.95	2,000	.0787	14	0,3	58	28	4
VDS202A02100	26.35	VDS402A02100	35.55	2,100	.0827	14	0,3	58	28	4
VDS202A02200	26.35	VDS402A02200	35.55	2,200	.0866	14	0,3	58	28	4
VDS202A02300	26.35	VDS402A02300	35.55	2,300	.0906	14	0,4	58	28	4
VDS202A02383	26.35	VDS402A02383	35.55	2,383	.0938	17	0,4	58	28	4
VDS202A02400	26.35	VDS402A02400	35.55	2,400	.0945	17	0,4	58	28	4
VDS202A02439	26.35	VDS402A02439	35.55	2,439	.0960	17	0,4	58	28	4
VDS202A02489	26.35	VDS402A02489	35.55	2,489	.0980	17	0,4	58	28	4
VDS202A02500	26.35	VDS402A02500	35.55	2,500	.0984	17	0,4	58	28	4
VDS202A02578	26.35	VDS402A02578	35.55	2,578	.1015	17	0,4	58	28	4
VDS202A02600	26.35	VDS402A02600	35.55	2,600	.1024	17	0,4	58	28	4
VDS202A02642	26.35	VDS402A02642	35.55	2,642	.1040	17	0,4	58	28	4
VDS202A02700	26.35	VDS402A02700	35.55	2,700	.1063	17	0,4	58	28	4
VDS202A02705	26.35	VDS402A02705	35.55	2,705	.1065	17	0,4	58	28	4
VDS202A02779	26.35	VDS402A02779	35.55	2,779	.1094	17	0,4	58	28	4
VDS202A02800	26.35	VDS402A02800	35.55	2,800	.1102	17	0,5	58	28	4
VDS202A02820	26.35	VDS402A02820	35.55	2,820	.1110	17	0,5	58	28	4
VDS202A02870	26.35	VDS402A02870	35.55	2,870	.1130	17	0,5	58	28	4
VDS202A02900	26.35	VDS402A02900	35.55	2,900	.1142	17	0,5	58	28	4
VDS202A02947	26.35	VDS402A02947	35.55	2,947	.1160	17	0,5	58	28	4
VDS202A03000	26.35	VDS402A03000	35.55	3,000	.1181	23	0,5	66	36	6

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(VariDrill™ • VDS202A/VDS402A • 5 x D continued)

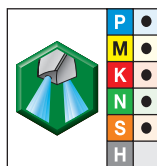


VDS202A • WU25PD	£	VDS402A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS202A03048	26.75	VDS402A03048	36.15	3,048	.1200	23	0,5	66	36	6
VDS202A03100	26.75	VDS402A03100	36.15	3,100	.1220	23	0,5	66	36	6
VDS202A03175	26.75	VDS402A03175	36.15	3,175	.1250	23	0,5	66	36	6
VDS202A03200	26.75	VDS402A03200	36.15	3,200	.1260	23	0,5	66	36	6
VDS202A03264	26.75	VDS402A03264	36.15	3,264	.1285	23	0,5	66	36	6
VDS202A03300	26.75	VDS402A03300	36.15	3,300	.1299	23	0,5	66	36	6
VDS202A03400	26.75	VDS402A03400	36.15	3,400	.1339	23	0,6	66	36	6
VDS202A03455	26.75	VDS402A03455	36.15	3,455	.1360	23	0,6	66	36	6
VDS202A03500	26.75	VDS402A03500	36.15	3,500	.1378	23	0,6	66	36	6
VDS202A03571	26.75	VDS402A03571	36.15	3,571	.1406	23	0,6	66	36	6
VDS202A03600	26.75	VDS402A03600	36.15	3,600	.1417	23	0,6	66	36	6
VDS202A03658	26.75	VDS402A03658	36.15	3,658	.1440	23	0,6	66	36	6
VDS202A03700	26.75	VDS402A03700	36.15	3,700	.1457	23	0,6	66	36	6
VDS202A03734	26.75	VDS402A03734	36.15	3,734	.1470	23	0,6	66	36	6
VDS202A03800	26.75	VDS402A03800	36.15	3,800	.1496	29	0,6	74	36	6
VDS202A03900	26.75	VDS402A03900	36.15	3,900	.1535	29	0,6	74	36	6
VDS202A03970	26.75	VDS402A03970	36.15	3,970	.1563	29	0,7	74	36	6
VDS202A04000	26.75	VDS402A04000	36.15	4,000	.1575	29	0,7	74	36	6
VDS202A04039	27.20	VDS402A04039	37.50	4,039	.1590	29	0,7	74	36	6
VDS202A04090	27.20	VDS402A04090	37.50	4,090	.1610	29	0,7	74	36	6
VDS202A04100	27.20	VDS402A04100	37.50	4,100	.1614	29	0,7	74	36	6
VDS202A04200	27.20	VDS402A04200	37.50	4,200	.1654	29	0,7	74	36	6
VDS202A04217	27.20	VDS402A04217	37.50	4,217	.1660	29	0,7	74	36	6
VDS202A04300	27.20	VDS402A04300	37.50	4,300	.1693	29	0,7	74	36	6
VDS202A04366	27.20	VDS402A04366	37.50	4,366	.1719	29	0,7	74	36	6
VDS202A04400	27.20	VDS402A04400	37.50	4,400	.1732	29	0,7	74	36	6
VDS202A04500	27.20	VDS402A04500	37.50	4,500	.1772	29	0,7	74	36	6
VDS202A04600	27.20	VDS402A04600	37.50	4,600	.1811	29	0,8	74	36	6
VDS202A04623	27.20	VDS402A04623	37.50	4,623	.1820	29	0,8	74	36	6
VDS202A04700	27.20	VDS402A04700	37.50	4,700	.1850	29	0,8	74	36	6
VDS202A04763	27.20	VDS402A04763	37.50	4,763	.1875	35	0,8	82	36	6
VDS202A04800	27.20	VDS402A04800	37.50	4,800	.1890	35	0,8	82	36	6
VDS202A04852	27.20	VDS402A04852	37.50	4,852	.1910	35	0,8	82	36	6
VDS202A04900	27.20	VDS402A04900	37.50	4,900	.1929	35	0,8	82	36	6
VDS202A05000	27.20	VDS402A05000	37.50	5,000	.1969	35	0,8	82	36	6
VDS202A05100	27.20	VDS402A05100	38.05	5,100	.2008	35	0,8	82	36	6
VDS202A05106	27.20	VDS402A05106	38.05	5,106	.2010	35	0,8	82	36	6
VDS202A05159	27.20	VDS402A05159	38.05	5,159	.2031	35	0,9	82	36	6
VDS202A05200	27.20	VDS402A05200	38.05	5,200	.2047	35	0,9	82	36	6
VDS202A05300	27.20	VDS402A05300	38.05	5,300	.2087	35	0,9	82	36	6
VDS202A05400	27.20	VDS402A05400	38.05	5,400	.2126	35	0,9	82	36	6
VDS202A05410	27.20	VDS402A05410	38.05	5,410	.2130	35	0,9	82	36	6
VDS202A05500	27.20	VDS402A05500	38.05	5,500	.2165	35	0,9	82	36	6
VDS202A05558	27.20	VDS402A05558	38.05	5,558	.2188	35	0,9	82	36	6

(continued)

Solid Carbide Drills

(VariDrill™ • VDS202A/VDS402A • 5 x D continued)



VDS202A • WU25PD	£	VDS402A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS202A05600	27.20	VDS402A05600	38.05	5,600	.2205	35	0,9	82	36	6
VDS202A05616	27.20	VDS402A05616	38.05	5,616	.2211	35	0,9	82	36	6
VDS202A05700	27.20	VDS402A05700	38.05	5,700	.2244	35	1,0	82	36	6
VDS202A05800	27.20	VDS402A05800	38.05	5,800	.2283	35	1,0	82	36	6
VDS202A05900	27.20	VDS402A05900	38.05	5,900	.2323	35	1,0	82	36	6
VDS202A05954	27.20	VDS402A05954	38.05	5,954	.2344	35	1,0	82	36	6
VDS202A06000	27.20	VDS402A06000	38.05	6,000	.2362	35	1,0	82	36	6
VDS202A06100	27.75	VDS402A06100	41.55	6,100	.2402	43	1,0	91	36	8
VDS202A06200	27.75	VDS402A06200	41.55	6,200	.2441	43	1,0	91	36	8
VDS202A06300	27.75	VDS402A06300	41.55	6,300	.2480	43	1,1	91	36	8
VDS202A06350	27.75	VDS402A06350	41.55	6,350	.2500	43	1,1	91	36	8
VDS202A06400	27.75	VDS402A06400	41.55	6,400	.2520	43	1,1	91	36	8
VDS202A06500	27.75	VDS402A06500	41.55	6,500	.2559	43	1,1	91	36	8
VDS202A06528	27.75	VDS402A06528	41.55	6,528	.2570	43	1,1	91	36	8
VDS202A06600	27.75	VDS402A06600	41.55	6,600	.2598	43	1,1	91	36	8
VDS202A06630	27.75	VDS402A06630	41.55	6,630	.2610	43	1,1	91	36	8
VDS202A06700	27.75	VDS402A06700	41.55	6,700	.2638	43	1,1	91	36	8
VDS202A06746	27.75	VDS402A06746	41.55	6,746	.2656	43	1,1	91	36	8
VDS202A06800	27.75	VDS402A06800	41.55	6,800	.2677	43	1,1	91	36	8
VDS202A06900	27.75	VDS402A06900	41.55	6,900	.2717	43	1,2	91	36	8
VDS202A07000	27.75	VDS402A07000	41.55	7,000	.2756	43	1,2	91	36	8
VDS202A07100	28.60	VDS402A07100	44.40	7,100	.2795	43	1,2	91	36	8
VDS202A07145	28.60	VDS402A07145	44.40	7,145	.2813	43	1,2	91	36	8
VDS202A07200	28.60	VDS402A07200	44.40	7,200	.2835	43	1,2	91	36	8
VDS202A07300	28.60	VDS402A07300	44.40	7,300	.2874	43	1,2	91	36	8
VDS202A07400	28.60	VDS402A07400	44.40	7,400	.2913	43	1,3	91	36	8
VDS202A07500	28.60	VDS402A07500	44.40	7,500	.2953	43	1,3	91	36	8
VDS202A07541	28.60	VDS402A07541	44.40	7,541	.2969	43	1,3	91	36	8
VDS202A07600	28.60	VDS402A07600	44.40	7,600	.2992	43	1,3	91	36	8
VDS202A07700	28.60	VDS402A07700	44.40	7,700	.3031	43	1,3	91	36	8
VDS202A07800	28.60	VDS402A07800	44.40	7,800	.3071	43	1,3	91	36	8
VDS202A07900	28.60	VDS402A07900	44.40	7,900	.3110	43	1,3	91	36	8
VDS202A07938	28.60	VDS402A07938	44.40	7,938	.3125	43	1,3	91	36	8
VDS202A08000	28.60	VDS402A08000	44.40	8,000	.3150	43	1,4	91	36	8
VDS202A08100	31.35	VDS402A08100	48.65	8,100	.3189	49	1,4	103	40	10
VDS202A08200	31.35	VDS402A08200	48.65	8,200	.3228	49	1,4	103	40	10
VDS202A08300	31.35	VDS402A08300	48.65	8,300	.3268	49	1,4	103	40	10
VDS202A08334	31.35	VDS402A08334	48.65	8,334	.3281	49	1,4	103	40	10
VDS202A08400	31.35	VDS402A08400	48.65	8,400	.3307	49	1,4	103	40	10
VDS202A08433	31.35	VDS402A08433	48.65	8,433	.3320	49	1,4	103	40	10
VDS202A08500	31.35	VDS402A08500	48.65	8,500	.3346	49	1,4	103	40	10
VDS202A08600	31.35	VDS402A08600	48.65	8,600	.3386	49	1,5	103	40	10
VDS202A08700	31.35	VDS402A08700	48.65	8,700	.3425	49	1,5	103	40	10
VDS202A08733	31.35	VDS402A08733	48.65	8,733	.3438	49	1,5	103	40	10
VDS202A08800	31.35	VDS402A08800	48.65	8,800	.3465	49	1,5	103	40	10
VDS202A08900	31.35	VDS402A08900	48.65	8,900	.3504	49	1,5	103	40	10

(continued)

(VariDrill™ • VDS202A/VDS402A • 5 x D continued)

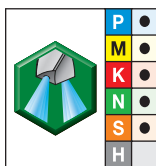


VDS202A • WU25PD	£	VDS402A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS202A09000	31.35	VDS402A09000	48.65	9,000	.3543	49	1,5	103	40	10
VDS202A09100	36.25	VDS402A09100	49.10	9,100	.3583	49	1,5	103	40	10
VDS202A09129	36.25	VDS402A09129	49.10	9,129	.3594	49	1,6	103	40	10
VDS202A09200	36.25	VDS402A09200	49.10	9,200	.3622	49	1,6	103	40	10
VDS202A09300	36.25	VDS402A09300	49.10	9,300	.3661	49	1,6	103	40	10
VDS202A09347	36.25	VDS402A09347	49.10	9,347	.3680	49	1,6	103	40	10
VDS202A09400	36.25	VDS402A09400	49.10	9,400	.3701	49	1,6	103	40	10
VDS202A09500	36.25	VDS402A09500	49.10	9,500	.3740	49	1,6	103	40	10
VDS202A09525	36.25	VDS402A09525	49.10	9,525	.3750	49	1,6	103	40	10
VDS202A09600	36.25	VDS402A09600	49.10	9,600	.3780	49	1,6	103	40	10
VDS202A09700	36.25	VDS402A09700	49.10	9,700	.3819	49	1,7	103	40	10
VDS202A09800	36.25	VDS402A09800	49.10	9,800	.3858	49	1,7	103	40	10
VDS202A09900	36.25	VDS402A09900	49.10	9,900	.3898	49	1,7	103	40	10
VDS202A09921	36.25	VDS402A09921	49.10	9,921	.3906	49	1,7	103	40	10
VDS202A10000	36.25	VDS402A10000	49.10	10,000	.3937	49	1,7	103	40	10
VDS202A10100	41.55	VDS402A10100	64.40	10,100	.3976	56	1,7	118	45	12
VDS202A10200	41.55	VDS402A10200	64.40	10,200	.4016	56	1,7	118	45	12
VDS202A10300	41.55	VDS402A10300	64.40	10,300	.4055	56	1,8	118	45	12
VDS202A10320	41.55	VDS402A10320	64.40	10,320	.4063	56	1,8	118	45	12
VDS202A10400	41.55	VDS402A10400	64.40	10,400	.4094	56	1,8	118	45	12
VDS202A10500	41.55	VDS402A10500	64.40	10,500	.4134	56	1,8	118	45	12
VDS202A10600	41.55	VDS402A10600	64.40	10,600	.4173	56	1,8	118	45	12
VDS202A10700	41.55	VDS402A10700	64.40	10,700	.4213	56	1,8	118	45	12
VDS202A10716	41.55	VDS402A10716	64.40	10,716	.4219	56	1,8	118	45	12
VDS202A10800	41.55	VDS402A10800	64.40	10,800	.4252	56	1,8	118	45	12
VDS202A10900	41.55	VDS402A10900	64.40	10,900	.4291	56	1,9	118	45	12
VDS202A11000	41.55	VDS402A11000	64.40	11,000	.4331	56	1,9	118	45	12
VDS202A11100	43.40	VDS402A11100	67.20	11,100	.4370	56	1,9	118	45	12
VDS202A11113	43.40	VDS402A11113	67.20	11,113	.4375	56	1,9	118	45	12
VDS202A11200	43.40	VDS402A11200	67.20	11,200	.4409	56	1,9	118	45	12
VDS202A11300	43.40	VDS402A11300	67.20	11,300	.4449	56	1,9	118	45	12
VDS202A11400	43.40	VDS402A11400	67.20	11,400	.4488	56	2,0	118	45	12
VDS202A11500	43.40	VDS402A11500	67.20	11,500	.4528	56	2,0	118	45	12
VDS202A11509	43.40	VDS402A11509	67.20	11,509	.4531	56	2,0	118	45	12
VDS202A11600	43.40	VDS402A11600	67.20	11,600	.4567	56	2,0	118	45	12
VDS202A11700	43.40	VDS402A11700	67.20	11,700	.4606	56	2,0	118	45	12
VDS202A11800	43.40	VDS402A11800	67.20	11,800	.4646	56	2,0	118	45	12
VDS202A11900	43.40	VDS402A11900	67.20	11,900	.4685	56	2,0	118	45	12
VDS202A11908	43.40	VDS402A11908	67.20	11,908	.4688	56	2,0	118	45	12
VDS202A12000	43.40	VDS402A12000	67.20	12,000	.4724	56	2,1	118	45	12
VDS202A12100	58.10	VDS402A12100	89.90	12,100	.4764	60	2,1	124	45	14
VDS202A12200	58.10	VDS402A12200	89.90	12,200	.4803	60	2,1	124	45	14
VDS202A12300	58.10	VDS402A12300	89.90	12,300	.4843	60	2,1	124	45	14
VDS202A12304	58.10	VDS402A12304	89.90	12,304	.4844	60	2,1	124	45	14
VDS202A12400	58.10	VDS402A12400	89.90	12,400	.4882	60	2,1	124	45	14
VDS202A12500	58.10	VDS402A12500	89.90	12,500	.4921	60	2,1	124	45	14

(continued)

Solid Carbide Drills

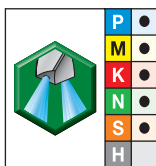
(VariDrill™ • VDS202A/VDS402A • 5 x D continued)



VDS202A • WU25PD	£	VDS402A • WU25PD	£	D1 diameter		L4 max	L5	L	LS	D
				mm	in					
VDS202A12600	58.10	VDS402A12600	89.90	12,600	.4961	60	2,2	124	45	14
VDS202A12700	58.10	VDS402A12700	89.90	12,700	.5000	60	2,2	124	45	14
VDS202A12800	58.10	VDS402A12800	89.90	12,800	.5039	60	2,2	124	45	14
VDS202A12900	58.10	VDS402A12900	89.90	12,900	.5079	60	2,2	124	45	14
VDS202A13000	58.10	VDS402A13000	89.90	13,000	.5118	60	2,2	124	45	14
VDS202A13096	60.00	VDS402A13096	93.00	13,096	.5156	60	2,3	124	45	14
VDS202A13100	60.00	VDS402A13100	93.00	13,100	.5157	60	2,3	124	45	14
VDS202A13200	60.00	VDS402A13200	93.00	13,200	.5197	60	2,3	124	45	14
VDS202A13300	60.00	VDS402A13300	93.00	13,300	.5236	60	2,3	124	45	14
VDS202A13400	60.00	VDS402A13400	93.00	13,400	.5276	60	2,3	124	45	14
VDS202A13500	60.00	VDS402A13500	93.00	13,500	.5315	60	2,3	124	45	14
VDS202A13600	60.00	VDS402A13600	93.00	13,600	.5354	60	2,3	124	45	14
VDS202A13700	60.00	VDS402A13700	93.00	13,700	.5394	60	2,4	124	45	14
VDS202A13800	60.00	VDS402A13800	93.00	13,800	.5433	60	2,4	124	45	14
VDS202A13891	60.00	VDS402A13891	93.00	13,891	.5469	60	2,4	124	45	14
VDS202A13900	60.00	VDS402A13900	93.00	13,900	.5472	60	2,4	124	45	14
VDS202A14000	60.00	VDS402A14000	93.00	14,000	.5512	60	2,4	124	45	14
VDS202A14100	69.10	VDS402A14100	104.00	14,100	.5551	63	2,4	133	48	16
VDS202A14200	69.10	VDS402A14200	104.00	14,200	.5591	63	2,5	133	48	16
VDS202A14288	69.10	VDS402A14288	104.00	14,288	.5625	63	2,5	133	48	16
VDS202A14300	69.10	VDS402A14300	104.00	14,300	.5630	63	2,5	133	48	16
VDS202A14400	69.10	VDS402A14400	104.00	14,400	.5669	63	2,5	133	48	16
VDS202A14500	69.10	VDS402A14500	104.00	14,500	.5709	63	2,5	133	48	16
VDS202A14600	69.10	VDS402A14600	104.00	14,600	.5748	63	2,5	133	48	16
VDS202A14684	69.10	VDS402A14684	104.00	14,684	.5781	63	2,5	133	48	16
VDS202A14700	69.10	VDS402A14700	104.00	14,700	.5787	63	2,5	133	48	16
VDS202A14800	69.10	VDS402A14800	104.00	14,800	.5827	63	2,6	133	48	16
VDS202A14900	69.10	VDS402A14900	104.00	14,900	.5866	63	2,6	133	48	16
VDS202A15000	69.10	VDS402A15000	104.00	15,000	.5906	63	2,6	133	48	16
VDS202A15083	78.80	VDS402A15083	122.00	15,083	.5938	63	2,6	133	48	16
VDS202A15100	78.80	VDS402A15100	122.00	15,100	.5945	63	2,6	133	48	16
VDS202A15200	78.80	VDS402A15200	122.00	15,200	.5984	63	2,6	133	48	16
VDS202A15300	78.80	VDS402A15300	122.00	15,300	.6024	63	2,6	133	48	16
VDS202A15400	78.80	VDS402A15400	122.00	15,400	.6063	63	2,7	133	48	16
VDS202A15479	78.80	VDS402A15479	122.00	15,479	.6094	63	2,7	133	48	16
VDS202A15500	78.80	VDS402A15500	122.00	15,500	.6102	63	2,7	133	48	16
VDS202A15600	78.80	VDS402A15600	122.00	15,600	.6142	63	2,7	133	48	16
VDS202A15700	78.80	VDS402A15700	122.00	15,700	.6181	63	2,7	133	48	16
VDS202A15800	78.80	VDS402A15800	122.00	15,800	.6220	63	2,7	133	48	16
VDS202A15875	78.80	VDS402A15875	122.00	15,875	.6250	63	2,7	133	48	16
VDS202A15900	78.80	VDS402A15900	122.00	15,900	.6260	63	2,8	133	48	16
VDS202A16000	78.80	VDS402A16000	122.00	16,000	.6299	63	2,8	133	48	16
VDS202A16100	91.30	VDS402A16100	138.00	16,100	.6339	71	2,8	143	48	18
VDS202A16200	91.30	VDS402A16200	138.00	16,200	.6378	71	2,8	143	48	18
VDS202A16271	91.30	VDS402A16271	138.00	16,271	.6406	71	2,8	143	48	18
VDS202A16300	91.30	VDS402A16300	138.00	16,300	.6417	71	2,8	143	48	18

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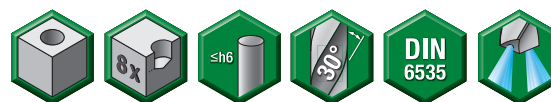
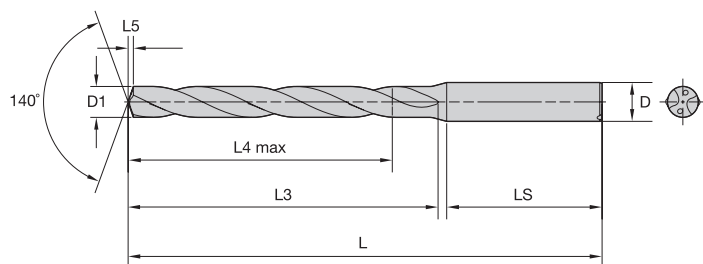
(VariDrill™ • VDS202A/VDS402A • 5 x D continued)



VDS202A • WU25PD		£	VDS402A • WU25PD		£	D1 diameter		L4 max	L5	L	LS	D
						mm	in					
VDS202A16400	91.30		VDS402A16400	138.00		16,400	.6457	71	2,8	143	48	18
VDS202A16500	91.30		VDS402A16500	138.00		16,500	.6496	71	2,9	143	48	18
VDS202A16600	91.30		VDS402A16600	138.00		16,600	.6535	71	2,9	143	48	18
VDS202A16670	91.30		VDS402A16670	138.00		16,670	.6563	71	2,9	143	48	18
VDS202A16700	91.30		VDS402A16700	138.00		16,700	.6575	71	2,9	143	48	18
VDS202A16800	91.30		VDS402A16800	138.00		16,800	.6614	71	2,9	143	48	18
VDS202A16900	91.30		VDS402A16900	138.00		16,900	.6654	71	2,9	143	48	18
VDS202A17000	91.30		VDS402A17000	138.00		17,000	.6693	71	2,9	143	48	18
VDS202A17100	110.00		VDS402A17100	170.00		17,100	.6732	71	3,0	143	48	18
VDS202A17200	110.00		VDS402A17200	170.00		17,200	.6772	71	3,0	143	48	18
VDS202A17300	110.00		VDS402A17300	170.00		17,300	.6811	71	3,0	143	48	18
VDS202A17400	110.00		VDS402A17400	170.00		17,400	.6850	71	3,0	143	48	18
VDS202A17463	110.00		VDS402A17463	170.00		17,463	.6875	71	3,0	143	48	18
VDS202A17500	110.00		VDS402A17500	170.00		17,500	.6890	71	3,0	143	48	18
VDS202A17600	110.00		VDS402A17600	170.00		17,600	.6929	71	3,1	143	48	18
VDS202A17700	110.00		VDS402A17700	170.00		17,700	.6969	71	3,1	143	48	18
VDS202A17800	110.00		VDS402A17800	170.00		17,800	.7008	71	3,1	143	48	18
VDS202A17859	110.00		VDS402A17859	170.00		17,859	.7031	71	3,1	143	48	18
VDS202A17900	110.00		VDS402A17900	170.00		17,900	.7047	71	3,1	143	48	18
VDS202A18000	110.00		VDS402A18000	170.00		18,000	.7087	71	3,1	143	48	18
VDS202A18100	118.50		VDS402A18100	179.00		18,100	.7126	77	3,1	153	50	20
VDS202A18200	118.50		VDS402A18200	179.00		18,200	.7165	77	3,2	153	50	20
VDS202A18258	118.50		VDS402A18258	179.00		18,258	.7188	77	3,2	153	50	20
VDS202A18300	118.50		VDS402A18300	179.00		18,300	.7205	77	3,2	153	50	20
VDS202A18400	118.50		VDS402A18400	179.00		18,400	.7244	77	3,2	153	50	20
VDS202A18500	118.50		VDS402A18500	179.00		18,500	.7283	77	3,2	153	50	20
VDS202A18600	118.50		VDS402A18600	179.00		18,600	.7323	77	3,2	153	50	20
VDS202A18654	118.50		VDS402A18654	179.00		18,654	.7344	77	3,2	153	50	20
VDS202A18700	118.50		VDS402A18700	179.00		18,700	.7362	77	3,2	153	50	20
VDS202A18800	118.50		VDS402A18800	179.00		18,800	.7402	77	3,3	153	50	20
VDS202A18900	118.50		VDS402A18900	179.00		18,900	.7441	77	3,3	153	50	20
VDS202A19000	118.50		VDS402A19000	179.00		19,000	.7480	77	3,3	153	50	20
VDS202A19050	128.50		VDS402A19050	199.00		19,050	.7500	77	3,3	153	50	20
VDS202A19100	128.50		VDS402A19100	199.00		19,100	.7520	77	3,3	153	50	20
VDS202A19200	128.50		VDS402A19200	199.00		19,200	.7559	77	3,3	153	50	20
VDS202A19300	128.50		VDS402A19300	199.00		19,300	.7598	77	3,4	153	50	20
VDS202A19400	128.50		VDS402A19400	199.00		19,400	.7638	77	3,4	153	50	20
VDS202A19500	128.50		VDS402A19500	199.00		19,500	.7677	77	3,4	153	50	20
VDS202A19600	128.50		VDS402A19600	199.00		19,600	.7717	77	3,4	153	50	20
VDS202A19700	128.50		VDS402A19700	199.00		19,700	.7756	77	3,4	153	50	20
VDS202A19800	128.50		VDS402A19800	199.00		19,800	.7795	77	3,4	153	50	20
VDS202A19900	128.50		VDS402A19900	199.00		19,900	.7835	77	3,5	153	50	20
VDS202A20000	128.50		VDS402A20000	199.00		20,000	.7874	77	3,5	153	50	20

NOTE: L4 max, L5, L, LS, and D table columns reflect millimetre measurements.

Solid Carbide Drills



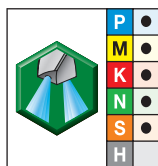
■ VariDrill™ • VDS403A • 8 x D



VDS403A • WU25PD	£	D1 diameter		L	L4 max	L5	LS	D
		mm	in					
VDS403A01500	55.90	1,500	.0591	58	15	0,2	28	4
VDS403A01600	55.90	1,600	.0630	58	15	0,2	28	4
VDS403A01700	55.90	1,700	.0669	58	15	0,3	28	4
VDS403A01800	55.90	1,800	.0709	58	15	0,3	28	4
VDS403A01900	55.90	1,900	.0748	58	15	0,3	28	4
VDS403A01984	55.90	1,984	.0781	66	22	0,3	28	4
VDS403A02000	55.90	2,000	.0787	66	22	0,3	28	4
VDS403A02100	56.80	2,100	.0827	66	22	0,3	28	4
VDS403A02200	56.80	2,200	.0866	66	22	0,3	28	4
VDS403A02300	56.80	2,300	.0906	66	22	0,4	28	4
VDS403A02383	56.80	2,383	.0938	66	25	0,4	28	4
VDS403A02400	56.80	2,400	.0945	66	25	0,4	28	4
VDS403A02439	56.80	2,439	.0960	66	25	0,4	28	4
VDS403A02489	56.80	2,489	.0980	66	25	0,4	28	4
VDS403A02500	56.80	2,500	.0984	66	25	0,4	28	4
VDS403A02578	56.80	2,578	.1015	66	25	0,4	28	4
VDS403A02600	56.80	2,600	.1024	66	25	0,4	28	4
VDS403A02642	56.80	2,642	.1040	66	25	0,4	28	4
VDS403A02700	56.80	2,700	.1063	66	25	0,4	28	4
VDS403A02705	56.80	2,705	.1065	66	25	0,4	28	4
VDS403A02779	56.80	2,779	.1094	66	25	0,4	28	4
VDS403A02800	56.80	2,800	.1102	66	25	0,5	28	4
VDS403A02820	56.80	2,820	.1110	66	25	0,5	28	4
VDS403A02870	56.80	2,870	.1130	66	25	0,5	28	4
VDS403A02900	56.80	2,900	.1142	66	25	0,5	28	4
VDS403A02947	56.80	2,947	.1160	66	25	0,5	28	4
VDS403A03000	56.80	3,000	.1181	78	33	0,5	36	6
VDS403A03048	57.80	3,048	.1200	78	33	0,5	36	6
VDS403A03100	57.80	3,100	.1220	78	33	0,5	36	6
VDS403A03175	57.80	3,175	.1250	78	33	0,5	36	6
VDS403A03200	57.80	3,200	.1260	78	33	0,5	36	6
VDS403A03264	57.80	3,264	.1285	78	33	0,5	36	6
VDS403A03300	57.80	3,300	.1299	78	33	0,5	36	6
VDS403A03400	57.80	3,400	.1339	78	33	0,6	36	6
VDS403A03455	57.80	3,455	.1360	78	33	0,6	36	6
VDS403A03500	57.80	3,500	.1378	78	33	0,6	36	6
VDS403A03571	57.80	3,571	.1406	78	33	0,6	36	6
VDS403A03600	57.80	3,600	.1417	78	33	0,6	36	6
VDS403A03658	57.80	3,658	.1440	78	33	0,6	36	6
VDS403A03700	57.80	3,700	.1457	78	33	0,6	36	6

(continued)

(VariDrill™ • VDS403A • 8 x D continued)



VDS403A • WU25PD	£	D1 diameter		L	L4 max	L5	LS	D
		mm	in					
VDS403A03734	57.80	3,734	.1470	78	33	0,6	36	6
VDS403A03800	57.80	3,800	.1496	87	41	0,6	36	6
VDS403A03900	57.80	3,900	.1535	87	41	0,6	36	6
VDS403A03970	57.80	3,970	.1563	87	41	0,7	36	6
VDS403A04000	57.80	4,000	.1575	87	41	0,7	36	6
VDS403A04039	59.90	4,039	.1590	87	41	0,7	36	6
VDS403A04090	59.90	4,090	.1610	87	41	0,7	36	6
VDS403A04100	59.90	4,100	.1614	87	41	0,7	36	6
VDS403A04200	59.90	4,200	.1654	87	41	0,7	36	6
VDS403A04217	59.90	4,217	.1660	87	41	0,7	36	6
VDS403A04300	59.90	4,300	.1693	87	41	0,7	36	6
VDS403A04366	59.90	4,366	.1719	87	41	0,7	36	6
VDS403A04400	59.90	4,400	.1732	87	41	0,7	36	6
VDS403A04500	59.90	4,500	.1772	87	41	0,7	36	6
VDS403A04600	59.90	4,600	.1811	87	41	0,8	36	6
VDS403A04623	59.90	4,623	.1820	87	41	0,8	36	6
VDS403A04700	59.90	4,700	.1850	87	41	0,8	36	6
VDS403A04763	59.90	4,763	.1875	94	48	0,8	36	6
VDS403A04800	59.90	4,800	.1890	94	48	0,8	36	6
VDS403A04852	59.90	4,852	.1910	94	48	0,8	36	6
VDS403A04900	59.90	4,900	.1929	94	48	0,8	36	6
VDS403A05000	59.90	5,000	.1969	94	48	0,8	36	6
VDS403A05100	61.00	5,100	.2008	94	48	0,8	36	6
VDS403A05106	61.00	5,106	.2010	94	48	0,8	36	6
VDS403A05159	61.00	5,159	.2031	94	48	0,9	36	6
VDS403A05200	61.00	5,200	.2047	94	48	0,9	36	6
VDS403A05300	61.00	5,300	.2087	94	48	0,9	36	6
VDS403A05400	61.00	5,400	.2126	94	48	0,9	36	6
VDS403A05410	61.00	5,410	.2130	94	48	0,9	36	6
VDS403A05500	61.00	5,500	.2165	94	48	0,9	36	6
VDS403A05558	61.00	5,558	.2188	94	48	0,9	36	6
VDS403A05600	61.00	5,600	.2205	94	48	0,9	36	6
VDS403A05616	61.00	5,616	.2211	94	48	0,9	36	6
VDS403A05700	61.00	5,700	.2244	94	48	1,0	36	6
VDS403A05800	61.00	5,800	.2283	94	48	1,0	36	6
VDS403A05900	61.00	5,900	.2323	94	48	1,0	36	6
VDS403A05954	61.00	5,954	.2344	94	48	1,0	36	6
VDS403A06000	61.00	6,000	.2362	94	48	1,0	36	6
VDS403A06100	66.30	6,100	.2402	105	57	1,0	36	8
VDS403A06200	66.30	6,200	.2441	105	57	1,0	36	8
VDS403A06300	66.30	6,300	.2480	105	57	1,1	36	8
VDS403A06350	66.30	6,350	.2500	105	57	1,1	36	8
VDS403A06400	66.30	6,400	.2520	105	57	1,1	36	8
VDS403A06500	66.30	6,500	.2559	105	57	1,1	36	8

(continued)

Solid Carbide Drills

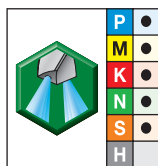
(VariDrill™ • VDS403A • 8 x D continued)



VDS403A • WU25PD	£	D1 diameter		L	L4 max	L5	LS	D
		mm	in					
VDS403A06528	66.30	6,528	.2570	105	57	1,1	36	8
VDS403A06600	66.30	6,600	.2598	105	57	1,1	36	8
VDS403A06630	66.30	6,630	.2610	105	57	1,1	36	8
VDS403A06700	66.30	6,700	.2638	105	57	1,1	36	8
VDS403A06746	66.30	6,746	.2656	105	57	1,1	36	8
VDS403A06800	66.30	6,800	.2677	105	57	1,1	36	8
VDS403A06900	66.30	6,900	.2717	105	57	1,2	36	8
VDS403A07000	66.30	7,000	.2756	105	57	1,2	36	8
VDS403A07100	71.20	7,100	.2795	110	61	1,2	36	8
VDS403A07145	71.20	7,145	.2813	110	61	1,2	36	8
VDS403A07200	71.20	7,200	.2835	110	61	1,2	36	8
VDS403A07300	71.20	7,300	.2874	110	61	1,2	36	8
VDS403A07400	71.20	7,400	.2913	110	61	1,3	36	8
VDS403A07500	71.20	7,500	.2953	110	61	1,3	36	8
VDS403A07541	71.20	7,541	.2969	110	61	1,3	36	8
VDS403A07600	71.20	7,600	.2992	110	61	1,3	36	8
VDS403A07700	71.20	7,700	.3031	110	61	1,3	36	8
VDS403A07800	71.20	7,800	.3071	110	61	1,3	36	8
VDS403A07900	71.20	7,900	.3110	110	61	1,3	36	8
VDS403A07938	71.20	7,938	.3125	110	61	1,3	36	8
VDS403A08000	71.20	8,000	.3150	110	61	1,4	36	8
VDS403A08100	77.80	8,100	.3189	122	68	1,4	40	10
VDS403A08200	77.80	8,200	.3228	122	68	1,4	40	10
VDS403A08300	77.80	8,300	.3268	122	68	1,4	40	10
VDS403A08334	77.80	8,334	.3281	122	68	1,4	40	10
VDS403A08400	77.80	8,400	.3307	122	68	1,4	40	10
VDS403A08433	77.80	8,433	.3320	122	68	1,4	40	10
VDS403A08500	77.80	8,500	.3346	122	68	1,4	40	10
VDS403A08600	77.80	8,600	.3386	122	68	1,5	40	10
VDS403A08700	77.80	8,700	.3425	122	68	1,5	40	10
VDS403A08733	77.80	8,733	.3438	122	68	1,5	40	10
VDS403A08800	77.80	8,800	.3465	122	68	1,5	40	10
VDS403A08900	77.80	8,900	.3504	122	68	1,5	40	10
VDS403A09000	77.80	9,000	.3543	122	68	1,5	40	10
VDS403A09100	88.50	9,100	.3583	122	68	1,5	40	10
VDS403A09129	88.50	9,129	.3594	122	68	1,6	40	10
VDS403A09200	88.50	9,200	.3622	122	68	1,6	40	10
VDS403A09300	88.50	9,300	.3661	122	68	1,6	40	10
VDS403A09347	88.50	9,347	.3680	122	68	1,6	40	10
VDS403A09400	88.50	9,400	.3701	122	68	1,6	40	10
VDS403A09500	88.50	9,500	.3740	122	68	1,6	40	10
VDS403A09525	88.50	9,525	.3750	122	68	1,6	40	10
VDS403A09600	88.50	9,600	.3780	122	68	1,6	40	10
VDS403A09700	88.50	9,700	.3819	122	68	1,7	40	10
VDS403A09800	88.50	9,800	.3858	122	68	1,7	40	10
VDS403A09900	88.50	9,900	.3898	122	68	1,7	40	10

(continued)

(VariDrill™ • VDS403A • 8 x D continued)

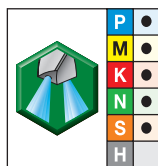


VDS403A • WU25PD	£	D1 diameter		L	L4 max	L5	LS	D
		mm	in					
VDS403A09921	88.50	9,921	.3906	122	68	1,7	40	10
VDS403A10000	88.50	10,000	.3937	122	68	1,7	40	10
VDS403A10100	103.00	10,100	.3976	141	79	1,7	45	12
VDS403A10200	103.00	10,200	.4016	141	79	1,7	45	12
VDS403A10300	103.00	10,300	.4055	141	79	1,8	45	12
VDS403A10320	103.00	10,320	.4063	141	79	1,8	45	12
VDS403A10400	103.00	10,400	.4094	141	79	1,8	45	12
VDS403A10500	103.00	10,500	.4134	141	79	1,8	45	12
VDS403A10600	103.00	10,600	.4173	141	79	1,8	45	12
VDS403A10700	103.00	10,700	.4213	141	79	1,8	45	12
VDS403A10716	103.00	10,716	.4219	141	79	1,8	45	12
VDS403A10800	103.00	10,800	.4252	141	79	1,8	45	12
VDS403A10900	103.00	10,900	.4291	141	79	1,9	45	12
VDS403A11000	103.00	11,000	.4331	141	79	1,9	45	12
VDS403A11100	107.50	11,100	.4370	141	79	1,9	45	12
VDS403A11113	107.50	11,113	.4375	141	79	1,9	45	12
VDS403A11200	107.50	11,200	.4409	141	79	1,9	45	12
VDS403A11300	107.50	11,300	.4449	141	79	1,9	45	12
VDS403A11400	107.50	11,400	.4488	141	79	2,0	45	12
VDS403A11500	107.50	11,500	.4528	141	79	2,0	45	12
VDS403A11509	107.50	11,509	.4531	141	79	2,0	45	12
VDS403A11600	107.50	11,600	.4567	141	79	2,0	45	12
VDS403A11700	107.50	11,700	.4606	141	79	2,0	45	12
VDS403A11800	107.50	11,800	.4646	141	79	2,0	45	12
VDS403A11900	107.50	11,900	.4685	141	79	2,0	45	12
VDS403A11908	107.50	11,908	.4688	141	79	2,0	45	12
VDS403A12000	107.50	12,000	.4724	141	79	2,1	45	12
VDS403A12100	144.00	12,100	.4764	155	91	2,1	45	14
VDS403A12200	144.00	12,200	.4803	155	91	2,1	45	14
VDS403A12300	144.00	12,300	.4843	155	91	2,1	45	14
VDS403A12304	144.00	12,304	.4844	155	91	2,1	45	14
VDS403A12400	144.00	12,400	.4882	155	91	2,1	45	14
VDS403A12500	144.00	12,500	.4921	155	91	2,1	45	14
VDS403A12600	144.00	12,600	.4961	155	91	2,2	45	14
VDS403A12700	144.00	12,700	.5000	155	91	2,2	45	14
VDS403A12800	144.00	12,800	.5039	155	91	2,2	45	14
VDS403A12900	144.00	12,900	.5079	155	91	2,2	45	14
VDS403A13000	144.00	13,000	.5118	155	91	2,2	45	14
VDS403A13096	149.50	13,096	.5156	155	91	2,3	45	14
VDS403A13100	149.50	13,100	.5157	155	91	2,3	45	14
VDS403A13200	149.50	13,200	.5197	155	91	2,3	45	14
VDS403A13300	149.50	13,300	.5236	155	91	2,3	45	14
VDS403A13400	149.50	13,400	.5276	155	91	2,3	45	14
VDS403A13500	149.50	13,500	.5315	155	91	2,3	45	14
VDS403A13600	149.50	13,600	.5354	155	91	2,3	45	14
VDS403A13700	149.50	13,700	.5394	155	91	2,4	45	14

(continued)

Solid Carbide Drills

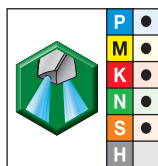
(VariDrill™ • VDS403A • 8 x D continued)



VDS403A • WU25PD	£	D1 diameter		L	L4 max	L5	LS	D
		mm	in					
VDS403A13800	149.50	13,800	.5433	155	91	2,4	45	14
VDS403A13891	149.50	13,891	.5469	155	91	2,4	45	14
VDS403A13900	149.50	13,900	.5472	155	91	2,4	45	14
VDS403A14000	149.50	14,000	.5512	155	91	2,4	45	14
VDS403A14100	167.00	14,100	.5551	171	101	2,4	48	16
VDS403A14200	167.00	14,200	.5591	171	101	2,5	48	16
VDS403A14288	167.00	14,288	.5625	171	101	2,5	48	16
VDS403A14300	167.00	14,300	.5630	171	101	2,5	48	16
VDS403A14400	167.00	14,400	.5669	171	101	2,5	48	16
VDS403A14500	167.00	14,500	.5709	171	101	2,5	48	16
VDS403A14600	167.00	14,600	.5748	171	101	2,5	48	16
VDS403A14684	167.00	14,684	.5781	171	101	2,5	48	16
VDS403A14700	167.00	14,700	.5787	171	101	2,5	48	16
VDS403A14800	167.00	14,800	.5827	171	101	2,6	48	16
VDS403A14900	167.00	14,900	.5866	171	101	2,6	48	16
VDS403A15000	167.00	15,000	.5906	171	101	2,6	48	16
VDS403A15083	195.00	15,083	.5938	171	101	2,6	48	16
VDS403A15100	195.00	15,100	.5945	171	101	2,6	48	16
VDS403A15200	195.00	15,200	.5984	171	101	2,6	48	16
VDS403A15300	195.00	15,300	.6024	171	101	2,6	48	16
VDS403A15400	195.00	15,400	.6063	171	101	2,7	48	16
VDS403A15479	195.00	15,479	.6094	171	101	2,7	48	16
VDS403A15500	195.00	15,500	.6102	171	101	2,7	48	16
VDS403A15600	195.00	15,600	.6142	171	101	2,7	48	16
VDS403A15700	195.00	15,700	.6181	171	101	2,7	48	16
VDS403A15800	195.00	15,800	.6220	171	101	2,7	48	16
VDS403A15875	195.00	15,875	.6250	171	101	2,7	48	16
VDS403A15900	195.00	15,900	.6260	171	101	2,8	48	16
VDS403A16000	195.00	16,000	.6299	171	101	2,8	48	16
VDS403A16100	220.50	16,100	.6339	185	113	2,8	48	18
VDS403A16200	220.50	16,200	.6378	185	113	2,8	48	18
VDS403A16271	220.50	16,271	.6406	185	113	2,8	48	18
VDS403A16300	220.50	16,300	.6417	185	113	2,8	48	18
VDS403A16400	220.50	16,400	.6457	185	113	2,8	48	18
VDS403A16500	220.50	16,500	.6496	185	113	2,9	48	18
VDS403A16600	220.50	16,600	.6535	185	113	2,9	48	18
VDS403A16670	220.50	16,670	.6563	185	113	2,9	48	18
VDS403A16700	220.50	16,700	.6575	185	113	2,9	48	18
VDS403A16800	220.50	16,800	.6614	185	113	2,9	48	18
VDS403A16900	220.50	16,900	.6654	185	113	2,9	48	18
VDS403A17000	220.50	17,000	.6693	185	113	2,9	48	18
VDS403A17100	272.00	17,100	.6732	185	113	3,0	48	18
VDS403A17200	272.00	17,200	.6772	185	113	3,0	48	18
VDS403A17300	272.00	17,300	.6811	185	113	3,0	48	18
VDS403A17400	272.00	17,400	.6850	185	113	3,0	48	18
VDS403A17463	272.00	17,463	.6875	185	113	3,0	48	18

(continued)

(VariDrill™ • VDS403A • 8 x D continued)



VDS403A • WU25PD	£	D1 diameter		L	L4 max	L5	LS	D
		mm	in					
VDS403A17500	272.00	17,500	.6890	185	113	3,0	48	18
VDS403A17600	272.00	17,600	.6929	185	113	3,1	48	18
VDS403A17700	272.00	17,700	.6969	185	113	3,1	48	18
VDS403A17800	272.00	17,800	.7008	185	113	3,1	48	18
VDS403A17859	272.00	17,859	.7031	185	113	3,1	48	18
VDS403A17900	272.00	17,900	.7047	185	113	3,1	48	18
VDS403A18000	272.00	18,000	.7087	185	113	3,1	48	18
VDS403A18100	286.50	18,100	.7126	200	124	3,1	50	20
VDS403A18200	286.50	18,200	.7165	200	124	3,2	50	20
VDS403A18258	286.50	18,258	.7188	200	124	3,2	50	20
VDS403A18300	286.50	18,300	.7205	200	124	3,2	50	20
VDS403A18400	286.50	18,400	.7244	200	124	3,2	50	20
VDS403A18500	286.50	18,500	.7283	200	124	3,2	50	20
VDS403A18600	286.50	18,600	.7323	200	124	3,2	50	20
VDS403A18654	286.50	18,654	.7344	200	124	3,2	50	20
VDS403A18700	286.50	18,700	.7362	200	124	3,2	50	20
VDS403A18800	286.50	18,800	.7402	200	124	3,3	50	20
VDS403A18900	286.50	18,900	.7441	200	124	3,3	50	20
VDS403A19000	286.50	19,000	.7480	200	124	3,3	50	20
VDS403A19050	318.50	19,050	.7500	200	124	3,3	50	20
VDS403A19100	318.50	19,100	.7520	200	124	3,3	50	20
VDS403A19200	318.50	19,200	.7559	200	124	3,3	50	20
VDS403A19300	318.50	19,300	.7598	200	124	3,4	50	20
VDS403A19400	318.50	19,400	.7638	200	124	3,4	50	20
VDS403A19500	318.50	19,500	.7677	200	124	3,4	50	20
VDS403A19600	318.50	19,600	.7717	200	124	3,4	50	20
VDS403A19700	318.50	19,700	.7756	200	124	3,4	50	20
VDS403A19800	318.50	19,800	.7795	200	124	3,4	50	20
VDS403A19900	318.50	19,900	.7835	200	124	3,5	50	20
VDS403A20000	318.50	20,000	.7874	200	124	3,5	50	20

NOTE: L4 max, L5, L, LS, and D table columns reflect millimetre measurements.

Tolerance		
Nominal Size Range	D1 Tolerance	D Tolerance h6
1–3	0,000/-0,014 (h8)	0,000/-0,006
>3–6	0,000/-0,012 (h7)	0,000/-0,008
>6–10	0,000/-0,015 (h7)	0,000/-0,009
>10–18	0,000/-0,018 (h7)	0,000/-0,011
>18–20	0,000/-0,021 (h7)	0,000/-0,013

Solid Carbide Drills

■ VariDrill™ • Steel, Stainless Steel, Cast Iron, Aluminium, and High-Temp Alloys • Speed and Feed Charts

VariDrill • VDS2 Series • WU25PD • Flood Coolant • Metric														
Group														
		Cutting Speed — vc												
		Range — m/min		Recommended Feed Rate (fz)										
		min	max	Tool Diameter	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	60	– 100	mm/r	0,04 – 0,09	0,05 – 0,12	0,07 – 0,14	0,08 – 0,16	0,11 – 0,22	0,13 – 0,26	0,15 – 0,31	0,18 – 0,35	0,22 – 0,42	0,28 – 0,54
	2, 3, 4, 6, 7	50	– 90	mm/r	0,05 – 0,10	0,06 – 0,13	0,08 – 0,15	0,09 – 0,17	0,13 – 0,23	0,15 – 0,28	0,19 – 0,33	0,22 – 0,38	0,26 – 0,47	0,34 – 0,59
	5, 9, 10, 11	50	– 100	mm/r	0,05 – 0,10	0,06 – 0,13	0,07 – 0,15	0,08 – 0,17	0,12 – 0,23	0,14 – 0,28	0,17 – 0,33	0,19 – 0,38	0,23 – 0,47	0,29 – 0,59
	12, 13	30	– 60	mm/r	0,03 – 0,05	0,04 – 0,06	0,05 – 0,08	0,06 – 0,10	0,08 – 0,14	0,10 – 0,18	0,13 – 0,22	0,14 – 0,24	0,18 – 0,32	0,23 – 0,41
M	14.1	30	– 50	mm/r	0,02 – 0,05	0,03 – 0,06	0,04 – 0,07	0,05 – 0,09	0,08 – 0,11	0,09 – 0,12	0,10 – 0,14	0,12 – 0,16	0,14 – 0,18	0,16 – 0,20
	14.3	40	– 60	mm/r	0,02 – 0,06	0,03 – 0,07	0,04 – 0,08	0,06 – 0,10	0,08 – 0,12	0,09 – 0,14	0,10 – 0,16	0,12 – 0,18	0,14 – 0,20	0,16 – 0,22
	14.2, 14.4	30	– 50	mm/r	0,02 – 0,05	0,03 – 0,06	0,04 – 0,07	0,06 – 0,09	0,08 – 0,11	0,09 – 0,12	0,10 – 0,14	0,12 – 0,16	0,14 – 0,18	0,16 – 0,20
K	15, 16	70	– 150	mm/r	0,06 – 0,13	0,07 – 0,14	0,09 – 0,18	0,10 – 0,19	0,13 – 0,25	0,16 – 0,30	0,18 – 0,35	0,20 – 0,39	0,25 – 0,48	0,30 – 0,59
	17, 18, 19	90	– 120	mm/r	0,08 – 0,11	0,09 – 0,12	0,10 – 0,13	0,10 – 0,15	0,13 – 0,20	0,16 – 0,25	0,18 – 0,29	0,20 – 0,32	0,25 – 0,38	0,30 – 0,48
	20	80	– 120	mm/r	0,04 – 0,10	0,06 – 0,12	0,06 – 0,14	0,07 – 0,15	0,10 – 0,20	0,11 – 0,24	0,14 – 0,28	0,15 – 0,32	0,19 – 0,38	0,24 – 0,48
N	21	90	– 270	mm/r	0,05 – 0,12	0,06 – 0,13	0,08 – 0,14	0,10 – 0,16	0,12 – 0,20	0,16 – 0,24	0,20 – 0,28	0,24 – 0,32	0,28 – 0,40	0,32 – 0,48
	22, 23, 24	90	– 270	mm/r	0,04 – 0,08	0,06 – 0,12	0,08 – 0,16	0,10 – 0,20	0,12 – 0,24	0,16 – 0,28	0,20 – 0,32	0,24 – 0,36	0,28 – 0,44	0,32 – 0,52
	25	90	– 225	mm/r	0,10 – 0,13	0,11 – 0,14	0,12 – 0,14	0,13 – 0,16	0,14 – 0,20	0,16 – 0,24	0,20 – 0,28	0,24 – 0,32	0,28 – 0,40	0,32 – 0,44
	26, 27, 28	90	– 270	mm/r	0,04 – 0,08	0,06 – 0,12	0,08 – 0,16	0,10 – 0,20	0,12 – 0,24	0,16 – 0,28	0,20 – 0,32	0,24 – 0,36	0,28 – 0,40	0,32 – 0,48
S	31, 32	20	– 30	mm/r	0,01 – 0,04	0,02 – 0,05	0,03 – 0,06	0,04 – 0,08	0,06 – 0,10	0,08 – 0,12	0,09 – 0,13	0,10 – 0,14	0,12 – 0,16	0,14 – 0,18
	33, 34, 35	10	– 30	mm/r	0,01 – 0,03	0,02 – 0,03	0,02 – 0,04	0,03 – 0,06	0,05 – 0,08	0,07 – 0,10	0,08 – 0,11	0,09 – 0,12	0,10 – 0,14	0,11 – 0,16
	36	20	– 40	mm/r	0,01 – 0,03	0,02 – 0,03	0,02 – 0,04	0,02 – 0,05	0,04 – 0,07	0,06 – 0,09	0,07 – 0,10	0,08 – 0,11	0,09 – 0,13	0,10 – 0,15
	37	20	– 50	mm/r	0,01 – 0,03	0,02 – 0,03	0,02 – 0,04	0,03 – 0,06	0,05 – 0,08	0,07 – 0,10	0,08 – 0,11	0,09 – 0,12	0,10 – 0,14	0,11 – 0,16

VariDrill • VDS4_ Series • WU25PD • Through Coolant • Metric															
Group				 											
		Cutting Speed – vc													
		Range – m/min		Recommended Feed Rate (fz)											
		min	max	Tool Diameter	1,0	2,0	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
P	1	70	– 140	mm/r	0,04 – 0,09	0,05 – 0,12	0,07 – 0,14	0,08 – 0,16	0,11 – 0,22	0,13 – 0,26	0,15 – 0,31	0,18 – 0,35	0,22 – 0,42	0,28 – 0,54	
	2, 3, 4, 6, 7	60	– 100	mm/r	0,05 – 0,10	0,06 – 0,13	0,08 – 0,15	0,09 – 0,17	0,13 – 0,23	0,15 – 0,28	0,19 – 0,33	0,22 – 0,38	0,26 – 0,47	0,34 – 0,59	
	5, 9, 10, 11	50	– 100	mm/r	0,05 – 0,10	0,06 – 0,13	0,07 – 0,15	0,08 – 0,17	0,12 – 0,23	0,14 – 0,28	0,17 – 0,33	0,19 – 0,38	0,23 – 0,47	0,29 – 0,59	
	12, 13	40	– 70	mm/r	0,03 – 0,05	0,04 – 0,06	0,05 – 0,08	0,06 – 0,10	0,08 – 0,14	0,10 – 0,18	0,13 – 0,22	0,14 – 0,24	0,18 – 0,32	0,23 – 0,41	
M	14.1	30	– 50	mm/r	0,02 – 0,05	0,03 – 0,06	0,04 – 0,07	0,05 – 0,09	0,08 – 0,11	0,09 – 0,12	0,10 – 0,14	0,12 – 0,16	0,14 – 0,18	0,16 – 0,20	
	14.3	40	– 60	mm/r	0,02 – 0,06	0,03 – 0,07	0,04 – 0,08	0,06 – 0,10	0,08 – 0,12	0,09 – 0,14	0,10 – 0,16	0,12 – 0,18	0,14 – 0,20	0,16 – 0,22	
	14.2, 14.4	30	– 50	mm/r	0,02 – 0,05	0,03 – 0,06	0,04 – 0,07	0,06 – 0,09	0,08 – 0,11	0,09 – 0,12	0,10 – 0,14	0,12 – 0,16	0,14 – 0,18	0,16 – 0,20	
K	15, 16	80	– 160	mm/r	0,07 – 0,14	0,08 – 0,15	0,10 – 0,20	0,11 – 0,22	0,14 – 0,28	0,18 – 0,34	0,21 – 0,40	0,23 – 0,44	0,28 – 0,54	0,34 – 0,67	
	17, 18, 19	90	– 140	mm/r	0,09 – 0,13	0,10 – 0,14	0,11 – 0,14	0,12 – 0,17	0,14 – 0,23	0,18 – 0,28	0,21 – 0,32	0,23 – 0,36	0,28 – 0,43	0,34 – 0,54	
	20	80	– 130	mm/r	0,05 – 0,12	0,06 – 0,14	0,07 – 0,15	0,08 – 0,17	0,11 – 0,23	0,13 – 0,27	0,15 – 0,32	0,17 – 0,36	0,22 – 0,43	0,27 – 0,54	
N	21	90	– 315	mm/r	0,05 – 0,12	0,06 – 0,13	0,08 – 0,14	0,10 – 0,16	0,12 – 0,20	0,16 – 0,24	0,20 – 0,28	0,24 – 0,32	0,28 – 0,40	0,32 – 0,48	
	22, 23, 24	90	– 270	mm/r	0,04 – 0,08	0,06 – 0,12	0,08 – 0,16	0,10 – 0,20	0,12 – 0,24	0,16 – 0,28	0,20 – 0,32	0,24 – 0,36	0,28 – 0,44	0,32 – 0,52	
	25	90	– 270	mm/r	0,10 – 0,13	0,11 – 0,14	0,12 – 0,14	0,13 – 0,16	0,14 – 0,20	0,16 – 0,24	0,20 – 0,28	0,24 – 0,32	0,28 – 0,40	0,32 – 0,44	
	26, 27, 28	90	– 270	mm/r	0,04 – 0,08	0,06 – 0,12	0,08 – 0,16	0,10 – 0,20	0,12 – 0,24	0,16 – 0,28	0,20 – 0,32	0,24 – 0,36	0,28 – 0,40	0,32 – 0,48	
S	31, 32	20	– 30	mm/r	0,01 – 0,04	0,02 – 0,05	0,03 – 0,06	0,04 – 0,08	0,06 – 0,10	0,08 – 0,12	0,09 – 0,13	0,10 – 0,14	0,12 – 0,16	0,14 – 0,18	
	33, 34, 35	10	– 30	mm/r	0,01 – 0,03	0,02 – 0,03	0,02 – 0,04	0,03 – 0,06	0,05 – 0,08	0,07 – 0,10	0,08 – 0,11	0,09 – 0,12	0,10 – 0,14	0,11 – 0,16	
	36	10	– 40	mm/r	0,01 – 0,03	0,02 – 0,03	0,02 – 0,04	0,02 – 0,05	0,04 – 0,07	0,06 – 0,09	0,07 – 0,10	0,08 – 0,11	0,09 – 0,13	0,10 – 0,15	
	37	10	– 40	mm/r	0,01 – 0,03	0,02 – 0,03	0,02 – 0,04	0,03 – 0,06	0,05 – 0,08	0,07 – 0,10	0,08 – 0,11	0,09 – 0,12	0,10 – 0,14	0,11 – 0,16	

Application Icons

 Face Milling	 Pocketing	 Counter Sinking/ Stroke Chamfering	 Drilling
 Shoulder Milling: Square End	 Shoulder Milling: Ball/Bull Nose	 Reaming: Through Hole	 Drilling: Inclined Entry
 Ramping	 Helical Milling	 Reaming: Blind Hole	 Drilling: Inclined Exit
 3D Profiling	 Slotting: Ball/Bull Nose	 Reaming: Through and Cross Hole	 Drilling: Stacked Plates
 Slotting: Square End	 Slotting: Side	 Reaming: Blind and Cross Hole	 Drilling: Convex
 Slotting: T-Slot	 Chamfer Milling		

Geometry Icons

 Shank: Plain	 Shank: SN Shank	 Shank: Weldon: 2Flat	 Shank: SK Shank (Rübig™)
 Shank: Plain ≤H6	 Shank: Shell Mill Shank	 Shank: Flat	 Shank: SSF Shank
 Shank: SF Shank	 Shank: Weldon®	 Shank: Screw-On	 Shank: KM™ Shank

Feature Icons

 Tool Dimensions: 2Flute/2Margin/ coolant	 Tool Dimensions: 2Flute/4Margin/ no coolant	 Through Coolant: Radial: Drilling	 Through Coolant: Axial: Drilling
 Tool Dimensions: 2Flute/4Margin/ coolant	 DIN Number: 6537	 Flood Coolant: Drilling	

DIN — German Institute for Standardisation

Material Overview • DIN

P Steel	K Cast Iron	S High-Temp Alloys
M Stainless Steel	N Non-Ferrous	H Hardened Materials

material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	–	–
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	–	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	Medium- and High-Carbon Steels	C >0,25%	>530	<220	<25	ST52, S355JR, C35, GS60, Cf53
P3	Alloy Steels and Tool Steels	C >0,25%	600–850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	Alloy Steels and Tool Steels	C >0,25%	850–1400	340–450	35–48	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	Ferritic, Martensitic, and PH Stainless Steels	–	600–900	<330	<35	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	–	900–1350	350–450	35–48	X102CrMo17, G-X120Cr29
M1	Austenitic Stainless Steel	–	<600	130–200	–	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	–	600–800	150–230	<25	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	Duplex Stainless Steel	–	<800	135–275	<30	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	Grey Cast Iron	–	125–500	120–290	<32	GG15, GG25, GG30, GG40, GTW40
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	–	<600	130–260	<28	GGG40, GTS35
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	–	>600	180–350	<43	GGG60, GTW55, GTS65
N1	Wrought Aluminium	–	–	–	–	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMgSiPb
N2	Low-Silicon Aluminium Alloys and Magnesium Alloys	Si <12,2%	–	–	–	GAISiCu4, GDAISi10Mg
N3	High-Silicon Aluminium Alloys and Magnesium Alloys	Si >12,2%	–	–	–	G-ALSi12, G-AISi17Cu4, G-AISi21CuNiMg
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	–	–	–	–	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fibreglass	–	–	–	–	LEXAN®, Hostalen®, Polystyrol, MAKROLON®
N6	Carbon, Graphite Composites, CFRP	–	–	–	–	CFK, GFK
N7	Metal Matrix Composites (MMC)	–	–	–	–	–
S1	Iron-Based, Heat-Resistant Alloys	–	500–1200	160–260	25–48	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Cobalt-Based, Heat-Resistant Alloys	–	1000–1450	250–450	25–48	Haynes® 188, Stellite® 6,21,31
S3	Nickel-Based, Heat-Resistant Alloys	–	600–1700	160–450	<48	INCONEL® 690, INCONEL 625, Hastelloy®, NIMONIC® 75
S4	Titanium and Titanium Alloys	–	900–1600	300–400	33–48	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Hardened Materials	–	–	–	44–48	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, Hardox® 400
H2	Hardened Materials	–	–	–	48–55	–
H3	Hardened Materials	–	–	–	56–60	–
H4	Hardened Materials	–	–	–	>60	–

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.

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