



Holemaking

Holemaking Introduction	S2-S8
Solid Carbide Drills.....	T1-T149
Modular Drills.....	U1-U45
Indexable Drills	V1-V40
Hole Finishing	W1-W81

HOLEMAKING PRODUCTS

Holemaking Made Easy and Economical

From sturdy, general-purpose solid carbide drills to high-precision fine boring systems, we offer the most comprehensive line of holemaking products available on the market today. If you need unmatched performance and reliability, look no further than our wide range of solid carbide, modular, and indexable drills, and hole finishing products.

Solid Carbide Drills

- VariDrill™
- TOP DRILL S™ for Steel
- TOP DRILL S™ for Cast Iron
- TOP DRILL S+™
- TOP DRILL S+ 12 x D
- TOP DRILL Deep-Hole Drill
- TOP DRILL G™



Modular Drills

- TOP DRILL M1™
- Spade Blades





Indexable Drills

- Top Cut 4™



Hole Finishing

- Reaming Tools
- ROTAFLEX™ Boring System
- Countersinking Tools



Added Value for Your Performance

Increase of Productivity and Efficiency

- Material and application-specific solutions.
- Maximum metal removal rates and repeatability.
- Standardised design platforms for special tools based on “proven solutions” for individual optimisations and combination tools.

Optimised Purchase

- Broad selection of holemaking tools.
- Integrated into a full range of cutting tools and service offers.
- Onsite service for an efficient development and implementation of machining solutions.

Control of Total Tooling Costs

- High tool utilisation through material and application-specific solutions.
- Process-safe regrinding service.
- Reduction of stocks through efficient modular concepts.
- Multiple platforms per application to achieve the most cost-efficient solution.

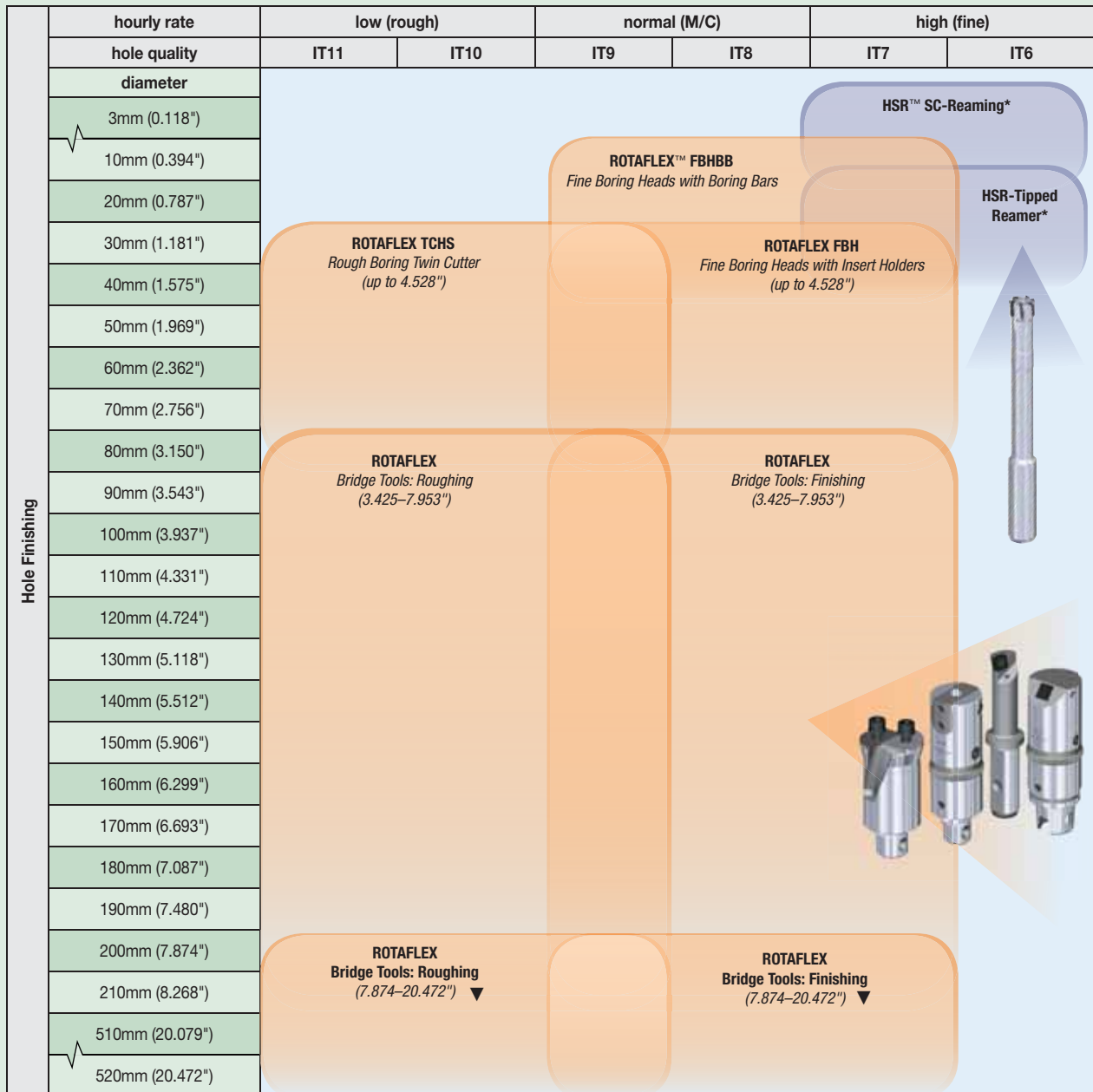
Select the Correct Holemaking Product Platform for Your Application

	hourly rate	low (rough)		normal (M/C)		high (fine)	
	hole quality	IT11	IT10	IT9	IT8	IT7	IT6
Solid Drilling	diameter						
	3mm (0.118")						
	6mm (0.236")						
	9mm (0.354")						
	12mm (0.472")						
	15mm (0.591")						
	18mm (0.709")						
	21mm (0.827")						
	24mm (0.945")						
	27mm (1.063")						
	30mm (1.181")						
	33mm (1.299")						
	36mm (1.417")						
	39mm (1.535")						
	42mm (1.654")						
	45mm (1.772")						
	58mm (2.283")						
	51mm (2.008")						
	54mm (2.126")						
	57mm (2.244")						
	60mm (2.362")						
	110mm (4.331")						

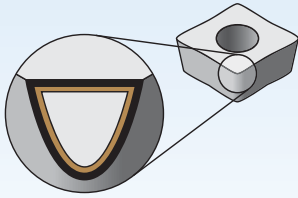
Determine the hole quality and diameter to show the available options and then decide the platform that will best fulfill your requirements.

- Solid Carbide Drills
- Modular Drills
- Indexable Drills
- Precision Hole Finishing
- Reaming

Select the Correct Holemaking Product Platform for Your Application



*IT6 is possible above 10mm (0.394") for both HSR SC-Reaming and HSR-Tipped Reamer in custom solutions.

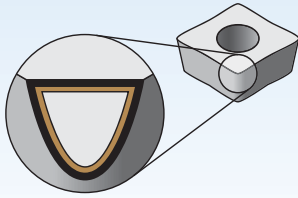


Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

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

wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45		
WU25PD		<p>Composition: With a multilayered PVD TiN-TiAlN coating and a high-quality submicron carbide substrate, this grade gives a high level of wear resistance at medium to high cutting speeds.</p> <p>Application: First choice for high reliability in all materials. This grade should be used at medium to high speeds and feeds. It is a general purpose grade that performs very well for alloyed and high-alloy steel and cast iron, but can also be used with excellent performance in all other material groups.</p>	P											
			M											
			K											
			N											
			S											
WP20PD		<p>Composition: With a multilayered PVD TiN-TiAlN coating, a high-quality submicron carbide substrate and a state-of-the-art surface condition, this grade gives the highest level of wear resistance at high cutting speeds.</p> <p>Application: A high productivity grade for high speeds and feeds. First choice for high productivity with excellent reliability in alloyed and high-alloyed steels and cast irons.</p>	P											
			M											
			K											
			N											
			S											
WK15PD		<p>Composition: With a newly developed unique multilayered PVD AlCrN coating and a high-quality submicron carbide substrate, this grade gives the highest level of wear resistance at high cutting speeds.</p> <p>Application: This grade offers extraordinary wear resistance in drilling of cast iron materials. With its high hot hardness it allows for high speed machining.</p>	P											
			M											
			K											
			N											
			S											
WU20PD		<p>Composition: With a multilayered PVD TiN-TiAlN coating, a high-quality submicron carbide substrate and a state-of-the-art surface condition, this grade gives the highest level of wear resistance at high cutting speeds.</p> <p>Application: First choice for alloyed and high-alloyed steels and cast irons. A state-of-the-art surface condition enables superior chip evacuation even when MQL is applied.</p>	P											
			M											
			K											
			N											
			S											
WN10HD		<p>Composition: This uncoated fine grain carbide with high hardness offers excellent abrasive wear resistance.</p> <p>Application: First choice for precision drilling of non-ferrous materials.</p>	P											
			M											
			K											
			N											
			S											

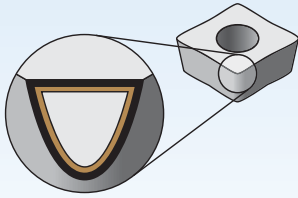


Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45		
Grade	WU25PD	<p>Composition: With a multilayered PVD TiN-TiAlN coating and a high-quality submicron carbide substrate, this grade gives a high level of wear resistance at medium to high cutting speeds.</p> <p>Application: First choice for high reliability in most materials. This grade should be used at medium to high speeds and feeds. It is a general purpose grade that performs very well for alloyed and high-alloy steel and cast iron, but can also be used with excellent performance in stainless steels.</p> <p>NOTE: Previously named K20FTiAlN.</p>	P											
			M											
			K											
Grade	WPK10CH	<p>Composition: With an advanced CVD TiCN-Al₂O₃ coating combined with a cobalt-enriched carbide substrate, this grade offers a balanced combination of deformation resistance and edge toughness.</p> <p>Application: Offers outstanding abrasion and crater wear resistance for high-speed machining of steels and cast irons. Use for very high cutting speeds with low to medium feed rates.</p>	P											
			M											
			K											
Grade	WU25CH	<p>Composition: Advanced CVD TiCN-Al₂O₃ coating together with a newly engineered tough carbide substrate. Ensures adequate deformation resistance and excellent edge strength and offers very good wear resistance over a wide range of machining conditions.</p> <p>Application: A high productivity grade with high speeds and feeds. First choice for high productivity with excellent reliability in steels, stainless steels, and cast iron rates.</p>	P											
			M											
			K											
Grade	WU40PH	<p>Composition: With a multilayered PVD TiN-TiAlN coating and a tough substrate, this grade withstands interruptions and provides high wear resistance for long tool life.</p> <p>Application: First choice for high reliability in most materials. This grade should be used at medium speeds and high feeds due to sharper edges and as a grade for high-toughness applications. It covers steel, stainless steel, cast iron, and high-temp alloys under certain conditions.</p>	P											
			M											
			K											



Coatings provide high-speed capability and are engineered for finishing to heavy roughing.

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

wear resistance ← → toughness

Coating		Grade Description		05	10	15	20	25	30	35	40	45	
K10F		<p>Composition: This uncoated fine grain carbide with high hardness offers excellent abrasive wear resistance paired with excellent toughness for fine-finishing applications.</p> <p>Application: First choice for precision reaming of non-ferrous materials.</p>	P										
			M										
			K										
			N										
			S										
K10F-DCFD		<p>Composition: With a PVD TiAlN coating and a fine grain carbide substrate, this grade offers excellent wear resistance paired with good toughness for medium speed fine-finishing applications.</p> <p>Application: First choice for precision reaming of steels, stainless steel, and cast irons.</p>	P										
			M										
			K										
			N										
			S										
CERMETDCFD		<p>Composition: With a PVD TiAlN coating and a cermet substrate, this grade offers exceptional wear resistance for high speed fine finishing applications.</p> <p>Application: First choice for precision reaming of steels and cast irons.</p>	P										
			M										
			K										
			N										
			S										

NOVO KNOWS CAD/CAM

With the addition of NOVO™ to your team, your CAD/CAM capabilities become much more accurate, streamlined, and productive.

Before NOVO: The programmer would be in their CAD/CAM software, programming a part. Using the outdated method of finding a tool in a catalogue, and then manually inputting the tooling information from the catalogue into the CAD/CAM software.

The concern is that assumptions are made, and only partial tooling information is entered.

With NOVO: The powerful digital intelligence of NOVO not only helps the programmer find the right tool for the metalcutting job, but also automatically integrates all the tooling data into a complete CAD/CAM solution. The integration of all the tooling data increases the viability of the part being programmed, and is delivered quickly — saving you time.

NOVO can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift. widia.com/novo





Holemaking • High-Performance Solid Carbide Drills

Introduction.....	T2-T4
VariDrill.....	T6-T45
TOP DRILL S.....	T48-T75
TOP DRILL S+.....	T76-T96
TOP DRILL S+ 12 x D.....	T98-T103
TOP DRILL Deep-Hole Drills.....	T104-T117
TOP DRILL G.....	T118-T139
Technical Information.....	T142-T149



solid carbide drills for external coolant or dry machining		series	grade	standard						hole tolerance	standard range		
				● first choice ○ alternate choice							diameter range		drilling depth L/D1
				P	M	K	N	S	H		min-max	min-max	
	VariDrill™ multiple-material drilling	VDS20	WU25PD	●	●	●	●	●		IT9-IT10	1,0-20,0	.0394-.7874	3 x-5 x
	TOP DRILL S™ for steel application-specific drilling	TDS202	WP20PD	●	○	○				IT9-IT10	3,0-20,0	.1181-.7874	5 x D
	TOP DRILL S for cast iron application-specific drilling	TDS212	WK15PD	○		●				IT9-IT10	3,0-20,0	.1181-.7874	5 x D
	TOP DRILL S+™ multiple-application drilling	TDS301	WU25PD	●	○	●	○	○		IT9-IT10	3,0-20,0	.1181-.7874	3 x D

solid carbide drills with internal coolant channel		series	grade	standard						hole tolerance	standard range		
				● first choice ○ alternate choice							diameter range		drilling depth L/D1
				P	M	K	N	S	H		min-max	min-max	
	VariDrill multiple-material drilling	VDS40	WU25PD	●	●	●	●	●	○	IT9-IT10	1,0-20,0	.0394-.7874	3 x-8 x
	TOP DRILL S for steel application-specific drilling	TDS40	WP20PD	●	○	○				IT9-IT10	3,0-20,0	.1181-.7874	3 x-8 x
	TOP DRILL S for cast iron application-specific drilling	TDS41	WK15PD	○		●				IT9-IT10	3,0-20,0	.1181-.7874	3 x-8 x
	TOP DRILL S+ multiple-application drilling	TDS50	WU25PD	●	○	●	○	○		IT9-IT10	3,0-20,0	.1181-.7874	3 x-8 x
	TOP DRILL S+ 12 x D deep-hole drilling without piloting	TDS504	WU20PD	●	●	●		○		IT9-IT10	3,0-20,0	.1181-.7874	3 x-8 x
	TOP DRILL Deep superior deep-hole drilling	TDD10	WU20PD	●	○	●				IT9-IT10	3,0-20,0	.1181-.5118	15 x- 30 x
	TOP DRILL G™ difficult drilling applications	TDG53	WN10HD				●			IT8-IT9	3,0-20,0	.1181-.7874	5 x-12 x
	TOP DRILL Flat-Bottom for flat-bottom applications	TDF51	WU20PD	●	○	●				IT9-IT10	-	-	-
			WN15HD				●			IT9-IT10	-	-	-

Solid Carbide Drills • Recommendation Chart

		Versatile				Application-Specific		
		General Purpose	General Purpose	Multipurpose	Multipurpose	High-Performance	High-Performance	Deep-Hole Drilling
		VariDrill™	VariDrill™	Top Drill S+™	Top Drill S+	Top Drill S/G	Top Drill S/G	WIDIA TDS+ WIDIA TDD
P	Steel	3 x D - VDS201A 3 x D - VDS201F 5 x D - VDS202A 5 x D - VDS202F	3 x D - VDS401A 3 x D - VDS401F 5 x D - VDS402A 5 x D - VDS402F 8 x D - VDS403A 8 x D - VDS403F	3 x D - TDS301A	3 x D - TDS501A 5 x D - TDS502A 8 x D - TDS503A	5 x D - TDS202A	3 x D - TDS401A 5 x D - TDS402A 8 x D - TDS403A	12 x D - TDS504A 15 x D - TDD105Z 20 x D - TDD106Z 25 x D - TDD107Z 30 x D - TDD108Z
M	Stainless Steel	3 x D - VDS201A 3 x D - VDS201F 5 x D - VDS202A 5 x D - VDS202F	3 x D - VDS401A 3 x D - VDS401F 5 x D - VDS402A 5 x D - VDS402F 8 x D - VDS403A 8 x D - VDS403F	3 x D - TDS301A	3 x D - TDS501A 5 x D - TDS502A 8 x D - TDS503A	-	WIDIA-Rübig™ Series Type WD	12 x D - TDS504A 15 x D - TDD105Z 20 x D - TDD106Z 25 x D - TDD107Z 30 x D - TDD108Z
K	Cast Iron	3 x D - VDS201A 3 x D - VDS201F 5 x D - VDS202A 5 x D - VDS202F	3 x D - VDS401A 3 x D - VDS401F 5 x D - VDS402A 5 x D - VDS402F 8 x D - VDS403A 8 x D - VDS403F	3 x D - TDS301A	3 x D - TDS501A 5 x D - TDS502A 8 x D - TDS503A	5 x D - TDS212A	3 x D - TDS411A 5 x D - TDS412A 8 x D - TDS413A	12 x D - TDS504A 15 x D - TDD105Z 20 x D - TDD106Z 25 x D - TDD107Z 30 x D - TDD108Z
N	Non-Ferrous	3 x D - VDS201A 3 x D - VDS201F 5 x D - VDS202A 5 x D - VDS202F	3 x D - VDS401A 3 x D - VDS401F 5 x D - VDS402A 5 x D - VDS402F 8 x D - VDS403A 8 x D - VDS403F	3 x D - TDS301A	3 x D - TDS501A 5 x D - TDS502A 8 x D - TDS503A		5 x D - TDG531A 8 x D - TDG532A 12 x D - TDG533A	TDD* uncoated, sharp
S	Heat-Resistant Alloys, Titanium Alloys	3 x D - VDS201A 3 x D - VDS201F 5 x D - VDS202A 5 x D - VDS202F	3 x D - VDS401A 3 x D - VDS401F 5 x D - VDS402A 5 x D - VDS402F 8 x D - VDS403A 8 x D - VDS403F	3 x D - TDS301A	3 x D - TDS501A 5 x D - TDS502A 8 x D - TDS503A	-	WIDIA-Rübig Series Type WD	12 x D - TDS504A 15 x D - TDD105Z 20 x D - TDD106Z 25 x D - TDD107Z 30 x D - TDD108Z
H	Hard Materials	VDS 3 x D - M155	VDS		TDS+			

standard first choice
alternate choice
simple special

Application-Specific Drilling for Steel and Cast Iron



EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

TOP DRILL S™

Top Drill S is the WIDIA line of solid carbide drills engineered to provide maximum performance and superior finish to application-specific tasks in steel and cast iron.

- Victory grades WP20PD™ for steel and WK15PD™ for cast iron are specially designed to resist high heat and wear.
- Lower cost-per-hole and greater productivity due to high MRR and long tool life.
- One of the broadest ranges in the market for diameter selection, length series, and coolant options.

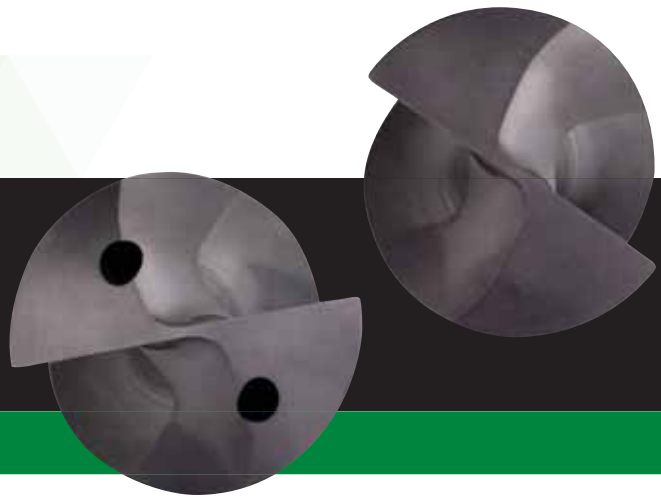
To learn more about the benefits of WIDIA™ TOP DRILL S, contact your local distributor.

WIDIA 

Multiple-Material Drilling •

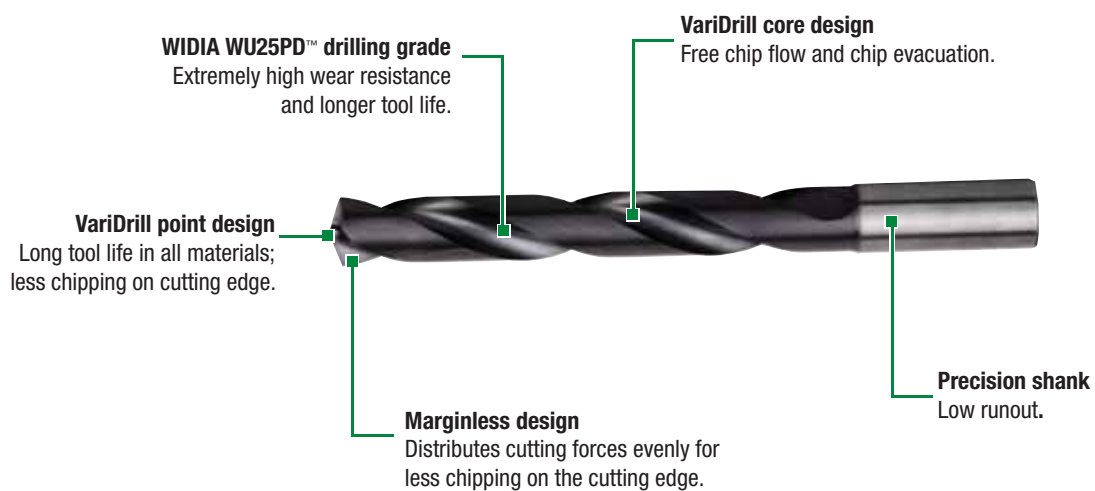
WIDIA™ VariDrill™

VariDrill



The VariDrill advanced-point geometry design offers the ultimate solution for multipurpose drilling operations. It offers dependable tool life in all materials due to less chipping on the cutting edge.

- Reduced chipping on cutting edge means longer tool life.
- Geometry design offers strength and versatility.
- Delivers proper surface finish across multiple materials: steel, stainless steel, cast iron, aluminium, and high-temp alloys.



Innovative Technology

VariDrill™ is a technologically advanced holemaking solution. These high-performance solid carbide drills were designed in Germany to provide the transportation, aerospace, general engineering, and energy industries with a tool that performs on multiple materials.

Elegance, Strength, and Versatility

The engineers at WIDIA™ developed an innovative new design to deliver drilling performance. These solid carbide drills have a distinctive geometry and marginless design. The VariDrill point is versatile enough to work through steel, stainless steel, cast iron, aluminium, and a range of high-temp alloys.

Optimum Hole Quality

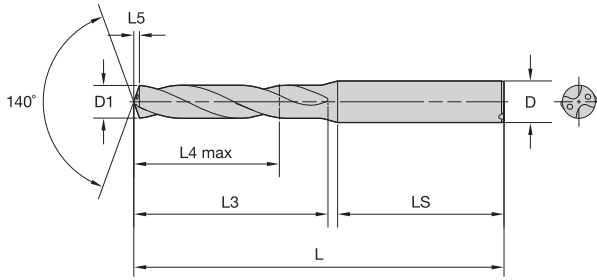
The unique marginless design reduces chipping on the tool's edge and stabilises cutting forces. This unique tool geometry enables chips to roll smoothly and evacuate easily, resulting in noticeably less friction, heat, jamming, and scratching. By minimising these drilling issues, VariDrill delivers an optimum surface finish with every hole — no matter the material.

More Options and Longer Tool Life

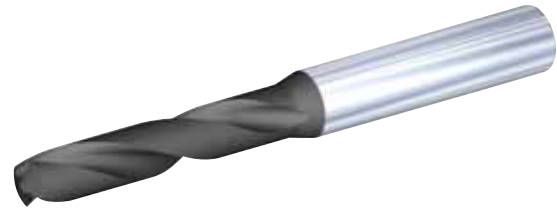
Aside from its uniquely engineered design, VariDrill also offers a broad portfolio of drilling options. With more than 2,200 items, VariDrill offers more choices than any other drill for general engineering operations. And because most drills can be reconditioned, your tools will gain extended life.

*VariDrill — Innovatively designed and technologically advanced.
Make VariDrill your go-to drill for hole after hole...after hole.*

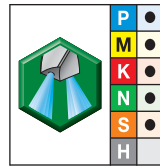
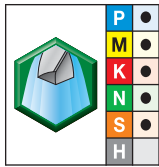




For information on L, L3, and L4 max, see page T143.



■ VDS201A • VDS401A • 3 x D

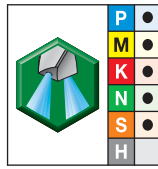
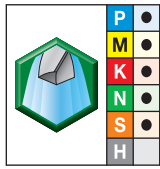


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4144195	VDS201A01000	-	-	1,000	.0394	5	7	0,1	58	28	4
4144196	VDS201A01016	-	-	1,016	.0400	5	7	0,1	58	28	4
4144197	VDS201A01041	-	-	1,041	.0410	5	7	0,2	58	28	4
4144198	VDS201A01067	-	-	1,067	.0420	5	7	0,2	58	28	4
4144199	VDS201A01092	-	-	1,092	.0430	5	7	0,2	58	28	4
4144200	VDS201A01100	-	-	1,100	.0433	5	7	0,2	58	28	4
4144201	VDS201A01181	-	-	1,181	.0465	5	7	0,2	58	28	4
4144202	VDS201A01191	-	-	1,191	.0469	5	7	0,2	58	28	4
4144523	VDS201A01200	-	-	1,200	.0472	5	7	0,2	58	28	4
4144524	VDS201A01300	-	-	1,300	.0512	5	7	0,2	58	28	4
4144525	VDS201A01321	-	-	1,321	.0520	5	7	0,2	58	28	4
4144526	VDS201A01397	-	-	1,397	.0550	5	7	0,2	58	28	4
4144527	VDS201A01400	-	-	1,400	.0551	5	7	0,2	58	28	4
4144528	VDS201A01500	4140270	VDS401A01500	1,500	.0591	6	9	0,2	58	28	4
4144529	VDS201A01600	4140271	VDS401A01600	1,600	.0630	6	9	0,2	58	28	4
4144530	VDS201A01700	4140272	VDS401A01700	1,700	.0669	6	9	0,3	58	28	4
4144531	VDS201A01800	4140423	VDS401A01800	1,800	.0709	6	9	0,3	58	28	4
4144532	VDS201A01900	4140424	VDS401A01900	1,900	.0748	6	9	0,3	58	28	4
4144533	VDS201A01984	4140425	VDS401A01984	1,984	.0781	10	13	0,3	58	28	4
4144534	VDS201A02000	4140426	VDS401A02000	2,000	.0787	10	13	0,3	58	28	4
4144535	VDS201A02100	4140427	VDS401A02100	2,100	.0827	10	13	0,3	58	28	4
4144536	VDS201A02200	4140428	VDS401A02200	2,200	.0866	10	13	0,3	58	28	4
4144537	VDS201A02300	4140429	VDS401A02300	2,300	.0906	10	13	0,4	58	28	4
4144538	VDS201A02383	4140430	VDS401A02383	2,383	.0938	12	17	0,4	58	28	4

(continued)

(VDS201A • VDS401A • 3 x D – continued)



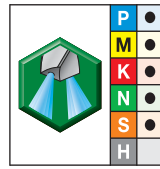
● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4144539	VDS201A02400	4140431	VDS401A02400	2,400	.0945	12	17	0,4	58	28	4
4144540	VDS201A02439	4140432	VDS401A02439	2,439	.0960	12	17	0,4	58	28	4
4144541	VDS201A02489	4140433	VDS401A02489	2,489	.0980	12	17	0,4	58	28	4
4144542	VDS201A02500	4140434	VDS401A02500	2,500	.0984	12	17	0,4	58	28	4
4144543	VDS201A02578	4140435	VDS401A02578	2,578	.1015	12	17	0,4	58	28	4
4144544	VDS201A02600	4140436	VDS401A02600	2,600	.1024	12	17	0,4	58	28	4
4144545	VDS201A02642	4140437	VDS401A02642	2,642	.1040	12	17	0,4	58	28	4
4144546	VDS201A02700	4140438	VDS401A02700	2,700	.1063	12	17	0,4	58	28	4
4144547	VDS201A02705	4140439	VDS401A02705	2,705	.1065	12	17	0,4	58	28	4
4144548	VDS201A02779	4140440	VDS401A02779	2,779	.1094	12	17	0,4	58	28	4
4144549	VDS201A02800	4140441	VDS401A02800	2,800	.1102	12	17	0,5	58	28	4
4144550	VDS201A02820	4140442	VDS401A02820	2,820	.1110	12	17	0,5	58	28	4
4144551	VDS201A02870	4140443	VDS401A02870	2,870	.1130	12	17	0,5	58	28	4
4144552	VDS201A02900	4140444	VDS401A02900	2,900	.1142	12	17	0,5	58	28	4
4144553	VDS201A02947	4140445	VDS401A02947	2,947	.1160	12	17	0,5	58	28	4
4143907	VDS201A03000	4140299	VDS401A03000	3,000	.1181	14	20	0,5	62	36	6
4143908	VDS201A03048	4140300	VDS401A03048	3,048	.1200	14	20	0,5	62	36	6
4143909	VDS201A03100	4140301	VDS401A03100	3,100	.1220	14	20	0,5	62	36	6
4143910	VDS201A03175	4140302	VDS401A03175	3,175	.1250	14	20	0,5	62	36	6
4143911	VDS201A03200	4140303	VDS401A03200	3,200	.1260	14	20	0,5	62	36	6
4143912	VDS201A03264	4140304	VDS401A03264	3,264	.1285	14	20	0,5	62	36	6
4143913	VDS201A03300	4140305	VDS401A03300	3,300	.1299	14	20	0,5	62	36	6
4143914	VDS201A03400	4140306	VDS401A03400	3,400	.1339	14	20	0,6	62	36	6
4143915	VDS201A03455	4140307	VDS401A03455	3,455	.1360	14	20	0,6	62	36	6
4143916	VDS201A03500	4140308	VDS401A03500	3,500	.1378	14	20	0,6	62	36	6
4143917	VDS201A03571	4140309	VDS401A03571	3,571	.1406	14	20	0,6	62	36	6
4143918	VDS201A03600	4140310	VDS401A03600	3,600	.1417	14	20	0,6	62	36	6
4143919	VDS201A03658	4140311	VDS401A03658	3,658	.1440	14	20	0,6	62	36	6
4143920	VDS201A03700	4140312	VDS401A03700	3,700	.1457	14	20	0,6	62	36	6
4143921	VDS201A03734	4140313	VDS401A03734	3,734	.1470	14	20	0,6	62	36	6
4143922	VDS201A03800	4140314	VDS401A03800	3,800	.1496	17	24	0,6	66	36	6
4143923	VDS201A03900	4140315	VDS401A03900	3,900	.1535	17	24	0,6	66	36	6
4143924	VDS201A03970	4140316	VDS401A03970	3,970	.1563	17	24	0,7	66	36	6
4143925	VDS201A04000	4140317	VDS401A04000	4,000	.1575	17	24	0,7	66	36	6
4143926	VDS201A04039	4140318	VDS401A04039	4,039	.1590	17	24	0,7	66	36	6
4143927	VDS201A04090	4140319	VDS401A04090	4,090	.1610	17	24	0,7	66	36	6
4143928	VDS201A04100	4140320	VDS401A04100	4,100	.1614	17	24	0,7	66	36	6
4143929	VDS201A04200	4140321	VDS401A04200	4,200	.1654	17	24	0,7	66	36	6
4143930	VDS201A04217	4140322	VDS401A04217	4,217	.1660	17	24	0,7	66	36	6
4143931	VDS201A04300	4140323	VDS401A04300	4,300	.1693	17	24	0,7	66	36	6

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Solid Carbide Drills

(VDS201A • VDS401A • 3 x D – continued)

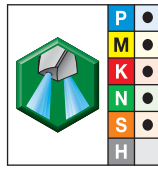
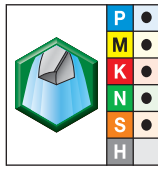


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143932	VDS201A04366	4140324	VDS401A04366	4,366	.1719	17	24	0,7	66	36	6
4143933	VDS201A04400	4140325	VDS401A04400	4,400	.1732	17	24	0,7	66	36	6
4143934	VDS201A04500	4140326	VDS401A04500	4,500	.1772	17	24	0,7	66	36	6
4143935	VDS201A04600	4140328	VDS401A04600	4,600	.1811	17	24	0,8	66	36	6
4143936	VDS201A04623	4140329	VDS401A04623	4,623	.1820	17	24	0,8	66	36	6
4143937	VDS201A04700	4140330	VDS401A04700	4,700	.1850	17	24	0,8	66	36	6
4143938	VDS201A04763	4140331	VDS401A04763	4,763	.1875	20	28	0,8	66	36	6
4143939	VDS201A04800	4140332	VDS401A04800	4,800	.1890	20	28	0,8	66	36	6
4143940	VDS201A04852	4140333	VDS401A04852	4,852	.1910	20	28	0,8	66	36	6
4143941	VDS201A04900	4140334	VDS401A04900	4,900	.1929	20	28	0,8	66	36	6
4143942	VDS201A05000	4140335	VDS401A05000	5,000	.1969	20	28	0,8	66	36	6
4143943	VDS201A05100	4140336	VDS401A05100	5,100	.2008	20	28	0,8	66	36	6
4143944	VDS201A05106	4140337	VDS401A05106	5,106	.2010	20	28	0,8	66	36	6
4143945	VDS201A05159	4140338	VDS401A05159	5,159	.2031	20	28	0,9	66	36	6
4143946	VDS201A05200	4140339	VDS401A05200	5,200	.2047	20	28	0,9	66	36	6
4143947	VDS201A05300	4140340	VDS401A05300	5,300	.2087	20	28	0,9	66	36	6
4143948	VDS201A05400	4140341	VDS401A05400	5,400	.2126	20	28	0,9	66	36	6
4143949	VDS201A05410	4140342	VDS401A05410	5,410	.2130	20	28	0,9	66	36	6
4143950	VDS201A05500	4140343	VDS401A05500	5,500	.2165	20	28	0,9	66	36	6
4143951	VDS201A05558	4140344	VDS401A05558	5,558	.2188	20	28	0,9	66	36	6
4143952	VDS201A05600	4140345	VDS401A05600	5,600	.2205	20	28	0,9	66	36	6
4143953	VDS201A05616	4140346	VDS401A05616	5,616	.2211	20	28	0,9	66	36	6
4143954	VDS201A05700	4140347	VDS401A05700	5,700	.2244	20	28	1,0	66	36	6
4143955	VDS201A05800	4140348	VDS401A05800	5,800	.2283	20	28	1,0	66	36	6
4143956	VDS201A05900	4140349	VDS401A05900	5,900	.2323	20	28	1,0	66	36	6
4143957	VDS201A05954	4140350	VDS401A05954	5,954	.2344	20	28	1,0	66	36	6
4143958	VDS201A06000	4140351	VDS401A06000	6,000	.2362	20	28	1,0	66	36	6
4143959	VDS201A06100	4140352	VDS401A06100	6,100	.2402	24	34	1,0	79	36	8
4143960	VDS201A06200	4140353	VDS401A06200	6,200	.2441	24	34	1,0	79	36	8
4143961	VDS201A06300	4140354	VDS401A06300	6,300	.2480	24	34	1,1	79	36	8
4143962	VDS201A06350	4140355	VDS401A06350	6,350	.2500	24	34	1,1	79	36	8
4143963	VDS201A06400	4140356	VDS401A06400	6,400	.2520	24	34	1,1	79	36	8
4143964	VDS201A06500	4140357	VDS401A06500	6,500	.2559	24	34	1,1	79	36	8
4143965	VDS201A06528	4140358	VDS401A06528	6,528	.2570	24	34	1,1	79	36	8
4143966	VDS201A06600	4140359	VDS401A06600	6,600	.2598	24	34	1,1	79	36	8
4143967	VDS201A06630	4140360	VDS401A06630	6,630	.2610	24	34	1,1	79	36	8
4143968	VDS201A06700	4140361	VDS401A06700	6,700	.2638	24	34	1,1	79	36	8
4143969	VDS201A06746	4140362	VDS401A06746	6,746	.2656	24	34	1,1	79	36	8
4143970	VDS201A06800	4140363	VDS401A06800	6,800	.2677	24	34	1,1	79	36	8
4143971	VDS201A06900	4140364	VDS401A06900	6,900	.2717	24	34	1,2	79	36	8

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(VDS201A • VDS401A • 3 x D – continued)



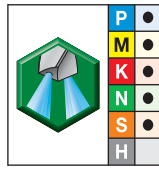
● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU401A TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143972	VDS201A07000	4140365	VDS401A07000	7,000	.2756	24	34	1,2	79	36	8
4143973	VDS201A07100	4140366	VDS401A07100	7,100	.2795	29	41	1,2	79	36	8
4143974	VDS201A07145	4140367	VDS401A07145	7,145	.2813	29	41	1,2	79	36	8
4143975	VDS201A07200	4140368	VDS401A07200	7,200	.2835	29	41	1,2	79	36	8
4143976	VDS201A07300	4140369	VDS401A07300	7,300	.2874	29	41	1,2	79	36	8
4143977	VDS201A07400	4140370	VDS401A07400	7,400	.2913	29	41	1,3	79	36	8
4143978	VDS201A07500	4140371	VDS401A07500	7,500	.2953	29	41	1,3	79	36	8
4143979	VDS201A07541	4140372	VDS401A07541	7,541	.2969	29	41	1,3	79	36	8
4143980	VDS201A07600	4140373	VDS401A07600	7,600	.2992	29	41	1,3	79	36	8
4143981	VDS201A07700	4140374	VDS401A07700	7,700	.3031	29	41	1,3	79	36	8
4143982	VDS201A07800	4140375	VDS401A07800	7,800	.3071	29	41	1,3	79	36	8
4143983	VDS201A07900	4140376	VDS401A07900	7,900	.3110	29	41	1,3	79	36	8
4143984	VDS201A07938	4140377	VDS401A07938	7,938	.3125	29	41	1,3	79	36	8
4143985	VDS201A08000	4140378	VDS401A08000	8,000	.3150	29	41	1,4	79	36	8
4143986	VDS201A08100	4140379	VDS401A08100	8,100	.3189	35	47	1,4	89	40	10
4143987	VDS201A08200	4140380	VDS401A08200	8,200	.3228	35	47	1,4	89	40	10
4143988	VDS201A08300	4140381	VDS401A08300	8,300	.3268	35	47	1,4	89	40	10
4143989	VDS201A08334	4140382	VDS401A08334	8,334	.3281	35	47	1,4	89	40	10
4143990	VDS201A08400	4140383	VDS401A08400	8,400	.3307	35	47	1,4	89	40	10
4143991	VDS201A08433	4140384	VDS401A08433	8,433	.3320	35	47	1,4	89	40	10
4143992	VDS201A08500	4140385	VDS401A08500	8,500	.3346	35	47	1,4	89	40	10
4143993	VDS201A08600	4140386	VDS401A08600	8,600	.3386	35	47	1,5	89	40	10
4143994	VDS201A08700	4140387	VDS401A08700	8,700	.3425	35	47	1,5	89	40	10
4143995	VDS201A08733	4140388	VDS401A08733	8,733	.3438	35	47	1,5	89	40	10
4143996	VDS201A08800	4140389	VDS401A08800	8,800	.3465	35	47	1,5	89	40	10
4143997	VDS201A08900	4140390	VDS401A08900	8,900	.3504	35	47	1,5	89	40	10
4143998	VDS201A09000	4140391	VDS401A09000	9,000	.3543	35	47	1,5	89	40	10
4143999	VDS201A09100	4140392	VDS401A09100	9,100	.3583	35	47	1,5	89	40	10
4144000	VDS201A09129	4140393	VDS401A09129	9,129	.3594	35	47	1,6	89	40	10
4144001	VDS201A09200	4140394	VDS401A09200	9,200	.3622	35	47	1,6	89	40	10
4144002	VDS201A09300	4140395	VDS401A09300	9,300	.3661	35	47	1,6	89	40	10
4144003	VDS201A09347	4140396	VDS401A09347	9,347	.3680	35	47	1,6	89	40	10
4144004	VDS201A09400	4140397	VDS401A09400	9,400	.3701	35	47	1,6	89	40	10
4144005	VDS201A09500	4140398	VDS401A09500	9,500	.3740	35	47	1,6	89	40	10
4144006	VDS201A09525	4140399	VDS401A09525	9,525	.3750	35	47	1,6	89	40	10
4144007	VDS201A09600	4140400	VDS401A09600	9,600	.3780	35	47	1,6	89	40	10
4144008	VDS201A09700	4140401	VDS401A09700	9,700	.3819	35	47	1,7	89	40	10
4144009	VDS201A09800	4140402	VDS401A09800	9,800	.3858	35	47	1,7	89	40	10
4144010	VDS201A09900	4140403	VDS401A09900	9,900	.3898	35	47	1,7	89	40	10
4144011	VDS201A09921	4140404	VDS401A09921	9,921	.3906	35	47	1,7	89	40	10

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Solid Carbide Drills

(VDS201A • VDS401A • 3 x D – continued)

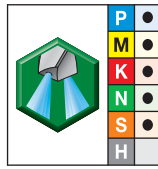
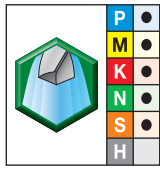


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		D1 diameter					
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4144172	VDS201A10000	4140001	VDS401A10000	10,000	.3937	35	47	1,7	89	40	10
4144423	VDS201A10100	4140002	VDS401A10100	10,100	.3976	40	55	1,7	102	45	12
4144424	VDS201A10200	4140163	VDS401A10200	10,200	.4016	40	55	1,7	102	45	12
4144425	VDS201A10300	4140164	VDS401A10300	10,300	.4055	40	55	1,8	102	45	12
4144426	VDS201A10320	4140165	VDS401A10320	10,320	.4063	40	55	1,8	102	45	12
4144427	VDS201A10400	4140166	VDS401A10400	10,400	.4094	40	55	1,8	102	45	12
4144428	VDS201A10500	4140167	VDS401A10500	10,500	.4134	40	55	1,8	102	45	12
4144429	VDS201A10600	4140168	VDS401A10600	10,600	.4173	40	55	1,8	102	45	12
4144430	VDS201A10700	4140169	VDS401A10700	10,700	.4213	40	55	1,8	102	45	12
4144431	VDS201A10716	4140170	VDS401A10716	10,716	.4219	40	55	1,8	102	45	12
4144432	VDS201A10800	4140171	VDS401A10800	10,800	.4252	40	55	1,8	102	45	12
4144433	VDS201A10900	4140172	VDS401A10900	10,900	.4291	40	55	1,9	102	45	12
4144434	VDS201A11000	4140173	VDS401A11000	11,000	.4331	40	55	1,9	102	45	12
4144435	VDS201A11100	4140174	VDS401A11100	11,100	.4370	40	55	1,9	102	45	12
4144436	VDS201A11113	4140175	VDS401A11113	11,113	.4375	40	55	1,9	102	45	12
4144437	VDS201A11200	4140176	VDS401A11200	11,200	.4409	40	55	1,9	102	45	12
4144438	VDS201A11300	4140177	VDS401A11300	11,300	.4449	40	55	1,9	102	45	12
4144439	VDS201A11400	4140178	VDS401A11400	11,400	.4488	40	55	2,0	102	45	12
4144440	VDS201A11500	4140179	VDS401A11500	11,500	.4528	40	55	2,0	102	45	12
4144441	VDS201A11509	4140180	VDS401A11509	11,509	.4531	40	55	2,0	102	45	12
4144442	VDS201A11600	4140181	VDS401A11600	11,600	.4567	40	55	2,0	102	45	12
4144443	VDS201A11700	4140182	VDS401A11700	11,700	.4606	40	55	2,0	102	45	12
4144444	VDS201A11800	4140183	VDS401A11800	11,800	.4646	40	55	2,0	102	45	12
4144445	VDS201A11900	4140184	VDS401A11900	11,900	.4685	40	55	2,0	102	45	12
4144446	VDS201A11908	4140185	VDS401A11908	11,908	.4688	40	55	2,0	102	45	12
4144447	VDS201A12000	4140186	VDS401A12000	12,000	.4724	40	55	2,1	102	45	12
4144448	VDS201A12100	4140187	VDS401A12100	12,100	.4764	43	60	2,1	107	45	14
4144449	VDS201A12200	4140188	VDS401A12200	12,200	.4803	43	60	2,1	107	45	14
4144450	VDS201A12300	4140189	VDS401A12300	12,300	.4843	43	60	2,1	107	45	14
4144451	VDS201A12304	4140190	VDS401A12304	12,304	.4844	43	60	2,1	107	45	14
4144452	VDS201A12400	4140191	VDS401A12400	12,400	.4882	43	60	2,1	107	45	14
4144453	VDS201A12500	4140192	VDS401A12500	12,500	.4921	43	60	2,1	107	45	14
4144454	VDS201A12600	4140194	VDS401A12600	12,600	.4961	43	60	2,2	107	45	14
4144455	VDS201A12700	4140195	VDS401A12700	12,700	.5000	43	60	2,2	107	45	14
4144456	VDS201A12800	4140196	VDS401A12800	12,800	.5039	43	60	2,2	107	45	14
4144457	VDS201A12900	4140197	VDS401A12900	12,900	.5079	43	60	2,2	107	45	14
4144458	VDS201A13000	4140198	VDS401A13000	13,000	.5118	43	60	2,2	107	45	14
4144459	VDS201A13096	4140199	VDS401A13096	13,096	.5156	43	60	2,3	107	45	14
4144460	VDS201A13100	4140200	VDS401A13100	13,100	.5157	43	60	2,3	107	45	14
4144461	VDS201A13200	4140201	VDS401A13200	13,200	.5197	43	60	2,3	107	45	14

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(VDS201A • VDS401A • 3 x D – continued)



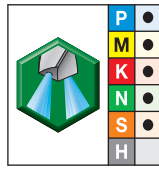
● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4144462	VDS201A13300	4140202	VDS401A13300	13,300	.5236	43	60	2,3	107	45	14
4144463	VDS201A13400	4140203	VDS401A13400	13,400	.5276	43	60	2,3	107	45	14
4144464	VDS201A13500	4140204	VDS401A13500	13,500	.5315	43	60	2,3	107	45	14
4144465	VDS201A13600	4140205	VDS401A13600	13,600	.5354	43	60	2,3	107	45	14
4144466	VDS201A13700	4140206	VDS401A13700	13,700	.5394	43	60	2,4	107	45	14
4144467	VDS201A13800	4140207	VDS401A13800	13,800	.5433	43	60	2,4	107	45	14
4144468	VDS201A13891	4140208	VDS401A13891	13,891	.5469	43	60	2,4	107	45	14
4144469	VDS201A13900	4140209	VDS401A13900	13,900	.5472	43	60	2,4	107	45	14
4144470	VDS201A14000	4140210	VDS401A14000	14,000	.5512	43	60	2,4	107	45	14
4144471	VDS201A14100	4140211	VDS401A14100	14,100	.5551	45	65	2,4	115	48	16
4144472	VDS201A14200	4140212	VDS401A14200	14,200	.5591	45	65	2,5	115	48	16
4144473	VDS201A14288	4140213	VDS401A14288	14,288	.5625	45	65	2,5	115	48	16
4144474	VDS201A14300	4140214	VDS401A14300	14,300	.5630	45	65	2,5	115	48	16
4144475	VDS201A14400	4140215	VDS401A14400	14,400	.5669	45	65	2,5	115	48	16
4144476	VDS201A14500	4140216	VDS401A14500	14,500	.5709	45	65	2,5	115	48	16
4144477	VDS201A14600	4140217	VDS401A14600	14,600	.5748	45	65	2,5	115	48	16
4144478	VDS201A14684	4140218	VDS401A14684	14,684	.5781	45	65	2,5	115	48	16
4144479	VDS201A14700	4140219	VDS401A14700	14,700	.5787	45	65	2,5	115	48	16
4144480	VDS201A14800	4140220	VDS401A14800	14,800	.5827	45	65	2,6	115	48	16
4144481	VDS201A14900	4140221	VDS401A14900	14,900	.5866	45	65	2,6	115	48	16
4144482	VDS201A15000	4140222	VDS401A15000	15,000	.5906	45	65	2,6	115	48	16
4144483	VDS201A15083	4140223	VDS401A15083	15,083	.5938	45	65	2,6	115	48	16
4144484	VDS201A15100	4140224	VDS401A15100	15,100	.5945	45	65	2,6	115	48	16
4144485	VDS201A15200	4140225	VDS401A15200	15,200	.5984	45	65	2,6	115	48	16
4144486	VDS201A15300	4140226	VDS401A15300	15,300	.6024	45	65	2,6	115	48	16
4144487	VDS201A15400	4140227	VDS401A15400	15,400	.6063	45	65	2,7	115	48	16
4144488	VDS201A15479	4140228	VDS401A15479	15,479	.6094	45	65	2,7	115	48	16
4144489	VDS201A15500	4140229	VDS401A15500	15,500	.6102	45	65	2,7	115	48	16
4144490	VDS201A15600	4140230	VDS401A15600	15,600	.6142	45	65	2,7	115	48	16
4144491	VDS201A15700	4140231	VDS401A15700	15,700	.6181	45	65	2,7	115	48	16
4144492	VDS201A15800	4140232	VDS401A15800	15,800	.6220	45	65	2,7	115	48	16
4144493	VDS201A15875	4140233	VDS401A15875	15,875	.6250	45	65	2,7	115	48	16
4144494	VDS201A15900	4140234	VDS401A15900	15,900	.6260	45	65	2,8	115	48	16
4144495	VDS201A16000	4140235	VDS401A16000	16,000	.6299	45	65	2,8	115	48	16
4144496	VDS201A16100	4140236	VDS401A16100	16,100	.6339	51	73	2,8	123	48	18
4144497	VDS201A16200	4140237	VDS401A16200	16,200	.6378	51	73	2,8	123	48	18
4144498	VDS201A16271	4140238	VDS401A16271	16,271	.6406	51	73	2,8	123	48	18
4144499	VDS201A16300	4140239	VDS401A16300	16,300	.6417	51	73	2,8	123	48	18
4144500	VDS201A16400	4140241	VDS401A16400	16,400	.6457	51	73	2,8	123	48	18
4144501	VDS201A16500	4140242	VDS401A16500	16,500	.6496	51	73	2,9	123	48	18

(continued)

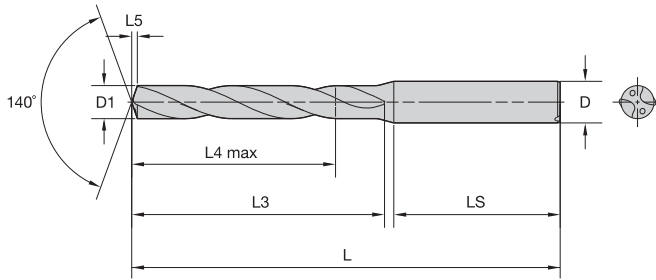
Solid Carbide Drills

(VDS201A • VDS401A • 3 x D – continued)

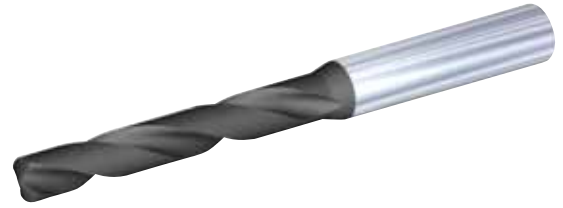


● first choice
○ alternate choice

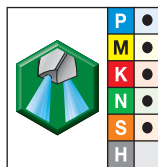
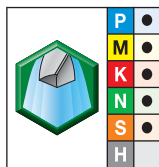
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4144503	VDS201A16600	4140243	VDS401A16600	16,600	.6535	51	73	2,9	123	48	18
4144504	VDS201A16670	4140244	VDS401A16670	16,670	.6563	51	73	2,9	123	48	18
4144505	VDS201A16700	4140245	VDS401A16700	16,700	.6575	51	73	2,9	123	48	18
4144506	VDS201A16800	4140246	VDS401A16800	16,800	.6614	51	73	2,9	123	48	18
4144507	VDS201A16900	4140247	VDS401A16900	16,900	.6654	51	73	2,9	123	48	18
4144508	VDS201A17000	4140248	VDS401A17000	17,000	.6693	51	73	2,9	123	48	18
4144509	VDS201A17100	4140249	VDS401A17100	17,100	.6732	51	73	3,0	123	48	18
4144510	VDS201A17200	4140250	VDS401A17200	17,200	.6772	51	73	3,0	123	48	18
4144511	VDS201A17300	4140251	VDS401A17300	17,300	.6811	51	73	3,0	123	48	18
4144512	VDS201A17400	4140252	VDS401A17400	17,400	.6850	51	73	3,0	123	48	18
4144513	VDS201A17463	4140253	VDS401A17463	17,463	.6875	51	73	3,0	123	48	18
4144514	VDS201A17500	4140254	VDS401A17500	17,500	.6890	51	73	3,0	123	48	18
4144515	VDS201A17600	4140255	VDS401A17600	17,600	.6929	51	73	3,1	123	48	18
4144516	VDS201A17700	4140256	VDS401A17700	17,700	.6969	51	73	3,1	123	48	18
4144517	VDS201A17800	4140257	VDS401A17800	17,800	.7008	51	73	3,1	123	48	18
4144518	VDS201A17859	4140258	VDS401A17859	17,859	.7031	51	73	3,1	123	48	18
4144519	VDS201A17900	4140259	VDS401A17900	17,900	.7047	51	73	3,1	123	48	18
4144590	VDS201A18000	4140449	VDS401A18000	18,000	.7087	51	73	3,1	123	48	18
4144591	VDS201A18100	4140450	VDS401A18100	18,100	.7126	55	79	3,1	131	50	20
4144592	VDS201A18200	4140451	VDS401A18200	18,200	.7165	55	79	3,2	131	50	20
4144593	VDS201A18258	4140452	VDS401A18258	18,258	.7188	55	79	3,2	131	50	20
4144594	VDS201A18300	4140463	VDS401A18300	18,300	.7205	55	79	3,2	131	50	20
4144595	VDS201A18400	4140464	VDS401A18400	18,400	.7244	55	79	3,2	131	50	20
4144596	VDS201A18500	4140465	VDS401A18500	18,500	.7283	55	79	3,2	131	50	20
4144597	VDS201A18600	4140466	VDS401A18600	18,600	.7323	55	79	3,2	131	50	20
4144598	VDS201A18654	4140467	VDS401A18654	18,654	.7344	55	79	3,2	131	50	20
4144599	VDS201A18700	4140468	VDS401A18700	18,700	.7362	55	79	3,2	131	50	20
4144600	VDS201A18800	4140469	VDS401A18800	18,800	.7402	55	79	3,3	131	50	20
4144601	VDS201A18900	4140470	VDS401A18900	18,900	.7441	55	79	3,3	131	50	20
4144602	VDS201A19000	4140471	VDS401A19000	19,000	.7480	55	79	3,3	131	50	20
4144603	VDS201A19050	4140472	VDS401A19050	19,050	.7500	55	79	3,3	131	50	20
4144604	VDS201A19100	4140473	VDS401A19100	19,100	.7520	55	79	3,3	131	50	20
4144605	VDS201A19200	4140474	VDS401A19200	19,200	.7559	55	79	3,3	131	50	20
4144606	VDS201A19300	4140475	VDS401A19300	19,300	.7598	55	79	3,4	131	50	20
4144607	VDS201A19400	4140476	VDS401A19400	19,400	.7638	55	79	3,4	131	50	20
4144608	VDS201A19500	4140477	VDS401A19500	19,500	.7677	55	79	3,4	131	50	20
4144609	VDS201A19600	4140478	VDS401A19600	19,600	.7717	55	79	3,4	131	50	20
4144610	VDS201A19700	4140479	VDS401A19700	19,700	.7756	55	79	3,4	131	50	20
4144611	VDS201A19800	4140480	VDS401A19800	19,800	.7795	55	79	3,4	131	50	20
4144612	VDS201A19900	4140481	VDS401A19900	19,900	.7835	55	79	3,5	131	50	20
4144613	VDS201A20000	4140482	VDS401A20000	20,000	.7874	55	79	3,5	131	50	20



For information on L, L3, and L4 max, see page T143.



■ VDS202A • VDS402A • 5 x D

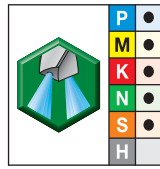


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4148000	VDS202A01000	-	-	1,000	.0394	6	9	0,1	58	28	4
4148001	VDS202A01016	-	-	1,016	.0400	6	9	0,1	58	28	4
4148002	VDS202A01041	-	-	1,041	.0410	6	9	0,2	58	28	4
4148003	VDS202A01067	-	-	1,067	.0420	6	9	0,2	58	28	4
4148004	VDS202A01092	-	-	1,092	.0430	6	9	0,2	58	28	4
4148005	VDS202A01100	-	-	1,100	.0433	6	9	0,2	58	28	4
4148006	VDS202A01181	-	-	1,181	.0465	6	9	0,2	58	28	4
4148007	VDS202A01191	-	-	1,191	.0469	6	9	0,2	58	28	4
4148008	VDS202A01200	-	-	1,200	.0472	6	9	0,2	58	28	4
4148009	VDS202A01300	-	-	1,300	.0512	6	9	0,2	58	28	4
4148010	VDS202A01321	-	-	1,321	.0520	6	9	0,2	58	28	4
4148011	VDS202A01397	-	-	1,397	.0550	6	9	0,2	58	28	4
4148012	VDS202A01400	-	-	1,400	.0551	6	9	0,2	58	28	4
4148013	VDS202A01500	4142871	VDS402A01500	1,500	.0591	9	12	0,2	58	40	4
4148014	VDS202A01600	4142884	VDS402A01600	1,600	.0630	9	12	0,2	58	28	4
4148015	VDS202A01700	4142887	VDS402A01700	1,700	.0669	9	12	0,3	58	28	4
4148016	VDS202A01800	4142890	VDS402A01800	1,800	.0709	9	12	0,3	58	28	4
4148017	VDS202A01900	4142893	VDS402A01900	1,900	.0748	9	12	0,3	58	28	4
4148018	VDS202A01984	4142896	VDS402A01984	1,984	.0781	14	18	0,3	58	28	4
4148019	VDS202A02000	4142899	VDS402A02000	2,000	.0787	14	18	0,3	58	28	4
4148020	VDS202A02100	4142902	VDS402A02100	2,100	.0827	14	18	0,3	58	28	4
4148021	VDS202A02200	4142905	VDS402A02200	2,200	.0866	14	18	0,3	58	28	4
4148022	VDS202A02300	4142908	VDS402A02300	2,300	.0906	14	18	0,4	58	28	4
4148023	VDS202A02383	4142911	VDS402A02383	2,383	.0938	17	22	0,4	58	28	4

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(VDS202A • VDS402A • 5 x D – continued)

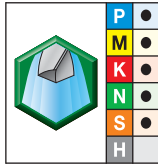


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148024	VDS202A02400	4142924	VDS402A02400	2,400	.0945	17	22	0,4	58	28	4
4148025	VDS202A02439	4142927	VDS402A02439	2,439	.0960	17	22	0,4	58	28	4
4148026	VDS202A02489	4142930	VDS402A02489	2,489	.0980	17	22	0,4	58	28	4
4148027	VDS202A02500	4142933	VDS402A02500	2,500	.0984	17	22	0,4	58	28	4
4148028	VDS202A02578	4142936	VDS402A02578	2,578	.1015	17	22	0,4	58	28	4
4148029	VDS202A02600	4142939	VDS402A02600	2,600	.1024	17	22	0,4	58	28	4
4148030	VDS202A02642	4142942	VDS402A02642	2,642	.1040	17	22	0,4	58	28	4
4148031	VDS202A02700	4142945	VDS402A02700	2,700	.1063	17	22	0,4	58	28	4
4148032	VDS202A02705	4142948	VDS402A02705	2,705	.1065	17	22	0,4	58	28	4
4148033	VDS202A02779	4142951	VDS402A02779	2,779	.1094	17	22	0,4	58	28	4
4148034	VDS202A02800	4142964	VDS402A02800	2,800	.1102	17	22	0,5	58	28	4
4148035	VDS202A02820	4142967	VDS402A02820	2,820	.1110	17	22	0,5	58	28	4
4148036	VDS202A02870	4142970	VDS402A02870	2,870	.1130	17	22	0,5	58	28	4
4148037	VDS202A02900	4142973	VDS402A02900	2,900	.1142	17	22	0,5	58	28	4
4148038	VDS202A02947	4142976	VDS402A02947	2,947	.1160	17	22	0,5	58	28	4
4148142	VDS202A03000	4142844	VDS402A03000	3,000	.1181	23	28	0,5	66	36	6
4148143	VDS202A03048	4142846	VDS402A03048	3,048	.1200	23	28	0,5	66	36	6
4148144	VDS202A03100	4142847	VDS402A03100	3,100	.1220	23	28	0,5	66	36	6
4148145	VDS202A03175	4142849	VDS402A03175	3,175	.1250	23	28	0,5	66	36	6
4148146	VDS202A03200	4142851	VDS402A03200	3,200	.1260	23	28	0,5	66	36	6
4148147	VDS202A03264	4142864	VDS402A03264	3,264	.1285	23	28	0,5	66	36	6
4148148	VDS202A03300	4142865	VDS402A03300	3,300	.1299	23	28	0,5	66	36	6
4148149	VDS202A03400	4142867	VDS402A03400	3,400	.1339	23	28	0,6	66	36	6
4148150	VDS202A03455	4142869	VDS402A03455	3,455	.1360	23	28	0,6	66	36	6
4148151	VDS202A03500	4142872	VDS402A03500	3,500	.1378	23	28	0,6	66	36	6
4148152	VDS202A03571	4142885	VDS402A03571	3,571	.1406	23	28	0,6	66	36	6
4148153	VDS202A03600	4142888	VDS402A03600	3,600	.1417	23	28	0,6	66	36	6
4148154	VDS202A03658	4142891	VDS402A03658	3,658	.1440	23	28	0,6	66	36	6
4148155	VDS202A03700	4142894	VDS402A03700	3,700	.1457	23	28	0,6	66	36	6
4148156	VDS202A03734	4142897	VDS402A03734	3,734	.1470	23	28	0,6	66	36	6
4148157	VDS202A03800	4142900	VDS402A03800	3,800	.1496	29	36	0,6	74	36	6
4148158	VDS202A03900	4142903	VDS402A03900	3,900	.1535	29	36	0,6	74	36	6
4148159	VDS202A03970	4142906	VDS402A03970	3,970	.1563	29	36	0,7	74	36	6
4148160	VDS202A04000	4142909	VDS402A04000	4,000	.1575	29	36	0,7	74	36	6
4148161	VDS202A04039	4142912	VDS402A04039	4,039	.1590	29	36	0,7	74	36	6
4148162	VDS202A04090	4142925	VDS402A04090	4,090	.1610	29	36	0,7	74	36	6
4148163	VDS202A04100	4142928	VDS402A04100	4,100	.1614	29	36	0,7	74	36	6
4148164	VDS202A04200	4142931	VDS402A04200	4,200	.1654	29	36	0,7	74	36	6
4148165	VDS202A04217	4142934	VDS402A04217	4,217	.1660	29	36	0,7	74	36	6
4148166	VDS202A04300	4142937	VDS402A04300	4,300	.1693	29	36	0,7	74	36	6

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(VDS202A • VDS402A • 5 x D – continued)

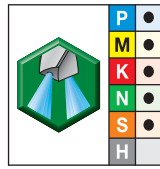


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		D1 diameter					
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148167	VDS202A04366	4142940	VDS402A04366	4,366	.1719	29	36	0,7	74	36	6
4148168	VDS202A04400	4142943	VDS402A04400	4,400	.1732	29	36	0,7	74	36	6
4148169	VDS202A04500	4142946	VDS402A04500	4,500	.1772	29	36	0,7	74	36	6
4148170	VDS202A04600	4142949	VDS402A04600	4,600	.1811	29	36	0,8	74	36	6
4148171	VDS202A04623	4142952	VDS402A04623	4,623	.1820	29	36	0,8	74	36	6
4148172	VDS202A04700	4142965	VDS402A04700	4,700	.1850	29	36	0,8	74	36	6
4148173	VDS202A04763	4142968	VDS402A04763	4,763	.1875	35	44	0,8	82	36	6
4148174	VDS202A04800	4142971	VDS402A04800	4,800	.1890	35	44	0,8	82	36	6
4148175	VDS202A04852	4142974	VDS402A04852	4,852	.1910	35	44	0,8	82	36	6
4148176	VDS202A04900	4142977	VDS402A04900	4,900	.1929	35	44	0,8	82	36	6
4148177	VDS202A05000	4142979	VDS402A05000	5,000	.1969	35	44	0,8	82	36	6
4148178	VDS202A05100	4142981	VDS402A05100	5,100	.2008	35	44	0,8	82	36	6
4148179	VDS202A05106	4142994	VDS402A05106	5,106	.2010	35	44	0,8	82	36	6
4148180	VDS202A05159	4142996	VDS402A05159	5,159	.2031	35	44	0,9	82	36	6
4148181	VDS202A05200	4142997	VDS402A05200	5,200	.2047	35	44	0,9	82	36	6
4148182	VDS202A05300	4142999	VDS402A05300	5,300	.2087	35	44	0,9	82	36	6
4148183	VDS202A05400	4143000	VDS402A05400	5,400	.2126	35	44	0,9	82	36	6
4148184	VDS202A05410	4143001	VDS402A05410	5,410	.2130	35	44	0,9	82	36	6
4148185	VDS202A05500	4143002	VDS402A05500	5,500	.2165	35	44	0,9	82	36	6
4148186	VDS202A05558	4143003	VDS402A05558	5,558	.2188	35	44	0,9	82	36	6
4148187	VDS202A05600	4143004	VDS402A05600	5,600	.2205	35	44	0,9	82	36	6
4148188	VDS202A05616	4143005	VDS402A05616	5,616	.2211	35	44	0,9	82	36	6
4148189	VDS202A05700	4143006	VDS402A05700	5,700	.2244	35	44	1,0	82	36	6
4148190	VDS202A05800	4143007	VDS402A05800	5,800	.2283	35	44	1,0	82	36	6
4148191	VDS202A05900	4143008	VDS402A05900	5,900	.2323	35	44	1,0	82	36	6
4148192	VDS202A05954	4143009	VDS402A05954	5,954	.2344	35	44	1,0	82	36	6
4148193	VDS202A06000	4143010	VDS402A06000	6,000	.2362	35	44	1,0	82	36	6
4148194	VDS202A06100	4143011	VDS402A06100	6,100	.2402	43	53	1,0	91	36	8
4148195	VDS202A06200	4143012	VDS402A06200	6,200	.2441	43	53	1,0	91	36	8
4148196	VDS202A06300	4143023	VDS402A06300	6,300	.2480	43	53	1,1	91	36	8
4148197	VDS202A06350	4143024	VDS402A06350	6,350	.2500	43	53	1,1	91	36	8
4148198	VDS202A06400	4143025	VDS402A06400	6,400	.2520	43	53	1,1	91	36	8
4148199	VDS202A06500	4143026	VDS402A06500	6,500	.2559	43	53	1,1	91	36	8
4148200	VDS202A06528	4143027	VDS402A06528	6,528	.2570	43	53	1,1	91	36	8
4148201	VDS202A06600	4143028	VDS402A06600	6,600	.2598	43	53	1,1	91	36	8
4148202	VDS202A06630	4143029	VDS402A06630	6,630	.2610	43	53	1,1	91	36	8
4148203	VDS202A06700	4143030	VDS402A06700	6,700	.2638	43	53	1,1	91	36	8
4148204	VDS202A06746	4143031	VDS402A06746	6,746	.2656	43	53	1,1	91	36	8
4148205	VDS202A06800	4143032	VDS402A06800	6,800	.2677	43	53	1,1	91	36	8
4148206	VDS202A06900	4143043	VDS402A06900	6,900	.2717	43	53	1,2	91	36	8

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(VDS202A • VDS402A • 5 x D – continued)

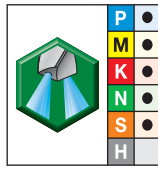
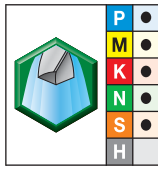


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		L4 max L3 L5 L LS D					
order #	catalogue #	order #	catalogue #	mm	in						
4148207	VDS202A07000	4143044	VDS402A07000	7,000	.2756	43	53	1,2	91	36	8
4148208	VDS202A07100	4143045	VDS402A07100	7,100	.2795	43	53	1,2	91	36	8
4148209	VDS202A07145	4143046	VDS402A07145	7,145	.2813	43	53	1,2	91	36	8
4148210	VDS202A07200	4143047	VDS402A07200	7,200	.2835	43	53	1,2	91	36	8
4148211	VDS202A07300	4143048	VDS402A07300	7,300	.2874	43	53	1,2	91	36	8
4148212	VDS202A07400	4143049	VDS402A07400	7,400	.2913	43	53	1,3	91	36	8
4148213	VDS202A07500	4143050	VDS402A07500	7,500	.2953	43	53	1,3	91	36	8
4148214	VDS202A07541	4143051	VDS402A07541	7,541	.2969	43	53	1,3	91	36	8
4148215	VDS202A07600	4143052	VDS402A07600	7,600	.2992	43	53	1,3	91	36	8
4148216	VDS202A07700	4143063	VDS402A07700	7,700	.3031	43	53	1,3	91	36	8
4148217	VDS202A07800	4143064	VDS402A07800	7,800	.3071	43	53	1,3	91	36	8
4148218	VDS202A07900	4143065	VDS402A07900	7,900	.3110	43	53	1,3	91	36	8
4148219	VDS202A07938	4143066	VDS402A07938	7,938	.3125	43	53	1,3	91	36	8
4148220	VDS202A08000	4143067	VDS402A08000	8,000	.3150	43	53	1,4	91	36	8
4148221	VDS202A08100	4143068	VDS402A08100	8,100	.3189	49	61	1,4	103	40	10
4148222	VDS202A08200	4143069	VDS402A08200	8,200	.3228	49	61	1,4	103	40	10
4148223	VDS202A08300	4143070	VDS402A08300	8,300	.3268	49	61	1,4	103	40	10
4148224	VDS202A08334	4143071	VDS402A08334	8,334	.3281	49	61	1,4	103	40	10
4148225	VDS202A08400	4143072	VDS402A08400	8,400	.3307	49	61	1,4	103	40	10
4148226	VDS202A08433	4143083	VDS402A08433	8,433	.3320	49	61	1,4	103	40	10
4148227	VDS202A08500	4143084	VDS402A08500	8,500	.3346	49	61	1,4	103	40	10
4148228	VDS202A08600	4143085	VDS402A08600	8,600	.3386	49	61	1,5	103	40	10
4148229	VDS202A08700	4143086	VDS402A08700	8,700	.3425	49	61	1,5	103	40	10
4148230	VDS202A08733	4143087	VDS402A08733	8,733	.3438	49	61	1,5	103	40	10
4148231	VDS202A08800	4143088	VDS402A08800	8,800	.3465	49	61	1,5	103	40	10
4148232	VDS202A08900	4143089	VDS402A08900	8,900	.3504	49	61	1,5	103	40	10
4148233	VDS202A09000	4143090	VDS402A09000	9,000	.3543	49	61	1,5	103	40	10
4148234	VDS202A09100	4143091	VDS402A09100	9,100	.3583	49	61	1,5	103	40	10
4148235	VDS202A09129	4143092	VDS402A09129	9,129	.3594	49	61	1,6	103	40	10
4148236	VDS202A09200	4143103	VDS402A09200	9,200	.3622	49	61	1,6	103	40	10
4148237	VDS202A09300	4143104	VDS402A09300	9,300	.3661	49	61	1,6	103	40	10
4148238	VDS202A09347	4143105	VDS402A09347	9,347	.3680	49	61	1,6	103	40	10
4148239	VDS202A09400	4143106	VDS402A09400	9,400	.3701	49	61	1,6	103	40	10
4148240	VDS202A09500	4143107	VDS402A09500	9,500	.3740	49	61	1,6	103	40	10
4148241	VDS202A09525	4143108	VDS402A09525	9,525	.3750	49	61	1,6	103	40	10
4148242	VDS202A09600	4143109	VDS402A09600	9,600	.3780	49	61	1,6	103	40	10
4148243	VDS202A09700	4143110	VDS402A09700	9,700	.3819	49	61	1,7	103	40	10
4148244	VDS202A09800	4143111	VDS402A09800	9,800	.3858	49	61	1,7	103	40	10
4148245	VDS202A09900	4143112	VDS402A09900	9,900	.3898	49	61	1,7	103	40	10
4148246	VDS202A09921	4143113	VDS402A09921	9,921	.3906	49	61	1,7	103	40	10

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(VDS202A • VDS402A • 5 x D – continued)

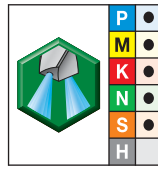


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148258	VDS202A10000	4142823	VDS402A10000	10,000	.3937	49	61	1,7	103	40	10
4148259	VDS202A10100	4142825	VDS402A10100	10,100	.3976	56	71	1,7	118	45	12
4148260	VDS202A10200	4142827	VDS402A10200	10,200	.4016	56	71	1,7	118	45	12
4148261	VDS202A10300	4142829	VDS402A10300	10,300	.4055	56	71	1,8	118	45	12
4148262	VDS202A10320	4142831	VDS402A10320	10,320	.4063	56	71	1,8	118	45	12
4148283	VDS202A10400	4142832	VDS402A10400	10,400	.4094	56	71	1,8	118	45	12
4148284	VDS202A10500	4142834	VDS402A10500	10,500	.4134	56	71	1,8	118	45	12
4148285	VDS202A10600	4142836	VDS402A10600	10,600	.4173	56	71	1,8	118	45	12
4148286	VDS202A10700	4142838	VDS402A10700	10,700	.4213	56	71	1,8	118	45	12
4148287	VDS202A10716	4142840	VDS402A10716	10,716	.4219	56	71	1,8	118	45	12
4148288	VDS202A10800	4142842	VDS402A10800	10,800	.4252	56	71	1,8	118	45	12
4148289	VDS202A10900	4142855	VDS402A10900	10,900	.4291	56	71	1,9	118	45	12
4148290	VDS202A11000	4142857	VDS402A11000	11,000	.4331	56	71	1,9	118	45	12
4148291	VDS202A11100	4142858	VDS402A11100	11,100	.4370	56	71	1,9	118	45	12
4148292	VDS202A11113	4142861	VDS402A11113	11,113	.4375	56	71	1,9	118	45	12
4148293	VDS202A11200	4142862	VDS402A11200	11,200	.4409	56	71	1,9	118	45	12
4148294	VDS202A11300	4142873	VDS402A11300	11,300	.4449	56	71	1,9	118	45	12
4148295	VDS202A11400	4142874	VDS402A11400	11,400	.4488	56	71	2,0	118	45	12
4148296	VDS202A11500	4142875	VDS402A11500	11,500	.4528	56	71	2,0	118	45	12
4148297	VDS202A11509	4142876	VDS402A11509	11,509	.4531	56	71	2,0	118	45	12
4148298	VDS202A11600	4142877	VDS402A11600	11,600	.4567	56	71	2,0	118	45	12
4148299	VDS202A11700	4142878	VDS402A11700	11,700	.4606	56	71	2,0	118	45	12
4148300	VDS202A11800	4142879	VDS402A11800	11,800	.4646	56	71	2,0	118	45	12
4148301	VDS202A11900	4142880	VDS402A11900	11,900	.4685	56	71	2,0	118	45	12
4148302	VDS202A11908	4142881	VDS402A11908	11,908	.4688	56	71	2,0	118	45	12
4148313	VDS202A12000	4142882	VDS402A12000	12,000	.4724	56	71	2,1	118	45	12
4148314	VDS202A12100	4142913	VDS402A12100	12,100	.4764	60	77	2,1	124	45	14
4148315	VDS202A12200	4142914	VDS402A12200	12,200	.4803	60	77	2,1	124	45	14
4148316	VDS202A12300	4142915	VDS402A12300	12,300	.4843	60	77	2,1	124	45	14
4148317	VDS202A12304	4142916	VDS402A12304	12,304	.4844	60	77	2,1	124	45	14
4148318	VDS202A12400	4142917	VDS402A12400	12,400	.4882	60	77	2,1	124	45	14
4148319	VDS202A12500	4142918	VDS402A12500	12,500	.4921	60	77	2,1	124	45	14
4148320	VDS202A12600	4142919	VDS402A12600	12,600	.4961	60	77	2,2	124	45	14
4148321	VDS202A12700	4142920	VDS402A12700	12,700	.5000	60	77	2,2	124	45	14
4148322	VDS202A12800	4142921	VDS402A12800	12,800	.5039	60	77	2,2	124	45	14
4148343	VDS202A12900	4142922	VDS402A12900	12,900	.5079	60	77	2,2	124	45	14
4148344	VDS202A13000	4142953	VDS402A13000	13,000	.5118	60	77	2,2	124	45	14
4148345	VDS202A13096	4142954	VDS402A13096	13,096	.5156	60	77	2,3	124	45	14
4148346	VDS202A13100	4142955	VDS402A13100	13,100	.5157	60	77	2,3	124	45	14
4148347	VDS202A13200	4142956	VDS402A13200	13,200	.5197	60	77	2,3	124	45	14

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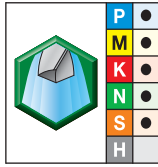


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		D1 diameter					
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148348	VDS202A13300	4142957	VDS402A13300	13,300	.5236	60	77	2,3	124	45	14
4148349	VDS202A13400	4142958	VDS402A13400	13,400	.5276	60	77	2,3	124	45	14
4148350	VDS202A13500	4142959	VDS402A13500	13,500	.5315	60	77	2,3	124	45	14
4148351	VDS202A13600	4142960	VDS402A13600	13,600	.5354	60	77	2,3	124	45	14
4148352	VDS202A13700	4142961	VDS402A13700	13,700	.5394	60	77	2,4	124	45	14
4148353	VDS202A13800	4142962	VDS402A13800	13,800	.5433	60	77	2,4	124	45	14
4148354	VDS202A13891	4142983	VDS402A13891	13,891	.5469	60	77	2,4	124	45	14
4148355	VDS202A13900	4142984	VDS402A13900	13,900	.5472	60	77	2,4	124	45	14
4148356	VDS202A14000	4142985	VDS402A14000	14,000	.5512	60	77	2,4	124	45	14
4148357	VDS202A14100	4142986	VDS402A14100	14,100	.5551	63	83	2,4	133	48	16
4148358	VDS202A14200	4142987	VDS402A14200	14,200	.5591	63	83	2,5	133	48	16
4148359	VDS202A14288	4142988	VDS402A14288	14,288	.5625	63	83	2,5	133	48	16
4148360	VDS202A14300	4142989	VDS402A14300	14,300	.5630	63	83	2,5	133	48	16
4148361	VDS202A14400	4142990	VDS402A14400	14,400	.5669	63	83	2,5	133	48	16
4148362	VDS202A14500	4142991	VDS402A14500	14,500	.5709	63	83	2,5	133	48	16
4148363	VDS202A14600	4142992	VDS402A14600	14,600	.5748	63	83	2,5	133	48	16
4148364	VDS202A14684	4143013	VDS402A14684	14,684	.5781	63	83	2,5	133	48	16
4148365	VDS202A14700	4143014	VDS402A14700	14,700	.5787	63	83	2,5	133	48	16
4148366	VDS202A14800	4143015	VDS402A14800	14,800	.5827	63	83	2,6	133	48	16
4148367	VDS202A14900	4143016	VDS402A14900	14,900	.5866	63	83	2,6	133	48	16
4148368	VDS202A15000	4143017	VDS402A15000	15,000	.5906	63	83	2,6	133	48	16
4148369	VDS202A15083	4143018	VDS402A15083	15,083	.5938	63	83	2,6	133	48	16
4148370	VDS202A15100	4143019	VDS402A15100	15,100	.5945	63	83	2,6	133	48	16
4148371	VDS202A15200	4143020	VDS402A15200	15,200	.5984	63	83	2,6	133	48	16
4148372	VDS202A15300	4143021	VDS402A15300	15,300	.6024	63	83	2,6	133	48	16
4148373	VDS202A15400	4143022	VDS402A15400	15,400	.6063	63	83	2,7	133	48	16
4148374	VDS202A15479	4143033	VDS402A15479	15,479	.6094	63	83	2,7	133	48	16
4148375	VDS202A15500	4143034	VDS402A15500	15,500	.6102	63	83	2,7	133	48	16
4148376	VDS202A15600	4143035	VDS402A15600	15,600	.6142	63	83	2,7	133	48	16
4148377	VDS202A15700	4143036	VDS402A15700	15,700	.6181	63	83	2,7	133	48	16
4148378	VDS202A15800	4143037	VDS402A15800	15,800	.6220	63	83	2,7	133	48	16
4148379	VDS202A15875	4143038	VDS402A15875	15,875	.6250	63	83	2,7	133	48	16
4148380	VDS202A15900	4143039	VDS402A15900	15,900	.6260	63	83	2,8	133	48	16
4148381	VDS202A16000	4143040	VDS402A16000	16,000	.6299	63	83	2,8	133	48	16
4148382	VDS202A16100	4143041	VDS402A16100	16,100	.6339	71	93	2,8	143	48	18
4148383	VDS202A16200	4143042	VDS402A16200	16,200	.6378	71	93	2,8	143	48	18
4148384	VDS202A16271	4143053	VDS402A16271	16,271	.6406	71	93	2,8	143	48	18
4148385	VDS202A16300	4143054	VDS402A16300	16,300	.6417	71	93	2,8	143	48	18
4148386	VDS202A16400	4143055	VDS402A16400	16,400	.6457	71	93	2,8	143	48	18
4148387	VDS202A16500	4143056	VDS402A16500	16,500	.6496	71	93	2,9	143	48	18

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(VDS202A • VDS402A • 5 x D – continued)

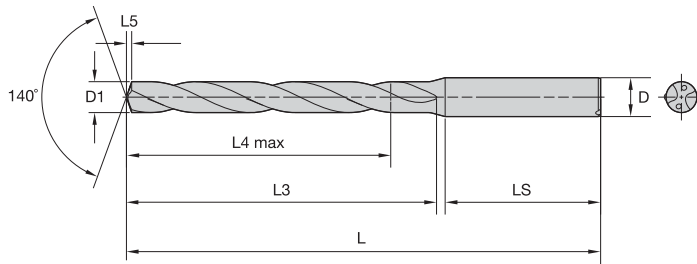


● first choice
○ alternate choice

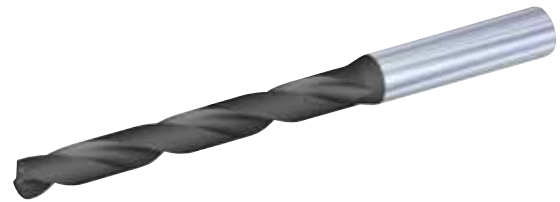
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		D1 diameter					
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148388	VDS202A16600	4143057	VDS402A16600	16,600	.6535	71	93	2,9	143	48	18
4148389	VDS202A16670	4143058	VDS402A16670	16,670	.6563	71	93	2,9	143	48	18
4148390	VDS202A16700	4143059	VDS402A16700	16,700	.6575	71	93	2,9	143	48	18
4148391	VDS202A16800	4143060	VDS402A16800	16,800	.6614	71	93	2,9	143	48	18
4148392	VDS202A16900	4143061	VDS402A16900	16,900	.6654	71	93	2,9	143	48	18
4148393	VDS202A17000	4143062	VDS402A17000	17,000	.6693	71	93	2,9	143	48	18
4148394	VDS202A17100	4143073	VDS402A17100	17,100	.6732	71	93	3,0	143	48	18
4148395	VDS202A17200	4143074	VDS402A17200	17,200	.6772	71	93	3,0	143	48	18
4148396	VDS202A17300	4143075	VDS402A17300	17,300	.6811	71	93	3,0	143	48	18
4148397	VDS202A17400	4143076	VDS402A17400	17,400	.6850	71	93	3,0	143	48	18
4148398	VDS202A17463	4143077	VDS402A17463	17,463	.6875	71	93	3,0	143	48	18
4148399	VDS202A17500	4143078	VDS402A17500	17,500	.6890	71	93	3,0	143	48	18
4148400	VDS202A17600	4143079	VDS402A17600	17,600	.6929	71	93	3,1	143	48	18
4148401	VDS202A17700	4143080	VDS402A17700	17,700	.6969	71	93	3,1	143	48	18
4148402	VDS202A17800	4143081	VDS402A17800	17,800	.7008	71	93	3,1	143	48	18
4148403	VDS202A17859	4143082	VDS402A17859	17,859	.7031	71	93	3,1	143	48	18
4148404	VDS202A17900	4143093	VDS402A17900	17,900	.7047	71	93	3,1	143	48	18
4147921	VDS202A18000	4142803	VDS402A18000	18,000	.7087	71	93	3,1	143	48	18
4147922	VDS202A18100	4142804	VDS402A18100	18,100	.7126	77	101	3,1	153	50	20
4148303	VDS202A18200	4142805	VDS402A18200	18,200	.7165	77	101	3,2	153	50	20
4148304	VDS202A18258	4142806	VDS402A18258	18,258	.7188	77	101	3,2	153	50	20
4148305	VDS202A18300	4142807	VDS402A18300	18,300	.7205	77	101	3,2	153	50	20
4148306	VDS202A18400	4142808	VDS402A18400	18,400	.7244	77	101	3,2	153	50	20
4148307	VDS202A18500	4142809	VDS402A18500	18,500	.7283	77	101	3,2	153	50	20
4148308	VDS202A18600	4142810	VDS402A18600	18,600	.7323	77	101	3,2	153	50	20
4148309	VDS202A18654	4142811	VDS402A18654	18,654	.7344	77	101	3,2	153	50	20
4148310	VDS202A18700	4142812	VDS402A18700	18,700	.7362	77	101	3,2	153	50	20
4148311	VDS202A18800	4142824	VDS402A18800	18,800	.7402	77	101	3,3	153	50	20
4148312	VDS202A18900	4142826	VDS402A18900	18,900	.7441	77	101	3,3	153	50	20
4148323	VDS202A19000	4142828	VDS402A19000	19,000	.7480	77	101	3,3	153	50	20
4148324	VDS202A19050	4142830	VDS402A19050	19,050	.7500	77	101	3,3	153	50	20
4148325	VDS202A19100	4142833	VDS402A19100	19,100	.7520	77	101	3,3	153	50	20
4148326	VDS202A19200	4142835	VDS402A19200	19,200	.7559	77	101	3,3	153	50	20
4148327	VDS202A19300	4142837	VDS402A19300	19,300	.7598	77	101	3,4	153	50	20
4148328	VDS202A19400	4142839	VDS402A19400	19,400	.7638	77	101	3,4	153	50	20
4148329	VDS202A19500	4142841	VDS402A19500	19,500	.7677	77	101	3,4	153	50	20
4148330	VDS202A19600	4142853	VDS402A19600	19,600	.7717	77	101	3,4	153	50	20
4148331	VDS202A19700	4142854	VDS402A19700	19,700	.7756	77	101	3,4	153	50	20
4148332	VDS202A19800	4142856	VDS402A19800	19,800	.7795	77	101	3,4	153	50	20
4148333	VDS202A19900	4142859	VDS402A19900	19,900	.7835	77	101	3,5	153	50	20
4148334	VDS202A20000	4142860	VDS402A20000	20,000	.7874	77	101	3,5	153	50	20



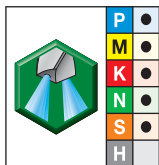
Solid Carbide Drills



For information on L, L3, and L4 max, see page T143.



■ VDS403A • 8 x D

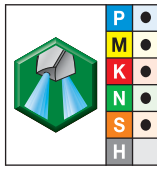


● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	mm	in						
6023126	VDS403A01000	1,000	.0394	10	12	0,1	58	28	4
6023127	VDS403A01016	1,016	.0400	10	12	0,1	58	28	4
6023128	VDS403A01067	1,067	.0420	10	12	0,2	58	28	4
6023129	VDS403A01100	1,100	.0433	10	12	0,2	58	28	4
6023130	VDS403A01181	1,181	.0465	10	12	0,2	58	28	4
6023131	VDS403A01191	1,191	.0469	10	12	0,2	58	28	4
6023132	VDS403A01200	1,200	.0472	10	12	0,2	58	28	4
6023133	VDS403A01300	1,300	.0512	10	12	0,2	58	28	4
6023134	VDS403A01321	1,321	.0520	10	12	0,2	58	28	4
6023135	VDS403A01397	1,397	.0550	10	12	0,2	58	28	4
6023136	VDS403A01400	1,400	.0551	10	12	0,2	58	28	4
4143700	VDS403A01500	1,500	.0591	15	18	0,2	58	28	4
4143701	VDS403A01600	1,600	.0630	15	18	0,2	58	28	4
4143702	VDS403A01700	1,700	.0669	15	18	0,3	58	28	4
4143723	VDS403A01800	1,800	.0709	15	18	0,3	58	28	4
4143724	VDS403A01900	1,900	.0748	15	18	0,3	58	28	4
4143725	VDS403A01984	1,984	.0781	22	26	0,3	66	28	4
4143726	VDS403A02000	2,000	.0787	22	26	0,3	66	28	4
4143727	VDS403A02100	2,100	.0827	22	26	0,3	66	28	4
4143728	VDS403A02200	2,200	.0866	22	26	0,3	66	28	4
4143729	VDS403A02300	2,300	.0906	22	26	0,4	66	28	4
4143730	VDS403A02383	2,383	.0938	25	30	0,4	66	28	4
4143731	VDS403A02400	2,400	.0945	25	30	0,4	66	28	4
4143732	VDS403A02439	2,439	.0960	25	30	0,4	66	28	4
4143733	VDS403A02489	2,489	.0980	25	30	0,4	66	28	4
4143734	VDS403A02500	2,500	.0984	25	30	0,4	66	28	4
4143735	VDS403A02578	2,578	.1015	25	30	0,4	66	28	4
4143736	VDS403A02600	2,600	.1024	25	30	0,4	66	28	4

(continued)

(VDS403A • 8 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143737	VDS403A02642	2,642	.1040	25	30	0,4	66	28	4
4143738	VDS403A02700	2,700	.1063	25	30	0,4	66	28	4
4143739	VDS403A02705	2,705	.1065	25	30	0,4	66	28	4
4143740	VDS403A02779	2,779	.1094	25	30	0,4	66	28	4
4143741	VDS403A02800	2,800	.1102	25	30	0,5	66	28	4
4143742	VDS403A02820	2,820	.1110	25	30	0,5	66	28	4
4143743	VDS403A02870	2,870	.1130	25	30	0,5	66	28	4
4143744	VDS403A02900	2,900	.1142	25	30	0,5	66	28	4
4143745	VDS403A02947	2,947	.1160	25	30	0,5	66	28	4
4143746	VDS403A03000	3,000	.1181	33	40	0,5	78	36	6
4143747	VDS403A03048	3,048	.1200	33	40	0,5	78	36	6
4143748	VDS403A03100	3,100	.1220	33	40	0,5	78	36	6
4143749	VDS403A03175	3,175	.1250	33	40	0,5	78	36	6
4143750	VDS403A03200	3,200	.1260	33	40	0,5	78	36	6
4143751	VDS403A03264	3,264	.1285	33	40	0,5	78	36	6
4143752	VDS403A03300	3,300	.1299	33	40	0,5	78	36	6
4143753	VDS403A03400	3,400	.1339	33	40	0,6	78	36	6
4143754	VDS403A03455	3,455	.1360	33	49	0,6	78	36	6
4143755	VDS403A03500	3,500	.1378	33	49	0,6	78	36	6
4143756	VDS403A03571	3,571	.1406	33	49	0,6	78	36	6
4143757	VDS403A03600	3,600	.1417	33	40	0,6	78	36	6
4143758	VDS403A03658	3,658	.1440	33	49	0,6	78	36	6
4143759	VDS403A03700	3,700	.1457	33	40	0,6	78	36	6
4143760	VDS403A03734	3,734	.1470	33	40	0,6	78	36	6
4143761	VDS403A03800	3,800	.1496	41	49	0,6	87	36	6
4143762	VDS403A03900	3,900	.1535	41	40	0,6	87	36	6
4143763	VDS403A03970	3,970	.1563	41	49	0,7	87	36	6
4143764	VDS403A04000	4,000	.1575	41	40	0,7	87	36	6
4143765	VDS403A04039	4,039	.1590	41	40	0,7	87	36	6
4143766	VDS403A04090	4,090	.1610	41	40	0,7	87	36	6
4143767	VDS403A04100	4,100	.1614	41	49	0,7	87	36	6
4143768	VDS403A04200	4,200	.1654	41	49	0,7	87	36	6
4143769	VDS403A04217	4,217	.1660	41	49	0,7	87	36	6
4143770	VDS403A04300	4,300	.1693	41	49	0,7	87	36	6
4143771	VDS403A04366	4,366	.1719	41	49	0,7	87	36	6
4143772	VDS403A04400	4,400	.1732	41	49	0,7	87	36	6
4143773	VDS403A04500	4,500	.1772	41	49	0,7	87	36	6
4143774	VDS403A04600	4,600	.1811	41	49	0,8	87	36	6
4143775	VDS403A04623	4,623	.1820	41	49	0,8	87	36	6
4143776	VDS403A04700	4,700	.1850	41	56	0,8	87	36	6

(continued)

(VDS403A • 8 x D – continued)

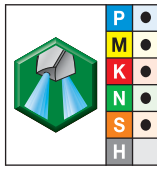


● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143777	VDS403A04763	4,763	.1875	48	49	0,8	94	36	6
4143778	VDS403A04800	4,800	.1890	48	56	0,8	94	36	6
4143779	VDS403A04852	4,852	.1910	48	56	0,8	94	36	6
4143780	VDS403A04900	4,900	.1929	48	56	0,8	94	36	6
4143781	VDS403A05000	5,000	.1969	48	56	0,8	94	36	6
4143782	VDS403A05100	5,100	.2008	48	56	0,8	94	36	6
4143783	VDS403A05106	5,106	.2010	48	56	0,8	94	36	6
4143784	VDS403A05159	5,159	.2031	48	56	0,9	94	36	6
4143785	VDS403A05200	5,200	.2047	48	56	0,9	94	36	6
4143786	VDS403A05300	5,300	.2087	48	56	0,9	94	36	6
4143787	VDS403A05400	5,400	.2126	48	56	0,9	94	36	6
4143788	VDS403A05410	5,410	.2130	48	56	0,9	94	36	6
4143789	VDS403A05500	5,500	.2165	48	56	0,9	94	36	6
4143790	VDS403A05558	5,558	.2188	48	56	0,9	94	36	6
4143791	VDS403A05600	5,600	.2205	48	56	0,9	94	36	6
4143792	VDS403A05616	5,616	.2211	48	56	0,9	94	36	6
4143793	VDS403A05700	5,700	.2244	48	56	1,0	94	36	6
4143794	VDS403A05800	5,800	.2283	48	67	1,0	94	36	6
4143795	VDS403A05900	5,900	.2323	48	67	1,0	94	36	6
4143796	VDS403A05954	5,954	.2344	48	56	1,0	94	36	6
4143797	VDS403A06000	6,000	.2362	48	67	1,0	94	36	6
4143798	VDS403A06100	6,100	.2402	57	67	1,0	105	36	8
4143799	VDS403A06200	6,200	.2441	57	67	1,0	105	36	8
4143800	VDS403A06300	6,300	.2480	57	56	1,1	105	36	8
4143801	VDS403A06350	6,350	.2500	57	67	1,1	105	36	8
4143802	VDS403A06400	6,400	.2520	57	67	1,1	105	36	8
4143803	VDS403A06500	6,500	.2559	57	67	1,1	105	36	8
4143804	VDS403A06528	6,528	.2570	57	67	1,1	105	36	8
4143805	VDS403A06600	6,600	.2598	57	67	1,1	105	36	8
4143806	VDS403A06630	6,630	.2610	57	56	1,1	105	36	8
4143807	VDS403A06700	6,700	.2638	57	67	1,1	105	36	8
4143808	VDS403A06746	6,746	.2656	57	56	1,1	105	36	8
4143809	VDS403A06800	6,800	.2677	57	67	1,1	105	36	8
4143810	VDS403A06900	6,900	.2717	57	67	1,2	105	36	8
4143811	VDS403A07000	7,000	.2756	57	72	1,2	105	36	8
4143812	VDS403A07100	7,100	.2795	61	72	1,2	110	36	8
4143813	VDS403A07145	7,145	.2813	61	67	1,2	110	36	8
4143814	VDS403A07200	7,200	.2835	61	72	1,2	110	36	8
4143815	VDS403A07300	7,300	.2874	61	72	1,2	110	36	8
4143816	VDS403A07400	7,400	.2913	61	72	1,3	110	36	8

(continued)

(VDS403A • 8 x D – continued)


 ● first choice
 ○ alternate choice

grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	mm	in						
4143817	VDS403A07500	7,500	.2953	61	72	1,3	110	36	8
4143818	VDS403A07541	7,541	.2969	61	72	1,3	110	36	8
4143819	VDS403A07600	7,600	.2992	61	80	1,3	110	36	8
4143820	VDS403A07700	7,700	.3031	61	80	1,3	110	36	8
4143821	VDS403A07800	7,800	.3071	61	80	1,3	110	36	8
4143822	VDS403A07900	7,900	.3110	61	80	1,3	110	36	8
4143823	VDS403A07938	7,938	.3125	61	80	1,3	110	36	8
4143824	VDS403A08000	8,000	.3150	61	80	1,4	110	36	8
4143825	VDS403A08100	8,100	.3189	68	80	1,4	122	40	10
4143826	VDS403A08200	8,200	.3228	68	80	1,4	122	40	10
4143827	VDS403A08300	8,300	.3268	68	80	1,4	122	40	10
4143828	VDS403A08334	8,334	.3281	68	80	1,4	122	40	10
4143829	VDS403A08400	8,400	.3307	68	72	1,4	122	40	10
4143830	VDS403A08433	8,433	.3320	68	80	1,4	122	40	10
4143831	VDS403A08500	8,500	.3346	68	80	1,4	122	40	10
4143832	VDS403A08600	8,600	.3386	68	80	1,5	122	40	10
4143833	VDS403A08700	8,700	.3425	68	72	1,5	122	40	10
4143834	VDS403A08733	8,733	.3438	68	72	1,5	122	40	10
4143835	VDS403A08800	8,800	.3465	68	72	1,5	122	40	10
4143836	VDS403A08900	8,900	.3504	68	72	1,5	122	40	10
4143837	VDS403A09000	9,000	.3543	68	72	1,5	122	40	10
4143838	VDS403A09100	9,100	.3583	68	80	1,5	122	40	10
4143839	VDS403A09129	9,129	.3594	68	80	1,6	122	40	10
4143840	VDS403A09200	9,200	.3622	68	80	1,6	122	40	10
4143841	VDS403A09300	9,300	.3661	68	80	1,6	122	40	10
4143842	VDS403A09347	9,347	.3680	68	80	1,6	122	40	10
4143843	VDS403A09400	9,400	.3701	68	80	1,6	122	40	10
4143844	VDS403A09500	9,500	.3740	68	80	1,6	122	40	10
4143845	VDS403A09525	9,525	.3750	68	80	1,6	122	40	10
4143846	VDS403A09600	9,600	.3780	68	80	1,6	122	40	10
4143847	VDS403A09700	9,700	.3819	68	80	1,7	122	40	10
4143848	VDS403A09800	9,800	.3858	68	80	1,7	122	40	10
4143849	VDS403A09900	9,900	.3898	68	80	1,7	122	40	10
4143850	VDS403A09921	9,921	.3906	68	80	1,7	122	40	10
4143421	VDS403A10000	10,000	.3937	68	80	1,7	122	40	10
4143422	VDS403A10100	10,100	.3976	79	94	1,7	141	45	12
4143473	VDS403A10200	10,200	.4016	79	94	1,7	141	45	12
4143474	VDS403A10300	10,300	.4055	79	94	1,8	141	45	12
4143475	VDS403A10320	10,320	.4063	79	94	1,8	141	45	12
4143476	VDS403A10400	10,400	.4094	79	94	1,8	141	45	12

(continued)

(VDS403A • 8 x D – continued)

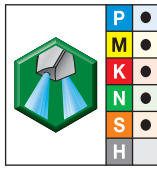


● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	mm	in						
4143477	VDS403A10500	10,500	.4134	79	94	1,8	141	45	12
4143478	VDS403A10600	10,600	.4173	79	94	1,8	141	45	12
4143479	VDS403A10700	10,700	.4213	79	94	1,8	141	45	12
4143480	VDS403A10716	10,716	.4219	79	94	1,8	141	45	12
4143481	VDS403A10800	10,800	.4252	79	94	1,8	141	45	12
4143482	VDS403A10900	10,900	.4291	79	94	1,9	141	45	12
4143483	VDS403A11000	11,000	.4331	79	94	1,9	141	45	12
4143484	VDS403A11100	11,100	.4370	79	94	1,9	141	45	12
4143485	VDS403A11113	11,113	.4375	79	94	1,9	141	45	12
4143486	VDS403A11200	11,200	.4409	79	94	1,9	141	45	12
4143487	VDS403A11300	11,300	.4449	79	94	1,9	141	45	12
4143488	VDS403A11400	11,400	.4488	79	94	2,0	141	45	12
4143489	VDS403A11500	11,500	.4528	79	94	2,0	141	45	12
4143490	VDS403A11509	11,509	.4531	79	94	2,0	141	45	12
4143491	VDS403A11600	11,600	.4567	79	94	2,0	141	45	12
4143492	VDS403A11700	11,700	.4606	79	94	2,0	141	45	12
4143493	VDS403A11800	11,800	.4646	79	94	2,0	141	45	12
4143494	VDS403A11900	11,900	.4685	79	94	2,0	141	45	12
4143495	VDS403A11908	11,908	.4688	79	94	2,0	141	45	12
4143496	VDS403A12000	12,000	.4724	79	94	2,1	141	45	12
4143497	VDS403A12100	12,100	.4764	91	108	2,1	155	45	14
4143498	VDS403A12200	12,200	.4803	91	108	2,1	155	45	14
4143499	VDS403A12300	12,300	.4843	91	108	2,1	155	45	14
4143500	VDS403A12304	12,304	.4844	91	108	2,1	155	45	14
4143501	VDS403A12400	12,400	.4882	91	108	2,1	155	45	14
4143502	VDS403A12500	12,500	.4921	91	108	2,1	155	45	14
4143503	VDS403A12600	12,600	.4961	91	108	2,2	155	45	14
4143504	VDS403A12700	12,700	.5000	91	108	2,2	155	45	14
4143505	VDS403A12800	12,800	.5039	91	108	2,2	155	45	14
4143506	VDS403A12900	12,900	.5079	91	108	2,2	155	45	14
4143507	VDS403A13000	13,000	.5118	91	108	2,2	155	45	14
4143508	VDS403A13096	13,096	.5156	91	108	2,3	155	45	14
4143509	VDS403A13100	13,100	.5157	91	108	2,3	155	45	14
4143510	VDS403A13200	13,200	.5197	91	108	2,3	155	45	14
4143511	VDS403A13300	13,300	.5236	91	108	2,3	155	45	14
4143512	VDS403A13400	13,400	.5276	91	108	2,3	155	45	14
4143513	VDS403A13500	13,500	.5315	91	108	2,3	155	45	14
4143514	VDS403A13600	13,600	.5354	91	108	2,3	155	45	14
4143515	VDS403A13700	13,700	.5394	91	108	2,4	155	45	14
4143516	VDS403A13800	13,800	.5433	91	108	2,4	155	45	14

(continued)

(VDS403A • 8 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4143517	VDS403A13891	13,891	.5469	91	108	2,4	155	45	14
4143518	VDS403A13900	13,900	.5472	91	108	2,4	155	45	14
4143519	VDS403A14000	14,000	.5512	91	108	2,4	155	45	14
4143520	VDS403A14100	14,100	.5551	101	121	2,4	171	48	16
4143521	VDS403A14200	14,200	.5591	101	121	2,5	171	48	16
4143522	VDS403A14288	14,288	.5625	101	121	2,5	171	48	16
4143523	VDS403A14300	14,300	.5630	101	121	2,5	171	48	16
4143524	VDS403A14400	14,400	.5669	101	121	2,5	171	48	16
4143525	VDS403A14500	14,500	.5709	101	121	2,5	171	48	16
4143526	VDS403A14600	14,600	.5748	101	121	2,5	171	48	16
4143527	VDS403A14684	14,684	.5781	101	121	2,5	171	48	16
4143528	VDS403A14700	14,700	.5787	101	121	2,5	171	48	16
4143529	VDS403A14800	14,800	.5827	101	121	2,6	171	48	16
4143530	VDS403A14900	14,900	.5866	101	121	2,6	171	48	16
4143531	VDS403A15000	15,000	.5906	101	121	2,6	171	48	16
4143532	VDS403A15083	15,083	.5938	101	121	2,6	171	48	16
4143533	VDS403A15100	15,100	.5945	101	121	2,6	171	48	16
4143534	VDS403A15200	15,200	.5984	101	121	2,6	171	48	16
4143535	VDS403A15300	15,300	.6024	101	121	2,6	171	48	16
4143536	VDS403A15400	15,400	.6063	101	121	2,7	171	48	16
4143537	VDS403A15479	15,479	.6094	101	121	2,7	171	48	16
4143538	VDS403A15500	15,500	.6102	101	121	2,7	171	48	16
4143539	VDS403A15600	15,600	.6142	101	121	2,7	171	48	16
4143540	VDS403A15700	15,700	.6181	101	121	2,7	171	48	16
4143541	VDS403A15800	15,800	.6220	101	121	2,7	171	48	16
4143542	VDS403A15875	15,875	.6250	101	121	2,7	171	48	16
4143543	VDS403A15900	15,900	.6260	101	121	2,8	171	48	16
4143544	VDS403A16000	16,000	.6299	101	121	2,8	171	48	16
4143545	VDS403A16100	16,100	.6339	113	135	2,8	185	48	18
4143546	VDS403A16200	16,200	.6378	113	135	2,8	185	48	18
4143547	VDS403A16271	16,271	.6406	113	135	2,8	185	48	18
4143548	VDS403A16300	16,300	.6417	113	135	2,8	185	48	18
4143549	VDS403A16400	16,400	.6457	113	135	2,8	185	48	18
4143550	VDS403A16500	16,500	.6496	113	135	2,9	185	48	18
4143551	VDS403A16600	16,600	.6535	113	135	2,9	185	48	18
4143552	VDS403A16670	16,670	.6563	113	135	2,9	185	48	18
4143553	VDS403A16700	16,700	.6575	113	135	2,9	185	48	18
4143554	VDS403A16800	16,800	.6614	113	135	2,9	185	48	18
4143555	VDS403A16900	16,900	.6654	113	135	2,9	185	48	18
4143556	VDS403A17000	17,000	.6693	113	135	2,9	185	48	18

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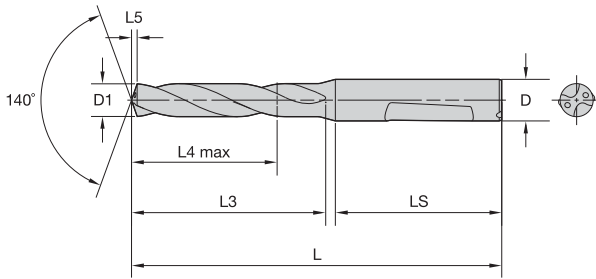
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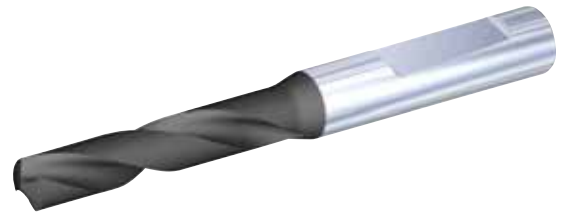
● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	mm	in						
4143557	VDS403A17100	17,100	.6732	113	135	3,0	185	48	18
4143558	VDS403A17200	17,200	.6772	113	135	3,0	185	48	18
4143559	VDS403A17300	17,300	.6811	113	135	3,0	185	48	18
4143560	VDS403A17400	17,400	.6850	113	135	3,0	185	48	18
4143561	VDS403A17463	17,463	.6875	113	135	3,0	185	48	18
4143562	VDS403A17500	17,500	.6890	113	135	3,0	185	48	18
4143563	VDS403A17600	17,600	.6929	113	135	3,1	185	48	18
4143564	VDS403A17700	17,700	.6969	113	135	3,1	185	48	18
4143565	VDS403A17800	17,800	.7008	113	135	3,1	185	48	18
4143566	VDS403A17859	17,859	.7031	113	135	3,1	185	48	18
4143567	VDS403A17900	17,900	.7047	113	135	3,1	185	48	18
4144209	VDS403A18000	18,000	.7087	113	135	3,1	185	48	18
4144211	VDS403A18100	18,100	.7126	124	148	3,1	200	50	20
4144212	VDS403A18200	18,200	.7165	124	148	3,2	200	50	20
4144244	VDS403A18258	18,258	.7188	124	148	3,2	200	50	20
4144246	VDS403A18300	18,300	.7205	124	148	3,2	200	50	20
4144248	VDS403A18400	18,400	.7244	124	148	3,2	200	50	20
4144250	VDS403A18500	18,500	.7283	124	148	3,2	200	50	20
4144252	VDS403A18600	18,600	.7323	124	148	3,2	200	50	20
4144254	VDS403A18654	18,654	.7344	124	148	3,2	200	50	20
4144256	VDS403A18700	18,700	.7362	124	148	3,2	200	50	20
4144258	VDS403A18800	18,800	.7402	124	148	3,3	200	50	20
4144260	VDS403A18900	18,900	.7441	124	148	3,3	200	50	20
4144262	VDS403A19000	19,000	.7480	124	148	3,3	200	50	20
4144275	VDS403A19050	19,050	.7500	124	148	3,3	200	50	20
4144277	VDS403A19100	19,100	.7520	124	148	3,3	200	50	20
4144279	VDS403A19200	19,200	.7559	124	148	3,3	200	50	20
4144281	VDS403A19300	19,300	.7598	124	148	3,4	200	50	20
4144283	VDS403A19400	19,400	.7638	124	148	3,4	200	50	20
4144285	VDS403A19500	19,500	.7677	124	148	3,4	200	50	20
4144287	VDS403A19600	19,600	.7717	124	148	3,4	200	50	20
4144289	VDS403A19700	19,700	.7756	124	148	3,4	200	50	20
4144291	VDS403A19800	19,800	.7795	124	148	3,4	200	50	20
4144303	VDS403A19900	19,900	.7835	124	148	3,5	200	50	20
4144305	VDS403A20000	20,000	.7874	124	148	3,5	200	50	20

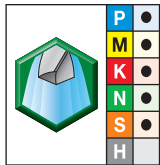
Solid Carbide Drills



For information on L, L3, and L4 max, see page T143.



■ VDS201F • VDS401F • 3 x D



grade WU25PD
TiAlN



grade WU25PD
TiAlN

● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4147927	VDS201F03000	4140012	VDS401F03000	3,000	.1181	14	20	0,5	62	36	6
4147928	VDS201F03100	4140023	VDS401F03100	3,100	.1220	14	20	0,5	62	36	6
4147929	VDS201F03200	4140024	VDS401F03200	3,200	.1260	14	20	0,5	62	36	6
4147930	VDS201F03300	4140025	VDS401F03300	3,300	.1299	14	20	0,5	62	36	6
4147931	VDS201F03400	4140026	VDS401F03400	3,400	.1339	14	20	0,6	62	36	6
4147932	VDS201F03500	4140027	VDS401F03500	3,500	.1378	14	20	0,6	62	36	6
4147933	VDS201F03600	4140028	VDS401F03600	3,600	.1417	14	20	0,6	62	36	6
4147934	VDS201F03700	4140029	VDS401F03700	3,700	.1457	14	20	0,6	62	36	6
4147935	VDS201F03800	4140030	VDS401F03800	3,800	.1496	17	24	0,6	66	36	6
4147936	VDS201F03900	4140031	VDS401F03900	3,900	.1535	17	24	0,6	66	36	6
4147937	VDS201F04000	4140032	VDS401F04000	4,000	.1575	17	24	0,7	66	36	6
4147938	VDS201F04100	4140033	VDS401F04100	4,100	.1614	17	24	0,7	66	36	6
4147939	VDS201F04200	4140034	VDS401F04200	4,200	.1654	17	24	0,7	66	36	6
4147940	VDS201F04300	4140035	VDS401F04300	4,300	.1693	17	24	0,7	66	36	6
4147941	VDS201F04400	4140036	VDS401F04400	4,400	.1732	17	24	0,7	66	36	6
4147942	VDS201F04500	4140037	VDS401F04500	4,500	.1772	17	24	0,7	66	36	6
4147943	VDS201F04600	4140038	VDS401F04600	4,600	.1811	17	24	0,8	66	36	6
4147944	VDS201F04700	4140039	VDS401F04700	4,700	.1850	17	24	0,8	66	36	6
4147945	VDS201F04800	4140040	VDS401F04800	4,800	.1890	20	28	0,8	66	36	6
4147946	VDS201F04900	4140041	VDS401F04900	4,900	.1929	20	28	0,8	66	36	6
4147947	VDS201F05000	4140042	VDS401F05000	5,000	.1969	20	28	0,8	66	36	6
4147948	VDS201F05100	4140043	VDS401F05100	5,100	.2008	20	28	0,8	66	36	6
4147949	VDS201F05200	4140044	VDS401F05200	5,200	.2047	20	28	0,9	66	36	6
4147950	VDS201F05300	4140045	VDS401F05300	5,300	.2087	20	28	0,9	66	36	6

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Solid Carbide Drills

(VDS201F • VDS401F • 3 x D — continued)

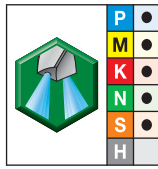
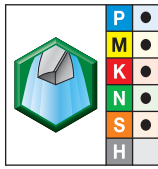


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		D1 diameter					
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4147951	VDS201F05400	4140046	VDS401F05400	5,400	.2126	20	28	0,9	66	36	6
4147952	VDS201F05500	4140047	VDS401F05500	5,500	.2165	20	28	0,9	66	36	6
4147953	VDS201F05600	4140048	VDS401F05600	5,600	.2205	20	28	0,9	66	36	6
4147954	VDS201F05700	4140049	VDS401F05700	5,700	.2244	20	28	1,0	66	36	6
4147955	VDS201F05800	4140050	VDS401F05800	5,800	.2283	20	28	1,0	66	36	6
4147956	VDS201F05900	4140051	VDS401F05900	5,900	.2323	20	28	1,0	66	36	6
4147957	VDS201F06000	4140052	VDS401F06000	6,000	.2362	20	28	1,0	66	36	6
4147958	VDS201F06100	4140053	VDS401F06100	6,100	.2402	24	34	1,0	79	36	8
4147959	VDS201F06200	4140054	VDS401F06200	6,200	.2441	24	34	1,0	79	36	8
4147960	VDS201F06300	4140055	VDS401F06300	6,300	.2480	24	34	1,1	79	36	8
4147961	VDS201F06400	4140056	VDS401F06400	6,400	.2520	24	34	1,1	79	36	8
4147962	VDS201F06500	4140057	VDS401F06500	6,500	.2559	24	34	1,1	79	36	8
4147963	VDS201F06600	4140058	VDS401F06600	6,600	.2598	24	34	1,1	79	36	8
4147964	VDS201F06700	4140059	VDS401F06700	6,700	.2638	24	34	1,1	79	36	8
4147965	VDS201F06800	4140060	VDS401F06800	6,800	.2677	24	34	1,1	79	36	8
4147966	VDS201F06900	4140061	VDS401F06900	6,900	.2717	24	34	1,2	79	36	8
4147967	VDS201F07000	4140062	VDS401F07000	7,000	.2756	24	34	1,2	79	36	8
4147968	VDS201F07100	4140063	VDS401F07100	7,100	.2795	29	41	1,2	79	36	8
4147969	VDS201F07200	4140064	VDS401F07200	7,200	.2835	29	41	1,2	79	36	8
4147970	VDS201F07300	4140065	VDS401F07300	7,300	.2874	29	41	1,2	79	36	8
4147971	VDS201F07400	4140066	VDS401F07400	7,400	.2913	29	41	1,3	79	36	8
4147972	VDS201F07500	4140067	VDS401F07500	7,500	.2953	29	41	1,3	79	36	8
4147973	VDS201F07600	4140068	VDS401F07600	7,600	.2992	29	41	1,3	79	36	8
4147974	VDS201F07700	4140069	VDS401F07700	7,700	.3031	29	41	1,3	79	36	8
4147975	VDS201F07800	4140070	VDS401F07800	7,800	.3071	29	41	1,3	79	36	8
4147976	VDS201F07900	4140071	VDS401F07900	7,900	.3110	29	41	1,3	79	36	8
4147977	VDS201F08000	4140072	VDS401F08000	8,000	.3150	29	41	1,4	79	36	8
4147978	VDS201F08100	4140073	VDS401F08100	8,100	.3189	35	47	1,4	89	40	10
4147979	VDS201F08200	4140074	VDS401F08200	8,200	.3228	35	47	1,4	89	40	10
4147980	VDS201F08300	4140075	VDS401F08300	8,300	.3268	35	47	1,4	89	40	10
4147981	VDS201F08400	4140076	VDS401F08400	8,400	.3307	35	47	1,4	89	40	10
4147982	VDS201F08500	4140077	VDS401F08500	8,500	.3346	35	47	1,4	89	40	10
4147983	VDS201F08600	4140078	VDS401F08600	8,600	.3386	35	47	1,5	89	40	10
4147984	VDS201F08700	4140079	VDS401F08700	8,700	.3425	35	47	1,5	89	40	10
4147985	VDS201F08800	4140080	VDS401F08800	8,800	.3465	35	47	1,5	89	40	10
4147986	VDS201F08900	4140081	VDS401F08900	8,900	.3504	35	47	1,5	89	40	10
4147987	VDS201F09000	4140082	VDS401F09000	9,000	.3543	35	47	1,5	89	40	10
4147988	VDS201F09100	4140083	VDS401F09100	9,100	.3583	35	47	1,5	89	40	10
4147989	VDS201F09200	4140084	VDS401F09200	9,200	.3622	35	47	1,6	89	40	10
4147990	VDS201F09300	4140085	VDS401F09300	9,300	.3661	35	47	1,6	89	40	10

(continued)

(VDS201F • VDS401F • 3 x D — continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4147991	VDS201F09400	4140086	VDS401F09400	9,400	.3701	35	47	1,6	89	40	10
4147992	VDS201F09500	4140087	VDS401F09500	9,500	.3740	35	47	1,6	89	40	10
4147993	VDS201F09600	4140088	VDS401F09600	9,600	.3780	35	47	1,6	89	40	10
4147994	VDS201F09700	4140089	VDS401F09700	9,700	.3819	35	47	1,7	89	40	10
4147995	VDS201F09800	4140090	VDS401F09800	9,800	.3858	35	47	1,7	89	40	10
4147996	VDS201F09900	4140091	VDS401F09900	9,900	.3898	35	47	1,7	89	40	10
4148039	VDS201F10000	4140410	VDS401F10000	10,000	.3937	35	47	1,7	89	40	10
4148040	VDS201F10100	4140411	VDS401F10100	10,100	.3976	40	55	1,7	102	45	12
4148041	VDS201F10200	4140412	VDS401F10200	10,200	.4016	40	55	1,7	102	45	12
4148042	VDS201F10300	4140503	VDS401F10300	10,300	.4055	40	55	1,8	102	45	12
4148043	VDS201F10400	4140504	VDS401F10400	10,400	.4094	40	55	1,8	102	45	12
4148044	VDS201F10500	4140505	VDS401F10500	10,500	.4134	40	55	1,8	102	45	12
4148045	VDS201F10600	4140506	VDS401F10600	10,600	.4173	40	55	1,8	102	45	12
4148046	VDS201F10700	4140507	VDS401F10700	10,700	.4213	40	55	1,8	102	45	12
4148047	VDS201F10800	4140508	VDS401F10800	10,800	.4252	40	55	1,8	102	45	12
4148048	VDS201F10900	4140509	VDS401F10900	10,900	.4291	40	55	1,9	102	45	12
4148049	VDS201F11000	4140510	VDS401F11000	11,000	.4331	40	55	1,9	102	45	12
4148050	VDS201F11100	4140511	VDS401F11100	11,100	.4370	40	55	1,9	102	45	12
4148051	VDS201F11200	4140512	VDS401F11200	11,200	.4409	40	55	1,9	102	45	12
4148052	VDS201F11300	4140513	VDS401F11300	11,300	.4449	40	55	1,9	102	45	12
4148053	VDS201F11400	4140514	VDS401F11400	11,400	.4488	40	55	2,0	102	45	12
4148054	VDS201F11500	4140515	VDS401F11500	11,500	.4528	40	55	2,0	102	45	12
4148055	VDS201F11600	4140516	VDS401F11600	11,600	.4567	40	55	2,0	102	45	12
4148056	VDS201F11700	4140517	VDS401F11700	11,700	.4606	40	55	2,0	102	45	12
4148057	VDS201F11800	4140518	VDS401F11800	11,800	.4646	40	55	2,0	102	45	12
4148058	VDS201F11900	4140519	VDS401F11900	11,900	.4685	40	55	2,0	102	45	12
4148059	VDS201F12000	4140520	VDS401F12000	12,000	.4724	40	55	2,1	102	45	12
4148060	VDS201F12100	4140521	VDS401F12100	12,100	.4764	43	60	2,1	107	45	14
4148061	VDS201F12200	4140522	VDS401F12200	12,200	.4803	43	60	2,1	107	45	14
4148062	VDS201F12300	4140523	VDS401F12300	12,300	.4843	43	60	2,1	107	45	14
4148063	VDS201F12400	4140524	VDS401F12400	12,400	.4882	43	60	2,1	107	45	14
4148064	VDS201F12500	4140525	VDS401F12500	12,500	.4921	43	60	2,1	107	45	14
4148065	VDS201F12600	4140526	VDS401F12600	12,600	.4961	43	60	2,2	107	45	14
4148066	VDS201F12700	4140527	VDS401F12700	12,700	.5000	43	60	2,2	107	45	14
4148067	VDS201F12800	4140528	VDS401F12800	12,800	.5039	43	60	2,2	107	45	14
4148068	VDS201F12900	4140529	VDS401F12900	12,900	.5079	43	60	2,2	107	45	14
4148069	VDS201F13000	4140530	VDS401F13000	13,000	.5118	43	60	2,2	107	45	14
4148070	VDS201F13100	4140531	VDS401F13100	13,100	.5157	43	60	2,3	107	45	14
4148071	VDS201F13200	4140532	VDS401F13200	13,200	.5197	43	60	2,3	107	45	14
4148072	VDS201F13300	4140533	VDS401F13300	13,300	.5236	43	60	2,3	107	45	14

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(VDS201F • VDS401F • 3 x D — continued)

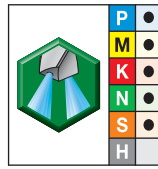
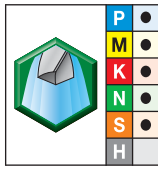


● first choice
○ alternate choice

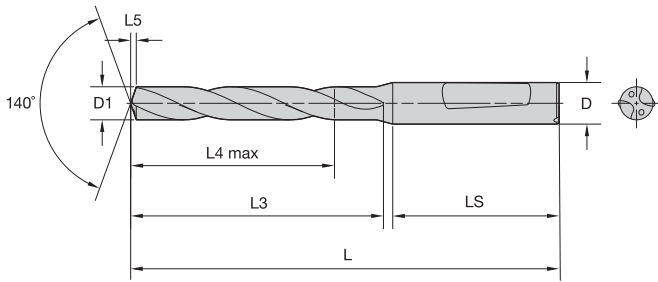
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		D1 diameter					
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148073	VDS201F13400	4140534	VDS401F13400	13,400	.5276	43	60	2,3	107	45	14
4148074	VDS201F13500	4140535	VDS401F13500	13,500	.5315	43	60	2,3	107	45	14
4148075	VDS201F13600	4140536	VDS401F13600	13,600	.5354	43	60	2,3	107	45	14
4148076	VDS201F13700	4140537	VDS401F13700	13,700	.5394	43	60	2,4	107	45	14
4148077	VDS201F13800	4140538	VDS401F13800	13,800	.5433	43	60	2,4	107	45	14
4148078	VDS201F13900	4140539	VDS401F13900	13,900	.5472	43	60	2,4	107	45	14
4148079	VDS201F14000	4140540	VDS401F14000	14,000	.5512	43	60	2,4	107	45	14
4148080	VDS201F14100	4140541	VDS401F14100	14,100	.5551	45	65	2,4	115	48	16
4148081	VDS201F14200	4140542	VDS401F14200	14,200	.5591	45	65	2,5	115	48	16
4148082	VDS201F14300	4140543	VDS401F14300	14,300	.5630	45	65	2,5	115	48	16
4148083	VDS201F14400	4140544	VDS401F14400	14,400	.5669	45	65	2,5	115	48	16
4148084	VDS201F14500	4140545	VDS401F14500	14,500	.5709	45	65	2,5	115	48	16
4148085	VDS201F14600	4140546	VDS401F14600	14,600	.5748	45	65	2,5	115	48	16
4148086	VDS201F14700	4140547	VDS401F14700	14,700	.5787	45	65	2,5	115	48	16
4148087	VDS201F14800	4140548	VDS401F14800	14,800	.5827	45	65	2,6	115	48	16
4148088	VDS201F14900	4140549	VDS401F14900	14,900	.5866	45	65	2,6	115	48	16
4148089	VDS201F15000	4140550	VDS401F15000	15,000	.5906	45	65	2,6	115	48	16
4148090	VDS201F15100	4140551	VDS401F15100	15,100	.5945	45	65	2,6	115	48	16
4148091	VDS201F15200	4140552	VDS401F15200	15,200	.5984	45	65	2,6	115	48	16
4148092	VDS201F15300	4140553	VDS401F15300	15,300	.6024	45	65	2,6	115	48	16
4148093	VDS201F15400	4140554	VDS401F15400	15,400	.6063	45	65	2,7	115	48	16
4148094	VDS201F15500	4140555	VDS401F15500	15,500	.6102	45	65	2,7	115	48	16
4148095	VDS201F15600	4140556	VDS401F15600	15,600	.6142	45	65	2,7	115	48	16
4148096	VDS201F15700	4140557	VDS401F15700	15,700	.6181	45	65	2,7	115	48	16
4148097	VDS201F15800	4140558	VDS401F15800	15,800	.6220	45	65	2,7	115	48	16
4148098	VDS201F15900	4140559	VDS401F15900	15,900	.6260	45	65	2,8	115	48	16
4148099	VDS201F16000	4140560	VDS401F16000	16,000	.6299	45	65	2,8	115	48	16
4148100	VDS201F16100	4140561	VDS401F16100	16,100	.6339	51	73	2,8	123	48	18
4148101	VDS201F16200	4140562	VDS401F16200	16,200	.6378	51	73	2,8	123	48	18
4148102	VDS201F16300	4140563	VDS401F16300	16,300	.6417	51	73	2,8	123	48	18
4148103	VDS201F16400	4140564	VDS401F16400	16,400	.6457	51	73	2,8	123	48	18
4148104	VDS201F16500	4140565	VDS401F16500	16,500	.6496	51	73	2,9	123	48	18
4148105	VDS201F16600	4140566	VDS401F16600	16,600	.6535	51	73	2,9	123	48	18
4148106	VDS201F16700	4140567	VDS401F16700	16,700	.6575	51	73	2,9	123	48	18
4148107	VDS201F16800	4140568	VDS401F16800	16,800	.6614	51	73	2,9	123	48	18
4148108	VDS201F16900	4140569	VDS401F16900	16,900	.6654	51	73	2,9	123	48	18
4148109	VDS201F17000	4140570	VDS401F17000	17,000	.6693	51	73	2,9	123	48	18
4148110	VDS201F17100	4140571	VDS401F17100	17,100	.6732	51	73	3,0	123	48	18
4148111	VDS201F17200	4140572	VDS401F17200	17,200	.6772	51	73	3,0	123	48	18
4148112	VDS201F17300	4140573	VDS401F17300	17,300	.6811	51	73	3,0	123	48	18

(continued)

(VDS201F • VDS401F • 3 x D — continued)


 ● first choice
 ○ alternate choice

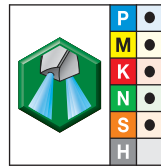
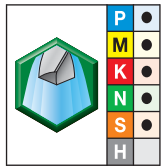
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148113	VDS201F17400	4140574	VDS401F17400	17,400	.6850	51	73	3,0	123	48	18
4148114	VDS201F17500	4140575	VDS401F17500	17,500	.6890	51	73	3,0	123	48	18
4148115	VDS201F17600	4140576	VDS401F17600	17,600	.6929	51	73	3,1	123	48	18
4148116	VDS201F17700	4140577	VDS401F17700	17,700	.6969	51	73	3,1	123	48	18
4148117	VDS201F17800	4140578	VDS401F17800	17,800	.7008	51	73	3,1	123	48	18
4148118	VDS201F17900	4140579	VDS401F17900	17,900	.7047	51	73	3,1	123	48	18
4148119	VDS201F18000	4140580	VDS401F18000	18,000	.7087	51	73	3,1	123	48	18
4148120	VDS201F18100	4140581	VDS401F18100	18,100	.7126	55	79	3,1	131	50	20
4148121	VDS201F18200	4140582	VDS401F18200	18,200	.7165	55	79	3,2	131	50	20
4148122	VDS201F18300	4140583	VDS401F18300	18,300	.7205	55	79	3,2	131	50	20
4148123	VDS201F18400	4140584	VDS401F18400	18,400	.7244	55	79	3,2	131	50	20
4148124	VDS201F18500	4140585	VDS401F18500	18,500	.7283	55	79	3,2	131	50	20
4148125	VDS201F18600	4140586	VDS401F18600	18,600	.7323	55	79	3,2	131	50	20
4148126	VDS201F18700	4140587	VDS401F18700	18,700	.7362	55	79	3,2	131	50	20
4148127	VDS201F18800	4140588	VDS401F18800	18,800	.7402	55	79	3,3	131	50	20
4148128	VDS201F18900	4140589	VDS401F18900	18,900	.7441	55	79	3,3	131	50	20
4148129	VDS201F19000	4140590	VDS401F19000	19,000	.7480	55	79	3,3	131	50	20
4148130	VDS201F19100	4140591	VDS401F19100	19,100	.7520	55	79	3,3	131	50	20
4148131	VDS201F19200	4140592	VDS401F19200	19,200	.7559	55	79	3,3	131	50	20
4148132	VDS201F19300	4140593	VDS401F19300	19,300	.7598	55	79	3,4	131	50	20
4148133	VDS201F19400	4140594	VDS401F19400	19,400	.7638	55	79	3,4	131	50	20
4148134	VDS201F19500	4140595	VDS401F19500	19,500	.7677	55	79	3,4	131	50	20
4148135	VDS201F19600	4140596	VDS401F19600	19,600	.7717	55	79	3,4	131	50	20
4148136	VDS201F19700	4140597	VDS401F19700	19,700	.7756	55	79	3,4	131	50	20
4148137	VDS201F19800	4140598	VDS401F19800	19,800	.7795	55	79	3,4	131	50	20
4148138	VDS201F19900	4140599	VDS401F19900	19,900	.7835	55	79	3,5	131	50	20
4148139	VDS201F20000	4140600	VDS401F20000	20,000	.7874	55	79	3,5	131	50	20



For information on L, L3, and L4 max, see page T143.



■ VDS202F • VDS402F • 5 x D

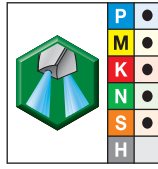
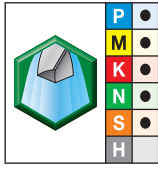


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4148335	VDS202F03000	4142783	VDS402F03000	3,000	.1181	23	28	0,5	66	36	6
4148336	VDS202F03100	4142784	VDS402F03100	3,100	.1220	23	28	0,5	66	36	6
4148337	VDS202F03200	4142785	VDS402F03200	3,200	.1260	23	28	0,5	66	36	6
4148338	VDS202F03300	4142786	VDS402F03300	3,300	.1299	23	28	0,5	66	36	6
4148339	VDS202F03400	4142787	VDS402F03400	3,400	.1339	23	28	0,6	66	36	6
4148340	VDS202F03500	4142788	VDS402F03500	3,500	.1378	23	28	0,6	66	36	6
4148341	VDS202F03600	4142789	VDS402F03600	3,600	.1417	23	28	0,6	66	36	6
4148342	VDS202F03700	4142790	VDS402F03700	3,700	.1457	23	28	0,6	66	36	6
4148413	VDS202F03800	4142791	VDS402F03800	3,800	.1496	29	36	0,6	74	36	6
4148414	VDS202F03900	4142792	VDS402F03900	3,900	.1535	29	36	0,6	74	36	6
4148415	VDS202F04000	4142793	VDS402F04000	4,000	.1575	29	36	0,7	74	36	6
4148416	VDS202F04100	4142794	VDS402F04100	4,100	.1614	29	36	0,7	74	36	6
4148417	VDS202F04200	4142795	VDS402F04200	4,200	.1654	29	36	0,7	74	36	6
4148418	VDS202F04300	4142796	VDS402F04300	4,300	.1693	29	36	0,7	74	36	6
4148419	VDS202F04400	4142797	VDS402F04400	4,400	.1732	29	36	0,7	74	36	6
4148420	VDS202F04500	4142798	VDS402F04500	4,500	.1772	29	36	0,7	74	36	6
4148421	VDS202F04600	4142799	VDS402F04600	4,600	.1811	29	36	0,8	74	36	6
4148422	VDS202F04700	4142800	VDS402F04700	4,700	.1850	29	36	0,8	74	36	6
4148423	VDS202F04800	4142801	VDS402F04800	4,800	.1890	35	44	0,8	82	36	6
4148424	VDS202F04900	4142802	VDS402F04900	4,900	.1929	35	44	0,8	82	36	6
4148425	VDS202F05000	4142813	VDS402F05000	5,000	.1969	35	44	0,8	82	36	6
4148426	VDS202F05100	4142814	VDS402F05100	5,100	.2008	35	44	0,8	82	36	6
4148427	VDS202F05200	4142815	VDS402F05200	5,200	.2047	35	44	0,9	82	36	6
4148428	VDS202F05300	4142816	VDS402F05300	5,300	.2087	35	44	0,9	82	36	6

(continued)

(VDS202F • VDS402F • 5 x D — continued)

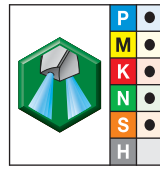
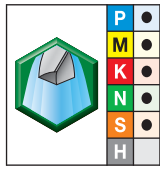


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148429	VDS202F05400	4142817	VDS402F05400	5,400	.2126	35	44	0,9	82	36	6
4148430	VDS202F05500	4142818	VDS402F05500	5,500	.2165	35	44	0,9	82	36	6
4148431	VDS202F05600	4142819	VDS402F05600	5,600	.2205	35	44	0,9	82	36	6
4148432	VDS202F05700	4142820	VDS402F05700	5,700	.2244	35	44	1,0	82	36	6
4148433	VDS202F05800	4142821	VDS402F05800	5,800	.2283	35	44	1,0	82	36	6
4148434	VDS202F05900	4142822	VDS402F05900	5,900	.2323	35	44	1,0	82	36	6
4148435	VDS202F06000	4142843	VDS402F06000	6,000	.2362	35	44	1,0	82	36	6
4148436	VDS202F06100	4142845	VDS402F06100	6,100	.2402	43	53	1,0	91	36	8
4148437	VDS202F06200	4142848	VDS402F06200	6,200	.2441	43	53	1,0	91	36	8
4148438	VDS202F06300	4142850	VDS402F06300	6,300	.2480	43	53	1,1	91	36	8
4148439	VDS202F06400	4142852	VDS402F06400	6,400	.2520	43	53	1,1	91	36	8
4148440	VDS202F06500	4142863	VDS402F06500	6,500	.2559	43	53	1,1	91	36	8
4148441	VDS202F06600	4142866	VDS402F06600	6,600	.2598	43	53	1,1	91	36	8
4148442	VDS202F06700	4142868	VDS402F06700	6,700	.2638	43	53	1,1	91	36	8
4148443	VDS202F06800	4142870	VDS402F06800	6,800	.2677	43	53	1,1	91	36	8
4148444	VDS202F06900	4142883	VDS402F06900	6,900	.2717	43	53	1,2	91	36	8
4148445	VDS202F07000	4142886	VDS402F07000	7,000	.2756	43	53	1,2	91	36	8
4148446	VDS202F07100	4142889	VDS402F07100	7,100	.2795	43	53	1,2	91	36	8
4148447	VDS202F07200	4142892	VDS402F07200	7,200	.2835	43	53	1,2	91	36	8
4148448	VDS202F07300	4142895	VDS402F07300	7,300	.2874	43	53	1,2	91	36	8
4148449	VDS202F07400	4142898	VDS402F07400	7,400	.2913	43	53	1,3	91	36	8
4148450	VDS202F07500	4142901	VDS402F07500	7,500	.2953	43	53	1,3	91	36	8
4148451	VDS202F07600	4142904	VDS402F07600	7,600	.2992	43	53	1,3	91	36	8
4148452	VDS202F07700	4142907	VDS402F07700	7,700	.3031	43	53	1,3	91	36	8
4148453	VDS202F07800	4142910	VDS402F07800	7,800	.3071	43	53	1,3	91	36	8
4148454	VDS202F07900	4142923	VDS402F07900	7,900	.3110	43	53	1,3	91	36	8
4148455	VDS202F08000	4142926	VDS402F08000	8,000	.3150	43	53	1,4	91	36	8
4148456	VDS202F08100	4142929	VDS402F08100	8,100	.3189	49	61	1,4	103	40	10
4148457	VDS202F08200	4142932	VDS402F08200	8,200	.3228	49	61	1,4	103	40	10
4148458	VDS202F08300	4142935	VDS402F08300	8,300	.3268	49	61	1,4	103	40	10
4148459	VDS202F08400	4142938	VDS402F08400	8,400	.3307	49	61	1,4	103	40	10
4148460	VDS202F08500	4142941	VDS402F08500	8,500	.3346	49	61	1,4	103	40	10
4148461	VDS202F08600	4142944	VDS402F08600	8,600	.3386	49	61	1,5	103	40	10
4148462	VDS202F08700	4142947	VDS402F08700	8,700	.3425	49	61	1,5	103	40	10
4148463	VDS202F08800	4142950	VDS402F08800	8,800	.3465	49	61	1,5	103	40	10
4148464	VDS202F08900	4142963	VDS402F08900	8,900	.3504	49	61	1,5	103	40	10
4148465	VDS202F09000	4142966	VDS402F09000	9,000	.3543	49	61	1,5	103	40	10
4148466	VDS202F09100	4142969	VDS402F09100	9,100	.3583	49	61	1,5	103	40	10
4148467	VDS202F09200	4142972	VDS402F09200	9,200	.3622	49	61	1,6	103	40	10
4148468	VDS202F09300	4142975	VDS402F09300	9,300	.3661	49	61	1,6	103	40	10

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(VDS202F • VDS402F • 5 x D — continued)

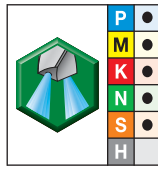


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148469	VDS202F09400	4142978	VDS402F09400	9,400	.3701	49	61	1,6	103	40	10
4148470	VDS202F09500	4142980	VDS402F09500	9,500	.3740	49	61	1,6	103	40	10
4148471	VDS202F09600	4142982	VDS402F09600	9,600	.3780	49	61	1,6	103	40	10
4148472	VDS202F09700	4142993	VDS402F09700	9,700	.3819	49	61	1,7	103	40	10
4148473	VDS202F09800	4142995	VDS402F09800	9,800	.3858	49	61	1,7	103	40	10
4148474	VDS202F09900	4142998	VDS402F09900	9,900	.3898	49	61	1,7	103	40	10
4148405	VDS202F10000	4143569	VDS402F10000	10,000	.3937	49	61	1,7	103	40	10
4148406	VDS202F10100	4143570	VDS402F10100	10,100	.3976	56	71	1,7	118	45	12
4148407	VDS202F10200	4143571	VDS402F10200	10,200	.4016	56	71	1,7	118	45	12
4148408	VDS202F10300	4143572	VDS402F10300	10,300	.4055	56	71	1,8	118	45	12
4148409	VDS202F10400	4143583	VDS402F10400	10,400	.4094	56	71	1,8	118	45	12
4148410	VDS202F10500	4143584	VDS402F10500	10,500	.4134	56	71	1,8	118	45	12
4148411	VDS202F10600	4143585	VDS402F10600	10,600	.4173	56	71	1,8	118	45	12
4148412	VDS202F10700	4143586	VDS402F10700	10,700	.4213	56	71	1,8	118	45	12
4148483	VDS202F10800	4143587	VDS402F10800	10,800	.4252	56	71	1,8	118	45	12
4148484	VDS202F10900	4143588	VDS402F10900	10,900	.4291	56	71	1,9	118	45	12
4148485	VDS202F11000	4143589	VDS402F11000	11,000	.4331	56	71	1,9	118	45	12
4148486	VDS202F11100	4143590	VDS402F11100	11,100	.4370	56	71	1,9	118	45	12
4148487	VDS202F11200	4143591	VDS402F11200	11,200	.4409	56	71	1,9	118	45	12
4148488	VDS202F11300	4143592	VDS402F11300	11,300	.4449	56	71	1,9	118	45	12
4148489	VDS202F11400	4143593	VDS402F11400	11,400	.4488	56	71	2,0	118	45	12
4148490	VDS202F11500	4143594	VDS402F11500	11,500	.4528	56	71	2,0	118	45	12
4148491	VDS202F11600	4143595	VDS402F11600	11,600	.4567	56	71	2,0	118	45	12
4148492	VDS202F11700	4143596	VDS402F11700	11,700	.4606	56	71	2,0	118	45	12
4148493	VDS202F11800	4143597	VDS402F11800	11,800	.4646	56	71	2,0	118	45	12
4148494	VDS202F11900	4143598	VDS402F11900	11,900	.4685	56	71	2,0	118	45	12
4148495	VDS202F12000	4143599	VDS402F12000	12,000	.4724	56	71	2,1	118	45	12
4148496	VDS202F12100	4143600	VDS402F12100	12,100	.4764	60	77	2,1	124	45	14
4148497	VDS202F12200	4143601	VDS402F12200	12,200	.4803	60	77	2,1	124	45	14
4148498	VDS202F12300	4143602	VDS402F12300	12,300	.4843	60	77	2,1	124	45	14
4148499	VDS202F12400	4143603	VDS402F12400	12,400	.4882	60	77	2,1	124	45	14
4148500	VDS202F12500	4143604	VDS402F12500	12,500	.4921	60	77	2,1	124	45	14
4148501	VDS202F12600	4143605	VDS402F12600	12,600	.4961	60	77	2,2	124	45	14
4148502	VDS202F12700	4143606	VDS402F12700	12,700	.5000	60	77	2,2	124	45	14
4148503	VDS202F12800	4143607	VDS402F12800	12,800	.5039	60	77	2,2	124	45	14
4148504	VDS202F12900	4143608	VDS402F12900	12,900	.5079	60	77	2,2	124	45	14
4148505	VDS202F13000	4143609	VDS402F13000	13,000	.5118	60	77	2,2	124	45	14
4148506	VDS202F13100	4143610	VDS402F13100	13,100	.5157	60	77	2,3	124	45	14
4148507	VDS202F13200	4143611	VDS402F13200	13,200	.5197	60	77	2,3	124	45	14
4148508	VDS202F13300	4143612	VDS402F13300	13,300	.5236	60	77	2,3	124	45	14

(continued)

(VDS202F • VDS402F • 5 x D — continued)

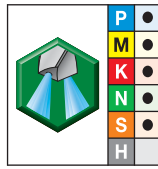
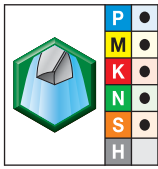


● first choice
○ alternate choice

grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148509	VDS202F13400	4143613	VDS402F13400	13,400	.5276	60	77	2,3	124	45	14
4148510	VDS202F13500	4143614	VDS402F13500	13,500	.5315	60	77	2,3	124	45	14
4148511	VDS202F13600	4143615	VDS402F13600	13,600	.5354	60	77	2,3	124	45	14
4148512	VDS202F13700	4143616	VDS402F13700	13,700	.5394	60	77	2,4	124	45	14
4148513	VDS202F13800	4143617	VDS402F13800	13,800	.5433	60	77	2,4	124	45	14
4148514	VDS202F13900	4143618	VDS402F13900	13,900	.5472	60	77	2,4	124	45	14
4148515	VDS202F14000	4143619	VDS402F14000	14,000	.5512	60	77	2,4	124	45	14
4148516	VDS202F14100	4143620	VDS402F14100	14,100	.5551	63	83	2,4	133	48	16
4148517	VDS202F14200	4143621	VDS402F14200	14,200	.5591	63	83	2,5	133	48	16
4148518	VDS202F14300	4143622	VDS402F14300	14,300	.5630	63	83	2,5	133	48	16
4148519	VDS202F14400	4143623	VDS402F14400	14,400	.5669	63	83	2,5	133	48	16
4148520	VDS202F14500	4143624	VDS402F14500	14,500	.5709	63	83	2,5	133	48	16
4148521	VDS202F14600	4143625	VDS402F14600	14,600	.5748	63	83	2,5	133	48	16
4148522	VDS202F14700	4143626	VDS402F14700	14,700	.5787	63	83	2,5	133	48	16
4148523	VDS202F14800	4143627	VDS402F14800	14,800	.5827	63	83	2,6	133	48	16
4148524	VDS202F14900	4143628	VDS402F14900	14,900	.5866	63	83	2,6	133	48	16
4148525	VDS202F15000	4143629	VDS402F15000	15,000	.5906	63	83	2,6	133	48	16
4148526	VDS202F15100	4143630	VDS402F15100	15,100	.5945	63	83	2,6	133	48	16
4148527	VDS202F15200	4143631	VDS402F15200	15,200	.5984	63	83	2,6	133	48	16
4148528	VDS202F15300	4143632	VDS402F15300	15,300	.6024	63	83	2,6	133	48	16
4148529	VDS202F15400	4143633	VDS402F15400	15,400	.6063	63	83	2,7	133	48	16
4148530	VDS202F15500	4143634	VDS402F15500	15,500	.6102	63	83	2,7	133	48	16
4148531	VDS202F15600	4143635	VDS402F15600	15,600	.6142	63	83	2,7	133	48	16
4148532	VDS202F15700	4143636	VDS402F15700	15,700	.6181	63	83	2,7	133	48	16
4148533	VDS202F15800	4143637	VDS402F15800	15,800	.6220	63	83	2,7	133	48	16
4148534	VDS202F15900	4143638	VDS402F15900	15,900	.6260	63	83	2,8	133	48	16
4148535	VDS202F16000	4143639	VDS402F16000	16,000	.6299	63	83	2,8	133	48	16
4148536	VDS202F16100	4143640	VDS402F16100	16,100	.6339	71	93	2,8	143	48	18
4148537	VDS202F16200	4143641	VDS402F16200	16,200	.6378	71	93	2,8	143	48	18
4148538	VDS202F16300	4143642	VDS402F16300	16,300	.6417	71	93	2,8	143	48	18
4148539	VDS202F16400	4143643	VDS402F16400	16,400	.6457	71	93	2,8	143	48	18
4148540	VDS202F16500	4143644	VDS402F16500	16,500	.6496	71	93	2,9	143	48	18
4148541	VDS202F16600	4143645	VDS402F16600	16,600	.6535	71	93	2,9	143	48	18
4148542	VDS202F16700	4143646	VDS402F16700	16,700	.6575	71	93	2,9	143	48	18
4148543	VDS202F16800	4143647	VDS402F16800	16,800	.6614	71	93	2,9	143	48	18
4148544	VDS202F16900	4143648	VDS402F16900	16,900	.6654	71	93	2,9	143	48	18
4148545	VDS202F17000	4143649	VDS402F17000	17,000	.6693	71	93	2,9	143	48	18
4148546	VDS202F17100	4143650	VDS402F17100	17,100	.6732	71	93	3,0	143	48	18
4148547	VDS202F17200	4143651	VDS402F17200	17,200	.6772	71	93	3,0	143	48	18
4148548	VDS202F17300	4143652	VDS402F17300	17,300	.6811	71	93	3,0	143	48	18

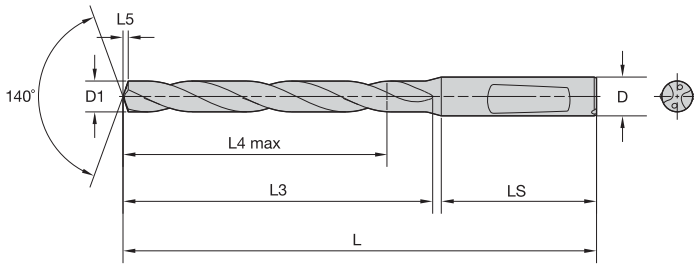
(continued)

(VDS202F • VDS402F • 5 x D — continued)



● first choice
○ alternate choice

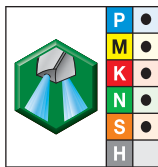
grade WU25PD TiAlN		grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L4 max	L3	L5	L	LS	D
4148549	VDS202F17400	4143653	VDS402F17400	17,400	.6850	71	93	3,0	143	48	18
4148550	VDS202F17500	4143654	VDS402F17500	17,500	.6890	71	93	3,0	143	48	18
4148551	VDS202F17600	4143655	VDS402F17600	17,600	.6929	71	93	3,1	143	48	18
4148552	VDS202F17700	4143656	VDS402F17700	17,700	.6969	71	93	3,1	143	48	18
4148553	VDS202F17800	4143657	VDS402F17800	17,800	.7008	71	93	3,1	143	48	18
4148554	VDS202F17900	4143658	VDS402F17900	17,900	.7047	71	93	3,1	143	48	18
4148555	VDS202F18000	4143659	VDS402F18000	18,000	.7087	71	93	3,1	143	48	18
4148556	VDS202F18100	4143660	VDS402F18100	18,100	.7126	77	101	3,1	153	50	20
4148557	VDS202F18200	4143661	VDS402F18200	18,200	.7165	77	101	3,2	153	50	20
4148558	VDS202F18300	4143662	VDS402F18300	18,300	.7205	77	101	3,2	153	50	20
4148559	VDS202F18400	4143663	VDS402F18400	18,400	.7244	77	101	3,2	153	50	20
4148560	VDS202F18500	4143664	VDS402F18500	18,500	.7283	77	101	3,2	153	50	20
4148561	VDS202F18600	4143665	VDS402F18600	18,600	.7323	77	101	3,2	153	50	20
4148562	VDS202F18700	4143666	VDS402F18700	18,700	.7362	77	101	3,2	153	50	20
4148563	VDS202F18800	4143667	VDS402F18800	18,800	.7402	77	101	3,3	153	50	20
4148564	VDS202F18900	4143668	VDS402F18900	18,900	.7441	77	101	3,3	153	50	20
4148565	VDS202F19000	4143669	VDS402F19000	19,000	.7480	77	101	3,3	153	50	20
4148566	VDS202F19100	4143670	VDS402F19100	19,100	.7520	77	101	3,3	153	50	20
4148567	VDS202F19200	4143671	VDS402F19200	19,200	.7559	77	101	3,3	153	50	20
4148568	VDS202F19300	4143672	VDS402F19300	19,300	.7598	77	101	3,4	153	50	20
4148569	VDS202F19400	4143673	VDS402F19400	19,400	.7638	77	101	3,4	153	50	20
4148570	VDS202F19500	4143674	VDS402F19500	19,500	.7677	77	101	3,4	153	50	20
4148571	VDS202F19600	4143675	VDS402F19600	19,600	.7717	77	101	3,4	153	50	20
4148572	VDS202F19700	4143676	VDS402F19700	19,700	.7756	77	101	3,4	153	50	20
4148573	VDS202F19800	4143677	VDS402F19800	19,800	.7795	77	101	3,4	153	50	20
4148574	VDS202F19900	4143678	VDS402F19900	19,900	.7835	77	101	3,5	153	50	20
4148575	VDS202F20000	4143679	VDS402F20000	20,000	.7874	77	101	3,5	153	50	20



For information on L, L3, and L4 max, see page T143.



■ **VDS403F • 8 x D**



● first choice
○ alternate choice

		D1 diameter							
grade WU25PD TiAlN		mm	in	L4 max	L3	L5	L	LS	D
4144208	VDS403F03000	3,000	.1181	33	40	0,5	78	36	6
4144210	VDS403F03100	3,100	.1220	33	40	0,5	78	36	6
4144243	VDS403F03200	3,200	.1260	33	40	0,5	78	36	6
4144245	VDS403F03300	3,300	.1299	33	40	0,5	78	36	6
4144247	VDS403F03400	3,400	.1339	33	40	0,6	78	36	6
4144249	VDS403F03500	3,500	.1378	33	40	0,6	78	36	6
4144251	VDS403F03600	3,600	.1417	33	40	0,6	78	36	6
4144253	VDS403F03700	3,700	.1457	33	40	0,6	78	36	6
4144255	VDS403F03800	3,800	.1496	41	49	0,6	87	36	6
4144257	VDS403F03900	3,900	.1535	41	49	0,6	87	36	6
4144259	VDS403F04000	4,000	.1575	41	49	0,7	87	36	6
4144261	VDS403F04100	4,100	.1614	41	49	0,7	87	36	6
4144273	VDS403F04200	4,200	.1654	41	49	0,7	87	36	6
4144274	VDS403F04300	4,300	.1693	41	49	0,7	87	36	6
4144276	VDS403F04400	4,400	.1732	41	49	0,7	87	36	6
4144278	VDS403F04500	4,500	.1772	41	49	0,7	87	36	6
4144280	VDS403F04600	4,600	.1811	41	49	0,8	87	36	6
4144282	VDS403F04700	4,700	.1850	41	49	0,8	87	36	6
4144284	VDS403F04800	4,800	.1890	48	56	0,8	94	36	6
4144286	VDS403F04900	4,900	.1929	48	56	0,8	94	36	6
4144288	VDS403F05000	5,000	.1969	48	56	0,8	94	36	6
4144290	VDS403F05100	5,100	.2008	48	56	0,8	94	36	6
4144292	VDS403F05200	5,200	.2047	48	56	0,9	94	36	6
4144304	VDS403F05300	5,300	.2087	48	56	0,9	94	36	6

(continued)

Solid Carbide Drills

(VDS403F • 8 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAIN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	mm	in						
4144306	VDS403F05400	5,400	.2126	48	56	0,9	94	36	6
4144307	VDS403F05500	5,500	.2165	48	56	0,9	94	36	6
4144308	VDS403F05600	5,600	.2205	48	56	0,9	94	36	6
4144309	VDS403F05700	5,700	.2244	48	56	1,0	94	36	6
4144310	VDS403F05800	5,800	.2283	48	56	1,0	94	36	6
4144311	VDS403F05900	5,900	.2323	48	56	1,0	94	36	6
4144312	VDS403F06000	6,000	.2362	48	56	1,0	94	36	6
4144313	VDS403F06100	6,100	.2402	57	67	1,0	105	36	8
4144314	VDS403F06200	6,200	.2441	57	67	1,0	105	36	8
4144315	VDS403F06300	6,300	.2480	57	67	1,1	105	36	8
4144316	VDS403F06400	6,400	.2520	57	67	1,1	105	36	8
4144317	VDS403F06500	6,500	.2559	57	67	1,1	105	36	8
4144318	VDS403F06600	6,600	.2598	57	67	1,1	105	36	8
4144319	VDS403F06700	6,700	.2638	57	67	1,1	105	36	8
4144320	VDS403F06800	6,800	.2677	57	67	1,1	105	36	8
4144321	VDS403F06900	6,900	.2717	57	67	1,2	105	36	8
4144322	VDS403F07000	7,000	.2756	57	67	1,2	105	36	8
4144343	VDS403F07100	7,100	.2795	61	72	1,2	110	36	8
4144344	VDS403F07200	7,200	.2835	61	72	1,2	110	36	8
4144345	VDS403F07300	7,300	.2874	61	72	1,2	110	36	8
4144346	VDS403F07400	7,400	.2913	61	72	1,3	110	36	8
4144347	VDS403F07500	7,500	.2953	61	72	1,3	110	36	8
4144348	VDS403F07600	7,600	.2992	61	72	1,3	110	36	8
4144349	VDS403F07700	7,700	.3031	61	72	1,3	110	36	8
4144350	VDS403F07800	7,800	.3071	61	72	1,3	110	36	8
4144351	VDS403F07900	7,900	.3110	61	72	1,3	110	36	8
4144352	VDS403F08000	8,000	.3150	61	72	1,4	110	36	8
4144363	VDS403F08100	8,100	.3189	68	80	1,4	122	40	10
4144364	VDS403F08200	8,200	.3228	68	80	1,4	122	40	10
4144365	VDS403F08300	8,300	.3268	68	80	1,4	122	40	10
4144366	VDS403F08400	8,400	.3307	68	80	1,4	122	40	10
4144367	VDS403F08500	8,500	.3346	68	80	1,4	122	40	10
4144368	VDS403F08600	8,600	.3386	68	80	1,5	122	40	10
4144369	VDS403F08700	8,700	.3425	68	80	1,5	122	40	10
4144370	VDS403F08800	8,800	.3465	68	80	1,5	122	40	10
4144371	VDS403F08900	8,900	.3504	68	80	1,5	122	40	10
4144372	VDS403F09000	9,000	.3543	68	80	1,5	122	40	10
4144373	VDS403F09100	9,100	.3583	68	80	1,5	122	40	10
4144374	VDS403F09200	9,200	.3622	68	80	1,6	122	40	10
4144375	VDS403F09300	9,300	.3661	68	80	1,6	122	40	10

(continued)

(VDS403F • 8 x D – continued)



● first choice
○ alternate choice

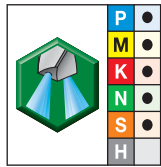
grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	mm	in						
4144376	VDS403F09400	9,400	.3701	68	80	1,6	122	40	10
4144377	VDS403F09500	9,500	.3740	68	80	1,6	122	40	10
4144378	VDS403F09600	9,600	.3780	68	80	1,6	122	40	10
4144379	VDS403F09700	9,700	.3819	68	80	1,7	122	40	10
4144380	VDS403F09800	9,800	.3858	68	80	1,7	122	40	10
4144381	VDS403F09900	9,900	.3898	68	80	1,7	122	40	10
4144207	VDS403F10000	10,000	.3937	68	80	1,7	122	40	10
4143888	VDS403F10100	10,100	.3976	79	94	1,7	141	45	12
4143889	VDS403F10200	10,200	.4016	79	94	1,7	141	45	12
4143890	VDS403F10300	10,300	.4055	79	94	1,8	141	45	12
4143891	VDS403F10400	10,400	.4094	79	94	1,8	141	45	12
4143892	VDS403F10500	10,500	.4134	79	94	1,8	141	45	12
4144223	VDS403F10600	10,600	.4173	79	94	1,8	141	45	12
4144224	VDS403F10700	10,700	.4213	79	94	1,8	141	45	12
4144225	VDS403F10800	10,800	.4252	79	94	1,8	141	45	12
4144226	VDS403F10900	10,900	.4291	79	94	1,9	141	45	12
4144227	VDS403F11000	11,000	.4331	79	94	1,9	141	45	12
4144228	VDS403F11100	11,100	.4370	79	94	1,9	141	45	12
4144229	VDS403F11200	11,200	.4409	79	94	1,9	141	45	12
4144230	VDS403F11300	11,300	.4449	79	94	1,9	141	45	12
4144231	VDS403F11400	11,400	.4488	79	94	2,0	141	45	12
4144232	VDS403F11500	11,500	.4528	79	94	2,0	141	45	12
4144233	VDS403F11600	11,600	.4567	79	94	2,0	141	45	12
4144234	VDS403F11700	11,700	.4606	79	94	2,0	141	45	12
4144235	VDS403F11800	11,800	.4646	79	94	2,0	141	45	12
4144236	VDS403F11900	11,900	.4685	79	94	2,0	141	45	12
4144237	VDS403F12000	12,000	.4724	79	94	2,1	141	45	12
4144238	VDS403F12100	12,100	.4764	91	108	2,1	155	45	14
4144239	VDS403F12200	12,200	.4803	91	108	2,1	155	45	14
4144240	VDS403F12300	12,300	.4843	91	108	2,1	155	45	14
4144241	VDS403F12400	12,400	.4882	91	108	2,1	155	45	14
4144242	VDS403F12500	12,500	.4921	91	108	2,1	155	45	14
4144263	VDS403F12600	12,600	.4961	91	108	2,2	155	45	14
4144264	VDS403F12700	12,700	.5000	91	108	2,2	155	45	14
4144265	VDS403F12800	12,800	.5039	91	108	2,2	155	45	14
4144266	VDS403F12900	12,900	.5079	91	108	2,2	155	45	14
4144267	VDS403F13000	13,000	.5118	91	108	2,2	155	45	14
4144268	VDS403F13100	13,100	.5157	91	108	2,3	155	45	14
4144269	VDS403F13200	13,200	.5197	91	108	2,3	155	45	14
4144270	VDS403F13300	13,300	.5236	91	108	2,3	155	45	14

(continued)



Solid Carbide Drills

(VDS403F • 8 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	mm	in						
4144271	VDS403F13400	13,400	.5276	91	108	2,3	155	45	14
4144272	VDS403F13500	13,500	.5315	91	108	2,3	155	45	14
4144293	VDS403F13600	13,600	.5354	91	108	2,3	155	45	14
4144294	VDS403F13700	13,700	.5394	91	108	2,4	155	45	14
4144295	VDS403F13800	13,800	.5433	91	108	2,4	155	45	14
4144296	VDS403F13900	13,900	.5472	91	108	2,4	155	45	14
4144297	VDS403F14000	14,000	.5512	91	108	2,4	155	45	14
4144298	VDS403F14100	14,100	.5551	101	121	2,4	171	48	16
4144299	VDS403F14200	14,200	.5591	101	121	2,5	171	48	16
4144300	VDS403F14300	14,300	.5630	101	121	2,5	171	48	16
4144301	VDS403F14400	14,400	.5669	101	121	2,5	171	48	16
4144302	VDS403F14500	14,500	.5709	101	121	2,5	171	48	16
4144323	VDS403F14600	14,600	.5748	101	121	2,5	171	48	16
4144324	VDS403F14700	14,700	.5787	101	121	2,5	171	48	16
4144325	VDS403F14800	14,800	.5827	101	121	2,6	171	48	16
4144326	VDS403F14900	14,900	.5866	101	121	2,6	171	48	16
4144327	VDS403F15000	15,000	.5906	101	121	2,6	171	48	16
4144328	VDS403F15100	15,100	.5945	101	121	2,6	171	48	16
4144329	VDS403F15200	15,200	.5984	101	121	2,6	171	48	16
4144330	VDS403F15300	15,300	.6024	101	121	2,6	171	48	16
4144331	VDS403F15400	15,400	.6063	101	121	2,7	171	48	16
4144332	VDS403F15500	15,500	.6102	101	121	2,7	171	48	16
4144333	VDS403F15600	15,600	.6142	101	121	2,7	171	48	16
4144334	VDS403F15700	15,700	.6181	101	121	2,7	171	48	16
4144335	VDS403F15800	15,800	.6220	101	121	2,7	171	48	16
4144336	VDS403F15900	15,900	.6260	101	121	2,8	171	48	16
4144337	VDS403F16000	16,000	.6299	101	121	2,8	171	48	16
4144338	VDS403F16100	16,100	.6339	113	135	2,8	185	48	18
4144339	VDS403F16200	16,200	.6378	113	135	2,8	185	48	18
4144340	VDS403F16300	16,300	.6417	113	135	2,8	185	48	18
4144341	VDS403F16400	16,400	.6457	113	135	2,8	185	48	18
4144342	VDS403F16500	16,500	.6496	113	135	2,9	185	48	18
4144353	VDS403F16600	16,600	.6535	113	135	2,9	185	48	18
4144354	VDS403F16700	16,700	.6575	113	135	2,9	185	48	18
4144355	VDS403F16800	16,800	.6614	113	135	2,9	185	48	18
4144356	VDS403F16900	16,900	.6654	113	135	2,9	185	48	18
4144357	VDS403F17000	17,000	.6693	113	135	2,9	185	48	18
4144358	VDS403F17100	17,100	.6732	113	135	3,0	185	48	18
4144359	VDS403F17200	17,200	.6772	113	135	3,0	185	48	18
4144360	VDS403F17300	17,300	.6811	113	135	3,0	185	48	18

(continued)

(VDS403F • 8 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		L4 max	L3	L5	L	LS	D
order #	catalogue #	mm	in						
4144361	VDS403F17400	17,400	.6850	113	135	3,0	185	48	18
4144362	VDS403F17500	17,500	.6890	113	135	3,0	185	48	18
4144383	VDS403F17600	17,600	.6929	113	135	3,1	185	48	18
4144384	VDS403F17700	17,700	.6969	113	135	3,1	185	48	18
4144385	VDS403F17800	17,800	.7008	113	135	3,1	185	48	18
4144386	VDS403F17900	17,900	.7047	113	135	3,1	185	48	18
4144387	VDS403F18000	18,000	.7087	113	135	3,1	185	48	18
4144388	VDS403F18100	18,100	.7126	124	148	3,1	200	50	20
4144389	VDS403F18200	18,200	.7165	124	148	3,2	200	50	20
4144390	VDS403F18300	18,300	.7205	124	148	3,2	200	50	20
4144391	VDS403F18400	18,400	.7244	124	148	3,2	200	50	20
4144392	VDS403F18500	18,500	.7283	124	148	3,2	200	50	20
4144393	VDS403F18600	18,600	.7323	124	148	3,2	200	50	20
4144394	VDS403F18700	18,700	.7362	124	148	3,2	200	50	20
4144395	VDS403F18800	18,800	.7402	124	148	3,3	200	50	20
4144396	VDS403F18900	18,900	.7441	124	148	3,3	200	50	20
4144397	VDS403F19000	19,000	.7480	124	148	3,3	200	50	20
4144398	VDS403F19100	19,100	.7520	124	148	3,3	200	50	20
4144399	VDS403F19200	19,200	.7559	124	148	3,3	200	50	20
4144400	VDS403F19300	19,300	.7598	124	148	3,4	200	50	20
4144401	VDS403F19400	19,400	.7638	124	148	3,4	200	50	20
4144402	VDS403F19500	19,500	.7677	124	148	3,4	200	50	20
4144403	VDS403F19600	19,600	.7717	124	148	3,4	200	50	20
4144404	VDS403F19700	19,700	.7756	124	148	3,4	200	50	20
4144405	VDS403F19800	19,800	.7795	124	148	3,4	200	50	20
4144406	VDS403F19900	19,900	.7835	124	148	3,5	200	50	20
4144407	VDS403F20000	20,000	.7874	124	148	3,5	200	50	20

Solid Carbide Drills

■ VariDrill • VDS2_Series • WU25PD™ • Flood Coolant • Metric

Material Group		Cutting Speed – vc Range – m/min		Recommended Feed Rate (f) by Diameter										
		min	max	Tool Diameter (mm)	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

Solid Carbide Drills

nominal size range	Metric tolerance	
	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

■ VariDrill • VDS4_Series • WU25PD™ • Through Coolant • Metric

Material Group	Cutting Speed – vc Range – m/min	Tool Diameter (mm)	Recommended Feed Rate (f) by Diameter												
			min	–	max	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		

Metric 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



EXTREME CHALLENGES. EXTREME RESULTS.

TDF Drills for Flat-Bottom Applications (Available as Semi-Standards)

Primary Application

Engineered specifically to eliminate the need for a two-part operation when drilling flat-bottom holes or on an inclined surface:

- Drill flat-bottom holes in one step.
- Eliminate the need to use both an end mill and a drill to machine a flat on an inclined surface.
- After full cylindrical engagement, the drills run at normal solid carbide drilling parameters.

Features and Benefits

- Four-Margin Design
 - Increases contact with material at full diameter.
 - Improves hold quality and drill stability in the cut.
 - Enables interrupted cuts and inclined exits.
- Special Point-Thinning
 - Increases centring capability.
 - Improves chip formation and flow.
 - Reduces cutting forces.

Product Portfolio

- The Flat-Bottom Drill product series TDF51* is pre-designed in four lengths and available in two grades, WN15HD for non-ferrous materials, and WU20PD™ for steel, iron, and stainless steel.

– TDF510*	1,5 x D
– TDF511*	3 x D
– TDF512*	5 x D
– TDF513*	8 x D
- Length variations and step drills available as engineered solutions.

Ordering Process

- Please contact your local Authorised Distributor for a quote.

WIDIA 

For a Wide Range of Materials



EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

VariDrill™

The VariDrill offers the ultimate solution for multipurpose drilling operations. Its advanced-point geometry design enables less chipping on the cutting edge, resulting in longer tool life. It delivers proper surface finish across multiple materials, including steel, stainless steel, cast iron, aluminium, and high-temp alloys.

- WU25PD™ drilling grade for extremely high wear resistance and longer tool life.
- VariDrill core design offers free chip flow and chip evacuation, resulting in optimum hole quality.
- Broad portfolio of items, with more than 2,200 choices.
- Reconditioning options for extended tool life.

To learn more about the benefits of **WIDIA™ VariDrill**, contact your local distributor.

WIDIA 

Application-Specific Drilling •

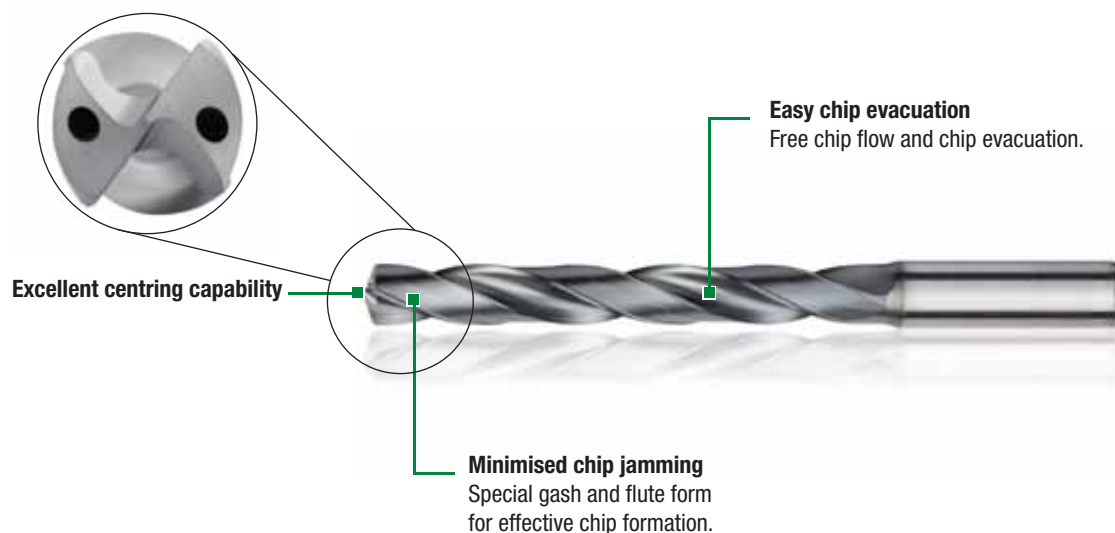
WIDIA™ TOP DRILL S™ for Steel and Cast Iron

TOP DRILL S



TOP DRILL S is WIDIA's line of solid carbide drills engineered to provide maximum performance and superior finish for application-specific tasks. Available in two material applications, TDS for steel and cast iron are each specially designed and coated to maximise output and increase tool life — offering less cost-per-hole and greater productivity.

- Designed for maximum productivity and longer tool life for steel and cast iron.
- Easy to choose and apply.
- One of the broadest ranges on the market for diameter selection, length series, and coolant options.
- Highest metal removal rates possible without sacrificing tool life.
- Latest Victory™ grades from WIDIA.



TOP DRILL S™ for Steel

TOP DRILL S for steel is a high-performance solid carbide drill with an application-specific design. Although the point geometry is strong enough to drill stainless steel and cast iron, it is engineered to maximise performance when drilling steel. The WP20PD™ grade, designed to resist high heat and wear, is the latest in WIDIA™ technology. The two-margin design facilitates excellent hole quality and less friction when drilling steel at high speeds.

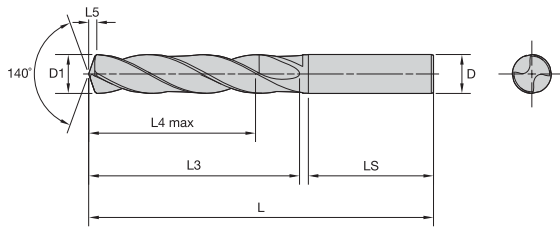
TOP DRILL S for Cast Iron

TOP DRILL S for cast iron is designed with application-specific point geometry for maximum performance in cast iron materials. The point features corner chamfers that minimise breakout on exit holes. A four-margin design improves hole straightness, increasing tool life and extending cross-hole and inclined exit capabilities when drilling tough cast iron. The technologically advanced WK15PD™ grade is specially engineered to withstand high wear.

WIDIA Advantage

- Application-specific geometry with the latest WIDIA grade technology.
- Lower cost-per-hole due to high MRR and long tool life.
- Consistent performance from internally controlled supply chain:
Powder > Rod > Grinding > Coating
- Part of the complete WIDIA holemaking solution.
- Broad range of standard lengths, diameters, and coolant options in one line, including extensive intermediate metric, inch, fraction, and wire sizes.





For information on L, L3, and L4 max, see page T143.



■ TDS202A • TDS212A • 5 x D



grade WP20PD
TiAlN



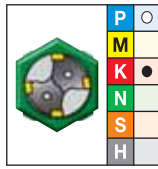
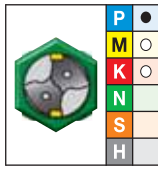
grade WK15PD
AlCrN

● first choice
○ alternate choice

				D1 diameter							
order #	catalogue #	order #	catalogue #	mm	in	L	L3	L4 max	L5	LS	D
4162258	TDS202A03000	4162417	TDS212A03000	3,000	.1181	66	28	23	0,5	36	6
4162259	TDS202A03048	4162418	TDS212A03048	3,048	.1200	66	28	23	0,5	36	6
4162260	TDS202A03100	4162419	TDS212A03100	3,100	.1220	66	28	23	0,5	36	6
4162261	TDS202A03175	4162420	TDS212A03175	3,175	.1250	66	28	23	0,5	36	6
4162262	TDS202A03200	4162421	TDS212A03200	3,200	.1260	66	28	23	0,5	36	6
4162283	TDS202A03264	4162422	TDS212A03264	3,264	.1285	66	28	23	0,5	36	6
4162284	TDS202A03300	4162543	TDS212A03300	3,300	.1299	66	28	23	0,5	36	6
4162285	TDS202A03400	4162544	TDS212A03400	3,400	.1339	66	28	23	0,6	36	6
4162286	TDS202A03455	4162545	TDS212A03455	3,455	.1360	66	28	23	0,6	36	6
4162287	TDS202A03500	4162546	TDS212A03500	3,500	.1378	66	28	23	0,6	36	6
4162288	TDS202A03571	4162547	TDS212A03571	3,571	.1406	66	28	23	0,6	36	6
4162289	TDS202A03600	4162548	TDS212A03600	3,600	.1417	66	28	23	0,6	36	6
4162290	TDS202A03658	4162549	TDS212A03658	3,658	.1440	66	28	23	0,6	36	6
4162291	TDS202A03700	4162550	TDS212A03700	3,700	.1457	66	28	23	0,6	36	6
4162292	TDS202A03734	4162551	TDS212A03734	3,734	.1470	66	28	23	0,6	36	6
4162293	TDS202A03800	4162552	TDS212A03800	3,800	.1496	74	36	29	0,6	36	6
4162294	TDS202A03900	4162553	TDS212A03900	3,900	.1535	74	36	29	0,6	36	6
4162295	TDS202A03970	4162554	TDS212A03970	3,970	.1563	74	36	29	0,7	36	6
4162296	TDS202A04000	4162555	TDS212A04000	4,000	.1575	74	36	29	0,7	36	6
4162297	TDS202A04039	4162556	TDS212A04039	4,039	.1590	74	36	29	0,7	36	6
4162298	TDS202A04090	4162557	TDS212A04090	4,090	.1610	74	36	29	0,7	36	6
4162299	TDS202A04100	4162558	TDS212A04100	4,100	.1614	74	36	29	0,7	36	6
4162300	TDS202A04200	4162559	TDS212A04200	4,200	.1654	74	36	29	0,7	36	6
4162301	TDS202A04217	4162560	TDS212A04217	4,217	.1660	74	36	29	0,7	36	6

(continued)

(TDS202A • TDS212A • 5 x D – continued)

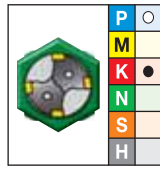


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162302	TDS202A04300	4162561	TDS212A04300	4,300	.1693	74	36	29	0,7	36	6
4162303	TDS202A04366	4162562	TDS212A04366	4,366	.1719	74	36	29	0,7	36	6
4162304	TDS202A04400	4162563	TDS212A04400	4,400	.1732	74	36	29	0,7	36	6
4162305	TDS202A04500	4162564	TDS212A04500	4,500	.1772	74	36	29	0,7	36	6
4162306	TDS202A04600	4162565	TDS212A04600	4,600	.1811	74	36	29	0,8	36	6
4162307	TDS202A04623	4162566	TDS212A04623	4,623	.1820	74	36	29	0,8	36	6
4162308	TDS202A04700	4162567	TDS212A04700	4,700	.1850	74	36	29	0,8	36	6
4162309	TDS202A04763	4162568	TDS212A04763	4,763	.1875	82	44	35	0,8	36	6
4162310	TDS202A04800	4162569	TDS212A04800	4,800	.1890	82	44	35	0,8	36	6
4162311	TDS202A04852	4162570	TDS212A04852	4,852	.1910	82	44	35	0,8	36	6
4162312	TDS202A04900	4162571	TDS212A04900	4,900	.1929	82	44	35	0,8	36	6
4162313	TDS202A05000	4162572	TDS212A05000	5,000	.1969	82	44	35	0,8	36	6
4162314	TDS202A05100	4162573	TDS212A05100	5,100	.2008	82	44	35	0,8	36	6
4162315	TDS202A05106	4162574	TDS212A05106	5,106	.2010	82	44	35	0,8	36	6
4162316	TDS202A05159	4162575	TDS212A05159	5,159	.2031	82	44	35	0,9	36	6
4162317	TDS202A05200	4162576	TDS212A05200	5,200	.2047	82	44	35	0,9	36	6
4162318	TDS202A05300	4162577	TDS212A05300	5,300	.2087	82	44	35	0,9	36	6
4162319	TDS202A05400	4162578	TDS212A05400	5,400	.2126	82	44	35	0,9	36	6
4162320	TDS202A05410	4162579	TDS212A05410	5,410	.2130	82	44	35	0,9	36	6
4162321	TDS202A05500	4162580	TDS212A05500	5,500	.2165	82	44	35	0,9	36	6
4162322	TDS202A05558	4162581	TDS212A05558	5,558	.2188	82	44	35	0,9	36	6
4162323	TDS202A05600	4162582	TDS212A05600	5,600	.2205	82	44	35	0,9	36	6
4162324	TDS202A05616	4162583	TDS212A05616	5,616	.2211	82	44	35	0,9	36	6
4162325	TDS202A05700	4162584	TDS212A05700	5,700	.2244	82	44	35	1,0	36	6
4162326	TDS202A05800	4162585	TDS212A05800	5,800	.2283	82	44	35	1,0	36	6
4162327	TDS202A05900	4162586	TDS212A05900	5,900	.2323	82	44	35	1,0	36	6
4162328	TDS202A05954	4162587	TDS212A05954	5,954	.2344	82	44	35	1,0	36	6
4162329	TDS202A06000	4162588	TDS212A06000	6,000	.2362	82	44	35	1,0	36	6
4162330	TDS202A06100	4162589	TDS212A06100	6,100	.2402	91	53	43	1,0	36	8
4162331	TDS202A06200	4162590	TDS212A06200	6,200	.2441	91	53	43	1,0	36	8
4162332	TDS202A06300	4162591	TDS212A06300	6,300	.2480	91	53	43	1,1	36	8
4162333	TDS202A06350	4162592	TDS212A06350	6,350	.2500	91	53	43	1,1	36	8
4162334	TDS202A06400	4162593	TDS212A06400	6,400	.2520	91	53	43	1,1	36	8
4162335	TDS202A06500	4162594	TDS212A06500	6,500	.2559	91	53	43	1,1	36	8
4162336	TDS202A06528	4162595	TDS212A06528	6,528	.2570	91	53	43	1,1	36	8
4162337	TDS202A06600	4162596	TDS212A06600	6,600	.2598	91	53	43	1,1	36	8
4162338	TDS202A06630	4162597	TDS212A06630	6,630	.2610	91	53	43	1,1	36	8
4162339	TDS202A06700	4162598	TDS212A06700	6,700	.2638	91	53	43	1,1	36	8
4162340	TDS202A06746	4162599	TDS212A06746	6,746	.2656	91	53	43	1,1	36	8
4148908	TDS202A06800	4148983	TDS212A06800	6,800	.2677	91	53	43	1,1	36	8

(continued)

(TDS202A • TDS212A • 5 x D – continued)



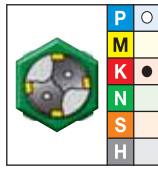
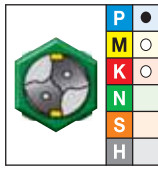
● first choice
○ alternate choice

D1 diameter

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162341	TDS202A06900	4162600	TDS212A06900	6,900	.2717	91	53	43	1,2	36	8
4162342	TDS202A07000	4162601	TDS212A07000	7,000	.2756	91	53	43	1,2	36	8
4162343	TDS202A07100	4162602	TDS212A07100	7,100	.2795	91	53	43	1,2	36	8
4162344	TDS202A07145	4162603	TDS212A07145	7,145	.2813	91	53	43	1,2	36	8
4162345	TDS202A07200	4162604	TDS212A07200	7,200	.2835	91	53	43	1,2	36	8
4162346	TDS202A07300	4162605	TDS212A07300	7,300	.2874	91	53	43	1,2	36	8
4162347	TDS202A07400	4162606	TDS212A07400	7,400	.2913	91	53	43	1,3	36	8
4162348	TDS202A07500	4162607	TDS212A07500	7,500	.2953	91	53	43	1,3	36	8
4162349	TDS202A07541	4162608	TDS212A07541	7,541	.2969	91	53	43	1,3	36	8
4162350	TDS202A07600	4162609	TDS212A07600	7,600	.2992	91	53	43	1,3	36	8
4162351	TDS202A07700	4162610	TDS212A07700	7,700	.3031	91	53	43	1,3	36	8
4162352	TDS202A07800	4162611	TDS212A07800	7,800	.3071	91	53	43	1,3	36	8
4162353	TDS202A07900	4162612	TDS212A07900	7,900	.3110	91	53	43	1,3	36	8
4162354	TDS202A07938	4162613	TDS212A07938	7,938	.3125	91	53	43	1,3	36	8
4162355	TDS202A08000	4162614	TDS212A08000	8,000	.3150	91	53	43	1,4	36	8
4162356	TDS202A08100	4162615	TDS212A08100	8,100	.3189	103	61	49	1,4	40	10
4162357	TDS202A08200	4162616	TDS212A08200	8,200	.3228	103	61	49	1,4	40	10
4162358	TDS202A08300	4162617	TDS212A08300	8,300	.3268	103	61	49	1,4	40	10
4162359	TDS202A08334	4162618	TDS212A08334	8,334	.3281	103	61	49	1,4	40	10
4162360	TDS202A08400	4162619	TDS212A08400	8,400	.3307	103	61	49	1,4	40	10
4162361	TDS202A08433	4162620	TDS212A08433	8,433	.3320	103	61	49	1,4	40	10
4162362	TDS202A08500	4162621	TDS212A08500	8,500	.3346	103	61	49	1,4	40	10
4162363	TDS202A08600	4162622	TDS212A08600	8,600	.3386	103	61	49	1,5	40	10
4162364	TDS202A08700	4162623	TDS212A08700	8,700	.3425	103	61	49	1,5	40	10
4162365	TDS202A08733	4162624	TDS212A08733	8,733	.3438	103	61	49	1,5	40	10
4162366	TDS202A08800	4162625	TDS212A08800	8,800	.3465	103	61	49	1,5	40	10
4162367	TDS202A08900	4162626	TDS212A08900	8,900	.3504	103	61	49	1,5	40	10
4162368	TDS202A09000	4162627	TDS212A09000	9,000	.3543	103	61	49	1,5	40	10
4162369	TDS202A09100	4162628	TDS212A09100	9,100	.3583	103	61	49	1,5	40	10
4162370	TDS202A09129	4162629	TDS212A09129	9,129	.3594	103	61	49	1,6	40	10
4162371	TDS202A09200	4162630	TDS212A09200	9,200	.3622	103	61	49	1,6	40	10
4162372	TDS202A09300	4162631	TDS212A09300	9,300	.3661	103	61	49	1,6	40	10
4162373	TDS202A09347	4162632	TDS212A09347	9,347	.3680	103	61	49	1,6	40	10
4162374	TDS202A09400	4162633	TDS212A09400	9,400	.3701	103	61	49	1,6	40	10
4162375	TDS202A09500	4162634	TDS212A09500	9,500	.3740	103	61	49	1,6	40	10
4162376	TDS202A09525	4162635	TDS212A09525	9,525	.3750	103	61	49	1,6	40	10
4162377	TDS202A09600	4162636	TDS212A09600	9,600	.3780	103	61	49	1,6	40	10
4162378	TDS202A09700	4162637	TDS212A09700	9,700	.3819	103	61	49	1,7	40	10
4162379	TDS202A09800	4162638	TDS212A09800	9,800	.3858	103	61	49	1,7	40	10
4162380	TDS202A09900	4162639	TDS212A09900	9,900	.3898	103	61	49	1,7	40	10

(continued)

(TDS202A • TDS212A • 5 x D – continued)

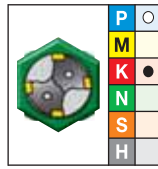
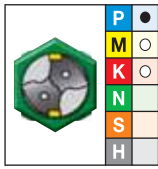


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162381	TDS202A09921	4162640	TDS212A09921	9,921	.3906	103	61	49	1,7	40	10
4167196	TDS202A10000	4162408	TDS212A10000	10,000	.3937	103	61	49	1,7	40	10
4167198	TDS202A10100	4162409	TDS212A10100	10,100	.3976	118	71	56	1,7	45	12
4167199	TDS202A10200	4162410	TDS212A10200	10,200	.4016	118	71	56	1,7	45	12
4167200	TDS202A10300	4162411	TDS212A10300	10,300	.4055	118	71	56	1,8	45	12
4167201	TDS202A10320	4162412	TDS212A10320	10,320	.4063	118	71	56	1,8	45	12
4167202	TDS202A10400	4162423	TDS212A10400	10,400	.4094	118	71	56	1,8	45	12
4167203	TDS202A10500	4162424	TDS212A10500	10,500	.4134	118	71	56	1,8	45	12
4167204	TDS202A10600	4162425	TDS212A10600	10,600	.4173	118	71	56	1,8	45	12
4167205	TDS202A10700	4162426	TDS212A10700	10,700	.4213	118	71	56	1,8	45	12
4167206	TDS202A10716	4162427	TDS212A10716	10,716	.4219	118	71	56	1,8	45	12
4167207	TDS202A10800	4162428	TDS212A10800	10,800	.4252	118	71	56	1,8	45	12
4167208	TDS202A10900	4162429	TDS212A10900	10,900	.4291	118	71	56	1,9	45	12
4167209	TDS202A11000	4162430	TDS212A11000	11,000	.4331	118	71	56	1,9	45	12
4167210	TDS202A11100	4162431	TDS212A11100	11,100	.4370	118	71	56	1,9	45	12
4167211	TDS202A11113	4162432	TDS212A11113	11,113	.4375	118	71	56	1,9	45	12
4167212	TDS202A11200	4162433	TDS212A11200	11,200	.4409	118	71	56	1,9	45	12
4167213	TDS202A11300	4162434	TDS212A11300	11,300	.4449	118	71	56	1,9	45	12
4167214	TDS202A11400	4162435	TDS212A11400	11,400	.4488	118	71	56	2,0	45	12
4167215	TDS202A11500	4162436	TDS212A11500	11,500	.4528	118	71	56	2,0	45	12
4167216	TDS202A11509	4162437	TDS212A11509	11,509	.4531	118	71	56	2,0	45	12
4167217	TDS202A11600	4162438	TDS212A11600	11,600	.4567	118	71	56	2,0	45	12
4167218	TDS202A11700	4162439	TDS212A11700	11,700	.4606	118	71	56	2,0	45	12
4167219	TDS202A11800	4162440	TDS212A11800	11,800	.4646	118	71	56	2,0	45	12
4167220	TDS202A11900	4162441	TDS212A11900	11,900	.4685	118	71	56	2,0	45	12
4167221	TDS202A11908	4162442	TDS212A11908	11,908	.4688	118	71	56	2,0	45	12
4167222	TDS202A12000	4162443	TDS212A12000	12,000	.4724	118	71	56	2,1	45	12
4167223	TDS202A12100	4162444	TDS212A12100	12,100	.4764	124	77	60	2,1	45	14
4167224	TDS202A12200	4162445	TDS212A12200	12,200	.4803	124	77	60	2,1	45	14
4167225	TDS202A12300	4162446	TDS212A12300	12,300	.4843	124	77	60	2,1	45	14
4167226	TDS202A12304	4162447	TDS212A12304	12,304	.4844	124	77	60	2,1	45	14
4167227	TDS202A12400	4162448	TDS212A12400	12,400	.4882	124	77	60	2,1	45	14
4167228	TDS202A12500	4162449	TDS212A12500	12,500	.4921	124	77	60	2,1	45	14
4167229	TDS202A12600	4162450	TDS212A12600	12,600	.4961	124	77	60	2,2	45	14
4167230	TDS202A12700	4162451	TDS212A12700	12,700	.5000	124	77	60	2,2	45	14
4167231	TDS202A12800	4162452	TDS212A12800	12,800	.5039	124	77	60	2,2	45	14
4167232	TDS202A12900	4162453	TDS212A12900	12,900	.5079	124	77	60	2,2	45	14
4167233	TDS202A13000	4162454	TDS212A13000	13,000	.5118	124	77	60	2,2	45	14
4167234	TDS202A13096	4162455	TDS212A13096	13,096	.5156	124	77	60	2,3	45	14
4167235	TDS202A13100	4162456	TDS212A13100	13,100	.5157	124	77	60	2,3	45	14

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(TDS202A • TDS212A • 5 x D – continued)

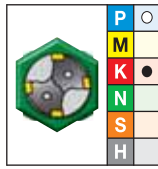
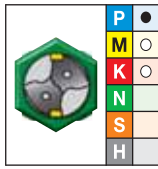


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4167236	TDS202A13200	4162457	TDS212A13200	13,200	.5197	124	77	60	2,3	45	14
4167237	TDS202A13300	4162458	TDS212A13300	13,300	.5236	124	77	60	2,3	45	14
4167238	TDS202A13400	4162459	TDS212A13400	13,400	.5276	124	77	60	2,3	45	14
4167239	TDS202A13500	4162460	TDS212A13500	13,500	.5315	124	77	60	2,3	45	14
4167240	TDS202A13600	4162461	TDS212A13600	13,600	.5354	124	77	60	2,3	45	14
4167241	TDS202A13700	4162462	TDS212A13700	13,700	.5394	124	77	60	2,4	45	14
4167242	TDS202A13800	4162463	TDS212A13800	13,800	.5433	124	77	60	2,4	45	14
4167243	TDS202A13891	4162464	TDS212A13891	13,891	.5469	124	77	60	2,4	45	14
4167244	TDS202A13900	4162465	TDS212A13900	13,900	.5472	124	77	60	2,4	45	14
4167245	TDS202A14000	4162466	TDS212A14000	14,000	.5512	124	77	60	2,4	45	14
4167246	TDS202A14100	4162467	TDS212A14100	14,100	.5551	133	83	63	2,4	48	16
4167247	TDS202A14200	4162468	TDS212A14200	14,200	.5591	133	83	63	2,5	48	16
4167248	TDS202A14288	4162469	TDS212A14288	14,288	.5625	133	83	63	2,5	48	16
4167249	TDS202A14300	4162470	TDS212A14300	14,300	.5630	133	83	63	2,5	48	16
4167250	TDS202A14400	4162471	TDS212A14400	14,400	.5669	133	83	63	2,5	48	16
4167251	TDS202A14500	4162472	TDS212A14500	14,500	.5709	133	83	63	2,5	48	16
4167252	TDS202A14600	4162473	TDS212A14600	14,600	.5748	133	83	63	2,5	48	16
4167253	TDS202A14684	4162474	TDS212A14684	14,684	.5781	133	83	63	2,5	48	16
4167254	TDS202A14700	4162475	TDS212A14700	14,700	.5787	133	83	63	2,5	48	16
4167255	TDS202A14800	4162476	TDS212A14800	14,800	.5827	133	83	63	2,6	48	16
4167256	TDS202A14900	4162477	TDS212A14900	14,900	.5866	133	83	63	2,6	48	16
4167257	TDS202A15000	4162478	TDS212A15000	15,000	.5906	133	83	63	2,6	48	16
4167258	TDS202A15083	4162479	TDS212A15083	15,083	.5938	133	83	63	2,6	48	16
4167259	TDS202A15100	4162480	TDS212A15100	15,100	.5945	133	83	63	2,6	48	16
4167260	TDS202A15200	4162481	TDS212A15200	15,200	.5984	133	83	63	2,6	48	16
4167261	TDS202A15300	4162482	TDS212A15300	15,300	.6024	133	83	63	2,6	48	16
4167262	TDS202A15400	4162483	TDS212A15400	15,400	.6063	133	83	63	2,7	48	16
4167263	TDS202A15479	4162484	TDS212A15479	15,479	.6094	133	83	63	2,7	48	16
4167264	TDS202A15500	4162485	TDS212A15500	15,500	.6102	133	83	63	2,7	48	16
4167265	TDS202A15600	4162486	TDS212A15600	15,600	.6142	133	83	63	2,7	48	16
4167266	TDS202A15700	4162487	TDS212A15700	15,700	.6181	133	83	63	2,7	48	16
4167267	TDS202A15800	4162488	TDS212A15800	15,800	.6220	133	83	63	2,7	48	16
4167268	TDS202A15875	4162489	TDS212A15875	15,875	.6250	133	83	63	2,7	48	16
4167269	TDS202A15900	4162490	TDS212A15900	15,900	.6260	133	83	63	2,8	48	16
4167270	TDS202A16000	4162491	TDS212A16000	16,000	.6299	133	83	63	2,8	48	16
4167271	TDS202A16100	4162492	TDS212A16100	16,100	.6339	143	93	71	2,8	48	18
4167272	TDS202A16200	4162493	TDS212A16200	16,200	.6378	143	93	71	2,8	48	18
4167273	TDS202A16271	4162494	TDS212A16271	16,271	.6406	143	93	71	2,8	48	18
4167274	TDS202A16300	4162495	TDS212A16300	16,300	.6417	143	93	71	2,8	48	18
4167275	TDS202A16400	4162496	TDS212A16400	16,400	.6457	143	93	71	2,8	48	18

(continued)

(TDS202A • TDS212A • 5 x D – continued)

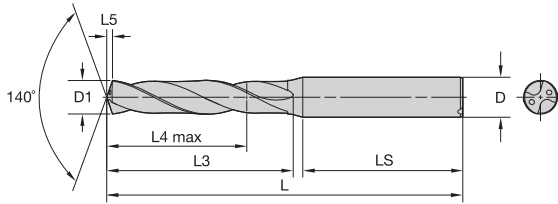


● first choice
○ alternate choice

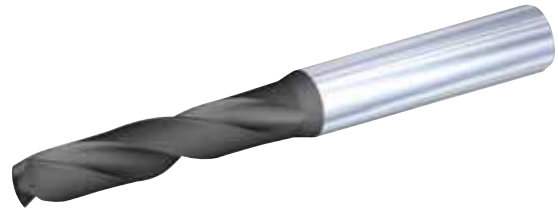
grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4167276	TDS202A16500	4162497	TDS212A16500	16,500	.6496	143	93	71	2,9	48	18
4167277	TDS202A16600	4162498	TDS212A16600	16,600	.6535	143	93	71	2,9	48	18
4167278	TDS202A16670	4162499	TDS212A16670	16,670	.6563	143	93	71	2,9	48	18
4167279	TDS202A16700	4162500	TDS212A16700	16,700	.6575	143	93	71	2,9	48	18
4167280	TDS202A16800	4162501	TDS212A16800	16,800	.6614	143	93	71	2,9	48	18
4167281	TDS202A16900	4162502	TDS212A16900	16,900	.6654	143	93	71	2,9	48	18
4167282	TDS202A17000	4162503	TDS212A17000	17,000	.6693	143	93	71	2,9	48	18
4167283	TDS202A17100	4162504	TDS212A17100	17,100	.6732	143	93	71	3,0	48	18
4167284	TDS202A17200	4162505	TDS212A17200	17,200	.6772	143	93	71	3,0	48	18
4167285	TDS202A17300	4162506	TDS212A17300	17,300	.6811	143	93	71	3,0	48	18
4167286	TDS202A17400	4162507	TDS212A17400	17,400	.6850	143	93	71	3,0	48	18
4167287	TDS202A17463	4162508	TDS212A17463	17,463	.6875	143	93	71	3,0	48	18
4167288	TDS202A17500	4162509	TDS212A17500	17,500	.6890	143	93	71	3,0	48	18
4167289	TDS202A17600	4162510	TDS212A17600	17,600	.6929	143	93	71	3,1	48	18
4167290	TDS202A17700	4162511	TDS212A17700	17,700	.6969	143	93	71	3,1	48	18
4167291	TDS202A17800	4162512	TDS212A17800	17,800	.7008	143	93	71	3,1	48	18
4167292	TDS202A17859	4162513	TDS212A17859	17,859	.7031	143	93	71	3,1	48	18
4167293	TDS202A17900	4162514	TDS212A17900	17,900	.7047	143	93	71	3,1	48	18
4163313	TDS202A18000	4160528	TDS212A18000	18,000	.7087	143	93	71	3,1	48	18
4163314	TDS202A18100	4160464	TDS212A18100	18,100	.7126	153	101	77	3,1	50	20
4163305	TDS202A18200	4160465	TDS212A18200	18,200	.7165	153	101	77	3,2	50	20
4163306	TDS202A18258	4160466	TDS212A18258	18,258	.7188	153	101	77	3,2	50	20
4163307	TDS202A18300	4160467	TDS212A18300	18,300	.7205	153	101	77	3,2	50	20
4163308	TDS202A18400	4160468	TDS212A18400	18,400	.7244	153	101	77	3,2	50	20
4163309	TDS202A18500	4160469	TDS212A18500	18,500	.7283	153	101	77	3,2	50	20
4163310	TDS202A18600	4160470	TDS212A18600	18,600	.7323	153	101	77	3,2	50	20
4163311	TDS202A18654	4160471	TDS212A18654	18,654	.7344	153	101	77	3,2	50	20
4163312	TDS202A18700	4160472	TDS212A18700	18,700	.7362	153	101	77	3,2	50	20
4163323	TDS202A18800	4160583	TDS212A18800	18,800	.7402	153	101	77	3,3	50	20
4163324	TDS202A18900	4160584	TDS212A18900	18,900	.7441	153	101	77	3,3	50	20
4163325	TDS202A19000	4160585	TDS212A19000	19,000	.7480	153	101	77	3,3	50	20
4163326	TDS202A19050	4160586	TDS212A19050	19,050	.7500	153	101	77	3,3	50	20
4163327	TDS202A19100	4160587	TDS212A19100	19,100	.7520	153	101	77	3,3	50	20
4163328	TDS202A19200	4160588	TDS212A19200	19,200	.7559	153	101	77	3,3	50	20
4163329	TDS202A19300	4160589	TDS212A19300	19,300	.7598	153	101	77	3,4	50	20
4163330	TDS202A19400	4160590	TDS212A19400	19,400	.7638	153	101	77	3,4	50	20
4163331	TDS202A19500	4160591	TDS212A19500	19,500	.7677	153	101	77	3,4	50	20
4163332	TDS202A19600	4160592	TDS212A19600	19,600	.7717	153	101	77	3,4	50	20
4163333	TDS202A19700	4160593	TDS212A19700	19,700	.7756	153	101	77	3,4	50	20
4163334	TDS202A19800	4160594	TDS212A19800	19,800	.7795	153	101	77	3,4	50	20
4163335	TDS202A19900	4160595	TDS212A19900	19,900	.7835	153	101	77	3,5	50	20
4163336	TDS202A20000	4160596	TDS212A20000	20,000	.7874	153	101	77	3,5	50	20



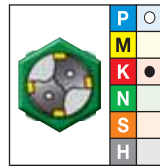
Solid Carbide Drills



For information on L, L3, and L4 max, see page T143.



■ TDS401A • TDS411A • 3 x D

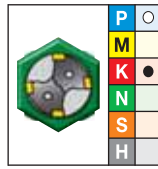
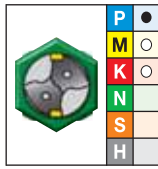


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163315	TDS401A03000	4157799	TDS411A03000	3,000	.1181	62	20	14	0,5	36	6
4163337	TDS401A03048	4157800	TDS411A03048	3,048	.1200	62	20	14	0,5	36	6
4163338	TDS401A03100	4157801	TDS411A03100	3,100	.1220	62	20	14	0,5	36	6
4163339	TDS401A03175	4157802	TDS411A03175	3,175	.1250	62	20	14	0,5	36	6
4163340	TDS401A03200	4157803	TDS411A03200	3,200	.1260	62	20	14	0,5	36	6
4163341	TDS401A03264	4157804	TDS411A03264	3,264	.1285	62	20	14	0,5	36	6
4163342	TDS401A03300	4157805	TDS411A03300	3,300	.1299	62	20	14	0,5	36	6
4163463	TDS401A03400	4157806	TDS411A03400	3,400	.1339	62	20	14	0,6	36	6
4163464	TDS401A03455	4157807	TDS411A03455	3,455	.1360	62	20	14	0,6	36	6
4163465	TDS401A03500	4157808	TDS411A03500	3,500	.1378	62	20	14	0,6	36	6
4163466	TDS401A03571	4157809	TDS411A03571	3,571	.1406	62	20	14	0,6	36	6
4163467	TDS401A03600	4157810	TDS411A03600	3,600	.1417	62	20	14	0,6	36	6
4163468	TDS401A03658	4157811	TDS411A03658	3,658	.1440	62	20	14	0,6	36	6
4163469	TDS401A03700	4157812	TDS411A03700	3,700	.1457	62	20	14	0,6	36	6
4163470	TDS401A03734	4157813	TDS411A03734	3,734	.1470	62	20	14	0,6	36	6
4163471	TDS401A03800	4157814	TDS411A03800	3,800	.1496	66	24	17	0,6	36	6
4163472	TDS401A03900	4157815	TDS411A03900	3,900	.1535	66	24	17	0,6	36	6
4163473	TDS401A03970	4157816	TDS411A03970	3,970	.1563	66	24	17	0,7	36	6
4163474	TDS401A04000	4157817	TDS411A04000	4,000	.1575	66	24	17	0,7	36	6
4163475	TDS401A04039	4157818	TDS411A04039	4,039	.1590	66	24	17	0,7	36	6
4163476	TDS401A04090	4157819	TDS411A04090	4,090	.1610	66	24	17	0,7	36	6
4163477	TDS401A04100	4157820	TDS411A04100	4,100	.1614	66	24	17	0,7	36	6
4163478	TDS401A04200	4157821	TDS411A04200	4,200	.1654	66	24	17	0,7	36	6
4163479	TDS401A04217	4157822	TDS411A04217	4,217	.1660	66	24	17	0,7	36	6

(continued)

(TDS401A • TDS411A • 3 x D – continued)



● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163480	TDS401A04300	4157823	TDS411A04300	4,300	.1693	66	24	17	0,7	36	6
4163481	TDS401A04366	4157824	TDS411A04366	4,366	.1719	66	24	17	0,7	36	6
4163482	TDS401A04400	4157825	TDS411A04400	4,400	.1732	66	24	17	0,7	36	6
4163483	TDS401A04500	4157826	TDS411A04500	4,500	.1772	66	24	17	0,7	36	6
4163484	TDS401A04600	4157827	TDS411A04600	4,600	.1811	66	24	17	0,8	36	6
4163485	TDS401A04623	4157828	TDS411A04623	4,623	.1820	66	24	17	0,8	36	6
4163486	TDS401A04700	4157829	TDS411A04700	4,700	.1850	66	24	17	0,8	36	6
4163487	TDS401A04763	4157830	TDS411A04763	4,763	.1875	66	28	20	0,8	36	6
4163488	TDS401A04800	4157831	TDS411A04800	4,800	.1890	66	28	20	0,8	36	6
4163489	TDS401A04852	4157832	TDS411A04852	4,852	.1910	66	28	20	0,8	36	6
4163490	TDS401A04900	4157833	TDS411A04900	4,900	.1929	66	28	20	0,8	36	6
4163491	TDS401A05000	4157834	TDS411A05000	5,000	.1969	66	28	20	0,8	36	6
4163492	TDS401A05100	4157835	TDS411A05100	5,100	.2008	66	28	20	0,8	36	6
4163493	TDS401A05106	4157836	TDS411A05106	5,106	.2010	66	28	20	0,8	36	6
4163494	TDS401A05159	4157837	TDS411A05159	5,159	.2031	66	28	20	0,9	36	6
4163495	TDS401A05200	4157838	TDS411A05200	5,200	.2047	66	28	20	0,9	36	6
4163496	TDS401A05300	4157839	TDS411A05300	5,300	.2087	66	28	20	0,9	36	6
4163497	TDS401A05400	4157840	TDS411A05400	5,400	.2126	66	28	20	0,9	36	6
4163498	TDS401A05410	4157841	TDS411A05410	5,410	.2130	66	28	20	0,9	36	6
4163499	TDS401A05500	4157842	TDS411A05500	5,500	.2165	66	28	20	0,9	36	6
4163500	TDS401A05558	4157843	TDS411A05558	5,558	.2188	66	28	20	0,9	36	6
4163501	TDS401A05600	4157844	TDS411A05600	5,600	.2205	66	28	20	0,9	36	6
4163502	TDS401A05616	4157845	TDS411A05616	5,616	.2211	66	28	20	0,9	36	6
4163503	TDS401A05700	4157846	TDS411A05700	5,700	.2244	66	28	20	1,0	36	6
4163504	TDS401A05800	4157847	TDS411A05800	5,800	.2283	66	28	20	1,0	36	6
4163505	TDS401A05900	4157848	TDS411A05900	5,900	.2323	66	28	20	1,0	36	6
4163506	TDS401A05954	4157849	TDS411A05954	5,954	.2344	66	28	20	1,0	36	6
4163507	TDS401A06000	4157850	TDS411A06000	6,000	.2362	66	28	20	1,0	36	6
4163508	TDS401A06100	4157851	TDS411A06100	6,100	.2402	79	34	24	1,0	36	8
4163509	TDS401A06200	4157852	TDS411A06200	6,200	.2441	79	34	24	1,0	36	8
4163510	TDS401A06300	4157853	TDS411A06300	6,300	.2480	79	34	24	1,1	36	8
4163511	TDS401A06350	4157854	TDS411A06350	6,350	.2500	79	34	24	1,1	36	8
4163512	TDS401A06400	4157855	TDS411A06400	6,400	.2520	79	34	24	1,1	36	8
4163513	TDS401A06500	4157856	TDS411A06500	6,500	.2559	79	34	24	1,1	36	8
4163514	TDS401A06528	4157857	TDS411A06528	6,528	.2570	79	34	24	1,1	36	8
4163515	TDS401A06600	4157858	TDS411A06600	6,600	.2598	79	34	24	1,1	36	8
4163516	TDS401A06630	4157859	TDS411A06630	6,630	.2610	79	34	24	1,1	36	8
4163517	TDS401A06700	4157860	TDS411A06700	6,700	.2638	79	34	24	1,1	36	8
4163518	TDS401A06746	4157861	TDS411A06746	6,746	.2656	79	34	24	1,1	36	8
4163519	TDS401A06800	4157862	TDS411A06800	6,800	.2677	79	34	24	1,1	36	8

(continued)

(TDS401A • TDS411A • 3 x D – continued)

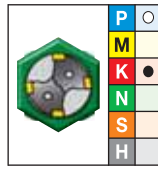
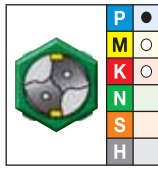


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163520	TDS401A06900	4157863	TDS411A06900	6,900	.2717	79	34	24	1,2	36	8
4163521	TDS401A07000	4157864	TDS411A07000	7,000	.2756	79	34	24	1,2	36	8
4163522	TDS401A07100	4157865	TDS411A07100	7,100	.2795	79	41	29	1,2	36	8
4163523	TDS401A07145	4157866	TDS411A07145	7,145	.2813	79	41	29	1,2	36	8
4163524	TDS401A07200	4157867	TDS411A07200	7,200	.2835	79	41	29	1,2	36	8
4163525	TDS401A07300	4157868	TDS411A07300	7,300	.2874	79	41	29	1,2	36	8
4163526	TDS401A07400	4157869	TDS411A07400	7,400	.2913	79	41	29	1,3	36	8
4163527	TDS401A07500	4157870	TDS411A07500	7,500	.2953	79	41	29	1,3	36	8
4163528	TDS401A07541	4157871	TDS411A07541	7,541	.2969	79	41	29	1,3	36	8
4163529	TDS401A07600	4157872	TDS411A07600	7,600	.2992	79	41	29	1,3	36	8
4163530	TDS401A07700	4157873	TDS411A07700	7,700	.3031	79	41	29	1,3	36	8
4163531	TDS401A07800	4157874	TDS411A07800	7,800	.3071	79	41	29	1,3	36	8
4163532	TDS401A07900	4157875	TDS411A07900	7,900	.3110	79	41	29	1,3	36	8
4163533	TDS401A07938	4157876	TDS411A07938	7,938	.3125	79	41	29	1,3	36	8
4163534	TDS401A08000	4157877	TDS411A08000	8,000	.3150	79	41	29	1,4	36	8
4163535	TDS401A08100	4157878	TDS411A08100	8,100	.3189	89	47	35	1,4	40	10
4163536	TDS401A08200	4157879	TDS411A08200	8,200	.3228	89	47	35	1,4	40	10
4163537	TDS401A08300	4157880	TDS411A08300	8,300	.3268	89	47	35	1,4	40	10
4163538	TDS401A08334	4157881	TDS411A08334	8,334	.3281	89	47	35	1,4	40	10
4163539	TDS401A08400	4157882	TDS411A08400	8,400	.3307	89	47	35	1,4	40	10
4163540	TDS401A08433	4157883	TDS411A08433	8,433	.3320	89	47	35	1,4	40	10
4163541	TDS401A08500	4157884	TDS411A08500	8,500	.3346	89	47	35	1,4	40	10
4163542	TDS401A08600	4157885	TDS411A08600	8,600	.3386	89	47	35	1,5	40	10
4163543	TDS401A08700	4157886	TDS411A08700	8,700	.3425	89	47	35	1,5	40	10
4163544	TDS401A08733	4157887	TDS411A08733	8,733	.3438	89	47	35	1,5	40	10
4163545	TDS401A08800	4157888	TDS411A08800	8,800	.3465	89	47	35	1,5	40	10
4163546	TDS401A08900	4157889	TDS411A08900	8,900	.3504	89	47	35	1,5	40	10
4163547	TDS401A09000	4157890	TDS411A09000	9,000	.3543	89	47	35	1,5	40	10
4163548	TDS401A09100	4157891	TDS411A09100	9,100	.3583	89	47	35	1,5	40	10
4163549	TDS401A09129	4157892	TDS411A09129	9,129	.3594	89	47	35	1,6	40	10
4163550	TDS401A09200	4157893	TDS411A09200	9,200	.3622	89	47	35	1,6	40	10
4163551	TDS401A09300	4157894	TDS411A09300	9,300	.3661	89	47	35	1,6	40	10
4163552	TDS401A09347	4157895	TDS411A09347	9,347	.3680	89	47	35	1,6	40	10
4163553	TDS401A09400	4157896	TDS411A09400	9,400	.3701	89	47	35	1,6	40	10
4163554	TDS401A09500	4157897	TDS411A09500	9,500	.3740	89	47	35	1,6	40	10
4163555	TDS401A09525	4157898	TDS411A09525	9,525	.3750	89	47	35	1,6	40	10
4163556	TDS401A09600	4157899	TDS411A09600	9,600	.3780	89	47	35	1,6	40	10
4163557	TDS401A09700	4157900	TDS411A09700	9,700	.3819	89	47	35	1,7	40	10
4163558	TDS401A09800	4157901	TDS411A09800	9,800	.3858	89	47	35	1,7	40	10
4163559	TDS401A09900	4157902	TDS411A09900	9,900	.3898	89	47	35	1,7	40	10

(continued)

(TDS401A • TDS411A • 3 x D – continued)

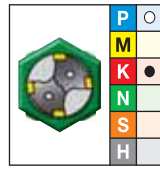
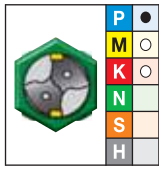


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163560	TDS401A09921	4157903	TDS411A09921	9,921	.3906	89	47	35	1,7	40	10
4162950	TDS401A10000	4156562	TDS411A10000	10,000	.3937	89	47	35	1,7	40	10
4162951	TDS401A10100	4156603	TDS411A10100	10,100	.3976	102	55	40	1,7	45	12
4162952	TDS401A10200	4156604	TDS411A10200	10,200	.4016	102	55	40	1,7	45	12
4163343	TDS401A10300	4156605	TDS411A10300	10,300	.4055	102	55	40	1,8	45	12
4163344	TDS401A10320	4156606	TDS411A10320	10,320	.4063	102	55	40	1,8	45	12
4163345	TDS401A10400	4156607	TDS411A10400	10,400	.4094	102	55	40	1,8	45	12
4163346	TDS401A10500	4156608	TDS411A10500	10,500	.4134	102	55	40	1,8	45	12
4163347	TDS401A10600	4156609	TDS411A10600	10,600	.4173	102	55	40	1,8	45	12
4163348	TDS401A10700	4156610	TDS411A10700	10,700	.4213	102	55	40	1,8	45	12
4163349	TDS401A10716	4156611	TDS411A10716	10,716	.4219	102	55	40	1,8	45	12
4163350	TDS401A10800	4156612	TDS411A10800	10,800	.4252	102	55	40	1,8	45	12
4163351	TDS401A10900	4156613	TDS411A10900	10,900	.4291	102	55	40	1,9	45	12
4163352	TDS401A11000	4156614	TDS411A11000	11,000	.4331	102	55	40	1,9	45	12
4163353	TDS401A11100	4156615	TDS411A11100	11,100	.4370	102	55	40	1,9	45	12
4163354	TDS401A11113	4156616	TDS411A11113	11,113	.4375	102	55	40	1,9	45	12
4163355	TDS401A11200	4156617	TDS411A11200	11,200	.4409	102	55	40	1,9	45	12
4163356	TDS401A11300	4156618	TDS411A11300	11,300	.4449	102	55	40	1,9	45	12
4163357	TDS401A11400	4156619	TDS411A11400	11,400	.4488	102	55	40	2,0	45	12
4163358	TDS401A11500	4156620	TDS411A11500	11,500	.4528	102	55	40	2,0	45	12
4163359	TDS401A11509	4156621	TDS411A11509	11,509	.4531	102	55	40	2,0	45	12
4163360	TDS401A11600	4156622	TDS411A11600	11,600	.4567	102	55	40	2,0	45	12
4163361	TDS401A11700	4156623	TDS411A11700	11,700	.4606	102	55	40	2,0	45	12
4163362	TDS401A11800	4156624	TDS411A11800	11,800	.4646	102	55	40	2,0	45	12
4163363	TDS401A11900	4156625	TDS411A11900	11,900	.4685	102	55	40	2,0	45	12
4163364	TDS401A11908	4156626	TDS411A11908	11,908	.4688	102	55	40	2,0	45	12
4163365	TDS401A12000	4156627	TDS411A12000	12,000	.4724	102	55	40	2,1	45	12
4163366	TDS401A12100	4156628	TDS411A12100	12,100	.4764	107	60	43	2,1	45	14
4163367	TDS401A12200	4156629	TDS411A12200	12,200	.4803	107	60	43	2,1	45	14
4163368	TDS401A12300	4156630	TDS411A12300	12,300	.4843	107	60	43	2,1	45	14
4163369	TDS401A12304	4156631	TDS411A12304	12,304	.4844	107	60	43	2,1	45	14
4163370	TDS401A12400	4156632	TDS411A12400	12,400	.4882	107	60	43	2,1	45	14
4163371	TDS401A12500	4156633	TDS411A12500	12,500	.4921	107	60	43	2,1	45	14
4163372	TDS401A12600	4156634	TDS411A12600	12,600	.4961	107	60	43	2,2	45	14
4163373	TDS401A12700	4156635	TDS411A12700	12,700	.5000	107	60	43	2,2	45	14
4163374	TDS401A12800	4156636	TDS411A12800	12,800	.5039	107	60	43	2,2	45	14
4163375	TDS401A12900	4156637	TDS411A12900	12,900	.5079	107	60	43	2,2	45	14
4163376	TDS401A13000	4156638	TDS411A13000	13,000	.5118	107	60	43	2,2	45	14
4163377	TDS401A13096	4156639	TDS411A13096	13,096	.5156	107	60	43	2,3	45	14
4163378	TDS401A13100	4156640	TDS411A13100	13,100	.5157	107	60	43	2,3	45	14

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(TDS401A • TDS411A • 3 x D – continued)

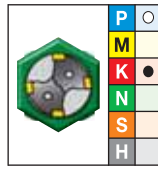
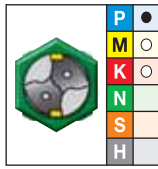


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163379	TDS401A13200	4156641	TDS411A13200	13,200	.5197	107	60	43	2,3	45	14
4163380	TDS401A13300	4156642	TDS411A13300	13,300	.5236	107	60	43	2,3	45	14
4163381	TDS401A13400	4156643	TDS411A13400	13,400	.5276	107	60	43	2,3	45	14
4163382	TDS401A13500	4156644	TDS411A13500	13,500	.5315	107	60	43	2,3	45	14
4163383	TDS401A13600	4156645	TDS411A13600	13,600	.5354	107	60	43	2,3	45	14
4163384	TDS401A13700	4156646	TDS411A13700	13,700	.5394	107	60	43	2,4	45	14
4163385	TDS401A13800	4156647	TDS411A13800	13,800	.5433	107	60	43	2,4	45	14
4163386	TDS401A13891	4156648	TDS411A13891	13,891	.5469	107	60	43	2,4	45	14
4163387	TDS401A13900	4156649	TDS411A13900	13,900	.5472	107	60	43	2,4	45	14
4163388	TDS401A14000	4156650	TDS411A14000	14,000	.5512	107	60	43	2,4	45	14
4163389	TDS401A14100	4156651	TDS411A14100	14,100	.5551	115	65	45	2,4	48	16
4163390	TDS401A14200	4156652	TDS411A14200	14,200	.5591	115	65	45	2,5	48	16
4163391	TDS401A14288	4156653	TDS411A14288	14,288	.5625	115	65	45	2,5	48	16
4163392	TDS401A14300	4156654	TDS411A14300	14,300	.5630	115	65	45	2,5	48	16
4163393	TDS401A14400	4156655	TDS411A14400	14,400	.5669	115	65	45	2,5	48	16
4163394	TDS401A14500	4156656	TDS411A14500	14,500	.5709	115	65	45	2,5	48	16
4163395	TDS401A14600	4156657	TDS411A14600	14,600	.5748	115	65	45	2,5	48	16
4163396	TDS401A14684	4156658	TDS411A14684	14,684	.5781	115	65	45	2,5	48	16
4163397	TDS401A14700	4156659	TDS411A14700	14,700	.5787	115	65	45	2,5	48	16
4163398	TDS401A14800	4156660	TDS411A14800	14,800	.5827	115	65	45	2,6	48	16
4163399	TDS401A14900	4156661	TDS411A14900	14,900	.5866	115	65	45	2,6	48	16
4163400	TDS401A15000	4156662	TDS411A15000	15,000	.5906	115	65	45	2,6	48	16
4163401	TDS401A15083	4156663	TDS411A15083	15,083	.5938	115	65	45	2,6	48	16
4163402	TDS401A15100	4156664	TDS411A15100	15,100	.5945	115	65	45	2,6	48	16
4163403	TDS401A15200	4156665	TDS411A15200	15,200	.5984	115	65	45	2,6	48	16
4163404	TDS401A15300	4156666	TDS411A15300	15,300	.6024	115	65	45	2,6	48	16
4163405	TDS401A15400	4156667	TDS411A15400	15,400	.6063	115	65	45	2,7	48	16
4163406	TDS401A15479	4156668	TDS411A15479	15,479	.6094	115	65	45	2,7	48	16
4163407	TDS401A15500	4156669	TDS411A15500	15,500	.6102	115	65	45	2,7	48	16
4163408	TDS401A15600	4156670	TDS411A15600	15,600	.6142	115	65	45	2,7	48	16
4163409	TDS401A15700	4156671	TDS411A15700	15,700	.6181	115	65	45	2,7	48	16
4163410	TDS401A15800	4156672	TDS411A15800	15,800	.6220	115	65	45	2,7	48	16
4163411	TDS401A15875	4156673	TDS411A15875	15,875	.6250	115	65	45	2,7	48	16
4163412	TDS401A15900	4156674	TDS411A15900	15,900	.6260	115	65	45	2,8	48	16
4163413	TDS401A16000	4156675	TDS411A16000	16,000	.6299	115	65	45	2,8	48	16
4163414	TDS401A16100	4156676	TDS411A16100	16,100	.6339	123	73	51	2,8	48	18
4163415	TDS401A16200	4156677	TDS411A16200	16,200	.6378	123	73	51	2,8	48	18
4163416	TDS401A16271	4156678	TDS411A16271	16,271	.6406	123	73	51	2,8	48	18
4163417	TDS401A16300	4156679	TDS411A16300	16,300	.6417	123	73	51	2,8	48	18
4163418	TDS401A16400	4156680	TDS411A16400	16,400	.6457	123	73	51	2,8	48	18

(continued)

(TDS401A • TDS411A • 3 x D – continued)

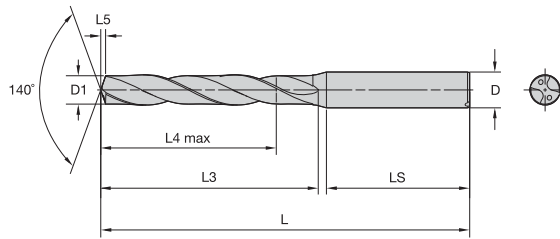


● first choice
○ alternate choice

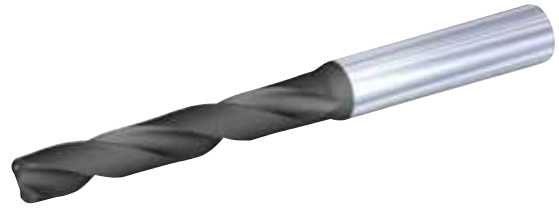
grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163419	TDS401A16500	4156681	TDS411A16500	16,500	.6496	123	73	51	2,9	48	18
4163420	TDS401A16600	4156682	TDS411A16600	16,600	.6535	123	73	51	2,9	48	18
4163421	TDS401A16670	4156683	TDS411A16670	16,670	.6563	123	73	51	2,9	48	18
4163422	TDS401A16700	4156684	TDS411A16700	16,700	.6575	123	73	51	2,9	48	18
4163423	TDS401A16800	4156685	TDS411A16800	16,800	.6614	123	73	51	2,9	48	18
4163424	TDS401A16900	4156686	TDS411A16900	16,900	.6654	123	73	51	2,9	48	18
4163425	TDS401A17000	4156687	TDS411A17000	17,000	.6693	123	73	51	2,9	48	18
4163426	TDS401A17100	4156688	TDS411A17100	17,100	.6732	123	73	51	3,0	48	18
4163427	TDS401A17200	4156689	TDS411A17200	17,200	.6772	123	73	51	3,0	48	18
4163428	TDS401A17300	4156690	TDS411A17300	17,300	.6811	123	73	51	3,0	48	18
4163429	TDS401A17400	4156691	TDS411A17400	17,400	.6850	123	73	51	3,0	48	18
4163430	TDS401A17463	4156692	TDS411A17463	17,463	.6875	123	73	51	3,0	48	18
4163431	TDS401A17500	4156693	TDS411A17500	17,500	.6890	123	73	51	3,0	48	18
4163432	TDS401A17600	4156694	TDS411A17600	17,600	.6929	123	73	51	3,1	48	18
4163433	TDS401A17700	4156695	TDS411A17700	17,700	.6969	123	73	51	3,1	48	18
4163434	TDS401A17800	4156696	TDS411A17800	17,800	.7008	123	73	51	3,1	48	18
4163435	TDS401A17859	4156697	TDS411A17859	17,859	.7031	123	73	51	3,1	48	18
4163436	TDS401A17900	4156698	TDS411A17900	17,900	.7047	123	73	51	3,1	48	18
4163271	TDS401A18000	4156699	TDS411A18000	18,000	.7087	123	73	51	3,1	48	18
4163272	TDS401A18100	4156700	TDS411A18100	18,100	.7126	131	79	55	3,1	50	20
4163283	TDS401A18200	4156701	TDS411A18200	18,200	.7165	131	79	55	3,2	50	20
4163284	TDS401A18258	4156702	TDS411A18258	18,258	.7188	131	79	55	3,2	50	20
4163285	TDS401A18300	4156713	TDS411A18300	18,300	.7205	131	79	55	3,2	50	20
4163286	TDS401A18400	4156714	TDS411A18400	18,400	.7244	131	79	55	3,2	50	20
4163287	TDS401A18500	4156715	TDS411A18500	18,500	.7283	131	79	55	3,2	50	20
4163288	TDS401A18600	4156716	TDS411A18600	18,600	.7323	131	79	55	3,2	50	20
4163289	TDS401A18654	4156717	TDS411A18654	18,654	.7344	131	79	55	3,2	50	20
4163290	TDS401A18700	4156718	TDS411A18700	18,700	.7362	131	79	55	3,2	50	20
4163291	TDS401A18800	4156719	TDS411A18800	18,800	.7402	131	79	55	3,3	50	20
4163292	TDS401A18900	4156720	TDS411A18900	18,900	.7441	131	79	55	3,3	50	20
4163293	TDS401A19000	4156721	TDS411A19000	19,000	.7480	131	79	55	3,3	50	20
4163294	TDS401A19050	4156722	TDS411A19050	19,050	.7500	131	79	55	3,3	50	20
4163295	TDS401A19100	4156723	TDS411A19100	19,100	.7520	131	79	55	3,3	50	20
4163296	TDS401A19200	4156724	TDS411A19200	19,200	.7559	131	79	55	3,3	50	20
4163297	TDS401A19300	4156725	TDS411A19300	19,300	.7598	131	79	55	3,4	50	20
4163298	TDS401A19400	4156726	TDS411A19400	19,400	.7638	131	79	55	3,4	50	20
4163299	TDS401A19500	4156727	TDS411A19500	19,500	.7677	131	79	55	3,4	50	20
4163300	TDS401A19600	4156728	TDS411A19600	19,600	.7717	131	79	55	3,4	50	20
4163301	TDS401A19700	4156729	TDS411A19700	19,700	.7756	131	79	55	3,4	50	20
4163302	TDS401A19800	4156730	TDS411A19800	19,800	.7795	131	79	55	3,4	50	20
4163303	TDS401A19900	4156731	TDS411A19900	19,900	.7835	131	79	55	3,5	50	20
4163304	TDS401A20000	4156732	TDS411A20000	20,000	.7874	131	79	55	3,5	50	20



Solid Carbide Drills



For information on L, L3, and L4 max, see page T143.



■ TDS402A • TDS412A • 5 x D

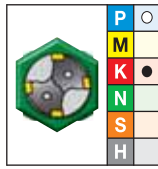
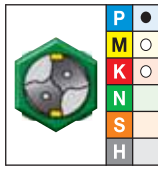


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162967	TDS402A03000	4158757	TDS412A03000	3,000	.1181	66	28	23	0,5	36	6
4162968	TDS402A03048	4158758	TDS412A03048	3,048	.1200	66	28	23	0,5	36	6
4162969	TDS402A03100	4158759	TDS412A03100	3,100	.1220	66	28	23	0,5	36	6
4162970	TDS402A03175	4158760	TDS412A03175	3,175	.1250	66	28	23	0,5	36	6
4162972	TDS402A03200	4158761	TDS412A03200	3,200	.1260	66	28	23	0,5	36	6
4162983	TDS402A03264	4158762	TDS412A03264	3,264	.1285	66	28	23	0,5	36	6
4162984	TDS402A03300	4158793	TDS412A03300	3,300	.1299	66	28	23	0,5	36	6
4162985	TDS402A03400	4158794	TDS412A03400	3,400	.1339	66	28	23	0,6	36	6
4162986	TDS402A03455	4158795	TDS412A03455	3,455	.1360	66	28	23	0,6	36	6
4162987	TDS402A03500	4158796	TDS412A03500	3,500	.1378	66	28	23	0,6	36	6
4162988	TDS402A03571	4158797	TDS412A03571	3,571	.1406	66	28	23	0,6	36	6
4162989	TDS402A03600	4158798	TDS412A03600	3,600	.1417	66	28	23	0,6	36	6
4162990	TDS402A03658	4158799	TDS412A03658	3,658	.1440	66	28	23	0,6	36	6
4162991	TDS402A03700	4158800	TDS412A03700	3,700	.1457	66	28	23	0,6	36	6
4162992	TDS402A03734	4158801	TDS412A03734	3,734	.1470	66	28	23	0,6	36	6
4162993	TDS402A03800	4158802	TDS412A03800	3,800	.1496	74	36	29	0,6	36	6
4162994	TDS402A03900	4158803	TDS412A03900	3,900	.1535	74	36	29	0,6	36	6
4162995	TDS402A03970	4158804	TDS412A03970	3,970	.1563	74	36	29	0,7	36	6
4162996	TDS402A04000	4158805	TDS412A04000	4,000	.1575	74	36	29	0,7	36	6
4162997	TDS402A04039	4158806	TDS412A04039	4,039	.1590	74	36	29	0,7	36	6
4162998	TDS402A04090	4158807	TDS412A04090	4,090	.1610	74	36	29	0,7	36	6
4162999	TDS402A04100	4158808	TDS412A04100	4,100	.1614	74	36	29	0,7	36	6
4163000	TDS402A04200	4158809	TDS412A04200	4,200	.1654	74	36	29	0,7	36	6
4163001	TDS402A04217	4158810	TDS412A04217	4,217	.1660	74	36	29	0,7	36	6

(continued)

(TDS402A • TDS412A • 5 x D – continued)

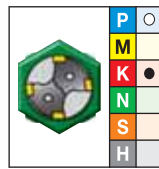


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163002	TDS402A04300	4158811	TDS412A04300	4,300	.1693	74	36	29	0,7	36	6
4163013	TDS402A04366	4158812	TDS412A04366	4,366	.1719	74	36	29	0,7	36	6
4163014	TDS402A04400	4158813	TDS412A04400	4,400	.1732	74	36	29	0,7	36	6
4163015	TDS402A04500	4158814	TDS412A04500	4,500	.1772	74	36	29	0,7	36	6
4163016	TDS402A04600	4158815	TDS412A04600	4,600	.1811	74	36	29	0,8	36	6
4163017	TDS402A04623	4158816	TDS412A04623	4,623	.1820	74	36	29	0,8	36	6
4163018	TDS402A04700	4158817	TDS412A04700	4,700	.1850	74	36	29	0,8	36	6
4163019	TDS402A04763	4158818	TDS412A04763	4,763	.1875	82	44	35	0,8	36	6
4163020	TDS402A04800	4158819	TDS412A04800	4,800	.1890	82	44	35	0,8	36	6
4163021	TDS402A04852	4158820	TDS412A04852	4,852	.1910	82	44	35	0,8	36	6
4163022	TDS402A04900	4158821	TDS412A04900	4,900	.1929	82	44	35	0,8	36	6
4163023	TDS402A05000	4158822	TDS412A05000	5,000	.1969	82	44	35	0,8	36	6
4163024	TDS402A05100	4158823	TDS412A05100	5,100	.2008	82	44	35	0,8	36	6
4163025	TDS402A05106	4158824	TDS412A05106	5,106	.2010	82	44	35	0,8	36	6
4163026	TDS402A05159	4158825	TDS412A05159	5,159	.2031	82	44	35	0,9	36	6
4163027	TDS402A05200	4158826	TDS412A05200	5,200	.2047	82	44	35	0,9	36	6
4163028	TDS402A05300	4158827	TDS412A05300	5,300	.2087	82	44	35	0,9	36	6
4163029	TDS402A05400	4158828	TDS412A05400	5,400	.2126	82	44	35	0,9	36	6
4163030	TDS402A05410	4158829	TDS412A05410	5,410	.2130	82	44	35	0,9	36	6
4163031	TDS402A05500	4158830	TDS412A05500	5,500	.2165	82	44	35	0,9	36	6
4163032	TDS402A05558	4158831	TDS412A05558	5,558	.2188	82	44	35	0,9	36	6
4163034	TDS402A05600	4158832	TDS412A05600	5,600	.2205	82	44	35	0,9	36	6
4163035	TDS402A05616	4158833	TDS412A05616	5,616	.2211	82	44	35	0,9	36	6
4163036	TDS402A05700	4158834	TDS412A05700	5,700	.2244	82	44	35	1,0	36	6
4163037	TDS402A05800	4158835	TDS412A05800	5,800	.2283	82	44	35	1,0	36	6
4163038	TDS402A05900	4158836	TDS412A05900	5,900	.2323	82	44	35	1,0	36	6
4163039	TDS402A05954	4158837	TDS412A05954	5,954	.2344	82	44	35	1,0	36	6
4163040	TDS402A06000	4158838	TDS412A06000	6,000	.2362	82	44	35	1,0	36	6
4163041	TDS402A06100	4158839	TDS412A06100	6,100	.2402	91	53	43	1,0	36	8
4163042	TDS402A06200	4158840	TDS412A06200	6,200	.2441	91	53	43	1,0	36	8
4163043	TDS402A06300	4158841	TDS412A06300	6,300	.2480	91	53	43	1,1	36	8
4163044	TDS402A06350	4158842	TDS412A06350	6,350	.2500	91	53	43	1,1	36	8
4163045	TDS402A06400	4158843	TDS412A06400	6,400	.2520	91	53	43	1,1	36	8
4163046	TDS402A06500	4158844	TDS412A06500	6,500	.2559	91	53	43	1,1	36	8
4163047	TDS402A06528	4158845	TDS412A06528	6,528	.2570	91	53	43	1,1	36	8
4163048	TDS402A06600	4158846	TDS412A06600	6,600	.2598	91	53	43	1,1	36	8
4163049	TDS402A06630	4158847	TDS412A06630	6,630	.2610	91	53	43	1,1	36	8
4163050	TDS402A06700	4158848	TDS412A06700	6,700	.2638	91	53	43	1,1	36	8
4163051	TDS402A06746	4158849	TDS412A06746	6,746	.2656	91	53	43	1,1	36	8
4163052	TDS402A06800	4158850	TDS412A06800	6,800	.2677	91	53	43	1,1	36	8

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(TDS402A • TDS412A • 5 x D – continued)

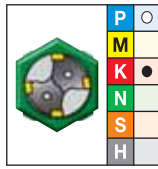
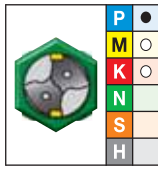


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163053	TDS402A06900	4158851	TDS412A06900	6,900	.2717	91	53	43	1,2	36	8
4163054	TDS402A07000	4158852	TDS412A07000	7,000	.2756	91	53	43	1,2	36	8
4163055	TDS402A07100	4158853	TDS412A07100	7,100	.2795	91	53	43	1,2	36	8
4163056	TDS402A07145	4158854	TDS412A07145	7,145	.2813	91	53	43	1,2	36	8
4163057	TDS402A07200	4158855	TDS412A07200	7,200	.2835	91	53	43	1,2	36	8
4163058	TDS402A07300	4158856	TDS412A07300	7,300	.2874	91	53	43	1,2	36	8
4163059	TDS402A07400	4158857	TDS412A07400	7,400	.2913	91	53	43	1,3	36	8
4163060	TDS402A07500	4158858	TDS412A07500	7,500	.2953	91	53	43	1,3	36	8
4163061	TDS402A07541	4158859	TDS412A07541	7,541	.2969	91	53	43	1,3	36	8
4163062	TDS402A07600	4158860	TDS412A07600	7,600	.2992	91	53	43	1,3	36	8
4163063	TDS402A07700	4158861	TDS412A07700	7,700	.3031	91	53	43	1,3	36	8
4163064	TDS402A07800	4158862	TDS412A07800	7,800	.3071	91	53	43	1,3	36	8
4163065	TDS402A07900	4158863	TDS412A07900	7,900	.3110	91	53	43	1,3	36	8
4163066	TDS402A07938	4158864	TDS412A07938	7,938	.3125	91	53	43	1,3	36	8
4163067	TDS402A08000	4158865	TDS412A08000	8,000	.3150	91	53	43	1,4	36	8
4163068	TDS402A08100	4158866	TDS412A08100	8,100	.3189	103	61	49	1,4	40	10
4163069	TDS402A08200	4158867	TDS412A08200	8,200	.3228	103	61	49	1,4	40	10
4163070	TDS402A08300	4158868	TDS412A08300	8,300	.3268	103	61	49	1,4	40	10
4163071	TDS402A08334	4158869	TDS412A08334	8,334	.3281	103	61	49	1,4	40	10
4163072	TDS402A08400	4158870	TDS412A08400	8,400	.3307	103	61	49	1,4	40	10
4163073	TDS402A08433	4158871	TDS412A08433	8,433	.3320	103	61	49	1,4	40	10
4163074	TDS402A08500	4158872	TDS412A08500	8,500	.3346	103	61	49	1,4	40	10
4163075	TDS402A08600	4158873	TDS412A08600	8,600	.3386	103	61	49	1,5	40	10
4163077	TDS402A08700	4158874	TDS412A08700	8,700	.3425	103	61	49	1,5	40	10
4163078	TDS402A08733	4158875	TDS412A08733	8,733	.3438	103	61	49	1,5	40	10
4163079	TDS402A08800	4158876	TDS412A08800	8,800	.3465	103	61	49	1,5	40	10
4163080	TDS402A08900	4158877	TDS412A08900	8,900	.3504	103	61	49	1,5	40	10
4163081	TDS402A09000	4158878	TDS412A09000	9,000	.3543	103	61	49	1,5	40	10
4163082	TDS402A09100	4158879	TDS412A09100	9,100	.3583	103	61	49	1,5	40	10
4163083	TDS402A09129	4158880	TDS412A09129	9,129	.3594	103	61	49	1,6	40	10
4163084	TDS402A09200	4158881	TDS412A09200	9,200	.3622	103	61	49	1,6	40	10
4163085	TDS402A09300	4158882	TDS412A09300	9,300	.3661	103	61	49	1,6	40	10
4163086	TDS402A09347	4158883	TDS412A09347	9,347	.3680	103	61	49	1,6	40	10
4163087	TDS402A09400	4158884	TDS412A09400	9,400	.3701	103	61	49	1,6	40	10
4163088	TDS402A09500	4158885	TDS412A09500	9,500	.3740	103	61	49	1,6	40	10
4163089	TDS402A09525	4158886	TDS412A09525	9,525	.3750	103	61	49	1,6	40	10
4163090	TDS402A09600	4158887	TDS412A09600	9,600	.3780	103	61	49	1,6	40	10
4163091	TDS402A09700	4158888	TDS412A09700	9,700	.3819	103	61	49	1,7	40	10
4163092	TDS402A09800	4158889	TDS412A09800	9,800	.3858	103	61	49	1,7	40	10
4163093	TDS402A09900	4158890	TDS412A09900	9,900	.3898	103	61	49	1,7	40	10

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(TDS402A • TDS412A • 5 x D – continued)

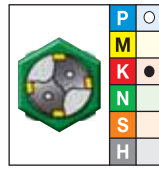


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163094	TDS402A09921	4158891	TDS412A09921	9,921	.3906	103	61	49	1,7	40	10
4162803	TDS402A10000	4156602	TDS412A10000	10,000	.3937	103	61	49	1,7	40	10
4162804	TDS402A10100	4156733	TDS412A10100	10,100	.3976	118	71	56	1,7	45	12
4162805	TDS402A10200	4156734	TDS412A10200	10,200	.4016	118	71	56	1,7	45	12
4162806	TDS402A10300	4156735	TDS412A10300	10,300	.4055	118	71	56	1,8	45	12
4162807	TDS402A10320	4156736	TDS412A10320	10,320	.4063	118	71	56	1,8	45	12
4162808	TDS402A10400	4156737	TDS412A10400	10,400	.4094	118	71	56	1,8	45	12
4162809	TDS402A10500	4156738	TDS412A10500	10,500	.4134	118	71	56	1,8	45	12
4162810	TDS402A10600	4156739	TDS412A10600	10,600	.4173	118	71	56	1,8	45	12
4162811	TDS402A10700	4156740	TDS412A10700	10,700	.4213	118	71	56	1,8	45	12
4162812	TDS402A10716	4156741	TDS412A10716	10,716	.4219	118	71	56	1,8	45	12
4162813	TDS402A10800	4156742	TDS412A10800	10,800	.4252	118	71	56	1,8	45	12
4162814	TDS402A10900	4156743	TDS412A10900	10,900	.4291	118	71	56	1,9	45	12
4162815	TDS402A11000	4156744	TDS412A11000	11,000	.4331	118	71	56	1,9	45	12
4162816	TDS402A11100	4156745	TDS412A11100	11,100	.4370	118	71	56	1,9	45	12
4162817	TDS402A11113	4156746	TDS412A11113	11,113	.4375	118	71	56	1,9	45	12
4162818	TDS402A11200	4156747	TDS412A11200	11,200	.4409	118	71	56	1,9	45	12
4162819	TDS402A11300	4156748	TDS412A11300	11,300	.4449	118	71	56	1,9	45	12
4162820	TDS402A11400	4156749	TDS412A11400	11,400	.4488	118	71	56	2,0	45	12
4162821	TDS402A11500	4156750	TDS412A11500	11,500	.4528	118	71	56	2,0	45	12
4162822	TDS402A11509	4156751	TDS412A11509	11,509	.4531	118	71	56	2,0	45	12
4162823	TDS402A11600	4156752	TDS412A11600	11,600	.4567	118	71	56	2,0	45	12
4162824	TDS402A11700	4156753	TDS412A11700	11,700	.4606	118	71	56	2,0	45	12
4162825	TDS402A11800	4156754	TDS412A11800	11,800	.4646	118	71	56	2,0	45	12
4162826	TDS402A11900	4156755	TDS412A11900	11,900	.4685	118	71	56	2,0	45	12
4162827	TDS402A11908	4156756	TDS412A11908	11,908	.4688	118	71	56	2,0	45	12
4162828	TDS402A12000	4156757	TDS412A12000	12,000	.4724	118	71	56	2,1	45	12
4162829	TDS402A12100	4156758	TDS412A12100	12,100	.4764	124	77	60	2,1	45	14
4162830	TDS402A12200	4156759	TDS412A12200	12,200	.4803	124	77	60	2,1	45	14
4162831	TDS402A12300	4156760	TDS412A12300	12,300	.4843	124	77	60	2,1	45	14
4162832	TDS402A12304	4156761	TDS412A12304	12,304	.4844	124	77	60	2,1	45	14
4162833	TDS402A12400	4156762	TDS412A12400	12,400	.4882	124	77	60	2,1	45	14
4162834	TDS402A12500	4156763	TDS412A12500	12,500	.4921	124	77	60	2,1	45	14
4162835	TDS402A12600	4156764	TDS412A12600	12,600	.4961	124	77	60	2,2	45	14
4162836	TDS402A12700	4156765	TDS412A12700	12,700	.5000	124	77	60	2,2	45	14
4162837	TDS402A12800	4156766	TDS412A12800	12,800	.5039	124	77	60	2,2	45	14
4162838	TDS402A12900	4156767	TDS412A12900	12,900	.5079	124	77	60	2,2	45	14
4162839	TDS402A13000	4156768	TDS412A13000	13,000	.5118	124	77	60	2,2	45	14
4162840	TDS402A13096	4156769	TDS412A13096	13,096	.5156	124	77	60	2,3	45	14
4162841	TDS402A13100	4156770	TDS412A13100	13,100	.5157	124	77	60	2,3	45	14

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(TDS402A • TDS412A • 5 x D – continued)

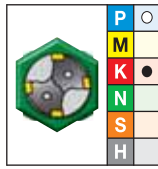
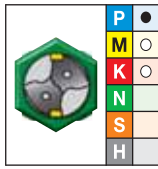


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162842	TDS402A13200	4156771	TDS412A13200	13,200	.5197	124	77	60	2,3	45	14
4162843	TDS402A13300	4156772	TDS412A13300	13,300	.5236	124	77	60	2,3	45	14
4162844	TDS402A13400	4156773	TDS412A13400	13,400	.5276	124	77	60	2,3	45	14
4162845	TDS402A13500	4156774	TDS412A13500	13,500	.5315	124	77	60	2,3	45	14
4162846	TDS402A13600	4156775	TDS412A13600	13,600	.5354	124	77	60	2,3	45	14
4162847	TDS402A13700	4156776	TDS412A13700	13,700	.5394	124	77	60	2,4	45	14
4162848	TDS402A13800	4156777	TDS412A13800	13,800	.5433	124	77	60	2,4	45	14
4162849	TDS402A13891	4156778	TDS412A13891	13,891	.5469	124	77	60	2,4	45	14
4162850	TDS402A13900	4156779	TDS412A13900	13,900	.5472	124	77	60	2,4	45	14
4162851	TDS402A14000	4156780	TDS412A14000	14,000	.5512	124	77	60	2,4	45	14
4162852	TDS402A14100	4156781	TDS412A14100	14,100	.5551	133	83	63	2,4	48	16
4162853	TDS402A14200	4156782	TDS412A14200	14,200	.5591	133	83	63	2,5	48	16
4162854	TDS402A14288	4156783	TDS412A14288	14,288	.5625	133	83	63	2,5	48	16
4162855	TDS402A14300	4156784	TDS412A14300	14,300	.5630	133	83	63	2,5	48	16
4162856	TDS402A14400	4156785	TDS412A14400	14,400	.5669	133	83	63	2,5	48	16
4162857	TDS402A14500	4156786	TDS412A14500	14,500	.5709	133	83	63	2,5	48	16
4162858	TDS402A14600	4156787	TDS412A14600	14,600	.5748	133	83	63	2,5	48	16
4162859	TDS402A14684	4156788	TDS412A14684	14,684	.5781	133	83	63	2,5	48	16
4162860	TDS402A14700	4156789	TDS412A14700	14,700	.5787	133	83	63	2,5	48	16
4162861	TDS402A14800	4156790	TDS412A14800	14,800	.5827	133	83	63	2,6	48	16
4162862	TDS402A14900	4156791	TDS412A14900	14,900	.5866	133	83	63	2,6	48	16
4162863	TDS402A15000	4156792	TDS412A15000	15,000	.5906	133	83	63	2,6	48	16
4162864	TDS402A15083	4156793	TDS412A15083	15,083	.5938	133	83	63	2,6	48	16
4162865	TDS402A15100	4156794	TDS412A15100	15,100	.5945	133	83	63	2,6	48	16
4162866	TDS402A15200	4156795	TDS412A15200	15,200	.5984	133	83	63	2,6	48	16
4162867	TDS402A15300	4156796	TDS412A15300	15,300	.6024	133	83	63	2,6	48	16
4162868	TDS402A15400	4156797	TDS412A15400	15,400	.6063	133	83	63	2,7	48	16
4162869	TDS402A15479	4156798	TDS412A15479	15,479	.6094	133	83	63	2,7	48	16
4162870	TDS402A15500	4156799	TDS412A15500	15,500	.6102	133	83	63	2,7	48	16
4162871	TDS402A15600	4156800	TDS412A15600	15,600	.6142	133	83	63	2,7	48	16
4162872	TDS402A15700	4156801	TDS412A15700	15,700	.6181	133	83	63	2,7	48	16
4162873	TDS402A15800	4156802	TDS412A15800	15,800	.6220	133	83	63	2,7	48	16
4162874	TDS402A15875	4156803	TDS412A15875	15,875	.6250	133	83	63	2,7	48	16
4162875	TDS402A15900	4156804	TDS412A15900	15,900	.6260	133	83	63	2,8	48	16
4162876	TDS402A16000	4156805	TDS412A16000	16,000	.6299	133	83	63	2,8	48	16
4162877	TDS402A16100	4156806	TDS412A16100	16,100	.6339	143	93	71	2,8	48	18
4162878	TDS402A16200	4156807	TDS412A16200	16,200	.6378	143	93	71	2,8	48	18
4162879	TDS402A16271	4156808	TDS412A16271	16,271	.6406	143	93	71	2,8	48	18
4162880	TDS402A16300	4156809	TDS412A16300	16,300	.6417	143	93	71	2,8	48	18
4162881	TDS402A16400	4156810	TDS412A16400	16,400	.6457	143	93	71	2,8	48	18

(continued)

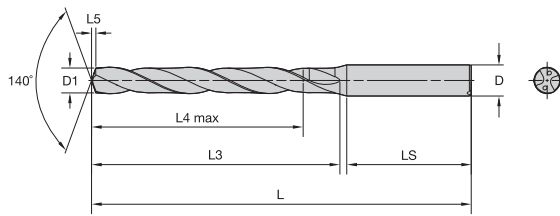
(TDS402A • TDS412A • 5 x D – continued)



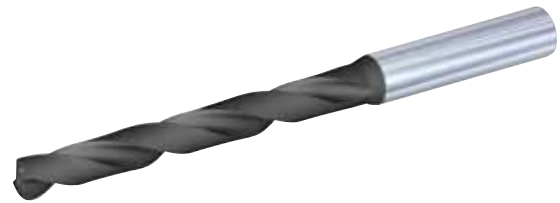
● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162882	TDS402A16500	4156811	TDS412A16500	16,500	.6496	143	93	71	2,9	48	18
4162883	TDS402A16600	4156812	TDS412A16600	16,600	.6535	143	93	71	2,9	48	18
4162884	TDS402A16670	4156813	TDS412A16670	16,670	.6563	143	93	71	2,9	48	18
4162885	TDS402A16700	4156814	TDS412A16700	16,700	.6575	143	93	71	2,9	48	18
4162886	TDS402A16800	4156815	TDS412A16800	16,800	.6614	143	93	71	2,9	48	18
4162887	TDS402A16900	4156816	TDS412A16900	16,900	.6654	143	93	71	2,9	48	18
4162888	TDS402A17000	4156817	TDS412A17000	17,000	.6693	143	93	71	2,9	48	18
4162889	TDS402A17100	4156818	TDS412A17100	17,100	.6732	143	93	71	3,0	48	18
4162890	TDS402A17200	4156819	TDS412A17200	17,200	.6772	143	93	71	3,0	48	18
4162891	TDS402A17300	4156820	TDS412A17300	17,300	.6811	143	93	71	3,0	48	18
4162892	TDS402A17400	4156821	TDS412A17400	17,400	.6850	143	93	71	3,0	48	18
4162893	TDS402A17463	4156822	TDS412A17463	17,463	.6875	143	93	71	3,0	48	18
4162894	TDS402A17500	4156823	TDS412A17500	17,500	.6890	143	93	71	3,0	48	18
4162895	TDS402A17600	4156824	TDS412A17600	17,600	.6929	143	93	71	3,1	48	18
4162896	TDS402A17700	4156825	TDS412A17700	17,700	.6969	143	93	71	3,1	48	18
4162897	TDS402A17800	4156826	TDS412A17800	17,800	.7008	143	93	71	3,1	48	18
4162898	TDS402A17859	4156827	TDS412A17859	17,859	.7031	143	93	71	3,1	48	18
4162899	TDS402A17900	4156828	TDS412A17900	17,900	.7047	143	93	71	3,1	48	18
4162274	TDS402A18000	4156853	TDS412A18000	18,000	.7087	143	93	71	3,1	48	18
4162275	TDS402A18100	4156854	TDS412A18100	18,100	.7126	153	101	77	3,1	50	20
4162276	TDS402A18200	4156855	TDS412A18200	18,200	.7165	153	101	77	3,2	50	20
4162277	TDS402A18258	4156856	TDS412A18258	18,258	.7188	153	101	77	3,2	50	20
4162278	TDS402A18300	4156857	TDS412A18300	18,300	.7205	153	101	77	3,2	50	20
4162279	TDS402A18400	4156858	TDS412A18400	18,400	.7244	153	101	77	3,2	50	20
4162280	TDS402A18500	4156859	TDS412A18500	18,500	.7283	153	101	77	3,2	50	20
4162281	TDS402A18600	4156860	TDS412A18600	18,600	.7323	153	101	77	3,2	50	20
4162282	TDS402A18654	4156861	TDS412A18654	18,654	.7344	153	101	77	3,2	50	20
4162393	TDS402A18700	4156862	TDS412A18700	18,700	.7362	153	101	77	3,2	50	20
4162394	TDS402A18800	4156863	TDS412A18800	18,800	.7402	153	101	77	3,3	50	20
4162395	TDS402A18900	4156864	TDS412A18900	18,900	.7441	153	101	77	3,3	50	20
4162396	TDS402A19000	4156865	TDS412A19000	19,000	.7480	153	101	77	3,3	50	20
4162397	TDS402A19050	4156866	TDS412A19050	19,050	.7500	153	101	77	3,3	50	20
4162398	TDS402A19100	4156867	TDS412A19100	19,100	.7520	153	101	77	3,3	50	20
4162399	TDS402A19200	4156868	TDS412A19200	19,200	.7559	153	101	77	3,3	50	20
4162400	TDS402A19300	4156869	TDS412A19300	19,300	.7598	153	101	77	3,4	50	20
4162401	TDS402A19400	4156870	TDS412A19400	19,400	.7638	153	101	77	3,4	50	20
4162402	TDS402A19500	4156871	TDS412A19500	19,500	.7677	153	101	77	3,4	50	20
4162403	TDS402A19600	4156872	TDS412A19600	19,600	.7717	153	101	77	3,4	50	20
4162404	TDS402A19700	4156873	TDS412A19700	19,700	.7756	153	101	77	3,4	50	20
4162405	TDS402A19800	4156874	TDS412A19800	19,800	.7795	153	101	77	3,4	50	20
4162406	TDS402A19900	4156875	TDS412A19900	19,900	.7835	153	101	77	3,5	50	20
4162407	TDS402A20000	4156876	TDS412A20000	20,000	.7874	153	101	77	3,5	50	20

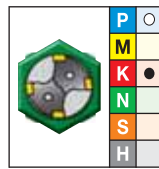
Solid Carbide Drills



For information on L, L3, and L4 max, see page T143.



■ TDS403A • TDS413A • 8 x D

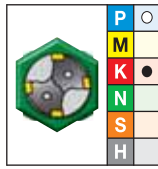
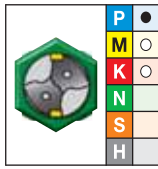


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162796	TDS403A03000	4156972	TDS413A03000	3,000	.1181	78	40	33	0,5	36	6
4162797	TDS403A03048	4156993	TDS413A03048	3,048	.1200	78	40	33	0,5	36	6
4162798	TDS403A03100	4156994	TDS413A03100	3,100	.1220	78	40	33	0,5	36	6
4162799	TDS403A03175	4156995	TDS413A03175	3,175	.1250	78	40	33	0,5	36	6
4162800	TDS403A03200	4156996	TDS413A03200	3,200	.1260	78	40	33	0,5	36	6
4162801	TDS403A03264	4156997	TDS413A03264	3,264	.1285	78	40	33	0,5	36	6
4162802	TDS403A03300	4156998	TDS413A03300	3,300	.1299	78	40	33	0,5	36	6
4163163	TDS403A03400	4156999	TDS413A03400	3,400	.1339	78	40	33	0,6	36	6
4163164	TDS403A03455	4157000	TDS413A03455	3,455	.1360	78	40	33	0,6	36	6
4163165	TDS403A03500	4157001	TDS413A03500	3,500	.1378	78	40	33	0,6	36	6
4163166	TDS403A03571	4157002	TDS413A03571	3,571	.1406	78	40	33	0,6	36	6
4163167	TDS403A03600	4157003	TDS413A03600	3,600	.1417	78	40	33	0,6	36	6
4163168	TDS403A03658	4157004	TDS413A03658	3,658	.1440	78	40	33	0,6	36	6
4163169	TDS403A03700	4157005	TDS413A03700	3,700	.1457	78	40	33	0,6	36	6
4163170	TDS403A03734	4157006	TDS413A03734	3,734	.1470	78	40	33	0,6	36	6
4163171	TDS403A03800	4157007	TDS413A03800	3,800	.1496	87	49	41	0,6	36	6
4163172	TDS403A03900	4157008	TDS413A03900	3,900	.1535	87	49	41	0,6	36	6
4163173	TDS403A03970	4157009	TDS413A03970	3,970	.1563	87	49	41	0,7	36	6
4163174	TDS403A04000	4157010	TDS413A04000	4,000	.1575	87	49	41	0,7	36	6
4163175	TDS403A04039	4157011	TDS413A04039	4,039	.1590	87	49	41	0,7	36	6
4163176	TDS403A04090	4157012	TDS413A04090	4,090	.1610	87	49	41	0,7	36	6
4163177	TDS403A04100	4157013	TDS413A04100	4,100	.1614	87	49	41	0,7	36	6
4163178	TDS403A04200	4157014	TDS413A04200	4,200	.1654	87	49	41	0,7	36	6
4163179	TDS403A04217	4157015	TDS413A04217	4,217	.1660	87	49	41	0,7	36	6
4163180	TDS403A04300	4157016	TDS413A04300	4,300	.1693	87	49	41	0,7	36	6
4163181	TDS403A04366	4157017	TDS413A04366	4,366	.1719	87	49	41	0,7	36	6
4163182	TDS403A04400	4157018	TDS413A04400	4,400	.1732	87	49	41	0,7	36	6
4163193	TDS403A04500	4157019	TDS413A04500	4,500	.1772	87	49	41	0,7	36	6

(continued)

(TDS403A • TDS413A • 8 x D – continued)

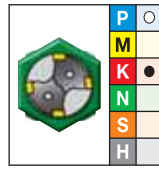
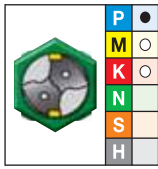


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163194	TDS403A04600	4157020	TDS413A04600	4,600	.1811	87	49	41	0,8	36	6
4163195	TDS403A04623	4157021	TDS413A04623	4,623	.1820	87	49	41	0,8	36	6
4163196	TDS403A04700	4157022	TDS413A04700	4,700	.1850	87	49	41	0,8	36	6
4163197	TDS403A04763	4157023	TDS413A04763	4,763	.1875	94	56	48	0,8	36	6
4163198	TDS403A04800	4157024	TDS413A04800	4,800	.1890	94	56	48	0,8	36	6
4163199	TDS403A04852	4157025	TDS413A04852	4,852	.1910	94	56	48	0,8	36	6
4163200	TDS403A04900	4157026	TDS413A04900	4,900	.1929	94	56	48	0,8	36	6
4163201	TDS403A05000	4157027	TDS413A05000	5,000	.1969	94	56	48	0,8	36	6
4163202	TDS403A05100	4157028	TDS413A05100	5,100	.2008	94	56	48	0,8	36	6
4163203	TDS403A05106	4157029	TDS413A05106	5,106	.2010	94	56	48	0,8	36	6
4163204	TDS403A05159	4157030	TDS413A05159	5,159	.2031	94	56	48	0,9	36	6
4163205	TDS403A05200	4157031	TDS413A05200	5,200	.2047	94	56	48	0,9	36	6
4163206	TDS403A05300	4157032	TDS413A05300	5,300	.2087	94	56	48	0,9	36	6
4163207	TDS403A05400	4157033	TDS413A05400	5,400	.2126	94	56	48	0,9	36	6
4163208	TDS403A05410	4157034	TDS413A05410	5,410	.2130	94	56	48	0,9	36	6
4163209	TDS403A05500	4157035	TDS413A05500	5,500	.2165	94	56	48	0,9	36	6
4163210	TDS403A05558	4157036	TDS413A05558	5,558	.2188	94	56	48	0,9	36	6
4163211	TDS403A05600	4157037	TDS413A05600	5,600	.2205	94	56	48	0,9	36	6
4163212	TDS403A05616	4157038	TDS413A05616	5,616	.2211	94	56	48	0,9	36	6
4163213	TDS403A05700	4157039	TDS413A05700	5,700	.2244	94	56	48	1,0	36	6
4163214	TDS403A05800	4157040	TDS413A05800	5,800	.2283	94	56	48	1,0	36	6
4163215	TDS403A05900	4157041	TDS413A05900	5,900	.2323	94	56	48	1,0	36	6
4163216	TDS403A05954	4157042	TDS413A05954	5,954	.2344	94	56	48	1,0	36	6
4163217	TDS403A06000	4157043	TDS413A06000	6,000	.2362	94	56	48	1,0	36	6
4163218	TDS403A06100	4157044	TDS413A06100	6,100	.2402	105	67	57	1,0	36	8
4163219	TDS403A06200	4157045	TDS413A06200	6,200	.2441	105	67	57	1,0	36	8
4163220	TDS403A06300	4157046	TDS413A06300	6,300	.2480	105	67	57	1,1	36	8
4163221	TDS403A06350	4157047	TDS413A06350	6,350	.2500	105	67	57	1,1	36	8
4163222	TDS403A06400	4157048	TDS413A06400	6,400	.2520	105	67	57	1,1	36	8
4163223	TDS403A06500	4157049	TDS413A06500	6,500	.2559	105	67	57	1,1	36	8
4163224	TDS403A06528	4157050	TDS413A06528	6,528	.2570	105	67	57	1,1	36	8
4163225	TDS403A06600	4157051	TDS413A06600	6,600	.2598	105	67	57	1,1	36	8
4163226	TDS403A06630	4157052	TDS413A06630	6,630	.2610	105	67	57	1,1	36	8
4163227	TDS403A06700	4157053	TDS413A06700	6,700	.2638	105	67	57	1,1	36	8
4163228	TDS403A06746	4157054	TDS413A06746	6,746	.2656	105	67	57	1,1	36	8
4163229	TDS403A06800	4157055	TDS413A06800	6,800	.2677	105	67	57	1,1	36	8
4163230	TDS403A06900	4157056	TDS413A06900	6,900	.2717	105	67	57	1,2	36	8
4163231	TDS403A07000	4157057	TDS413A07000	7,000	.2756	105	67	57	1,2	36	8
4163232	TDS403A07100	4157058	TDS413A07100	7,100	.2795	110	72	61	1,2	36	8
4163233	TDS403A07145	4157059	TDS413A07145	7,145	.2813	110	72	61	1,2	36	8

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(TDS403A • TDS413A • 8 x D – continued)

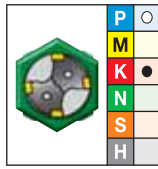
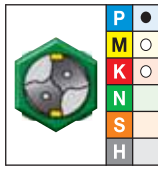


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4163234	TDS403A07200	4157060	TDS413A07200	7,200	.2835	110	72	61	1,2	36	8
4163235	TDS403A07300	4157061	TDS413A07300	7,300	.2874	110	72	61	1,2	36	8
4163236	TDS403A07400	4157062	TDS413A07400	7,400	.2913	110	72	61	1,3	36	8
4163237	TDS403A07500	4157063	TDS413A07500	7,500	.2953	110	72	61	1,3	36	8
4163238	TDS403A07541	4157064	TDS413A07541	7,541	.2969	110	72	61	1,3	36	8
4163239	TDS403A07600	4157065	TDS413A07600	7,600	.2992	110	72	61	1,3	36	8
4163240	TDS403A07700	4157066	TDS413A07700	7,700	.3031	110	72	61	1,3	36	8
4163241	TDS403A07800	4157067	TDS413A07800	7,800	.3071	110	72	61	1,3	36	8
4163242	TDS403A07900	4157068	TDS413A07900	7,900	.3110	110	72	61	1,3	36	8
4163243	TDS403A07938	4157069	TDS413A07938	7,938	.3125	110	72	61	1,3	36	8
4163244	TDS403A08000	4157070	TDS413A08000	8,000	.3150	110	72	61	1,4	36	8
4163245	TDS403A08100	4157071	TDS413A08100	8,100	.3189	122	80	68	1,4	40	10
4163246	TDS403A08200	4157072	TDS413A08200	8,200	.3228	122	80	68	1,4	40	10
4163247	TDS403A08300	4157073	TDS413A08300	8,300	.3268	122	80	68	1,4	40	10
4163248	TDS403A08334	4157074	TDS413A08334	8,334	.3281	122	80	68	1,4	40	10
4163249	TDS403A08400	4157075	TDS413A08400	8,400	.3307	122	80	68	1,4	40	10
4163250	TDS403A08433	4157076	TDS413A08433	8,433	.3320	122	80	68	1,4	40	10
4163251	TDS403A08500	4157077	TDS413A08500	8,500	.3346	122	80	68	1,4	40	10
4163252	TDS403A08600	4157078	TDS413A08600	8,600	.3386	122	80	68	1,5	40	10
4163253	TDS403A08700	4157079	TDS413A08700	8,700	.3425	122	80	68	1,5	40	10
4163254	TDS403A08733	4157080	TDS413A08733	8,733	.3438	122	80	68	1,5	40	10
4163255	TDS403A08800	4157081	TDS413A08800	8,800	.3465	122	80	68	1,5	40	10
4163256	TDS403A08900	4157082	TDS413A08900	8,900	.3504	122	80	68	1,5	40	10
4163257	TDS403A09000	4157083	TDS413A09000	9,000	.3543	122	80	68	1,5	40	10
4163258	TDS403A09100	4157084	TDS413A09100	9,100	.3583	122	80	68	1,5	40	10
4163259	TDS403A09129	4157085	TDS413A09129	9,129	.3594	122	80	68	1,6	40	10
4163260	TDS403A09200	4157086	TDS413A09200	9,200	.3622	122	80	68	1,6	40	10
4163261	TDS403A09300	4157087	TDS413A09300	9,300	.3661	122	80	68	1,6	40	10
4163262	TDS403A09347	4157088	TDS413A09347	9,347	.3680	122	80	68	1,6	40	10
4163263	TDS403A09400	4157089	TDS413A09400	9,400	.3701	122	80	68	1,6	40	10
4163264	TDS403A09500	4157090	TDS413A09500	9,500	.3740	122	80	68	1,6	40	10
4163265	TDS403A09525	4157091	TDS413A09525	9,525	.3750	122	80	68	1,6	40	10
4163266	TDS403A09600	4157092	TDS413A09600	9,600	.3780	122	80	68	1,6	40	10
4163267	TDS403A09700	4157093	TDS413A09700	9,700	.3819	122	80	68	1,7	40	10
4163268	TDS403A09800	4157094	TDS413A09800	9,800	.3858	122	80	68	1,7	40	10
4163269	TDS403A09900	4157095	TDS413A09900	9,900	.3898	122	80	68	1,7	40	10
4163270	TDS403A09921	4157096	TDS413A09921	9,921	.3906	122	80	68	1,7	40	10
4162679	TDS403A10000	4156836	TDS413A10000	10,000	.3937	122	80	68	1,7	40	10
4162680	TDS403A10100	4156837	TDS413A10100	10,100	.3976	141	94	79	1,7	45	12
4162382	TDS403A10200	4156838	TDS413A10200	10,200	.4016	141	94	79	1,7	45	12

(continued)

(TDS403A • TDS413A • 8 x D – continued)

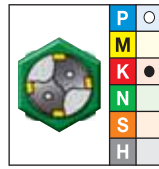


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162703	TDS403A10300	4156839	TDS413A10300	10,300	.4055	141	94	79	1,8	45	12
4162704	TDS403A10320	4156840	TDS413A10320	10,320	.4063	141	94	79	1,8	45	12
4162705	TDS403A10400	4156841	TDS413A10400	10,400	.4094	141	94	79	1,8	45	12
4162706	TDS403A10500	4156842	TDS413A10500	10,500	.4134	141	94	79	1,8	45	12
4162707	TDS403A10600	4156883	TDS413A10600	10,600	.4173	141	94	79	1,8	45	12
4162708	TDS403A10700	4156884	TDS413A10700	10,700	.4213	141	94	79	1,8	45	12
4162709	TDS403A10716	4156885	TDS413A10716	10,716	.4219	141	94	79	1,8	45	12
4162710	TDS403A10800	4156886	TDS413A10800	10,800	.4252	141	94	79	1,8	45	12
4162711	TDS403A10900	4156887	TDS413A10900	10,900	.4291	141	94	79	1,9	45	12
4162712	TDS403A11000	4156888	TDS413A11000	11,000	.4331	141	94	79	1,9	45	12
4162713	TDS403A11100	4156889	TDS413A11100	11,100	.4370	141	94	79	1,9	45	12
4162714	TDS403A11113	4156890	TDS413A11113	11,113	.4375	141	94	79	1,9	45	12
4162715	TDS403A11200	4156891	TDS413A11200	11,200	.4409	141	94	79	1,9	45	12
4162716	TDS403A11300	4156892	TDS413A11300	11,300	.4449	141	94	79	1,9	45	12
4162717	TDS403A11400	4156893	TDS413A11400	11,400	.4488	141	94	79	2,0	45	12
4162718	TDS403A11500	4156894	TDS413A11500	11,500	.4528	141	94	79	2,0	45	12
4162719	TDS403A11509	4156895	TDS413A11509	11,509	.4531	141	94	79	2,0	45	12
4162720	TDS403A11600	4156896	TDS413A11600	11,600	.4567	141	94	79	2,0	45	12
4162721	TDS403A11700	4156897	TDS413A11700	11,700	.4606	141	94	79	2,0	45	12
4162722	TDS403A11800	4156898	TDS413A11800	11,800	.4646	141	94	79	2,0	45	12
4162723	TDS403A11900	4156899	TDS413A11900	11,900	.4685	141	94	79	2,0	45	12
4162724	TDS403A11908	4156900	TDS413A11908	11,908	.4688	141	94	79	2,0	45	12
4162725	TDS403A12000	4156901	TDS413A12000	12,000	.4724	141	94	79	2,1	45	12
4162726	TDS403A12100	4156902	TDS413A12100	12,100	.4764	155	108	91	2,1	45	14
4162727	TDS403A12200	4156903	TDS413A12200	12,200	.4803	155	108	91	2,1	45	14
4162728	TDS403A12300	4156904	TDS413A12300	12,300	.4843	155	108	91	2,1	45	14
4162729	TDS403A12304	4156905	TDS413A12304	12,304	.4844	155	108	91	2,1	45	14
4162730	TDS403A12400	4156906	TDS413A12400	12,400	.4882	155	108	91	2,1	45	14
4162681	TDS403A12500	4148984	TDS413A12500	12,500	.4921	155	108	91	2,1	45	14
4162731	TDS403A12600	4156907	TDS413A12600	12,600	.4961	155	108	91	2,2	45	14
4162732	TDS403A12700	4156908	TDS413A12700	12,700	.5000	155	108	91	2,2	45	14
4162733	TDS403A12800	4156909	TDS413A12800	12,800	.5039	155	108	91	2,2	45	14
4162734	TDS403A12900	4156910	TDS413A12900	12,900	.5079	155	108	91	2,2	45	14
4162735	TDS403A13000	4156911	TDS413A13000	13,000	.5118	155	108	91	2,2	45	14
4162736	TDS403A13096	4156912	TDS413A13096	13,096	.5156	155	108	91	2,3	45	14
4162737	TDS403A13100	4156913	TDS413A13100	13,100	.5157	155	108	91	2,3	45	14
4162738	TDS403A13200	4156914	TDS413A13200	13,200	.5197	155	108	91	2,3	45	14
4162739	TDS403A13300	4156915	TDS413A13300	13,300	.5236	155	108	91	2,3	45	14
4162740	TDS403A13400	4156916	TDS413A13400	13,400	.5276	155	108	91	2,3	45	14
4162741	TDS403A13500	4156917	TDS413A13500	13,500	.5315	155	108	91	2,3	45	14

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(TDS403A • TDS413A • 8 x D – continued)

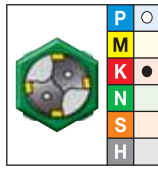
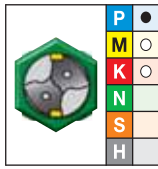


● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162742	TDS403A13600	4156918	TDS413A13600	13,600	.5354	155	108	91	2,3	45	14
4162743	TDS403A13700	4156919	TDS413A13700	13,700	.5394	155	108	91	2,4	45	14
4162744	TDS403A13800	4156920	TDS413A13800	13,800	.5433	155	108	91	2,4	45	14
4162745	TDS403A13891	4156921	TDS413A13891	13,891	.5469	155	108	91	2,4	45	14
4162746	TDS403A13900	4156922	TDS413A13900	13,900	.5472	155	108	91	2,4	45	14
4162747	TDS403A14000	4156923	TDS413A14000	14,000	.5512	155	108	91	2,4	45	14
4162748	TDS403A14100	4156924	TDS413A14100	14,100	.5551	171	121	101	2,4	48	16
4162749	TDS403A14200	4156925	TDS413A14200	14,200	.5591	171	121	101	2,5	48	16
4162750	TDS403A14288	4156926	TDS413A14288	14,288	.5625	171	121	101	2,5	48	16
4162751	TDS403A14300	4156927	TDS413A14300	14,300	.5630	171	121	101	2,5	48	16
4162752	TDS403A14400	4156928	TDS413A14400	14,400	.5669	171	121	101	2,5	48	16
4162753	TDS403A14500	4156929	TDS413A14500	14,500	.5709	171	121	101	2,5	48	16
4162754	TDS403A14600	4156930	TDS413A14600	14,600	.5748	171	121	101	2,5	48	16
4162755	TDS403A14684	4156931	TDS413A14684	14,684	.5781	171	121	101	2,5	48	16
4162756	TDS403A14700	4156932	TDS413A14700	14,700	.5787	171	121	101	2,5	48	16
4162757	TDS403A14800	4156933	TDS413A14800	14,800	.5827	171	121	101	2,6	48	16
4162758	TDS403A14900	4156934	TDS413A14900	14,900	.5866	171	121	101	2,6	48	16
4162759	TDS403A15000	4156935	TDS413A15000	15,000	.5906	171	121	101	2,6	48	16
4162760	TDS403A15083	4156936	TDS413A15083	15,083	.5938	171	121	101	2,6	48	16
4162761	TDS403A15100	4156937	TDS413A15100	15,100	.5945	171	121	101	2,6	48	16
4162762	TDS403A15200	4156938	TDS413A15200	15,200	.5984	171	121	101	2,6	48	16
4162763	TDS403A15300	4156939	TDS413A15300	15,300	.6024	171	121	101	2,6	48	16
4162764	TDS403A15400	4156940	TDS413A15400	15,400	.6063	171	121	101	2,7	48	16
4162765	TDS403A15479	4156941	TDS413A15479	15,479	.6094	171	121	101	2,7	48	16
4162766	TDS403A15500	4156942	TDS413A15500	15,500	.6102	171	121	101	2,7	48	16
4162767	TDS403A15600	4156943	TDS413A15600	15,600	.6142	171	121	101	2,7	48	16
4162768	TDS403A15700	4156944	TDS413A15700	15,700	.6181	171	121	101	2,7	48	16
4162769	TDS403A15800	4156945	TDS413A15800	15,800	.6220	171	121	101	2,7	48	16
4162770	TDS403A15875	4156946	TDS413A15875	15,875	.6250	171	121	101	2,7	48	16
4162771	TDS403A15900	4156947	TDS413A15900	15,900	.6260	171	121	101	2,8	48	16
4162772	TDS403A16000	4156948	TDS413A16000	16,000	.6299	171	121	101	2,8	48	16
4162773	TDS403A16100	4156949	TDS413A16100	16,100	.6339	185	135	113	2,8	48	18
4162774	TDS403A16200	4156950	TDS413A16200	16,200	.6378	185	135	113	2,8	48	18
4162775	TDS403A16271	4156951	TDS413A16271	16,271	.6406	185	135	113	2,8	48	18
4162776	TDS403A16300	4156952	TDS413A16300	16,300	.6417	185	135	113	2,8	48	18
4162777	TDS403A16400	4156953	TDS413A16400	16,400	.6457	185	135	113	2,8	48	18
4162778	TDS403A16500	4156954	TDS413A16500	16,500	.6496	185	135	113	2,9	48	18
4162779	TDS403A16600	4156955	TDS413A16600	16,600	.6535	185	135	113	2,9	48	18
4162780	TDS403A16670	4156956	TDS413A16670	16,670	.6563	185	135	113	2,9	48	18
4162781	TDS403A16700	4156957	TDS413A16700	16,700	.6575	185	135	113	2,9	48	18

(continued)

(TDS403A • TDS413A • 8 x D – continued)



● first choice
○ alternate choice

grade WP20PD TiAlN		grade WK15PD AlCrN		D1 diameter		L	L3	L4 max	L5	LS	D
order #	catalogue #	order #	catalogue #	mm	in						
4162782	TDS403A16800	4156958	TDS413A16800	16,800	.6614	185	135	113	2,9	48	18
4162783	TDS403A16900	4156959	TDS413A16900	16,900	.6654	185	135	113	2,9	48	18
4162784	TDS403A17000	4156960	TDS413A17000	17,000	.6693	185	135	113	2,9	48	18
4162785	TDS403A17100	4156961	TDS413A17100	17,100	.6732	185	135	113	3,0	48	18
4162786	TDS403A17200	4156962	TDS413A17200	17,200	.6772	185	135	113	3,0	48	18
4162787	TDS403A17300	4156963	TDS413A17300	17,300	.6811	185	135	113	3,0	48	18
4162788	TDS403A17400	4156964	TDS413A17400	17,400	.6850	185	135	113	3,0	48	18
4162789	TDS403A17463	4156965	TDS413A17463	17,463	.6875	185	135	113	3,0	48	18
4162790	TDS403A17500	4156966	TDS413A17500	17,500	.6890	185	135	113	3,0	48	18
4162791	TDS403A17600	4156967	TDS413A17600	17,600	.6929	185	135	113	3,1	48	18
4162792	TDS403A17700	4156968	TDS413A17700	17,700	.6969	185	135	113	3,1	48	18
4162793	TDS403A17800	4156969	TDS413A17800	17,800	.7008	185	135	113	3,1	48	18
4162794	TDS403A17859	4156970	TDS413A17859	17,859	.7031	185	135	113	3,1	48	18
4162795	TDS403A17900	4156971	TDS413A17900	17,900	.7047	185	135	113	3,1	48	18
4162515	TDS403A18000	4157206	TDS413A18000	18,000	.7087	185	135	113	3,1	48	18
4162516	TDS403A18100	4157207	TDS413A18100	18,100	.7126	200	148	124	3,1	50	20
4162517	TDS403A18200	4157208	TDS413A18200	18,200	.7165	200	148	124	3,2	50	20
4162518	TDS403A18258	4157209	TDS413A18258	18,258	.7188	200	148	124	3,2	50	20
4162519	TDS403A18300	4157210	TDS413A18300	18,300	.7205	200	148	124	3,2	50	20
4162520	TDS403A18400	4157211	TDS413A18400	18,400	.7244	200	148	124	3,2	50	20
4162521	TDS403A18500	4157212	TDS413A18500	18,500	.7283	200	148	124	3,2	50	20
4162522	TDS403A18600	4157253	TDS413A18600	18,600	.7323	200	148	124	3,2	50	20
4162663	TDS403A18654	4157254	TDS413A18654	18,654	.7344	200	148	124	3,2	50	20
4162664	TDS403A18700	4157255	TDS413A18700	18,700	.7362	200	148	124	3,2	50	20
4162665	TDS403A18800	4157256	TDS413A18800	18,800	.7402	200	148	124	3,3	50	20
4162666	TDS403A18900	4157257	TDS413A18900	18,900	.7441	200	148	124	3,3	50	20
4162667	TDS403A19000	4157258	TDS413A19000	19,000	.7480	200	148	124	3,3	50	20
4162668	TDS403A19050	4157259	TDS413A19050	19,050	.7500	200	148	124	3,3	50	20
4162669	TDS403A19100	4157260	TDS413A19100	19,100	.7520	200	148	124	3,3	50	20
4162670	TDS403A19200	4157261	TDS413A19200	19,200	.7559	200	148	124	3,3	50	20
4162671	TDS403A19300	4157262	TDS413A19300	19,300	.7598	200	148	124	3,4	50	20
4162672	TDS403A19400	4157263	TDS413A19400	19,400	.7638	200	148	124	3,4	50	20
4162673	TDS403A19500	4157264	TDS413A19500	19,500	.7677	200	148	124	3,4	50	20
4162674	TDS403A19600	4157265	TDS413A19600	19,600	.7717	200	148	124	3,4	50	20
4162675	TDS403A19700	4157266	TDS413A19700	19,700	.7756	200	148	124	3,4	50	20
4162676	TDS403A19800	4157267	TDS413A19800	19,800	.7795	200	148	124	3,4	50	20
4162677	TDS403A19900	4157268	TDS413A19900	19,900	.7835	200	148	124	3,5	50	20
4162678	TDS403A20000	4157269	TDS413A20000	20,000	.7874	200	148	124	3,5	50	20



Solid Carbide Drills

■ TOP DRILL S • TDS202 • WP20PD™ • Flood Coolant • Metric

Material Group		Cutting Speed – vc Range – m/min		Recommended Feed Rate (f) by Diameter								
				Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
		min	max									
P	1	70	140	mm/r	0,08–0,15	0,10–0,18	0,12–0,25	0,15–0,30	0,15–0,34	0,20–0,38	0,23–0,45	0,28–0,55
	2, 3, 4, 6, 7	70	140	mm/r	0,08–0,16	0,10–0,19	0,12–0,25	0,15–0,30	0,19–0,34	0,22–0,38	0,28–0,48	0,34–0,60
	5, 9, 10, 11	60	120	mm/r	0,08–0,16	0,10–0,19	0,12–0,25	0,14–0,30	0,17–0,33	0,20–0,38	0,24–0,48	0,29–0,60
	12, 13.1, 13.2	40	60	mm/r	0,06–0,10	0,08–0,12	0,10–0,20	0,10–0,22	0,13–0,24	0,14–0,27	0,18–0,32	0,24–0,42
M	14.1	30	50	mm/r	0,05–0,09	0,06–0,11	0,08–0,13	0,09–0,15	0,10–0,17	0,12–0,20	0,14–0,22	0,16–0,25
	14.3	40	60	mm/r	0,05–0,10	0,07–0,12	0,09–0,13	0,10–0,18	0,10–0,20	0,12–0,22	0,14–0,25	0,16–0,28
	14.2, 14.4	30	50	mm/r	0,05–0,09	0,07–0,11	0,08–0,12	0,09–0,15	0,10–0,17	0,12–0,19	0,14–0,21	0,16–0,25

■ TOP DRILL S • TDS401/TDS402/TDS403 • WP20PD • Through Coolant • Metric

Material Group		Cutting Speed – vc Range – m/min		Recommended Feed Rate (f) by Diameter								
				Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
		min	max									
P	1	80	180	mm/r	0,08–0,16	0,11–0,19	0,13–0,26	0,16–0,32	0,16–0,36	0,21–0,40	0,24–0,47	0,29–0,58
	2, 3, 4, 6, 7	80	160	mm/r	0,09–0,17	0,11–0,20	0,13–0,26	0,16–0,32	0,20–0,36	0,23–0,40	0,29–0,50	0,36–0,63
	5, 9, 10, 11	80	140	mm/r	0,08–0,17	0,11–0,20	0,12–0,26	0,15–0,32	0,18–0,35	0,21–0,40	0,25–0,50	0,30–0,63
	12, 13.1, 13.2	50	80	mm/r	0,06–0,11	0,08–0,13	0,11–0,21	0,10–0,23	0,13–0,25	0,14–0,28	0,29–0,33	0,25–0,44
M	14.1	40	60	mm/r	0,05–0,09	0,06–0,12	0,08–0,14	0,09–0,16	0,11–0,18	0,13–0,21	0,15–0,23	0,17–0,26
	14.3	40	70	mm/r	0,05–0,11	0,07–0,13	0,09–0,14	0,11–0,19	0,11–0,21	0,13–0,23	0,15–0,26	0,17–0,29
	14.2, 14.4	35	50	mm/r	0,05–0,09	0,07–0,12	0,08–0,13	0,09–0,16	0,11–0,18	0,13–0,20	0,15–0,22	0,17–0,26



Metric

tolerance



nominal size range	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008
>6–10	0,006/0,021	0,000/-0,009
>10–18	0,007/0,025	0,000/-0,011
>18–25,4	0,008/0,029	0,000/-0,013

Solid Carbide Drills

■ TOP DRILL S • TDS212 • WK15PD™ • Flood Coolant • Metric

													
		Cutting Speed – vc Range – m/min		Recommended Feed Rate (f) by Diameter									
Material Group	min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
					mm/r	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74	0,31–0,60	0,38–0,74
K	15, 16	70	–	170	mm/r	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74	0,31–0,60	0,38–0,74
	17, 18, 19	80	–	140	mm/r	0,16–0,25	0,20–0,31	0,23–0,36	0,25–0,40	0,31–0,48	0,38–0,60	0,31–0,48	0,38–0,60
	20	70	–	130	mm/r	0,12–0,25	0,14–0,30	0,17–0,35	0,19–0,40	0,24–0,48	0,30–0,60	0,24–0,48	0,30–0,60

■ TOP DRILL S • TDS411/TDS412/TDS413 • WK15PD • Through Coolant • Metric

													
		Cutting Speed – vc Range – m/min		Recommended Feed Rate (f) by Diameter									
Material Group	min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
					mm/r	0,11–0,22	0,12–0,24	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74
K	15, 16	80	–	190	mm/r	0,11–0,22	0,12–0,24	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74
	17, 18, 19	90	–	170	mm/r	0,12–0,16	0,13–0,19	0,16–0,25	0,20–0,31	0,23–0,36	0,25–0,40	0,31–0,48	0,38–0,60
	20	80	–	150	mm/r	0,08–0,17	0,09–0,19	0,12–0,25	0,14–0,30	0,17–0,35	0,19–0,40	0,24–0,48	0,30–0,60

nominal size range	Metric tolerance	
	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008
>6–10	0,006/0,021	0,000/-0,009
>10–18	0,007/0,025	0,000/-0,011
>18–25,4	0,008/0,029	0,000/-0,013

Multiple-Application Drilling •
TOP DRILL S+™

TOP DRILL S+



The WIDIA™ line of TOP DRILL S+ enables superior performance across a wide variety of even the most complex and challenging applications, such as drilling through inclined entries, x-holes, and exits. Proprietary technology ensures the highest speed and feed rates available. Advanced grade and geometry features define the TOP DRILL S+ as a true troubleshooter.

- Suitable for a broad range of materials and applications.
- Ensures increased tool life and enhanced wear resistance.
- Facilitates consistent chip forming and breaking.

The versatile TOP DRILL S+ provides reliable performance across a broad scope of applications, including alloyed and unalloyed steel, cast iron, and some stainless steels and high-temperature alloys.

- Four-margin design ensures stability, consistency, and improved hole quality.
- PVD coating provides increased tool life and wear resistance.
- Through tool coolant and solid versions available standard.

Use as Pilot Drill

- Ideal point angle and tolerance make the TOP DRILL S+™ drill the preferred pilot drill for TDD Series solid carbide deep-hole drills.

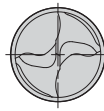
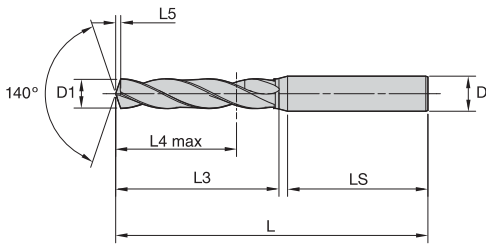
TOP DRILL S+ Drill-Point Design

- Low thrust. Works well on a variety of machines.
- Excellent centring capabilities.
- Easy to regrind.

Four-Margin Land Design

- Improves hole straightness and roundness.
- Provides good alignment and stability in tough drilling applications — even when drilling through cross holes.





■ TDS301A • 3 x D

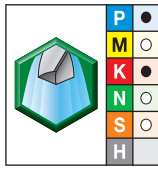


● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
2964222	TDS301A03000	3,000	.1181	6	20	14	0,48	36	62
2964233	TDS301A03100	3,100	.1220	6	20	14	0,50	36	62
2964234	TDS301A03200	3,200	.1260	6	20	14	0,52	36	62
2964235	TDS301A03250	3,250	.1280	6	20	14	0,53	36	62
2964236	TDS301A03300	3,300	.1299	6	20	14	0,54	36	62
2964237	TDS301A03400	3,400	.1339	6	20	14	0,55	36	62
2964238	TDS301A03500	3,500	.1378	6	20	14	0,57	36	62
2964239	TDS301A03600	3,600	.1417	6	20	14	0,59	36	62
2964240	TDS301A03700	3,700	.1457	6	20	14	0,61	36	62
2964241	TDS301A03800	3,800	.1496	6	24	17	0,62	36	66
2964242	TDS301A03900	3,900	.1535	6	24	17	0,64	36	66
2964243	TDS301A04000	4,000	.1575	6	24	17	0,66	36	66
2964244	TDS301A04100	4,100	.1614	6	24	17	0,67	36	66
2964245	TDS301A04200	4,200	.1654	6	24	17	0,69	36	66
2964246	TDS301A04300	4,300	.1693	6	24	17	0,71	36	66
2964247	TDS301A04370	4,370	.1720	6	24	17	0,72	36	66
2964248	TDS301A04400	4,400	.1732	6	24	17	0,73	36	66
2964249	TDS301A04500	4,500	.1772	6	24	17	0,74	36	66
2964250	TDS301A04600	4,600	.1811	6	24	17	0,76	36	66
2964251	TDS301A04650	4,650	.1831	6	24	17	0,77	36	66
2964252	TDS301A04700	4,700	.1850	6	24	17	0,78	36	66
2964273	TDS301A04760	4,760	.1874	6	28	20	0,79	36	66
2964274	TDS301A04800	4,800	.1890	6	28	20	0,80	36	66
2964275	TDS301A04900	4,900	.1929	6	28	20	0,81	36	66

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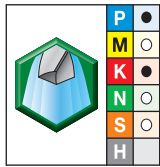
(TDS301A • 3 x D – continued)


 ● first choice
 ○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
2964276	TDS301A05000	5,000	.1969	6	28	20	0,83	36	66
2964277	TDS301A05100	5,100	.2008	6	28	20	0,85	36	66
2964278	TDS301A05160	5,160	.2031	6	28	20	0,86	36	66
2964279	TDS301A05200	5,200	.2047	6	28	20	0,87	36	66
2964280	TDS301A05300	5,300	.2087	6	28	20	0,88	36	66
2964281	TDS301A05400	5,400	.2126	6	28	20	0,90	36	66
2964282	TDS301A05500	5,500	.2165	6	28	20	0,92	36	66
2964293	TDS301A05550	5,550	.2185	6	28	20	0,93	36	66
2964294	TDS301A05560	5,560	.2189	6	28	20	0,93	36	66
2964295	TDS301A05600	5,600	.2205	6	28	20	0,94	36	66
2964296	TDS301A05700	5,700	.2244	6	28	20	0,95	36	66
2964297	TDS301A05800	5,800	.2283	6	28	20	0,97	36	66
2964298	TDS301A05900	5,900	.2323	6	28	20	0,99	36	66
2964299	TDS301A05950	5,950	.2343	6	28	20	1,00	36	66
2964300	TDS301A06000	6,000	.2362	6	28	20	1,00	36	66
2964301	TDS301A06100	6,100	.2402	8	34	24	1,02	36	79
2964302	TDS301A06200	6,200	.2441	8	34	24	1,04	36	79
2964313	TDS301A06300	6,300	.2480	8	34	24	1,06	36	79
2964314	TDS301A06350	6,350	.2500	8	34	24	1,07	36	79
2964315	TDS301A06400	6,400	.2520	8	34	24	1,07	36	79
2964316	TDS301A06500	6,500	.2559	8	34	24	1,09	36	79
2964317	TDS301A06600	6,600	.2598	8	34	24	1,11	36	79
2964318	TDS301A06700	6,700	.2638	8	34	24	1,13	36	79
2964319	TDS301A06750	6,750	.2657	8	34	24	1,14	36	79
2964320	TDS301A06800	6,800	.2677	8	34	24	1,14	36	79
2964321	TDS301A06900	6,900	.2717	8	34	24	1,16	36	79
2964322	TDS301A07000	7,000	.2756	8	34	24	1,18	36	79
2964333	TDS301A07100	7,100	.2795	8	41	29	1,20	36	79
2964334	TDS301A07140	7,140	.2811	8	41	29	1,20	36	79
2964335	TDS301A07200	7,200	.2835	8	41	29	1,21	36	79
2964336	TDS301A07300	7,300	.2874	8	41	29	1,23	36	79
2964337	TDS301A07400	7,400	.2913	8	41	29	1,25	36	79
2964338	TDS301A07500	7,500	.2953	8	41	29	1,27	36	79
2964339	TDS301A07540	7,540	.2969	8	41	29	1,27	36	79
2964340	TDS301A07600	7,600	.2992	8	41	29	1,29	36	79
2964341	TDS301A07700	7,700	.3031	8	41	29	1,30	36	79
2964342	TDS301A07800	7,800	.3071	8	41	29	1,32	36	79
2964353	TDS301A07900	7,900	.3110	8	41	29	1,34	36	79
2964354	TDS301A07940	7,940	.3126	8	41	29	1,34	36	79
2964355	TDS301A08000	8,000	.3150	8	41	29	1,36	36	79

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(TDS301A • 3 x D – continued)

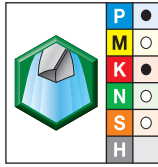


● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
2964356	TDS301A08100	8,100	.3189	10	47	35	1,37	40	89
2964357	TDS301A08200	8,200	.3228	10	47	35	1,39	40	89
2964358	TDS301A08300	8,300	.3268	10	47	35	1,41	40	89
2964359	TDS301A08330	8,330	.3280	10	47	35	1,41	40	89
2964360	TDS301A08400	8,400	.3307	10	47	35	1,43	40	89
2964361	TDS301A08500	8,500	.3346	10	47	35	1,44	40	89
2964362	TDS301A08600	8,600	.3386	10	47	35	1,46	40	89
2964373	TDS301A08700	8,700	.3425	10	47	35	1,48	40	89
2964374	TDS301A08800	8,800	.3465	10	47	35	1,50	40	89
2964375	TDS301A08900	8,900	.3504	10	47	35	1,51	40	89
2964376	TDS301A09000	9,000	.3543	10	47	35	1,53	40	89
2964377	TDS301A09100	9,100	.3583	10	47	35	1,55	40	89
2964378	TDS301A09130	9,130	.3594	10	47	35	1,55	40	89
2964379	TDS301A09200	9,200	.3622	10	47	35	1,57	40	89
2964380	TDS301A09300	9,300	.3661	10	47	35	1,58	40	89
2964381	TDS301A09400	9,400	.3701	10	47	35	1,60	40	89
2964382	TDS301A09500	9,500	.3740	10	47	35	1,62	40	89
2964393	TDS301A09520	9,520	.3748	10	47	35	1,62	40	89
2964394	TDS301A09600	9,600	.3780	10	47	35	1,64	40	89
2964395	TDS301A09700	9,700	.3819	10	47	35	1,65	40	89
2964396	TDS301A09800	9,800	.3858	10	47	35	1,67	40	89
2964397	TDS301A09900	9,900	.3898	10	47	35	1,69	40	89
2964398	TDS301A09920	9,920	.3906	10	47	35	1,69	40	89
2964399	TDS301A10000	10,000	.3937	10	47	35	1,71	40	89
2964400	TDS301A10100	10,100	.3976	12	55	40	1,73	45	102
2964401	TDS301A10200	10,200	.4016	12	55	40	1,74	45	102
2964402	TDS301A10300	10,300	.4055	12	55	40	1,76	45	102
2964413	TDS301A10320	10,320	.4063	12	55	40	1,76	45	102
2964414	TDS301A10400	10,400	.4094	12	55	40	1,78	45	102
2964415	TDS301A10500	10,500	.4134	12	55	40	1,80	45	102
2964416	TDS301A10600	10,600	.4173	12	55	40	1,81	45	102
2964417	TDS301A10700	10,700	.4213	12	55	40	1,83	45	102
2964418	TDS301A10720	10,720	.4220	12	55	40	1,83	45	102
2964419	TDS301A10800	10,800	.4252	12	55	40	1,85	45	102
2964420	TDS301A10900	10,900	.4291	12	55	40	1,87	45	102
2964421	TDS301A11000	11,000	.4331	12	55	40	1,88	45	102
2964423	TDS301A11100	11,100	.4370	12	55	40	1,90	45	102
2964424	TDS301A11110	11,110	.4374	12	55	40	1,90	45	102
2964425	TDS301A11200	11,200	.4409	12	55	40	1,92	45	102
2964426	TDS301A11300	11,300	.4449	12	55	40	1,94	45	102

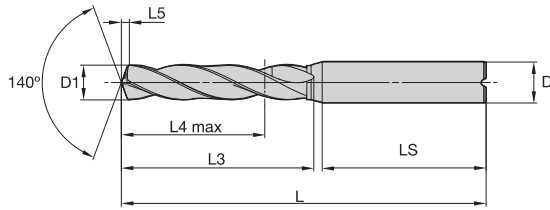
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(TDS301A • 3 x D – continued)

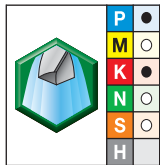


● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
2964427	TDS301A11400	11,400	.4488	12	55	40	1,95	45	102
2964428	TDS301A11500	11,500	.4528	12	55	40	1,97	45	102
2964429	TDS301A11600	11,600	.4567	12	55	40	1,99	45	102
2964430	TDS301A11700	11,700	.4606	12	55	40	2,01	45	102
2964431	TDS301A11800	11,800	.4646	12	55	40	2,03	45	102
2964432	TDS301A11900	11,900	.4685	12	55	40	2,04	45	102
2964433	TDS301A11910	11,910	.4689	12	55	40	2,04	45	102
2964434	TDS301A12000	12,000	.4724	12	55	40	2,06	45	102
2964435	TDS301A12300	12,300	.4843	14	60	43	2,11	45	107
2964436	TDS301A12500	12,500	.4921	14	60	43	2,15	45	107
2964437	TDS301A12700	12,700	.5000	14	60	43	2,18	45	107
2964438	TDS301A12800	12,800	.5039	14	60	43	2,20	45	107
2964439	TDS301A13000	13,000	.5118	14	60	43	2,24	45	107
2964440	TDS301A13500	13,500	.5315	14	60	43	2,33	45	107
2964441	TDS301A13800	13,800	.5433	14	60	43	2,38	45	107
2964442	TDS301A14000	14,000	.5512	14	60	43	2,41	45	107
2964443	TDS301A14290	14,290	.5626	16	65	45	2,47	48	115
2964444	TDS301A14500	14,500	.5709	16	65	45	2,50	48	115
2964445	TDS301A14800	14,800	.5827	16	65	45	2,56	48	115
2964446	TDS301A15000	15,000	.5906	16	65	45	2,59	48	115
2964447	TDS301A15500	15,500	.6102	16	65	45	2,68	48	115
2964448	TDS301A15800	15,800	.6220	16	65	45	2,73	48	115
2964449	TDS301A15870	15,870	.6248	16	65	45	2,75	48	115
2964450	TDS301A16000	16,000	.6299	16	65	45	2,77	48	115
2964451	TDS301A16500	16,500	.6496	18	73	51	2,86	48	123
2964452	TDS301A16670	16,670	.6563	18	73	51	2,89	48	123
2964453	TDS301A16800	16,800	.6614	18	73	51	2,91	48	123
2964454	TDS301A17000	17,000	.6693	18	73	51	2,95	48	123
2964455	TDS301A17500	17,500	.6890	18	73	51	3,04	48	123
2964456	TDS301A17800	17,800	.7008	18	73	51	3,09	48	123
2964457	TDS301A18000	18,000	.7087	18	73	51	3,12	48	123
2964458	TDS301A18500	18,500	.7283	20	79	55	3,21	50	131
2964459	TDS301A18800	18,800	.7402	20	79	55	3,27	50	131
2964460	TDS301A19000	19,000	.7480	20	79	55	3,30	50	131
2964461	TDS301A19050	19,050	.7500	20	79	55	3,31	50	131
2964462	TDS301A19500	19,500	.7677	20	79	55	3,39	50	131
2964463	TDS301A19800	19,800	.7795	20	79	55	3,44	50	131
2964464	TDS301A20000	20,000	.7874	20	79	55	3,48	50	131



■ TDS501A • 3 x D



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
2964947	TDS501A03000	3,000	.1181	6	20	14	0,48	36	62
2964948	TDS501A03100	3,100	.1220	6	20	14	0,50	36	62
4051234	TDS501A03175	3,175	.1250	6	20	14	0,64	36	62
2964949	TDS501A03200	3,200	.1260	6	20	14	0,52	36	62
2964950	TDS501A03250	3,250	.1280	6	20	14	0,53	36	62
2964951	TDS501A03300	3,300	.1299	6	20	14	0,54	36	62
2964952	TDS501A03400	3,400	.1339	6	20	14	0,55	36	62
4051233	TDS501A03455	3,450	.1358	6	20	14	0,56	36	62
2964953	TDS501A03500	3,500	.1378	6	20	14	0,57	36	62
5661464	TDS501A03571	3,571	.1406	6	20	14	0,58	36	62
2964954	TDS501A03600	3,600	.1417	6	20	14	0,59	36	62
2964955	TDS501A03700	3,700	.1457	6	20	14	0,61	36	62
2964956	TDS501A03800	3,800	.1496	6	24	17	0,62	36	66
2964957	TDS501A03900	3,900	.1535	6	24	17	0,64	36	66
2964958	TDS501A04000	4,000	.1575	6	24	17	0,66	36	66
2964959	TDS501A04100	4,100	.1614	6	24	17	0,67	36	66
2964960	TDS501A04200	4,200	.1654	6	24	17	0,69	36	66
2964961	TDS501A04300	4,300	.1693	6	24	17	0,71	36	66
2964962	TDS501A04370	4,370	.1720	6	24	17	0,72	36	66
2964963	TDS501A04400	4,400	.1732	6	24	17	0,73	36	66
2964964	TDS501A04500	4,500	.1772	6	24	17	0,74	36	66
2964965	TDS501A04600	4,600	.1811	6	24	17	0,76	36	66
5661502	TDS501A04623	4,623	.1820	6	24	17	0,77	36	66
2964966	TDS501A04650	4,650	.1831	6	24	17	0,77	36	66

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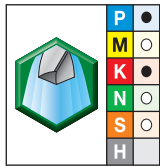
(TDS501A • 3 x D – continued)


 ● first choice
 ○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
2964967	TDS501A04700	4,700	.1850	6	24	17	0,78	36	66
5661503	TDS501A04763	4,763	.1875	6	28	20	0,79	36	66
2964969	TDS501A04800	4,800	.1890	6	28	20	0,80	36	66
2964970	TDS501A04900	4,900	.1929	6	28	20	0,81	36	66
2964971	TDS501A05000	5,000	.1969	6	28	20	0,83	36	66
2964972	TDS501A05100	5,100	.2008	6	28	20	0,85	36	66
2964973	TDS501A05160	5,160	.2031	6	28	20	0,86	36	66
2964974	TDS501A05200	5,200	.2047	6	28	20	0,87	36	66
2964975	TDS501A05300	5,300	.2087	6	28	20	0,88	36	66
2964976	TDS501A05400	5,400	.2126	6	28	20	0,90	36	66
5661504	TDS501A05410	5,410	.2130	6	28	20	0,90	36	66
2964977	TDS501A05500	5,500	.2165	6	28	20	0,92	36	66
2964978	TDS501A05550	5,550	.2185	6	28	20	0,93	36	66
5661505	TDS501A05558	5,558	.2188	6	28	20	0,93	36	66
2964980	TDS501A05600	5,600	.2205	6	28	20	0,94	36	66
2964981	TDS501A05700	5,700	.2244	6	28	20	0,95	36	66
2964982	TDS501A05800	5,800	.2283	6	28	20	0,97	36	66
2964983	TDS501A05900	5,900	.2323	6	28	20	0,99	36	66
2964984	TDS501A05950	5,950	.2343	6	28	20	1,00	36	66
2964985	TDS501A06000	6,000	.2362	6	28	20	1,00	36	66
2964986	TDS501A06100	6,100	.2402	8	34	24	1,02	36	79
2964987	TDS501A06200	6,200	.2441	8	34	24	1,04	36	79
2964988	TDS501A06300	6,300	.2480	8	34	24	1,06	36	79
2964989	TDS501A06350	6,350	.2500	8	34	24	1,07	36	79
2964990	TDS501A06400	6,400	.2520	8	34	24	1,07	36	79
2964991	TDS501A06500	6,500	.2559	8	34	24	1,09	36	79
5661506	TDS501A06528	6,528	.2570	8	34	24	1,10	36	79
2964992	TDS501A06600	6,600	.2598	8	34	24	1,11	36	79
2964993	TDS501A06700	6,700	.2638	8	34	24	1,13	36	79
5661507	TDS501A06746	6,746	.2656	8	34	24	1,14	36	79
2964995	TDS501A06800	6,800	.2677	8	34	24	1,14	36	79
2964996	TDS501A06900	6,900	.2717	8	34	24	1,16	36	79
2964997	TDS501A07000	7,000	.2756	8	34	24	1,18	36	79
2964998	TDS501A07100	7,100	.2795	8	41	29	1,20	36	79
5661509	TDS501A07145	7,145	.2813	8	41	29	1,21	36	79
2965000	TDS501A07200	7,200	.2835	8	41	29	1,21	36	79
2965001	TDS501A07300	7,300	.2874	8	41	29	1,23	36	79
2965002	TDS501A07400	7,400	.2913	8	41	29	1,25	36	79
2965003	TDS501A07500	7,500	.2953	8	41	29	1,27	36	79
2965004	TDS501A07541	7,540	.2969	8	41	29	1,27	36	79

(continued)

(TDS501A • 3 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
2965005	TDS501A07600	7,600	.2992	8	41	29	1,29	36	79
2965006	TDS501A07700	7,700	.3031	8	41	29	1,30	36	79
2965007	TDS501A07800	7,800	.3071	8	41	29	1,32	36	79
2965008	TDS501A07900	7,900	.3110	8	41	29	1,34	36	79
5661540	TDS501A07938	7,938	.3125	8	41	29	1,34	36	79
2965010	TDS501A08000	8,000	.3150	8	41	29	1,36	36	79
2965011	TDS501A08100	8,100	.3189	10	47	35	1,37	40	89
2965012	TDS501A08200	8,200	.3228	10	47	35	1,39	40	89
2965013	TDS501A08300	8,300	.3268	10	47	35	1,41	40	89
5661541	TDS501A08334	8,334	.3281	10	47	35	1,41	40	89
2965015	TDS501A08400	8,400	.3307	10	47	35	1,43	40	89
5661542	TDS501A08433	8,433	.3320	10	47	35	1,43	40	89
2965016	TDS501A08500	8,500	.3346	10	47	35	1,44	40	89
2965017	TDS501A08600	8,600	.3386	10	47	35	1,46	40	89
2965018	TDS501A08700	8,700	.3425	10	47	35	1,48	40	89
5661543	TDS501A08733	8,733	.3438	10	47	35	1,48	40	89
2965019	TDS501A08800	8,800	.3465	10	47	35	1,50	40	89
2965020	TDS501A08900	8,900	.3504	10	47	35	1,51	40	89
2965021	TDS501A09000	9,000	.3543	10	47	35	1,53	40	89
2965022	TDS501A09100	9,100	.3583	10	47	35	1,55	40	89
2965023	TDS501A09129	9,130	.3594	10	47	35	1,55	40	89
2965024	TDS501A09200	9,200	.3622	10	47	35	1,57	40	89
2965025	TDS501A09300	9,300	.3661	10	47	35	1,58	40	89
5661544	TDS501A09347	9,347	.3680	10	47	35	1,59	40	89
2965026	TDS501A09400	9,400	.3701	10	47	35	1,60	40	89
2965027	TDS501A09500	9,500	.3740	10	47	35	1,62	40	89
2965029	TDS501A09600	9,600	.3780	10	47	35	1,64	40	89
2965030	TDS501A09700	9,700	.3819	10	47	35	1,65	40	89
5661546	TDS501A09750	9,750	.3839	10	47	35	1,66	40	89
2965031	TDS501A09800	9,800	.3858	10	47	35	1,67	40	89
2965032	TDS501A09900	9,900	.3898	10	47	35	1,69	40	89
2965033	TDS501A09921	9,920	.3906	10	47	35	1,69	40	89
2965034	TDS501A10000	10,000	.3937	10	47	35	1,71	40	89
2965035	TDS501A10100	10,100	.3976	12	55	40	1,73	45	102
2965036	TDS501A10200	10,200	.4016	12	55	40	1,74	45	102
2965037	TDS501A10300	10,300	.4055	12	55	40	1,76	45	102
2965038	TDS501A10320	10,320	.4063	12	55	40	1,76	45	102
2965039	TDS501A10400	10,400	.4094	12	55	40	1,78	45	102
2965040	TDS501A10500	10,500	.4134	12	55	40	1,80	45	102
2965041	TDS501A10600	10,600	.4173	12	55	40	1,81	45	102

(continued)

(TDS501A • 3 x D – continued)


 ● first choice
 ○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
2965042	TDS501A10700	10,700	.4213	12	55	40	1,83	45	102
5661547	TDS501A10716	10,716	.4219	12	55	40	1,83	45	102
2965044	TDS501A10800	10,800	.4252	12	55	40	1,85	45	102
2965045	TDS501A10900	10,900	.4291	12	55	40	1,87	45	102
2965046	TDS501A11000	11,000	.4331	12	55	40	1,88	45	102
2965047	TDS501A11100	11,100	.4370	12	55	40	1,90	45	102
2965048	TDS501A11113	11,113	.4375	12	55	40	1,90	45	102
2964736	TDS501A11200	11,200	.4409	12	55	40	1,92	45	102
2964737	TDS501A11300	11,300	.4449	12	55	40	1,94	45	102
2964738	TDS501A11400	11,400	.4488	12	55	40	1,95	45	102
2964739	TDS501A11500	11,500	.4528	12	55	40	1,97	45	102
2964740	TDS501A11600	11,600	.4567	12	55	40	1,99	45	102
2964741	TDS501A11700	11,700	.4606	12	55	40	2,01	45	102
2964742	TDS501A11800	11,800	.4646	12	55	40	2,03	45	102
2965053	TDS501A11900	11,900	.4685	12	55	40	2,04	45	102
2965054	TDS501A11910	11,910	.4689	12	55	40	2,04	45	102
2965055	TDS501A12000	12,000	.4724	12	55	40	2,06	45	102
2965056	TDS501A12300	12,300	.4843	14	60	43	2,11	45	107
5661548	TDS501A12304	12,304	.4844	14	60	43	2,11	45	107
2965057	TDS501A12500	12,500	.4921	14	60	43	2,15	45	107
2965058	TDS501A12700	12,700	.5000	14	60	43	2,18	45	107
2965059	TDS501A12800	12,800	.5039	14	60	43	2,20	45	107
2965060	TDS501A13000	13,000	.5118	14	60	43	2,24	45	107
4051235	TDS501A13100	13,100	.5157	14	60	43	2,79	45	107
2965061	TDS501A13500	13,500	.5315	14	60	43	2,33	45	107
2965062	TDS501A13800	13,800	.5433	14	60	43	2,38	45	107
2965063	TDS501A14000	14,000	.5512	14	60	43	2,41	45	107
2965064	TDS501A14290	14,290	.5626	16	65	45	2,47	48	115
2965065	TDS501A14500	14,500	.5709	16	65	45	2,50	48	115
2965066	TDS501A14800	14,800	.5827	16	65	45	2,56	48	115
2965067	TDS501A15000	15,000	.5906	16	65	45	2,59	48	115
2965068	TDS501A15500	15,500	.6102	16	65	45	2,68	48	115
2965069	TDS501A15800	15,800	.6220	16	65	45	2,73	48	115
2965070	TDS501A15870	15,870	.6248	16	65	45	2,75	48	115
2965071	TDS501A16000	16,000	.6299	16	65	45	2,77	48	115
2965072	TDS501A16500	16,500	.6496	18	73	51	2,86	48	123
2965073	TDS501A16670	16,670	.6563	18	73	51	2,89	48	123
2965074	TDS501A16800	16,800	.6614	18	73	51	2,91	48	123
2965075	TDS501A17000	17,000	.6693	18	73	51	2,95	48	123
2965076	TDS501A17500	17,500	.6890	18	73	51	3,04	48	123

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Solid Carbide Drills

TOP DRILL S+™ • Steel, Stainless Steel, Cast Iron, Aluminium, and High-Temp Alloys • 3 x D

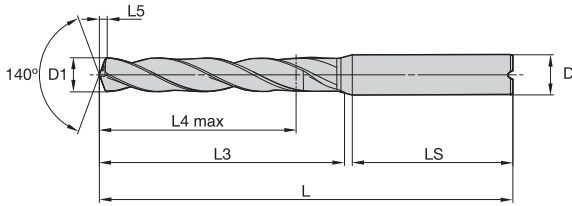


(TDS501A • 3 x D – continued)

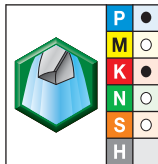


● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
2965077	TDS501A17800	17,800	.7008	18	73	51	3,09	48	123
2965078	TDS501A18000	18,000	.7087	18	73	51	3,12	48	123
2965079	TDS501A18500	18,500	.7283	20	79	55	3,21	50	131
2965080	TDS501A18800	18,800	.7402	20	79	55	3,27	50	131
2965081	TDS501A19000	19,000	.7480	20	79	55	3,30	50	131
2965082	TDS501A19050	19,050	.7500	20	79	55	3,31	50	131
2965083	TDS501A19500	19,500	.7677	20	79	55	3,39	50	131
2965084	TDS501A19800	19,800	.7795	20	79	55	3,44	50	131
2965085	TDS501A20000	20,000	.7874	20	79	55	3,48	50	131



■ TDS502A • 5 x D

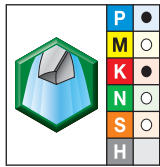


● first choice
○ alternate choice

		D1 diameter							
grade WU25PD TiAlN		mm	in	D	L3	L4 max	L5	LS	L
2964803	TDS502A03000	3,000	.1181	6	28	23	0,48	36	66
2964804	TDS502A03100	3,100	.1220	6	28	23	0,50	36	66
4051237	TDS502A03175	3,175	.1250	6	28	23	0,64	36	66
2964805	TDS502A03200	3,200	.1260	6	28	23	0,52	36	66
2964806	TDS502A03250	3,250	.1280	6	28	23	0,53	36	66
2964807	TDS502A03300	3,300	.1299	6	28	23	0,54	36	66
2964808	TDS502A03400	3,400	.1339	6	28	23	0,55	36	66
4051236	TDS502A03455	3,455	.1360	6	28	23	0,70	36	66
2964809	TDS502A03500	3,500	.1378	6	28	23	0,57	36	66
2964810	TDS502A03600	3,600	.1417	6	28	23	0,59	36	66
2964811	TDS502A03700	3,700	.1457	6	28	23	0,61	36	66
2964812	TDS502A03800	3,800	.1496	6	36	29	0,62	36	74
2964813	TDS502A03900	3,900	.1535	6	36	29	0,64	36	74
2964814	TDS502A04000	4,000	.1575	6	36	29	0,66	36	74
2964815	TDS502A04100	4,100	.1614	6	36	29	0,67	36	74
2964816	TDS502A04200	4,200	.1654	6	36	29	0,69	36	74
2964817	TDS502A04300	4,300	.1693	6	36	29	0,71	36	74
2964818	TDS502A04370	4,370	.1720	6	36	29	0,72	36	74
2964819	TDS502A04400	4,400	.1732	6	36	29	0,73	36	74
2964820	TDS502A04500	4,500	.1772	6	36	29	0,74	36	74
2964821	TDS502A04600	4,600	.1811	6	36	29	0,76	36	74
2964822	TDS502A04650	4,650	.1831	6	36	29	0,77	36	74
2964823	TDS502A04700	4,700	.1850	6	36	29	0,78	36	74
2964824	TDS502A04760	4,760	.1874	6	44	35	0,79	36	82

(continued)

(TDS502A • 5 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
2964825	TDS502A04800	4,800	.1890	6	44	35	0,80	36	82
2964826	TDS502A04900	4,900	.1929	6	44	35	0,81	36	82
2964827	TDS502A05000	5,000	.1969	6	44	35	0,83	36	82
2964828	TDS502A05100	5,100	.2008	6	44	35	0,85	36	82
2964829	TDS502A05160	5,160	.2031	6	44	35	0,86	36	82
2964830	TDS502A05200	5,200	.2047	6	44	35	0,87	36	82
2964831	TDS502A05300	5,300	.2087	6	44	35	0,88	36	82
2964832	TDS502A05400	5,400	.2126	6	44	35	0,90	36	82
2964833	TDS502A05500	5,500	.2165	6	44	35	0,92	36	82
2964834	TDS502A05550	5,550	.2185	6	44	35	0,93	36	82
2964835	TDS502A05560	5,560	.2189	6	44	35	0,93	36	82
2964836	TDS502A05600	5,600	.2205	6	44	35	0,94	36	82
2964837	TDS502A05700	5,700	.2244	6	44	35	0,95	36	82
2964838	TDS502A05800	5,800	.2283	6	44	35	0,97	36	82
2964839	TDS502A05900	5,900	.2323	6	44	35	0,99	36	82
2964840	TDS502A05950	5,950	.2343	6	44	35	1,00	36	82
2964841	TDS502A06000	6,000	.2362	6	44	35	1,00	36	82
2964842	TDS502A06100	6,100	.2402	8	53	43	1,02	36	91
2964843	TDS502A06200	6,200	.2441	8	53	43	1,04	36	91
2964844	TDS502A06300	6,300	.2480	8	53	43	1,06	36	91
2964845	TDS502A06350	6,350	.2500	8	53	43	1,07	36	91
2964846	TDS502A06400	6,400	.2520	8	53	43	1,07	36	91
2964847	TDS502A06500	6,500	.2559	8	53	43	1,09	36	91
2964848	TDS502A06600	6,600	.2598	8	53	43	1,11	36	91
2964849	TDS502A06700	6,700	.2638	8	53	43	1,13	36	91
2964850	TDS502A06750	6,750	.2657	8	53	43	1,14	36	91
2964851	TDS502A06800	6,800	.2677	8	53	43	1,14	36	91
2964852	TDS502A06900	6,900	.2717	8	53	43	1,16	36	91
2964853	TDS502A07000	7,000	.2756	8	53	43	1,18	36	91
2964854	TDS502A07100	7,100	.2795	8	53	43	1,20	36	91
2964855	TDS502A07140	7,140	.2811	8	53	43	1,20	36	91
2964856	TDS502A07200	7,200	.2835	8	53	43	1,21	36	91
2964857	TDS502A07300	7,300	.2874	8	53	43	1,23	36	91
2964858	TDS502A07400	7,400	.2913	8	53	43	1,25	36	91
2964859	TDS502A07500	7,500	.2953	8	53	43	1,27	36	91
2964860	TDS502A07540	7,540	.2969	8	53	43	1,27	36	91
2964861	TDS502A07600	7,600	.2992	8	53	43	1,29	36	91
2964862	TDS502A07700	7,700	.3031	8	53	43	1,30	36	91
2964863	TDS502A07800	7,800	.3071	8	53	43	1,32	36	91
2964864	TDS502A07900	7,900	.3110	8	53	43	1,34	36	91

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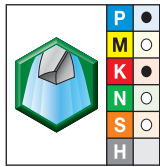
(TDS502A • 5 x D – continued)


 ● first choice
 ○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
2964865	TDS502A07940	7,940	.3126	8	53	43	1,34	36	91
2964866	TDS502A08000	8,000	.3150	8	53	43	1,36	36	91
2964867	TDS502A08100	8,100	.3189	10	61	49	1,37	40	103
2964868	TDS502A08200	8,200	.3228	10	61	49	1,39	40	103
2964869	TDS502A08300	8,300	.3268	10	61	49	1,41	40	103
2964870	TDS502A08330	8,330	.3280	10	61	49	1,41	40	103
2964871	TDS502A08400	8,400	.3307	10	61	49	1,43	40	103
2964872	TDS502A08500	8,500	.3346	10	61	49	1,44	40	103
2964873	TDS502A08600	8,600	.3386	10	61	49	1,46	40	103
2964874	TDS502A08700	8,700	.3425	10	61	49	1,48	40	103
2964875	TDS502A08800	8,800	.3465	10	61	49	1,50	40	103
2964876	TDS502A08900	8,900	.3504	10	61	49	1,51	40	103
2964877	TDS502A09000	9,000	.3543	10	61	49	1,53	40	103
2964878	TDS502A09100	9,100	.3583	10	61	49	1,55	40	103
2964879	TDS502A09130	9,130	.3594	10	61	49	1,55	40	103
2964880	TDS502A09200	9,200	.3622	10	61	49	1,57	40	103
2964881	TDS502A09300	9,300	.3661	10	61	49	1,58	40	103
2964882	TDS502A09400	9,400	.3701	10	61	49	1,60	40	103
2964883	TDS502A09500	9,500	.3740	10	61	49	1,62	40	103
2964884	TDS502A09520	9,520	.3748	10	61	49	1,62	40	103
2964885	TDS502A09600	9,600	.3780	10	61	49	1,64	40	103
2964886	TDS502A09700	9,700	.3819	10	61	49	1,65	40	103
2964887	TDS502A09800	9,800	.3858	10	61	49	1,67	40	103
2964888	TDS502A09900	9,900	.3898	10	61	49	1,69	40	103
2964889	TDS502A09920	9,920	.3906	10	61	49	1,69	40	103
2964890	TDS502A10000	10,000	.3937	10	61	49	1,71	40	103
2964891	TDS502A10100	10,100	.3976	12	71	56	1,73	45	118
2964892	TDS502A10200	10,200	.4016	12	71	56	1,74	45	118
2964893	TDS502A10300	10,300	.4055	12	71	56	1,76	45	118
2964894	TDS502A10320	10,320	.4063	12	71	56	1,76	45	118
2964895	TDS502A10400	10,400	.4094	12	71	56	1,78	45	118
2964896	TDS502A10500	10,500	.4134	12	71	56	1,80	45	118
2964897	TDS502A10600	10,600	.4173	12	71	56	1,81	45	118
2964898	TDS502A10700	10,700	.4213	12	71	56	1,83	45	118
2964899	TDS502A10720	10,720	.4220	12	71	56	1,83	45	118
2964900	TDS502A10800	10,800	.4252	12	71	56	1,85	45	118
2964901	TDS502A10900	10,900	.4291	12	71	56	1,87	45	118
2964902	TDS502A11000	11,000	.4331	12	71	56	1,88	45	118
2964903	TDS502A11100	11,100	.4370	12	71	56	1,90	45	118
2964904	TDS502A11110	11,110	.4374	12	71	56	1,90	45	118

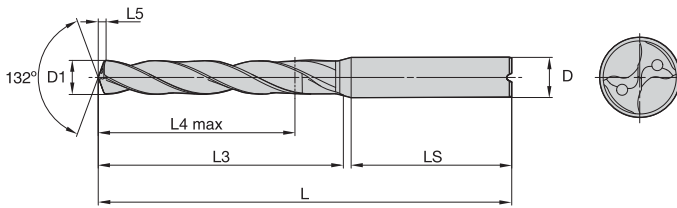
(continued)

(TDS502A • 5 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
2964905	TDS502A11200	11,200	.4409	12	71	56	1,92	45	118
2964906	TDS502A11300	11,300	.4449	12	71	56	1,94	45	118
2968374	TDS502A11400	11,400	.4488	12	71	56	1,95	45	118
2968375	TDS502A11500	11,500	.4528	12	71	56	1,97	45	118
2968376	TDS502A11600	11,600	.4567	12	71	56	1,99	45	118
2968377	TDS502A11700	11,700	.4606	12	71	56	2,01	45	118
2968378	TDS502A11800	11,800	.4646	12	71	56	2,03	45	118
2968379	TDS502A11900	11,900	.4685	12	71	56	2,04	45	118
2968380	TDS502A11910	11,910	.4689	12	71	56	2,04	45	118
2968381	TDS502A12000	12,000	.4724	12	71	56	2,06	45	118
2968382	TDS502A12300	12,300	.4843	14	77	60	2,11	45	124
2968393	TDS502A12500	12,500	.4921	14	77	60	2,15	45	124
2968394	TDS502A12700	12,700	.5000	14	77	60	2,18	45	124
2968395	TDS502A12800	12,800	.5039	14	77	60	2,20	45	124
2968396	TDS502A13000	13,000	.5118	14	77	60	2,24	45	124
4051238	TDS502A13100	13,100	.5157	14	77	60	2,79	45	124
2968397	TDS502A13500	13,500	.5315	14	77	60	2,33	45	124
2968398	TDS502A13800	13,800	.5433	14	77	60	2,38	45	124
2968399	TDS502A14000	14,000	.5512	14	77	60	2,41	45	124
2968400	TDS502A14290	14,290	.5626	16	83	63	2,47	48	133
2968401	TDS502A14500	14,500	.5709	16	83	63	2,50	48	133
2968402	TDS502A14800	14,800	.5827	16	83	63	2,56	48	133
2968403	TDS502A15000	15,000	.5906	16	83	63	2,59	48	133
2968404	TDS502A15500	15,500	.6102	16	83	63	2,68	48	133
2968405	TDS502A15800	15,800	.6220	16	83	63	2,73	48	133
2968406	TDS502A15870	15,870	.6248	16	83	63	2,75	48	133
2968407	TDS502A16000	16,000	.6299	16	83	63	2,77	48	133
2968408	TDS502A16500	16,500	.6496	18	93	71	2,86	48	143
2968409	TDS502A16670	16,670	.6563	18	93	71	2,89	48	143
2968410	TDS502A16800	16,800	.6614	18	93	71	2,91	48	143
2968411	TDS502A17000	17,000	.6693	18	93	71	2,95	48	143
2968412	TDS502A17500	17,500	.6890	18	93	71	3,04	48	143
2968413	TDS502A17800	17,800	.7008	18	93	71	3,09	48	143
2968414	TDS502A18000	18,000	.7087	18	93	71	3,12	48	143
2968415	TDS502A18500	18,500	.7283	20	101	77	3,21	50	153
2968416	TDS502A18800	18,800	.7402	20	101	77	3,27	50	153
2968417	TDS502A19000	19,000	.7480	20	101	77	3,30	50	153
2968418	TDS502A19050	19,050	.7500	20	101	77	3,31	50	153
2968419	TDS502A19500	19,500	.7677	20	101	77	3,39	50	153
2968420	TDS502A19800	19,800	.7795	20	101	77	3,44	50	153
2968421	TDS502A20000	20,000	.7874	20	101	77	3,48	50	153



■ **TDS503A • 8 x D**



grade WU25PD
TiAlN

● first choice
○ alternate choice

order #	catalogue #	D1 diameter		D	L3	L4 max	L5	LS	L
		mm	in						
2968422	TDS503A03000	3,000	.1181	6	40	33	0,61	36	78
4051239	TDS503A03100	3,100	.1220	6	40	33	0,63	36	78
4051240	TDS503A03175	3,175	.1250	6	40	33	0,64	36	78
4051241	TDS503A03200	3,200	.1260	6	40	33	0,65	36	78
4051242	TDS503A03250	3,250	.1280	6	40	33	0,66	36	78
2968503	TDS503A03300	3,300	.1299	6	40	33	0,67	36	78
4051243	TDS503A03400	3,400	.1339	6	40	33	0,69	36	78
4051244	TDS503A03455	3,455	.1360	6	40	33	0,70	36	78
2968504	TDS503A03500	3,500	.1378	6	40	33	0,71	36	78
2968505	TDS503A03700	3,700	.1457	6	40	33	0,76	36	78
2968506	TDS503A03800	3,800	.1496	6	49	41	0,78	36	87
4051245	TDS503A03900	3,900	.1535	6	49	41	0,80	36	87
2968507	TDS503A04000	4,000	.1575	6	49	41	0,82	36	87
4051246	TDS503A04100	4,100	.1614	6	49	41	0,84	36	87
2968508	TDS503A04200	4,200	.1654	6	49	41	0,86	36	87
4051247	TDS503A04300	4,300	.1693	6	49	41	0,88	36	87
2968509	TDS503A04370	4,370	.1720	6	49	41	0,90	36	87
4051248	TDS503A04400	4,400	.1732	6	49	41	0,91	36	87
2968510	TDS503A04500	4,500	.1772	6	49	41	0,93	36	87
4051249	TDS503A04600	4,600	.1811	6	49	41	0,95	36	87
4051250	TDS503A04650	4,650	.1831	6	49	41	0,96	36	87
2968511	TDS503A04700	4,700	.1850	6	49	41	0,97	36	87
2968512	TDS503A04760	4,760	.1874	6	56	48	0,98	36	94
2968513	TDS503A04800	4,800	.1890	6	56	48	0,99	36	94

(continued)

Solid Carbide Drills

(TDS503A • 8 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
4051251	TDS503A04900	4,900	.1929	6	56	48	1,01	36	94
2968514	TDS503A05000	5,000	.1969	6	56	48	1,03	36	94
4051252	TDS503A05100	5,100	.2008	6	56	48	1,06	36	94
2968515	TDS503A05160	5,160	.2031	6	56	48	1,07	36	94
4051253	TDS503A05200	5,200	.2047	6	56	48	1,08	36	94
4051254	TDS503A05300	5,300	.2087	6	56	48	1,10	36	94
4051255	TDS503A05400	5,400	.2126	6	56	48	1,12	36	94
2968516	TDS503A05500	5,500	.2165	6	56	48	1,14	36	94
4051256	TDS503A05550	5,550	.2185	6	56	48	1,15	36	94
2968517	TDS503A05560	5,560	.2189	6	56	48	1,15	36	94
4051257	TDS503A05600	5,600	.2205	6	56	48	1,16	36	94
4051258	TDS503A05700	5,700	.2244	6	56	48	1,18	36	94
2968518	TDS503A05800	5,800	.2283	6	56	48	1,21	36	94
4051259	TDS503A05900	5,900	.2323	6	56	48	1,23	36	94
2968519	TDS503A05950	5,950	.2343	6	56	48	1,24	36	94
2968520	TDS503A06000	6,000	.2362	6	56	48	1,25	36	94
4051260	TDS503A06100	6,100	.2402	8	67	57	1,27	36	105
4051261	TDS503A06200	6,200	.2441	8	67	57	1,29	36	105
4051262	TDS503A06300	6,300	.2480	8	67	57	1,31	36	105
2968521	TDS503A06350	6,350	.2500	8	67	57	1,32	36	105
4051263	TDS503A06400	6,400	.2520	8	67	57	1,33	36	105
2968522	TDS503A06500	6,500	.2559	8	67	57	1,36	36	105
4051264	TDS503A06600	6,600	.2598	8	67	57	1,38	36	105
4051265	TDS503A06700	6,700	.2638	8	67	57	1,40	36	105
2968523	TDS503A06750	6,750	.2657	8	67	57	1,41	36	105
2968524	TDS503A06800	6,800	.2677	8	67	57	1,42	36	105
4051266	TDS503A06900	6,900	.2717	8	67	57	1,44	36	105
2968525	TDS503A07000	7,000	.2756	8	67	57	1,46	36	105
4051267	TDS503A07100	7,100	.2795	8	72	61	1,49	36	110
2968526	TDS503A07140	7,140	.2811	8	72	61	1,49	36	110
4051268	TDS503A07200	7,200	.2835	8	72	61	1,51	36	110
4051269	TDS503A07300	7,300	.2874	8	72	61	1,53	36	110
4051270	TDS503A07400	7,400	.2913	8	72	61	1,55	36	110
2968527	TDS503A07500	7,500	.2953	8	72	61	1,57	36	110
2968528	TDS503A07540	7,540	.2969	8	72	61	1,58	36	110
3998454	TDS503A07600	7,600	.2992	8	72	61	1,59	36	110
4051271	TDS503A07700	7,700	.3031	8	72	61	1,62	36	110
2968529	TDS503A07800	7,800	.3071	8	72	61	1,64	36	110
4051272	TDS503A07900	7,900	.3110	8	72	61	1,66	36	110
2968530	TDS503A07940	7,940	.3126	8	72	61	1,67	36	110

(continued)

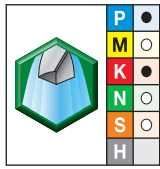
(TDS503A • 8 x D – continued)


 ● first choice
 ○ alternate choice

grade WU25PD TiAlN		D1 diameter							
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L
2968531	TDS503A08000	8,000	.3150	8	72	61	1,68	36	110
4051273	TDS503A08100	8,100	.3189	10	80	68	1,70	40	122
4051274	TDS503A08200	8,200	.3228	10	80	68	1,72	40	122
4051275	TDS503A08300	8,300	.3268	10	80	68	1,75	40	122
2968532	TDS503A08330	8,330	.3280	10	80	68	1,75	40	122
4051276	TDS503A08400	8,400	.3307	10	80	68	1,77	40	122
2968533	TDS503A08500	8,500	.3346	10	80	68	1,79	40	122
4051277	TDS503A08600	8,600	.3386	10	80	68	1,81	40	122
4051278	TDS503A08700	8,700	.3425	10	80	68	1,83	40	122
4051279	TDS503A08800	8,800	.3465	10	80	68	1,85	40	122
4051280	TDS503A08900	8,900	.3504	10	80	68	1,88	40	122
2968534	TDS503A09000	9,000	.3543	10	80	68	1,90	40	122
4051281	TDS503A09100	9,100	.3583	10	80	68	1,92	40	122
2968535	TDS503A09130	9,130	.3594	10	80	68	1,93	40	122
4051282	TDS503A09200	9,200	.3622	10	80	68	1,94	40	122
4051283	TDS503A09300	9,300	.3661	10	80	68	1,96	40	122
4051284	TDS503A09400	9,400	.3701	10	80	68	1,98	40	122
2968536	TDS503A09500	9,500	.3740	10	80	68	2,01	40	122
2968537	TDS503A09520	9,520	.3748	10	80	68	2,01	40	122
4051285	TDS503A09600	9,600	.3780	10	80	68	2,03	40	122
4051286	TDS503A09700	9,700	.3819	10	80	68	2,05	40	122
2968538	TDS503A09800	9,800	.3858	10	80	68	2,07	40	122
4051287	TDS503A09900	9,900	.3898	10	80	68	2,09	40	122
2968539	TDS503A09920	9,920	.3906	10	80	68	2,10	40	122
2968540	TDS503A10000	10,000	.3937	10	80	68	2,11	40	122
4051288	TDS503A10100	10,100	.3976	12	94	79	2,14	45	141
2968541	TDS503A10200	10,200	.4016	12	94	79	2,16	45	141
4051289	TDS503A10300	10,300	.4055	12	94	79	2,18	45	141
2968542	TDS503A10320	10,320	.4063	12	94	79	2,18	45	141
4051290	TDS503A10400	10,400	.4094	12	94	79	2,20	45	141
2968543	TDS503A10500	10,500	.4134	12	94	79	2,22	45	141
4051291	TDS503A10600	10,600	.4173	12	94	79	2,24	45	141
4051292	TDS503A10700	10,700	.4213	12	94	79	2,27	45	141
2968544	TDS503A10720	10,720	.4220	12	94	79	2,27	45	141
2968545	TDS503A10800	10,800	.4252	12	94	79	2,29	45	141
4051293	TDS503A10900	10,900	.4291	12	94	79	2,31	45	141
2968546	TDS503A11000	11,000	.4331	12	94	79	2,33	45	141
4051294	TDS503A11100	11,100	.4370	12	94	79	2,35	45	141
3998456	TDS503A11110	11,110	.4374	12	94	79	2,35	45	141
4051295	TDS503A11200	11,200	.4409	12	94	79	2,37	45	141

(continued)

(TDS503A • 8 x D – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L
order #	catalogue #	mm	in						
4051296	TDS503A11300	11,300	.4449	12	94	79	2,40	45	141
4051297	TDS503A11400	11,400	.4488	12	94	79	2,42	45	141
2968547	TDS503A11500	11,500	.4528	12	94	79	2,44	45	141
4051298	TDS503A11600	11,600	.4567	12	94	79	2,46	45	141
4051299	TDS503A11700	11,700	.4606	12	94	79	2,48	45	141
2968548	TDS503A11800	11,800	.4646	12	94	79	2,50	45	141
4051300	TDS503A11900	11,900	.4685	12	94	79	2,53	45	141
2968549	TDS503A11910	11,910	.4689	12	94	79	2,53	45	141
2968550	TDS503A12000	12,000	.4724	12	94	79	2,55	45	141
2968551	TDS503A12300	12,300	.4843	14	108	91	2,61	45	155
2968552	TDS503A12500	12,500	.4921	14	108	91	2,66	45	155
2968553	TDS503A12700	12,700	.5000	14	108	91	2,70	45	155
2968554	TDS503A12800	12,800	.5039	14	108	91	2,72	45	155
2968555	TDS503A13000	13,000	.5118	14	108	91	2,77	45	155
4051301	TDS503A13100	13,100	.5157	14	108	91	2,79	45	155
2968556	TDS503A13500	13,500	.5315	14	108	91	2,87	45	155
2968557	TDS503A13800	13,800	.5433	14	108	91	2,94	45	155
2968558	TDS503A14000	14,000	.5512	14	108	91	2,98	45	155
2968559	TDS503A14290	14,290	.5626	16	121	101	3,05	48	171
2968560	TDS503A14500	14,500	.5709	16	121	101	3,09	48	171
2968561	TDS503A14800	14,800	.5827	16	121	101	3,16	48	171
2968562	TDS503A15000	15,000	.5906	16	121	101	3,20	48	171
2968563	TDS503A15500	15,500	.6102	16	121	101	3,31	48	171
2968564	TDS503A15800	15,800	.6220	16	121	101	3,38	48	171
2968565	TDS503A15870	15,870	.6248	16	121	101	3,39	48	171
2968566	TDS503A16000	16,000	.6299	16	121	101	3,42	48	171
4051302	TDS503A16500	16,500	.6496	18	135	113	3,53	48	185
4051303	TDS503A16670	16,670	.6563	18	135	113	3,57	48	185
4051304	TDS503A16800	16,800	.6614	18	135	113	3,59	48	185
4051305	TDS503A17000	17,000	.6693	18	135	113	3,64	48	185
4051306	TDS503A17500	17,500	.6890	18	135	113	3,75	48	185
4051307	TDS503A17800	17,800	.7008	18	135	113	3,81	48	185
4051308	TDS503A18000	18,000	.7087	18	135	113	3,86	48	185
4051309	TDS503A18500	18,500	.7283	20	148	124	3,97	50	200
4051310	TDS503A18800	18,800	.7402	20	148	124	4,03	50	200
4051311	TDS503A19000	19,000	.7480	20	148	124	4,07	50	200
4051312	TDS503A19050	19,050	.7500	20	148	124	4,09	50	200
4051313	TDS503A19500	19,500	.7677	20	148	124	4,18	50	200
4051314	TDS503A19800	19,800	.7795	20	148	124	4,25	50	200
4051315	TDS503A20000	20,000	.7874	20	148	124	4,29	50	200

Solid Carbide Drills

■ TOP DRILL S+ • TDS301 • WU25PD™ • Flood Coolant • Metric

Material Group													
		Cutting Speed – vc Range – m/min			Recommended Feed Rate (f) by Diameter								
		min	-	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	80	-	130	mm/r	0,06-0,12	0,10-0,18	0,12-0,24	0,14-0,29	0,17-0,34	0,20-0,39	0,24-0,47	0,31-0,60
	2, 3, 4, 6, 7	60	-	120	mm/r	0,07-0,13	0,10-0,19	0,14-0,25	0,17-0,31	0,21-0,37	0,24-0,42	0,29-0,52	0,38-0,65
	5, 9, 10, 11	60	-	120	mm/r	0,07-0,13	0,09-0,19	0,13-0,25	0,16-0,31	0,19-0,37	0,21-0,42	0,26-0,52	0,32-0,65
	12, 13.1, 13.2	40	-	70	mm/r	0,05-0,08	0,06-0,11	0,09-0,16	0,11-0,20	0,13-0,24	0,15-0,27	0,20-0,35	0,26-0,45
M	14.1	30	-	50	mm/r	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	30	-	60	mm/r	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	0,04-0,07	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	100	-	210	mm/r	0,08-0,16	0,12-0,24	0,16-0,31	0,20-0,38	0,23-0,44	0,25-0,49	0,31-0,06	0,38-0,74
	17, 18, 19	130	-	160	mm/r	0,08-0,13	0,12-0,19	0,16-0,25	0,20-0,31	0,23-0,36	0,25-0,40	0,31-0,48	0,38-0,60
	20	100	-	170	mm/r	0,06-0,13	0,09-0,19	0,12-0,25	0,14-0,30	0,17-0,35	0,19-0,40	0,25-0,48	0,30-0,60
N	21	100	-	300	mm/r	0,10-0,18	0,12-0,20	0,15-0,25	0,20-0,30	0,25-0,35	0,30-0,40	0,35-0,50	0,40-0,60
	22, 23, 24	100	-	300	mm/r	0,10-0,20	0,12-0,25	0,15-0,30	0,20-0,35	0,25-0,40	0,30-0,45	0,35-0,55	0,40-0,65
	25	100	-	300	mm/r	0,15-0,18	0,16-0,20	0,18-0,25	0,20-0,30	0,25-0,35	0,30-0,40	0,35-0,50	0,40-0,55
	26, 27, 28	100	-	250	mm/r	0,10-0,20	0,12-0,25	0,15-0,30	0,20-0,35	0,25-0,40	0,30-0,45	0,35-0,50	0,40-0,60
S	31, 32	20	-	30	mm/r	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	0,02-0,04	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	0,02-0,04	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	0,02-0,04	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

Metric tolerance

nominal size range	D1 tolerance	D tolerance h6
>3-6	0,004/0,016	0,000/-0,008
>6-10	0,006/0,021	0,000/-0,009
>10-18	0,007/0,025	0,000/-0,011
>18-21	0,008/0,029	0,000/-0,013

■ TOP DRILL S+ • TDS501 TDS502 TDS503 • WU25PD™ • Through Coolant • Metric

Material Group	Cutting Speed – vc Range – m/min	Recommended Feed Rate (f) by Diameter											
		min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
						mm/r	mm/r	mm/r	mm/r	mm/r	mm/r	mm/r	mm/r
P	1	90	–	180	mm/r	0,08–0,16	0,09–0,18	0,12–0,24	0,14–0,29	0,17–0,34	0,20–0,39	0,24–0,47	0,31–0,60
	2, 3, 4, 6, 7	80	–	120	mm/r	0,09–0,17	0,10–0,19	0,14–0,25	0,17–0,31	0,21–0,37	0,24–0,42	0,29–0,52	0,38–0,65
	5, 9, 10, 11	70	–	120	mm/r	0,08–0,17	0,09–0,19	0,13–0,25	0,16–0,31	0,19–0,37	0,21–0,42	0,26–0,52	0,32–0,65
	12, 13.1, 13.2	50	–	80	mm/r	0,05–0,09	0,06–0,11	0,09–0,16	0,11–0,20	0,14–0,24	0,15–0,27	0,20–0,35	0,26–0,45
M	14.1	30	–	50	mm/r	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	30	–	60	mm/r	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	0,04–0,07	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	100	–	210	mm/r	0,11–0,22	0,12–0,24	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74
	17, 18, 19	130	–	160	mm/r	0,11–0,17	0,12–0,19	0,16–0,25	0,20–0,31	0,23–0,36	0,25–0,40	0,31–0,48	0,38–0,60
	20	100	–	170	mm/r	0,08–0,17	0,09–0,19	0,12–0,25	0,14–0,30	0,17–0,35	0,19–0,40	0,24–0,48	0,30–0,60
N	21	100	–	350	mm/r	0,10–0,18	0,12–0,20	0,15–0,25	0,20–0,30	0,25–0,35	0,30–0,40	0,35–0,50	0,40–0,60
	22, 23, 24	100	–	300	mm/r	0,10–0,20	0,12–0,25	0,15–0,30	0,20–0,35	0,25–0,40	0,30–0,45	0,35–0,55	0,40–0,65
	25	100	–	300	mm/r	0,15–0,18	0,16–0,20	0,18–0,25	0,20–0,30	0,25–0,35	0,30–0,40	0,35–0,50	0,40–0,55
	26, 27, 28	100	–	250	mm/r	0,10–0,20	0,12–0,25	0,15–0,30	0,20–0,35	0,25–0,40	0,30–0,45	0,35–0,50	0,40–0,60
S	31, 32	20	–	30	mm/r	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	0,02–0,04	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	0,02–0,04	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	0,02–0,04	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

Solid Carbide Drills

nominal size range	Metric tolerance	
	D1 tolerance	D tolerance h6
>3–6	0,004/0,016	0,000/–0,008
>6–10	0,006/0,021	0,000/–0,009
>10–18	0,007/0,025	0,000/–0,011
>18–21	0,008/0,029	0,000/–0,013

Good for You, Better for the Environment!

The WIDIA™ Carbide Recycling Program can turn accumulated scrap carbide tooling in your shop into cash.

Carbide Recycling

EXTREME CHALLENGES. EXTREME RESULTS.

We pay cash for used carbide tooling, including coated or non-coated carbide inserts, drills, end mills, reamers, and taps, regardless of brand.

It's good for the environment and a responsible way to dispose of scrap carbide.

Our carbide recycling program features:

- Easy-to-use web portal that shows what your scrap carbide is worth before sending it to us.
- Online forms that make it easy to ship scrap carbide to WIDIA.
- Green Box™ containers for safe, convenient shipping of scrap carbide to WIDIA.
- Cash payment for used carbide tooling.



For more information, contact your local WIDIA
Authorised Distributor or visit widia.com/services.

WIDIA 

Deep-Hole Drilling without Piloting •

WIDIA™ TOP DRILL S+™ 12 x D

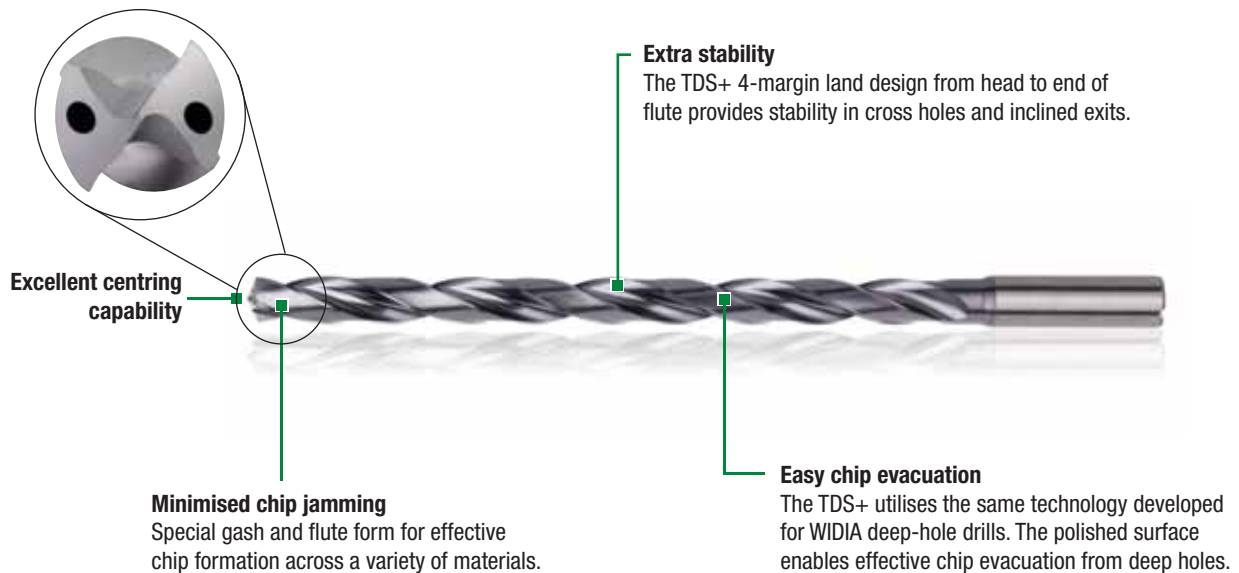
The versatile TOP DRILL S+ provides reliable performance across a broad scope of applications, including alloyed and unalloyed steel, cast iron, and some stainless steels and high-temperature alloys. TDS+ is now available in 12 x D, adding to its already wide range of options from 3–8 x D.



TOP DRILL S+ 12 x D

TDS+ 12 x D is capable of drilling an array of materials. The 4-margin land configuration offers stability, minimises chipping and jamming, and promotes chip evacuation. Because TDS+ 12 x D does not require a pilot drill, it increases efficiency by reducing the number of steps required for basic applications.

- 12 x D fits the gap between 8 x D and 15 x D.
- One drill that covers all materials.
- Can be used without a pilot.



Improved Productivity

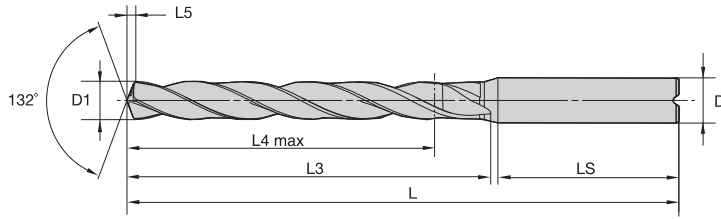
- Excellent centring capability — the new TDS+ 12 x D point is engineered to provide excellent centring capability.
- No pilot drill required — save time and money by reducing the number of steps required for your 12 x D application.

Increased Tool Life

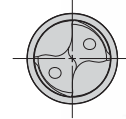
- Minimised runout — cylindrical body design provides guidance, and precision h6 shank is standard for better runout and less breakage.
- New WU20PD™ grade — designed specifically for long tool life.
- Factory regrind service — available through your WIDIA™ reconditioning service.

WIDIA Advantage

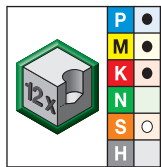
- Lower cost-per-hole due to high MRR and long tool life.
- Consistent performance from internally controlled supply chain:
Powder > Rod > Grinding > Coating
- Part of the complete WIDIA holemaking solution.
- Get more predictable results from local regrind services using OEM standards to recondition, ensuring value throughout the entire life of the drill.
- Broad range of standard lengths, diameters, and coolant options in one line. Includes extensive intermediate metric, inch, fraction, and wire size, including tap drill sizes.



For information on L, L3, and L4 max, see page T143.



■ TDS504A • 12 x D



● first choice
○ alternate choice

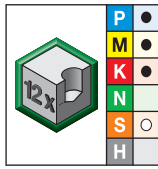
grade WU20PD
TiAlN

D1 diameter

order #	catalogue #	mm	in	L	L4 max	L3	L5	LS	D
4173459	TDS504A03000	3,000	.1181	93	44	52,0	0,6	36	6
4173460	TDS504A03175	3,175	.1250	93	44	52,0	0,7	36	6
4173461	TDS504A03264	3,264	.1285	93	44	53,0	0,7	36	6
4173545	TDS504A03455	3,455	.1360	93	44	53,0	0,7	36	6
4173462	TDS504A03500	3,500	.1378	93	44	53,0	0,7	36	6
4173546	TDS504A03734	3,734	.1470	93	45	54,0	0,8	36	6
4173463	TDS504A03970	3,970	.1563	107	56	66,0	0,8	36	6
4173464	TDS504A04000	4,000	.1575	107	56	66,0	0,8	36	6
4173465	TDS504A04500	4,500	.1772	107	56	67,0	0,9	36	6
4173466	TDS504A04600	4,600	.1811	107	57	68,0	1,0	36	6
4173467	TDS504A04763	4,763	.1875	125	69	82,0	1,0	36	6
4173468	TDS504A04800	4,800	.1890	125	69	82,0	1,0	36	6
4173469	TDS504A05000	5,000	.1969	125	70	83,0	1,1	36	6
4173470	TDS504A05100	5,100	.2008	125	70	83,0	1,1	36	6
4173471	TDS504A05200	5,200	.2047	125	70	83,0	1,1	36	6
4173472	TDS504A05300	5,300	.2087	125	71	84,0	1,1	36	6
4173473	TDS504A05410	5,410	.2130	125	71	84,0	1,1	36	6
4173474	TDS504A05500	5,500	.2165	125	71	84,0	1,2	36	6
4173475	TDS504A05558	5,558	.2188	125	71	84,0	1,2	36	6
4173476	TDS504A05600	5,600	.2205	125	72	85,0	1,2	36	6
4173477	TDS504A05700	5,700	.2244	125	72	85,0	1,2	36	6
4173478	TDS504A05800	5,800	.2283	125	71	85,0	1,2	36	6
4173479	TDS504A06000	6,000	.2362	125	72	86,0	1,3	36	6
4173480	TDS504A06200	6,200	.2441	139	82	97,0	1,3	36	8

(continued)

(TDS504A • 12 x D — continued)

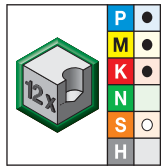


● first choice
○ alternate choice

grade WU20PD TiAlN		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4173481	TDS504A06350	6,350	.2500	139	83	98,0	1,3	36	8
4173482	TDS504A06500	6,500	.2559	139	83	98,0	1,4	36	8
4173483	TDS504A06528	6,528	.2570	139	83	98,0	1,4	36	8
4173484	TDS504A06600	6,600	.2598	139	84	99,0	1,4	36	8
4173485	TDS504A06746	6,746	.2656	139	83	99,0	1,4	36	8
4173486	TDS504A06800	6,800	.2677	139	83	99,0	1,4	36	8
4173487	TDS504A06909	6,909	.2720	139	84	100,0	1,5	36	8
4173488	TDS504A07000	7,000	.2756	139	84	100,0	1,5	36	8
4173489	TDS504A07145	7,145	.2813	153	94	111,0	1,5	36	8
4173490	TDS504A07500	7,500	.2953	153	95	112,0	1,6	36	8
4173491	TDS504A07541	7,541	.2969	153	95	112,0	1,6	36	8
4173492	TDS504A07700	7,700	.3031	153	96	113,0	1,6	36	8
4173493	TDS504A07800	7,800	.3071	153	95	113,0	1,7	36	8
4173494	TDS504A07938	7,938	.3125	153	96	114,0	1,7	36	8
4173495	TDS504A08000	8,000	.3150	153	96	114,0	1,7	36	8
4173496	TDS504A08100	8,100	.3189	185	116	136,0	1,7	40	10
4173497	TDS504A08334	8,334	.3281	185	117	137,0	1,8	40	10
4173498	TDS504A08433	8,433	.3320	185	117	137,0	1,8	40	10
4173499	TDS504A08500	8,500	.3346	185	117	137,0	1,8	40	10
4173500	TDS504A08700	8,700	.3425	185	118	138,0	1,9	40	10
4173501	TDS504A08733	8,733	.3438	185	117	138,0	1,9	40	10
4173502	TDS504A09000	9,000	.3543	185	118	139,0	1,9	40	10
4173503	TDS504A09100	9,100	.3583	185	118	139,0	1,9	40	10
4173504	TDS504A09129	9,129	.3594	185	118	139,0	1,9	40	10
4173547	TDS504A09347	9,347	.3680	185	119	140,0	2,0	40	10
4173505	TDS504A09500	9,500	.3740	185	119	140,0	2,0	40	10
4173506	TDS504A09525	9,525	.3750	185	119	140,0	2,0	40	10
4173507	TDS504A09921	9,921	.3906	185	120	142,0	2,1	40	10
4173508	TDS504A10000	10,000	.3937	185	120	142,0	2,1	40	10
4173509	TDS504A10200	10,200	.4016	218	140	164,0	2,2	45	12
4173510	TDS504A10300	10,300	.4055	218	141	165,0	2,2	45	12
4173511	TDS504A10320	10,320	.4063	218	141	165,0	2,2	45	12
4173512	TDS504A10500	10,500	.4134	218	141	165,0	2,2	45	12
4173513	TDS504A10716	10,716	.4219	218	142	166,0	2,3	45	12
4173514	TDS504A10800	10,800	.4252	218	141	166,0	2,3	45	12
4173515	TDS504A11000	11,000	.4331	218	142	167,0	2,4	45	12
4173516	TDS504A11113	11,113	.4375	218	142	167,0	2,4	45	12
4173517	TDS504A11500	11,500	.4528	218	143	168,0	2,5	45	12
4173518	TDS504A11800	11,800	.4646	218	143	169,0	2,5	45	12
4173519	TDS504A12000	12,000	.4724	218	144	170,0	2,6	45	12

(continued)



(TDS504A • 12 x D — continued)



● first choice
○ alternate choice

grade WU20PD TiAlN		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4173520	TDS504A12100	12,100	.4764	246	164	192,0	2,6	45	14
4173521	TDS504A12304	12,304	.4844	246	165	193,0	2,6	45	14
4148906	TDS504A12500	12,500	.4921	246	165	193,0	2,7	45	14
4173522	TDS504A12700	12,700	.5000	246	166	194,0	2,7	45	14
4173523	TDS504A13000	13,000	.5118	246	166	195,0	2,8	45	14
4173524	TDS504A13100	13,100	.5157	246	166	195,0	2,8	45	14
4173525	TDS504A13500	13,500	.5315	246	167	196,0	2,9	45	14
4173526	TDS504A14000	14,000	.5512	246	168	198,0	3,0	45	14
4173527	TDS504A14100	14,100	.5551	277	188	220,0	3,0	48	16
4173528	TDS504A14288	14,288	.5625	277	188	220,0	3,1	48	16
4173529	TDS504A14500	14,500	.5709	277	189	221,0	3,1	48	16
4173530	TDS504A14684	14,684	.5781	277	190	222,0	3,2	48	16
4173531	TDS504A15000	15,000	.5906	277	190	223,0	3,2	48	16
4173532	TDS504A15500	15,500	.6102	277	191	224,0	3,3	48	16
4173533	TDS504A15875	15,875	.6250	277	192	225,0	3,4	48	16
4173534	TDS504A16000	16,000	.6299	277	192	226,0	3,4	48	16
4173535	TDS504A16500	16,500	.6496	305	213	249,0	3,6	48	18
4173536	TDS504A17000	17,000	.6693	305	214	250,0	3,7	48	18
4173537	TDS504A17463	17,463	.6875	305	215	252,0	3,8	48	18
4173538	TDS504A17500	17,500	.6890	305	215	252,0	3,8	48	18
4173539	TDS504A18000	18,000	.7087	305	216	253,0	3,9	48	18
4173540	TDS504A18500	18,500	.7283	334	237	277,0	4,0	50	20
4173541	TDS504A19000	19,000	.7480	334	238	278,0	4,1	50	20
4173542	TDS504A19050	19,050	.7500	334	239	279,0	4,1	50	20
4173543	TDS504A19500	19,500	.7677	334	239	280,0	4,2	50	20
4173544	TDS504A20000	20,000	.7874	334	240	281,0	4,3	50	20

TOP DRILL S+ • TDS504 • WU20PD™ • Through Coolant • Metric

													
													Cutting Speed – vc Range – m/min
Material Group		min	–	max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0
P	1	90	–	180	mm/r	0,08–0,16	0,09–0,18	0,12–0,24	0,14–0,29	0,17–0,34	0,20–0,39	0,24–0,47	0,31–0,60
	2, 3, 4, 6, 7	80	–	120	mm/r	0,09–0,17	0,10–0,19	0,14–0,25	0,17–0,31	0,21–0,37	0,24–0,42	0,29–0,52	0,38–0,65
	5, 9, 10, 11	70	–	120	mm/r	0,08–0,17	0,09–0,19	0,13–0,25	0,16–0,31	0,19–0,37	0,21–0,42	0,26–0,52	0,32–0,65
	12, 13	50	–	80	mm/r	0,05–0,09	0,06–0,11	0,09–0,16	0,11–0,20	0,14–0,24	0,15–0,27	0,20–0,35	0,26–0,45
M	14,1	30	–	50	mm/r	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	30	–	60	mm/r	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	0,04–0,07	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	100	–	210	mm/r	0,11–0,22	0,12–0,24	0,16–0,31	0,20–0,38	0,23–0,44	0,25–0,49	0,31–0,60	0,38–0,74
	17, 18, 19	130	–	160	mm/r	0,11–0,17	0,12–0,19	0,16–0,25	0,20–0,31	0,23–0,36	0,25–0,40	0,31–0,48	0,38–0,60
	20	100	–	170	mm/r	0,08–0,17	0,09–0,19	0,12–0,25	0,14–0,30	0,17–0,35	0,19–0,40	0,24–0,48	0,30–0,60

Metric
tolerance

nominal size range	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008
>6–10	0,006/0,021	0,000/-0,009
>10–18	0,007/0,025	0,000/-0,011
>18–25,4	0,008/0,029	0,000/-0,013

Superior Deep-Hole Drilling •

WIDIA™ TOP DRILL™ Deep-Hole Drills for Steel and Cast Iron



Top Drill Deep-Hole Drills

Solid carbide deep-hole drills outperform gun drills and HSS deep-hole drills in deep-hole applications up to 30 x D by increasing metal removal rates by 3–4 times. Increased MRR equals bottom-line savings to customers in throughput, machine time, and personnel hours.

The TDD1*Z* Series in the WU20PD™ grade offers secure and consistent performance, excellent hole quality, and reduced cycle times. The standard lines are available from 3 to 13mm and lengths of 15, 20, 25, and 30 x D. It eliminates the traditional HSS or gun drilling without pecking, at up to 100% increased penetration rates.

132° TDS Point Geometry

- Low thrust.
- Excellent centring capabilities.
- Easy to regrind.

30° Helix with Optimised Flute Profile

- Reduces risk of chip jamming and catastrophic failure.

Four-Margin Lands

- Improves hole straightness.
- Improves hole alignment when drilling through cross holes and inclined exits.

Highly Polished Surfaces

- Reduction of friction in the chip flute and on the lands, resulting in superior chip evacuation.
- Shorter drilling time through omission of reversing cycles.

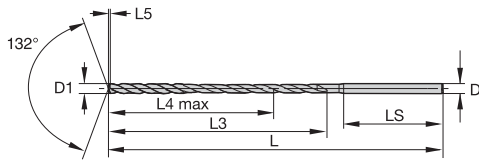
WU20PD™ Grade

- Advanced TiAlN multilayer PVD coating for steel and cast iron.
- Ultra fine-grain carbide ensures process reliability at high feed rates.

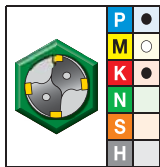
Customisation

- Intermediate sizes, even up to 16mm diameter, available as semi-standards.
- Length variations, including longer versions up to 550mm, available as custom solutions.
- For drilling non-ferrous and uncoated materials, sharp versions are recommended and available as custom solutions.
- Excellent surface finish and concentricity.





■ Deep Hole Drills for Steel and Cast Iron • 2 Flute • WU20PD™ • 15 x D • Z Shank

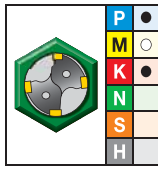


● first choice
○ alternate choice

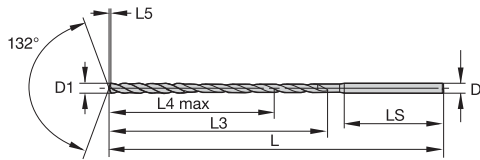
grade WU20PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L	pilot drill
order #	catalogue #	mm	in							
3899626	TDD105Z03000	3,000	.1181	3	53	45	0,6	30	86	TDS501A03000
3899627	TDD105Z03175	3,175	.1250	4	67	58	0,6	32	105	TDS501A03175
3899628	TDD105Z03500	3,500	.1378	4	68	59	0,7	32	105	TDS501A03500
3899629	TDD105Z03571	3,571	.1406	4	68	59	0,7	32	105	TDS501A03571
3899630	TDD105Z03800	3,800	.1496	4	69	60	0,8	32	105	TDS501A03800
3899631	TDD105Z03970	3,970	.1563	4	70	60	0,8	32	105	TDS501A03970
3899632	TDD105Z04000	4,000	.1575	4	70	60	0,8	32	105	TDS501A04000
3899683	TDD105Z04039	4,039	.1590	5	84	73	0,8	34	124	TDS501A04039
3899684	TDD105Z04300	4,300	.1693	5	85	74	0,9	34	124	TDS501A04300
3899685	TDD105Z04500	4,500	.1772	5	85	74	0,9	34	124	TDS501A04500
3899686	TDD105Z04623	4,623	.1820	5	86	74	1,0	34	124	TDS501A04623
3899687	TDD105Z04763	4,763	.1875	5	86	75	1,0	34	124	TDS501A04763
3899688	TDD105Z05000	5,000	.1969	5	87	75	1,0	34	124	TDS501A05000
3899689	TDD105Z05159	5,159	.2031	6	102	88	1,1	36	143	TDS501A05160
3899690	TDD105Z05410	5,410	.2130	6	102	89	1,1	36	143	TDS501A05410
3899691	TDD105Z05500	5,500	.2165	6	102	89	1,1	36	143	TDS501A05500
3899692	TDD105Z05558	5,558	.2188	6	102	89	1,2	36	143	TDS501A05558
3899693	TDD105Z05800	5,800	.2283	6	103	90	1,2	36	143	TDS501A05800
3899694	TDD105Z06000	6,000	.2362	6	104	90	1,2	36	143	TDS501A06000
3899695	TDD105Z06200	6,200	.2441	7	118	103	1,3	38	162	TDS501A06200
3899696	TDD105Z06350	6,350	.2500	7	119	104	1,3	38	162	TDS501A06350
3899697	TDD105Z06500	6,500	.2559	7	119	104	1,4	38	162	TDS501A06500
3899698	TDD105Z06528	6,528	.2570	7	119	104	1,4	38	162	TDS501A06528
3899699	TDD105Z06746	6,746	.2656	7	120	105	1,4	38	162	TDS501A06746

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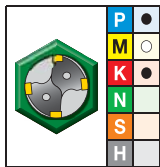
(Deep-Hole Drills for Steel and Cast Iron • 2 Flute • WU20PD™ • 15 x D • Z Shank — continued)


 ● first choice
 ○ alternate choice

grade WU20PD TAIN		D1 diameter								pilot drill
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L	
3899700	TDD105Z06800	6,800	.2677	7	120	105	1,4	38	162	TDS501A06800
3899701	TDD105Z06909	6,909	.2720	7	121	105	1,4	38	162	TDS501A06909
3899702	TDD105Z07000	7,000	.2756	7	121	105	1,5	38	162	TDS501A07000
3900612	TDD105Z07145	7,145	.2813	8	135	118	1,5	40	181	TDS501A07145
3900633	TDD105Z07500	7,500	.2953	8	136	119	1,6	40	181	TDS501A07500
3899764	TDD106Z07500	7,500	.2953	8	174	157	1,6	40	221	TDS501A07500
3900634	TDD105Z07541	7,541	.2969	8	136	119	1,6	40	181	TDS501A07541
3900635	TDD105Z07938	7,938	.3125	8	138	120	1,7	40	181	TDS501A07938
3900636	TDD105Z08000	8,000	.3150	8	138	120	1,7	40	181	TDS501A08000
3900637	TDD105Z08334	8,334	.3281	9	153	134	1,8	42	200	TDS501A08334
3900638	TDD105Z08433	8,433	.3320	9	153	134	1,8	42	200	TDS501A08433
3900639	TDD105Z08500	8,500	.3346	9	153	134	1,8	42	200	TDS501A08500
3900640	TDD105Z08733	8,733	.3438	9	154	135	1,8	42	200	TDS501A08733
3900641	TDD105Z09000	9,000	.3543	9	155	135	1,9	42	200	TDS501A09000
3900642	TDD105Z09347	9,347	.3680	10	170	149	2,0	44	219	TDS501A09347
3900643	TDD105Z09500	9,500	.3740	10	170	149	2,0	44	219	TDS501A09500
3900644	TDD105Z09525	9,525	.3750	10	170	149	2,0	44	219	TDS501A09525
3900645	TDD105Z09750	9,750	.3839	10	171	150	2,1	44	219	TDS501A09750
3900647	TDD105Z10000	10,000	.3937	10	172	150	2,1	44	219	TDS501A10000
3900648	TDD105Z10200	10,200	.4016	11	186	163	2,2	46	238	TDS501A10200
3900649	TDD105Z10320	10,317	.4062	11	187	164	2,2	46	238	TDS501A10317
3900650	TDD105Z10500	10,500	.4134	11	187	164	2,2	46	238	TDS501A10500
3900651	TDD105Z10716	10,716	.4219	11	188	164	2,3	46	238	TDS501A10716
3900652	TDD105Z11000	11,000	.4331	11	203	178	2,3	46	238	TDS501A11000
3900653	TDD105Z11113	11,113	.4375	12	203	178	2,4	48	257	TDS501A11113
3900654	TDD105Z11500	11,500	.4528	12	204	179	2,4	48	257	TDS501A11500
3900656	TDD105Z12000	12,000	.4724	12	206	180	2,5	48	257	TDS501A12000
3900657	TDD105Z12304	12,304	.4844	13	221	194	2,6	50	276	TDS501A12304
3900658	TDD105Z12500	12,500	.4921	13	221	194	2,7	50	276	TDS501A12500
3900659	TDD105Z12700	12,700	.5000	13	222	194	2,7	50	276	TDS501A12700
3900660	TDD105Z13000	13,000	.5118	13	223	195	2,8	50	276	TDS501A13000



■ Deep-Hole Drills for Steel and Cast Iron • 2 Flute • WU20PD™ • 20 x D • Z Shank

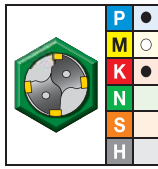


● first choice
○ alternate choice

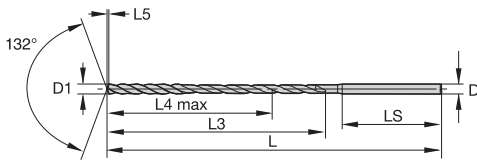
grade WU20PD TiAlN		D1 diameter		D	L3	L4 max	L5	LS	L	pilot drill
order #	catalogue #	mm	in							
3899782	TDD106Z03000	3,000	.1181	3	68	60	0,6	30	101	TDS501A03000
3899803	TDD106Z03175	3,175	.1250	4	83	74	0,6	32	125	TDS501A03175
3899804	TDD106Z03500	3,500	.1378	4	86	77	0,7	32	125	TDS501A03500
3899805	TDD106Z03571	3,571	.1406	4	86	77	0,7	32	125	TDS501A03571
3899806	TDD106Z03800	3,800	.1496	4	88	79	0,8	32	125	TDS501A03800
3899807	TDD106Z03970	3,970	.1563	4	89	80	0,8	32	125	TDS501A03970
3899808	TDD106Z04000	4,000	.1575	4	90	80	0,8	32	125	TDS501A04000
3899809	TDD106Z04039	4,039	.1590	5	104	93	0,8	34	149	TDS501A04039
3899810	TDD106Z04300	4,300	.1693	5	106	95	0,9	34	149	TDS501A04300
3899811	TDD106Z04500	4,500	.1772	5	108	97	0,9	34	149	TDS501A04500
3899812	TDD106Z04623	4,623	.1820	5	109	97	1,0	34	149	TDS501A04623
3899813	TDD106Z04763	4,763	.1875	5	110	98	1,0	34	149	TDS501A04763
3899814	TDD106Z05000	5,000	.1969	5	112	100	1,0	34	149	TDS501A05000
3899815	TDD106Z05159	5,159	.2031	6	128	114	1,1	36	173	TDS501A05160
3899816	TDD106Z05410	5,410	.2130	6	129	116	1,1	36	173	TDS501A05410
3899818	TDD106Z05500	5,500	.2165	6	130	117	1,1	36	173	TDS501A05500
3899819	TDD106Z05558	5,558	.2188	6	130	117	1,2	36	173	TDS501A05558
3899820	TDD106Z05800	5,800	.2283	6	132	119	1,2	36	173	TDS501A05800
3899821	TDD106Z06000	6,000	.2362	6	134	120	1,2	36	173	TDS501A06000
3899822	TDD106Z06200	6,200	.2441	7	149	134	1,3	38	197	TDS501A06200
3899823	TDD106Z06350	6,350	.2500	7	151	136	1,3	38	197	TDS501A06350
3899824	TDD106Z06500	6,500	.2559	7	152	137	1,4	38	197	TDS501A06500
3899825	TDD106Z06528	6,528	.2570	7	152	137	1,4	38	197	TDS501A06528
3899826	TDD106Z06746	6,746	.2656	7	154	138	1,4	38	197	TDS501A06746

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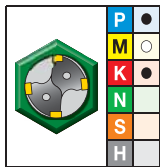
(Deep-Hole Drills for Steel and Cast Iron • 2 Flute • WU20PD™ • 20 x D • Z Shank — continued)


 ● first choice
 ○ alternate choice

grade WU20PD TAIN		D1 diameter								pilot drill
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L	
3899827	TDD106Z06800	6,800	.2677	7	154	139	1,4	38	197	TDS501A06800
3899828	TDD106Z06909	6,909	.2720	7	155	139	1,4	38	197	TDS501A06909
3899829	TDD106Z07000	7,000	.2756	7	156	140	1,5	38	197	TDS501A07000
3899763	TDD106Z07145	7,145	.2813	8	171	154	1,5	40	221	TDS501A07145
3899765	TDD106Z07541	7,541	.2969	8	174	157	1,6	40	221	TDS501A07541
3899766	TDD106Z07938	7,938	.3125	8	177	160	1,7	40	221	TDS501A07938
3899767	TDD106Z08000	8,000	.3150	8	178	160	1,7	40	221	TDS501A08000
3899768	TDD106Z08334	8,334	.3281	9	195	175	1,8	42	245	TDS501A08334
3899769	TDD106Z08433	8,433	.3320	9	195	176	1,8	42	245	TDS501A08433
3899770	TDD106Z08500	8,500	.3346	9	196	177	1,8	42	245	TDS501A08500
3899771	TDD106Z08733	8,733	.3438	9	198	178	1,8	42	245	TDS501A08733
3899772	TDD106Z09000	9,000	.3543	9	200	180	1,9	42	245	TDS501A09000
3899783	TDD106Z09347	9,347	.3680	10	217	195	2,0	44	269	TDS501A09347
3899784	TDD106Z09500	9,500	.3740	10	218	197	2,0	44	269	TDS501A09500
3899785	TDD106Z09525	9,525	.3750	10	218	197	2,0	44	269	TDS501A09525
3899786	TDD106Z09750	9,750	.3839	10	220	198	2,1	44	269	TDS501A09750
3899787	TDD106Z09921	9,921	.3906	10	221	199	2,1	44	269	TDS501A09921
3899788	TDD106Z10000	10,000	.3937	10	222	200	2,1	44	269	TDS501A10000
3899789	TDD106Z10200	10,200	.4016	11	237	214	2,2	46	293	TDS501A10200
3899790	TDD106Z10320	10,317	.4062	11	238	215	2,2	46	293	TDS501A10317
3899791	TDD106Z10500	10,500	.4134	11	240	217	2,2	46	293	TDS501A10500
3899792	TDD106Z10716	10,716	.4219	11	242	218	2,3	46	293	TDS501A10716
3899793	TDD106Z11000	11,000	.4331	11	258	233	2,3	46	317	TDS501A11000
3899794	TDD106Z11113	11,113	.4375	12	259	234	2,4	48	317	TDS501A11113
3899795	TDD106Z11500	11,500	.4528	12	262	237	2,4	48	317	TDS501A11500
3899797	TDD106Z12000	12,000	.4724	12	266	240	2,5	48	317	TDS501A12000
3899799	TDD106Z12500	12,500	.4921	13	284	257	2,7	50	341	TDS501A12500
3899800	TDD106Z12700	12,700	.5000	13	285	258	2,7	50	341	TDS501A12700
3899801	TDD106Z13000	13,000	.5118	13	288	260	2,8	50	341	TDS501A13000



■ Deep-Hole Drills for Steel and Cast Iron • 2 Flute • WU20PD™ • 25 x D • Z Shank

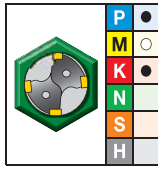


● first choice
○ alternate choice

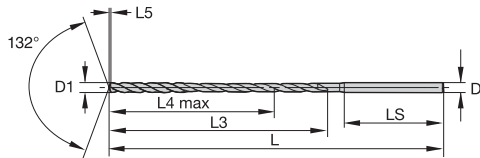
order #	catalogue #	D1 diameter		D	L3	L4 max	L5	LS	L	pilot drill
		mm	in							
3899708	TDD107Z03000	3,000	.1181	3	83	75	0,6	30	116	TDS501A03000
3899709	TDD107Z03175	3,175	.1250	4	99	90	0,6	32	145	TDS501A03175
3899710	TDD107Z03500	3,500	.1378	4	103	94	0,7	32	145	TDS501A03500
3899712	TDD107Z03800	3,800	.1496	4	107	98	0,8	32	145	TDS501A03800
3899733	TDD107Z03970	3,970	.1563	4	109	100	0,8	32	145	TDS501A03970
3899734	TDD107Z04000	4,000	.1575	4	110	100	0,8	32	145	TDS501A04000
3899735	TDD107Z04039	4,039	.1590	5	124	113	0,8	34	174	TDS501A04039
3899737	TDD107Z04500	4,500	.1772	5	130	119	0,9	34	174	TDS501A04500
3899739	TDD107Z04763	4,763	.1875	5	134	122	1,0	34	174	TDS501A04763
3899740	TDD107Z05000	5,000	.1969	5	137	125	1,0	34	174	TDS501A05000
3899743	TDD107Z05500	5,500	.2165	6	157	144	1,1	36	203	TDS501A05500
3899744	TDD107Z05558	5,558	.2188	6	158	145	1,2	36	203	TDS501A05558
3899745	TDD107Z05800	5,800	.2283	6	161	148	1,2	36	203	TDS501A05800
3899746	TDD107Z06000	6,000	.2362	6	164	150	1,2	36	203	TDS501A06000
3899748	TDD107Z06350	6,350	.2500	7	182	167	1,3	38	232	TDS501A06350
3899749	TDD107Z06500	6,500	.2559	7	184	169	1,4	38	232	TDS501A06500
3899750	TDD107Z06528	6,528	.2570	7	185	169	1,4	38	232	TDS501A06528
3899751	TDD107Z06746	6,746	.2656	7	188	172	1,4	38	232	TDS501A06746
3899753	TDD107Z06909	6,909	.2720	7	190	174	1,4	38	232	TDS501A06909
3899754	TDD107Z07000	7,000	.2756	7	191	175	1,5	38	232	TDS501A07000
3899567	TDD107Z07541	7,541	.2969	8	212	194	1,6	40	261	TDS501A07541
3899568	TDD107Z07938	7,938	.3125	8	217	199	1,7	40	261	TDS501A07938
3899569	TDD107Z08000	8,000	.3150	8	218	200	1,7	40	261	TDS501A08000
3899571	TDD107Z08433	8,433	.3320	9	237	218	1,8	42	290	TDS501A08433

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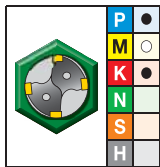
(Deep-Hole Drills for Steel and Cast Iron • 2 Flute • WU20PD™ • 25 x D • Z Shank — continued)


 ● first choice
 ○ alternate choice

grade WU20PD TAIN		D1 diameter								pilot drill
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L	
3899572	TDD107Z08500	8,500	.3346	9	238	219	1,8	42	290	TDS501A08500
3899603	TDD107Z08733	8,733	.3438	9	241	222	1,8	42	290	TDS501A08733
3899604	TDD107Z09000	9,000	.3543	9	245	225	1,9	42	290	TDS501A09000
3899605	TDD107Z09347	9,347	.3680	10	263	242	2,0	44	319	TDS501A09347
3899606	TDD107Z09500	9,500	.3740	10	265	244	2,0	44	319	TDS501A09500
3899607	TDD107Z09525	9,525	.3750	10	266	244	2,0	44	319	TDS501A09525
3899610	TDD107Z10000	10,000	.3937	10	272	250	2,1	44	319	TDS501A10000
3899611	TDD107Z10300	10,200	.4016	11	288	265	2,2	46	348	TDS501A10300
3899612	TDD107Z10320	10,317	.4062	11	290	267	2,2	46	348	TDS501A10317
3899613	TDD107Z10500	10,500	.4134	11	292	269	2,2	46	348	TDS501A10500
3899614	TDD107Z10716	10,716	.4219	11	295	272	2,3	46	348	TDS501A10716
3899615	TDD107Z11000	11,000	.4331	11	313	288	2,3	46	377	TDS501A11000
3899616	TDD107Z11113	11,113	.4375	12	314	289	2,4	48	377	TDS501A11113
3899617	TDD107Z11500	11,500	.4528	12	319	294	2,4	48	377	TDS501A11500
3899619	TDD107Z12000	12,000	.4724	12	326	300	2,5	48	377	TDS501A12000
3899621	TDD107Z12500	12,500	.4921	13	346	319	2,7	50	406	TDS501A12500
3899622	TDD107Z12700	12,700	.5000	13	349	321	2,7	50	406	TDS501A12700
3899623	TDD107Z13000	13,000	.5118	13	353	325	2,8	50	406	TDS501A13000



■ Deep-Hole Drills for Steel and Cast Iron • 2 Flute • WU20PD™ • 30 x D • Z Shank

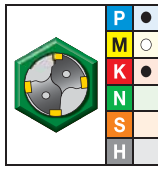


● first choice
○ alternate choice

order #	catalogue #	D1 diameter		D	L3	L4 max	L5	LS	L	pilot drill
		mm	in							
3899539	TDD108Z03000	3,000	.1181	3	98	90	0,6	30	131	TDS501A03000
3899540	TDD108Z03175	3,175	.1250	4	115	106	0,6	32	165	TDS501A03175
3899541	TDD108Z03500	3,500	.1378	4	121	112	0,7	32	165	TDS501A03500
3899542	TDD108Z03571	3,571	.1406	4	122	113	0,7	32	165	TDS501A03571
3899573	TDD108Z03800	3,800	.1496	4	126	117	0,8	32	165	TDS501A03800
3899574	TDD108Z03970	3,970	.1563	4	129	119	0,8	32	165	TDS501A03970
3899575	TDD108Z04000	4,000	.1575	4	130	120	0,8	32	165	TDS501A04000
3899576	TDD108Z04039	4,039	.1590	5	144	134	0,8	34	199	TDS501A04039
3899577	TDD108Z04300	4,300	.1693	5	149	138	0,9	34	199	TDS501A04300
3899578	TDD108Z04500	4,500	.1772	5	153	142	0,9	34	199	TDS501A04500
3899579	TDD108Z04623	4,623	.1820	5	155	144	1,0	34	199	TDS501A04623
3899580	TDD108Z04763	4,763	.1875	5	157	146	1,0	34	199	TDS501A04763
3899581	TDD108Z05000	5,000	.1969	5	162	150	1,0	34	199	TDS501A05000
3899582	TDD108Z05159	5,159	.2031	6	180	166	1,1	36	233	TDS501A05160
3899583	TDD108Z05410	5,410	.2130	6	183	170	1,1	36	233	TDS501A05410
3899584	TDD108Z05500	5,500	.2165	6	185	172	1,1	36	233	TDS501A05500
3899585	TDD108Z05558	5,558	.2188	6	186	172	1,2	36	233	TDS501A05558
3899586	TDD108Z05800	5,800	.2283	6	190	177	1,2	36	233	TDS501A05800
3899587	TDD108Z06000	6,000	.2362	6	194	180	1,2	36	233	TDS501A06000
3899588	TDD108Z06200	6,200	.2441	7	211	196	1,3	38	267	TDS501A06200
3899589	TDD108Z06350	6,350	.2500	7	214	199	1,3	38	267	TDS501A06350
3899590	TDD108Z06500	6,500	.2559	7	217	202	1,4	38	267	TDS501A06500
3899591	TDD108Z06528	6,528	.2570	7	217	202	1,4	38	267	TDS501A06528
3899592	TDD108Z06746	6,746	.2656	7	221	206	1,4	38	267	TDS501A06746

(continued)

(Deep-Hole Drills for Steel and Cast Iron • 2 Flute • WU20PD™ • 30 x D • Z Shank — continued)


 ● first choice
 ○ alternate choice

grade WU20PD TAIN		D1 diameter								
order #	catalogue #	mm	in	D	L3	L4 max	L5	LS	L	pilot drill
3899593	TDD108Z06800	6,800	.2677	7	222	207	1,4	38	267	TDS501A06800
3899594	TDD108Z06909	6,909	.2720	7	224	208	1,4	38	267	TDS501A06909
3899595	TDD108Z07000	7,000	.2756	7	226	210	1,5	38	267	TDS501A07000
3899600	TDD108Z07145	7,145	.2813	8	242	225	1,5	40	301	TDS501A07145
3899601	TDD108Z07500	7,500	.2953	8	249	232	1,6	40	301	TDS501A07500
3899653	TDD108Z07938	7,938	.3125	8	257	239	1,7	40	301	TDS501A07938
3899654	TDD108Z08000	8,000	.3150	8	258	240	1,7	40	301	TDS501A08000
3899655	TDD108Z08334	8,334	.3281	9	278	259	1,8	42	335	TDS501A08334
3899657	TDD108Z08500	8,500	.3346	9	281	262	1,8	42	335	TDS501A08500
3899658	TDD108Z08733	8,733	.3438	9	285	265	1,8	42	335	TDS501A08733
3899659	TDD108Z09000	9,000	.3543	9	290	270	1,9	42	335	TDS501A09000
3899661	TDD108Z09500	9,500	.3740	10	313	292	2,0	44	369	TDS501A09500
3899662	TDD108Z09525	9,525	.3750	10	313	292	2,0	44	369	TDS501A09525
3899663	TDD108Z09750	9,750	.3839	10	317	296	2,1	44	369	TDS501A09750
3899665	TDD108Z10000	10,000	.3937	10	322	300	2,1	44	369	TDS501A10000
3899666	TDD108Z10200	10,200	.4016	11	339	316	2,2	46	403	TDS501A10200
3899667	TDD108Z10320	10,317	.4062	11	342	318	2,2	46	403	TDS501A10317
3899668	TDD108Z10500	10,500	.4134	11	345	322	2,2	46	403	TDS501A10500
3899670	TDD108Z11000	11,000	.4331	11	368	343	2,3	46	437	TDS501A11000
3899671	TDD108Z11113	11,113	.4375	12	370	345	2,4	48	437	TDS501A11113
3899672	TDD108Z11500	11,500	.4528	12	377	352	2,4	48	437	TDS501A11500
3899674	TDD108Z12000	12,000	.4724	12	386	360	2,5	48	437	TDS501A12000
3899675	TDD108Z12304	12,304	.4844	13	405	378	2,6	50	471	TDS501A12304
3899676	TDD108Z12500	12,500	.4921	13	409	382	2,7	50	471	TDS501A12500
3899677	TDD108Z12700	12,700	.5000	13	412	385	2,7	50	471	TDS501A12700
3899678	TDD108Z13000	13,000	.5118	13	418	390	2,8	50	471	TDS501A13000

■ Series TDD • Deep-Hole SC Drills • Through Coolant Applications • Metric

Material Group	Cutting Speed – vc Range – m/min		Recommended Feed Rate (f) by Diameter									
	min	– max	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
	P	1	90 – 130	mm/r	0,08–0,12	0,12–0,18	0,18–0,20	0,20–0,22	0,22–0,25	0,25–0,28	0,28–0,30	0,30–0,34
	2	80 – 115	mm/r	0,08–0,12	0,12–0,18	0,18–0,20	0,20–0,22	0,22–0,25	0,25–0,28	0,28–0,30	0,30–0,34	
	3	70 – 110	mm/r	0,05–0,10	0,10–0,16	0,16–0,18	0,18–0,20	0,20–0,22	0,22–0,24	0,24–0,26	0,26–0,28	
	4	65 – 95	mm/r	0,05–0,10	0,10–0,16	0,16–0,18	0,18–0,20	0,20–0,22	0,22–0,24	0,24–0,26	0,26–0,28	
K	1	105 – 145	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38	
	2	85 – 120	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38	
	3	100 – 140	mm/r	0,10–0,15	0,15–0,20	0,20–0,25	0,25–0,28	0,28–0,30	0,30–0,33	0,33–0,36	0,36–0,38	

Metric tolerance

nominal size range	D1 tolerance	D1 tolerance	D tolerance h6
>3-6	0,000/-0,012	>3-6	0,000/-0,008
>6-10	0,000/-0,015	>6-10	0,000/-0,009
>10-13	0,000/-0,018	>10-13	0,000/-0,011



WIDIA™ TOP DRILL™ Deep-Hole Drills Customisation



EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

Diameters

- Intermediate sizes, even up to 16mm diameter, available as semi-standards.

Lengths

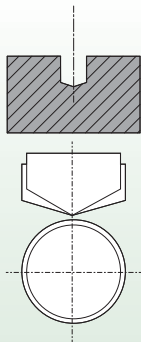
- Length variations, including longer versions up to 550mm depending on diameter, available as custom solutions.

Material-Specific

- For drilling non-ferrous materials, sharp and uncoated versions are recommended and available as custom solutions.

Consult the custom solutions department for specific applications.

WIDIA ™

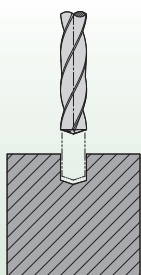


1) Pilot Drill Hole — IMPORTANT!

- The point angle of the pilot drill must be greater than one of the following deep-hole drills to protect its cutting corners.
- The diameter size of the pilot drill must be greater than one of the deep-hole drills to enable easy fit and protect margin lands. The required difference in diameter is covered by design with the different position of tolerance.
- Drill \varnothing = nominal \varnothing up to nominal +0,010mm.
- Depth of pilot hole: minimum 2 x D.
- Deeper pilot holes are preferable.

Recommendations:

- Use a conical (TDS*) or split-point drill to pilot (do not use a TDG, VariDrill™, or TDS 12 x D or any competitive drill).
- Check the pilot drill for wear, which can lead to premature wear on the TDD10* cutting edge and possibly catastrophic failure.
- TOP DRILL S™ for steel or cast iron (TDS4* series) and TOP DRILL S +™ for multiple applications (TDS501* series 3 x D and TD502* series 5 x D) with a 140° point angle are recommended.
- TDS503* series 8 x D and TDS504* series 12 x D is not recommended as the point angle is 132°!

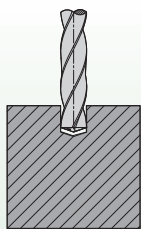


2) Feed TDD10* into Pilot Hole

- Max 500 RPM and recommended feed rate; no rapid traverse.
- Run anti-clockwise, especially in horizontal applications to protect the cutting edge, when entering the pilot hole.
- Depth: 1mm above the bottom of pilot hole.
- Feed TDD10* into pilot hole

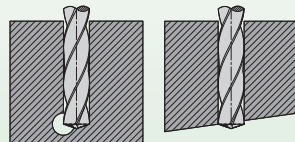
Recommendations:

- Reduce cutting speed to minimise imbalances in machine spindle/adaptor!



3) Drill Hole

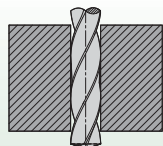
Cutting Parameters: Start recommended speed and feed rate at 1mm from the bottom of the pilot hole, clockwise.



Recommendations:

- DO NOT PECK OR DWELL up to 30 x D!
- With long-chipping steel materials, it may be necessary to increase feed rate by 10–20% to provide optimal chip control.
- For long-chipping aluminium materials, it may be necessary to decrease feed rate and increase speed.
- Reduce feed rate on angled exits and crossholes by 50–60%.

HP feed recommendations are usually higher than with competitive SC drills!



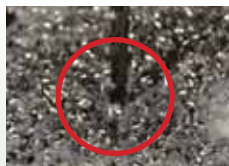
4) Drill Retraction

Cutting Parameters: 50–500 RPM and feed rate 2–6 m/min.

Recommendations:

To achieve the best tool performance, we recommend using the deep-hole drill with a hydraulic chuck.

Reduce cutting speed to minimise imbalances in machine spindle/adaptor!



5) Vertical Applications

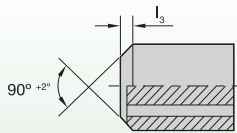
- If the pilot holes are close to each other, chips can fall into the neighboring hole.
- Do not enter a pilot hole that might contain chips with a deep hole drill to avoid chip jamming, wear, or breakage.
- If required holes are close to each other, use smart drilling strategies, make sure the pilot holes are getting properly cleaned, or switch to horizontal drilling.

Horizontal drilling process preferred for optimum chip evacuation.



6) Coolant

- For increased stability, the coolant channels of the TDD10* are smaller than on typical WIDIA™ drills.
- Steady supply of coolant delivered to the cutting edges necessary. If coolant supply is not steady or is unequal through both channels, check:
 - Coolant filtering system.
 - Sealing of adaptor/spindle.
 - Chips blocking the coolant hole on the drill shank.
- Make sure that the coolant supply reaches the cutting edge before drilling begins.
- Pressure by diameter: <5mm 40–50 bar maximum; >5mm 25 bar minimum.



MQL back end according to DIN 69090-3

7) Minimal Quantity Lubrication

- On MQL applications, make sure that the coolant is directly supplied from the chuck into the back end of the drill shank (without gap) to avoid leakage.
- Pressure should be between 1–10 bar depending on coolant hole size.
- Spray contains an amount of oil less than 50 ml/h.
- If required, the shank can be evenly optimised for MQL applications with enlarged 90° chamfer instead of 40°.



8) Shanks

- Other than normal SC Drills, TDD10* series have a “Z” shank, increasing with 1mm-steps.
- For drills with uneven shank size, use reduction sleeves to adapt the shank to the customer’s toolholder.
- The clamping force is better with increasing diameter.
- If required, DIN-shanks (even, 2mm steps) are available as custom solutions.

Achieve the best tool performance with hydraulic chucks.

D1	12mm hydraulic reducer sleeve		20mm hydraulic reducer sleeve		25mm hydraulic reducer sleeve		32mm hydraulic reducer sleeve		.500" hydraulic reducer sleeve		.750" hydraulic reducer sleeve	
	order number	catalogue number	order number	catalogue number	order number	catalogue number	order number	catalogue number	order number	catalogue number	order number	catalogue number
3	3026450	12MHC030M	3026648	20MHC030M	3026662	25MHC030M	–	–	2248993	50HC030M	2248995	75HC030M
4	3026451	12MHC040M	3026649	20MHC040M	3026663	25MHC040M	–	–	1606050	50HC040M	2248996	75HC040M
5	3026452	12MHC050M	3026650	20MHC050M	3026664	25MHC050M	–	–	2248994	50HC050M	2248997	75HC050M
6	3026643	12MHC060M	3026651	20MHC060M	3026665	25MHC060M	3026675	32MHC060M	1606061	50HC060M	1093271	75HC060M
7	3026644	12MHC070M	3026652	20MHC070M	3026666	25MHC070M	3026676	32MHC070M	–	–	–	–
8	3026645	12MHC080M	3026653	20MHC080M	3026667	25MHC080M	3026677	32MHC080M	1606062	50HC080M	1093272	75HC080M
9	3026646	12MHC090M	3026654	20MHC090M	3026668	25MHC090M	3026678	32MHC090M	–	–	–	–
10	3026647	12MHC100M	3026655	20MHC100M	3026669	25MHC100M	3026679	32MHC100M	1606064	50HC100M	1093273	75HC100M
11	–	–	3026656	20MHC110M	–	–	3026680	32MHC110M	–	–	–	–
12	–	–	3026657	20MHC120M	3026669	25MHC120M	3026681	32MHC120M	–	–	1093524	75HC120M
13	–	–	3026658	20MHC130M	–	–	3026682	32MHC130M	–	–	–	–
14	–	–	3026659	20MHC140M	3026671	25MHC140M	3026683	32MHC140M	–	–	1093525	75HC140M
15	–	–	3026660	20MHC150M	–	–	3026684	32MHC150M	–	–	–	–
16	–	–	3026661	20MHC160M	3026672	25MHC160M	3026685	32MHC160M	–	–	1093526	75HC160M

Difficult Drilling Applications •

WIDIA™ TOP DRILL G™ for Non-Ferrous Materials

TOP DRILL G



TOP DRILL G is WIDIA's solution for difficult drilling applications. Designed specifically for non-ferrous materials, TDG can be used on challenging applications with tighter hole tolerance, inclined planes, intersecting holes, and cored holes. The design of these drills also makes them appropriate for drilling custom aluminium applications.

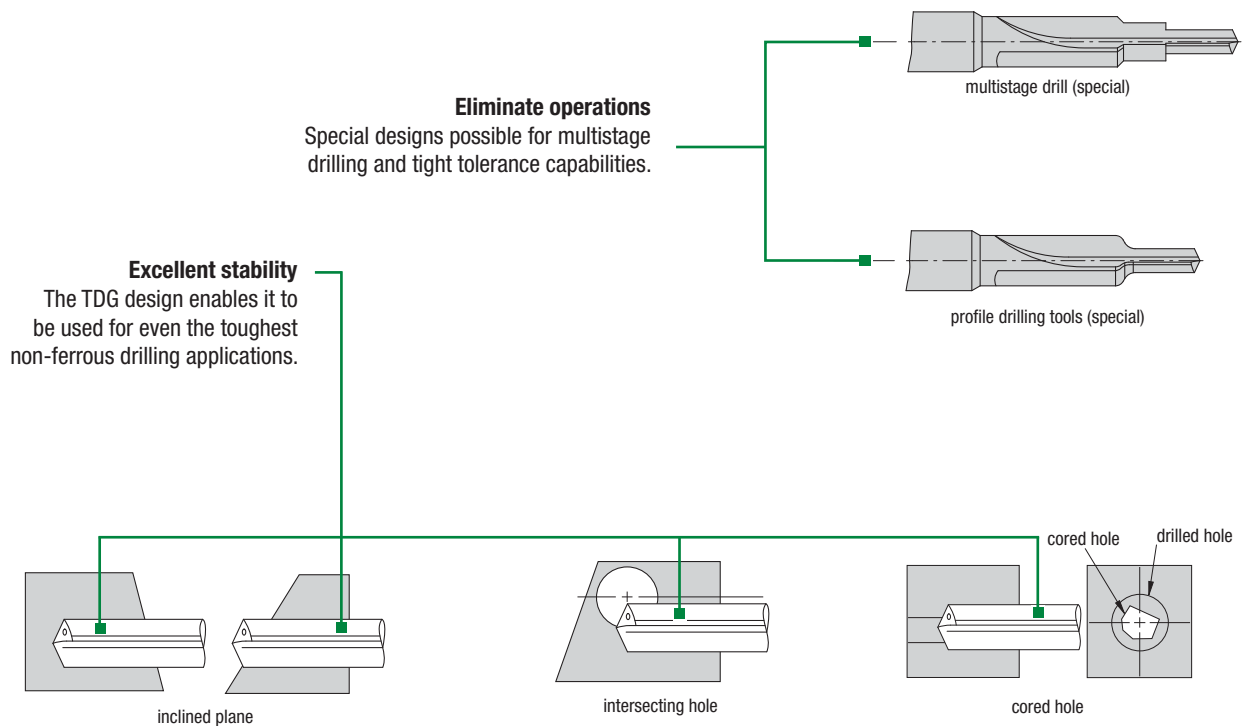
- Next generation of GGX WIDIA-Rübig™ series.
- Targeted for aluminium and non-ferrous materials.
- Can be used in challenging conditions.
- Good for multi-step drills.

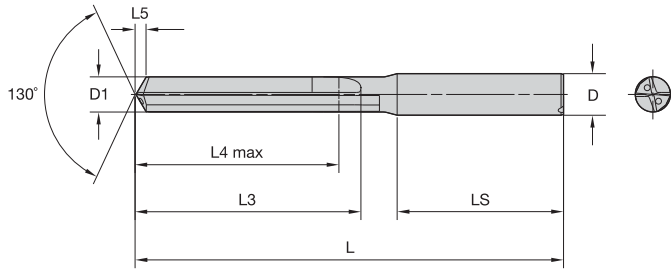
TOP DRILL G™ Design

TDG is designed to handle the toughest non-ferrous drilling applications. The WN10HD™ grade is the latest in application-specific technology. This advanced grade, combined with the TDG's optimal concentricity and safe transmission of torque, gives it long tool life and extreme repeatability. The design of TDG is optimised to evacuate “sticky” chips that result from drilling non-ferrous materials. Easily evacuating these difficult-to-remove chips results in better hole quality due to less heat and friction while drilling.

WIDIA™ Advantage

- Lower cost-per-hole due to high MRR and long tool life.
- Consistent performance from internally controlled supply chain:
Powder > Rod > Grinding > Coating
- Part of the complete WIDIA holemaking solution.
- Get more predictable results from local regrind services using OEM standards to recondition, ensuring value throughout the entire life of the drill.
- Broad range of standard lengths, diameters, and coolant options in one line. Includes extensive intermediate metric, inch, fraction, and wire sizes, including tap drill sizes.

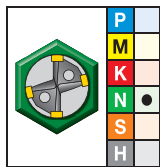




For information on L, L3, and L4 max, see page T143.



■ TDG532A • 5 x D



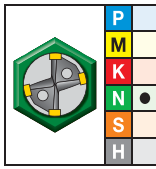
grade WN10HD

● first choice
○ alternate choice

order #	catalogue #	D1 diameter		L	L4 max	L3	L5	LS	D
		mm	in						
4157950	TDG532A03000	3,000	.1181	66	23	28	0,7	36	6
4157951	TDG532A03048	3,048	.1200	66	23	28	0,7	36	6
4157952	TDG532A03100	3,100	.1220	66	23	28	0,7	36	6
4157973	TDG532A03175	3,175	.1250	66	23	28	0,7	36	6
4157974	TDG532A03200	3,200	.1260	66	23	28	0,7	36	6
4157975	TDG532A03264	3,264	.1285	66	23	28	0,8	36	6
4157976	TDG532A03300	3,300	.1299	66	23	28	0,8	36	6
4157977	TDG532A03400	3,400	.1339	66	23	28	0,8	36	6
4157978	TDG532A03455	3,455	.1360	66	23	28	0,8	36	6
4157979	TDG532A03500	3,500	.1378	66	23	28	0,8	36	6
4157980	TDG532A03571	3,571	.1406	66	23	28	0,8	36	6
4157981	TDG532A03600	3,600	.1417	66	23	28	0,8	36	6
4157982	TDG532A03658	3,658	.1440	66	23	28	0,9	36	6
4157983	TDG532A03700	3,700	.1457	66	23	28	0,9	36	6
4157984	TDG532A03734	3,734	.1470	66	23	28	0,9	36	6
4157985	TDG532A03800	3,800	.1496	74	29	36	0,9	36	6
4157986	TDG532A03900	3,900	.1535	74	29	36	0,9	36	6
4157987	TDG532A03970	3,970	.1563	74	29	36	0,9	36	6
4157988	TDG532A04000	4,000	.1575	74	29	36	0,9	36	6
4157989	TDG532A04039	4,039	.1590	74	29	36	0,9	36	6
4157990	TDG532A04090	4,090	.1610	74	29	36	1,0	36	6
4157991	TDG532A04100	4,100	.1614	74	29	36	1,0	36	6
4157992	TDG532A04200	4,200	.1654	74	29	36	1,0	36	6
4157993	TDG532A04217	4,217	.1660	74	29	36	1,0	36	6

(continued)

(TDG532A • 5 x D – continued)

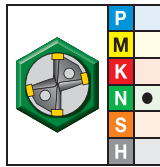


● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4157994	TDG532A04300	4,300	.1693	74	29	36	1,0	36	6
4157995	TDG532A04366	4,366	.1719	74	29	36	1,0	36	6
4157996	TDG532A04400	4,400	.1732	74	29	36	1,0	36	6
4157997	TDG532A04500	4,500	.1772	74	29	36	1,0	36	6
4157998	TDG532A04600	4,600	.1811	74	29	36	1,1	36	6
4157999	TDG532A04623	4,623	.1820	74	29	36	1,1	36	6
4158000	TDG532A04700	4,700	.1850	74	29	36	1,1	36	6
4158001	TDG532A04763	4,763	.1875	82	35	44	1,1	36	6
4158002	TDG532A04800	4,800	.1890	82	35	44	1,1	36	6
4158003	TDG532A04852	4,852	.1910	82	35	44	1,1	36	6
4158004	TDG532A04900	4,900	.1929	82	35	44	1,1	36	6
4158005	TDG532A05000	5,000	.1969	82	35	44	1,2	36	6
4158006	TDG532A05100	5,100	.2008	82	35	44	1,2	36	6
4158007	TDG532A05106	5,106	.2010	82	35	44	1,2	36	6
4158008	TDG532A05159	5,159	.2031	82	35	44	1,2	36	6
4158009	TDG532A05200	5,200	.2047	82	35	44	1,2	36	6
4158010	TDG532A05300	5,300	.2087	82	35	44	1,2	36	6
4158011	TDG532A05400	5,400	.2126	82	35	44	1,3	36	6
4158012	TDG532A05410	5,410	.2130	82	35	44	1,3	36	6
4158013	TDG532A05500	5,500	.2165	82	35	44	1,3	36	6
4158014	TDG532A05558	5,558	.2188	82	35	44	1,3	36	6
4158015	TDG532A05600	5,600	.2205	82	35	44	1,3	36	6
4158016	TDG532A05616	5,616	.2211	82	35	44	1,3	36	6
4158017	TDG532A05700	5,700	.2244	82	35	44	1,3	36	6
4158018	TDG532A05800	5,800	.2283	82	35	44	1,4	36	6
4158019	TDG532A05900	5,900	.2323	82	35	44	1,4	36	6
4158020	TDG532A05954	5,954	.2344	82	35	44	1,4	36	6
4158021	TDG532A06000	6,000	.2362	82	35	44	1,4	36	6
4158022	TDG532A06100	6,100	.2402	91	43	53	1,4	36	8
4158023	TDG532A06200	6,200	.2441	91	43	53	1,4	36	8
4158024	TDG532A06300	6,300	.2480	91	43	53	1,5	36	8
4158025	TDG532A06350	6,350	.2500	91	43	53	1,5	36	8
4158026	TDG532A06400	6,400	.2520	91	43	53	1,5	36	8
4158027	TDG532A06500	6,500	.2559	91	43	53	1,5	36	8
4158028	TDG532A06528	6,528	.2570	91	43	53	1,5	36	8
4158029	TDG532A06600	6,600	.2598	91	43	53	1,5	36	8
4158030	TDG532A06630	6,630	.2610	91	43	53	1,5	36	8
4158031	TDG532A06700	6,700	.2638	91	43	53	1,6	36	8
4158032	TDG532A06746	6,746	.2656	91	43	53	1,6	36	8
4158033	TDG532A06800	6,800	.2677	91	43	53	1,6	36	8

(continued)

(TDG532A • 5 x D – continued)

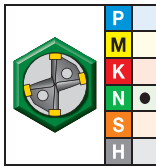


- first choice
- alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158034	TDG532A06900	6,900	.2717	91	43	53	1,6	36	8
4158035	TDG532A07000	7,000	.2756	91	43	53	1,6	36	8
4158036	TDG532A07100	7,100	.2795	91	43	53	1,7	36	8
4158037	TDG532A07145	7,145	.2813	91	43	53	1,7	36	8
4158038	TDG532A07200	7,200	.2835	91	43	53	1,7	36	8
4158039	TDG532A07300	7,300	.2874	91	43	53	1,7	36	8
4158040	TDG532A07400	7,400	.2913	91	43	53	1,7	36	8
4158041	TDG532A07500	7,500	.2953	91	43	53	1,7	36	8
4158042	TDG532A07541	7,541	.2969	91	43	53	1,8	36	8
4158043	TDG532A07600	7,600	.2992	91	43	53	1,8	36	8
4158044	TDG532A07700	7,700	.3031	91	43	53	1,8	36	8
4158045	TDG532A07800	7,800	.3071	91	43	53	1,8	36	8
4158046	TDG532A07900	7,900	.3110	91	43	53	1,8	36	8
4158047	TDG532A07938	7,938	.3125	91	43	53	1,9	36	8
4158048	TDG532A08000	8,000	.3150	91	43	53	1,9	36	8
4158049	TDG532A08100	8,100	.3189	103	49	61	1,9	40	10
4158050	TDG532A08200	8,200	.3228	103	49	61	1,9	40	10
4158051	TDG532A08300	8,300	.3268	103	49	61	1,9	40	10
4158052	TDG532A08334	8,334	.3281	103	49	61	1,9	40	10
4158053	TDG532A08400	8,400	.3307	103	49	61	2,0	40	10
4158054	TDG532A08433	8,433	.3320	103	49	61	2,0	40	10
4158055	TDG532A08500	8,500	.3346	103	49	61	2,0	40	10
4158056	TDG532A08600	8,600	.3386	103	49	61	2,0	40	10
4158057	TDG532A08700	8,700	.3425	103	49	61	2,0	40	10
4158058	TDG532A08733	8,733	.3438	103	49	61	2,0	40	10
4158059	TDG532A08800	8,800	.3465	103	49	61	2,1	40	10
4158060	TDG532A08900	8,900	.3504	103	49	61	2,1	40	10
4158061	TDG532A09000	9,000	.3543	103	49	61	2,1	40	10
4158062	TDG532A09100	9,100	.3583	103	49	61	2,1	40	10
4158063	TDG532A09129	9,129	.3594	103	49	61	2,1	40	10
4158064	TDG532A09200	9,200	.3622	103	49	61	2,1	40	10
4158065	TDG532A09300	9,300	.3661	103	49	61	2,2	40	10
4158066	TDG532A09347	9,347	.3680	103	49	61	2,2	40	10
4158067	TDG532A09400	9,400	.3701	103	49	61	2,2	40	10
4158068	TDG532A09500	9,500	.3740	103	49	61	2,2	40	10
4158069	TDG532A09525	9,525	.3750	103	49	61	2,2	40	10
4158070	TDG532A09600	9,600	.3780	103	49	61	2,2	40	10
4158071	TDG532A09700	9,700	.3819	103	49	61	2,3	40	10
4158072	TDG532A09800	9,800	.3858	103	49	61	2,3	40	10
4158073	TDG532A09900	9,900	.3898	103	49	61	2,3	40	10

(continued)

(TDG532A • 5 x D – continued)



● first choice
○ alternate choice

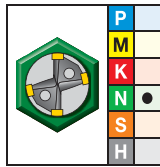
grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158074	TDG532A09921	9,921	.3906	103	49	61	2,3	40	10
4158081	TDG532A10000	10,000	.3937	103	49	61	2,3	40	10
4158082	TDG532A10100	10,100	.3976	118	56	71	2,4	45	12
4158353	TDG532A10200	10,200	.4016	118	56	71	2,4	45	12
4158354	TDG532A10300	10,300	.4055	118	56	71	2,4	45	12
4158355	TDG532A10320	10,320	.4063	118	56	71	2,4	45	12
4158356	TDG532A10400	10,400	.4094	118	56	71	2,4	45	12
4158357	TDG532A10500	10,500	.4134	118	56	71	2,4	45	12
4158358	TDG532A10600	10,600	.4173	118	56	71	2,5	45	12
4158359	TDG532A10700	10,700	.4213	118	56	71	2,5	45	12
4158360	TDG532A10716	10,716	.4219	118	56	71	2,5	45	12
4158361	TDG532A10800	10,800	.4252	118	56	71	2,5	45	12
4158362	TDG532A10900	10,900	.4291	118	56	71	2,5	45	12
4158363	TDG532A11000	11,000	.4331	118	56	71	2,6	45	12
4158364	TDG532A11100	11,100	.4370	118	56	71	2,6	45	12
4158365	TDG532A11113	11,113	.4375	118	56	71	2,6	45	12
4158366	TDG532A11200	11,200	.4409	118	56	71	2,6	45	12
4158367	TDG532A11300	11,300	.4449	118	56	71	2,6	45	12
4158368	TDG532A11400	11,400	.4488	118	56	71	2,7	45	12
4158369	TDG532A11500	11,500	.4528	118	56	71	2,7	45	12
4158370	TDG532A11509	11,509	.4531	118	56	71	2,7	45	12
4158371	TDG532A11600	11,600	.4567	118	56	71	2,7	45	12
4158372	TDG532A11700	11,700	.4606	118	56	71	2,7	45	12
4158373	TDG532A11800	11,800	.4646	118	56	71	2,8	45	12
4158374	TDG532A11900	11,900	.4685	118	56	71	2,8	45	12
4158375	TDG532A11908	11,908	.4688	118	56	71	2,8	45	12
4158376	TDG532A12000	12,000	.4724	118	56	71	2,8	45	12
4158377	TDG532A12100	12,100	.4764	124	60	77	2,8	45	14
4158378	TDG532A12200	12,200	.4803	124	60	77	2,8	45	14
4158379	TDG532A12300	12,300	.4843	124	60	77	2,9	45	14
4158380	TDG532A12304	12,304	.4844	124	60	77	2,9	45	14
4158381	TDG532A12400	12,400	.4882	124	60	77	2,9	45	14
4158382	TDG532A12500	12,500	.4921	124	60	77	2,9	45	14
4158383	TDG532A12600	12,600	.4961	124	60	77	2,9	45	14
4158384	TDG532A12700	12,700	.5000	124	60	77	3,0	45	14
4158385	TDG532A12800	12,800	.5039	124	60	77	3,0	45	14
4158386	TDG532A12900	12,900	.5079	124	60	77	3,0	45	14
4158387	TDG532A13000	13,000	.5118	124	60	77	3,0	45	14
4158388	TDG532A13096	13,096	.5156	124	60	77	3,1	45	14
4158389	TDG532A13100	13,100	.5157	124	60	77	3,1	45	14

(continued)



Solid Carbide Drills

(TDG532A • 5 x D – continued)

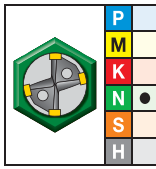


● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158390	TDG532A13200	13,200	.5197	124	60	77	3,1	45	14
4158391	TDG532A13300	13,300	.5236	124	60	77	3,1	45	14
4158392	TDG532A13400	13,400	.5276	124	60	77	3,1	45	14
4158448	TDG532A13490	13,490	.5311	124	60	77	3,1	45	14
4158393	TDG532A13500	13,500	.5315	124	60	77	3,1	45	14
4158394	TDG532A13600	13,600	.5354	124	60	77	3,2	45	14
4158395	TDG532A13700	13,700	.5394	124	60	77	3,2	45	14
4158396	TDG532A13800	13,800	.5433	124	60	77	3,2	45	14
4158397	TDG532A13891	13,891	.5469	124	60	77	3,2	45	14
4158398	TDG532A13900	13,900	.5472	124	60	77	3,2	45	14
4158399	TDG532A14000	14,000	.5512	124	60	77	3,3	45	14
4158400	TDG532A14100	14,100	.5551	133	63	83	3,3	48	16
4158401	TDG532A14200	14,200	.5591	133	63	83	3,3	48	16
4158402	TDG532A14288	14,288	.5625	133	63	83	3,3	48	16
4158403	TDG532A14300	14,300	.5630	133	63	83	3,3	48	16
4158404	TDG532A14400	14,400	.5669	133	63	83	3,4	48	16
4158405	TDG532A14500	14,500	.5709	133	63	83	3,4	48	16
4158406	TDG532A14600	14,600	.5748	133	63	83	3,4	48	16
4158407	TDG532A14684	14,684	.5781	133	63	83	3,4	48	16
4158408	TDG532A14700	14,700	.5787	133	63	83	3,4	48	16
4158409	TDG532A14800	14,800	.5827	133	63	83	3,5	48	16
4158410	TDG532A14900	14,900	.5866	133	63	83	3,5	48	16
4158411	TDG532A15000	15,000	.5906	133	63	83	3,5	48	16
4158412	TDG532A15083	15,083	.5938	133	63	83	3,5	48	16
4158413	TDG532A15100	15,100	.5945	133	63	83	3,5	48	16
4158414	TDG532A15200	15,200	.5984	133	63	83	3,5	48	16
4158415	TDG532A15300	15,300	.6024	133	63	83	3,6	48	16
4158416	TDG532A15400	15,400	.6063	133	63	83	3,6	48	16
4158417	TDG532A15479	15,479	.6094	133	63	83	3,6	48	16
4158418	TDG532A15500	15,500	.6102	133	63	83	3,6	48	16
4158419	TDG532A15600	15,600	.6142	133	63	83	3,6	48	16
4158420	TDG532A15700	15,700	.6181	133	63	83	3,7	48	16
4158421	TDG532A15800	15,800	.6220	133	63	83	3,7	48	16
4158422	TDG532A15875	15,875	.6250	133	63	83	3,7	48	16
4158423	TDG532A15900	15,900	.6260	133	63	83	3,7	48	16
4158424	TDG532A16000	16,000	.6299	133	63	83	3,7	48	16
4158425	TDG532A16100	16,100	.6339	143	71	93	3,8	48	18
4158426	TDG532A16200	16,200	.6378	143	71	93	3,8	48	18
4158427	TDG532A16271	16,271	.6406	143	71	93	3,8	48	18
4158428	TDG532A16300	16,300	.6417	143	71	93	3,8	48	18

(continued)

(TDG532A • 5 x D – continued)



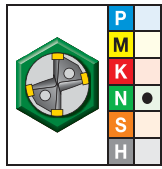
● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158429	TDG532A16400	16,400	.6457	143	71	93	3,8	48	18
4158430	TDG532A16500	16,500	.6496	143	71	93	3,8	48	18
4158431	TDG532A16600	16,600	.6535	143	71	93	3,9	48	18
4158432	TDG532A16670	16,670	.6563	143	71	93	3,9	48	18
4158433	TDG532A16700	16,700	.6575	143	71	93	3,9	48	18
4158434	TDG532A16800	16,800	.6614	143	71	93	3,9	48	18
4158435	TDG532A16900	16,900	.6654	143	71	93	3,9	48	18
4158436	TDG532A17000	17,000	.6693	143	71	93	4,0	48	18
4158437	TDG532A17100	17,100	.6732	143	71	93	4,0	48	18
4158438	TDG532A17200	17,200	.6772	143	71	93	4,0	48	18
4158439	TDG532A17300	17,300	.6811	143	71	93	4,0	48	18
4158440	TDG532A17400	17,400	.6850	143	71	93	4,1	48	18
4158441	TDG532A17463	17,463	.6875	143	71	93	4,1	48	18
4158442	TDG532A17500	17,500	.6890	143	71	93	4,1	48	18
4158443	TDG532A17600	17,600	.6929	143	71	93	4,1	48	18
4158444	TDG532A17700	17,700	.6969	143	71	93	4,1	48	18
4158445	TDG532A17800	17,800	.7008	143	71	93	4,2	48	18
4158446	TDG532A17859	17,859	.7031	143	71	93	4,2	48	18
4158447	TDG532A17900	17,900	.7047	143	71	93	4,2	48	18
4158555	TDG532A18000	18,000	.7087	143	71	93	4,2	48	18
4158557	TDG532A18100	18,100	.7126	153	77	101	4,2	50	20
4158559	TDG532A18200	18,200	.7165	153	77	101	4,2	50	20
4158561	TDG532A18258	18,258	.7188	153	77	101	4,3	50	20
4158573	TDG532A18300	18,300	.7205	153	77	101	4,3	50	20
4158575	TDG532A18400	18,400	.7244	153	77	101	4,3	50	20
4158577	TDG532A18500	18,500	.7283	153	77	101	4,3	50	20
4158579	TDG532A18600	18,600	.7323	153	77	101	4,3	50	20
4158581	TDG532A18654	18,654	.7344	153	77	101	4,3	50	20
4158584	TDG532A18700	18,700	.7362	153	77	101	4,4	50	20
4158585	TDG532A18800	18,800	.7402	153	77	101	4,4	50	20
4158587	TDG532A18900	18,900	.7441	153	77	101	4,4	50	20
4158589	TDG532A19000	19,000	.7480	153	77	101	4,4	50	20
4158591	TDG532A19050	19,050	.7500	153	77	101	4,4	50	20
4158603	TDG532A19100	19,100	.7520	153	77	101	4,5	50	20
4158605	TDG532A19200	19,200	.7559	153	77	101	4,5	50	20
4158607	TDG532A19300	19,300	.7598	153	77	101	4,5	50	20
4158609	TDG532A19400	19,400	.7638	153	77	101	4,5	50	20
4158611	TDG532A19500	19,500	.7677	153	77	101	4,5	50	20
4158613	TDG532A19600	19,600	.7717	153	77	101	4,6	50	20
4158616	TDG532A19700	19,700	.7756	153	77	101	4,6	50	20

(continued)

Solid Carbide Drills

(TDG532A • 5 x D – continued)



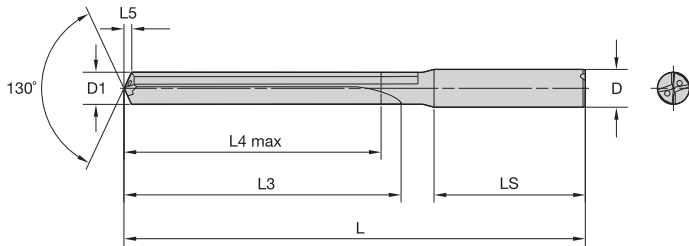
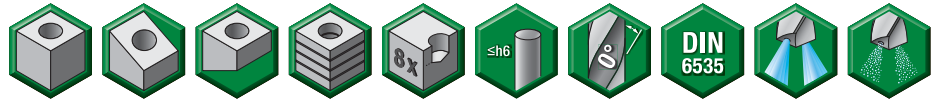
grade WN10HD

D1 diameter

- first choice
- alternate choice

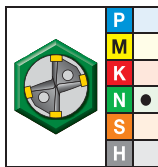
order #	catalogue #	D1 diameter		L	L4 max	L3	L5	LS	D
		mm	in						
4158618	TDG532A19800	19,800	.7795	153	77	101	4,6	50	20
4158620	TDG532A19900	19,900	.7835	153	77	101	4,6	50	20
4158622	TDG532A20000	20,000	.7874	153	77	101	4,7	50	20
4158634	TDG532A21000	21,000	.8268	167	85	114	4,9	50	20
4158636	TDG532A22000	22,000	.8661	167	85	114	5,1	50	20
4158637	TDG532A23000	23,000	.9055	184	98	126	5,4	56	25





For information on L, L3, and L4 max, see page T143.

■ TDG533A • 8 x D



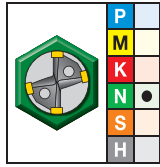
grade WN10HD

- first choice
- alternate choice

order #	catalogue #	D1 diameter		L	L4 max	L3	L5	LS	D
		mm	in						
4158475	TDG533A03000	3,000	.1181	78	33	40	0,7	36	6
4158476	TDG533A03048	3,048	.1200	78	33	40	0,7	36	6
4158477	TDG533A03100	3,100	.1220	78	33	40	0,7	36	6
4158478	TDG533A03175	3,175	.1250	78	33	40	0,7	36	6
4158479	TDG533A03200	3,200	.1260	78	33	40	0,7	36	6
4158480	TDG533A03264	3,264	.1285	78	33	40	0,8	36	6
4158481	TDG533A03300	3,300	.1299	78	33	40	0,8	36	6
4158482	TDG533A03400	3,400	.1339	78	33	40	0,8	36	6
4158553	TDG533A03455	3,455	.1360	78	33	40	0,8	36	6
4158554	TDG533A03500	3,500	.1378	78	33	40	0,8	36	6
4158556	TDG533A03571	3,571	.1406	78	33	40	0,8	36	6
4158558	TDG533A03600	3,600	.1417	78	33	40	0,8	36	6
4158560	TDG533A03658	3,658	.1440	78	33	40	0,9	36	6
4158562	TDG533A03700	3,700	.1457	78	33	40	0,9	36	6
4158574	TDG533A03734	3,734	.1470	78	33	40	0,9	36	6
4158576	TDG533A03800	3,800	.1496	87	41	49	0,9	36	6
4158578	TDG533A03900	3,900	.1535	87	41	49	0,9	36	6
4158580	TDG533A03970	3,970	.1563	87	41	49	0,9	36	6
4158582	TDG533A04000	4,000	.1575	87	41	49	0,9	36	6
4158583	TDG533A04039	4,039	.1590	87	41	49	0,9	36	6
4158586	TDG533A04090	4,090	.1610	87	41	49	1,0	36	6
4158588	TDG533A04100	4,100	.1614	87	41	49	1,0	36	6
4158590	TDG533A04200	4,200	.1654	87	41	49	1,0	36	6
4158592	TDG533A04217	4,217	.1660	87	41	49	1,0	36	6

(continued)

(TDG533A • 8 x D – continued)

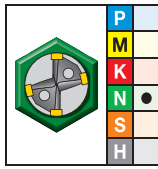


● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158604	TDG533A04300	4,300	.1693	87	41	49	1,0	36	6
4158606	TDG533A04366	4,366	.1719	87	41	49	1,0	36	6
4158608	TDG533A04400	4,400	.1732	87	41	49	1,0	36	6
4158610	TDG533A04500	4,500	.1772	87	41	49	1,0	36	6
4158612	TDG533A04600	4,600	.1811	87	41	49	1,1	36	6
4158614	TDG533A04623	4,623	.1820	87	41	49	1,1	36	6
4158615	TDG533A04700	4,700	.1850	87	41	49	1,1	36	6
4158617	TDG533A04763	4,763	.1875	94	48	56	1,1	36	6
4158619	TDG533A04800	4,800	.1890	94	48	56	1,1	36	6
4158621	TDG533A04852	4,852	.1910	94	48	56	1,1	36	6
4158633	TDG533A04900	4,900	.1929	94	48	56	1,1	36	6
4158635	TDG533A05000	5,000	.1969	94	48	56	1,2	36	6
4158638	TDG533A05100	5,100	.2008	94	48	56	1,2	36	6
4158639	TDG533A05106	5,106	.2010	94	48	56	1,2	36	6
4158640	TDG533A05159	5,159	.2031	94	48	56	1,2	36	6
4158641	TDG533A05200	5,200	.2047	94	48	56	1,2	36	6
4158642	TDG533A05300	5,300	.2087	94	48	56	1,2	36	6
4158653	TDG533A05400	5,400	.2126	94	48	56	1,3	36	6
4158654	TDG533A05410	5,410	.2130	94	48	56	1,3	36	6
4158655	TDG533A05500	5,500	.2165	94	48	56	1,3	36	6
4158656	TDG533A05558	5,558	.2188	94	48	56	1,3	36	6
4158657	TDG533A05600	5,600	.2205	94	48	56	1,3	36	6
4158658	TDG533A05616	5,616	.2211	94	48	56	1,3	36	6
4158659	TDG533A05700	5,700	.2244	94	48	56	1,3	36	6
4158660	TDG533A05800	5,800	.2283	94	48	56	1,4	36	6
4158661	TDG533A05900	5,900	.2323	94	48	56	1,4	36	6
4158662	TDG533A05954	5,954	.2344	94	48	56	1,4	36	6
4158673	TDG533A06000	6,000	.2362	94	48	56	1,4	36	6
4158674	TDG533A06100	6,100	.2402	105	57	67	1,4	36	8
4158675	TDG533A06200	6,200	.2441	105	57	67	1,4	36	8
4158676	TDG533A06300	6,300	.2480	105	57	67	1,5	36	8
4158677	TDG533A06350	6,350	.2500	105	57	67	1,5	36	8
4158678	TDG533A06400	6,400	.2520	105	57	67	1,5	36	8
4158679	TDG533A06500	6,500	.2559	105	57	67	1,5	36	8
4158680	TDG533A06528	6,528	.2570	105	57	67	1,5	36	8
4158681	TDG533A06600	6,600	.2598	105	57	67	1,5	36	8
4158682	TDG533A06630	6,630	.2610	105	57	67	1,5	36	8
4158693	TDG533A06700	6,700	.2638	105	57	67	1,6	36	8
4158694	TDG533A06746	6,746	.2656	105	57	67	1,6	36	8
4158695	TDG533A06800	6,800	.2677	105	57	67	1,6	36	8

(continued)

(TDG533A • 8 x D – continued)

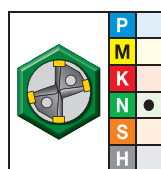


● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158696	TDG533A06900	6,900	.2717	105	57	67	1,6	36	8
4158697	TDG533A07000	7,000	.2756	105	57	67	1,6	36	8
4158698	TDG533A07100	7,100	.2795	110	61	72	1,7	36	8
4158699	TDG533A07145	7,145	.2813	110	61	72	1,7	36	8
4158700	TDG533A07200	7,200	.2835	110	61	72	1,7	36	8
4158701	TDG533A07300	7,300	.2874	110	61	72	1,7	36	8
4158702	TDG533A07400	7,400	.2913	110	61	72	1,7	36	8
4158713	TDG533A07500	7,500	.2953	110	61	72	1,7	36	8
4158714	TDG533A07541	7,541	.2969	110	61	72	1,8	36	8
4158715	TDG533A07600	7,600	.2992	110	61	72	1,8	36	8
4158716	TDG533A07700	7,700	.3031	110	61	72	1,8	36	8
4158717	TDG533A07800	7,800	.3071	110	61	72	1,8	36	8
4158718	TDG533A07900	7,900	.3110	110	61	72	1,8	36	8
4158719	TDG533A07938	7,938	.3125	110	61	72	1,9	36	8
4158720	TDG533A08000	8,000	.3150	110	61	72	1,9	36	8
4158721	TDG533A08100	8,100	.3189	122	68	80	1,9	40	10
4158722	TDG533A08200	8,200	.3228	122	68	80	1,9	40	10
4158733	TDG533A08300	8,300	.3268	122	68	80	1,9	40	10
4158734	TDG533A08334	8,334	.3281	122	68	80	1,9	40	10
4158735	TDG533A08400	8,400	.3307	122	68	80	2,0	40	10
4158736	TDG533A08433	8,433	.3320	122	68	80	2,0	40	10
4158737	TDG533A08500	8,500	.3346	122	68	80	2,0	40	10
4158738	TDG533A08600	8,600	.3386	122	68	80	2,0	40	10
4158739	TDG533A08700	8,700	.3425	122	68	80	2,0	40	10
4158740	TDG533A08733	8,733	.3438	122	68	80	2,0	40	10
4158741	TDG533A08800	8,800	.3465	122	68	80	2,1	40	10
4158742	TDG533A08900	8,900	.3504	122	68	80	2,1	40	10
4158743	TDG533A09000	9,000	.3543	122	68	80	2,1	40	10
4158744	TDG533A09100	9,100	.3583	122	68	80	2,1	40	10
4158745	TDG533A09129	9,129	.3594	122	68	80	2,1	40	10
4158746	TDG533A09200	9,200	.3622	122	68	80	2,1	40	10
4158747	TDG533A09300	9,300	.3661	122	68	80	2,2	40	10
4158748	TDG533A09347	9,347	.3680	122	68	80	2,2	40	10
4158749	TDG533A09400	9,400	.3701	122	68	80	2,2	40	10
4158750	TDG533A09500	9,500	.3740	122	68	80	2,2	40	10
4158751	TDG533A09525	9,525	.3750	122	68	80	2,2	40	10
4158752	TDG533A09600	9,600	.3780	122	68	80	2,2	40	10
4158753	TDG533A09700	9,700	.3819	122	68	80	2,3	40	10
4158754	TDG533A09800	9,800	.3858	122	68	80	2,3	40	10
4158755	TDG533A09900	9,900	.3898	122	68	80	2,3	40	10

(continued)

(TDG533A • 8 x D – continued)

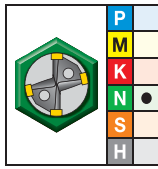


● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158756	TDG533A09921	9,921	.3906	122	68	80	2,3	40	10
4158520	TDG533A10000	10,000	.3937	122	68	80	2,3	40	10
4158521	TDG533A10100	10,100	.3976	141	79	94	2,4	45	12
4158522	TDG533A10200	10,200	.4016	141	79	94	2,4	45	12
4158533	TDG533A10300	10,300	.4055	141	79	94	2,4	45	12
4158534	TDG533A10320	10,320	.4063	141	79	94	2,4	45	12
4158535	TDG533A10400	10,400	.4094	141	79	94	2,4	45	12
4158536	TDG533A10500	10,500	.4134	141	79	94	2,4	45	12
4158537	TDG533A10600	10,600	.4173	141	79	94	2,5	45	12
4158538	TDG533A10700	10,700	.4213	141	79	94	2,5	45	12
4158539	TDG533A10716	10,716	.4219	141	79	94	2,5	45	12
4158540	TDG533A10800	10,800	.4252	141	79	94	2,5	45	12
4158541	TDG533A10900	10,900	.4291	141	79	94	2,5	45	12
4158542	TDG533A11000	11,000	.4331	141	79	94	2,6	45	12
4158543	TDG533A11100	11,100	.4370	141	79	94	2,6	45	12
4158544	TDG533A11113	11,113	.4375	141	79	94	2,6	45	12
4158545	TDG533A11200	11,200	.4409	141	79	94	2,6	45	12
4158546	TDG533A11300	11,300	.4449	141	79	94	2,6	45	12
4158547	TDG533A11400	11,400	.4488	141	79	94	2,7	45	12
4158548	TDG533A11500	11,500	.4528	141	79	94	2,7	45	12
4158549	TDG533A11509	11,509	.4531	141	79	94	2,7	45	12
4158550	TDG533A11600	11,600	.4567	141	79	94	2,7	45	12
4158551	TDG533A11700	11,700	.4606	141	79	94	2,7	45	12
4158552	TDG533A11800	11,800	.4646	141	79	94	2,8	45	12
4158563	TDG533A11900	11,900	.4685	141	79	94	2,8	45	12
4158564	TDG533A11908	11,908	.4688	141	79	94	2,8	45	12
4158565	TDG533A12000	12,000	.4724	141	79	94	2,8	45	12
4158566	TDG533A12100	12,100	.4764	155	91	108	2,8	45	14
4158567	TDG533A12200	12,200	.4803	155	91	108	2,8	45	14
4158568	TDG533A12300	12,300	.4843	155	91	108	2,9	45	14
4158569	TDG533A12304	12,304	.4844	155	91	108	2,9	45	14
4158570	TDG533A12400	12,400	.4882	155	91	108	2,9	45	14
4158571	TDG533A12500	12,500	.4921	155	91	108	2,9	45	14
4158572	TDG533A12600	12,600	.4961	155	91	108	2,9	45	14
4158593	TDG533A12700	12,700	.5000	155	91	108	3,0	45	14
4158594	TDG533A12800	12,800	.5039	155	91	108	3,0	45	14
4158595	TDG533A12900	12,900	.5079	155	91	108	3,0	45	14
4158596	TDG533A13000	13,000	.5118	155	91	108	3,0	45	14
4158597	TDG533A13096	13,096	.5156	155	91	108	3,1	45	14
4158598	TDG533A13100	13,100	.5157	155	91	108	3,1	45	14

(continued)

(TDG533A • 8 x D – continued)



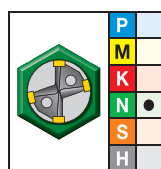
● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158599	TDG533A13200	13,200	.5197	155	91	108	3,1	45	14
4158600	TDG533A13300	13,300	.5236	155	91	108	3,1	45	14
4158601	TDG533A13400	13,400	.5276	155	91	108	3,1	45	14
4158727	TDG533A13490	13,490	.5311	155	91	108	3,1	45	14
4158602	TDG533A13500	13,500	.5315	155	91	108	3,1	45	14
4158623	TDG533A13600	13,600	.5354	155	91	108	3,2	45	14
4158624	TDG533A13700	13,700	.5394	155	91	108	3,2	45	14
4158625	TDG533A13800	13,800	.5433	155	91	108	3,2	45	14
4158626	TDG533A13891	13,891	.5469	155	91	108	3,2	45	14
4158627	TDG533A13900	13,900	.5472	155	91	108	3,2	45	14
4158628	TDG533A14000	14,000	.5512	155	91	108	3,3	45	14
4158629	TDG533A14100	14,100	.5551	171	101	121	3,3	48	16
4158630	TDG533A14200	14,200	.5591	171	101	121	3,3	48	16
4158631	TDG533A14288	14,288	.5625	171	101	121	3,3	48	16
4158632	TDG533A14300	14,300	.5630	171	101	121	3,3	48	16
4158643	TDG533A14400	14,400	.5669	171	101	121	3,4	48	16
4158644	TDG533A14500	14,500	.5709	171	101	121	3,4	48	16
4158645	TDG533A14600	14,600	.5748	171	101	121	3,4	48	16
4158646	TDG533A14684	14,684	.5781	171	101	121	3,4	48	16
4158647	TDG533A14700	14,700	.5787	171	101	121	3,4	48	16
4158648	TDG533A14800	14,800	.5827	171	101	121	3,5	48	16
4158649	TDG533A14900	14,900	.5866	171	101	121	3,5	48	16
4158650	TDG533A15000	15,000	.5906	171	101	121	3,5	48	16
4158651	TDG533A15083	15,083	.5938	171	101	121	3,5	48	16
4158652	TDG533A15100	15,100	.5945	171	101	121	3,5	48	16
4158663	TDG533A15200	15,200	.5984	171	101	121	3,5	48	16
4158664	TDG533A15300	15,300	.6024	171	101	121	3,6	48	16
4158665	TDG533A15400	15,400	.6063	171	101	121	3,6	48	16
4158666	TDG533A15479	15,479	.6094	171	101	121	3,6	48	16
4158667	TDG533A15500	15,500	.6102	171	101	121	3,6	48	16
4158668	TDG533A15600	15,600	.6142	171	101	121	3,6	48	16
4158669	TDG533A15700	15,700	.6181	171	101	121	3,7	48	16
4158670	TDG533A15800	15,800	.6220	171	101	121	3,7	48	16
4158671	TDG533A15875	15,875	.6250	171	101	121	3,7	48	16
4158672	TDG533A15900	15,900	.6260	171	101	121	3,7	48	16
4158683	TDG533A16000	16,000	.6299	171	101	121	3,7	48	16
4158684	TDG533A16100	16,100	.6339	185	113	135	3,8	48	18
4158685	TDG533A16200	16,200	.6378	185	113	135	3,8	48	18
4158686	TDG533A16271	16,271	.6406	185	113	135	3,8	48	18
4158687	TDG533A16300	16,300	.6417	185	113	135	3,8	48	18

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Solid Carbide Drills

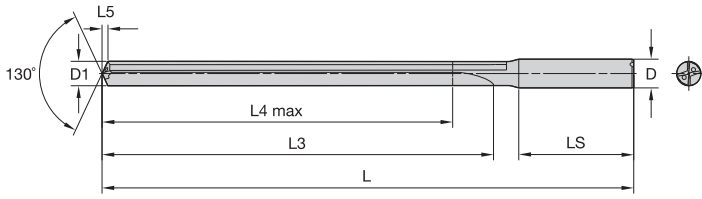
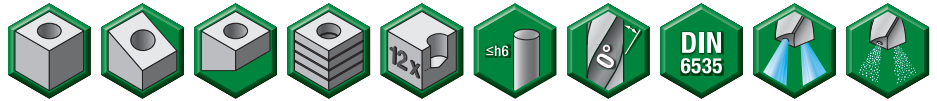
(TDG533A • 8 x D – continued)



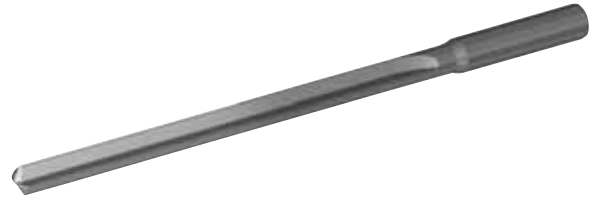
● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4158688	TDG533A16400	16,400	.6457	185	113	135	3,8	48	18
4158689	TDG533A16500	16,500	.6496	185	113	135	3,8	48	18
4158690	TDG533A16600	16,600	.6535	185	113	135	3,9	48	18
4158691	TDG533A16670	16,670	.6563	185	113	135	3,9	48	18
4158692	TDG533A16700	16,700	.6575	185	113	135	3,9	48	18
4158703	TDG533A16800	16,800	.6614	185	113	135	3,9	48	18
4158704	TDG533A16900	16,900	.6654	185	113	135	3,9	48	18
4158705	TDG533A17000	17,000	.6693	185	113	135	4,0	48	18
4158706	TDG533A17100	17,100	.6732	185	113	135	4,0	48	18
4158707	TDG533A17200	17,200	.6772	185	113	135	4,0	48	18
4158708	TDG533A17300	17,300	.6811	185	113	135	4,0	48	18
4158709	TDG533A17400	17,400	.6850	185	113	135	4,1	48	18
4158710	TDG533A17463	17,463	.6875	185	113	135	4,1	48	18
4158711	TDG533A17500	17,500	.6890	185	113	135	4,1	48	18
4158712	TDG533A17600	17,600	.6929	185	113	135	4,1	48	18
4158723	TDG533A17700	17,700	.6969	185	113	135	4,1	48	18
4158724	TDG533A17800	17,800	.7008	185	113	135	4,2	48	18
4158725	TDG533A17859	17,859	.7031	185	113	135	4,2	48	18
4158726	TDG533A17900	17,900	.7047	185	113	135	4,2	48	18
4157333	TDG533A18000	18,000	.7087	185	113	135	4,2	48	18
4157334	TDG533A18100	18,100	.7126	200	124	148	4,2	50	20
4157335	TDG533A18200	18,200	.7165	200	124	148	4,2	50	20
4157336	TDG533A18258	18,258	.7188	200	124	148	4,3	50	20
4157337	TDG533A18300	18,300	.7205	200	124	148	4,3	50	20
4157338	TDG533A18400	18,400	.7244	200	124	148	4,3	50	20
4157339	TDG533A18500	18,500	.7283	200	124	148	4,3	50	20
4157340	TDG533A18600	18,600	.7323	200	124	148	4,3	50	20
4157341	TDG533A18654	18,654	.7344	200	124	148	4,3	50	20
4157342	TDG533A18700	18,700	.7362	200	124	148	4,4	50	20
4157343	TDG533A18800	18,800	.7402	200	124	148	4,4	50	20
4157344	TDG533A18900	18,900	.7441	200	124	148	4,4	50	20
4157345	TDG533A19000	19,000	.7480	200	124	148	4,4	50	20
4157346	TDG533A19050	19,050	.7500	200	124	148	4,4	50	20
4157347	TDG533A19100	19,100	.7520	200	124	148	4,5	50	20
4157348	TDG533A19200	19,200	.7559	200	124	148	4,5	50	20
4157349	TDG533A19300	19,300	.7598	200	124	148	4,5	50	20
4157350	TDG533A19400	19,400	.7638	200	124	148	4,5	50	20
4157351	TDG533A19500	19,500	.7677	200	124	148	4,5	50	20
4157352	TDG533A19600	19,600	.7717	200	124	148	4,6	50	20
4157353	TDG533A19700	19,700	.7756	200	124	148	4,6	50	20
4157354	TDG533A19800	19,800	.7795	200	124	148	4,6	50	20
4157355	TDG533A19900	19,900	.7835	200	124	148	4,6	50	20
4157356	TDG533A20000	20,000	.7874	200	124	148	4,7	50	20

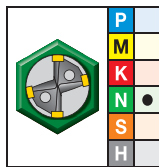
Solid Carbide Drills



For information on L, L3, and L4 max, see page T143.



■ TDG534A • 12 x D



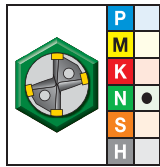
grade WN10HD

- first choice
- alternate choice

order #	catalogue #	D1 diameter		L	L4 max	L3	L5	LS	D
		mm	in						
4157357	TDG534A03000	3,000	.1181	93	44	55	0,7	36	6
4157358	TDG534A03048	3,048	.1200	93	44	55	0,7	36	6
4157359	TDG534A03100	3,100	.1220	93	44	55	0,7	36	6
4157360	TDG534A03175	3,175	.1250	93	44	55	0,7	36	6
4157361	TDG534A03200	3,200	.1260	93	43	55	0,7	36	6
4157362	TDG534A03264	3,264	.1285	93	44	55	0,8	36	6
4157363	TDG534A03300	3,300	.1299	93	44	55	0,8	36	6
4157364	TDG534A03400	3,400	.1339	93	44	55	0,8	36	6
4157365	TDG534A03455	3,455	.1360	93	44	55	0,8	36	6
4157366	TDG534A03500	3,500	.1378	93	44	55	0,8	36	6
4157367	TDG534A03571	3,571	.1406	93	45	55	0,8	36	6
4157368	TDG534A03600	3,600	.1417	93	45	55	0,8	36	6
4157369	TDG534A03658	3,658	.1440	93	45	55	0,9	36	6
4157370	TDG534A03700	3,700	.1457	93	45	55	0,9	36	6
4157371	TDG534A03734	3,734	.1470	93	45	55	0,9	36	6
4157372	TDG534A03800	3,800	.1496	107	55	69	0,9	36	6
4157373	TDG534A03900	3,900	.1535	107	56	69	0,9	36	6
4157374	TDG534A03970	3,970	.1563	107	56	69	0,9	36	6
4157375	TDG534A04000	4,000	.1575	107	56	69	0,9	36	6
4157376	TDG534A04039	4,039	.1590	107	56	69	0,9	36	6
4157377	TDG534A04090	4,090	.1610	107	55	69	1,0	36	6
4157378	TDG534A04100	4,100	.1614	107	55	69	1,0	36	6
4157379	TDG534A04200	4,200	.1654	107	56	69	1,0	36	6
4157380	TDG534A04217	4,217	.1660	107	56	69	1,0	36	6

(continued)

(TDG534A • 12 x D — continued)

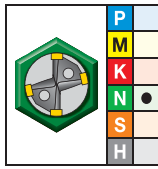


● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4157381	TDG534A04300	4,300	.1693	107	56	69	1,0	36	6
4157382	TDG534A04366	4,366	.1719	107	56	69	1,0	36	6
4157383	TDG534A04400	4,400	.1732	107	56	69	1,0	36	6
4157384	TDG534A04500	4,500	.1772	107	56	69	1,0	36	6
4157385	TDG534A04600	4,600	.1811	107	57	69	1,1	36	6
4157386	TDG534A04623	4,623	.1820	107	57	69	1,1	36	6
4157387	TDG534A04700	4,700	.1850	107	57	69	1,1	36	6
4157388	TDG534A04763	4,763	.1875	125	69	87	1,1	36	6
4157389	TDG534A04800	4,800	.1890	125	69	87	1,1	36	6
4157390	TDG534A04852	4,852	.1910	125	69	87	1,1	36	6
4157391	TDG534A04900	4,900	.1929	125	69	87	1,1	36	6
4157392	TDG534A05000	5,000	.1969	125	70	87	1,2	36	6
4157393	TDG534A05100	5,100	.2008	125	70	87	1,2	36	6
4157394	TDG534A05106	5,106	.2010	125	70	87	1,2	36	6
4157395	TDG534A05159	5,159	.2031	125	70	87	1,2	36	6
4157396	TDG534A05200	5,200	.2047	125	70	87	1,2	36	6
4157397	TDG534A05300	5,300	.2087	125	71	87	1,2	36	6
4157398	TDG534A05400	5,400	.2126	125	71	87	1,3	36	6
4157399	TDG534A05410	5,410	.2130	125	71	87	1,3	36	6
4157400	TDG534A05500	5,500	.2165	125	71	87	1,3	36	6
4157401	TDG534A05558	5,558	.2188	125	71	87	1,3	36	6
4157402	TDG534A05600	5,600	.2205	125	72	87	1,3	36	6
4157403	TDG534A05616	5,616	.2211	125	72	87	1,3	36	6
4157404	TDG534A05700	5,700	.2244	125	72	87	1,3	36	6
4157405	TDG534A05800	5,800	.2283	125	71	87	1,4	36	6
4157406	TDG534A05900	5,900	.2323	125	71	87	1,4	36	6
4157407	TDG534A05954	5,954	.2344	125	72	87	1,4	36	6
4157408	TDG534A06000	6,000	.2362	125	72	87	1,4	36	6
4157409	TDG534A06100	6,100	.2402	139	82	101	1,4	36	8
4157410	TDG534A06200	6,200	.2441	139	82	101	1,4	36	8
4157411	TDG534A06300	6,300	.2480	139	83	101	1,5	36	8
4157412	TDG534A06350	6,350	.2500	139	83	101	1,5	36	8
4157413	TDG534A06400	6,400	.2520	139	83	101	1,5	36	8
4157414	TDG534A06500	6,500	.2559	139	83	101	1,5	36	8
4157415	TDG534A06528	6,528	.2570	139	83	101	1,5	36	8
4157416	TDG534A06600	6,600	.2598	139	84	101	1,5	36	8
4157417	TDG534A06630	6,630	.2610	139	84	101	1,5	36	8
4157418	TDG534A06700	6,700	.2638	139	84	101	1,6	36	8
4157419	TDG534A06746	6,746	.2656	139	83	101	1,6	36	8
4157420	TDG534A06800	6,800	.2677	139	83	101	1,6	36	8

(continued)

(TDG534A • 12 x D — continued)

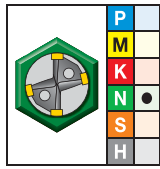


● first choice
○ alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4157421	TDG534A06900	6,900	.2717	139	83	101	1,6	36	8
4157422	TDG534A07000	7,000	.2756	139	84	101	1,6	36	8
4157423	TDG534A07100	7,100	.2795	153	94	115	1,7	36	8
4157424	TDG534A07145	7,145	.2813	153	94	115	1,7	36	8
4157425	TDG534A07200	7,200	.2835	153	94	115	1,7	36	8
4157426	TDG534A07300	7,300	.2874	153	95	115	1,7	36	8
4157427	TDG534A07400	7,400	.2913	153	95	115	1,7	36	8
4157428	TDG534A07500	7,500	.2953	153	95	115	1,7	36	8
4157429	TDG534A07541	7,541	.2969	153	95	115	1,8	36	8
4157430	TDG534A07600	7,600	.2992	153	96	115	1,8	36	8
4157431	TDG534A07700	7,700	.3031	153	96	115	1,8	36	8
4157432	TDG534A07800	7,800	.3071	153	95	115	1,8	36	8
4157433	TDG534A07900	7,900	.3110	153	95	115	1,8	36	8
4157434	TDG534A07938	7,938	.3125	153	96	115	1,9	36	8
4157435	TDG534A08000	8,000	.3150	153	96	115	1,9	36	8
4157436	TDG534A08100	8,100	.3189	185	116	143	1,9	40	10
4157437	TDG534A08200	8,200	.3228	185	116	143	1,9	40	10
4157438	TDG534A08300	8,300	.3268	185	117	143	1,9	40	10
4157439	TDG534A08334	8,334	.3281	185	117	143	1,9	40	10
4157440	TDG534A08400	8,400	.3307	185	117	143	2,0	40	10
4157441	TDG534A08433	8,433	.3320	185	117	143	2,0	40	10
4157442	TDG534A08500	8,500	.3346	185	117	143	2,0	40	10
4157443	TDG534A08600	8,600	.3386	185	118	143	2,0	40	10
4157444	TDG534A08700	8,700	.3425	185	118	143	2,0	40	10
4157445	TDG534A08733	8,733	.3438	185	117	143	2,0	40	10
4157446	TDG534A08800	8,800	.3465	185	117	143	2,1	40	10
4157447	TDG534A08900	8,900	.3504	185	117	143	2,1	40	10
4157448	TDG534A09000	9,000	.3543	185	118	143	2,1	40	10
4157449	TDG534A09100	9,100	.3583	185	118	143	2,1	40	10
4157450	TDG534A09129	9,129	.3594	185	118	143	2,1	40	10
4157451	TDG534A09200	9,200	.3622	185	118	143	2,1	40	10
4157452	TDG534A09300	9,300	.3661	185	119	143	2,2	40	10
4157453	TDG534A09347	9,347	.3680	185	119	143	2,2	40	10
4157454	TDG534A09400	9,400	.3701	185	119	143	2,2	40	10
4157455	TDG534A09500	9,500	.3740	185	119	143	2,2	40	10
4157456	TDG534A09525	9,525	.3750	185	119	143	2,2	40	10
4157457	TDG534A09600	9,600	.3780	185	120	143	2,2	40	10
4157458	TDG534A09700	9,700	.3819	185	120	143	2,3	40	10
4157459	TDG534A09800	9,800	.3858	185	119	143	2,3	40	10
4157460	TDG534A09900	9,900	.3898	185	119	143	2,3	40	10

(continued)

(TDG534A • 12 x D — continued)



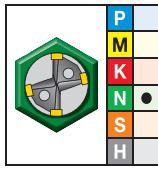
- first choice
- alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4157461	TDG534A09921	9,921	.3906	185	120	143	2,3	40	10
4157476	TDG534A10000	10,000	.3937	185	120	143	2,3	40	10
4157555	TDG534A10100	10,100	.3976	218	140	171	2,4	45	12
4157556	TDG534A10200	10,200	.4016	218	140	171	2,4	45	12
4157557	TDG534A10300	10,300	.4055	218	141	171	2,4	45	12
4157558	TDG534A10320	10,320	.4063	218	141	171	2,4	45	12
4157559	TDG534A10400	10,400	.4094	218	141	171	2,4	45	12
4157560	TDG534A10500	10,500	.4134	218	141	171	2,4	45	12
4157561	TDG534A10600	10,600	.4173	218	142	171	2,5	45	12
4157562	TDG534A10700	10,700	.4213	218	142	171	2,5	45	12
4157583	TDG534A10716	10,716	.4219	218	142	171	2,5	45	12
4157584	TDG534A10800	10,800	.4252	218	141	171	2,5	45	12
4157585	TDG534A10900	10,900	.4291	218	141	171	2,5	45	12
4157586	TDG534A11000	11,000	.4331	218	142	171	2,6	45	12
4157587	TDG534A11100	11,100	.4370	218	142	171	2,6	45	12
4157588	TDG534A11113	11,113	.4375	218	142	171	2,6	45	12
4157589	TDG534A11200	11,200	.4409	218	142	171	2,6	45	12
4157590	TDG534A11300	11,300	.4449	218	143	171	2,6	45	12
4157591	TDG534A11400	11,400	.4488	218	143	171	2,7	45	12
4157592	TDG534A11500	11,500	.4528	218	143	171	2,7	45	12
4157593	TDG534A11509	11,509	.4531	218	143	171	2,7	45	12
4157594	TDG534A11600	11,600	.4567	218	144	171	2,7	45	12
4157595	TDG534A11700	11,700	.4606	218	144	171	2,7	45	12
4157596	TDG534A11800	11,800	.4646	218	143	171	2,8	45	12
4157597	TDG534A11900	11,900	.4685	218	143	171	2,8	45	12
4157598	TDG534A11908	11,908	.4688	218	143	171	2,8	45	12
4157599	TDG534A12000	12,000	.4724	218	144	171	2,8	45	12
4157600	TDG534A12100	12,100	.4764	246	164	199	2,8	45	14
4157601	TDG534A12200	12,200	.4803	246	164	199	2,8	45	14
4157602	TDG534A12300	12,300	.4843	246	165	199	2,9	45	14
4157603	TDG534A12304	12,304	.4844	246	165	199	2,9	45	14
4157604	TDG534A12400	12,400	.4882	246	165	199	2,9	45	14
4157605	TDG534A12500	12,500	.4921	246	165	199	2,9	45	14
4157606	TDG534A12600	12,600	.4961	246	165	199	2,9	45	14
4157607	TDG534A12700	12,700	.5000	246	166	199	3,0	45	14
4157608	TDG534A12800	12,800	.5039	246	166	199	3,0	45	14
4157609	TDG534A12900	12,900	.5079	246	165	199	3,0	45	14
4157610	TDG534A13000	13,000	.5118	246	166	199	3,0	45	14
4157611	TDG534A13096	13,096	.5156	246	166	199	3,1	45	14
4157612	TDG534A13100	13,100	.5157	246	166	199	3,1	45	14

(continued)

Solid Carbide Drills

(TDG534A • 12 x D — continued)



● first choice
○ alternate choice

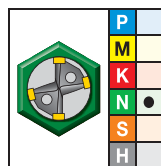
grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4157613	TDG534A13200	13,200	.5197	246	166	199	3,1	45	14
4157614	TDG534A13300	13,300	.5236	246	167	199	3,1	45	14
4157615	TDG534A13400	13,400	.5276	246	167	199	3,1	45	14
4157671	TDG534A13490	13,490	.5311	246	167	199	3,1	45	14
4157616	TDG534A13500	13,500	.5315	246	167	199	3,1	45	14
4157617	TDG534A13600	13,600	.5354	246	167	199	3,2	45	14
4157618	TDG534A13700	13,700	.5394	246	168	199	3,2	45	14
4157619	TDG534A13800	13,800	.5433	246	168	199	3,2	45	14
4157620	TDG534A13891	13,891	.5469	246	167	199	3,2	45	14
4157621	TDG534A13900	13,900	.5472	246	167	199	3,2	45	14
4157622	TDG534A14000	14,000	.5512	246	168	199	3,3	45	14
4157623	TDG534A14100	14,100	.5551	277	188	227	3,3	48	16
4157624	TDG534A14200	14,200	.5591	277	188	227	3,3	48	16
4157625	TDG534A14288	14,288	.5625	277	188	227	3,3	48	16
4157626	TDG534A14300	14,300	.5630	277	188	227	3,3	48	16
4157627	TDG534A14400	14,400	.5669	277	189	227	3,4	48	16
4157628	TDG534A14500	14,500	.5709	277	189	227	3,4	48	16
4157629	TDG534A14600	14,600	.5748	277	189	227	3,4	48	16
4157630	TDG534A14684	14,684	.5781	277	190	227	3,4	48	16
4157631	TDG534A14700	14,700	.5787	277	190	227	3,4	48	16
4157632	TDG534A14800	14,800	.5827	277	190	227	3,5	48	16
4157633	TDG534A14900	14,900	.5866	277	190	227	3,5	48	16
4157634	TDG534A15000	15,000	.5906	277	190	227	3,5	48	16
4157635	TDG534A15083	15,083	.5938	277	190	227	3,5	48	16
4157636	TDG534A15100	15,100	.5945	277	190	227	3,5	48	16
4157637	TDG534A15200	15,200	.5984	277	190	227	3,5	48	16
4157638	TDG534A15300	15,300	.6024	277	191	227	3,6	48	16
4157639	TDG534A15400	15,400	.6063	277	191	227	3,6	48	16
4157640	TDG534A15479	15,479	.6094	277	191	227	3,6	48	16
4157641	TDG534A15500	15,500	.6102	277	191	227	3,6	48	16
4157642	TDG534A15600	15,600	.6142	277	191	227	3,6	48	16
4157643	TDG534A15700	15,700	.6181	277	192	227	3,7	48	16
4157644	TDG534A15800	15,800	.6220	277	192	227	3,7	48	16
4157645	TDG534A15875	15,875	.6250	277	192	227	3,7	48	16
4157646	TDG534A15900	15,900	.6260	277	192	227	3,7	48	16
4157647	TDG534A16000	16,000	.6299	277	192	227	3,7	48	16
4157648	TDG534A16100	16,100	.6339	305	212	255	3,8	48	18
4157649	TDG534A16200	16,200	.6378	305	212	255	3,8	48	18
4157650	TDG534A16271	16,271	.6406	305	212	255	3,8	48	18
4157651	TDG534A16300	16,300	.6417	305	212	255	3,8	48	18

(continued)



Solid Carbide Drills

(TDG534A • 12 x D — continued)



- first choice
- alternate choice

grade WN10HD		D1 diameter		L	L4 max	L3	L5	LS	D
order #	catalogue #	mm	in						
4157652	TDG534A16400	16,400	.6457	305	213	255	3,8	48	18
4157653	TDG534A16500	16,500	.6496	305	213	255	3,8	48	18
4157654	TDG534A16600	16,600	.6535	305	213	255	3,9	48	18
4157655	TDG534A16670	16,670	.6563	305	214	255	3,9	48	18
4157656	TDG534A16700	16,700	.6575	305	214	255	3,9	48	18
4157657	TDG534A16800	16,800	.6614	305	214	255	3,9	48	18
4157658	TDG534A16900	16,900	.6654	305	214	255	3,9	48	18
4157659	TDG534A17000	17,000	.6693	305	214	255	4,0	48	18
4157660	TDG534A17100	17,100	.6732	305	214	255	4,0	48	18
4157661	TDG534A17200	17,200	.6772	305	214	255	4,0	48	18
4157662	TDG534A17300	17,300	.6811	305	214	255	4,0	48	18
4157663	TDG534A17400	17,400	.6850	305	215	255	4,1	48	18
4157664	TDG534A17463	17,463	.6875	305	215	255	4,1	48	18
4157665	TDG534A17500	17,500	.6890	305	215	255	4,1	48	18
4157666	TDG534A17600	17,600	.6929	305	215	255	4,1	48	18
4157667	TDG534A17700	17,700	.6969	305	216	255	4,1	48	18
4157668	TDG534A17800	17,800	.7008	305	216	255	4,2	48	18
4157669	TDG534A17859	17,859	.7031	305	216	255	4,2	48	18
4157670	TDG534A17900	17,900	.7047	305	216	255	4,2	48	18
4156877	TDG534A18000	18,000	.7087	305	216	255	4,2	48	18
4156878	TDG534A18100	18,100	.7126	334	237	282	4,2	50	20
4156879	TDG534A18200	18,200	.7165	334	236	282	4,2	50	20
4156880	TDG534A18258	18,258	.7188	334	236	282	4,3	50	20
4156881	TDG534A18300	18,300	.7205	334	236	282	4,3	50	20
4156882	TDG534A18400	18,400	.7244	334	237	282	4,3	50	20
4156973	TDG534A18500	18,500	.7283	334	237	282	4,3	50	20
4156974	TDG534A18600	18,600	.7323	334	237	282	4,3	50	20
4156975	TDG534A18654	18,654	.7344	334	237	282	4,3	50	20
4156976	TDG534A18700	18,700	.7362	334	237	282	4,4	50	20
4156977	TDG534A18800	18,800	.7402	334	238	282	4,4	50	20
4156978	TDG534A18900	18,900	.7441	334	238	282	4,4	50	20
4156979	TDG534A19000	19,000	.7480	334	238	282	4,4	50	20
4156980	TDG534A19050	19,050	.7500	334	239	282	4,4	50	20
4156981	TDG534A19100	19,100	.7520	334	239	282	4,5	50	20
4156982	TDG534A19200	19,200	.7559	334	238	282	4,5	50	20
4156983	TDG534A19300	19,300	.7598	334	238	282	4,5	50	20
4156984	TDG534A19400	19,400	.7638	334	239	282	4,5	50	20
4156985	TDG534A19500	19,500	.7677	334	239	282	4,5	50	20
4156986	TDG534A19600	19,600	.7717	334	239	282	4,6	50	20
4156987	TDG534A19700	19,700	.7756	334	239	282	4,6	50	20
4156988	TDG534A19800	19,800	.7795	334	240	282	4,6	50	20
4156989	TDG534A19900	19,900	.7835	334	240	282	4,6	50	20
4156990	TDG534A20000	20,000	.7874	334	240	282	4,7	50	20

■ TOP DRILL G • TDG532/TDG533/TDG534 • WN10HD™ • Through Coolant • Metric

Material Group												
		Cutting Speed – vc	Recommended Feed Rate (f) by Diameter									
		Range – m/min										
		min – min	Tool Diameter (mm)	3,0	4,0	6,0	8,0	10,0	12,0	16,0	20,0	
N	21	100 – 450	mm/r	0,16–0,25	0,19–0,29	0,23–0,35	0,27–0,42	0,31–0,50	0,36–0,57	0,44–0,69	0,52–0,82	
	22, 23, 24	100 – 300	mm/r	0,15–0,23	0,17–0,28	0,21–0,34	0,25–0,39	0,30–0,46	0,34–0,54	0,42–0,67	0,52–0,82	
	26	100 – 250	mm/r	0,16–0,28	0,15–0,32	0,19–0,36	0,23–0,40	0,25–0,44	0,28–0,48	0,32–0,56	0,35–0,63	

Metric
tolerance

nominal size range	D1 tolerance m7	D tolerance h6
>3–6	0,004/0,016	0,000/-0,008
>6–10	0,006/0,021	0,000/-0,009
>10–18	0,007/0,025	0,000/-0,011
>18–25,4	0,008/0,029	0,000/-0,013



WIDIA™ Solid Carbide Drills — Reconditioning

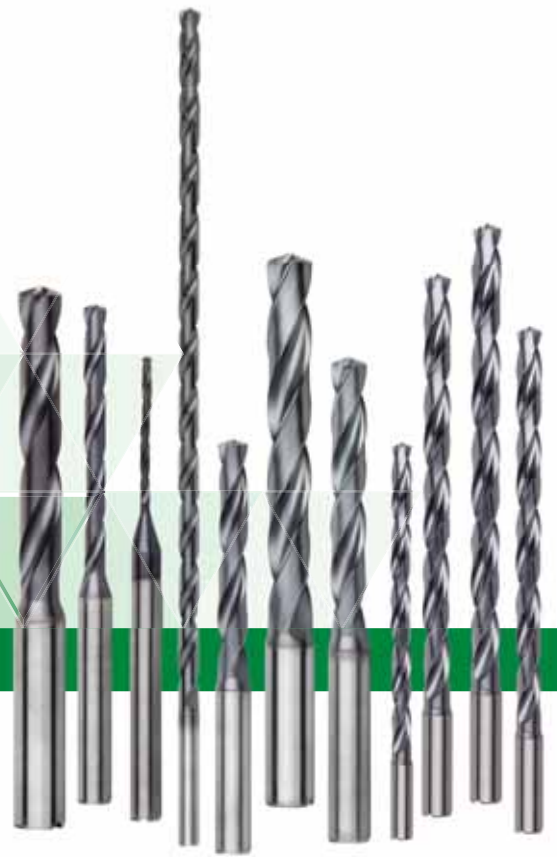
Anyone can regrind your tools — only we can recondition them.

WIDIA Reconditioning Services optimise the value of metalcutting tools throughout their entire lifecycle by giving like-new performance — with rapid turnaround time — so tools are always on hand and perform just like new.

How Does WIDIA Do It?

- Reconditioned tooling undergoes the same process as new tools — the same drill point (WIDIA proprietary geometry) and coating are applied back on the tool.
- Tooling is returned to like-new condition, with WIDIA proprietary geometry providing a longer tooling lifecycle and increased performance.
- With current lead-time less than 10 days, customers get tools back quickly — lowering cost-per-tool usage.

Protect your investment by using the WIDIA™ Reconditioning Programme.



EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

To use WIDIA tool reconditioning services, contact your authorised WIDIA distributor to get started.

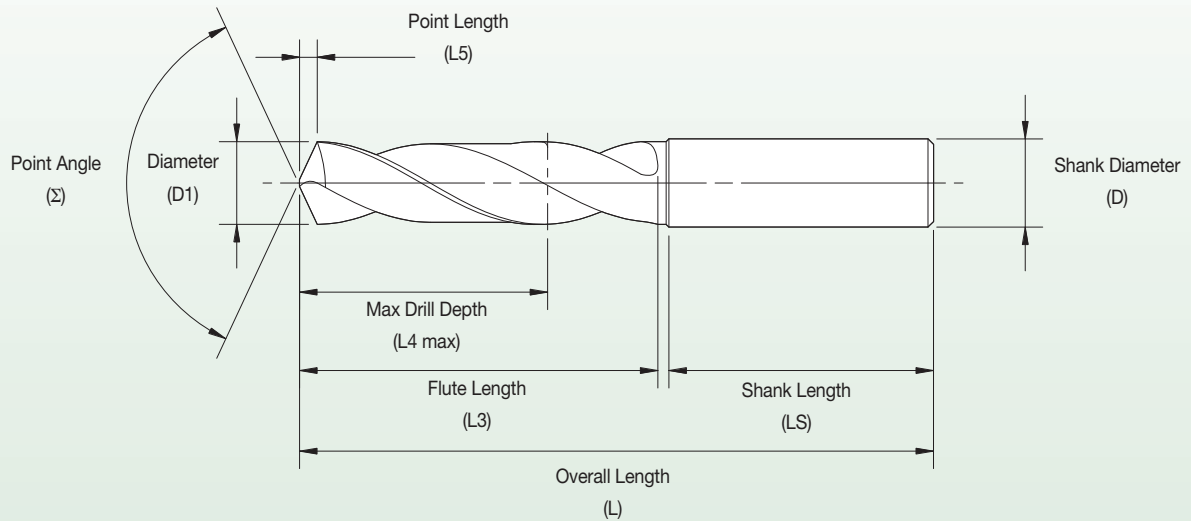
WIDIA Solid Carbide Drills Reconditioning Product Lines.

- VariDrill™
- TOP DRILL S™ for Steel
- TOP DRILL S™ for Cast Iron
- TOP DRILL S+™
- TOP DRILL G™

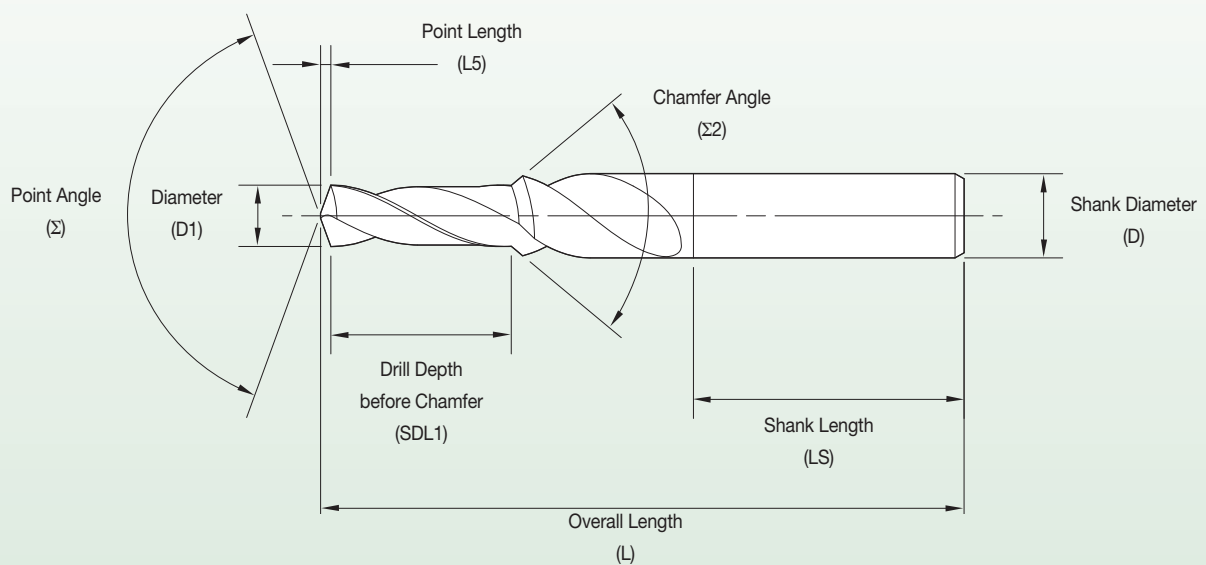
WIDIA 

The Anatomy of a Drill

Use this diagram when describing features of a solid carbide drill.



Use this diagram when describing features of a solid carbide step drill.



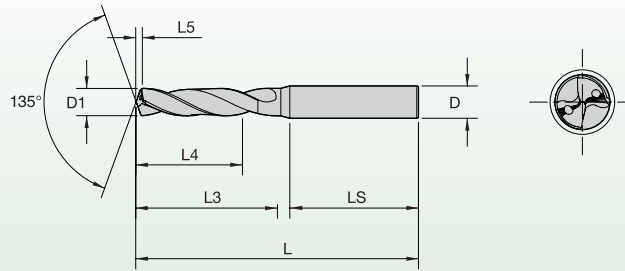
Shank Designs to DIN 6535



Form HE,
2° angle
Design F



Form HA,
straight
design A



Dimensions for WIDIA™ High-Performance Solid Carbide Drills

mm ∅		DIN 6535		SHORT* ~3 x D			LONG* ~5 x D			EXTRA LONG** ~8 x D		
D1 min	D1 max	D	LS	L	L3	L4 max	L	L3	L4 max	L	L3	L4 max
1,000	1,400	4	28	58	7	5	58	9	6	58	12	10
1,401	1,900	4	28	58	9	6	58	12	9	58	18	15
1,901	2,300	4	28	58	13	9	58	18	14	66	26	22
2,301	2,999	4	28	58	17	12	58	22	17	66	30	25
3,000	3,750	6	36	62	20	14	66	28	23	78	40	33
3,751	4,750	6	36	66	24	17	74	36	29	87	49	41
4,751	6,000	6	36	66	28	20	82	44	35	94	56	48
6,001	7,000	8	36	79	34	24	91	53	43	105	67	57
7,001	8,000	8	36	79	41	29	91	53	43	110	72	61
8,001	10,000	10	40	89	47	35	103	61	49	122	80	68
10,001	12,000	12	45	102	55	40	118	71	56	141	94	79
12,001	14,000	14	45	107	60	43	124	77	60	155	108	91
14,001	16,000	16	48	115	65	45	133	83	63	171	121	101
16,001	18,000	18	48	123	73	51	143	93	71	185	135	113
18,001	20,000	20	50	131	79	55	153	101	77	200	148	124
20,001	22,000	20	50	141	86	60	167	112	85	217	162	136
22,001	25,000	25	56	153	95	65	184	126	98	238	180	150

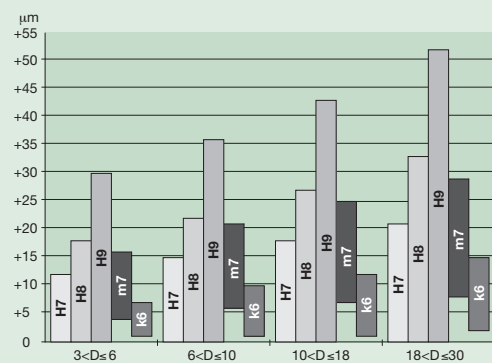
* D1 < 20mm to DIN 6537K
D1 > 20mm to factory standard
** To factory standard

NOTE: Solid Carbide Drills from WIDIA in short and regular lengths conform to DIN 6537.
Drills with long lengths conform to WIDIA factory standard.
Solid Carbide Drills with diameter D1 > 20mm (not DIN 6537) are also standardised to factory standard.

Tolerances of Drills and Holes

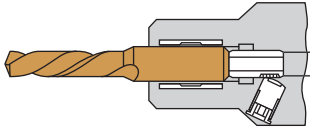
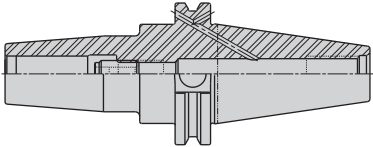
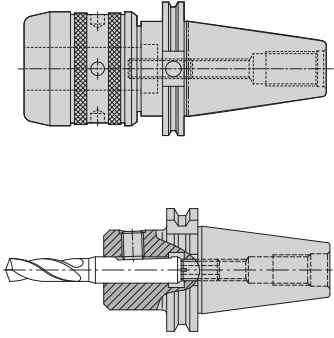
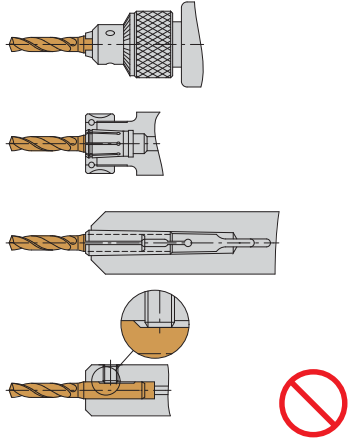
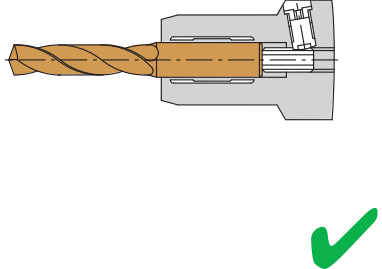
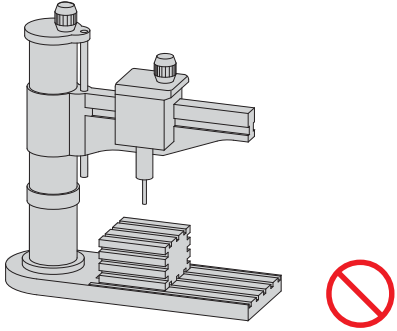
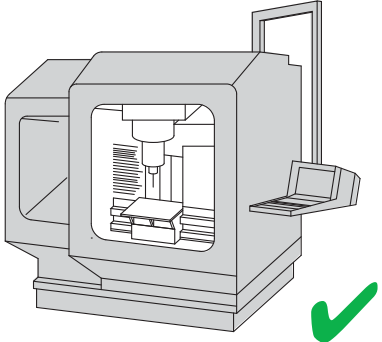
High-performance solid carbide drills with tolerances of m7 create holes with tolerances of H9. H8 can be achieved in very good conditions. The drill should be used for holes in H8, and in favourable conditions, H7 can be achieved. Solid carbide drills with H7 create holes in K9-K11. Other drilling tolerances require special solid carbide drill versions.

Tolerances of diameter D1 on:
Spiral Flute
TDG Drill



Toolholding Systems

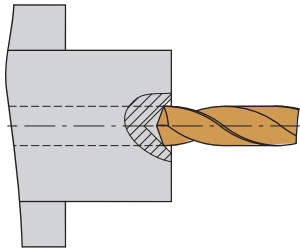
As with any drilling system, components of the entire system contribute to the quality of the machined hole, not just the drill itself. For maximum efficiency and accuracy, the following toolholding systems are your best choices:

<p>First Choice Hydraulic chucks</p> 	<p>Second Choice Shrink Fit</p> 	<p>Third Choice High-performance milling chucks with reduction sleeves</p> 
<p>Not Recommended</p> 	<p>Clamping Chuck Use of all-purpose drilling chuck collets, clamping sleeves, and Weldon® clamping chucks should be avoided because they do not absorb cutting forces reliably and provide insufficient precision of concentricity.</p>	<p>Highly Recommended Hydraulic chucks ensure a secure torque transmission with excellent concentricity.</p> 
<p>Not Recommended</p> 	<p>Machine Solid carbide drills have a much higher rigidity than conventional high-speed steel drills. This enables the machining of close-tolerance holes with a position accuracy of $\pm 0.025\text{mm}$. However, it also means that drills require rigid machine tools with good spindles.</p>	<p>Rigid Machine Tool Recommended</p> 

(continued)

(continued)

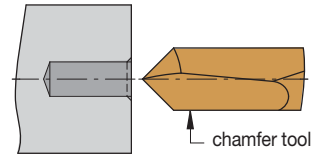
Wrong



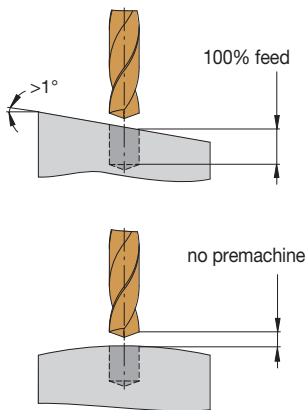
Drilling and Chamfering

Drill into the solid first, then chamfer.

Correct



Wrong



Drilling on Inclined or Rounded Surfaces

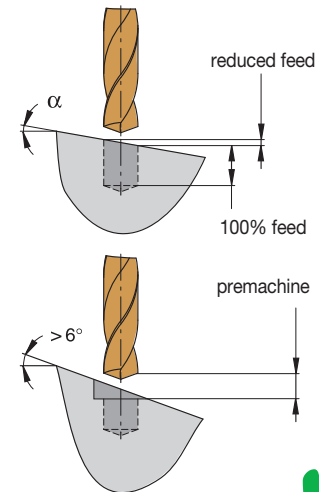
When drilling on inclined or curved surfaces, use a lower feed than the standard value. The reduction of feed required is dependent on the inclination angle of the workpiece surface and the drill type (see table).

reduced feed (% of standard value)

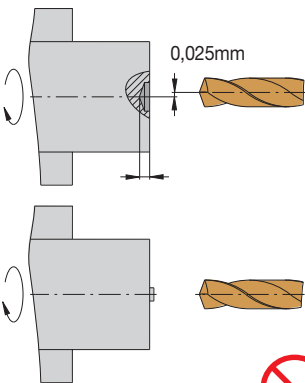
inclination α	3 x D	5 x D Long	<5 x D
1°	100%	80%	premachine
2°	80–50%	80–50%	premachine
3°	65%	50%	premachine
4°	50%	premachine	premachine
6°	30%	premachine	premachine

Premachining is usually done with an end mill operation.

Correct



Wrong



Drilling on Turning Machines

When drilling on turning machines, the drill must be on centre. The tolerance range of the centre position should not exceed $\pm 0.025\text{mm}$. On bar-turning lathes, do not drill into centre stub or bur. Cut-off tools must be mounted precisely to eliminate centre stub or bur. Do not drill into pre-existing holes.

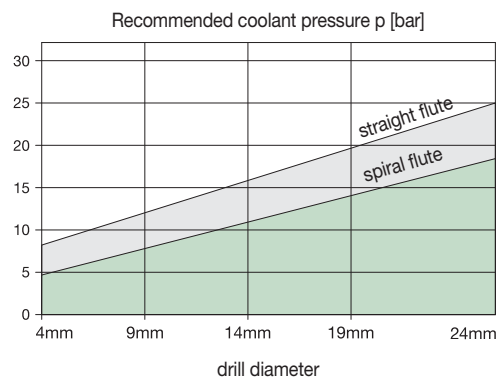
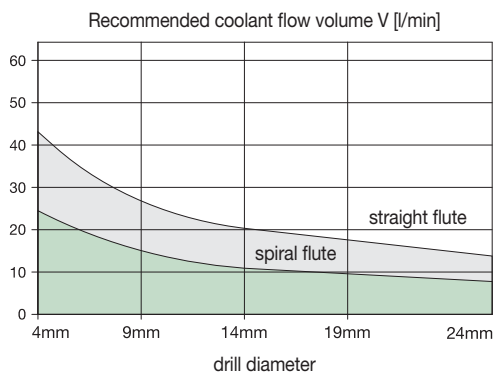
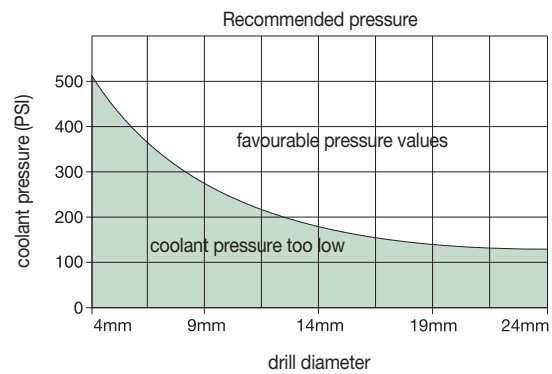
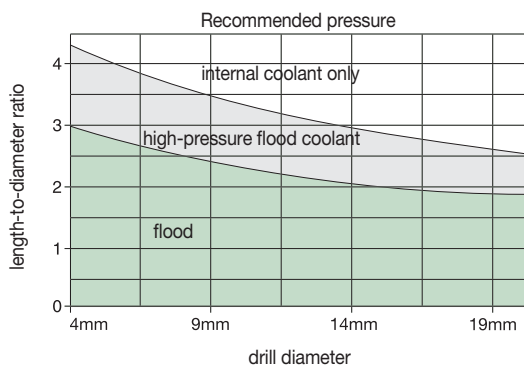
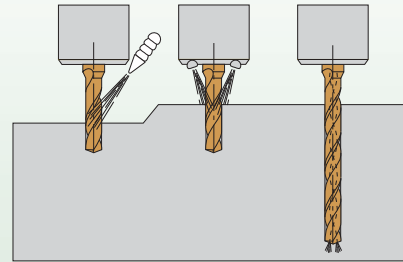
Hole Depths Greater than 3 x D

Hole depths that are deeper than three times the drill diameter may require a speed reduction. A 15% lower speed is suggested.

Coolant

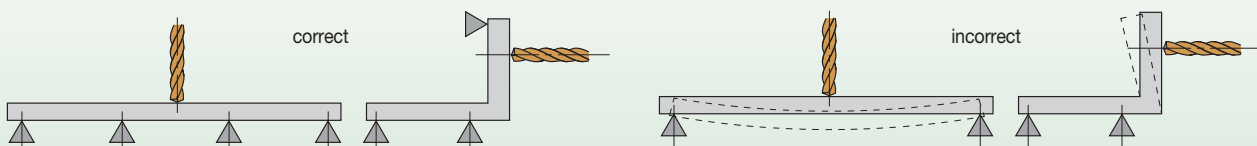
- To optimise their performance, drills must be adequately cooled. With the proper coolant flow, better tool life and higher maximum effective cutting speeds can be achieved.
- If not properly cooled, the drill will heat up rapidly. This causes the drill diameter to expand, which in turn may cause the drill to seize inside the hole.
- Solid carbide drills with internal coolant channels require deeper drilling depths to be effective. The higher the coolant pressure, the better the drilling results. Drill life and hole quality improve with ample coolant flow.
- When using drills without internal coolant flow, try to get at least one coolant jet as parallel to the drill as possible.
- For short-hole applications, drills without internal coolant may often provide better tool life. The tool is more solid, and it does not suffer from thermal shock at the cutting edge.
- It is important to use high coolant concentration to provide lubricity, which will aid in tool life, chip evacuation, and finer surface finishes.
- High-pressure coolant, either through the tool or through a line adjacent and parallel to the tool, should always be considered for increased tool life and production.
- Do not use multi-coolant lines. Use one line with 100% of the flow capacity to evacuate the chips from the hole.






Coolant requirement for carbide drills

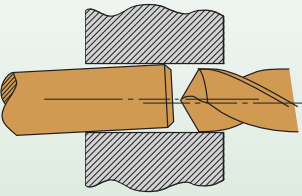
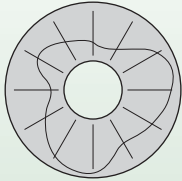
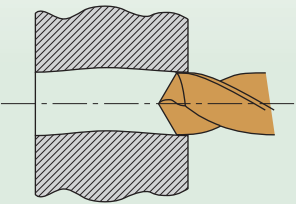



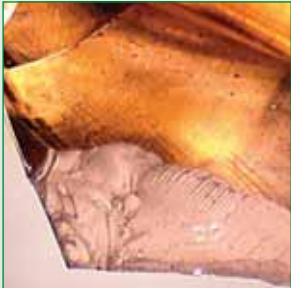
Workpiece Rigidity

Because solid carbide drills have much higher penetration rates, it is important that the workpiece has adequate support.




problem	source	solution
heavy wear on the cutting corners 	insufficient coolant	<ul style="list-style-type: none"> Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.
	workpiece movement	<ul style="list-style-type: none"> Stabilise workpiece chucking and check stability of machine tool.
	wrong drill	<ul style="list-style-type: none"> Check drill type, drilling depth, cooling system, and workpiece material.
	cutting conditions	<ul style="list-style-type: none"> Reduce cutting speed; increase feed.
splintering on the chisel edge 	clamping chuck	<ul style="list-style-type: none"> Check clamping accuracy. Use hydraulic clamping chuck or high-precision chucking system.
	cutting conditions	<ul style="list-style-type: none"> Decrease feed; increase speed.
built-up edge 	insufficient coolant	<ul style="list-style-type: none"> Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.
	cutting conditions	<ul style="list-style-type: none"> Increase speed 20–30%.
splintering on the cutting edges 	clamping chuck	<ul style="list-style-type: none"> Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.
	cutting conditions caused by built-up edge	<ul style="list-style-type: none"> Check cutting values, and possibly increase cutting speed.
		<ul style="list-style-type: none"> Examine regularly for built-up edge.
thermal checking/comb cracking 	cutting conditions	<ul style="list-style-type: none"> Adapt coolant and cutting conditions to reduce thermal shock.

problem	source	solution
<p>hole too big</p> 	cutting conditions	<ul style="list-style-type: none"> • Check cutting values, increase cutting speed, or reduce feed.
	clamping chuck	<ul style="list-style-type: none"> • Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.
	wrong drill	<ul style="list-style-type: none"> • Check drill diameter. Please note that drills are ground to a positive tolerance. Check concentric running.
<p>hole too small</p> 	insufficient coolant	<ul style="list-style-type: none"> • Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.
	cutting conditions	<ul style="list-style-type: none"> • Decrease feed; increase speed.
	wrong drill	<ul style="list-style-type: none"> • Check cutting-edge diameter.
<p>hole not cylindrical</p> 	clamping chuck	<ul style="list-style-type: none"> • Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.
	workpiece movement	<ul style="list-style-type: none"> • Stabilise workpiece chucking and check stability of machine tool.
	wrong drill	<ul style="list-style-type: none"> • Check drill type and drilling depth. Use longer drills.
	cutting conditions	<ul style="list-style-type: none"> • Reduce feed at entry.

problem	source	solution
<p>drill breakage</p> 	<p>clamping chuck</p>	<ul style="list-style-type: none"> • Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.
	<p>workpiece movement</p>	<ul style="list-style-type: none"> • Stabilise workpiece chucking and check stability of machine tool.
	<p>wrong drill</p>	<ul style="list-style-type: none"> • Check drill type, drilling depth, cooling system, and workpiece material.
	<p>insufficient coolant</p>	<ul style="list-style-type: none"> • Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.
	<p>cutting conditions</p>	<ul style="list-style-type: none"> • Check cutting values, and possibly reduce feed.
	<p>clamping chuck</p>	<ul style="list-style-type: none"> • Check torque transmission. Use hydraulic clamping chuck or high-precision chucking system.
<p>splintering on the cutting corners</p> 	<p>workpiece movement</p>	<ul style="list-style-type: none"> • Stabilise workpiece chucking and check stability of machine tool.
	<p>wrong drill</p>	<ul style="list-style-type: none"> • Check drill type, drilling depth, cooling system, and workpiece material. Possibly use longer drill.
	<p>insufficient coolant</p>	<ul style="list-style-type: none"> • Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.
	<p>cutting conditions</p>	<ul style="list-style-type: none"> • Check cutting values, and possibly reduce feed.

NOVO KNOWS

ART TO PART TO PROFIT



Being as productive and profitable as possible is your fundamental goal. With the addition of NOVO™ to your team, your goal can be achieved. NOVO possesses powerful digital tools that link together process planning, inventory availability and purchase, cost-per-part management, and productivity improvements.

NOVO can ensure you have the right tools on your machines, in the right sequence. Resulting in flawless execution that accelerates every job, and maximises every shift.

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01

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NOVO  TM



Holemaking • Modular Drills

Introduction..... U2-U3
TOP DRILL M1 U4-U24
Spade Blades U26-U45



modular drills with internal coolant channel		grade/series	standard*						hole tolerance	standard range			
			● first choice ○ alternate choice							diameter range			
			P	M	K	N	S	H		D1 mm min-max	D1 inch min-max	drilling depth L/D1	
TOP DRILL M1™ with front clamping mechanism													
	TOP DRILL M1 inserts	WU25PD**	●	○	●				IT9-IT11	7,94-25,99	.3125-1.1023	—	
	chamfering inserts	TopSTEP SH-WP20PH	●	○	○	●	○		—	12,50-36,01	.4921-1.4177	—	
		TopSTEP VG-WP20PH	●	○	○	○	○		—				
	TOP DRILL M1 bodies	—							—	7,94≤Ø<9,50	.3125≤Ø<.3740	max 3-8 x D	
										9,50≤Ø<11,00	.3740≤Ø<.4331		
											11,00≤Ø<12,50		.4331≤Ø<.4921
											12,50≤Ø<14,00		.4921≤Ø<.5512
											14,00≤Ø<15,50		.5512≤Ø<.6102
											15,50≤Ø<16,50		.6102≤Ø<.6496
											16,50≤Ø<20,50		.6496≤Ø<.8071
											20,50≤Ø<21,00		.8071≤Ø<.8268
								21,00≤Ø<25,99	.8268≤Ø<1.023				

* Apart from our standard drills, we can offer you a wide variety of special coating solutions and edge preparations to fulfill all your needs.
If a specific drill is not suitable for your workpiece material, please contact your WIDIA™ distributor for available options.

** Grade WU25PD™ was previously named K20FTIAIN.

- Standard Product
- Engineered Solutions

engineered solution range			coolant	drilling	inclined exit	counter-sinking	counter-boring	2 flute, 2 margin cooled	corner chamfer	plain shank \leq H6	SCF Shanks	page(s)
diameter range												
D1 mm min-max	D1 inch min-max	max drilling depth										
TOP DRILL M1™ with front clamping mechanism (continued)												
7,94–27,99	.3125–1.1020	–		●	●			●	●			U10–U15
12,50–36,01	.4921–1.4177	–				●						U16–U19
		–				●	●					
7,94 ≤ Ø < 9,50	.3125 ≤ Ø < .3740	12 x D	●	●	●	○	○			●	●	U6–U8
9,50 ≤ Ø < 11,00	.3740 ≤ Ø < .4331	13 x D	●	●	●	○	○			●	●	
11,00 ≤ Ø < 12,50	.5424 ≤ Ø < .4921	14 x D	●	●	●	○	○			●	●	
12,50 ≤ Ø < 14,00	.4921 ≤ Ø < .5512	15 x D	●	●	●	○	○			●	●	
14,00 ≤ Ø < 15,00	.5512 ≤ Ø < .6102	16 x D	●	●	●	○	○			●	●	
15,50 ≤ Ø < 16,50	.6102 ≤ Ø < .6496	17 x D	●	●	●	○	○			●	●	
16,50 ≤ Ø < 20,50	.6496 ≤ Ø < .8070	18 x D	●	●	●	○	○			●	●	
20,50 ≤ Ø < 21,00	.8070 ≤ Ø < .8267	20 x D	●	●	●	○	○			●	●	
21,00 ≤ Ø < 27,99	.8267 ≤ Ø < 1.1010	500,0mm	●	●	●	○	○			●	●	

TOP DRILL M1™ Modular Drill System

TOP DRILL M1

With performance levels and metal removal rates comparable to that of solid carbide drills, WIDIA™ TOP DRILL M1 offers all the quality and performance you need in one versatile, economical package. The unique front clamping system enables inserts to be changed quickly, even inside the machine tool, saving setup time and manufacturing costs.

The TDM1 platform offers UP(M) drill-point design in WU25PD™ grade — a wide application range geometry, specially developed for cost-efficient drilling of steel, cast iron, and stainless steel. It covers diameter ranges from 8–25,99mm within the standard offering in L/D ratios of 3, 5, and 8 x D.

With its high level of performance, wide application range, and proven point geometry, TDM1 combines all of the economic benefits of a modular drilling system with the machining performance and hole quality to tackle even your most challenging operations.



UP Point Design — Versatility and Productivity

- One insert style for all your work in steel, cast iron, and even stainless steels.
- Low cutting forces and excellent centring capabilities.
- Universal point style for consistent performance and excellent hole quality.

Easy Insert Change

- No screws or clamps required.
- Insert blades can be changed with a simple wrench that comes with each holder.

Disposable

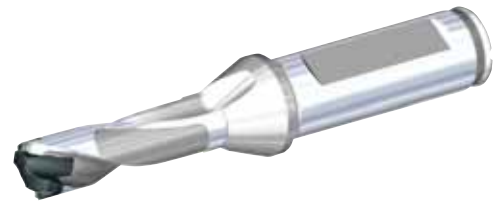
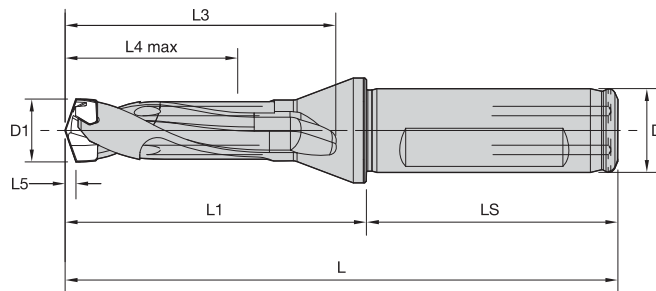
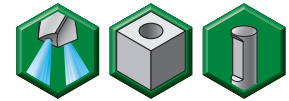
- No reconditioning costs.
- Consistent performance from tip to tip.
- Eliminates number of tools waiting for reconditioning, thus avoiding hidden costs.

Customisation

- All intermediate diameters are quickly available as semi-standards.
- Multiple step drills available as customised solutions.
- New TopSTEP range of inserts offer extended chamfering and counterboring to your one-shot drilling solution.



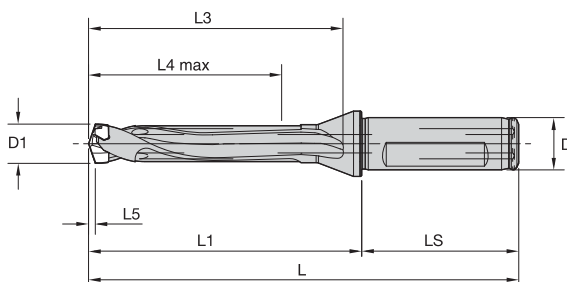
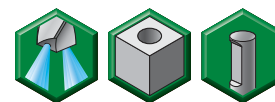
- Tool body shipped with insert wrench.



■ TOP DRILL M1 • 3 x D • Flanged • Metric

order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	insert blade seat size
3850904	TDM080R3SCF12M	7,94	8,49	12	86	41	35	26	1,5	45	W10
3850906	TDM085R3SCF12M	8,50	8,99	12	88	43	37	27	1,6	45	W11
3850908	TDM090R3SCF12M	9,00	9,49	12	90	45	39	29	1,7	45	W12
3850910	TDM095R3SCF12M	9,50	9,99	12	92	47	41	30	1,8	45	W13
3850912	TDM100R3SCF16M	10,00	10,49	16	97	49	43	32	1,9	48	W14
3850924	TDM105R3SCF16M	10,50	10,99	16	99	51	45	33	2,0	48	W15
3850926	TDM110R3SCF16M	11,00	11,49	16	101	53	47	35	2,1	48	W16
3850928	TDM115R3SCF16M	11,50	11,99	16	103	55	49	36	2,2	48	W17
3850930	TDM120R3SCF16M	12,00	12,49	16	106	58	52	38	2,3	48	W18
3850932	TDM125R3SCF16M	12,50	12,99	16	108	60	54	39	2,4	48	W19
3850934	TDM130R3SCF16M	13,00	13,49	16	110	62	56	41	2,5	48	W20
3850936	TDM135R3SCF16M	13,50	13,99	16	112	64	58	42	2,6	48	W21
3850938	TDM140R3SCF16M	14,00	14,49	16	114	66	60	44	2,7	48	W22
3850940	TDM145R3SCF16M	14,50	14,99	16	116	68	62	45	2,8	48	W23
3850942	TDM150R3SCF20M	15,00	15,99	20	122	72	66	48	2,8	50	W24
3850944	TDM160R3SCF20M	16,00	16,99	20	126	76	70	51	3,0	50	W25
3850946	TDM170R3SCF20M	17,00	17,99	20	131	81	75	54	3,2	50	W26
3850948	TDM180R3SCF25M	18,00	18,99	25	141	85	79	57	3,4	56	W27
3850950	TDM190R3SCF25M	19,00	19,99	25	144	89	83	60	3,6	56	W28
3850952	TDM200R3SCF25M	20,00	20,99	25	149	93	87	63	3,8	56	W29
3992070	TDM210R3SCF25M	21,00	21,99	25	153	97	91	66	3,7	56	W30
3992071	TDM220R3SCF25M	22,00	22,99	25	158	102	96	69	3,9	56	W31
3992072	TDM230R3SCF25M	23,00	23,99	25	162	106	100	72	4,1	56	W32
3992483	TDM240R3SCF25M	24,00	24,99	25	166	110	104	75	4,2	56	W33
3992484	TDM250R3SCF25M	25,00	25,99	25	170	114	108	78	4,4	56	W34

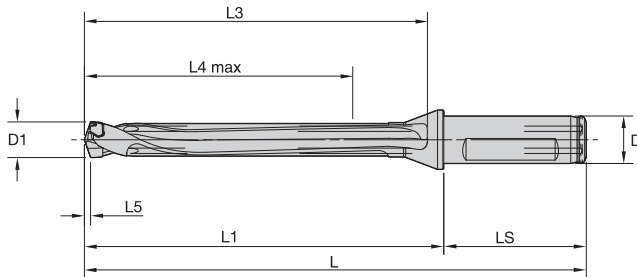
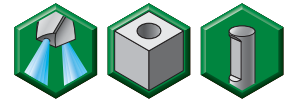
- Tool body shipped with insert wrench.



■ TOP DRILL M1 • 5 x D • Flanged • Metric

order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	insert blade seat size
3850905	TDM080R5SCF12M	7,94	8,49	12	104	59	53	43	1,5	45	W10
3850907	TDM085R5SCF12M	8,50	8,99	12	107	62	56	45	1,6	45	W11
3850909	TDM090R5SCF12M	9,00	9,49	12	110	65	59	48	1,7	45	W12
3850911	TDM095R5SCF12M	9,50	9,99	12	114	69	63	50	1,8	45	W13
3850923	TDM100R5SCF16M	10,00	10,49	16	120	72	66	53	1,9	48	W14
3850925	TDM105R5SCF16M	10,50	10,99	16	123	75	69	55	2,0	48	W15
3850927	TDM110R5SCF16M	11,00	11,49	16	126	78	72	58	2,1	48	W16
3850929	TDM115R5SCF16M	11,50	11,99	16	129	81	75	60	2,2	48	W17
3850931	TDM120R5SCF16M	12,00	12,49	16	132	84	78	63	2,3	48	W18
3850933	TDM125R5SCF16M	12,50	12,99	16	135	87	81	65	2,4	48	W19
3850935	TDM130R5SCF16M	13,00	13,49	16	138	90	84	68	2,5	48	W20
3850937	TDM135R5SCF16M	13,50	13,99	16	142	94	88	70	2,6	48	W21
3850939	TDM140R5SCF16M	14,00	14,49	16	145	97	91	73	2,7	48	W22
3850941	TDM145R5SCF16M	14,50	14,99	16	148	100	94	75	2,8	48	W23
3850943	TDM150R5SCF20M	15,00	15,99	20	156	106	100	80	2,8	50	W24
3850945	TDM160R5SCF20M	16,00	16,99	20	162	112	106	85	3,0	50	W25
3850947	TDM170R5SCF20M	17,00	17,99	20	169	119	113	90	3,2	50	W26
3850949	TDM180R5SCF25M	18,00	18,99	25	181	125	119	95	3,4	56	W27
3850951	TDM190R5SCF25M	19,00	19,99	25	187	131	125	100	3,6	56	W28
3850953	TDM200R5SCF25M	20,00	20,99	25	193	137	131	105	3,8	56	W29
3992485	TDM210R5SCF25M	21,00	21,99	25	200	144	138	110	3,7	56	W30
3992486	TDM220R5SCF25M	22,00	22,99	25	206	150	144	115	3,9	56	W31
3992487	TDM230R5SCF25M	23,00	23,99	25	212	156	150	120	4,1	56	W32
3992488	TDM240R5SCF25M	24,00	24,99	25	218	162	156	125	4,2	56	W33
3992489	TDM250R5SCF25M	25,00	25,99	25	225	169	163	130	4,4	56	W34

- Tool body shipped with insert wrench.



■ TOP DRILL M1 • 8 x D • Flanged • Metric

order number	catalogue number	D1	D1 max	D	L	L1	L3	L4 max	L5	LS	insert blade seat size
3992141	TDM080R8SCF12M	7,94	8,49	12	129	84	79	68	1,4	45	W10
3992142	TDM085R8SCF12M	8,50	8,99	12	134	89	83	72	1,5	45	W11
3992213	TDM090R8SCF12M	9,00	9,49	12	138	93	88	76	1,6	45	W12
3992214	TDM095R8SCF12M	9,50	9,99	12	144	99	93	80	1,7	45	W13
3992215	TDM100R8SCF16M	10,00	10,49	16	151	103	98	84	1,8	48	W14
3992216	TDM105R8SCF16M	10,50	10,99	16	156	108	102	88	1,9	48	W15
3992217	TDM110R8SCF16M	11,00	11,49	16	160	112	107	92	2,0	48	W16
3992218	TDM115R8SCF16M	11,50	11,99	16	165	117	111	96	2,1	48	W17
3992219	TDM120R8SCF16M	12,00	12,49	16	169	121	116	100	2,1	48	W18
3992220	TDM125R8SCF16M	12,50	12,99	16	174	126	120	104	2,2	48	W19
3992221	TDM130R8SCF16M	13,00	13,49	16	178	130	125	108	2,3	48	W20
3992222	TDM135R8SCF16M	13,50	13,99	16	184	136	130	112	2,4	48	W21
3992223	TDM140R8SCF16M	14,00	14,49	16	188	140	135	116	2,5	48	W22
3992224	TDM145R8SCF16M	14,50	14,99	16	193	145	139	120	2,6	48	W23
3992225	TDM150R8SCF20M	15,00	15,99	20	204	154	148	128	2,7	50	W24
3992226	TDM160R8SCF20M	16,00	16,99	20	213	163	157	136	2,8	50	W25
3992227	TDM170R8SCF20M	17,00	17,99	20	223	173	167	144	3,0	50	W26
3992228	TDM180R8SCF25M	18,00	18,99	25	238	182	176	152	3,2	56	W27
3992229	TDM190R8SCF25M	19,00	19,99	25	247	191	185	160	3,4	56	W28
3992230	TDM200R8SCF25M	20,00	20,99	25	256	200	194	168	3,6	56	W29
3992231	TDM210R8SCF25M	21,00	21,99	25	266	210	204	176	3,7	56	W30
3992232	TDM220R8SCF25M	22,00	22,99	25	275	219	213	184	3,9	56	W31
3992233	TDM230R8SCF25M	23,00	23,99	25	284	228	222	192	4,1	56	W32
3992234	TDM240R8SCF25M	24,00	24,99	25	293	237	231	200	4,2	56	W33
3992235	TDM250R8SCF25M	25,00	25,99	25	303	247	241	208	4,4	56	W34



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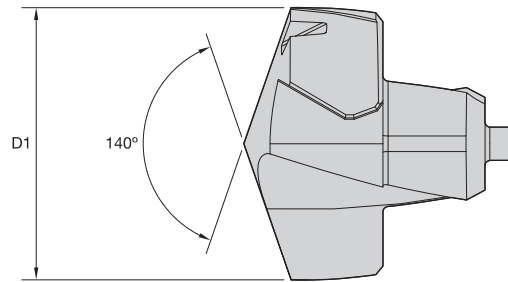
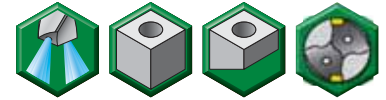
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■ TOP DRILL M1 • UP(M)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1	seat size/series
order #	catalogue #		
3850959	TDM0794UPM	7,94	W10
3848984	TDM0800UPM	8,00	W10
3848985	TDM0810UPM	8,10	W10
3850960	TDM0816UPM	8,16	W10
3850961	TDM0820UPM	8,20	W10
3848986	TDM0830UPM	8,30	W10
3850962	TDM0833UPM	8,33	W10
3848987	TDM0840UPM	8,40	W10
3850963	TDM0843UPM	8,43	W10
3848988	TDM0850UPM	8,50	W11
3848989	TDM0860UPM	8,60	W11
3850964	TDM0861UPM	8,61	W11
3848990	TDM0870UPM	8,70	W11
3850965	TDM0873UPM	8,73	W11
3848991	TDM0880UPM	8,80	W11
3850966	TDM0884UPM	8,84	W11
3848992	TDM0890UPM	8,90	W11
3849043	TDM0900UPM	9,00	W12
3850967	TDM0909UPM	9,09	W12
3849044	TDM0910UPM	9,10	W12
3850968	TDM0913UPM	9,13	W12
3849045	TDM0920UPM	9,20	W12
3849046	TDM0930UPM	9,30	W12
3850969	TDM0935UPM	9,35	W12

(continued)

(TOP DRILL M1 • UP(M) – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1	seat size/series
order #	catalogue #		
3849047	TDM0940UPM	9,40	W12
3849048	TDM0950UPM	9,50	W13
3850970	TDM0953UPM	9,53	W13
3850971	TDM0956UPM	9,56	W13
3850972	TDM0958UPM	9,58	W13
3849049	TDM0960UPM	9,60	W13
3850973	TDM0970UPM	9,70	W13
3850974	TDM0980UPM	9,80	W13
3849050	TDM0990UPM	9,90	W13
3850975	TDM0992UPM	9,92	W13
3849051	TDM1000UPM	10,00	W14
3850976	TDM1002UPM	10,02	W14
3850977	TDM1008UPM	10,08	W14
3849052	TDM1010UPM	10,10	W14
3849053	TDM1020UPM	10,20	W14
3850978	TDM1026UPM	10,26	W14
3849054	TDM1030UPM	10,30	W14
3850979	TDM1032UPM	10,32	W14
3849055	TDM1040UPM	10,40	W14
3850980	TDM1049UPM	10,49	W14
3849056	TDM1050UPM	10,50	W15
3849057	TDM1060UPM	10,60	W15
3849058	TDM1070UPM	10,70	W15
3850981	TDM1072UPM	10,72	W15
3849059	TDM1080UPM	10,80	W15
3849060	TDM1090UPM	10,90	W15
3849061	TDM1100UPM	11,00	W16
3849062	TDM1110UPM	11,10	W16
3850982	TDM1111UPM	11,11	W16
3849063	TDM1120UPM	11,20	W16
3849064	TDM1130UPM	11,30	W16
3849065	TDM1140UPM	11,40	W16
3849066	TDM1150UPM	11,50	W17
3850983	TDM1151UPM	11,51	W17
3849067	TDM1160UPM	11,60	W17
3850984	TDM1161UPM	11,61	W17
3849068	TDM1170UPM	11,70	W17
3849069	TDM1180UPM	11,80	W17
3849070	TDM1190UPM	11,90	W17
3850985	TDM1191UPM	11,91	W17

(continued)

(TOP DRILL M1 • UP(M) – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1	seat size/series
order #	catalogue #		
3849071	TDM1200UPM	12,00	W18
3849072	TDM1210UPM	12,10	W18
3849073	TDM1220UPM	12,20	W18
3850986	TDM1230UPM	12,30	W18
3849074	TDM1240UPM	12,40	W18
3850987	TDM1247UPM	12,47	W18
3849075	TDM1250UPM	12,50	W19
3849076	TDM1260UPM	12,60	W19
3850988	TDM1270UPM	12,70	W19
3849077	TDM1280UPM	12,80	W19
3850989	TDM1290UPM	12,90	W19
3849078	TDM1300UPM	13,00	W20
3850990	TDM1310UPM	13,10	W20
3849079	TDM1320UPM	13,20	W20
3849080	TDM1330UPM	13,30	W20
3849081	TDM1340UPM	13,40	W20
3850991	TDM1349UPM	13,49	W20
3849082	TDM1350UPM	13,50	W21
3849083	TDM1360UPM	13,60	W21
3849084	TDM1370UPM	13,70	W21
3849085	TDM1380UPM	13,80	W21
3850992	TDM1389UPM	13,89	W21
3850993	TDM1390UPM	13,90	W21
3849086	TDM1400UPM	14,00	W22
3849087	TDM1410UPM	14,10	W22
3849088	TDM1420UPM	14,20	W22
3850994	TDM1429UPM	14,29	W22
3849089	TDM1430UPM	14,30	W22
3849090	TDM1440UPM	14,40	W22
3849091	TDM1450UPM	14,50	W23
3849092	TDM1460UPM	14,60	W23
3850995	TDM1467UPM	14,67	W23
3850996	TDM1468UPM	14,68	W23
3849093	TDM1470UPM	14,70	W23
3849094	TDM1480UPM	14,80	W23
3849095	TDM1490UPM	14,90	W23
3849096	TDM1500UPM	15,00	W24
3850997	TDM1508UPM	15,08	W24
3849097	TDM1510UPM	15,10	W24
3849098	TDM1520UPM	15,20	W24

(continued)

(TOP DRILL M1 • UP(M) – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1	seat size/series
order #	catalogue #		
3849099	TDM1530UPM	15,30	W24
3849100	TDM1540UPM	15,40	W24
3850998	TDM1548UPM	15,48	W24
3849101	TDM1550UPM	15,50	W24
3849102	TDM1560UPM	15,60	W24
3849103	TDM1570UPM	15,70	W24
3849104	TDM1580UPM	15,80	W24
3850999	TDM1588UPM	15,88	W24
3849105	TDM1600UPM	16,00	W25
3851000	TDM1603UPM	16,03	W25
3851001	TDM1608UPM	16,08	W25
3849106	TDM1610UPM	16,10	W25
4010625	TDM1618UPM	16,18	W25
3849107	TDM1620UPM	16,20	W25
3851002	TDM1627UPM	16,27	W25
3849108	TDM1630UPM	16,30	W25
3849109	TDM1640UPM	16,40	W25
3849110	TDM1650UPM	16,50	W25
3849111	TDM1660UPM	16,60	W25
3851003	TDM1667UPM	16,67	W25
3849112	TDM1670UPM	16,70	W25
3849113	TDM1680UPM	16,80	W25
3851004	TDM1687UPM	16,87	W25
3849114	TDM1690UPM	16,90	W25
3849119	TDM1700UPM	17,00	W26
3851005	TDM1707UPM	17,07	W26
3849120	TDM1710UPM	17,10	W26
3849121	TDM1720UPM	17,20	W26
3849122	TDM1730UPM	17,30	W26
3849193	TDM1740UPM	17,40	W26
3851006	TDM1746UPM	17,46	W26
3849194	TDM1750UPM	17,50	W26
3849195	TDM1760UPM	17,60	W26
3849196	TDM1770UPM	17,70	W26
3849197	TDM1780UPM	17,80	W26
3851007	TDM1786UPM	17,86	W26
3849198	TDM1790UPM	17,90	W26
3849199	TDM1800UPM	18,00	W27
3849200	TDM1810UPM	18,10	W27
3849201	TDM1820UPM	18,20	W27

(continued)

(TOP DRILL M1 • UP(M) – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1	seat size/series
order #	catalogue #		
3851008	TDM1826UPM	18,26	W27
3849202	TDM1830UPM	18,30	W27
3849203	TDM1840UPM	18,40	W27
3849204	TDM1850UPM	18,50	W27
3849205	TDM1860UPM	18,60	W27
3851009	TDM1865UPM	18,65	W27
3849206	TDM1870UPM	18,70	W27
3849207	TDM1880UPM	18,80	W27
3849208	TDM1890UPM	18,90	W27
3849209	TDM1900UPM	19,00	W28
3851010	TDM1905UPM	19,05	W28
3849210	TDM1910UPM	19,10	W28
3849211	TDM1920UPM	19,20	W28
3851011	TDM1923UPM	19,23	W28
3851012	TDM1925UPM	19,25	W28
3851013	TDM1928UPM	19,28	W28
3849212	TDM1930UPM	19,30	W28
3851014	TDM1935UPM	19,35	W28
3849213	TDM1940UPM	19,40	W28
3851015	TDM1945UPM	19,45	W28
3849214	TDM1950UPM	19,50	W28
3849215	TDM1960UPM	19,60	W28
3849216	TDM1970UPM	19,70	W28
3849217	TDM1980UPM	19,80	W28
3851016	TDM1984UPM	19,84	W28
3849218	TDM1990UPM	19,90	W28
3849219	TDM2000UPM	20,00	W29
3849220	TDM2010UPM	20,10	W29
3849221	TDM2020UPM	20,20	W29
3851017	TDM2024UPM	20,24	W29
3849222	TDM2030UPM	20,30	W29
3849223	TDM2040UPM	20,40	W29
3849224	TDM2050UPM	20,50	W29
3849225	TDM2060UPM	20,60	W29
3851018	TDM2064UPM	20,64	W29
3849226	TDM2070UPM	20,70	W29
3849227	TDM2080UPM	20,80	W29
3849228	TDM2090UPM	20,90	W29
3849229	TDM2099UPM	20,99	W29
4003225	TDM2100UPM	21,00	W30

(continued)

(TOP DRILL M1 • UP(M) – continued)



● first choice
○ alternate choice

grade WU25PD TiAlN		D1	seat size/series
order #	catalogue #		
4003203	TDM2144UPM	21,44	W30
3969291	TDM2150UPM	21,50	W30
4003226	TDM2200UPM	22,00	W31
4003204	TDM2223UPM	22,23	W31
4003205	TDM2245UPM	22,45	W31
4003227	TDM2250UPM	22,50	W31
4003228	TDM2300UPM	23,00	W32
4003229	TDM2350UPM	23,50	W32
4003206	TDM2381UPM	23,81	W32
4003230	TDM2400UPM	24,00	W33
4003231	TDM2450UPM	24,50	W33
4003207	TDM2461UPM	24,61	W33
4003232	TDM2500UPM	25,00	W34
4003208	TDM2540UPM	25,40	W34
4002444	TDM2550UPM	25,50	W34
4003209	TDM2568UPM	25,68	W34
4003210	TDM2581UPM	25,81	W34
3992013	TDM2599UPM	25,99	W34

Metric
tolerance

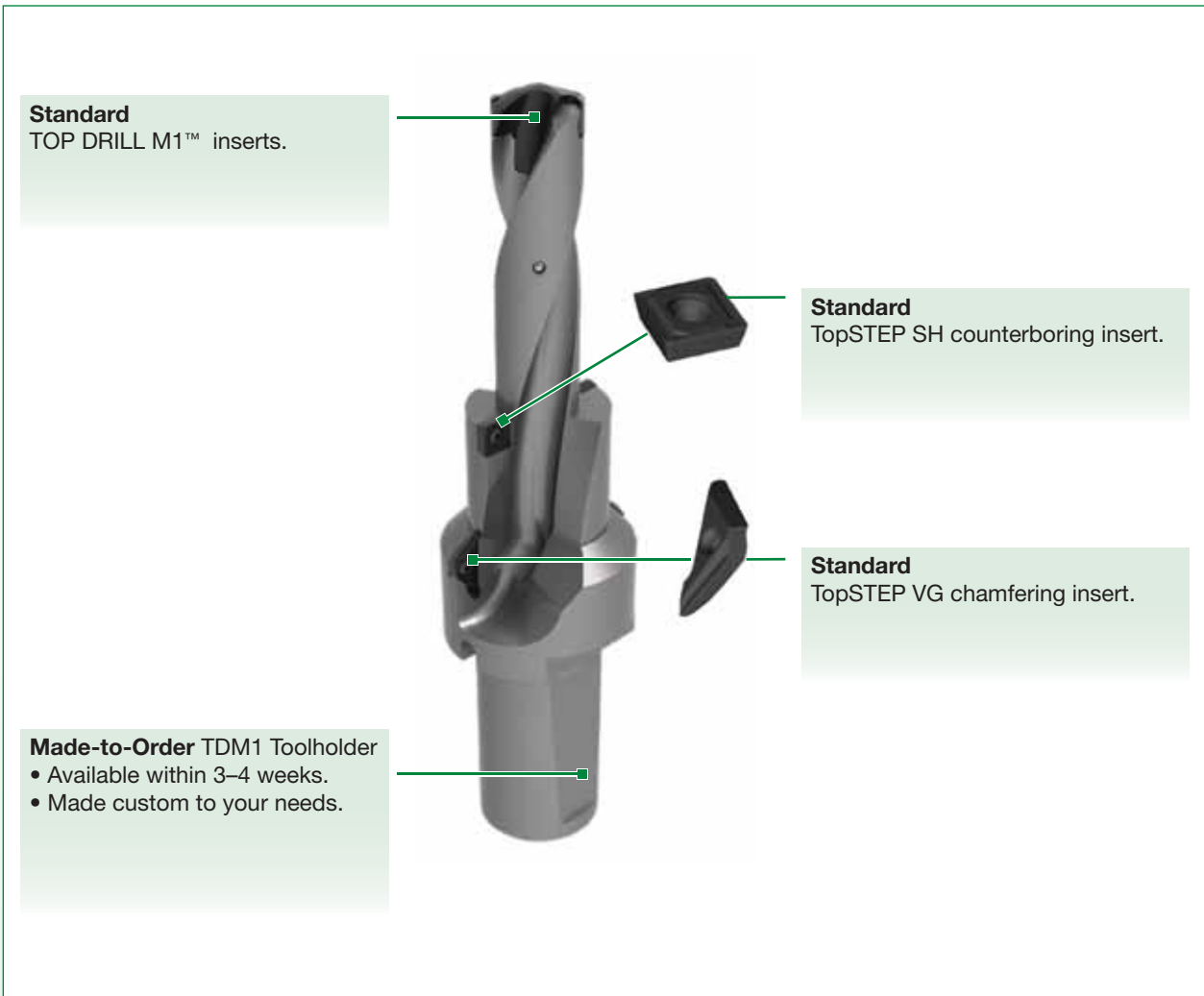
D1	tolerance k8
8–10	0,000/+0,022
>10–17	0,000/+0,027
>17–18	0,000/+0,027
>18–21	0,000/+0,033



Modular TOP DRILL M1 Step Drill

Provides high productivity through high-feed, one-shot operations, and excellent tool life.

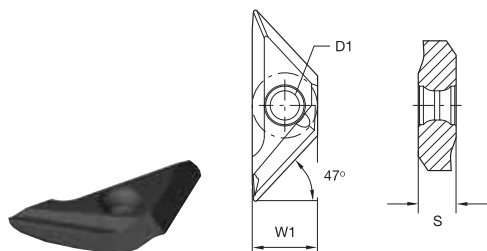
- Use TopSTEP VG and SH chamfer and counterboring inserts to create your specific TDM1 modular step drill.
- Create complex holes with countersinks, chamfers, or even both operations in one shot.
- Save time, achieve better cost, and run your complex drilling process with higher stability.



Let your WIDIA™ representative know about your specific needs. Use the Chamfer and Counterboring Order Planning pages to create and send us your request – available online as well.

TopSTEP VG Chamfering Inserts

- 45° chamfer angle with broad cutting edge.
- Hassle-free usage.
- Very stable and accurate positioning in pocket.
- Two times indexable.
- One universal insert size for a lot of applications.



- first choice
- alternate choice

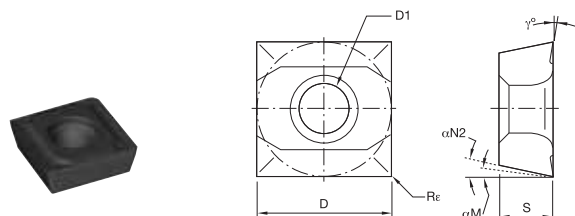
P	●
M	○
K	●
N	○
S	○
H	

■ TopSTEP VG Chamfering Inserts

catalogue number	W1	D1	S	WP20PH
VXGX10030234	6,35	2,85	3,48	5983706

TopSTEP SH Counterboring Inserts

- 90° insert can be positioned in alternative angles.
- Very good chip forming and surface quality.
- Two times indexable.
- Stocked standards in six insert sizes.



- first choice
- alternate choice

P	●
M	○
K	○
N	
S	
H	

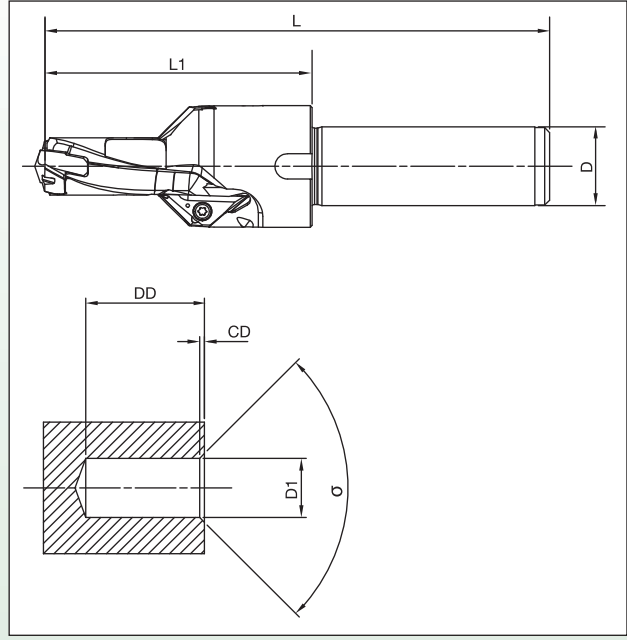
■ TopSTEP SH Counterboring Inserts

catalogue number	D	D1	S	Rε	αN	αN M	WP20PH
SXHX060204R20	6,35	2,85	2,38	0,40	11	7	5983390
SXHX070304R20	6,35	2,85	2,38	0,40	11	7	5983702
SXHX060208R20	6,35	2,85	2,38	0,80	11	7	5983701
SXHX070308R20	6,35	2,85	2,38	0,80	11	7	5983703
SXHX090304R20	9,52	3,50	3,18	0,40	11	7	5983704
SXHX090308R20	9,52	3,50	3,18	0,80	11	7	5983705

Please utilise guide below to plan your TOP DRILL M1™ modular step drill based on your needs and requirements. Please contact your distributor for a quote.

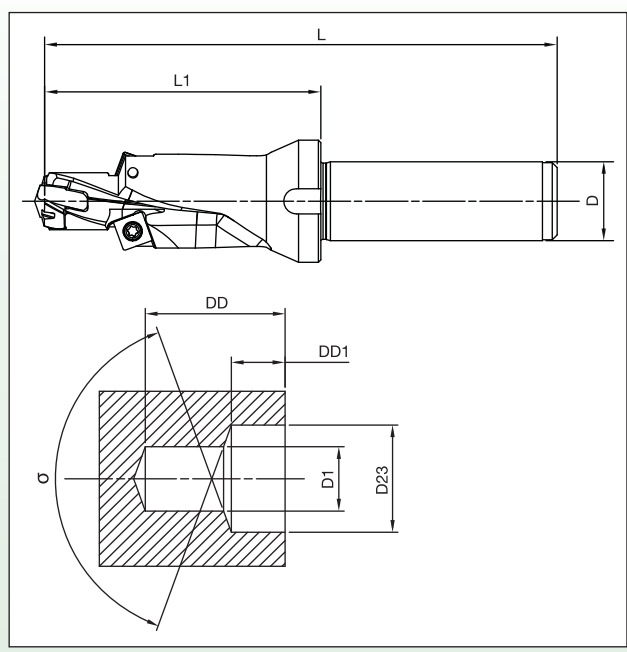
Option 1 TOP DRILL M1 Drilling and Chamfering

Overall Length	[L]	<input type="text"/>
Drill Length	[L1]	<input type="text"/>
Shank Diameter	[D]	<input type="text"/>
Drill Diameter Min	[D1]	<input type="text"/>
Drilling Depth	[DD]	<input type="text"/>
Cutting Diameter 2 Angle	σ	<input type="text"/>
Chamfering Depth	[CD]	<input type="text"/>



Option 2 TOP DRILL M1 Drilling and Countersinking

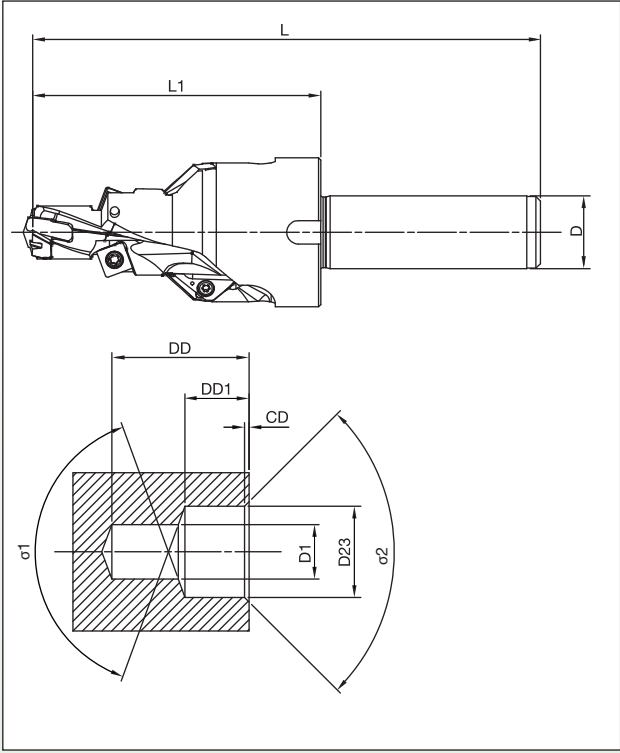
Overall Length	[L]	<input type="text"/>
Drill Length	[L1]	<input type="text"/>
Shank Diameter	[D]	<input type="text"/>
Drill Diameter Min	[D1]	<input type="text"/>
Drilling Depth	[DD]	<input type="text"/>
Cut Diameter 23	[D23]	<input type="text"/>
Countersinking Depth	[DD1]	<input type="text"/>
Cutting Diameter 2 Angle	σ	<input type="text"/>



Please utilise guide below to plan your TOP DRILL M1™ modular step drill based on your needs and requirements. Please contact your distributor for a quote.

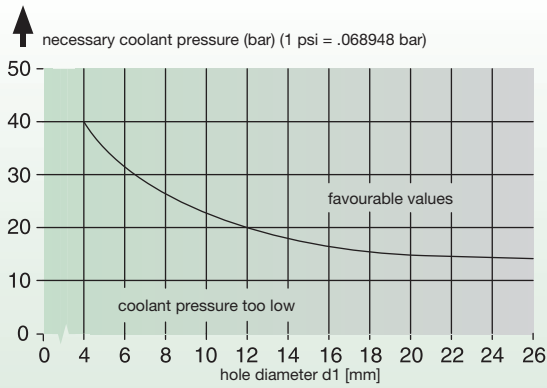
Option 3 TOP DRILL M1 Drilling and Countersinking and Chamfering

Overall Length	[L]	<input type="text"/>
Drill Length	[L1]	<input type="text"/>
Shank Diameter	[D]	<input type="text"/>
Drill Diameter Min	[D1]	<input type="text"/>
Drilling Depth	[DD]	<input type="text"/>
Cut Diameter 23	[D23]	<input type="text"/>
Countersinking Depth	[DD1]	<input type="text"/>
Cutting Diameter 2 Angle	$\sigma 1$	<input type="text"/>
Cutting Diameter 3 Angle	$\sigma 2$	<input type="text"/>
Chamfering depth	[CD]	<input type="text"/>



If a more complex tool is required, we need your individual information to serve your specific needs. Please contact your WIDIA™ distributor for further guidance.





Coolant Pressure

The diagram at left shows the coolant pressure as a function of the hole diameter. The higher the coolant pressure, the better the drilling result. Tool life and hole quality improve with increased coolant flow.

Drilling on Inclined Surfaces

When drilling on inclined or curved surfaces, use a 50% lower feed than the standard value. After the drill margins are fully engaged in the workpiece, increase the feed to the standard value (100%). Premachining is required on surfaces with inclination greater than 3°.

■ TOP DRILL M1 • UP(M) • WU25PD™ • Speed and Feed Chart • Metric

Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate							
					Tool Diameter (mm)	8,0	10,0	12,0	14,0	16,0	20,0	25,0
		min	Starting Value	max								
P	1	90	125	170	mm/r	0,11–0,20	0,13–0,25	0,14–0,31	0,17–0,39	0,19–0,45	0,25–0,48	0,30–0,52
	2	105	140	180	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,21–0,46	0,23–0,46	0,28–0,50	0,30–0,52
	3	50	75	100	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,21–0,46	0,23–0,46	0,28–0,50	0,30–0,52
	4	50	75	100	mm/r	0,11–0,28	0,12–0,35	0,16–0,37	0,17–0,36	0,19–0,45	0,22–0,48	0,25–0,50
	5	50	65	80	mm/r	0,10–0,20	0,10–0,23	0,10–0,25	0,14–0,29	0,16–0,32	0,18–0,36	0,22–0,42
	6	50	65	80	mm/r	0,10–0,20	0,10–0,23	0,10–0,25	0,14–0,29	0,16–0,32	0,18–0,36	0,22–0,42
M	1	40	80	110	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
	2	35	55	75	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
	3	20	35	50	mm/r	0,06–0,22	0,08–0,23	0,09–0,24	0,10–0,25	0,11–0,26	0,13–0,28	0,13–0,32
K	1	60	95	170	mm/r	0,15–0,29	0,16–0,32	0,17–0,35	0,21–0,42	0,25–0,48	0,28–0,52	0,32–0,56
	2	60	75	90	mm/r	0,15–0,29	0,16–0,30	0,17–0,33	0,21–0,41	0,25–0,48	0,28–0,52	0,32–0,56
	3	40	65	90	mm/r	0,16–0,30	0,17–0,33	0,18–0,36	0,20–0,41	0,21–0,44	0,23–0,48	0,25–0,50

NOTE: Through coolant recommended for greater than 3 x D applications.

How to attach inserts



1) Fix drill holder on arbour. For insert exchange, fix arbour on the machine or set on tool presetter.



2) Remove dust using air blast.



3) Put insert into drill holder. (Use gloves to protect your hands.)



4) Turn lightly in a clockwise direction. (Use gloves to protect your hands.)



5) Set the wrench properly.*



6) Make sure the wrench fits with the insert slot for the wrench. (Is the wrench unfixed from the slot?)



7) Slowly turn the wrench in a clockwise direction.



8) Complete.

How to detach inserts



1) Remove dust from insert using air blast.



2) Set the wrench properly.*



3) Fit the wrench to insert slot.



4) Turn the wrench in an anti-clockwise direction.



5) Once lock is released, insert can be turned with fingers. (Use gloves to protect your hands.)



6) Remove insert. (Use gloves to protect your hands.)

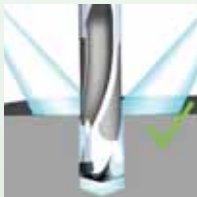
**To order the TDM1 Wrench, please use order number 3861623 and catalogue number 170.315.*

Cautions

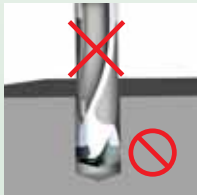
Coolant



1) Internal coolant is recommended.



2) In case of external coolant, cutting depth must be 3 x D or less.

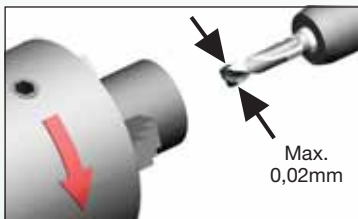


3) Dry cutting is not recommended. Limited applicability in cast iron materials, MQL strongly recommended.

Usage Precautions

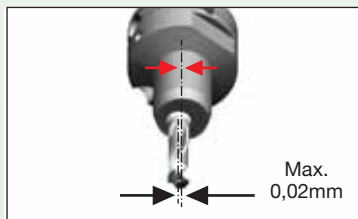
Core deviation

1) For Turning Machines



Set deviation amount under 0,02mm between workpiece and drill.

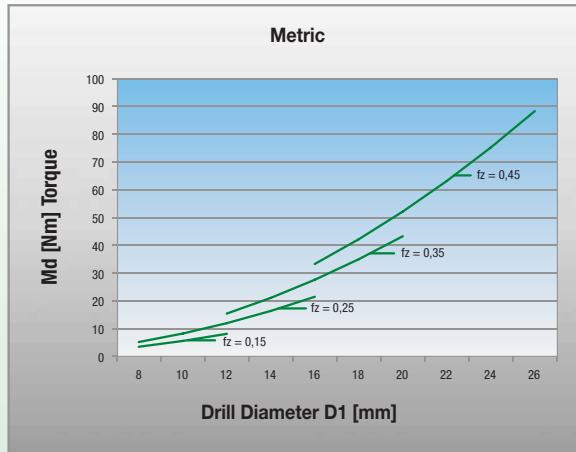
2) For Machining Centres



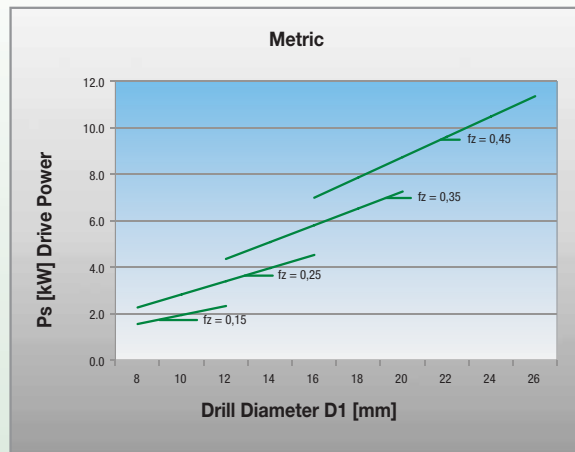
Do not use any arbour with a damaged attachment surface. Centre of arbour deviation must be within 0,02mm.

Application Recommendation	Workpiece Shape
Flat Face Recommended	
Stacked Plates Recommended	
Inclined Surface >3° Not Recommended	
Half Cylindrical Not Recommended	
Hole Expansion Not Recommended	
Concave Surface Not Recommended	
Pipe Material Not Recommended	
Cored Hole Not Recommended	

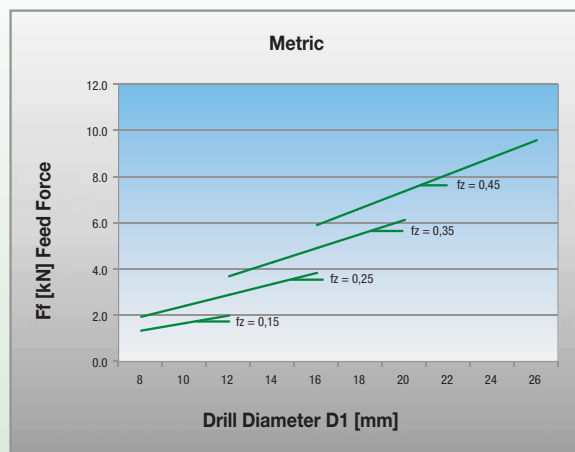
■ Torque



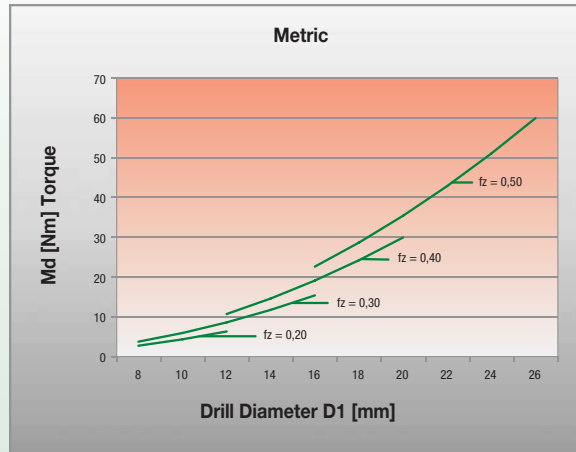
■ Power



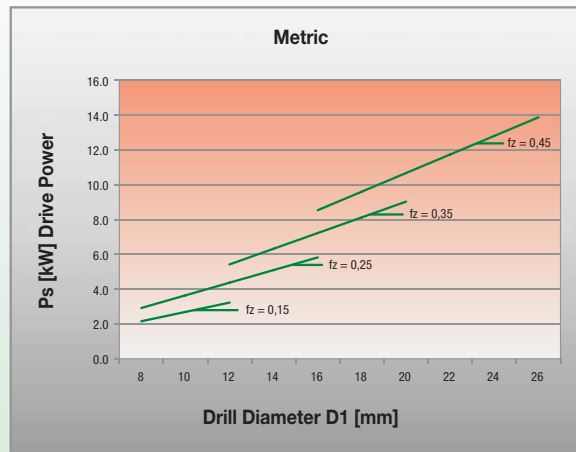
■ Feed Force



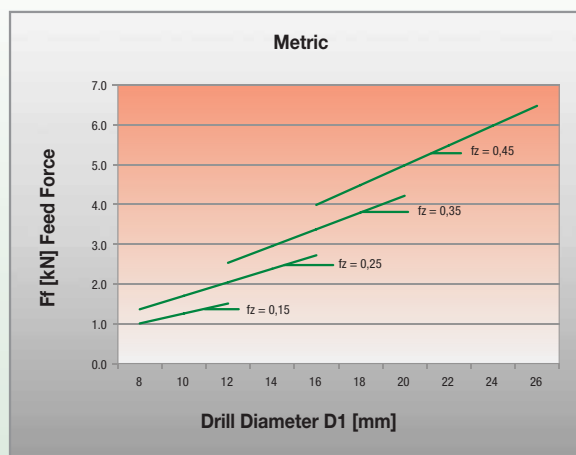
■ Torque



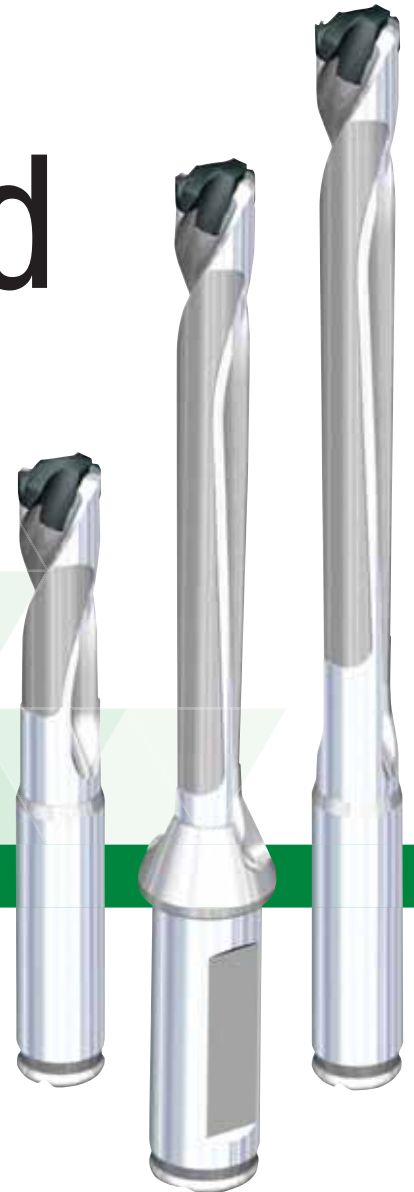
■ Power



■ Feed Force



Cut Time and Costs, Not Quality and Performance



EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

TOP DRILL M1™

The TDM1 modular drill system offers performance levels and Metal Removal Rates (MRR) comparable to that of solid carbide drills. The unique front clamping system enables inserts to be changed quickly, even inside the machine tool, saving setup time and manufacturing costs.

- UP(M) drill point design in WU25PD™.
- Diameter ranges from 8-25,99mm in L/D ratios of 3, 5, and 8 x D.
- Disposable — eliminates number of tools waiting for reconditioning, avoiding hidden costs.
- All intermediate diameters available as semi-standards. Multiple step drills available as customised solutions. New TopSTEP range of inserts offer extended chamfering and counterboring.

To learn more about the benefits of **WIDIA™ TOP DRILL M1**, contact your local distributor.

WIDIA 

WIDIA-Metcut™ Spade Blades •
A complement to TOP DRILL M1™

Spade Blades

WIDIA™ provides a comprehensive line of spade blades from 8–114mm (.315–4.5") to cover a wide range of machining environments and materials.

- Fast penetration rates, less downtime, and lower variability.
- Interchangeable with other conventional spade blade holders.
- Improved surface finish — eliminates subsequent hole finishing operations.
- Standard and special drill body/holder offering, including step drill and porting tool configurations.
- Intermediate diameters and specific toolholder length quickly available upon request.

WIDIA-Metcut spade blades are great choices for:

- Universal application for most plain and alloyed steel applications as well as for cast iron and stainless steels.
- Machining environments where rigidity, coolant supply, or speed and feed rates are limiting factors.
- Short run manufacturing and prototyping environments.
- Especially when dealing with larger diameters and deeper holes.



Application Information

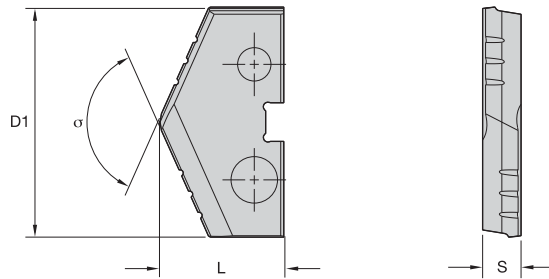
T-15 HSS spade blades are recommended:

- For providing straighter and more consistent holes with superior surface finishes than can be produced using either HSS twist drills or carbide indexable drills.
- When rigidity of the machine or the fixture requires a more forgiving, durable, and tougher tool; T-15 steel possesses a higher transverse rupture strength and is more impact-resistant than comparable carbide spade blades and/or carbide indexable drills.
- In applications requiring hole depths up through 15x to 20x diameter; pecking may be required for depths above 7x diameter for some materials.
- As a cost-effective alternative to carbide indexable drills since T-15 steel spade blades operate at comparable penetration rates to single-effective indexable drills in materials <35 Rc, and one spade blade holder accommodates multiple diameter blades.



Spade Blade Holders

Generally can accommodate a range of blade sizes up to 1.30–1.35 times the smallest blade size. It is therefore possible to cover the entire range of hole sizes with just a few spade drill holders. Contrast this with the inventories required for indexable drills and steel taper shank drills.



■ Seat Size Z



TiAlN



TiN

- first choice
- alternate choice

TiAlN		TiN		D1	L	S	σ
order #	catalogue #	order #	catalogue #	mm	mm	mm	
2759621	7FZ-0438A	—	—	11,11	9,19	2,39	132°
2759599	7FZ-0472A	—	—	12,00	9,19	2,39	132°
2759592	7FZ-0484A	—	—	12,30	9,19	2,39	132°
2759588	7FZ-0492A	—	—	12,50	9,19	2,39	132°
2891175	7FZ-0500A	2759581	7FZ-0500T	12,70	9,19	2,39	132°

NOTE: Toolholders available upon request as an Engineered Solution.

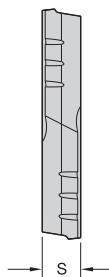
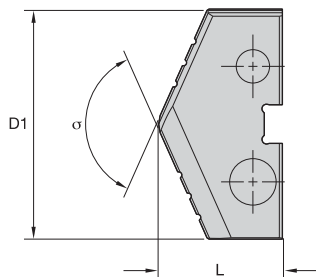




TiAlN



TiN



■ Seat Size 0



TiAlN

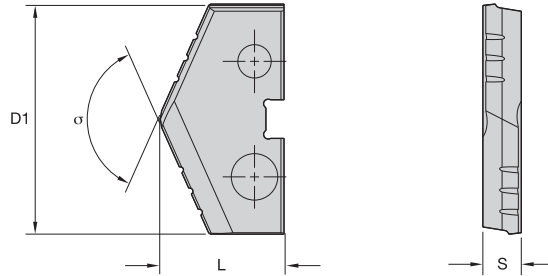


TiN

● first choice
○ alternate choice

TiAlN		TiN		D1	L	S	σ
order #	catalogue #	order #	catalogue #	mm	mm	mm	
2907270	7F0-0509A	—	—	12,93	10,80	3,18	132°
—	—	2760494	7F0-0512T	13,00	10,80	3,18	132°
2760492	7F0-0516A	—	—	13,10	10,80	3,18	132°
2760489	7F0-0531A	2760485	7F0-0531T	13,50	10,80	3,18	132°
2760481	7F0-0547A	2760478	7F0-0547T	13,89	10,80	3,18	132°
2760477	7F0-0551A	2760473	7F0-0551T	14,00	10,80	3,18	132°
2760472	7F0-0563A	2760466	7F0-0563T	14,29	10,80	3,18	132°
2760463	7F0-0571A	—	—	14,50	10,80	3,18	132°
2760460	7F0-0578A	2760458	7F0-0578T	14,68	10,80	3,18	132°
2760454	7F0-0591A	2760453	7F0-0591T	15,00	10,80	3,18	132°
2760452	7F0-0594A	2760449	7F0-0594T	15,08	10,80	3,18	132°
2760444	7F0-0609A	2760441	7F0-0609T	15,48	10,80	3,18	132°
2760440	7F0-0610A	—	—	15,50	10,80	3,18	132°
3053979	7F0-0625A	2760430	7F0-0625T	15,88	10,80	3,18	132°
2891178	7F0-0630A	2760424	7F0-0630T	16,00	10,80	3,18	132°
2760420	7F0-0641A	2760418	7F0-0641T	16,27	10,80	3,18	132°
—	—	2760415	7F0-0650T	16,50	10,80	3,18	132°
2760413	7F0-0656A	1988432	7F0-0656T	16,67	10,80	3,18	132°
2760404	7F0-0669A	—	—	17,00	10,80	3,18	132°
2760399	7F0-0672A	2760397	7F0-0672T	17,07	10,80	3,18	132°
2760393	7F0-0688A	2760390	7F0-0688T	17,46	10,80	3,18	132°
3083635	7F0-0689A	2760386	7F0-0689T	17,50	10,80	3,18	132°

NOTE: Toolholders available upon request as an Engineered Solution.



■ Seat Size 1



TiAlN

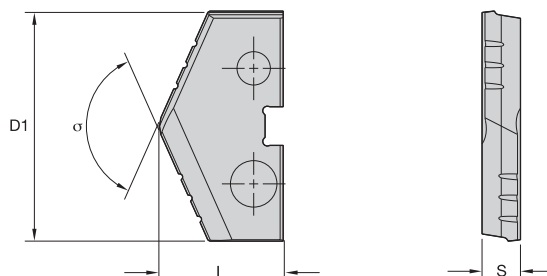
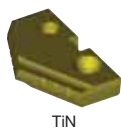


TiN

● first choice
○ alternate choice

TiAlN		TiN		D1	L	S	σ
order #	catalogue #	order #	catalogue #	mm	mm	mm	
2760383	7F1-0703A	2760381	7F1-0703T	17,86	13,84	3,96	132°
2760380	7F1-0709A	2760377	7F1-0709T	18,00	13,84	3,96	132°
—	—	2760371	7F1-0719T	18,26	13,84	3,96	132°
2760365	7F1-0734A	2760362	7F1-0734T	18,65	13,84	3,96	132°
2760361	7F1-0748A	2760359	7F1-0748T	19,00	13,84	3,96	132°
3114699	7F1-0750A	2387228	7F1-0750T	19,05	13,84	3,96	132°
—	—	2604191	7F1-0756T	19,20	13,84	3,96	132°
2760344	7F1-0766A	2760341	7F1-0766T	19,45	13,84	3,96	132°
—	—	2760338	7F1-0768T	19,50	13,84	3,96	132°
2760335	7F1-0781A	2760331	7F1-0781T	19,85	13,84	3,96	132°
2760330	7F1-0787A	2760328	7F1-0787T	20,00	13,84	3,96	132°
—	—	2760323	7F1-0797T	20,24	13,84	3,96	132°
2255810	7F1-0806A	—	—	20,47	13,84	3,96	132°
2760319	7F1-0807A	2760316	7F1-0807T	20,50	13,84	3,96	132°
2760315	7F1-0813A	2760310	7F1-0813T	20,64	13,84	3,96	132°
2760305	7F1-0827A	2760303	7F1-0827T	21,00	13,84	3,96	132°
2760302	7F1-0828A	2760300	7F1-0828T	21,03	13,84	3,96	132°
—	—	2760296	7F1-0844T	21,43	13,84	3,96	132°
2760292	7F1-0859A	2760290	7F1-0859T	21,83	13,84	3,96	132°
2940716	7F1-0866A	2760287	7F1-0866T	22,00	13,84	3,96	132°
1926120	7F1-0875A	2760282	7F1-0875T	22,23	13,84	3,96	132°
2760280	7F1-0891A	2760278	7F1-0891T	22,62	13,84	3,96	132°
2760276	7F1-0906A	2760273	7F1-0906T	23,02	13,84	3,96	132°
3099442	7F1-0922A	2760268	7F1-0922T	23,42	13,84	3,96	132°
2760265	7F1-0938A	2760262	7F1-0938T	23,81	13,84	3,96	132°
2891181	7F1-0945A	2760257	7F1-0945T	24,00	13,84	3,96	132°
2760256	7F1-0953A	2760253	7F1-0953T	24,21	13,84	3,96	132°
—	—	3339713	7F1-0960T	24,38	13,84	3,96	132°

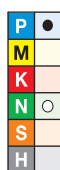
NOTE: Toolholders available upon request as an Engineered Solution.



■ Seat Size 2



TiAlN



TiN

● first choice
○ alternate choice

TiAlN		TiN		D1	L	S	σ
order #	catalogue #	order #	catalogue #	mm	mm	mm	
—	—	2760247	7F2-0969T	24,61	16,13	4,76	132°
2760243	7F2-0984A	2760240	7F2-0984T	25,00	16,13	4,76	132°
2760239	7F2-1000A	2760235	7F2-1000T	25,40	16,13	4,76	132°
2760234	7F2-1003A	—	—	25,48	16,13	4,76	132°
3088200	7F2-1016A	2760226	7F2-1016T	25,80	16,13	4,76	132°
3096208	7F2-1024A	2760223	7F2-1024T	26,00	16,13	4,76	132°
2760222	7F2-1031A	2760219	7F2-1031T	26,20	16,13	4,76	132°
2760216	7F2-1047A	2760214	7F2-1047T	26,59	16,13	4,76	132°
3096207	7F2-1063A	2760207	7F2-1063T	26,99	16,13	4,76	132°
2261849	7F2-1078A	2760203	7F2-1078T	27,61	16,13	4,76	132°
2760199	7F2-1094A	2760196	7F2-1094T	27,78	16,13	4,76	132°
2760195	7F2-1102A	2760194	7F2-1102T	28,00	16,13	4,76	132°
—	—	2760189	7F2-1109T	28,17	16,13	4,76	132°
2760188	7F2-1125A	2760184	7F2-1125T	28,58	16,13	4,76	132°
3024915	7F2-1141A	—	—	28,97	16,13	4,76	132°
2760181	7F2-1142A	—	—	29,00	16,13	4,76	132°
3088746	7F2-1156A	2760174	7F2-1156T	29,37	16,13	4,76	132°
—	—	2760169	7F2-1172T	29,77	16,13	4,76	132°
2760167	7F2-1181A	2760164	7F2-1181T	30,00	16,13	4,76	132°
2760162	7F2-1188A	2760159	7F2-1188T	30,16	16,13	4,76	132°
—	—	2760152	7F2-1203T	30,56	16,13	4,76	132°
2760150	7F2-1219A	2760148	7F2-1219T	30,96	16,13	4,76	132°
2760147	7F2-1221A	—	—	31,00	16,13	4,76	132°
2907272	7F2-1231A	—	—	31,27	16,13	4,76	132°
—	—	2760141	7F2-1234T	31,35	16,13	4,76	132°
2760137	7F2-1250A	2760134	7F2-1250T	31,75	16,13	4,76	132°
—	—	2895976	7F2-1254T	31,85	16,13	4,76	132°
2760131	7F2-1260A	2760128	7F2-1260T	32,00	16,13	4,76	132°
3032539	7F2-1266A	2967699	7F2-1266T	32,15	16,13	4,76	132°
—	—	2760121	7F2-1281T	32,55	16,13	4,76	132°
2760118	7F2-1299A	—	—	33,00	16,13	4,76	132°
2760112	7F2-1313A	2760109	7F2-1313T	33,34	16,13	4,76	132°

NOTE: Toolholders available upon request as an Engineered Solution.

(continued)

(Seat Size 2 – continued)



TiAlN



TiN

● first choice
○ alternate choice

TiAlN		TiN		D1	L	S	σ
order #	catalogue #	order #	catalogue #	mm	mm	mm	
—	—	2760106	7F2-1328T	33,73	16,13	4,76	132°
2760105	7F2-1339A	—	—	34,00	16,13	4,76	132°
2760101	7F2-1344A	2760098	7F2-1344T	34,13	16,13	4,76	132°
—	—	2760094	7F2-1359T	34,53	16,13	4,76	132°
1926121	7F2-1375A	2760090	7F2-1375T	34,93	16,13	4,76	132°
2760089	7F2-1378A	—	—	35,00	16,13	4,76	132°
2759880	7F4-2166A	—	—	55,02	23,62	7,94	132°

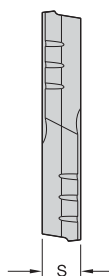
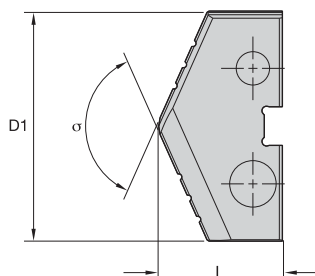
NOTE: Toolholders available upon request as an Engineered Solution.



TiAlN



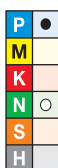
TiN



■ Seat Size 3



TiAlN

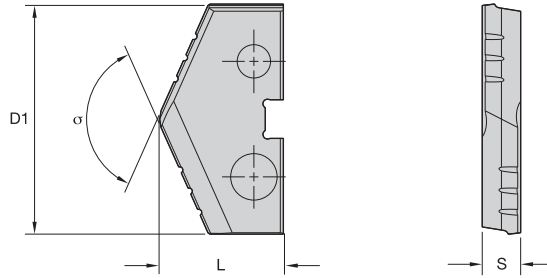


TiN

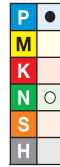
● first choice
○ alternate choice

order #	catalogue #	order #	catalogue #	D1 mm	L mm	S mm	σ
—	—	2760079	7F3-1391T	35,32	20,45	6,35	132°
2760078	7F3-1406A	2760076	7F3-1406T	35,72	20,45	6,35	132°
2760072	7F3-1417A	2760069	7F3-1417T	36,00	20,45	6,35	132°
2760066	7F3-1438A	2760063	7F3-1438T	36,51	20,45	6,35	132°
2760060	7F3-1457A	2760059	7F3-1457T	37,00	20,45	6,35	132°
2760058	7F3-1469A	2760056	7F3-1469T	37,31	20,45	6,35	132°
—	—	2760053	7F3-1484T	37,70	20,45	6,35	132°
2760051	7F3-1496A	—	—	38,00	20,45	6,35	132°
2760048	7F3-1500A	2760045	7F3-1500T	38,10	20,45	6,35	132°
—	—	2760038	7F3-1516T	38,50	20,45	6,35	132°
—	—	2760035	7F3-1531T	38,90	20,45	6,35	132°
2760034	7F3-1535A	—	—	39,00	20,45	6,35	132°
2760027	7F3-1563A	2760024	7F3-1563T	39,69	20,45	6,35	132°
2760023	7F3-1575A	2760021	7F3-1575T	40,00	20,45	6,35	132°
—	—	2760015	7F3-1594T	40,48	20,45	6,35	132°
2760011	7F3-1614A	—	—	41,00	20,45	6,35	132°
2760008	7F3-1625A	2760004	7F3-1625T	41,28	20,45	6,35	132°
2760001	7F3-1654A	—	—	42,00	20,45	6,35	132°
—	—	2759996	7F3-1656T	42,07	20,45	6,35	132°
2759993	7F3-1688A	2759991	7F3-1688T	42,86	20,45	6,35	132°
—	—	2759989	7F3-1693T	43,00	20,45	6,35	132°
2759987	7F3-1719A	2759985	7F3-1719T	43,66	20,45	6,35	132°
2759984	7F3-1732A	—	—	44,00	20,45	6,35	132°
2759977	7F3-1750A	2759974	7F3-1750T	44,45	20,45	6,35	132°
—	—	2759970	7F3-1766T	44,85	20,45	6,35	132°
2759969	7F3-1772A	2759967	7F3-1772T	45,00	20,45	6,35	132°
—	—	2759963	7F3-1781T	45,25	20,45	6,35	132°
2759960	7F3-1811A	—	—	46,00	20,45	6,35	132°
2759958	7F3-1813A	2759956	7F3-1813T	46,04	20,45	6,35	132°
—	—	2759951	7F3-1844T	46,83	20,45	6,35	132°
—	—	2759949	7F3-1850T	47,00	20,45	6,35	132°
2759945	7F3-1875A	2759942	7F3-1875T	47,63	20,45	6,35	132°

NOTE: Toolholders available upon request as an Engineered Solution.



■ Seat Size 4



● first choice
○ alternate choice

order #	catalogue #	order #	catalogue #	D1 mm	L mm	S mm	σ
—	—	2759937	7F4-1880T	47,75	23,62	7,95	132°
2759936	7F4-1890A	2759935	7F4-1890T	48,00	23,62	7,95	132°
2759934	7F4-1906A	2759932	7F4-1906T	48,42	23,62	7,95	132°
2759930	7F4-1929A	—	—	49,00	23,62	7,95	132°
2759927	7F4-1938A	2759925	7F4-1938T	49,21	23,62	7,95	132°
2759921	7F4-1969A	2759919	7F4-1969T	50,00	23,62	7,95	132°
2759916	7F4-2000A	2759913	7F4-2000T	50,80	23,62	7,95	132°
—	—	2759911	7F4-2008T	51,00	23,62	7,95	132°
—	—	2952747	7F4-2016T	51,20	23,62	7,95	132°
2759904	7F4-2031A	2759902	7F4-2031T	51,60	23,62	7,95	132°
2759901	7F4-2047A	2759900	7F4-2047T	52,00	23,62	7,95	132°
2759899	7F4-2063A	2759896	7F4-2063T	52,39	23,62	7,95	132°
2895971	7F4-2087A	—	—	53,00	23,62	7,95	132°
—	—	2759892	7F4-2094T	53,18	23,62	7,95	132°
2759891	7F4-2125A	2759888	7F4-2125T	53,98	23,62	7,95	132°
2759887	7F4-2126A	—	—	54,00	23,62	7,95	132°
—	—	2759882	7F4-2156T	54,77	23,62	7,95	132°
2759880	7F4-2166A	—	—	55,02	23,62	7,94	132°
—	—	2759876	7F4-2188T	55,56	23,62	7,95	132°
2759874	7F4-2205A	—	—	56,00	23,62	7,95	132°
2759872	7F4-2219A	2759870	7F4-2219T	56,36	23,62	7,95	132°
2759868	7F4-2244A	—	—	57,00	23,62	7,95	132°
2759865	7F4-2250A	2759862	7F4-2250T	57,15	23,62	7,95	132°
—	—	2759858	7F4-2281T	57,95	23,62	7,95	132°
2759857	7F4-2284A	—	—	58,00	23,62	7,95	132°
2759854	7F4-2313A	2759852	7F4-2313T	58,74	23,62	7,95	132°
2759851	7F4-2323A	—	—	59,00	23,62	7,95	132°
—	—	2759848	7F4-2344T	59,53	23,62	7,95	132°

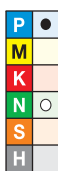
NOTE: Toolholders available upon request as an Engineered Solution.

(continued)

(Seat Size 4 – continued)



TiAlN

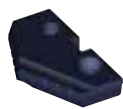


TiN

● first choice
○ alternate choice

TiAlN		TiN		D1	L	S	σ
order #	catalogue #	order #	catalogue #	mm	mm	mm	
—	—	2759845	7F4-2362T	60,00	23,62	7,95	132°
2759843	7F4-2375A	2759840	7F4-2375T	60,33	23,62	7,95	132°
2759833	7F4-2438A	2759831	7F4-2438T	61,91	23,62	7,95	132°
2759830	7F4-2441A	—	—	62,00	23,62	7,95	132°
2759828	7F4-2469A	—	—	62,71	23,62	7,95	132°
—	—	2759823	7F4-2480T	63,00	23,62	7,95	132°
2759822	7F4-2500A	2759820	7F4-2500T	63,50	23,62	7,95	132°
—	—	2759816	7F4-2531T	64,30	23,62	7,95	132°
3027222	7F4-2559A	—	—	65,00	23,62	7,95	132°
2759813	7F4-2563A	2759811	7F4-2563T	65,09	23,62	7,95	132°

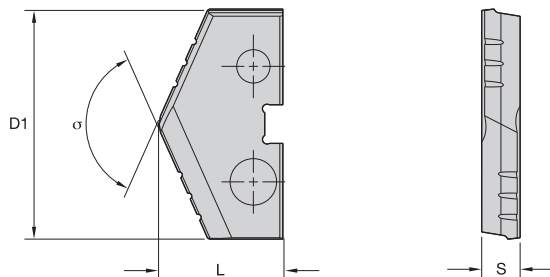
NOTE: Toolholders available upon request as an Engineered Solution.



TiAlN



TiN



■ Seat Size 5



TiAlN

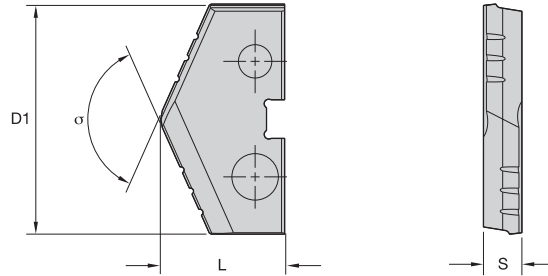


TiN

● first choice
○ alternate choice

order #	catalogue #	order #	catalogue #	D1 mm	L mm	S mm	σ
—	—	2759808	7F5-2500T	63,50	31,50	11,11	144°
2759802	7F5-2563A	2759801	7F5-2563T	65,09	31,50	11,11	144°
—	—	2759791	7F5-2625T	66,68	31,50	11,11	144°
—	—	2759789	7F5-2656T	67,47	31,50	11,11	144°
2759788	7F5-2677A	—	—	68,00	31,50	11,11	144°
—	—	2759781	7F5-2719T	69,06	31,50	11,11	144°
2759780	7F5-2750A	2759778	7F5-2750T	69,85	31,50	11,11	144°
2961641	7F5-2756A	—	—	70,00	31,50	11,11	144°
2759773	7F5-2813A	—	—	71,44	31,50	11,11	144°
2759766	7F5-2875A	2759764	7F5-2875T	73,03	31,50	11,11	144°
—	—	2759756	7F5-2938T	74,61	31,50	11,11	144°
2759755	7F5-2969A	2759753	7F5-2969T	75,41	31,50	11,11	144°
2759751	7F5-3000A	2759748	7F5-3000T	76,20	31,50	11,11	144°

NOTE: Toolholders available upon request as an Engineered Solution.



■ Seat Size 6



TiAlN



TiN

● first choice
○ alternate choice

order #	catalogue #	order #	catalogue #	D1 mm	L mm	S mm	σ
2759745	7F6-3063A	2759743	7F6-3063T	77,79	31,50	11,11	144°
2759742	7F6-3071A	—	—	78,00	31,50	11,11	144°
2759739	7F6-3125A	—	—	79,38	31,50	11,11	144°
2759736	7F6-3150A	—	—	80,00	31,50	11,11	144°
—	—	2759731	7F6-3188T	80,96	31,50	11,11	144°
—	—	2759726	7F6-3250T	82,55	31,50	11,11	144°
—	—	2759718	7F6-3375T	85,73	31,50	11,13	144°
—	—	2759715	7F6-3438T	87,31	31,50	11,13	144°
—	—	2759709	7F6-3500T	88,90	31,50	11,13	144°

NOTE: Toolholders available upon request as an Engineered Solution.

■ Seat Size 7



TiAlN



TiN

● first choice
○ alternate choice

order #	catalogue #	order #	catalogue #	D1 mm	L mm	S mm	σ
—	—	3279755	7F7-3543T	90,00	31,50	11,13	144°
—	—	2759703	7F7-3563T	90,49	31,50	11,13	144°
—	—	2759698	7F7-3688T	93,66	31,50	11,13	144°
—	—	2759688	7F7-3938T	96,00	31,50	11,13	144°
2972689	7F7-3813A	—	—	96,84	31,50	11,13	144°
2759684	7F7-4000A	—	—	101,60	31,50	11,13	144°

NOTE: Toolholders available upon request as an Engineered Solution.

Modular Drills

■ HSS Spade Blades • Speed and Feed Chart • Metric

Material Group	Hardness BHN	Grade		Feed (mm/rev)								
		TiN	TiAlN	Y & Z (9.5-12.7)	0 (13-17.5)	1 (17.86-24)	2 (24.61-35)	3 (35.72-47.63)	4 (48-65.09)	5 (63.5-76.2)	6-7-8 (76.99-114.3)	
P	0	85-125	55	-	0,18	0,23	0,30	0,38	0,48	0,58	0,64	0,69
		125-175	50	-	0,15	0,23	0,30	0,38	0,48	0,58	0,61	0,66
		175-225	45	-	0,13	0,20	0,25	0,36	0,46	0,53	0,58	0,64
		225-275	45	-	0,13	0,20	0,25	0,36	0,46	0,53	0,58	0,64
	1	100-150	60	-	0,20	0,28	0,36	0,43	0,53	0,64	0,66	0,71
		150-200	55	-	0,18	0,25	0,33	0,41	0,51	0,58	0,61	0,66
		200-250	50	-	0,15	0,25	0,33	0,41	0,51	0,58	0,61	0,66
	2	125-175	50	-	0,15	0,23	0,30	0,38	0,48	0,58	0,64	0,69
		175-225	45	-	0,13	0,20	0,25	0,36	0,46	0,53	0,58	0,64
		225-275	45	65	0,13	0,20	0,25	0,36	0,46	0,53	0,56	0,61
		275-325	40	60	0,10	0,18	0,23	0,30	0,41	0,48	0,53	0,58
	3	125-175	45	-	0,18	0,23	0,28	0,36	0,46	0,53	0,58	0,64
		175-225	45	-	0,15	0,20	0,25	0,36	0,43	0,48	0,53	0,58
		225-275	40	55	0,13	0,18	0,25	0,33	0,43	0,48	0,51	0,53
		275-325	35	50	0,10	0,15	0,23	0,30	0,38	0,43	0,46	0,48
		325-375	35	50	0,08	0,15	0,23	0,30	0,38	0,43	0,46	0,48
	4	225-300	25	35	0,13	0,18	0,23	0,25	0,36	0,41	0,46	0,51
		300-350	20	30	0,10	0,18	0,23	0,25	0,36	0,41	0,46	0,51
		350-400	15	25	0,08	0,15	0,20	0,23	0,30	0,36	0,41	0,46
	5	100-150	45	-	0,15	0,25	0,30	0,36	0,46	0,53	0,56	0,61
		150-250	40	60	0,13	0,23	0,25	0,30	0,41	0,48	0,51	0,56
		250-350	30	50	0,10	0,20	0,23	0,25	0,36	0,43	0,46	0,51
	6	150-200	25	-	0,13	0,15	0,20	0,25	0,30	0,38	0,41	0,43
		200-250	20	-	0,10	0,15	0,20	0,25	0,30	0,38	0,41	0,43
250-300		15	20	0,10	0,13	0,18	0,20	0,25	0,33	0,36	0,38	
300-350		-	15	0,08	0,10	0,15	0,18	0,23	0,30	0,33	0,36	
M	1	135-185	25	35	0,15	0,20	0,23	0,28	0,36	0,41	0,46	0,51
		185-275	30	30	0,13	0,18	0,20	0,25	0,30	0,36	0,41	0,46
		275-350	-	25	0,13	0,15	0,18	0,23	0,28	0,33	0,38	0,43
K	1,2	120-150	55	80	0,20	0,30	0,41	0,51	0,61	0,69	0,74	0,79
		150-200	45	75	0,18	0,28	0,36	0,46	0,56	0,64	0,69	0,74
		200-220	40	65	0,15	0,23	0,30	0,41	0,46	0,53	0,58	0,64
		220-260	35	55	0,13	0,18	0,23	0,30	0,36	0,43	0,48	0,53
		260-320	30	45	0,10	0,15	0,18	0,23	0,30	0,36	0,41	0,46
N	1	-	180	-	0,18	0,30	0,38	0,48	0,53	0,61	0,64	0,66
		-	90	-	0,20	0,33	0,41	0,51	0,56	0,64	0,66	0,69
S	1	140-210	-	15	0,13	0,18	0,20	0,25	0,30	0,38	0,41	0,43
		210-280	-	10	0,10	0,15	0,18	0,20	0,25	0,30	0,33	0,36
		280-340	-	10	0,10	0,13	0,15	0,18	0,23	0,28	0,30	0,33

Modular Drills



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The Knowledge Center offers several ways to get trained: industry- and application-specific courses, customer onsite programs, and online-based certified metalcutting professional courses. In-person classes include lecture, lab, and machining demonstrations.

Regional Training

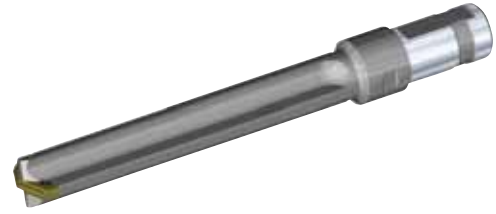
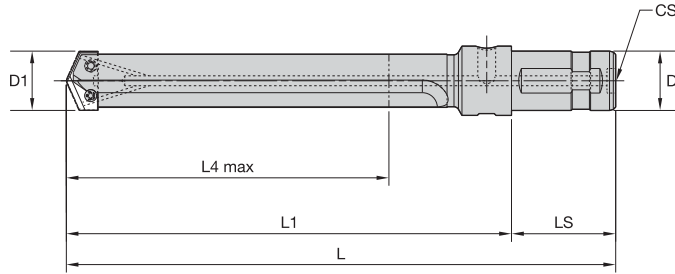
The Regional Application Engineering Program is designed to provide a broad base of knowledge for the selection and use of metalcutting tools. Instruction includes lecture-style presentations and video demonstrations. Participants receive notes and text materials, and the video demonstrations reinforce the theories presented in the lecture.

Metalcutting Application Training

The Comprehensive Metalworking Application Course provides a broad base of knowledge for the selection and use of metalcutting tools. Lecture-style presentations and laboratory demonstrations enhance course material through actual cutting tests and reinforce the theories presented in the lecture.

For more information, contact your local WIDIA
Authorised Distributor or visit widia.com/services.

WIDIA 



■ Straight Flute Holders • Inch • Short

short	D1		D1 max		L	L1	L4 max	LS	D	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
7SZSS	11,10	.437	12,90	.508	5.75	3.37	1.09	2.38	.750	Z	1/8 - 27 NPT	56-1015	56-2026
7S0SS	12,93	.509	17,65	.695	6.35	3.97	1.85	2.38	.750	0	1/8 - 27 NPT	56-1014	56-2017
7S0.5SS	15,47	.609	17,65	.695	6.35	3.97	1.76	2.38	.750	—	1/8 - 27 NPT	56-1014	56-2017
7S1SS	17,53	.690	24,38	.960	7.23	4.85	2.25	2.38	1.000	1	1/4 - 18 NPT	56-1020	56-2028
7S1.5SS	21,82	.859	24,38	.960	7.23	4.85	2.17	2.38	1.000	1.5	1/4 - 18 NPT	56-1020	56-2028
7S2SS	24,41	.961	35,05	1.380	8.00	5.56	2.77	2.44	1.250	2	1/4 - 18 NPT	56-1018	56-2015
7S2.5SS	30,15	1.187	35,05	1.380	8.00	5.56	3.59	2.44	1.250	2.5	1/4 - 18 NPT	56-1018	56-2015
7S3SS	35,08	1.381	47,73	1.879	9.88	7.25	3.76	2.63	1.500	3	1/4 - 18 NPT	56-1585	56-2020
7S4SS	47,75	1.880	65,28	2.570	11.38	8.75	6.21	2.63	1.500	4	1/4 - 18 NPT	56-1585	56-2020
7S5SS	63,50	2.500	88,90	3.500	12.50	9.25	5.36	3.25	2.000	5	1/4 - 18 NPT	56-1025	56-2125

■ Straight Flute Holders • Inch • Medium

medium	D1		D1 max		L	L1	L4 max	LS	D	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
7SZSM	11,10	.437	12,90	.508	6.76	4.38	2.08	2.38	.750	Z	1/8 - 27 NPT	56-1015	56-2026
7S0SM	12,93	.509	17,65	.695	7.71	5.33	2.93	2.38	.750	0	1/8 - 27 NPT	56-1014	56-2017
7S0.5SM	15,47	.609	17,65	.695	7.71	5.33	2.90	2.38	.750	—	1/8 - 27 NPT	56-1014	56-2017
7S1SM	17,53	.690	24,38	.960	9.18	6.80	4.20	2.38	1.000	1	1/4 - 18 NPT	56-1020	56-2028
7S1.5SM	21,82	.859	24,38	.960	9.18	6.80	4.12	2.38	1.000	1.5	1/4 - 18 NPT	56-1020	56-2028
7S2SM	24,41	.961	35,05	1.380	10.38	7.94	5.15	2.44	1.250	2	1/4 - 18 NPT	56-1018	56-2015
7S2.5SM	30,15	1.187	35,05	1.380	10.38	7.94	5.03	2.44	1.250	2.5	1/4 - 18 NPT	56-1020	56-2028
7S3SM	35,08	1.381	47,73	1.879	13.88	11.25	7.89	2.63	1.500	3	1/4 - 18 NPT	56-1585	56-2020
7S4SM	47,75	1.880	65,28	2.570	15.38	12.75	9.57	2.63	1.500	4	1/4 - 18 NPT	56-1585	56-2020
7S5SM	63,50	2.500	88,90	3.500	18.25	15.00	11.38	3.25	2.000	5	1/4 - 18 NPT	56-1025	56-2125
7S7SM	88,93	3.501	114,30	4.500	21.25	14.62	11.50	6.63	3.000	7	1/4 - 18 NPT	56-1025	56-2125

Modular Drills

■ Straight Flute Holders • Inch • Long

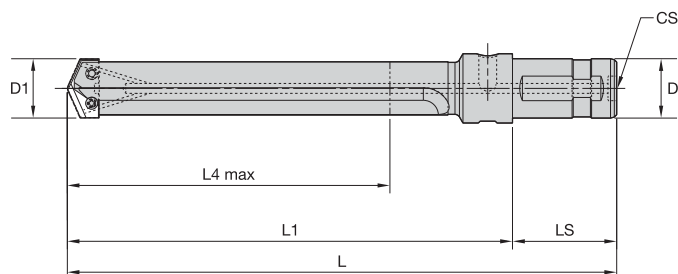
long	D1		D1 max		L	L1	L4 max	LS	D	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
7SZSL	11,10	.437	12,90	.508	7.76	5.38	3.10	2.38	.750	Z	1/8 - 27 NPT	56-1015	56-2026
7S0SL	12,93	.509	17,65	.695	9.13	6.75	4.60	2.38	.750	0	1/8 - 27 NPT	56-1014	56-2017
7S0.5SL	15,47	.609	17,65	.695	9.13	6.75	7.36	2.38	.750	—	1/8 - 27 NPT	56-1014	56-2017
7S1SL	17,53	.690	24,38	.960	11.10	8.72	6.34	2.38	1.000	1	1/4 - 18 NPT	56-1020	56-2028
7S2SL	24,41	.961	35,05	1.380	12.75	10.31	7.86	2.44	1.250	2	1/4 - 18 NPT	56-1018	56-2015
7S3SL	35,08	1.381	47,73	1.879	18.63	16.00	13.28	2.63	1.500	3	1/4 - 18 NPT	56-1585	56-2020
7S4SL	47,75	1.880	65,28	2.570	21.50	18.87	15.89	2.63	1.500	4	1/4 - 18 NPT	56-1585	56-2020
7S7SL	88,93	3.501	114,30	4.500	29.50	22.88	19.25	6.63	3.000	7	1/4 - 18 NPT	56-1025	56-2125



■ Straight Flute Holders • Inch • Extra Long

extra long	D1		D1 max		L	L1	L4 max	LS	D	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
7S0SE	12,93	.509	17,65	.695	12.17	9.80	7.44	2.38	.750	0	1/8 - 27 NPT	56-1014	56-2017
7S0.5SE	15,47	.609	17,65	.695	12.17	9.80	7.60	2.38	.750	—	1/8 - 27 NPT	56-1014	56-2017
7S1SE	17,53	.690	24,38	.960	15.12	12.75	5.67	2.38	1.000	1	1/4 - 18 NPT	56-1020	56-2028
7S1.5SE	21,82	.859	24,38	.960	15.13	12.75	10.29	2.38	1.000	1.5	1/4 - 18 NPT	56-1020	56-2028
7S2SE	24,41	.961	35,05	1.380	15.82	13.38	11.07	2.44	1.250	2	1/4 - 18 NPT	56-1018	56-2015
7S3SE	35,08	1.381	47,73	1.879	25.51	22.88	20.16	2.63	1.500	3	1/4 - 18 NPT	56-1585	56-2020
7S4SE	47,75	1.880	65,28	2.570	—	—	15.89	2.63	1.500	4	1/4 - 18 NPT	56-1585	56-2020





■ Straight Flute Holders • Metric • Short

short	D1		D1 max		L	L1	L4 max	LS	D	seat size	insert screw	Torx wrench
	mm	in	mm	in								
8S0SS	13,00	.512	17,50	.689	4.88	2.88	1.91	2.01	.787	0	56-1014	FT7
8S1SS	17,86	.703	24,00	.945	6.53	4.33	2.16	2.24	.984	1	56-1020	FT8
8S2SS	24,61	.969	35,00	1.378	7.49	5.13	2.72	2.40	1.260	2	56-1585	FT15
8S4SS	48,00	1.890	65,09	2.563	10.08	7.32	3.97	2.80	1.575	4	56-1585	FT20

■ Straight Flute Holders • Metric • Medium

medium	D1		D1 max		L	L1	L4 max	LS	D	seat size	insert screw	Torx wrench
	mm	in	mm	in								
8S0SM	13,00	.512	17,50	.689	6.01	4.00	2.76	2.01	.787	0	56-1014	FT7
8S1SM	17,86	.703	24,00	.945	8.58	6.33	4.16	2.24	.984	1	56-1020	FT8
8S2SM	24,61	.969	35,00	1.378	9.53	7.13	4.72	2.40	1.260	2	56-1018	FT15
8S3SM	35,72	1.406	47,63	1.875	11.11	8.31	5.32	2.80	1.575	3	56-1585	FT20

■ Straight Flute Holders • Metric • Long

long	D1		D1 max		L	L1	L4 max	LS	D	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
8S0SL	12,93	.509	17,53	.690	8.01	6.00	4.13	2.01	.787	0	R1/8	56-1014	FT7
8S1SL	17,86	.703	24,00	.945	10.53	8.33	6.16	2.24	.984	1	—	56-1020	FT8
8S2SL	24,61	.969	35,00	1.378	11.53	9.13	6.72	2.40	1.260	2	—	56-1018	FT15

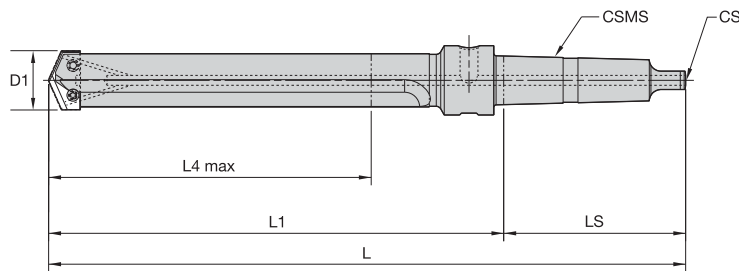


■ Straight Flute Holders • Metric • Extra Long

extra long	D1		D1 max		L	L1	L4 max	LS	D	seat size	insert screw	Torx wrench
	mm	in	mm	in								
8S2SE	24,61	.969	35,00	1.378	18.17	15.76	14.27	2.40	1.260	2	56-1018	FT15



- Through coolant must be used with spade drills depths greater than 1 x D.
- Direct spindle cooling is preferable when using WIDIA™ Spade Blades.
- If spindle cooling is unavailable, then coolant glands or inducers should be used to provide through coolant capability.
- Our holders provide both options; please find available coolant glands below.



■ Straight Flute Holders • Short

short	D1		D1 max		L	L1	L4 max	LS	CSMS system size	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
7SZTS	11,10	.437	12,90	.508	6.50	3.56	1.30	3.13	2	Z	8 - 32	56-1015	56-2026
7S1TS	17,53	.690	24,38	.960	8.73	5.04	2.48	3.88	3	1	1/4 - 20	56-1020	56-2028
7S2TS	24,41	.961	35,05	1.380	9.44	5.75	3.11	3.88	3	2	1/4 - 20	56-1018	56-2015
7S2.5TS	30,15	1.187	35,05	1.380	9.44	5.56	3.00	3.88	3	2.5	1/4 - 20	56-1018	56-2015
7S3TS	35,08	1.381	47,73	1.879	12.13	7.50	4.21	4.88	4	3	5/16-18	56-1585	56-2020
7S4TS	47,75	1.880	65,28	2.570	13.62	9.00	5.60	4.88	4	4	5/16-18	56-1585	56-2020
7S5TS	63,50	2.500	88,90	3.500	15.38	9.50	5.63	6.13	5	5	1/2 - 13	56-1025	56-2125

NOTE: CSMS = Morse taper size.

■ Straight Flute Holders • Medium

medium	D1		D1 max		L	L1	L4 max	LS	CSMS system size	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
7S0TM	12,93	.509	17,65	.695	8.46	5.52	3.20	3.13	2	0	8 - 32	56-1014	56-2017
7S1TM	17,53	.690	24,38	.960	10.68	6.99	4.43	3.88	3	1	1/4 - 20	56-1020	56-2028
7S1.5TM	21,82	.859	24,38	.960	10.68	6.80	4.35	3.88	3	1.5	1/4 - 20	56-1020	56-2028
7S2TM	24,41	.961	35,05	1.380	11.82	8.13	5.49	3.88	3	2	1/4 - 20	56-1018	56-2015
7S2.5TM-4MT	30,15	1.187	35,05	1.380	12.82	8.19	5.38	4.88	4	2.5	5/16-18	56-1018	56-2015
7S3TM	35,08	1.381	47,73	1.879	16.13	11.50	8.34	4.88	4	3	5/16-18	56-1585	56-2020
7S4TM	47,75	1.880	65,28	2.570	17.63	13.00	9.58	4.88	4	4	5/16-18	56-1585	56-2020
7S5TM	63,50	2.500	88,90	3.500	21.13	15.25	11.38	6.13	5	5	1/2 - 13	56-1025	56-2125
7S7TM	88,93	3.501	114,30	4.500	22.28	16.40	11.50	6.13	5	7	1/2 - 13	56-1025	56-2125

NOTE: CSMS = Morse taper size.

■ Straight Flute Holders • Long

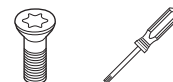
long	D1		D1 max		L	L1	L4 max	LS	CSMS system size	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
7SZTL	11,10	.437	12,90	.508	8.51	5.57	3.30	3.13	2	Z	8 - 32	56-1015	56-2026
7S0TL	12,93	.509	17,65	.695	9.88	6.94	4.60	3.13	2	0	8 - 32	56-1014	56-2017
7S1TL	17,53	.690	24,38	.960	12.60	8.91	6.36	3.88	3	1	1/4 - 20	56-1020	56-2028
7S2TL	24,41	.961	35,05	1.380	14.19	10.50	7.86	3.88	3	2	1/4 - 20	56-1018	56-2015
7S3TL	35,08	1.381	47,73	1.879	20.88	16.25	13.28	4.88	4	3	5/16-18	56-1585	56-2020
7S4TL	47,75	1.880	65,28	2.570	23.75	19.12	15.90	4.88	4	4	5/16-18	56-1585	56-2020
7S5TL	63,50	2.500	88,90	3.500	26.88	21.00	17.13	6.13	5	5	1/2 - 13	56-1025	56-2125
7S7TL	88,93	3.501	114,30	4.500	30.53	24.65	19.75	6.13	5	7	1/2 - 13	56-1025	56-2125

NOTE: CSMS = Morse taper size.

■ Straight Flute Holders • Extra Long

extra long	D1		D1 max		L	L1	L4 max	LS	CSMS system size	seat size	CS	insert screw	Torx wrench
	mm	in	mm	in									
7S0TE	12,93	.509	17,65	.695	12.93	10.00	7.65	3.13	2	0	8 - 32	56-1014	56-2017
7S0.5TE	15,47	.609	17,65	.695	12.93	9.80	7.60	3.13	2	—	8 - 32	56-1014	56-2017
7S2TE	24,41	.961	35,05	1.380	17.26	13.57	11.07	3.88	3	2	1/4 - 20	56-1018	56-2015

NOTE: CSMS = Morse taper size.



On the Web

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HydroForce™ HT Chuck



EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

HydroForce™ HT Chuck High Torque for High Metal
Removal Rates (MRR) and Superior Surface Finish

- HydroForce gives you an unmatched combination of accuracy and clamping forces.
- Compact and stable design.
- Advanced hydraulic clamping with lowest runout and superior vibration dampening.
- Balanced quality to lower vibration, especially at high speeds.
- Focused and flexible product offering.

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Authorised Distributor or visit www.widia.com.


WIDIA 



Holemaking • Indexable Drills

Introduction..... V2-V3
Top Cut 4..... V4-V40





























		standard						hole tolerance	standard range			customised solution range		
		● first choice ○ alternate choice							diameter range		drilling depth L/D1	diameter range		drilling depth
		P	M	K	N	S	H		D1 mm	D1 in		D1 mm	D1 inch	
		min-max		min-max		min-max			min-max			min-max		
	Top Cut 4™ Indexable Drill Body Short Hole Drilling	●	●	●				IT9-11	12-68	.473-2.5	2 x D 3 x D 4 x D 5 x D	12-110	.473-4.33	2-5 x D ²⁾

In regard to insert and drill coatings, anything is possible. If a specific insert or drill is not suitable for your workpiece material, please contact our Engineered Solutions Department for an offer about special coatings and edge preparations.

*Except for L/D 5 x D.

1) Other shank styles available as customised solution.

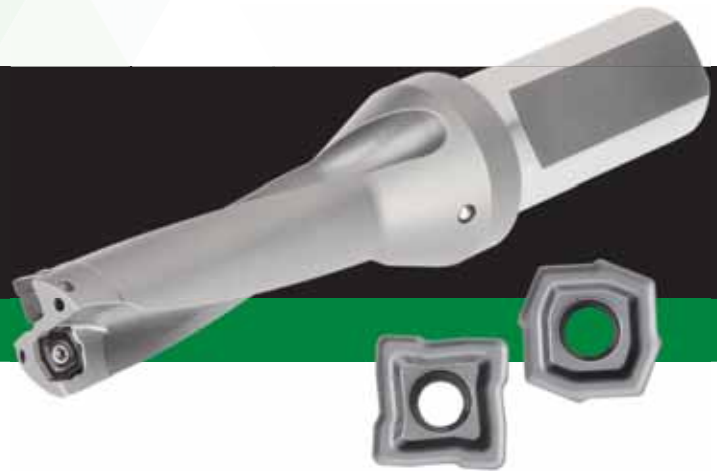
2) Dependent on the application, up to 6 x D is possible.

● standard capabilities ¹⁾			● standard ○ customised solution capabilities											page(s)
Coolant														
														
	●	●●	●	●	●	●	●	●	●*	●	●	●	●	V8-V23

WIDIA™ Top Cut 4™ •

New Generation Indexable Drilling System

Top Cut 4



The new WIDIA Top Cut 4 (TC4) portfolio is a broad offering for customers looking for a versatile indexable drilling platform.

The newly developed TC4 features improved centring capabilities and inserts with four cutting edges for both pocket seats (central and periphery). This, in combination with the renowned WIDIA grade technology, leads to outstanding flexibility and efficiency.

The TC4 platform offers three easy-to-select grades and two geometries applicable for steel, cast iron, and stainless steel materials. It covers the diameter range from 12–68mm within the standard offering in L/D ratios of 2–5 x D.

One Comprehensive Platform

- Standard diameter range covering 12–68mm in 2 x D, 3 x D, 4 x D, and 5 x D.
- Four real cutting edges each for entire platform.
- Eight insert sizes to cover complete diameter range.

Easy to Apply

- No risk of mixing up inner and outer insert due to clear visual differences.
- Easy-to-change inserts, laser marked with geometries and grades.
- Easy-to-use nomenclature guide enabling the tool body and the related insert selection to avoid order failures.

Highly Versatile

- Breadth of application capabilities include through and cross holes, inclined entry and exit opportunity, 45° corner, half cylindrical, concave, or chain drilling.
- Various geometries and grades available.

Highest Performance

- 2x four true cutting edges.
- Cutting edge profile of central and periphery insert work together, leading to high stabilisation of the drill, preventing drifting of the tool even on irregular surfaces.
- X-offset design to adjust diameter size on turning machines and optimise tolerances on machining centres.
- Apply where speed and economy are prime considerations.
- Three grades to achieve higher tool life at accelerated speeds:
 - WU25CH grade for highest metal removal rate in general applications.
 - WU40PH grade for high toughness demands.
 - WPK10CH grade for high-speed applications.



The guide below provides an example of how to select the Top Cut 4 tool body and accompanying inserts for a stable steel drilling application.

Metric Body

TCF	250	R	3	SL	32	M	D
Tool Family Top Cut 4	Diameter Metric = 3 digits (e.g. 250 = 25mm) Inch = 4 digits (e.g. 2500 = 2.5")	Right-Hand Cutting	Length Diameter Ratio L/D = 3 x D	Shank Style SL = Side Lock Adaptor	Shank Size	Metric	Insert Size

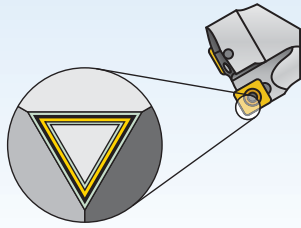
Periphery Insert

TCF	08	03	08	D	P	V34	WU25CH
Tool Family Top Cut 4	Size In-Circle D1	Insert Thickness	Insert Corner Radius	Insert Size	Insert Positioning C = Central P = Periphery	Insert Geometry	Grade

Insert Geometry – V34 for steel or cast iron or V36 for stainless steel and long chipping steel.

Insert Guide for Grades

W	U	25	C	H
W	U	40	P	H
W	PK	10	C	H
WIDIA™	Material Range U = Universal P = Steel K = Cast Iron	Toughness Range Choose high numbers for toughness in stable conditions, low numbers for high wear resistance at continuous cuts.	Coating P = PVD C = CVD	Application H = Holemaking

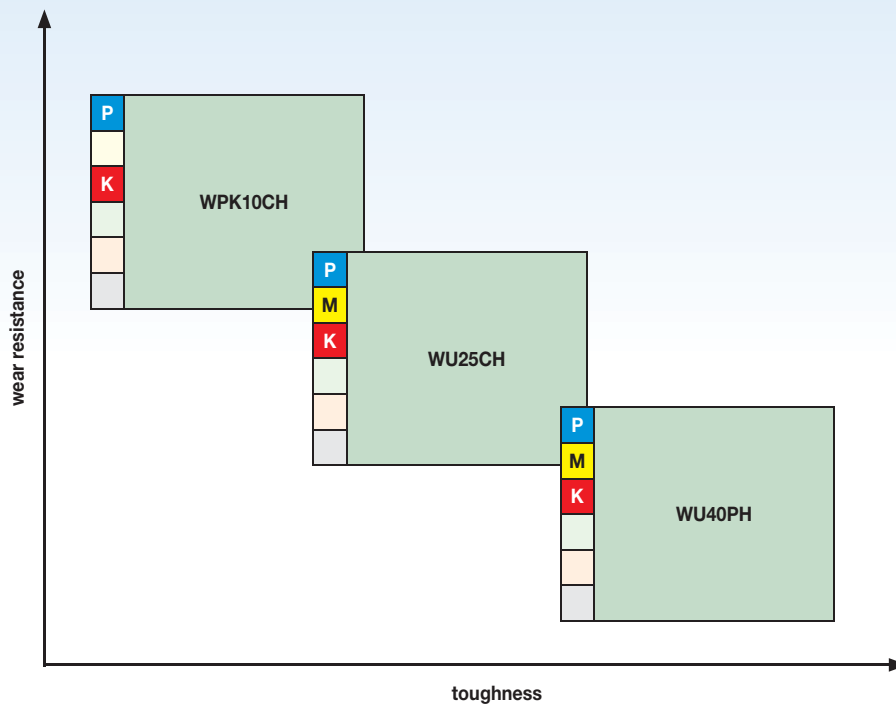


Coatings provide high-speed capability and are engineered for finishing to light roughing.

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

wear resistance ← → toughness

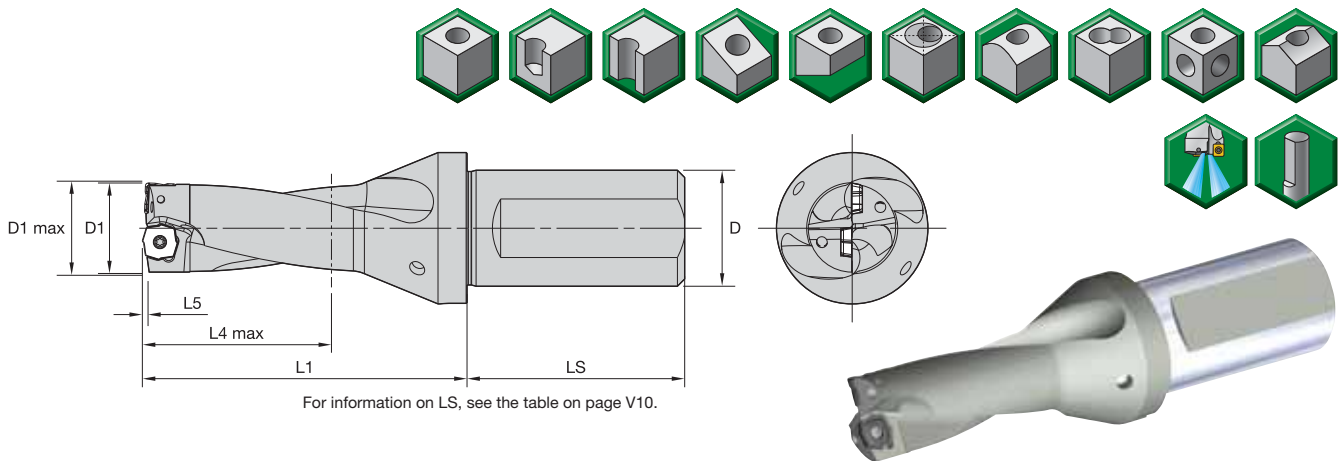
Coating		Grade Description		05	10	15	20	25	30	35	40	45		
Grade	WPK10CH TiCN-Al ₂ O ₃	<p>Composition: With an advanced CVD TiCN-Al₂O₃ coating combined with a cobalt-enriched carbide substrate, this grade offers a balanced combination of deformation-resistance and edge toughness.</p> <p>Application: Offers outstanding abrasion and crater wear resistance for high-speed machining of steels and cast irons. Use for very high cutting speeds with low to medium feed rates.</p>	P											
			M											
			K											
WU25CH TiCN-Al ₂ O ₃	<p>Composition: Advanced CVD TiCN-Al₂O₃ coating together with a newly engineered tough carbide substrate. Ensures adequate deformation resistance and excellent edge strength and offers very good wear resistance over a wide range of machining conditions.</p> <p>Application: A high productivity grade with high speeds and feeds. First choice for high productivity with very good reliability in steels, stainless steels, and cast iron rates.</p>	P												
		M												
		K												
WU40PH TiCN-Al ₂ O ₃	<p>Composition: With a multilayered PVD TiN-TiAlN coating and a tough substrate, this grade withstands interruptions and provides high wear resistance for long tool life.</p> <p>Application: First choice for high reliability in most materials. This grade should be used at medium speeds and high feeds due to sharper edges and as a grade for high-toughness applications. It covers steel, stainless steel, cast iron, and high-temp alloys under certain conditions.</p>	P												
		M												
		K												



WPK10CH:
High-Speed Grade

WU25CH:
High Metal Removal Rate Grade

WU40PH:
High Toughness Grade



■ Top Cut 4 Drill • Metric • 2 x D • SL Shanks

order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	insert size	periphery insert	centre insert
5537778	TCF120R2SL20MA	12,00	12,50	20	54,6	24,0	0,41	A	TCF040204AP	TCF040203AC
5537779	TCF125R2SL20MA	12,50	13,00	20	55,8	25,0	0,48	A	TCF040204AP	TCF040203AC
5537860	TCF127R2SL20MA	12,70	13,20	20	56,2	26,0	0,51	A	TCF040204AP	TCF040203AC
5537861	TCF130R2SL20MA	13,00	13,50	20	56,9	26,0	0,56	A	TCF040204AP	TCF040203AC
5537862	TCF135R2SL20MA	13,50	14,00	20	58,1	27,0	0,64	A	TCF040204AP	TCF040203AC
5577828	TCF140R2SL25MB	14,00	14,50	25	59,8	28,0	0,42	B	TCF050204BP	TCF060203BC
5577829	TCF145R2SL25MB	14,50	15,00	25	60,9	29,0	0,45	B	TCF050204BP	TCF060203BC
5577920	TCF150R2SL25MB	15,00	15,50	25	62,1	30,0	0,49	B	TCF050204BP	TCF060203BC
5577921	TCF155R2SL25MB	15,50	16,00	25	63,3	31,0	0,54	B	TCF050204BP	TCF060203BC
5577922	TCF160R2SL25MB	16,00	16,50	25	64,4	32,0	0,60	B	TCF050204BP	TCF060203BC
5577923	TCF165R2SL25MB	16,50	17,00	25	65,6	33,0	0,68	B	TCF050204BP	TCF060203BC
5577924	TCF170R2SL25MB	17,00	17,50	25	68,4	34,0	0,74	B	TCF050204BP	TCF060203BC
5577925	TCF175R2SL25MB	17,50	18,00	25	69,6	35,0	0,79	B	TCF050204BP	TCF060203BC
5577926	TCF180R2SL25MB	18,00	18,50	25	70,8	36,0	0,86	B	TCF050204BP	TCF060203BC
5577927	TCF185R2SL25MB	18,50	19,00	25	71,9	37,0	0,83	B	TCF050204BP	TCF060203BC
5578820	TCF190R2SL25MC	19,00	19,50	25	72,1	38,0	0,60	C	TCF070306CP	TCF070304CC
5578821	TCF195R2SL25MC	19,50	20,00	25	73,2	39,0	0,70	C	TCF070306CP	TCF070304CC
5578822	TCF200R2SL25MC	20,00	20,50	25	74,4	40,0	0,70	C	TCF070306CP	TCF070304CC
5578823	TCF205R2SL25MC	20,50	21,00	25	75,6	41,0	0,70	C	TCF070306CP	TCF070304CC
5578824	TCF210R2SL25MC	21,00	21,50	25	76,7	42,0	0,80	C	TCF070306CP	TCF070304CC
5578825	TCF220R2SL25MC	22,00	22,50	25	79,0	44,0	1,00	C	TCF070306CP	TCF070304CC
5578826	TCF225R2SL25MC	22,50	23,00	25	80,2	45,0	1,10	C	TCF070306CP	TCF070304CC
5578827	TCF230R2SL25MC	23,00	23,50	25	81,4	46,0	1,10	C	TCF070306CP	TCF070304CC
5537167	TCF240R2SL25MD	24,00	25,00	25	87,2	48,0	0,78	D	TCF080308DP	TCF090305DC
5537168	TCF250R2SL32MD	25,00	26,00	32	89,6	50,0	0,86	D	TCF080308DP	TCF090305DC
5537169	TCF260R2SL32MD	26,00	27,00	32	91,9	52,0	0,97	D	TCF080308DP	TCF090305DC
5537820	TCF265R2SL32MD	26,50	27,50	32	93,0	53,0	1,05	D	TCF080308DP	TCF090305DC
5537821	TCF270R2SL32MD	27,00	28,00	32	94,2	54,0	1,15	D	TCF080308DP	TCF090305DC
5537822	TCF280R2SL32MD	28,00	29,00	32	96,5	56,0	1,30	D	TCF080308DP	TCF090305DC
5537823	TCF290R2SL32MD	29,00	30,00	32	98,8	58,0	1,45	D	TCF080308DP	TCF090305DC
5537937	TCF300R2SL32ME	30,00	31,00	32	100,2	60,0	0,63	E	TCF100408EP	TCF120405EC
5537938	TCF310R2SL32ME	31,00	32,00	32	102,5	62,0	0,72	E	TCF100408EP	TCF120405EC

(continued)

(Top Cut 4 Drill • Metric • 2 x D • SL Shanks — continued)

order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	insert size	periphery insert	centre insert
5537939	TCF320R2SL32ME	32,00	33,00	32	104,8	64,0	0,82	E	TCF100408EP	TCF120405EC
5537940	TCF330R2SL40ME	33,00	34,00	40	107,1	66,0	0,95	E	TCF100408EP	TCF120405EC
5537941	TCF340R2SL40ME	34,00	35,00	40	109,4	68,0	1,14	E	TCF100408EP	TCF120405EC
5537942	TCF350R2SL40ME	35,00	36,00	40	111,8	70,0	1,30	E	TCF100408EP	TCF120405EC
5537943	TCF360R2SL40ME	36,00	37,00	40	114,1	72,0	1,45	E	TCF100408EP	TCF120405EC
5578539	TCF370R2SL40MF	37,00	38,00	40	118,1	74,0	1,19	F	TCF120412FP	TCF150406FC
5578600	TCF375R2SL40MF	37,50	38,50	40	119,3	75,0	1,23	F	TCF120412FP	TCF150406FC
5578601	TCF380R2SL40MF	38,00	39,00	40	120,5	76,0	1,27	F	TCF120412FP	TCF150406FC
5578602	TCF390R2SL40MF	39,00	40,00	40	122,8	78,0	1,36	F	TCF120412FP	TCF150406FC
5578603	TCF400R2SL40MF	40,00	41,00	40	125,1	80,0	1,47	F	TCF120412FP	TCF150406FC
5578604	TCF410R2SL40MF	41,00	42,00	40	127,4	82,0	1,60	F	TCF120412FP	TCF150406FC
5578605	TCF420R2SL40MF	42,00	43,00	40	129,7	84,0	1,77	F	TCF120412FP	TCF150406FC
5578606	TCF430R2SL40MF	43,00	44,00	40	132,1	86,0	1,99	F	TCF120412FP	TCF150406FC
5578607	TCF440R2SL40MF	44,00	45,00	40	134,4	88,0	2,10	F	TCF120412FP	TCF150406FC
5578608	TCF450R2SL50MF	45,00	46,00	50	136,7	90,0	2,21	F	TCF120412FP	TCF150406FC
5578694	TCF460R2SL50MG	46,00	47,00	50	139,0	92,0	1,45	G	TCF150512GP	TCF180508GC
5578695	TCF470R2SL50MG	47,00	48,00	50	141,3	94,0	1,53	G	TCF150512GP	TCF180508GC
5578696	TCF480R2SL50MG	48,00	49,00	50	143,7	96,0	1,63	G	TCF150512GP	TCF180508GC
5578697	TCF490R2SL50MG	49,00	50,00	50	146,0	98,0	1,74	G	TCF150512GP	TCF180508GC
5578698	TCF500R2SL50MG	50,00	51,00	50	149,8	100,0	1,87	G	TCF150512GP	TCF180508GC
5578699	TCF505R2SL50MG	50,50	51,50	50	151,0	101,0	1,94	G	TCF150512GP	TCF180508GC
5578710	TCF510R2SL50MG	51,00	52,00	50	152,1	102,0	2,02	G	TCF150512GP	TCF180508GC
5578711	TCF520R2SL50MG	52,00	53,00	50	154,4	104,0	2,22	G	TCF150512GP	TCF180508GC
5578712	TCF530R2SL50MG	53,00	54,00	50	156,8	106,0	2,46	G	TCF150512GP	TCF180508GC
5578713	TCF540R2SL50MG	54,00	55,00	50	159,1	108,0	2,53	G	TCF150512GP	TCF180508GC
5578714	TCF550R2SL50MG	55,00	56,00	50	161,4	110,0	2,73	G	TCF150512GP	TCF180508GC
5578715	TCF560R2SL50MG	56,00	57,00	50	163,7	112,0	2,37	G	TCF150512GP	TCF180508GC
5538613	TCF570R2SL50MH	57,00	58,00	50	165,5	114,0	1,76	H	TCF180614HP	TCF210608HC
5538614	TCF580R2SL50MH	58,00	59,00	50	167,9	116,0	1,85	H	TCF180614HP	TCF210608HC
5538615	TCF590R2SL50MH	59,00	60,00	50	170,2	118,0	1,96	H	TCF180614HP	TCF210608HC
5538616	TCF600R2SL50MH	60,00	61,00	50	172,5	120,0	1,42	H	TCF180614HP	TCF210608HC
5538617	TCF610R2SL50MH	61,00	62,00	50	174,8	122,0	2,23	H	TCF180614HP	TCF210608HC
5538618	TCF620R2SL50MH	62,00	63,00	50	177,1	124,0	2,41	H	TCF180614HP	TCF210608HC
5538619	TCF630R2SL50MH	63,00	64,00	50	179,5	126,0	2,64	H	TCF180614HP	TCF210608HC
5538630	TCF640R2SL50MH	64,00	65,00	50	181,8	128,0	2,94	H	TCF180614HP	TCF210608HC
5538631	TCF650R2SL50MH	65,00	66,00	50	184,1	130,0	3,06	H	TCF180614HP	TCF210608HC
5538632	TCF660R2SL50MH	66,00	67,00	50	186,4	132,0	3,18	H	TCF180614HP	TCF210608HC
5538633	TCF670R2SL50MH	67,00	68,00	50	188,7	134,0	3,30	H	TCF180614HP	TCF210608HC
5538634	TCF680R2SL50MH	68,00	69,00	50	191,1	136,0	2,93	H	TCF180614HP	TCF210608HC

(continued)

(Top Cut 4 Drill • Metric • 2 x D • SL Shanks — continued)

■ Spare Parts



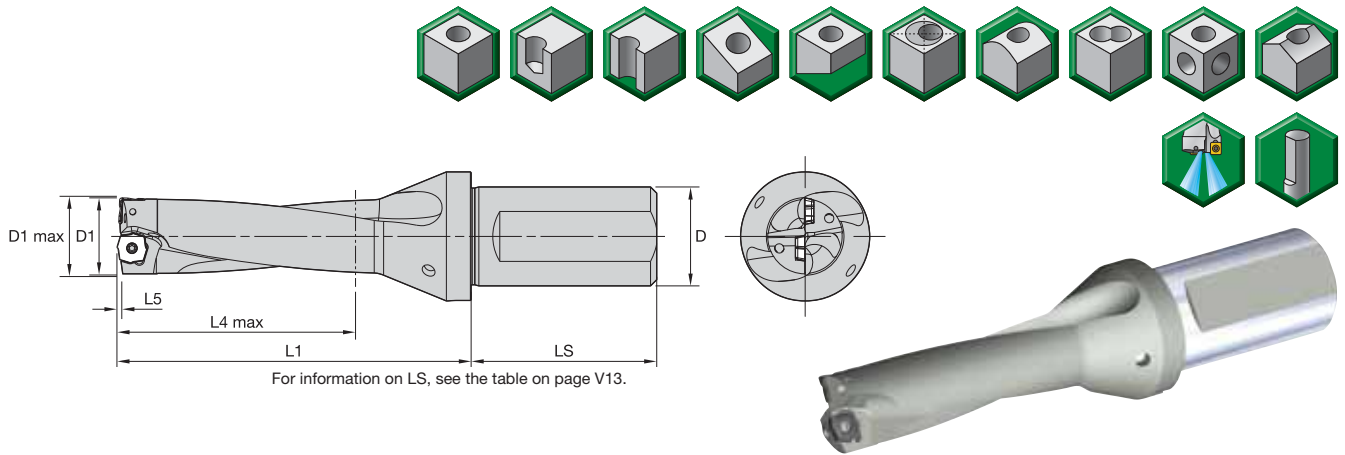
insert size	periphery insert	centre insert	insert screw order number	Torx size	Torx driver order number	tightening torque Nm
A	TCF040204AP	TCF040203AC	2025073	T5	2029221	0,40
B	TCF050204BP	TCF060203BC	1175225	T6	1138455	0,53
C	TCF070306CP	TCF070304CC	1021337	T7	2029266	0,90
D	TCF080308DP	TCF090305DC	1134385	T8	2029598	1,10
E	TCF100408EP	TCF120405EC	2018194	T9	1138430	2,00
F	TCF120412FP	TCF150406FC	1756815	T15	2029596	4,00
G	TCF150512GP	TCF180508GC	1099645	T20	2029488	6,30
H	TCF180614HP	TCF210608HC	1823871	T25	1022519	8,80

D	LS
20,00	50
25,00	56
32,00	60
40,00	70
50,00	80

NOTE: Drilling in stacked plates possible in certain applications. Ask for technical support.
Drill shipped with insert screws and Torx wrench.
See pages V20–V23 for inserts.
SL = Side Lock
D1 max is an achievable diameter using x-offset.



WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.



For information on LS, see the table on page V13.

■ Top Cut 4 Drill • Metric • 3 x D • SL Shanks

order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	insert size	periphery insert	centre insert
5537863	TCF120R3SL20MA	12,00	12,50	20	66,6	36,0	0,41	A	TCF040204AP	TCF040203AC
5537864	TCF125R3SL20MA	12,50	13,00	20	68,3	37,5	0,48	A	TCF040204AP	TCF040203AC
5537866	TCF127R3SL20MA	12,70	13,20	20	68,9	38,1	0,51	A	TCF040204AP	TCF040203AC
5537867	TCF130R3SL20MA	13,00	13,50	20	69,9	39,0	0,56	A	TCF040204AP	TCF040203AC
5537868	TCF135R3SL20MA	13,50	14,00	20	71,6	41,0	0,64	A	TCF040204AP	TCF040203AC
5577928	TCF140R3SL25MB	14,00	14,50	25	73,8	42,0	0,42	B	TCF050204BP	TCF060203BC
5577929	TCF145R3SL25MB	14,50	15,00	25	75,4	43,5	0,45	B	TCF050204BP	TCF060203BC
5577930	TCF150R3SL25MB	15,00	15,50	25	77,1	45,0	0,49	B	TCF050204BP	TCF060203BC
5577931	TCF155R3SL25MB	15,50	16,00	25	78,8	46,5	0,54	B	TCF050204BP	TCF060203BC
5577932	TCF160R3SL25MB	16,00	16,50	25	80,4	48,0	0,60	B	TCF050204BP	TCF060203BC
5577933	TCF165R3SL25MB	16,50	17,00	25	82,1	49,5	0,68	B	TCF050204BP	TCF060203BC
5577934	TCF170R3SL25MB	17,00	17,50	25	85,4	51,0	0,74	B	TCF050204BP	TCF060203BC
5577935	TCF175R3SL25MB	17,50	18,00	25	87,1	52,5	0,79	B	TCF050204BP	TCF060203BC
5577936	TCF180R3SL25MB	18,00	18,50	25	88,8	54,0	0,86	B	TCF050204BP	TCF060203BC
5577937	TCF185R3SL25MB	18,50	19,00	25	90,4	55,5	0,83	B	TCF050204BP	TCF060203BC
5578828	TCF190R3SL25MC	19,00	19,50	25	91,1	57,0	0,60	C	TCF070306CP	TCF070304CC
5578829	TCF195R3SL25MC	19,50	20,00	25	92,7	58,5	0,70	C	TCF070306CP	TCF070304CC
5578830	TCF200R3SL25MC	20,00	20,50	25	94,4	60,0	0,70	C	TCF070306CP	TCF070304CC
5578831	TCF205R3SL25MC	20,50	21,00	25	96,1	61,5	0,70	C	TCF070306CP	TCF070304CC
5578832	TCF210R3SL25MC	21,00	21,50	25	97,7	63,0	0,80	C	TCF070306CP	TCF070304CC
5578833	TCF220R3SL25MC	22,00	22,50	25	101,0	66,0	1,00	C	TCF070306CP	TCF070304CC
5578834	TCF225R3SL25MC	22,50	23,00	25	102,7	67,5	1,10	C	TCF070306CP	TCF070304CC
5578835	TCF230R3SL25MC	23,00	23,50	25	104,4	69,0	1,10	C	TCF070306CP	TCF070304CC
5537824	TCF240R3SL25MD	24,00	25,00	25	111,2	72,0	0,78	D	TCF080308DP	TCF090305DC
5537825	TCF250R3SL32MD	25,00	26,00	32	114,6	75,0	0,86	D	TCF080308DP	TCF090305DC
5537826	TCF260R3SL32MD	26,00	27,00	32	117,9	78,0	0,97	D	TCF080308DP	TCF090305DC
5537827	TCF265R3SL32MD	26,50	27,50	32	119,5	79,5	1,05	D	TCF080308DP	TCF090305DC
5537828	TCF270R3SL32MD	27,00	28,00	32	121,2	81,0	1,15	D	TCF080308DP	TCF090305DC
5537829	TCF280R3SL32MD	28,00	29,00	32	124,5	84,0	1,30	D	TCF080308DP	TCF090305DC
5537830	TCF290R3SL32MD	29,00	30,00	32	127,8	87,0	1,45	D	TCF080308DP	TCF090305DC
5537944	TCF300R3SL32ME	30,00	31,00	32	130,2	90,0	0,63	E	TCF100408EP	TCF120405EC
5537945	TCF310R3SL32ME	31,00	32,00	32	133,5	93,0	0,72	E	TCF100408EP	TCF120405EC

(continued)

(Top Cut 4 Drill • Metric • 3 x D • SL Shanks — continued)

order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	insert size	periphery insert	centre insert
5537946	TCF320R3SL32ME	32,00	33,00	32	136,8	96,0	0,82	E	TCF100408EP	TCF120405EC
5537947	TCF330R3SL40ME	33,00	34,00	40	140,1	99,0	0,95	E	TCF100408EP	TCF120405EC
5537948	TCF340R3SL40ME	34,00	35,00	40	143,4	102,0	1,14	E	TCF100408EP	TCF120405EC
5537949	TCF350R3SL40ME	35,00	36,00	40	146,8	105,0	1,30	E	TCF100408EP	TCF120405EC
5537950	TCF360R3SL40ME	36,00	37,00	40	150,1	108,0	1,45	E	TCF100408EP	TCF120405EC
5578609	TCF370R3SL40MF	37,00	38,00	40	155,1	111,0	1,19	F	TCF120412FP	TCF150406FC
5578610	TCF375R3SL40MF	37,50	38,50	40	156,8	113,0	1,23	F	TCF120412FP	TCF150406FC
5578611	TCF380R3SL40MF	38,00	39,00	40	158,5	114,0	1,27	F	TCF120412FP	TCF150406FC
5578612	TCF390R3SL40MF	39,00	40,00	40	161,8	117,0	1,36	F	TCF120412FP	TCF150406FC
5578613	TCF400R3SL40MF	40,00	41,00	40	165,1	120,0	1,47	F	TCF120412FP	TCF150406FC
5578614	TCF410R3SL40MF	41,00	42,00	40	168,4	123,0	1,60	F	TCF120412FP	TCF150406FC
5578615	TCF420R3SL40MF	42,00	43,00	40	171,7	126,0	1,77	F	TCF120412FP	TCF150406FC
5578616	TCF430R3SL40MF	43,00	44,00	40	175,1	129,0	1,99	F	TCF120412FP	TCF150406FC
5578617	TCF440R3SL40MF	44,00	45,00	40	178,4	132,0	2,10	F	TCF120412FP	TCF150406FC
5578618	TCF450R3SL50MF	45,00	46,00	50	181,7	135,0	2,21	F	TCF120412FP	TCF150406FC
5578716	TCF460R3SL50MG	46,00	47,00	50	185,0	138,0	1,45	G	TCF150512GP	TCF180508GC
5578717	TCF470R3SL50MG	47,00	48,00	50	188,3	141,0	1,53	G	TCF150512GP	TCF180508GC
5578718	TCF480R3SL50MG	48,00	49,00	50	191,7	144,0	1,63	G	TCF150512GP	TCF180508GC
5578719	TCF490R3SL50MG	49,00	50,00	50	195,0	147,0	1,74	G	TCF150512GP	TCF180508GC
5578720	TCF500R3SL50MG	50,00	51,00	50	199,8	150,0	1,87	G	TCF150512GP	TCF180508GC
5578721	TCF505R3SL50MG	50,50	51,50	50	201,5	152,0	1,94	G	TCF150512GP	TCF180508GC
5578722	TCF510R3SL50MG	51,00	52,00	50	203,1	153,0	2,02	G	TCF150512GP	TCF180508GC
5578723	TCF520R3SL50MG	52,00	53,00	50	206,4	156,0	2,22	G	TCF150512GP	TCF180508GC
5578724	TCF530R3SL50MG	53,00	54,00	50	209,8	159,0	2,46	G	TCF150512GP	TCF180508GC
5578726	TCF540R3SL50MG	54,00	55,00	50	213,1	162,0	2,53	G	TCF150512GP	TCF180508GC
5578727	TCF550R3SL50MG	55,00	56,00	50	216,4	165,0	2,73	G	TCF150512GP	TCF180508GC
5578728	TCF560R3SL50MG	56,00	57,00	50	219,7	168,0	2,37	G	TCF150512GP	TCF180508GC
5538635	TCF570R3SL50MH	57,00	58,00	50	222,5	171,0	1,76	H	TCF180614HP	TCF210608HC
5538636	TCF580R3SL50MH	58,00	59,00	50	225,9	174,0	1,85	H	TCF180614HP	TCF210608HC
5538637	TCF590R3SL50MH	59,00	60,00	50	229,2	177,0	1,96	H	TCF180614HP	TCF210608HC
5538638	TCF600R3SL50MH	60,00	61,00	50	232,5	180,0	1,42	H	TCF180614HP	TCF210608HC
5538639	TCF610R3SL50MH	61,00	62,00	50	235,8	183,0	2,23	H	TCF180614HP	TCF210608HC
5538640	TCF620R3SL50MH	62,00	63,00	50	239,1	186,0	2,41	H	TCF180614HP	TCF210608HC
5538641	TCF630R3SL50MH	63,00	64,00	50	242,5	189,0	2,64	H	TCF180614HP	TCF210608HC
5538642	TCF640R3SL50MH	64,00	65,00	50	245,8	192,0	2,94	H	TCF180614HP	TCF210608HC
5538643	TCF650R3SL50MH	65,00	66,00	50	249,1	195,0	3,06	H	TCF180614HP	TCF210608HC
5538644	TCF660R3SL50MH	66,00	67,00	50	252,4	198,0	3,18	H	TCF180614HP	TCF210608HC
5538645	TCF670R3SL50MH	67,00	68,00	50	255,7	201,0	3,30	H	TCF180614HP	TCF210608HC
5538646	TCF680R3SL50MH	68,00	69,00	50	259,1	204,0	2,93	H	TCF180614HP	TCF210608HC

(continued)

(Top Cut 4 Drill • Metric • 3 x D • SL Shanks — continued)

■ Spare Parts


insert size	periphery insert	centre insert	insert screw order number	Torx size	Torx driver order number	tightening torque Nm
A	TCF040204AP	TCF040203AC	2025073	T5	2029221	0,40
B	TCF050204BP	TCF060203BC	1175225	T6	1138455	0,53
C	TCF070306CP	TCF070304CC	1021337	T7	2029266	0,90
D	TCF080308DP	TCF090305DC	1134385	T8	2029598	1,10
E	TCF100408EP	TCF120405EC	2018194	T9	1138430	2,00
F	TCF120412FP	TCF150406FC	1756815	T15	2029596	4,00
G	TCF150512GP	TCF180508GC	1099645	T20	2029488	6,30
H	TCF180614HP	TCF210608HC	1823871	T25	1022519	8,80

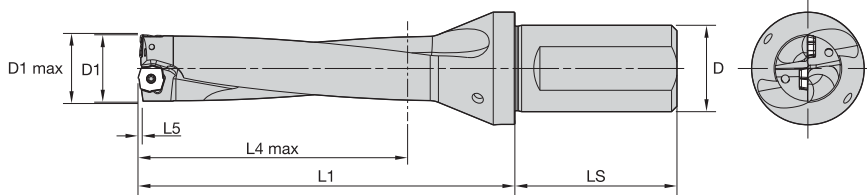
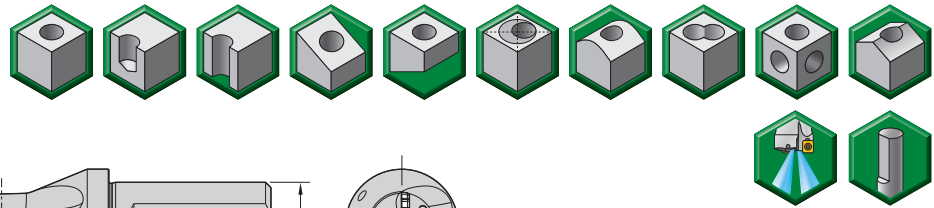
D	LS
20,00	50
25,00	56
32,00	60
40,00	70
50,00	80

NOTE: Drilling in stacked plates possible in certain applications. Ask for technical support.
 Drill shipped with insert screws and Torx wrench.
 See pages V20–V23 for inserts.
 SL = Side Lock
 D1 max is an achievable diameter using x-offset.



WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.



For information on LS, see the table on page V16.



■ Top Cut 4 Drill • Metric • 4 x D • SL Shanks

order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	insert size	periphery insert	centre insert
5537869	TCF120R4SL20MA	12,00	12,50	20	78,6	48,0	0,41	A	TCF040204AP	TCF040203AC
5537870	TCF125R4SL20MA	12,50	13,00	20	80,8	50,0	0,48	A	TCF040204AP	TCF040203AC
5537871	TCF127R4SL20MA	12,70	13,20	20	81,6	50,8	0,51	A	TCF040204AP	TCF040203AC
5537872	TCF130R4SL20MA	13,00	13,50	20	82,9	52,0	0,56	A	TCF040204AP	TCF040203AC
5537873	TCF135R4SL20MA	13,50	14,00	20	85,1	54,0	0,64	A	TCF040204AP	TCF040203AC
5577938	TCF140R4SL25MB	14,00	14,50	25	87,8	56,0	0,42	B	TCF050204BP	TCF060203BC
5577939	TCF145R4SL25MB	14,50	15,00	25	89,9	58,0	0,45	B	TCF050204BP	TCF060203BC
5577940	TCF150R4SL25MB	15,00	15,50	25	92,1	60,0	0,49	B	TCF050204BP	TCF060203BC
5577941	TCF155R4SL25MB	15,50	16,00	25	94,3	62,0	0,54	B	TCF050204BP	TCF060203BC
5577942	TCF160R4SL25MB	16,00	16,50	25	96,4	64,0	0,60	B	TCF050204BP	TCF060203BC
5577943	TCF165R4SL25MB	16,50	17,00	25	98,6	66,0	0,68	B	TCF050204BP	TCF060203BC
5577944	TCF170R4SL25MB	17,00	17,50	25	102,4	68,0	0,74	B	TCF050204BP	TCF060203BC
5577945	TCF175R4SL25MB	17,50	18,00	25	104,6	70,0	0,79	B	TCF050204BP	TCF060203BC
5577946	TCF180R4SL25MB	18,00	18,50	25	106,8	72,0	0,86	B	TCF050204BP	TCF060203BC
5577947	TCF185R4SL25MB	18,50	19,00	25	108,9	74,0	0,83	B	TCF050204BP	TCF060203BC
5578836	TCF190R4SL25MC	19,00	19,50	25	110,1	76,0	0,60	C	TCF070306CP	TCF070304CC
5578837	TCF195R4SL25MC	19,50	20,00	25	112,2	78,0	0,70	C	TCF070306CP	TCF070304CC
5578838	TCF200R4SL25MC	20,00	20,50	25	114,4	80,0	0,70	C	TCF070306CP	TCF070304CC
5578839	TCF205R4SL25MC	20,50	21,00	25	116,6	82,0	0,70	C	TCF070306CP	TCF070304CC
5578840	TCF210R4SL25MC	21,00	21,50	25	118,7	84,0	0,80	C	TCF070306CP	TCF070304CC
5578841	TCF220R4SL25MC	22,00	22,50	25	123,0	88,0	1,00	C	TCF070306CP	TCF070304CC
5578842	TCF225R4SL25MC	22,50	23,00	25	125,2	90,0	1,10	C	TCF070306CP	TCF070304CC
5578843	TCF230R4SL25MC	23,00	23,50	25	127,4	92,0	1,10	C	TCF070306CP	TCF070304CC
5537831	TCF240R4SL25MD	24,00	25,00	25	135,2	96,0	0,78	D	TCF080308DP	TCF090305DC
5537832	TCF250R4SL32MD	25,00	26,00	32	139,6	100,0	0,86	D	TCF080308DP	TCF090305DC
5537833	TCF260R4SL32MD	26,00	27,00	32	143,9	104,0	0,97	D	TCF080308DP	TCF090305DC
5537834	TCF265R4SL32MD	26,50	27,50	32	146,0	106,0	1,05	D	TCF080308DP	TCF090305DC
5537835	TCF270R4SL32MD	27,00	28,00	32	148,2	108,0	1,15	D	TCF080308DP	TCF090305DC
5537836	TCF280R4SL32MD	28,00	29,00	32	152,5	112,0	1,30	D	TCF080308DP	TCF090305DC
5537837	TCF290R4SL32MD	29,00	30,00	32	156,8	116,0	1,45	D	TCF080308DP	TCF090305DC
5537951	TCF300R4SL32ME	30,00	31,00	32	160,2	120,0	0,63	E	TCF100408EP	TCF120405EC
5537952	TCF310R4SL32ME	31,00	32,00	32	164,5	124,0	0,72	E	TCF100408EP	TCF120405EC

(continued)

(Top Cut 4 Drill • Metric • 4 x D • SL Shanks — continued)

order number	catalogue number	D1	D1 max	D	L1	L4 max	L5	insert size	periphery insert	centre insert
5537953	TCF320R4SL32ME	32,00	33,00	32	168,8	128,0	0,82	E	TCF100408EP	TCF120405EC
5537954	TCF330R4SL40ME	33,00	34,00	40	173,1	132,0	0,95	E	TCF100408EP	TCF120405EC
5537955	TCF340R4SL40ME	34,00	35,00	40	177,4	136,0	1,14	E	TCF100408EP	TCF120405EC
5537956	TCF350R4SL40ME	35,00	36,00	40	181,8	140,0	1,30	E	TCF100408EP	TCF120405EC
5537957	TCF360R4SL40ME	36,00	37,00	40	186,1	144,0	1,45	E	TCF100408EP	TCF120405EC
5578619	TCF370R4SL40MF	37,00	38,00	40	192,1	148,0	1,19	F	TCF120412FP	TCF150406FC
5578620	TCF375R4SL40MF	37,50	38,50	40	194,3	150,0	1,23	F	TCF120412FP	TCF150406FC
5578621	TCF380R4SL40MF	38,00	39,00	40	196,5	152,0	1,27	F	TCF120412FP	TCF150406FC
5578622	TCF390R4SL40MF	39,00	40,00	40	200,8	156,0	1,36	F	TCF120412FP	TCF150406FC
5578623	TCF400R4SL40MF	40,00	41,00	40	205,1	160,0	1,47	F	TCF120412FP	TCF150406FC
5578624	TCF410R4SL40MF	41,00	42,00	40	209,4	164,0	1,60	F	TCF120412FP	TCF150406FC
5578625	TCF420R4SL40MF	42,00	43,00	40	213,7	168,0	1,77	F	TCF120412FP	TCF150406FC
5578626	TCF430R4SL40MF	43,00	44,00	40	218,1	172,0	1,99	F	TCF120412FP	TCF150406FC
5578627	TCF440R4SL40MF	44,00	45,00	40	222,4	176,0	2,10	F	TCF120412FP	TCF150406FC
5578628	TCF450R4SL50MF	45,00	46,00	50	226,7	180,0	2,21	F	TCF120412FP	TCF150406FC
5578729	TCF460R4SL50MG	46,00	47,00	50	231,0	184,0	1,45	G	TCF150512GP	TCF180508GC
5578730	TCF470R4SL50MG	47,00	48,00	50	235,3	188,0	1,53	G	TCF150512GP	TCF180508GC
5578731	TCF480R4SL50MG	48,00	49,00	50	239,7	192,0	1,63	G	TCF150512GP	TCF180508GC
5578732	TCF490R4SL50MG	49,00	50,00	50	244,0	196,0	1,74	G	TCF150512GP	TCF180508GC
5578733	TCF500R4SL50MG	50,00	51,00	50	249,8	200,0	1,87	G	TCF150512GP	TCF180508GC
5578734	TCF505R4SL50MG	50,50	51,50	50	252,0	202,0	1,94	G	TCF150512GP	TCF180508GC
5578735	TCF510R4SL50MG	51,00	52,00	50	254,1	204,0	2,02	G	TCF150512GP	TCF180508GC
5578736	TCF520R4SL50MG	52,00	53,00	50	258,4	208,0	2,22	G	TCF150512GP	TCF180508GC
5578737	TCF530R4SL50MG	53,00	54,00	50	262,8	212,0	2,46	G	TCF150512GP	TCF180508GC
5578738	TCF540R4SL50MG	54,00	55,00	50	267,1	216,0	2,53	G	TCF150512GP	TCF180508GC
5578739	TCF550R4SL50MG	55,00	56,00	50	271,4	220,0	2,73	G	TCF150512GP	TCF180508GC
5578750	TCF560R4SL50MG	56,00	57,00	50	275,7	224,0	2,37	G	TCF150512GP	TCF180508GC
5538647	TCF570R4SL50MH	57,00	58,00	50	279,5	228,0	1,76	H	TCF180614HP	TCF210608HC
5538648	TCF580R4SL50MH	58,00	59,00	50	283,9	232,0	1,85	H	TCF180614HP	TCF210608HC
5538649	TCF590R4SL50MH	59,00	60,00	50	288,2	236,0	1,96	H	TCF180614HP	TCF210608HC
5538650	TCF600R4SL50MH	60,00	61,00	50	292,5	240,0	1,42	H	TCF180614HP	TCF210608HC
5538651	TCF610R4SL50MH	61,00	62,00	50	296,8	244,0	2,23	H	TCF180614HP	TCF210608HC
5538652	TCF620R4SL50MH	62,00	63,00	50	301,1	248,0	2,41	H	TCF180614HP	TCF210608HC
5538653	TCF630R4SL50MH	63,00	64,00	50	305,5	252,0	2,64	H	TCF180614HP	TCF210608HC
5538654	TCF640R4SL50MH	64,00	65,00	50	309,8	256,0	2,94	H	TCF180614HP	TCF210608HC
5538655	TCF650R4SL50MH	65,00	66,00	50	314,1	260,0	3,06	H	TCF180614HP	TCF210608HC
5538656	TCF660R4SL50MH	66,00	67,00	50	318,4	264,0	3,18	H	TCF180614HP	TCF210608HC
5538657	TCF670R4SL50MH	67,00	68,00	50	322,7	268,0	3,30	H	TCF180614HP	TCF210608HC
5538658	TCF680R4SL50MH	68,00	69,00	50	327,1	272,0	2,93	H	TCF180614HP	TCF210608HC

(continued)

(Top Cut 4 Drill • Metric • 4 x D • SL Shanks — continued)

■ Spare Parts



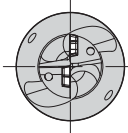
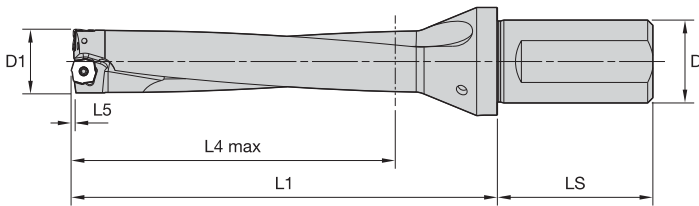
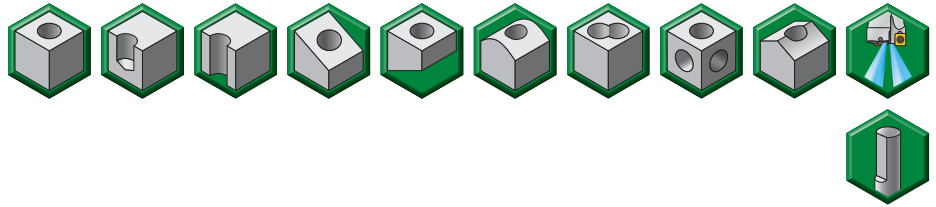
insert size	periphery insert	centre insert	insert screw order number	Torx size	Torx driver order number	tightening torque Nm
A	TCF040204AP	TCF040203AC	2025073	T5	2029221	0,40
B	TCF050204BP	TCF060203BC	1175225	T6	1138455	0,53
C	TCF070306CP	TCF070304CC	1021337	T7	2029266	0,90
D	TCF080308DP	TCF090305DC	1134385	T8	2029598	1,10
E	TCF100408EP	TCF120405EC	2018194	T9	1138430	2,00
F	TCF120412FP	TCF150406FC	1756815	T15	2029596	4,00
G	TCF150512GP	TCF180508GC	1099645	T20	2029488	6,30
H	TCF180614HP	TCF210608HC	1823871	T25	1022519	8,80

D	LS
20,00	50
25,00	56
32,00	60
40,00	70
50,00	80

NOTE: Drilling in stacked plates possible in certain applications. Ask for technical support.
Drill shipped with insert screws and Torx wrench.
See pages V20–V23 for inserts.
SL = Side Lock
D1 max is an achievable diameter using x-offset.



WARNING
During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.



For information on LS, see the table on page V19.

■ Top Cut 4 Drill • Metric • 5 x D • SL Shanks

order number	catalogue number	D1	D	L1	L4 max	L5	insert size	periphery insert	centre insert
5537874	TCF120R5SL20MA	12,00	20	86,0	60,0	0,41	A	TCF040204AP	TCF040203AC
5537875	TCF125R5SL20MA	12,50	20	89,0	63,0	0,48	A	TCF040204AP	TCF040203AC
5537876	TCF127R5SL20MA	12,70	20	90,0	63,5	0,51	A	TCF040204AP	TCF040203AC
5537877	TCF130R5SL20MA	13,00	20	90,0	65,0	0,56	A	TCF040204AP	TCF040203AC
5537878	TCF135R5SL20MA	13,50	20	94,0	68,0	0,64	A	TCF040204AP	TCF040203AC
5577948	TCF140R5SL25MB	14,00	25	99,0	70,0	0,42	B	TCF050204BP	TCF060203BC
5577949	TCF145R5SL25MB	14,50	25	100,0	72,5	0,45	B	TCF050204BP	TCF060203BC
5577950	TCF150R5SL25MB	15,00	25	103,0	75,0	0,49	B	TCF050204BP	TCF060203BC
5577951	TCF155R5SL25MB	15,50	25	104,8	77,5	0,54	B	TCF050204BP	TCF060203BC
5577952	TCF160R5SL25MB	16,00	25	108,4	80,0	0,60	B	TCF050204BP	TCF060203BC
5577953	TCF165R5SL25MB	16,50	25	111,1	82,5	0,68	B	TCF050204BP	TCF060203BC
5577954	TCF170R5SL25MB	17,00	25	115,4	85,0	0,74	B	TCF050204BP	TCF060203BC
5577955	TCF175R5SL25MB	17,50	25	118,1	87,5	0,79	B	TCF050204BP	TCF060203BC
5577956	TCF180R5SL25MB	18,00	25	120,8	90,0	0,86	B	TCF050204BP	TCF060203BC
5577957	TCF185R5SL25MB	18,50	25	122,4	92,5	0,83	B	TCF050204BP	TCF060203BC
5578844	TCF190R5SL25MC	19,00	25	129,1	95,0	0,60	C	TCF070306CP	TCF070304CC
5578845	TCF195R5SL25MC	19,50	25	131,7	97,5	0,70	C	TCF070306CP	TCF070304CC
5578846	TCF200R5SL25MC	20,00	25	132,0	100,0	0,70	C	TCF070306CP	TCF070304CC
5578847	TCF205R5SL25MC	20,50	25	134,1	102,5	0,70	C	TCF070306CP	TCF070304CC
5578848	TCF210R5SL25MC	21,00	25	137,0	105,0	0,80	C	TCF070306CP	TCF070304CC
5578849	TCF220R5SL25MC	22,00	25	142,0	110,0	1,00	C	TCF070306CP	TCF070304CC
5578850	TCF225R5SL25MC	22,50	25	144,7	112,5	1,10	C	TCF070306CP	TCF070304CC
5578851	TCF230R5SL25MC	23,00	25	147,0	115,0	1,10	C	TCF070306CP	TCF070304CC
5537838	TCF240R5SL25MD	24,00	25	152,0	120,0	0,78	D	TCF080308DP	TCF090305DC
5537839	TCF250R5SL32MD	25,00	32	158,0	125,0	0,86	D	TCF080308DP	TCF090305DC
5537840	TCF260R5SL32MD	26,00	32	164,0	130,0	0,97	D	TCF080308DP	TCF090305DC
5537841	TCF265R5SL32MD	26,50	32	166,5	132,5	1,05	D	TCF080308DP	TCF090305DC
5537842	TCF270R5SL32MD	27,00	32	170,0	135,0	1,15	D	TCF080308DP	TCF090305DC
5537843	TCF280R5SL32MD	28,00	32	176,5	140,0	1,30	D	TCF080308DP	TCF090305DC
5537844	TCF290R5SL32MD	29,00	32	181,0	145,0	1,45	D	TCF080308DP	TCF090305DC
5537958	TCF300R5SL32ME	30,00	32	186,0	150,0	0,63	E	TCF100408EP	TCF120405EC
5537959	TCF310R5SL32ME	31,00	32	193,0	155,0	0,72	E	TCF100408EP	TCF120405EC

(continued)

(Top Cut 4 Drill • Metric • 5 x D • SL Shanks — continued)

order number	catalogue number	D1	D	L1	L4 max	L5	insert size	periphery insert	centre insert
5537960	TCF320R5SL32ME	32,00	32	199,0	160,0	0,82	E	TCF100408EP	TCF120405EC
5537961	TCF330R5SL40ME	33,00	40	204,0	165,0	0,95	E	TCF100408EP	TCF120405EC
5537962	TCF340R5SL40ME	34,00	40	210,0	170,0	1,14	E	TCF100408EP	TCF120405EC
5537963	TCF350R5SL40ME	35,00	40	216,8	175,0	1,30	E	TCF100408EP	TCF120405EC
5537964	TCF360R5SL40ME	36,00	40	222,0	180,0	1,45	E	TCF100408EP	TCF120405EC
5578629	TCF370R5SL40MF	37,00	40	228,0	185,0	1,19	F	TCF120412FP	TCF150406FC
5578640	TCF375R5SL40MF	37,50	40	231,8	188,0	1,23	F	TCF120412FP	TCF150406FC
5578641	TCF380R5SL40MF	38,00	40	234,5	190,0	1,27	F	TCF120412FP	TCF150406FC
5578642	TCF390R5SL40MF	39,00	40	239,8	195,0	1,36	F	TCF120412FP	TCF150406FC
5578643	TCF400R5SL40MF	40,00	40	245,1	200,0	1,47	F	TCF120412FP	TCF150406FC
5578644	TCF410R5SL40MF	41,00	40	250,4	205,0	1,60	F	TCF120412FP	TCF150406FC
5578645	TCF420R5SL40MF	42,00	40	255,7	210,0	1,77	F	TCF120412FP	TCF150406FC
5578646	TCF430R5SL40MF	43,00	40	261,1	215,0	1,99	F	TCF120412FP	TCF150406FC
5578647	TCF440R5SL40MF	44,00	40	266,4	220,0	2,10	F	TCF120412FP	TCF150406FC
5578648	TCF450R5SL50MF	45,00	50	271,7	225,0	2,21	F	TCF120412FP	TCF150406FC
5578751	TCF460R5SL50MG	46,00	50	277,0	230,0	1,45	G	TCF150512GP	TCF180508GC
5578752	TCF470R5SL50MG	47,00	50	282,3	235,0	1,53	G	TCF150512GP	TCF180508GC
5578753	TCF480R5SL50MG	48,00	50	287,7	240,0	1,63	G	TCF150512GP	TCF180508GC
5578754	TCF490R5SL50MG	49,00	50	293,0	245,0	1,74	G	TCF150512GP	TCF180508GC
5578755	TCF500R5SL50MG	50,00	50	299,8	250,0	1,87	G	TCF150512GP	TCF180508GC
5578756	TCF505R5SL50MG	50,50	50	302,5	253,0	1,94	G	TCF150512GP	TCF180508GC
5578757	TCF510R5SL50MG	51,00	50	305,1	255,0	2,02	G	TCF150512GP	TCF180508GC
5578758	TCF520R5SL50MG	52,00	50	310,4	260,0	2,22	G	TCF150512GP	TCF180508GC
5578759	TCF530R5SL50MG	53,00	50	315,8	265,0	2,46	G	TCF150512GP	TCF180508GC
5578760	TCF540R5SL50MG	54,00	50	321,1	270,0	2,53	G	TCF150512GP	TCF180508GC
5578761	TCF550R5SL50MG	55,00	50	326,4	275,0	2,73	G	TCF150512GP	TCF180508GC
5578762	TCF560R5SL50MG	56,00	50	331,7	280,0	2,37	G	TCF150512GP	TCF180508GC
5538659	TCF570R5SL50MH	57,00	50	330,0	285,0	1,76	H	TCF180614HP	TCF210608HC
5538680	TCF580R5SL50MH	58,00	50	336,0	290,0	1,85	H	TCF180614HP	TCF210608HC
5538681	TCF590R5SL50MH	59,00	50	339,2	295,0	1,96	H	TCF180614HP	TCF210608HC
5538682	TCF600R5SL50MH	60,00	50	345,5	300,0	1,42	H	TCF180614HP	TCF210608HC
5538683	TCF610R5SL50MH	61,00	50	347,8	305,0	2,23	H	TCF180614HP	TCF210608HC
5538684	TCF620R5SL50MH	62,00	50	358,0	310,0	2,41	H	TCF180614HP	TCF210608HC
5538685	TCF630R5SL50MH	63,00	50	365,0	315,0	2,64	H	TCF180614HP	TCF210608HC
5538686	TCF640R5SL50MH	64,00	50	363,8	320,0	2,94	H	TCF180614HP	TCF210608HC
5538687	TCF650R5SL50MH	65,00	50	375,0	325,0	3,06	H	TCF180614HP	TCF210608HC
5538688	TCF660R5SL50MH	66,00	50	376,4	330,0	3,18	H	TCF180614HP	TCF210608HC
5538689	TCF670R5SL50MH	67,00	50	385,0	335,0	3,30	H	TCF180614HP	TCF210608HC
5538700	TCF680R5SL50MH	68,00	50	390,0	340,0	2,93	H	TCF180614HP	TCF210608HC

(continued)

(Top Cut 4 Drill • Metric • 5 x D • SL Shanks – continued)

■ Spare Parts


insert size	periphery insert	centre insert	insert screw order number	Torx size	Torx driver order number	tightening torque Nm
A	TCF040204AP	TCF040203AC	2025073	T5	2029221	0,40
B	TCF050204BP	TCF060203BC	1175225	T6	1138455	0,53
C	TCF070306CP	TCF070304CC	1021337	T7	2029266	0,90
D	TCF080308DP	TCF090305DC	1134385	T8	2029598	1,10
E	TCF100408EP	TCF120405EC	2018194	T9	1138430	2,00
F	TCF120412FP	TCF150406FC	1756815	T15	2029596	4,00
G	TCF150512GP	TCF180508GC	1099645	T20	2029488	6,30
H	TCF180614HP	TCF210608HC	1823871	T25	1022519	8,80

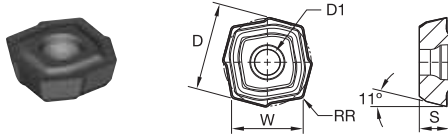
D	LS
20,00	50
25,00	56
32,00	60
40,00	70
50,00	80

NOTE: Drill shipped with insert screws and Torx wrench.
 See pages V20–V23 for inserts.
 SL = Side Lock



WARNING

During through-hole operations, a slug or disc is produced as the tool breaks through the workpiece. When the drill is stationary and the workpiece is rotating, this slug may be hurled from the chuck by centrifugal force. Provide adequate shielding to protect bystanders.



● first choice
○ alternate choice

P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

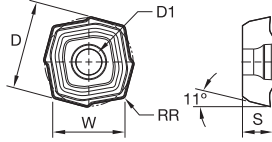
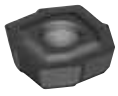
■ Top Cut 4 Drill • Centre Inserts • V34

catalogue number	D	D1	W	S	RR	insert size	WPK10CH	WU25CH	WU40PH
TCF040203ACV34	4,47	2,10	3,65	2,00	0,300	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TCF060203BCV34	6,00	2,40	4,90	2,40	0,300	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TCF070304CCV34	7,59	2,60	6,20	2,80	0,400	C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TCF090305DCV34	9,55	2,80	7,80	3,00	0,500	D	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TCF120405ECV34	12,00	3,40	9,80	3,60	0,500	E	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TCF150406FCV34	14,94	4,80	12,20	4,20	0,600	F	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TCF180508GCV34	17,88	6,00	14,60	5,40	0,800	G	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TCF210608HCV34	21,68	7,50	17,70	6,50	0,800	H	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

NOTE: For application-specific insert selection, please refer to the application data on pages V24–V35.

Indexable Drills

Geometry	Application
V34	First choice for machining steel, cast iron, and short chipping materials. Suitable for severe cutting conditions.
V36	First choice for stainless steel. Suitable for long chipping steel and where low power consumption is required.



● first choice
○ alternate choice

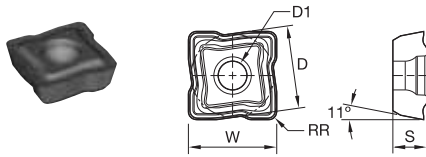
P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

■ Top Cut 4 Drill • Centre Inserts • V36

catalogue number	D	D1	W	S	RR	insert size	WPK10CH	WU25CH	WU40PH
TCF040203ACV36	4,47	2,10	3,65	2,00	0,300	A		5541819	5541840
TCF060203BCV36	6,00	2,40	4,90	2,40	0,300	B		5542606	5542607
TCF070304CCV36	7,59	2,60	6,20	2,80	0,400	C		5542644	5542645
TCF090305DCV36	9,55	2,80	7,80	3,00	0,500	D		5538556	5538557
TCF120405ECV36	12,00	3,40	9,80	3,60	0,500	E		5538606	5538607
TCF150406FCV36	14,94	4,80	12,20	4,20	0,600	F		5542625	5542626
TCF180508GCV36	17,88	6,00	14,60	5,40	0,800	G		5542477	5542478
TCF210608HCV36	21,68	7,50	17,70	6,50	0,800	H		5542004	5542005

NOTE: For application-specific insert selection, please refer to the application data on pages V24–V35.

Geometry	Application
V34	First choice for machining steel, cast iron, and short chipping materials. Suitable for severe cutting conditions.
V36	First choice for stainless steel. Suitable for long chipping steel and where low power consumption is required.



● first choice
○ alternate choice

P	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
M	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
K	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
N	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

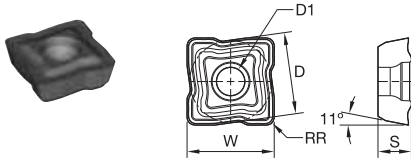
■ Top Cut 4 Drill • Periphery Inserts • V34

catalogue number	D	D1	W	S	RR	insert size			
TCF040204APV34	4,14	2,10	4,40	2,00	0,400	A			
TCF050204BPV34	5,07	2,40	5,40	2,40	0,400	B			
TCF070306CPV34	6,67	2,60	7,10	2,80	0,600	C			
TCF080308DPV34	8,08	2,80	8,60	3,00	0,800	D			
TCF100408EPV34	9,96	3,40	10,60	3,60	0,800	E			
TCF120412FPV34	12,59	4,80	13,40	4,20	1,200	F			
TCF150512GPV34	15,13	6,00	16,10	5,40	1,200	G			
TCF180614HPV34	18,04	7,50	19,20	6,50	1,400	H			
								WPK10CH	
								WU25CH	
								WU40PH	
								5541843	5541841
								5542620	5542608
								5542608	5541842
								5542620	5542609
								5542648	5542647
								5542646	
								5538600	5538559
								5538558	5538559
								5538610	5538609
								5538608	
								5542629	5542627
								5542627	5542628
								5542628	
								5542601	5542600
								5542601	
								5542479	
								5542600	
								5542008	5542007
								5542006	
								5542007	

NOTE: For application-specific insert selection, please refer to the application data on pages V24–V35.

Indexable Drills

Geometry	Application
V34	First choice for machining steel, cast iron, and short chipping materials. Suitable for severe cutting conditions.
V36	First choice for stainless steel. Suitable for long chipping steel and where low power consumption is required.



● first choice
○ alternate choice

P	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

■ Top Cut 4 Drill • Periphery Inserts • V36

catalogue number	D	D1	W	S	RR	insert size	WPK10CH	WU25CH	WU40PH
TCF040204APV36	4,14	2,10	4,40	2,00	0,400	A		5541844	5541845
TCF050204BPV36	5,07	2,40	5,40	2,40	0,400	B		5542621	5542622
TCF070306CPV36	6,67	2,60	7,10	2,80	0,600	C		5542649	5542650
TCF080308DPV36	8,08	2,80	8,60	3,00	0,800	D		5538601	5538602
TCF100408EPV36	9,96	3,40	10,60	3,60	0,800	E		5538611	5538612
TCF120412FPV36	12,59	4,80	13,40	4,20	1,200	F		5542640	5542641
TCF150512GPV36	15,13	6,00	16,10	5,40	1,200	G		5542603	5542605
TCF180614HPV36	18,04	7,50	19,20	6,50	1,400	H		5542009	5542020

NOTE: For application-specific insert selection, please refer to the application data on pages V24–V35.

Geometry	Application
V34	First choice for machining steel, cast iron, and short chipping materials. Suitable for severe cutting conditions.
V36	First choice for stainless steel. Suitable for long chipping steel and where low power consumption is required.

■ Top Cut 4 • Steel • 2 x D/3 x D • Feed Chart • Metric

Top Cut 4					Recommended Feed Rate by Diameter (mm/r)												
					Insert Size A			Insert Size B			Insert Size C			Insert Size D			
					TCF040203AC TCF040204AP 12,00–13,99mm			TCF060203BC TCF050204BP 14,00–18,99mm			TCF070304CC TCF070306CP 19,00–23,99mm			TCF090305DC TCF080308DP 24,00–29,99mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
P	1	S	P	V36	WU25CH	0,06	0,08	0,10	0,08	0,10	0,13	0,10	0,12	0,15	0,11	0,13	0,16
			C	V36	WU40PH												
		U	P	V36	WU40PH	0,06	0,08	0,10	0,08	0,10	0,13	0,10	0,12	0,15	0,11	0,13	0,16
			C	V36	WU40PH												
		I	P	V36	WU40PH	0,06	0,08	0,10	0,08	0,10	0,13	0,10	0,12	0,15	0,11	0,13	0,16
			C	V36	WU40PH												
	2	S	P	V34	WPK10CH	0,06	0,08	0,10	0,08	0,12	0,15	0,10	0,13	0,16	0,11	0,14	0,17
			C	V34	WU40PH												
		U	P	V34	WU25CH	0,06	0,08	0,10	0,08	0,12	0,15	0,10	0,13	0,16	0,11	0,14	0,17
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,06	0,08	0,10	0,08	0,12	0,15	0,10	0,13	0,16	0,11	0,14	0,17
			C	V34	WU40PH												
	3	S	P	V34	WPK10CH	0,08	0,11	0,15	0,10	0,12	0,16	0,11	0,14	0,18	0,12	0,15	0,20
			C	V34	WU40PH												
		U	P	V34	WU25CH	0,08	0,11	0,14	0,10	0,12	0,15	0,11	0,14	0,16	0,12	0,15	0,18
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,08	0,11	0,14	0,10	0,12	0,15	0,11	0,14	0,16	0,12	0,15	0,18
			C	V34	WU40PH												
	4	S	P	V34	WPK10CH	0,08	0,11	0,15	0,10	0,12	0,16	0,11	0,14	0,18	0,12	0,15	0,20
			C	V34	WU40PH												
		U	P	V34	WU25CH	0,08	0,11	0,14	0,10	0,12	0,15	0,11	0,14	0,16	0,12	0,15	0,18
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,08	0,11	0,14	0,10	0,12	0,15	0,11	0,14	0,16	0,12	0,15	0,18
			C	V34	WU40PH												
5	S	P	V36	WU25CH	0,06	0,08	0,10	0,08	0,10	0,14	0,10	0,12	0,15	0,11	0,13	0,16	
		C	V36	WU40PH													
	U	P	V36	WU40PH	0,06	0,08	0,10	0,08	0,10	0,14	0,10	0,12	0,15	0,11	0,13	0,16	
		C	V36	WU40PH													
	I	P	V36	WU40PH	0,06	0,08	0,10	0,08	0,10	0,14	0,10	0,12	0,15	0,11	0,13	0,16	
		C	V36	WU40PH													
6	S	P	V36	WU25CH	0,06	0,08	0,10	0,08	0,10	0,14	0,10	0,12	0,15	0,11	0,13	0,16	
		C	V36	WU40PH													
	U	P	V36	WU40PH	0,06	0,08	0,10	0,08	0,10	0,14	0,10	0,12	0,15	0,11	0,13	0,16	
		C	V36	WU40PH													
	I	P	V36	WU40PH	0,06	0,08	0,10	0,08	0,10	0,14	0,10	0,12	0,15	0,11	0,13	0,16	
		C	V36	WU40PH													

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

Indexable Drills



■ Top Cut 4 • Steel • 2 x D/3 x D • Speed Chart • Metric

Top Cut 4					Recommended Cutting Speed by Diameter (m/min)												
					Insert Size A			Insert Size B			Insert Size C			Insert Size D			
					TCF040203AC TCF040204AP 12,00–13,99mm			TCF060203BC TCF050204BP 14,00–18,99mm			TCF070304CC TCF070306CP 19,00–23,99mm			TCF090305DC TCF080308DP 24,00–29,99mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
P	1	S	P	V36	WU25CH	120	140	160	140	160	240	150	180	260	160	180	260
			C	V36	WU40PH												
		U	P	V36	WU40PH	110	120	140	130	150	220	130	170	250	140	170	250
			C	V36	WU40PH												
		I	P	V36	WU40PH	90	100	120	130	150	210	130	170	240	140	170	240
			C	V36	WU40PH												
	2	S	P	V34	WPK10CH	120	140	160	140	170	260	150	190	280	160	190	280
			C	V34	WU40PH												
		U	P	V34	WU25CH	110	120	140	130	170	240	140	180	260	150	180	260
			C	V34	WU40PH												
		I	P	V34	WU40PH	90	100	120	130	170	230	130	170	240	140	170	240
			C	V34	WU40PH												
	3	S	P	V34	WPK10CH	120	140	180	140	170	270	150	200	290	160	200	310
			C	V34	WU40PH												
		U	P	V34	WU25CH	110	120	160	130	160	260	140	200	280	150	200	280
			C	V34	WU40PH												
		I	P	V34	WU40PH	100	110	140	120	150	250	130	180	260	140	180	260
			C	V34	WU40PH												
	4	S	P	V34	WPK10CH	120	140	180	140	170	270	150	200	290	160	200	310
			C	V34	WU40PH												
		U	P	V34	WU25CH	110	120	160	130	160	260	140	200	280	150	200	280
			C	V34	WU40PH												
		I	P	V34	WU40PH	100	110	140	120	150	250	130	180	260	140	180	260
			C	V34	WU40PH												
5	S	P	V36	WU25CH	120	140	160	140	170	240	150	180	250	160	180	250	
		C	V36	WU40PH													
	U	P	V36	WU40PH	110	120	140	130	160	230	140	170	240	150	170	240	
		C	V36	WU40PH													
	I	P	V36	WU40PH	90	100	120	130	160	230	130	160	220	140	160	220	
		C	V36	WU40PH													
6	S	P	V36	WU25CH	120	140	160	140	170	200	140	170	210	150	170	210	
		C	V36	WU40PH													
	U	P	V36	WU40PH	110	120	140	120	150	190	130	160	200	140	160	200	
		C	V36	WU40PH													
	I	P	V36	WU40PH	90	100	120	110	130	180	120	140	190	120	140	190	
		C	V36	WU40PH													

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

■ Top Cut 4 • Steel • 2 x D/3 x D • Feed Chart • Metric

Top Cut 4					Recommended Feed Rate by Diameter (mm/r)												
					Insert Size E			Insert Size F			Insert Size G			Insert Size H			
					TCF120405EC TCF100408EP 30,00–36,99mm			TCF150406FC TCF120412FP 37,00–45,99mm			TCF180508GC TCF150512GP 46,00–56,99mm			TCF210608HC TCF180614HP 57,00–68,00mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
P	1	S	P	V36	WU25CH	0,13	0,14	0,18	0,15	0,17	0,20	0,16	0,23	0,27	0,17	0,24	0,29
			C	V36	WU40PH												
		U	P	V36	WU40PH	0,13	0,14	0,18	0,15	0,17	0,20	0,16	0,23	0,27	0,17	0,24	0,29
			C	V36	WU40PH												
		I	P	V36	WU40PH	0,13	0,14	0,18	0,15	0,17	0,20	0,16	0,23	0,27	0,17	0,24	0,29
			C	V36	WU40PH												
	2	S	P	V34	WPK10CH	0,13	0,15	0,20	0,15	0,18	0,21	0,16	0,24	0,28	0,17	0,25	0,30
			C	V34	WU40PH												
		U	P	V34	WU25CH	0,13	0,15	0,20	0,15	0,18	0,21	0,16	0,24	0,28	0,17	0,25	0,30
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,13	0,15	0,20	0,15	0,18	0,21	0,16	0,24	0,28	0,17	0,25	0,30
			C	V34	WU40PH												
	3	S	P	V34	WPK10CH	0,14	0,16	0,22	0,16	0,20	0,24	0,18	0,25	0,30	0,19	0,26	0,32
			C	V34	WU40PH												
		U	P	V34	WU25CH	0,14	0,16	0,20	0,16	0,20	0,23	0,18	0,25	0,28	0,19	0,26	0,30
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,14	0,16	0,20	0,16	0,20	0,22	0,18	0,25	0,28	0,19	0,26	0,30
			C	V34	WU40PH												
	4	S	P	V34	WPK10CH	0,14	0,16	0,22	0,16	0,20	0,24	0,18	0,25	0,30	0,19	0,26	0,32
			C	V34	WU40PH												
		U	P	V34	WU25CH	0,14	0,16	0,20	0,16	0,20	0,22	0,18	0,25	0,28	0,19	0,26	0,30
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,14	0,16	0,20	0,16	0,20	0,22	0,18	0,25	0,28	0,19	0,26	0,30
			C	V34	WU40PH												
5	S	P	V36	WU25CH	0,13	0,15	0,18	0,15	0,18	0,20	0,16	0,24	0,28	0,17	0,25	0,30	
		C	V36	WU40PH													
	U	P	V36	WU40PH	0,13	0,15	0,18	0,15	0,18	0,20	0,16	0,24	0,28	0,17	0,25	0,30	
		C	V36	WU40PH													
	I	P	V36	WU40PH	0,13	0,15	0,18	0,15	0,18	0,20	0,16	0,24	0,28	0,17	0,25	0,30	
		C	V36	WU40PH													
6	S	P	V36	WU25CH	0,13	0,15	0,18	0,15	0,17	0,20	0,16	0,23	0,28	0,17	0,24	0,29	
		C	V36	WU40PH													
	U	P	V36	WU40PH	0,13	0,15	0,18	0,15	0,17	0,20	0,16	0,23	0,28	0,17	0,24	0,29	
		C	V36	WU40PH													
	I	P	V36	WU40PH	0,13	0,15	0,18	0,15	0,17	0,20	0,16	0,23	0,28	0,17	0,24	0,29	
		C	V36	WU40PH													

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

Indexable Drills



■ Top Cut 4 • Steel • 2 x D/3 x D • Speed Chart • Metric

Top Cut 4					Recommended Cutting Speed by Diameter (m/min)													
					Insert Size E			Insert Size F			Insert Size G			Insert Size H				
					TCF120405EC TCF100408EP 30,00–36,99mm			TCF150406FC TCF120412FP 37,00–45,99mm			TCF180508GC TCF150512GP 46,00–56,99mm			TCF210608HC TCF180614HP 57,00–68,00mm				
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max		
P	1	S	P	V36	WU25CH	160	180	260	160	180	260	160	180	260	160	180	260	
			C	V36	WU40PH													
		U	P	V36	WU40PH	140	170	250	140	170	250	140	170	250	140	170	250	
			C	V36	WU40PH													
		I	P	V36	WU40PH	140	170	240	140	170	240	140	170	240	140	170	240	
			C	V36	WU40PH													
	2	S	P	V34	WPK10CH	160	190	280	160	190	280	160	190	280	160	190	280	
			C	V34	WU40PH													
		U	P	V34	WU25CH	150	180	260	150	180	260	150	180	260	150	180	260	
			C	V34	WU40PH													
		I	P	V34	WU40PH	140	170	240	140	170	240	140	170	240	140	170	240	
			C	V34	WU40PH													
	3	S	P	V34	WPK10CH	160	200	310	160	200	310	160	200	310	160	200	310	
			C	V34	WU40PH													
		U	P	V34	WU25CH	150	200	280	150	200	280	150	200	280	150	200	280	
			C	V34	WU40PH													
		I	P	V34	WU40PH	140	180	260	140	180	260	140	180	260	140	180	260	
			C	V34	WU40PH													
	4	S	P	V34	WPK10CH	160	200	310	160	200	310	160	200	310	160	200	310	
			C	V34	WU40PH													
		U	P	V34	WU25CH	150	200	280	150	200	280	150	200	280	150	200	280	
			C	V34	WU40PH													
		I	P	V34	WU40PH	140	180	260	140	180	260	140	180	260	140	180	260	
			C	V34	WU40PH													
5	S	P	V36	WU25CH	160	180	250	160	180	250	160	180	250	160	180	250		
		C	V36	WU40PH														
	U	P	V36	WU40PH	150	170	240	150	170	240	150	170	240	150	170	240		
		C	V36	WU40PH														
	I	P	V36	WU40PH	140	160	220	140	160	220	140	160	220	140	160	220		
		C	V36	WU40PH														
6	S	P	V36	WU25CH	150	170	210	150	170	210	150	170	210	150	170	210		
		C	V36	WU40PH														
	U	P	V36	WU40PH	140	160	200	140	160	200	140	160	200	140	160	200		
		C	V36	WU40PH														
	I	P	V36	WU40PH	120	140	190	120	140	190	120	140	190	120	140	190		
		C	V36	WU40PH														

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

■ **Top Cut 4 • Stainless Steel • 2 x D/3 x D • Feed Chart • Metric**

Top Cut 4					Recommended Feed Rate by Diameter (mm/r)												
					Insert Size A			Insert Size B			Insert Size C			Insert Size D			
					TCF040203AC TCF040204AP 12,00–13,99mm			TCF060203BC TCF050204BP 14,00–18,99mm			TCF070304CC TCF070306CP 19,00–23,99mm			TCF090305DC TCF080308DP 24,00–29,99mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
M	1	S	P	V36	WU40PH	0,06	0,08	0,12	0,07	0,10	0,13	0,08	0,10	0,15	0,10	0,12	0,16
			C	V36	WU40PH												
		U	P	V36	WU40PH	0,06	0,08	0,12	0,07	0,10	0,12	0,08	0,10	0,14	0,10	0,12	0,15
			C	V36	WU40PH												
		I	P	V36	WU40PH	0,06	0,08	0,11	0,07	0,10	0,11	0,08	0,10	0,14	0,10	0,12	0,15
			C	V36	WU40PH												
	2	S	P	V36	WU40PH	0,06	0,08	0,12	0,07	0,10	0,13	0,08	0,10	0,15	0,10	0,12	0,16
			C	V36	WU40PH												
		U	P	V36	WU40PH	0,06	0,08	0,12	0,07	0,10	0,12	0,08	0,10	0,14	0,10	0,12	0,15
			C	V36	WU40PH												
		I	P	V36	WU40PH	0,06	0,08	0,11	0,07	0,10	0,11	0,08	0,10	0,14	0,10	0,12	0,15
			C	V36	WU40PH												
3	S	P	V36	WU40PH	0,06	0,08	0,12	0,07	0,10	0,13	0,08	0,10	0,15	0,10	0,12	0,16	
		C	V36	WU40PH													
	U	P	V36	WU40PH	0,06	0,08	0,12	0,07	0,10	0,12	0,08	0,10	0,14	0,10	0,12	0,15	
		C	V36	WU40PH													
	I	P	V36	WU40PH	0,06	0,08	0,11	0,07	0,10	0,11	0,08	0,10	0,14	0,10	0,12	0,15	
		C	V36	WU40PH													

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

■ Top Cut 4 • Stainless Steel • 2 x D/3 x D • Speed Chart • Metric

Top Cut 4					Recommended Cutting Speed by Diameter (m/min)												
					Insert Size A			Insert Size B			Insert Size C			Insert Size D			
					TCF040203AC TCF040204AP 12,00–13,99mm			TCF060203BC TCF050204BP 14,00–18,99mm			TCF070304CC TCF070306CP 19,00–23,99mm			TCF090305DC TCF080308DP 24,00–29,99mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
M	1	S	P	V36	WU40PH	120	140	160	140	160	230	150	170	240	150	170	240
			C	V36	WU40PH												
		U	P	V36	WU40PH	110	120	140	130	150	210	130	160	210	130	160	210
			C	V36	WU40PH												
		I	P	V36	WU40PH	90	100	120	130	150	200	130	160	200	130	160	200
			C	V36	WU40PH												
	2	S	P	V36	WU40PH	120	140	160	140	160	200	150	170	210	150	170	210
			C	V36	WU40PH												
		U	P	V36	WU40PH	110	120	140	130	150	180	130	160	200	130	160	200
			C	V36	WU40PH												
		I	P	V36	WU40PH	90	100	120	120	140	170	130	150	180	130	150	180
			C	V36	WU40PH												
	3	S	P	V36	WU40PH	110	120	140	130	150	180	140	160	200	140	160	200
			C	V36	WU40PH												
		U	P	V36	WU40PH	90	110	120	120	130	160	130	140	180	130	140	180
			C	V36	WU40PH												
		I	P	V36	WU40PH	80	100	110	100	120	150	110	130	160	110	130	160
			C	V36	WU40PH												

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

■ **Top Cut 4 • Stainless Steel • 2 x D/3 x D • Feed Chart • Metric**

Top Cut 4					Recommended Feed Rate by Diameter (mm/r)												
					Insert Size E			Insert Size F			Insert Size G			Insert Size H			
					TCF120405EC TCF100408EP 30,00–36,99mm			TCF150406FC TCF120412FP 37,00–45,99mm			TCF180508GC TCF150512GP 46,00–56,99mm			TCF210608HC TCF180614HP 57,00–68,00mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
M	1	S	P	V36	WU40PH	0,12	0,14	0,20	0,14	0,16	0,25	0,16	0,18	0,28	0,16	0,20	0,30
			C	V36	WU40PH												
		U	P	V36	WU40PH	0,11	0,13	0,18	0,12	0,14	0,22	0,14	0,16	0,25	0,14	0,18	0,26
			C	V36	WU40PH												
		I	P	V36	WU40PH	0,11	0,13	0,18	0,12	0,14	0,22	0,14	0,16	0,25	0,14	0,18	0,26
			C	V36	WU40PH												
	2	S	P	V36	WU40PH	0,12	0,14	0,20	0,14	0,16	0,25	0,16	0,18	0,28	0,16	0,20	0,30
			C	V36	WU40PH												
		U	P	V36	WU40PH	0,11	0,13	0,18	0,12	0,14	0,22	0,14	0,16	0,25	0,14	0,18	0,26
			C	V36	WU40PH												
		I	P	V36	WU40PH	0,11	0,13	0,18	0,12	0,14	0,22	0,14	0,16	0,25	0,14	0,18	0,26
			C	V36	WU40PH												
3	S	P	V36	WU40PH	0,12	0,14	0,20	0,14	0,16	0,25	0,16	0,18	0,28	0,16	0,20	0,30	
		C	V36	WU40PH													
	U	P	V36	WU40PH	0,11	0,13	0,18	0,12	0,14	0,22	0,14	0,16	0,25	0,14	0,18	0,26	
		C	V36	WU40PH													
	I	P	V36	WU40PH	0,11	0,13	0,18	0,12	0,14	0,22	0,14	0,16	0,25	0,14	0,18	0,26	
		C	V36	WU40PH													

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

■ Top Cut 4 • Stainless Steel • 2 x D/3 x D • Speed Chart • Metric

Top Cut 4					Recommended Cutting Speed by Diameter (m/min)												
					Insert Size E			Insert Size F			Insert Size G			Insert Size H			
					TCF120405EC TCF100408EP 30,00–36,99mm			TCF150406FC TCF120412FP 37,00–45,99mm			TCF180508GC TCF150512GP 46,00–56,99mm			TCF210608HC TCF180614HP 57,00–68,00mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
M	1	S	P	V36	WU40PH	150	170	240	150	170	240	150	170	240	150	170	240
			C	V36	WU40PH												
		U	P	V36	WU40PH	130	160	210	130	160	210	130	160	210	130	160	210
			C	V36	WU40PH												
		I	P	V36	WU40PH	130	160	200	130	160	200	130	160	200	130	160	200
			C	V36	WU40PH												
	2	S	P	V36	WU40PH	150	170	210	150	170	210	150	170	210	150	170	210
			C	V36	WU40PH												
		U	P	V36	WU40PH	130	160	200	130	160	200	130	160	200	130	160	200
			C	V36	WU40PH												
		I	P	V36	WU40PH	130	150	180	130	150	180	130	150	180	130	150	180
			C	V36	WU40PH												
	3	S	P	V36	WU40PH	140	160	200	140	160	200	140	160	200	140	160	200
			C	V36	WU40PH												
		U	P	V36	WU40PH	130	140	180	130	140	180	130	140	180	130	140	180
			C	V36	WU40PH												
		I	P	V36	WU40PH	110	130	160	110	130	160	110	130	160	110	130	160
			C	V36	WU40PH												

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

■ Top Cut 4 • Cast Iron • 2 x D/3 x D • Feed Chart • Metric

Top Cut 4					Recommended Feed Rate by Diameter (mm/r)												
					Insert Size A			Insert Size B			Insert Size C			Insert Size D			
					TCF040203AC TCF040204AP 12,00–13,99mm			TCF060203BC TCF050204BP 14,00–18,99mm			TCF070304CC TCF070306CP 19,00–23,99mm			TCF090305DC TCF080308DP 24,00–29,99mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
K	1	S	P	V34	WPK10CH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24
			C	V34	WU25CH												
		U	P	V34	WU25CH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24
			C	V34	WU40PH												
	2	S	P	V34	WPK10CH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24
			C	V34	WU25CH												
		U	P	V34	WU25CH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24
			C	V34	WU40PH												
3	S	P	V34	WPK10CH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24	
		C	V34	WU25CH													
	U	P	V34	WU25CH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24	
		C	V34	WU40PH													
	I	P	V34	WU40PH	0,08	0,10	0,14	0,08	0,10	0,16	0,10	0,13	0,18	0,12	0,16	0,24	
		C	V34	WU40PH													

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

■ Top Cut 4 • Cast Iron • 2 x D/3 x D • Speed Chart • Metric

Top Cut 4					Recommended Cutting Speed by Diameter (m/min)												
					Insert Size A			Insert Size B			Insert Size C			Insert Size D			
					TCF040203AC TCF040204AP 12,00–13,99mm			TCF060203BC TCF050204BP 14,00–18,99mm			TCF070304CC TCF070306CP 19,00–23,99mm			TCF090305DC TCF080308DP 24,00–29,99mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
K	1	S	P	V34	WPK10CH	120	140	180	140	170	250	150	180	260	160	200	280
			C	V34	WU25CH												
		U	P	V34	WU25CH	110	120	160	130	160	240	140	170	250	150	180	260
			C	V34	WU40PH												
		I	P	V34	WU40PH	100	110	140	120	150	230	130	160	240	140	170	260
			C	V34	WU40PH												
	2	S	P	V34	WPK10CH	120	140	180	130	160	240	140	180	250	150	180	260
			C	V34	WU25CH												
		U	P	V34	WU25CH	110	120	160	120	150	230	130	160	240	140	160	250
			C	V34	WU40PH												
		I	P	V34	WU40PH	100	110	140	120	150	220	130	160	240	140	160	250
			C	V34	WU40PH												
3	S	P	V34	WPK10CH	120	140	160	130	160	240	140	170	240	150	170	250	
		C	V34	WU25CH													
	U	P	V34	WU25CH	110	120	140	120	150	230	130	160	230	140	160	240	
		C	V34	WU40PH													
	I	P	V34	WU40PH	90	100	120	120	150	230	130	160	230	140	160	220	
		C	V34	WU40PH													

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

■ Top Cut 4 • Cast Iron • 2 x D/3 x D • Feed Chart • Metric

Top Cut 4					Recommended Feed Rate by Diameter (mm/r)												
					Insert Size E			Insert Size F			Insert Size G			Insert Size H			
					TCF120405EC TCF100408EP 30,00–36,99mm			TCF150406FC TCF120412FP 37,00–45,99mm			TCF180508GC TCF150512GP 46,00–56,99mm			TCF210608HC TCF180614HP 57,00–68,00mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
K	1	S	P	V34	WPK10CH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU25CH												
		U	P	V34	WU25CH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU40PH												
	2	S	P	V34	WPK10CH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU25CH												
		U	P	V34	WU25CH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU40PH												
	3	S	P	V34	WPK10CH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU25CH												
		U	P	V34	WU25CH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU40PH												
		I	P	V34	WU40PH	0,14	0,16	0,26	0,16	0,20	0,3	0,18	0,22	0,32	0,20	0,24	0,36
			C	V34	WU40PH												

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert



■ Top Cut 4 • Cast Iron • 2 x D/3 x D • Speed Chart • Metric

Top Cut 4					Recommended Cutting Speed by Diameter (m/min)												
					Insert Size E			Insert Size F			Insert Size G			Insert Size H			
					TCF120405EC TCF100408EP 30,00–36,99mm			TCF150406FC TCF120412FP 37,00–45,99mm			TCF180508GC TCF150512GP 46,00–56,99mm			TCF210608HC TCF180614HP 57,00–68,00mm			
Material Group	Condition	Pocket Seat	Geometry	Grade	min	Start	max	min	Start	max	min	Start	max	min	Start	max	
K	1	S	P	V34	WPK10CH	160	200	280	160	200	280	160	200	280	160	200	280
			C	V34	WU25CH												
		U	P	V34	WU25CH	150	180	260	150	180	260	150	180	260	150	180	260
			C	V34	WU40PH												
		I	P	V34	WU40PH	140	170	260	140	170	260	140	170	260	140	170	260
			C	V34	WU40PH												
	2	S	P	V34	WPK10CH	150	180	260	150	180	260	150	180	260	150	180	260
			C	V34	WU25CH												
		U	P	V34	WU25CH	140	160	250	140	160	250	140	160	250	140	160	250
			C	V34	WU40PH												
		I	P	V34	WU40PH	140	160	250	140	160	250	140	160	250	140	160	250
			C	V34	WU40PH												
	3	S	P	V34	WPK10CH	150	170	250	150	170	250	150	170	250	150	170	250
			C	V34	WU25CH												
		U	P	V34	WU25CH	140	160	240	140	160	240	140	160	240	140	160	240
C			V34	WU40PH													
I		P	V34	WU40PH	140	160	220	140	160	220	140	160	220	140	160	220	
		C	V34	WU40PH													

NOTE: For 4 x D, it is highly recommended to start with feed and speed values reduced by 10% less than above recommendations.
 For 5 x D, diameter range 12–23,99mm (insert sizes A to C), it is highly recommended to start with feed and speed values reduced by 20% less than above recommendations.
 For 5 x D, diameter range 24–68mm (insert sizes D to H), it is highly recommended to start with feed and speed values reduced by 15% less than above recommendations.
 For 4 x D and 5 x D, it is recommended to reduce the feed rate during entry and exit by 30–50%.

Condition: S = stable conditions,
 U = unstable cutting conditions,
 I = interrupted cutting conditions
 Pocket Seat: P = periphery insert,
 C = centre insert

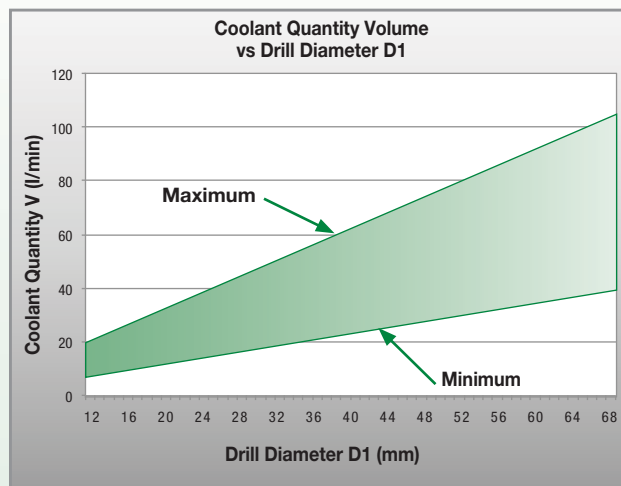
■ **Top Cut 4 • Drill Depth • 2 x D/3 x D • Hole Tolerance Table**

Insert size	Diameter Range (mm)	Hole Tolerance (mm)
A	12,00–13,99	+/- 0,20
B	14,00–18,99	+/- 0,20
C	19,00–23,99	+/- 0,20
D	24,00–29,99	+/- 0,20
E	30,00–36,99	+/- 0,20
F	37,00–45,99	+/- 0,25
G	46,00–56,99	+/- 0,25
H	57,00–68,00	+/- 0,28

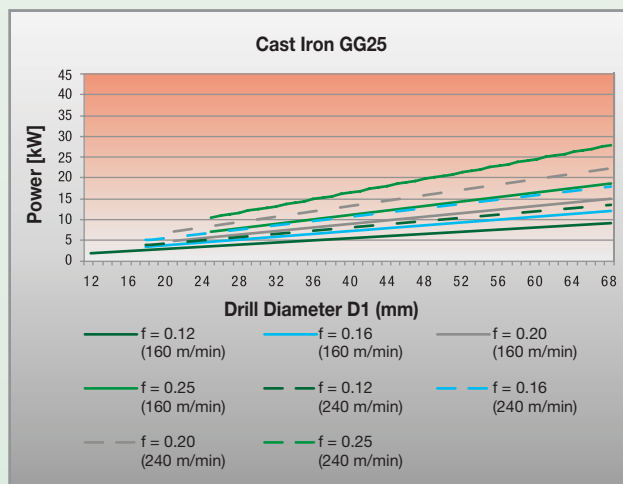
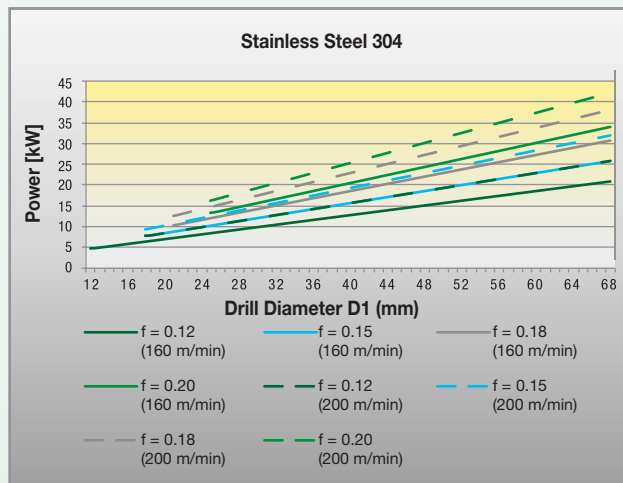
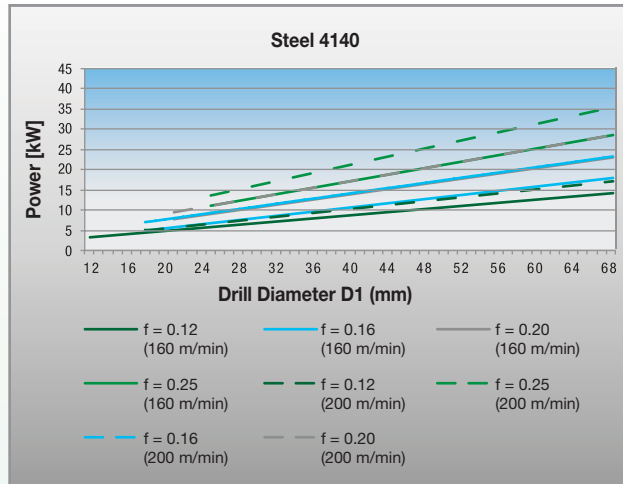
■ **Top Cut 4 • Drill Depth • 4 x D/5 x D • Hole Tolerance Table**

Insert size	Diameter Range (mm)	Hole Tolerance (mm)
A	12,00–13,99	+/- 0,35
B	14,00–18,99	+/- 0,35
C	19,00–23,99	+/- 0,35
D	24,00–29,99	+/- 0,35
E	30,00–36,99	+/- 0,35
F	37,00–45,99	+/- 0,38
G	46,00–56,99	+/- 0,38
H	57,00–68,00	+/- 0,42

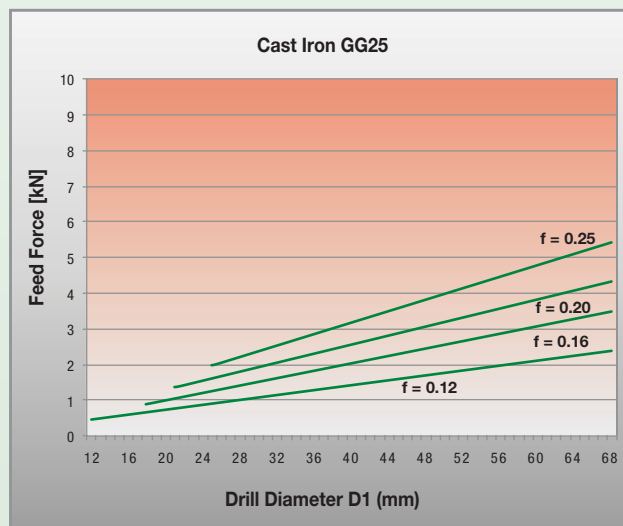
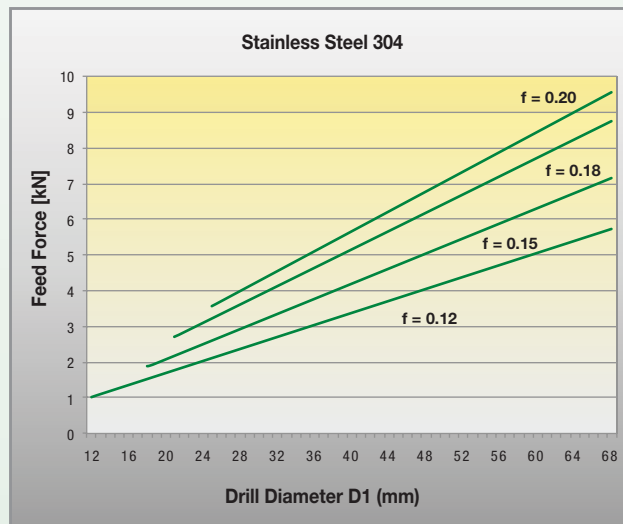
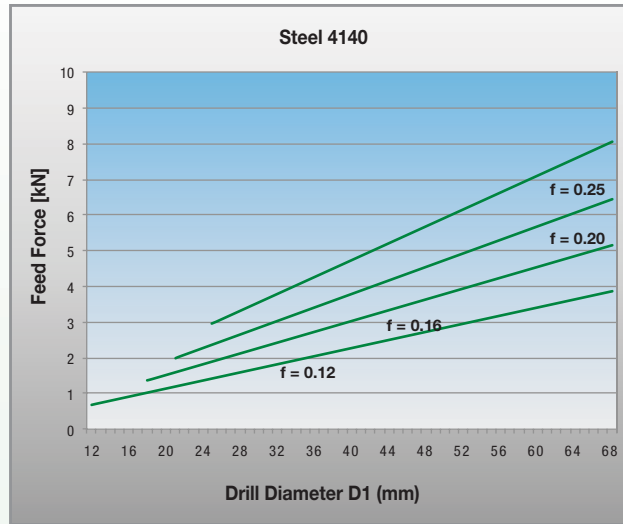
■ **Coolant Requirement/Recommendation**



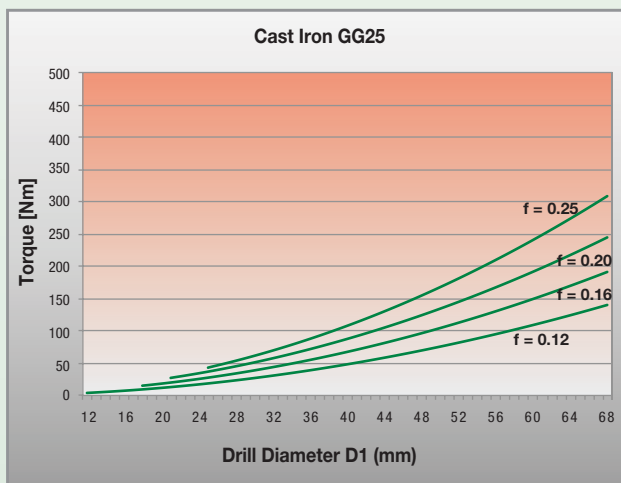
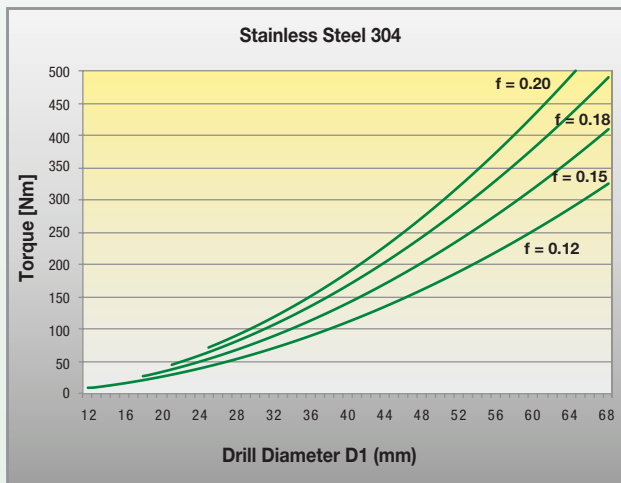
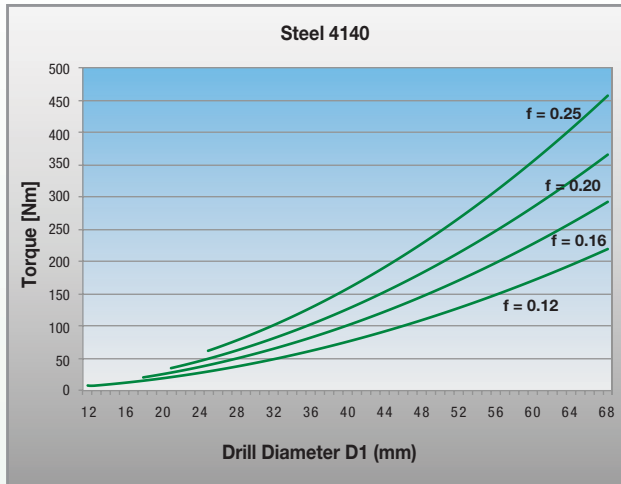
■ Power Requirement



■ Feed Force Requirement



■ Torque Requirement



■ X-Offset Capabilities • Metric

Insert size	Diameter Range (mm)	2 x D and 3 x D		4 x D		5 x D	
		X-offset value max. in mm	D1 max value	X-offset value max. in mm	D1 max value	X-offset value max.	D1 max value
A	12,00–13,99	0,5	D1 + 1mm	0,5	D1 + 1mm	–	–
B	14,00–18,99	0,5	D1 + 1mm	0,5	D1 + 1mm	–	–
C	19,00–23,99	0,5	D1 + 1mm	0,5	D1 + 1mm	–	–
D	24,00–29,99	0,8	D1 + 1,6mm	0,8	D1 + 1mm	–	–
E	30,00–36,99	0,8	D1 + 1,6mm	0,8	D1 + 1mm	–	–
F	37,00–45,99	0,8	D1 + 1,6mm	0,8	D1 + 1mm	–	–
G	46,00–56,99	1	D1 + 2mm	0,8	D1 + 1mm	–	–
H	57,00–68,00	1	D1 + 2mm	0,8	D1 + 1mm	–	–

Unmatched Versatility Meets Powerful Performance



EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

Top Cut 4™

Specifically designed for versatility — Top Cut 4 offers outstanding flexibility, increased productivity, and is the one tool to apply to a variety of drilling applications and different workpiece materials.

- High tool life at accelerated speeds.
- Efficient chip evacuation.
- Increased coolant supply.
- Up to 5 x D.

To learn more about the benefits of **WIDIA™ Top Cut 4**, contact your local distributor.

WIDIA 



Reconditioning Services

WIDIA™ Reconditioning Services Optimise the Total Value of Metalcutting Tools Throughout Their Entire Life

WIDIA Reconditioning Services optimise the value of metalcutting tools throughout their entire lifecycle by giving like-new performance — with rapid turnaround time — so tools are always on hand and perform just like new.

- Local support you can trust.
- Rapid turnaround to minimise inventory.
- Like-new performance continues delivering productivity.
- Application support throughout the tool lifecycle.
- WIDIA proprietary geometry specifications after each regrind.
- WIDIA certified coatings.
- Easy logistics through the reconditioning process.

Simple Logistics

Our unique reconditioning program simplifies sending and receiving reconditioned tools to reduce shipping time and increase on-hand inventory.

To use WIDIA tool reconditioning services, contact your authorised WIDIA distributor to get started.





Global Reconditioning Network



To locate a Reconditioning Center near you, visit widia.com/services.





Holemaking • Hole Finishing

Introduction.....	W2–W5
HSR Reaming Tools	W6–W29
WIDIA TRM.....	W30–W33
ROTAFLEX	W34–W71
Custom Solutions.....	W72–W81



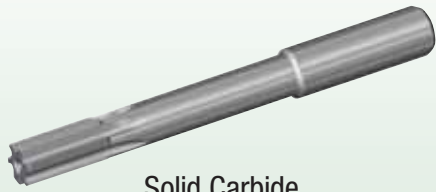
Hole Finishing with WIDIA™



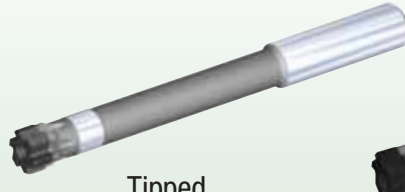
Hole Finishing with WIDIA

WIDIA is one of the only sources in the metalworking industry that offers all types of hole finishing tooling — from reaming and fine boring to motion tooling. By owning the entire process chain — from raw materials to reconditioning — WIDIA offers customised solutions to meet any imaging challenge, regardless of portfolio or capacity.

REAMING



Solid Carbide

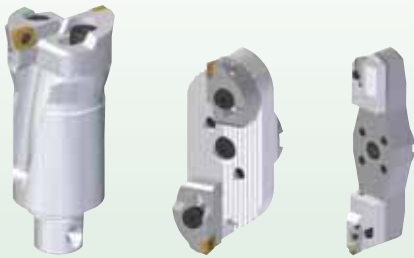


Tipped



Modular

BORING



Roughing



Finishing

COUNTERSINKING



Countersinkers



Porting
Fluid Power

PCD ROUND TOOLS



Steel-based



Carbide-based

● first choice
○ alternate choice

			P	M	K	N	S	H	standard diameter		engineered solution diameter			
									range	accuracy	range	accuracy		
reaming tools		HSR™ – Solid Carbide High-Speed Reamer Carbide	●	●	●	●	○		.196–.551" 5–14mm	IT7	.056–1.00" 1,4–25,4mm	IT6 >.39" >10mm	.0004" 10 μm	.0003" 7 μm
		HSR – Carbide Tipped High-Speed Reamer Carbide/Cermet	●	●	●	●	○		.551–1.26" 14–32mm	IT7	.551–2.55" 14–65mm	IT6	.0004" 10 μm	.0003" 7 μm
boring/fine-boring tools		ROTAFLEX™ FBHBB Fine-Boring Carbide/Cermet/PCD/CBN	●	●	●	●	●	○	.236–.866" 6–22mm	IT7	–	–	.0002" 5 μm	.0002– .0004" 5–10 μm
		ROTAFLEX FBH Fine-Boring Carbide/Cermet/PCD/CBN	●	●	●	●	●	○	.866–4.25" 22–115mm	IT7	–	–	.0002" 5 μm	.0002– .0004" 5–10 μm
		ROTAFLEX TCHS Roughing Carbide/Cermet/PCD/CBN	●	●	●	●	●		.886–4.52" 22,5–115mm	IT7	–	–	.0004" 10 μm	>.0008" >20 μm
		ROTAFLEX Small Bridge Tools Roughing Carbide/Cermet/PCD/CBN	●	●	●	●	●		3.425–7.87" 87–200mm	IT7	–	–	.0004" 10 μm	>.0008" >20 μm
		ROTAFLEX Large Bridge Tools Roughing Carbide/Cermet/PCD/CBN	●	●	●	●	●		7.87–20.47" 200–520mm	IT7	–	–	.0004" 10 μm	>.0008" >20 μm
		Fine-Boring Cartridges Fine-Boring Carbide/Cermet/PCD/CBN	●	○	●	●	○		3.425–20.47" 87–520mm	IT7	–	–	.0002" 5 μm	.0002– .0004" 5–10 μm
countersinking		Countersinking Round Tools Steel Base				●			–	–	–	IT7	.0004" 10 μm	.0004" 10 μm
		Port Cutters Carbide/Cermet Steel Base				●			for standard ports SAE, BSPP, ISO	–	–	IT7	.0004" 10 μm	.0004" 10 μm
PCD		PCD Round Tools Steel Base CBN				●			–	–	.394–4.00" 10–100mm	IT6	.0004" 10 μm	.0004" 10 μm
		PCD Round Tools Carbide Base				●			–	–	.197–1.00" 5–25mm	IT6	.0002" 5 μm	.0003" 7 μm



Cylindricity
NOTE: Process- and application-dependent.
Highly dependent on the pre-machine hole accuracy.
Use of high-performance drilling/pre-machining tools
mandatory to reach values.



Position
NOTE: Process- and application-dependent.
Highly dependent on the pre-machine hole accuracy.
Use of high-performance drilling/pre-machining tools
mandatory to reach values.

achievable surface quality Ra						capability				cost/part	cycle time	required operator experience	page(s)
P	M	K	N	S	H								
20-40 μ-in 0,5-1,0 μm	20-40 μ-in 0,5-1,0 μm	20-60 μ-in 0,5-1,5 μm	-	20-40 μ-in 0,5-1,0 μm	-	●	●	●	●	moderate	low	low	W8-W10, W13-W14
20-40 μ-in 0,5-1,0 μm	20-40 μ-in 0,5-1,0 μm	20-60 μ-in 0,5-1,5 μm	-	20-40 μ-in 0,5-1,0 μm	-	●	●	● carbide only	● carbide only	moderate	low	low	W11-W12, W15-W16
32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	<48 μ-in <1,2 μm	●	●	●	●	low	moderate	low- moderate	W49-W51
32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	<48 μ-in <1,2 μm	●	●	●	●	low	moderate	low- moderate	W52-W53
40-200 μ-in 1,0-5,0 μm	40-200 μ-in 1,0-5,0 μm	40-200 μ-in 1,0-5,0 μm	40-80 μ-in 1,0-2,0 μm	40-200 μ-in 1,0-5,0 μm	-	●	●	●	●	low	moderate	low- moderate	W36-W37
40-200 μ-in 1,0-5,0 μm	40-200 μ-in 1,0-5,0 μm	40-200 μ-in 1,0-5,0 μm	40-80 μ-in 1,0-2,0 μm	40-200 μ-in 1,0-5,0 μm	-	●	●	●	●	low	low	low- moderate	W38-W39
40-200 μ-in 1,0-5,0 μm	40-200 μ-in 1,0-5,0 μm	40-200 μ-in 1,0-5,0 μm	40-80 μ-in 1,0-2,0 μm	40-200 μ-in 1,0-5,0 μm	-	●	●	●	●	low	moderate	low- moderate	W40-W45
32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	32-80 μ-in 0,8-2,0 μm	-	●	●	○	○	low	moderate	low- moderate	W46-W48
32-80 μ-in -2,0 μm	32-80 μ-in -2,0 μm	32-80 μ-in -2,0 μm	32-80 μ-in 0,8-2,0 μm	-	-	●	●	●	●	very low	very low	moderate	W76-W77
32-80 μ-in -2,0 μm	32-80 μ-in -2,0 μm	32-80 μ-in -2,0 μm	32-80 μ-in 0,8-2,0 μm	-	-	●	●	●	●	very low	very low	moderate	W74-W75
-	-	-	4-32 μ-in 0,1-0,8 μm	-	-	●	●	●	●	low	very low	moderate	W80-W81
-	-	-	4-32 μ-in 0,1-0,8 μm	-	-	●	●	●	●	low	very low	moderate	W80-W81

Ra Surface roughness

NOTE: Surface roughness values are guidelines and depend on the application, coolant situation, machine, and cutting data applied.

HSR™ Reaming Tools combine high-performance micrograin substrates, specific coatings, and extremely unequal flutes for outstanding machining results. Increase your productivity with the HSR leads and lapped grinding surface of rake, clearance, and relief angle.



HSR Reaming Tools

HSR Solid Carbide Reaming Tools

- Diameters starting at 1,40mm (.055") with internal coolant supply available as standard.
- Ground to H7 tolerance class for use in most applications.
- Specific coatings and lead configurations available for high-speed machining of steel, stainless steel, and cast iron.
- Uncoated micrograin substrates for machining stainless steel and non-ferrous materials at accelerated speeds.

Features and Benefits

- Lapped ground leads for high-speed cutting.
- Long tool life with increased hole and surface quality.
- High Metal Removal Rates (MRR) at increased speeds and feeds.
- Radial coolant supply for through hole applications and axial coolant supply for blind holes to achieve higher feed rates.
- Decreased runout and improved straightness due to unequal flutes.

Customisation

- Diameters starting at 1,40mm (.055") up to 14,15mm (.557") available with and without internal coolant in 0,001mm steps.
- Solid cermet reaming tools and tooling for heat-resistant materials are available on request.

HSR™ Carbide- and Cermet-Tipped Reaming Tools

- Achieve solid carbide and solid cermet metal removal rates from 14–32mm (.551–1.26") with no customisation required.
- Ground to H7 tolerance class to accommodate most applications.
- Specific coatings and lead configuration for high-speed machining of steel, stainless steel, cast iron, and non-ferrous materials at accelerated speeds.
- Coated and uncoated micrograin substrate carbide and coated cermet specifically engineered for reaming.

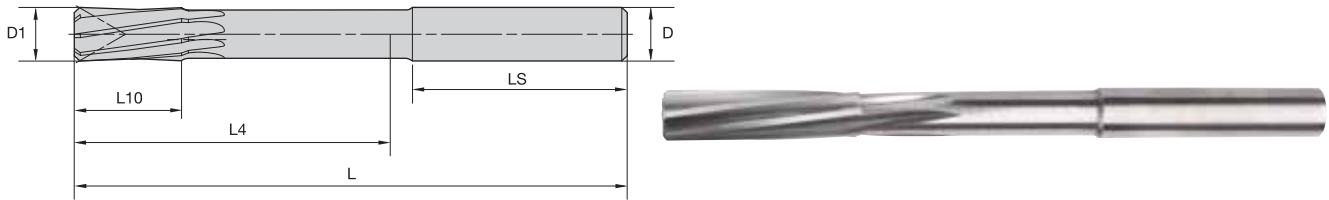
Features and Benefits

- Lapped ground leads for high-speed cutting.
- Long tool life with increased hole and surface quality.
- High metal removal rates at higher speeds and feeds.
- Decreased runout and improved straightness due to unequal flutes.
- Adjustment screw at straight-fluted HSR reamers to change internal coolant supply from axial to radial.
- Optimised coolant options for blind holes and blind hole applications with interrupted cut.

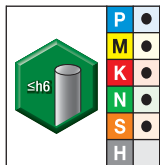
Customisation

- Diameters up to 50mm (1.968") available with and without internal coolant in 0,001mm steps.
- HSR tooling for machining heat-resistant materials is available on request.





■ HSR Reamers with Helical Flutes for Through Holes • K10™ • 1,4–10mm



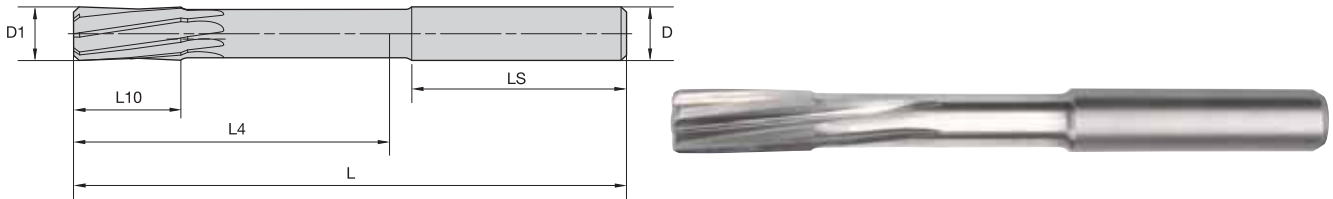
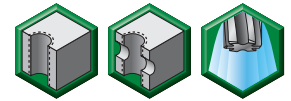
● first choice
○ alternate choice

grade K10
uncoated

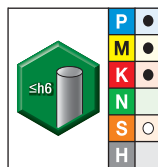
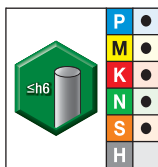
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2293638	050221-000016	1,60	1,60	43	20	9	23	3
2283423	050221-000020	2,00	2,00	49	24	11	25	4
2283424	050221-000022	2,20	2,20	53	26	12	27	4
2283426	050221-000025	2,50	2,50	57	28	14	29	4
2283427	050221-000028	2,80	2,80	61	32	15	29	4
2283428	050221-000030	3,00	3,00	61	32	15	29	6
2283429	050221-000032	3,20	3,20	65	35	16	30	6
2283430	050221-000035	3,50	3,50	70	40	18	30	6
2283431	050221-000040	4,00	4,00	75	41	19	32	6
2293640	050221-000045	4,50	4,50	80	44	21	33	6
2283445	050221-000050	5,00	5,00	86	51	23	34	6
2293641	050221-000055	5,50	5,60	93	57	26	36	6
2293642	050221-000060	6,00	5,60	93	53	26	36	6
2293643	050221-000065	6,50	6,30	101	63	28	38	6
2293644	050221-000070	7,00	7,10	109	69	31	40	6
2283450	050221-000075	7,50	7,10	109	69	31	40	6
2283451	050221-000080	8,00	8,00	117	75	33	42	6
2283463	050221-000085	8,50	8,00	117	75	33	42	6
2283464	050221-000090	9,00	9,00	125	81	36	44	6
2283465	050221-000095	9,50	9,00	125	81	36	44	6
2283466	050221-000100	10,00	10,00	133	87	38	46	6

Hole Finishing

- Standard reamers listed are ground to achieve an H7 tolerance hole. IT6 hole tolerance capability starting at diameter 10mm is available as a Custom Solution. Additional diameters and lengths made to order.



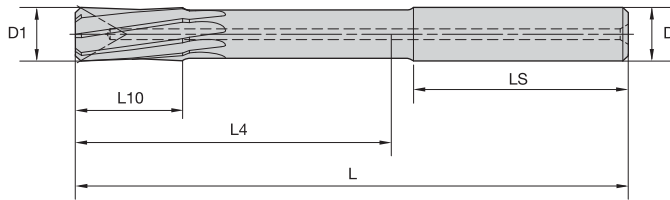
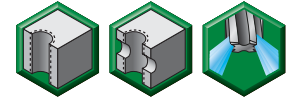
■ HSR Reamers with Helical Flutes for Through Holes • K10F™/K10F-DCFD™ • 2–144mm



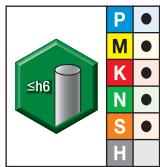
- first choice
- alternate choice

grade K10F uncoated		grade K10F-DCFD TiAlN		D1	D	L	L4	L10	LS	Z
order #	catalogue #	order #	catalogue #							
2436494	050227-000200	2441162	450227-000200	2,00	3,00	48	15	6	28	4
2436871	050227-000300	2441253	450227-000300	3,00	3,00	48	15	6	28	4
2436872	050227-000400	2441254	450227-000400	4,00	4,00	54	21	8	28	4
2436913	050227-000500	2441256	450227-000500	5,00	6,00	74	32	12	36	4
2436914	050227-000600	2441257	450227-000600	6,00	6,00	74	33	12	36	4
2436916	050227-000800	2441260	450227-000800	8,00	8,00	91	50	16	36	6
2436919	050227-001000	2441261	450227-001000	10,00	10,00	103	58	20	40	6
2436922	050227-001200	2441284	450227-001200	12,00	12,00	118	68	24	45	6
2436946	050227-001400	2441285	450227-001400	14,00	14,00	132	81	28	45	6

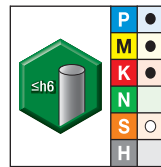
- Standard reamers listed are ground to achieve an H7 tolerance hole. IT6 capability is available. Additional diameters and lengths made to order.



■ HSR Reamers with Helical Flutes for Through Holes • K10F™/K10F-DCFD™ • 5–14mm



grade K10F
uncoated



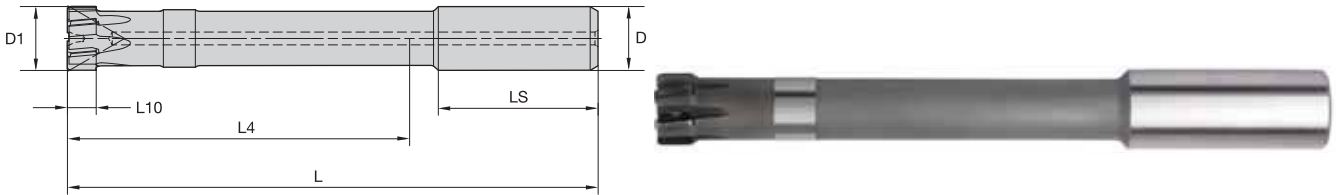
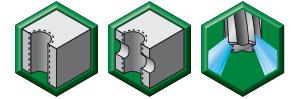
grade K10F-DCFD
TiAlN

- first choice
- alternate choice

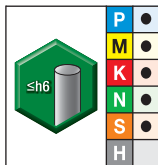
grade K10F uncoated		grade K10F-DCFD TiAlN		D1	D	L	L4	L10	LS	Z
order #	catalogue #	order #	catalogue #							
2437425	050271-000500	2441380	450271-000500	5,00	6,00	74	32	12	36	4
2437426	050271-000600	2441381	450271-000600	6,00	6,00	74	33	12	36	4
2437428	050271-000800	2441453	450271-000800	8,00	8,00	91	50	16	36	6
2437430	050271-001000	2441455	450271-001000	10,00	10,00	103	58	20	40	6
2437432	050271-001200	2441457	450271-001200	12,00	12,00	118	68	24	45	6
2437468	050271-001400	2441494	450271-001400	14,00	14,00	132	81	28	45	6



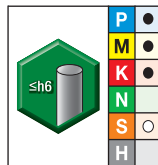
- Standard reamers listed are ground to achieve an H7 tolerance hole. IT6 capability is available. Additional diameters and lengths made to order.



■ HSR Reamers with Helical Flutes for Through Holes • K10F™/K10F-DCFD™ • 14–32mm



grade K10F
uncoated

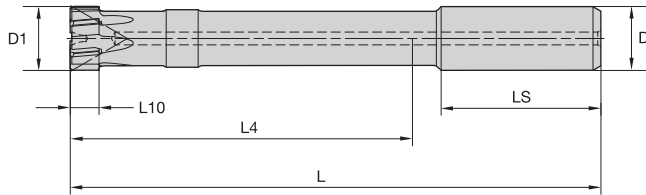
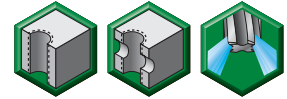


grade K10F-DCFD
TiAlN

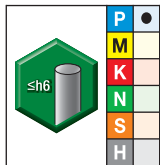
- first choice
- alternate choice

grade K10F uncoated		grade K10F-DCFD TiAlN		D1	D	L	L4	L10	LS	Z
order #	catalogue #	order #	catalogue #							
3084978	050281-001400	3084312	450281-001400	14,00	16,00	145	90	9	48	6
3084983	050281-001600	3084317	450281-001600	16,00	20,00	157	100	9	50	6
3084992	050281-001800	3084321	450281-001800	18,00	20,00	171	114	9	50	6
3085083	050281-002000	3084319	450281-002000	20,00	20,00	200	143	9	50	6
3085084	050281-002200	3084322	450281-002200	22,00	20,00	210	153	11	50	6
3085087	050281-002400	3084323	450281-002400	24,00	20,00	210	153	11	50	6
3085089	050281-002500	3084324	450281-002500	25,00	20,00	210	153	11	50	6
3085090	050281-002600	3084325	450281-002600	26,00	25,00	240	177	11	56	8
3085092	050281-002800	3084327	450281-002800	28,00	25,00	240	177	11	56	8
3085104	050281-003000	3084320	450281-003000	30,00	25,00	270	207	11	56	8
-		3084328	450281-003200	32,00	25,00	270	207	11	56	8

- Standard reamers listed are ground to achieve an H7 tolerance hole. IT6 capability is available. Additional diameters and lengths made to order.



■ HSR Reamers with Helical Flutes for Through Holes • CERMET-DCFD™ • 14–20mm

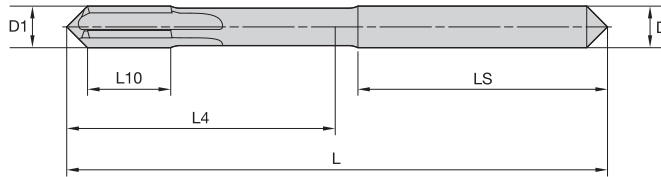
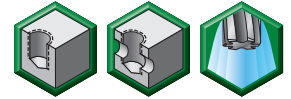


- first choice
- alternate choice

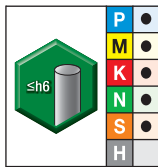
grade CERMET-DCFD TiAlN		D1	D	L	L4	L10	LS	Z
3888130	456681-001400	14,00	16,00	145	76	8	49	6
3888131	456681-001500	15,00	16,00	145	76	8	49	6
3888132	456681-001600	16,00	20,00	157	86	8	51	6
3888403	456681-001700	17,00	20,00	157	86	10	51	6
3888404	456681-001800	18,00	20,00	171	100	10	51	6
3888405	456681-001900	19,00	20,00	171	100	10	51	6
3888406	456681-002000	20,00	20,00	200	129	10	51	6



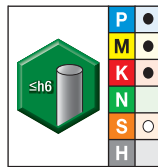
- Standard reamers listed are ground to achieve an H7 tolerance hole. IT6 capability is available. Additional diameters and lengths made to order.



■ HSR Reamers with Straight Flutes for Blind Holes • K10F™/K10F-DCFD™ • 2–4mm



grade K10F
uncoated

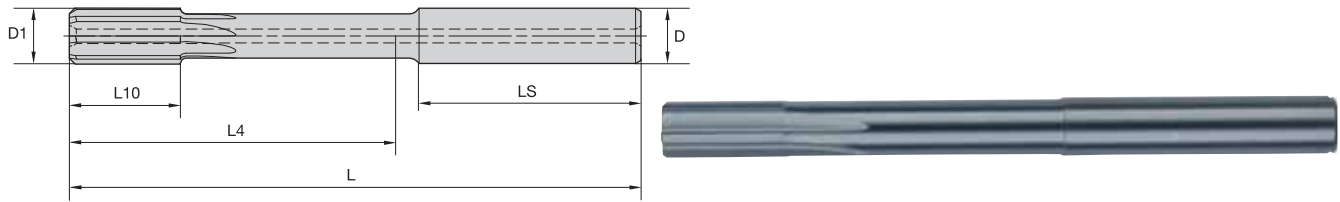
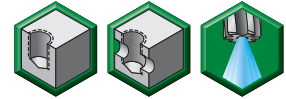


grade K10F-DCFD
TiAlN

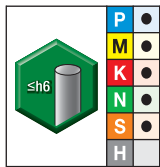
- first choice
- alternate choice

order #	catalogue #	order #	catalogue #	D1	D	L	L4	L10	LS	Z
2446025	050222-000200	2446371	450222-000200	2,00	3,00	48	15	6	28	4
2446029	050222-000300	2446372	450222-000300	3,00	3,00	48	15	8	28	4
2446031	050222-000400	2446415	450222-000400	4,00	4,00	54	21	8	28	4

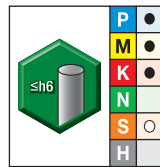
- Standard reamers listed are ground to achieve an H7 tolerance hole. IT6 capability is available. Additional diameters and lengths made to order.



■ HSR Reamers with Straight Flutes for Blind Holes • K10F™/K10F-DCFD™ • 5-14mm



grade K10F
uncoated

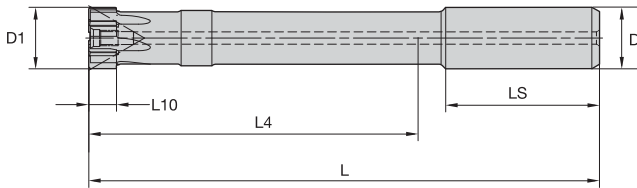
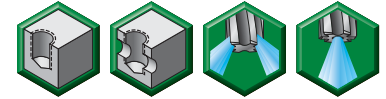


grade K10F-DCFD
TiAlN

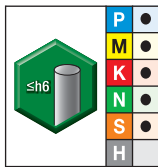
- first choice
- alternate choice

grade K10F uncoated		grade K10F-DCFD TiAlN		D1	D	L	L4	L10	LS	Z
order #	catalogue #	order #	catalogue #							
2437472	050270-000500	2441337	450270-000500	5,00	6,00	74	32	12	36	4
2437523	050270-000600	2441339	450270-000600	6,00	6,00	74	33	12	36	4
2437525	050270-000800	2441341	450270-000800	8,00	8,00	91	50	16	36	6
2437526	050270-001000	2441342	450270-001000	10,00	10,00	103	58	20	40	6
2437527	050270-001200	2441353	450270-001200	12,00	12,00	118	68	24	45	6
2437529	050270-001400	2441354	450270-001400	14,00	14,00	132	81	28	45	6

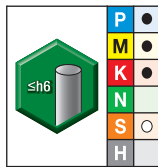
- Standard reamers listed are ground to achieve an H7 tolerance hole. IT6 capability is available. Additional diameters and lengths made to order.



■ HSR Reamers with Straight Flutes for Blind Holes • K10F™/K10F-DCFD™ • 14–32mm



grade K10F
uncoated

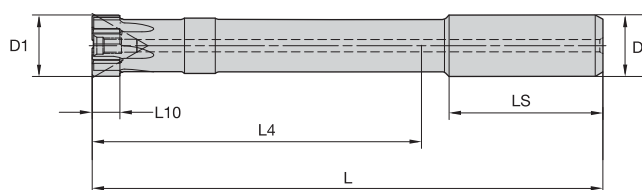


grade K10F-DCFD
TiAlN

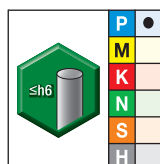
- first choice
- alternate choice

grade K10F uncoated		grade K10F-DCFD TiAlN		D1	D	L	L4	L10	LS	Z
order #	catalogue #	order #	catalogue #							
3055655	050280-001400	3084512	450280-001400	14,00	16,00	145	90	9	48	6
3055656	050280-001600	3084526	450280-001600	16,00	20,00	157	100	9	50	6
3055657	050280-001800	3084528	450280-001800	18,00	20,00	171	114	9	50	6
3056095	050280-002000	3077292	450280-002000	20,00	20,00	200	143	9	50	6
3056096	050280-002200	3084529	450280-002200	22,00	20,00	210	153	11	50	6
3056097	050280-002400	3084530	450280-002400	24,00	20,00	210	153	11	50	6
3056098	050280-002500	3084531	450280-002500	25,00	20,00	210	153	11	50	6
3056099	050280-002600	3084532	450280-002600	26,00	25,00	240	177	11	56	8
3056100	050280-002800	3084593	450280-002800	28,00	25,00	240	177	11	56	8
3056102	050280-003000	3084594	450280-003000	30,00	25,00	270	207	11	56	8
3056273	050280-003200	3084595	450280-003200	32,00	25,00	270	207	11	56	8

- Standard reamers listed are ground to achieve an H7 tolerance hole. IT6 capability is available. Additional diameters and lengths made to order.



■ HSR Reamers with Straight Flutes for Blind Holes • CERMET-DCFD™ • 14–20mm



- first choice
- alternate choice

grade CERMET-DCFD TiAlN		D1	D	L	L4	L10	LS	Z
3888407	456680-001400	14,00	16,00	145	76	8	49	6
3888408	456680-001500	15,00	16,00	145	76	8	49	6
3888409	456680-001600	16,00	20,00	157	86	8	51	6
3888410	456680-001700	17,00	20,00	157	86	10	51	6
3888411	456680-001800	18,00	20,00	171	100	10	51	6
3888412	456680-001900	19,00	20,00	171	100	10	51	6
3888413	456680-002000	20,00	20,00	200	129	10	51	6



■ Series 050221 • Solid Carbide • Helical Flute • Grade K10™ • Metric

Material Group											
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev						
		min		max	Tool Diameter	1,40–3,15	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	
P	1	20	–	30	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	2	20	–	20	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	3	10	–	20	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	4	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	5	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	6	10	–	10	mm/r	0,06–0,10	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	
M	1	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	2	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	3	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
K	1	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
	2	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
	3	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
N	1	30	–	30	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
	2	30	–	40	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
	3	30	–	40	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
	4	30	–	30	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
	5	20	–	30	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
	6	30	–	40	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	
S	1	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	2	10	–	10	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	3	10	–	20	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	
	4	10	–	20	mm/r	0,07–0,13	0,08–0,16	0,10–0,20	0,13–0,23	0,15–0,25	

■ Series 050227 • Solid Carbide • Helical Flute • Grade K10F™ • Metric

Material Group												
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev							
		min		max	Tool Diameter	1,40–3,15	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00	
P	1	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90	
	2	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90	
	3	30	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90	
	4	20	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90	
	5	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90	
	6	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
M	1	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
	3	10	–	10	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
K	1	20	–	30	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	2	20	–	30	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	3	20	–	30	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
N	1	70	–	90	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	2	80	–	100	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	3	80	–	100	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	4	70	–	90	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	5	60	–	80	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	6	90	–	110	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
S	1	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50	
	2	10	–	10	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50	
	3	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
	4	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	



■ Series 450227 • Solid Carbide • Helical Flute • Grade K10F-DCFD™ • Metric

Material Group											
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev						
		min	–	max	Tool Diameter	1,40–3,15	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00
P	1	60	–	80	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	2	60	–	80	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	3	60	–	70	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	4	40	–	60	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	5	20	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,40–0,70	0,40–0,80	0,50–0,90
	6	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
M	1	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	3	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
K	1	50	–	70	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	50	–	70	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	50	–	70	mm/r	0,25–0,45	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
S	1	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	2	10	–	20	mm/r	0,10–0,20	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50

■ Series 050271 • Solid Carbide • Helical Flute • Grade K10F™ • Metric

Material Group										
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev					
		min		max	Tool Diameter	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00
P	1	50	–	70	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	2	40	–	60	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	3	40	–	60	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	4	30	–	40	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	5	20	–	30	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
	6	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
M	1	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	2	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	3	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
K	1	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
N	1	130	–	150	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	2	140	–	160	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	3	140	–	160	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	4	130	–	150	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	5	120	–	140	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
	6	150	–	170	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
S	1	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
	3	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
	4	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65



■ Series 450271 • Solid Carbide • Helical Flute • Grade K10F-DCFD™ • Metric

Material Group											
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev						
		min		max	Tool Diameter	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00	
P	1	110	–	130	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90	
	2	110	–	130	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90	
	3	100	–	120	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90	
	4	60	–	80	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90	
	5	30	–	50	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90	
	6	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
M	1	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
	2	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
	3	20	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65	
K	1	80	–	100	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	2	80	–	100	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
	3	70	–	90	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20	
S	1	30	–	40	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50	
	2	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50	

■ Series 050281 • Uncoated • Carbide-Tipped • Helical Flute • Grade K10F™ • Metric




Material Group								
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev			
		min		max	Tool Diameter	12,70–15,00	15,00–20,00	20,00–32,00
P	1	50	–	70	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	2	40	–	60	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	3	40	–	60	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	4	30	–	40	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	5	20	–	30	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	6	10	–	20	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
M	1	10	–	20	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
	2	10	–	20	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
	3	10	–	20	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
K	1	30	–	50	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	2	30	–	50	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	3	30	–	40	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
N	1	130	–	150	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	2	140	–	160	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	3	140	–	160	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	4	130	–	150	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	5	120	–	140	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	6	150	–	170	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
S	1	10	–	20	mm/r	0,30–0,50	0,30–0,60	0,35–0,65
	2	10	–	20	mm/r	0,30–0,50	0,30–0,60	0,35–0,65
	3	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
	4	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90



■ Series 450281 • Coated • Carbide-Tipped • Helical Flute • Grade K10F-DCFD™ • Metric

Material Group								
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev			
		min		max	Tool Diameter	12,70–15,00	15,00–20,00	20,00–32,00
P	1	110	–	130	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	2	110	–	130	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	3	100	–	120	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	4	60	–	80	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	5	30	–	50	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
	6	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
M	1	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
	2	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
	3	20	–	30	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
K	1	80	–	100	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	2	80	–	100	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	3	70	–	90	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
S	1	30	–	40	mm/r	0,30–0,50	0,30–0,60	0,35–0,65
	2	20	–	30	mm/r	0,30–0,50	0,30–0,60	0,35–0,65

■ Series 456681 • Cermet-Tipped • Helical Flute • Grade CERMET-DCFD™ • Metric

Material Group		 					
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev		
		min		max	Tool Diameter	12,70–15,00	15,00–20,00
P	1	110	–	130	mm/r	0,50–0,90	0,60–1,05
	2	110	–	130	mm/r	0,50–0,90	0,60–1,05
	3	100	–	120	mm/r	0,50–0,90	0,60–1,05
	4	60	–	80	mm/r	0,50–0,90	0,60–1,05
	5	30	–	50	mm/r	0,50–0,90	0,60–1,05
	6	30	–	40	mm/r	0,35–0,65	0,40–0,80



■ Series 050222 • Solid Carbide • Straight Flute • Grade K10F™ • Metric

Material Group							
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev		
		min		max	Tool Diameter	1,40–3,15	3,16–4,80
P	1	30	–	40	mm/r	0,20–0,30	0,20–0,40
	2	30	–	40	mm/r	0,20–0,30	0,20–0,40
	3	30	–	30	mm/r	0,20–0,30	0,20–0,40
	4	20	–	30	mm/r	0,20–0,30	0,20–0,40
	5	10	–	20	mm/r	0,20–0,30	0,20–0,40
	6	10	–	20	mm/r	0,15–0,30	0,20–0,30
M	1	10	–	20	mm/r	0,15–0,30	0,20–0,30
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30
	3	10	–	10	mm/r	0,15–0,30	0,20–0,30
K	1	20	–	30	mm/r	0,25–0,45	0,35–0,65
	2	20	–	30	mm/r	0,25–0,45	0,35–0,65
	3	20	–	30	mm/r	0,25–0,45	0,35–0,65
N	1	70	–	90	mm/r	0,25–0,45	0,35–0,65
	2	80	–	100	mm/r	0,25–0,45	0,35–0,65
	3	80	–	100	mm/r	0,25–0,45	0,35–0,65
	4	70	–	90	mm/r	0,25–0,45	0,35–0,65
	5	60	–	80	mm/r	0,25–0,45	0,35–0,65
	6	90	–	110	mm/r	0,25–0,45	0,35–0,65
S	1	10	–	20	mm/r	0,10–0,20	0,15–0,30
	2	10	–	10	mm/r	0,10–0,20	0,15–0,30
	3	20	–	30	mm/r	0,15–0,30	0,20–0,30
	4	20	–	30	mm/r	0,15–0,30	0,20–0,30

■ Series 450222 • Solid Carbide • Straight Flute • Grade K10F-DCFD™ • Metric

Material Group							
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev		
		min		max	Tool Diameter	1,40–3,15	3,16–4,80
P	1	60	–	80	mm/r	0,20–0,30	0,20–0,40
	2	60	–	80	mm/r	0,20–0,30	0,20–0,40
	3	50	–	70	mm/r	0,20–0,30	0,20–0,40
	4	40	–	60	mm/r	0,20–0,30	0,20–0,40
	5	20	–	30	mm/r	0,20–0,30	0,20–0,40
	6	20	–	30	mm/r	0,15–0,30	0,20–0,30
M	1	10	–	20	mm/r	0,15–0,30	0,20–0,30
	2	10	–	20	mm/r	0,15–0,30	0,20–0,30
	3	10	–	20	mm/r	0,15–0,30	0,20–0,30
K	1	50	–	70	mm/r	0,25–0,45	0,35–0,65
	2	50	–	70	mm/r	0,25–0,45	0,35–0,65
	3	50	–	70	mm/r	0,25–0,45	0,35–0,65
S	1	10	–	20	mm/r	0,10–0,20	0,15–0,30
	2	10	–	20	mm/r	0,10–0,20	0,15–0,30



■ Series 050270 • Solid Carbide • Straight Flute • Grade K10F™ • Metric

Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev						
		min		max	Tool Diameter	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00	
		P		1	50	–	70	mm/r	0,20–0,40	0,30–0,50	0,35–0,65
2	40			–	60	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
M		3	40	–	60	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
		4	30	–	40	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
K		5	20	–	30	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
		6	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
N		1	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
		2	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
S		3	10	–	20	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
		1	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
M		2	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
		3	30	–	50	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
P		1	130	–	150	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
		2	140	–	160	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
M		3	140	–	160	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
		4	130	–	150	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
K		5	120	–	140	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
		6	150	–	170	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
N		1	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
		2	10	–	20	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
S		3	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
		4	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65

HSR™ Application Data • Series 450270

■ Series 450270 • Solid Carbide • Straight Flute • Grade K10F-DCFD™ • Metric

Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev						
		min		max	Tool Diameter	3,16–4,80	4,81–7,15	7,16–9,59	9,60–12,70	12,70–15,00	
		P		1	110	–	130	mm/r	0,20–0,40	0,30–0,50	0,35–0,65
2	110			–	130	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
M		3	100	–	120	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
		4	60	–	80	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
K		5	30	–	50	mm/r	0,20–0,40	0,30–0,50	0,35–0,65	0,40–0,80	0,50–0,90
		6	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
N		1	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
		2	30	–	40	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
S		3	20	–	30	mm/r	0,20–0,30	0,20–0,40	0,30–0,50	0,30–0,60	0,35–0,65
		1	80	–	100	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
P		2	80	–	100	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
		3	70	–	90	mm/r	0,35–0,65	0,40–0,80	0,50–0,90	0,60–1,05	0,60–1,20
M		1	30	–	40	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50
		2	20	–	30	mm/r	0,15–0,30	0,20–0,30	0,20–0,40	0,25–0,45	0,30–0,50

■ Series 050280 • Uncoated • Carbide-Tipped • Straight Flute • Grade K10F™ • Metric

Material Group								
		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev			
		min		max	Tool Diameter	12,70–15,00	15,00–20,00	20,00–32,00
P	1	50	–	70	mm/r	0,50–0,90	0,60–1,05	0,60–1,20
	2	40	–	60	mm/r	0,50–0,90	0,60–1,05	0,60–1,20
	3	40	–	60	mm/r	0,50–0,90	0,60–1,05	0,60–1,20
	4	30	–	40	mm/r	0,50–0,90	0,60–1,05	0,60–1,20
	5	20	–	30	mm/r	0,50–0,90	0,60–1,05	0,60–1,20
	6	10	–	20	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
M	1	10	–	20	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
	2	10	–	20	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
	3	10	–	20	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
K	1	30	–	50	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	2	30	–	50	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	3	30	–	40	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
N	1	130	–	150	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	2	140	–	160	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	3	140	–	160	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	4	130	–	150	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	5	120	–	140	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
	6	150	–	170	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
S	1	10	–	20	mm/r	0,30–0,50	0,30–0,60	0,35–0,65
	2	10	–	20	mm/r	0,30–0,50	0,30–0,60	0,35–0,65
	3	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
	4	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90



■ Series 450280 • Coated • Carbide-Tipped • Straight Flute • Grade K10F-DCFD™ • Metric

Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev				
		min		max	Tool Diameter	12,70–15,00	15,00–20,00	20,00–32,00	
		P		1	110	–	130	mm/r	0,50–0,90
2	110			–	130	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
P		3	100	–	120	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
		4	60	–	80	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
P		5	30	–	50	mm/r	0,50–0,90	0,60–1,05	0,60–1,10
		6	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
M		1	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
		2	30	–	40	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
		3	20	–	30	mm/r	0,35–0,65	0,40–0,80	0,50–0,90
K		1	80	–	100	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
		2	80	–	100	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
		3	70	–	90	mm/r	0,60–1,20	0,70–1,30	0,80–1,40
S		1	30	–	40	mm/r	0,30–0,50	0,30–0,60	0,35–0,65
		2	20	–	30	mm/r	0,30–0,50	0,30–0,60	0,35–0,65

HSR™ Application Data • Series 456680

■ Series 456680 • Cermet-Tipped • Straight Flute • Grade CERMET-DCFD™ • Metric

Material Group		Cutting Speed – vc Range – m/min			Recommended Feed Rate per Rev			
		min		max	Tool Diameter	12,70–15,00	15,00–20,00	
		P		1	110	–	130	mm/r
2	110			–	130	mm/r	0,50–0,90	0,60–1,05
3	100			–	120	mm/r	0,50–0,90	0,60–1,05
4	60			–	80	mm/r	0,50–0,90	0,60–1,05
5	30			–	50	mm/r	0,50–0,90	0,60–1,05
6	30			–	40	mm/r	0,35–0,65	0,40–0,80

WIDIA™ TRM •
Top Ream Modular (Available as Semi-Standards)



WIDIA TRM

Primary Application

- Achieve solid carbide metal removal rates.
- Five sizes of standard straight shank bodies available to couple reaming heads from 20–42mm (.787–1.653").

Features and Benefits

- High-speed and high-performance ready.
- Unique proprietary coupling system enables same runout accuracy as monoblock systems (<3 microns).
- Comfortable radial clamping for quick exchanging even in narrow situations in the machine.
- No fixture for clamping or dismounting necessary.

Customisation

- Heads fully customisable as simple specials with different lead geometries, grades, coatings, and edge hones.
- Semi-finished heads on stock for shorter lead times.

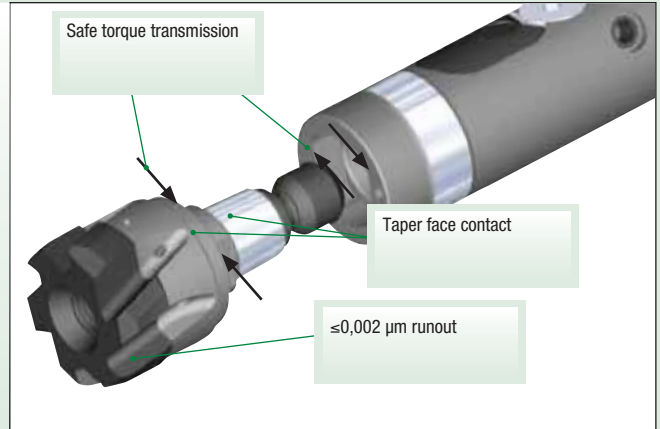
Ordering Process

- Please contact your local Authorised Distributor for a quote.

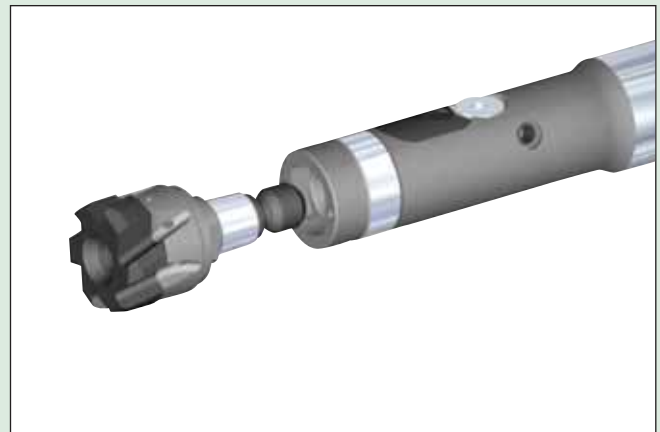
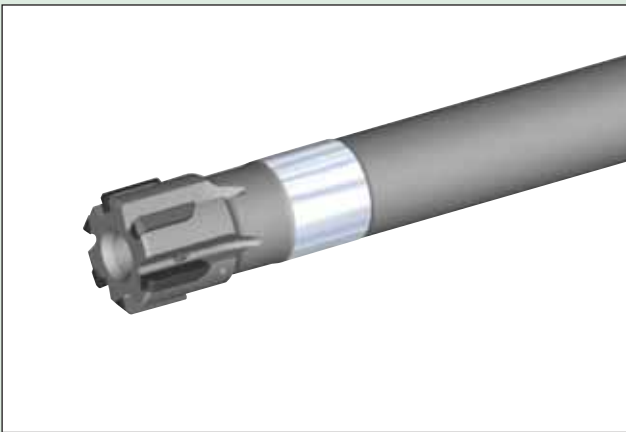


WST™ — WIDIA™ Short Taper

- Easy to handle.
- Fewer vibrations due to safe torque transmission.
- No head-to-body orientation adjustment necessary.
- Higher hole quality due to minimal runout and taper face contact.
- Easy to disassemble due to push out effect of head.



Special Design — Top Ream Tipped Tools



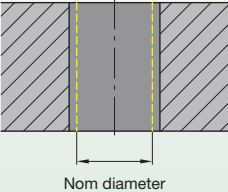
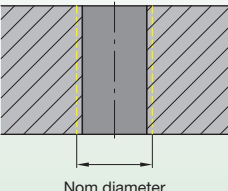
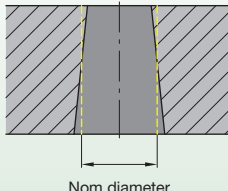
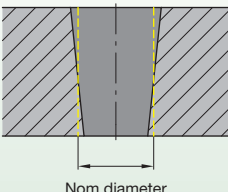
Regular Tipped

- 4–8 brazing joints depending on diameter (number of teeth).
- Less stiffness.
- More vibrations.
- Higher runout after thermal influence (e.g., coating, reconditioning, etc.).

WIDIA Top Ream

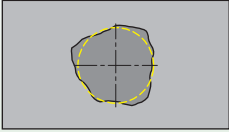

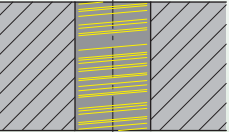
- Min 4x reconditionable.
- New reaming grade WU05PR™ holds bore surface finish more than 2x longer.
- Stronger brazing joint than conventional tipped reamers.
- Less influence of coating process on runout.

Reamer Troubleshooting

Problem	Cause	Possible Remedy
<p>Hole diameter too large</p>  <p>Nom diameter</p>	<ol style="list-style-type: none"> 1. Reaming tool running out of centre. 2. Concentricity of pilot hole and ream machining unsatisfactory. 3. Built-up edge. 4. Unsuitable cooling lubricant. 5. Reaming tool diameter too large. 	<ul style="list-style-type: none"> • Use equalising adaptor. • Re-align, use floating head. • Change cooling lubricant. • Change cutting speed. • Measure reamers and send for repairs.
<p>Hole diameter too small</p>  <p>Nom diameter</p>	<ol style="list-style-type: none"> 1. Reamer worn. 2. Unsuitable cooling lubricant. 3. Reaming allowance too small. 	<ul style="list-style-type: none"> • Replace and refit tool. • Change cooling lubricant. • Increase reaming allowance.
<p>Conical hole profile wider towards drill runout</p>  <p>Nom diameter</p>	<ol style="list-style-type: none"> 1. Concentricity of pilot hole and reaming unsatisfactory. 2. Positioning accuracy of pilot hole to reaming. 	<ul style="list-style-type: none"> • Re-align, use equalising adaptor. • Correct positioning accuracy.
<p>Conical hole profile wider at drill entry point</p>  <p>Nom diameter</p>	<ol style="list-style-type: none"> 1. Concentricity of pilot hole and reaming unsatisfactory. 2. Reaming tool skim cutting with ledger. 	<ul style="list-style-type: none"> • Re-align, use floating head. • Securely clamp reaming tool axially.

(continued)

Reamer Troubleshooting *(continued)*

Problem	Cause	Possible Remedy
<p>Conical hole profile wider at drill entry point</p> 	<ol style="list-style-type: none"> 1. Reaming tool running out of centre. 2. Slanted cutting surface/asymmetrical cutting. 3. Workpiece twisted. 	<ul style="list-style-type: none"> • Use equalising adaptor. • Spot face as drilling preparation. • Take the direction of impact into account when clamping the workpiece.
<p>Surface quality does not meet specification</p> 	<ol style="list-style-type: none"> 1. Tool cutters worn. 2. Reaming tool running out of centre. 3. Incorrect technology data (cutting parameters). 4. Inadequate chip evacuation. 	<ul style="list-style-type: none"> • Use equalising adaptor. • Re-align, use floating head. • Change cooling lubricant. • Change cutting speed. • Measure reamers and send for repairs.
<p>Feed grooves</p> 	<ol style="list-style-type: none"> 1. Built-up edge. 	<ul style="list-style-type: none"> • Change cooling lubricant. • Change cutting speed.

Precision Hole Finishing •
ROTAFLEX™

ROTAFLEX



The WIDIA™ line of Precision Hole Finishing ensures decreased vibration, increased productivity, and reduced calls for scheduled maintenance. You can count on consistent hole diameters, high speed and feed rates, and good surface quality at a great price.

- Easy adjustments and low initial investment.
- Roughing and precision finishing heads available.
- For roughing and fine finishing operations over a broad diameter range.

The newly developed RFX coupling eases assembly and disassembly and enhances stability

- Increased machine tool productivity and less vibration.
- Standard micro-adjustable cartridges for fine finishing operations.
- Internal coolant and spacious chip flutes.



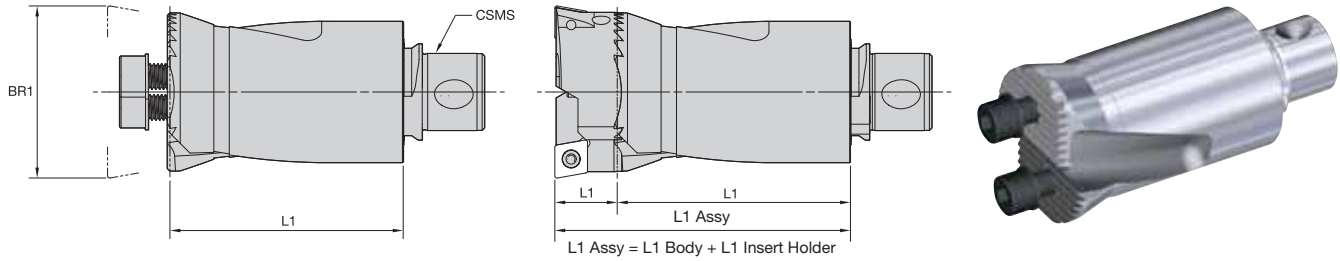
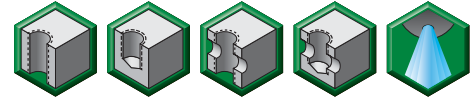
EXTREME CHALLENGES. EXTREME RESULTS.

Advanced system uses the progressive RFX coupling and the latest technology WIDIA™ Victory™ ISO turning inserts

- High feed rates due to the proprietary front serration of the TCHS twin cutters.
- Internal coolant and spacious chip flutes ensure secure chip evacuation.
- High-precision adjustment of FBH and FBHBB Fine-Boring Heads with the axial and radial pre-loaded eccentric bushing instead of a threaded spindle.
- Higher rigidity with the new RFX bayonet-type coupling.
- Achieve unmatched tool life with WIDIA Victory grades.

WIDIA 

- Basic body shipped without insert holders.
- Order insert holder, slides, or micro-adjustable cartridges separately.



■ TCHS • RFX Shank Series

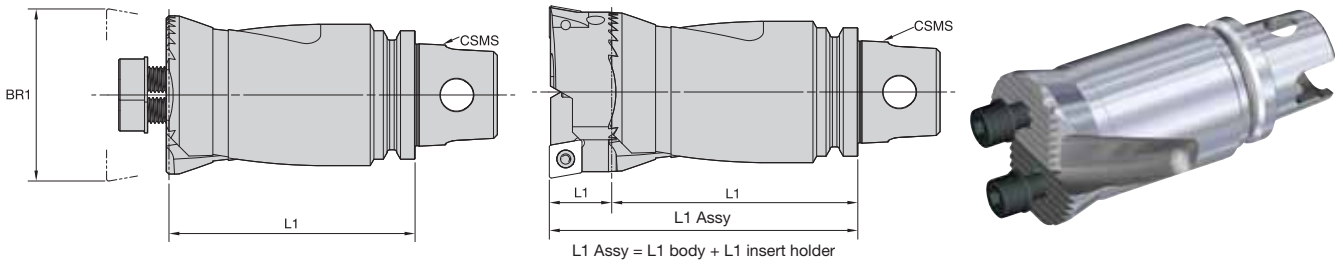
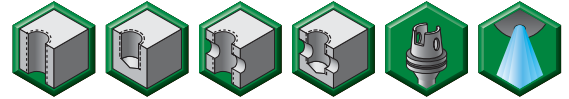
order number	catalogue number	BR1 bore range	L1	CSMS system size	kg
3861179	RFX185TCHS022030	22,500-30,000	27,7	RFX185	0,20
3861180	RFX245TCHS030039	30,000-39,000	37,7	RFX245	0,20
3861181	RFX320TCHS039050	39,000-50,000	48,7	RFX320	0,50
3861182	RFX420TCHS050067	50,000-67,000	68,2	RFX420	1,00
3861183	RFX550TCHS067088	67,000-88,000	90,7	RFX550	2,00
3861184	RFX720TCHS088115	88,000-115,000	113,7	RFX720	4,00

■ Spare Parts

catalogue number	fixing screw	disc washer
RFX185TCHS022030	12147602700	12147600100
RFX245TCHS030039	12147602300	12147603900
RFX320TCHS039050	12147602400	12147600200
RFX420TCHS050067	12147602500	12147604000
RFX550TCHS067088	12147602600	12147600300
RFX720TCHS088115	12147602800	12147600400



- Basic body shipped without insert holders.
- Order insert holder, slides, or micro-adjustable cartridges separately.



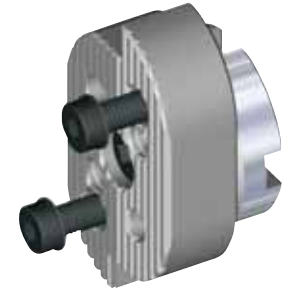
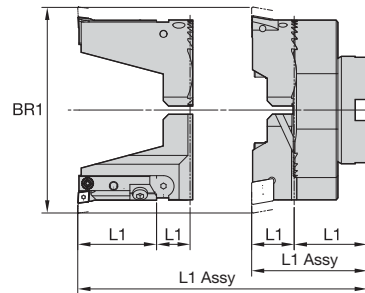
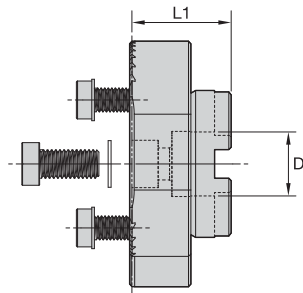
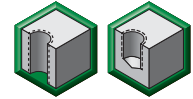
■ TCHS • KM™ Shank Series

order number	catalogue number	BR1 bore range	L1	CSMS system size	kg
3861149	KM32TSTCHS022030	22,000-30,000	52,7	KM32TS	0,30
3861150	KM32TSTCHS030039	30,000-39,000	67,7	KM32TS	0,50
3861152	KM40TSTCHS030039	30,000-39,000	87,7	KM40TS	0,60
3861151	KM32TSTCHS039050	39,000-50,000	63,7	KM32TS	0,70
3861173	KM40TSTCHS039050	39,000-50,000	83,7	KM40TS	1,00
3861174	KM40TSTCHS050067	50,000-67,000	78,2	KM40TS	1,10
3861175	KM50TSTCHS050067	50,000-67,000	88,2	KM50TS	1,20
3861176	KM50TSTCHS067088	67,000-88,000	95,7	KM50TS	1,40
3861177	KM63TSTCHS067088	67,000-88,000	95,7	KM63TS	1,80
3861178	KM63TSTCHS088115	88,000-115,000	93,7	KM63TS	2,40

■ Spare Parts

catalogue number	fixing screw	disc washer
KM32TSTCHS022030	12147602700	12147600100
KM32TSTCHS030039	12147602300	12147603900
KM32TSTCHS039050	12147602400	12147600200
KM40TSTCHS030039	12147602300	12147603900
KM40TSTCHS039050	12147602400	12147600200
KM40TSTCHS050067	12147602500	12147604000
KM50TSTCHS050067	12147602500	12147604000
KM50TSTCHS067088	12147602600	12147600300
KM63TSTCHS067088	12147602600	12147600300
KM63TSTCHS088115	12147602800	12147600400

- For use with shell mill adaptors; please order separately.
- Bridge body shipped without insert holder, slides, or micro-adjustable cartridges.
- Order insert holder separately for rough boring and slides for fine boring.
- Order micro-adjustable cartridges separately for fine boring.



L1 Assy = L1 bridge + L1 insert holder
 L1 Assy = L1 bridge + L1 slide + L1 cartridge

■ Bridge Tool • Small

order number	catalogue number	BR1 bore range	D	L1	kg
2006019	12600208800	87.000-110.000	27	40,3	1,70
2005500	12600210900	109.000-133.000	27	40,3	1,90
2005553	12600213200	132.000-156.000	27	40,3	2,10
2005556	12600215500	155.000-179.000	27	40,3	2,30
2005560	12600217800	178.000-202.000	27	40,3	2,50

NOTE: Use of ISO cartridges SCLCL12CA12, STGCL12CA16, or SSRCL12CA12 is recommended.

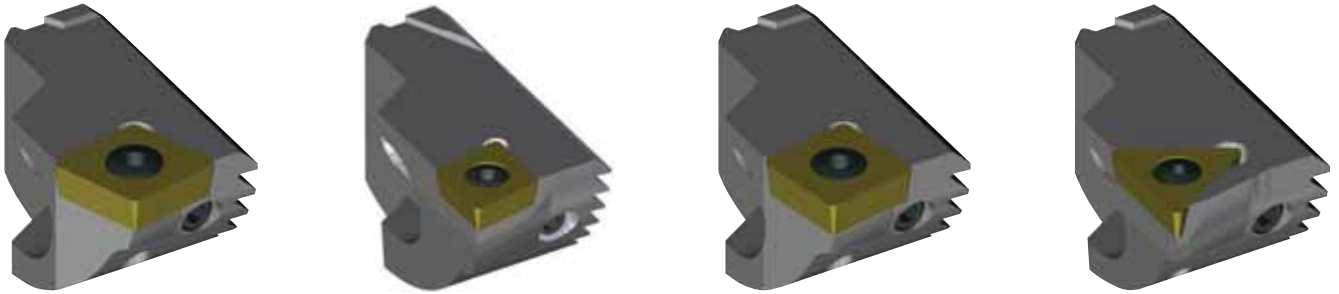
■ Spare Parts

catalogue number	fixing screw	fixing screw	fixing screw	disc washer	disc washer
12600208800	—	12346233000	12147519100	12147600300	—
12600210900	12147613500	—	12147519100	12147600300	12147740200
12600213200	12147613500	—	12147519100	12147600300	12147740200
12600215500	12147613500	—	12147519100	12147600300	12147740200
12600217800	12147613500	—	12147519100	12147600300	12147740200

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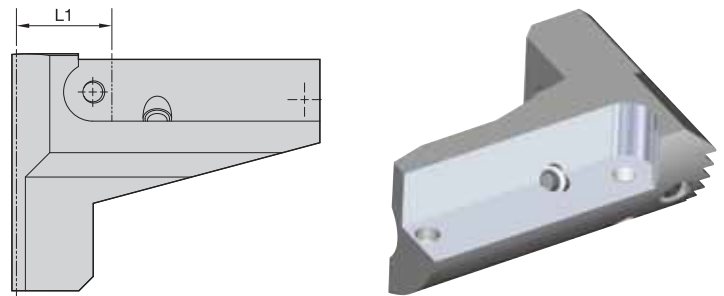


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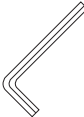


■ **Insert Holder Reference Chart**

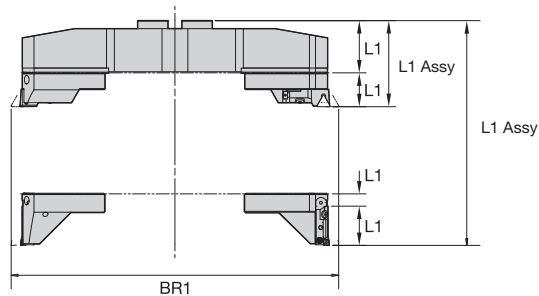
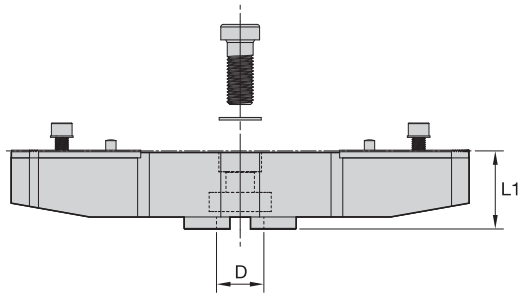
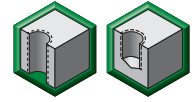
C-Style 70°	C-Style 90°	S-Style 80°	T-Style 90°
12625906700	12625706700	12626006700	12625806800



■ **Slide for Micro-Adjustable Cartridges**

order number	catalogue number	L1	 adjusting screw	 fixing screw	 hex wrench
3864647	SMAC087	19,2	12147665000	12147519100	12148041100

- For use with shell mill adaptors; please order separately.
- Bridge body shipped without ISO cartridges, slides, or micro-adjustable cartridges.
- Order ISO cartridges separately for rough boring.
- Order micro-adjustable cartridges separately for fine boring.



L1 Assy = L1 Bridge + L1 Insert Holder
 L1 Assy = L1 Bridge + L1 Slide + L1 Cartridge

■ Bridge Tool • Large

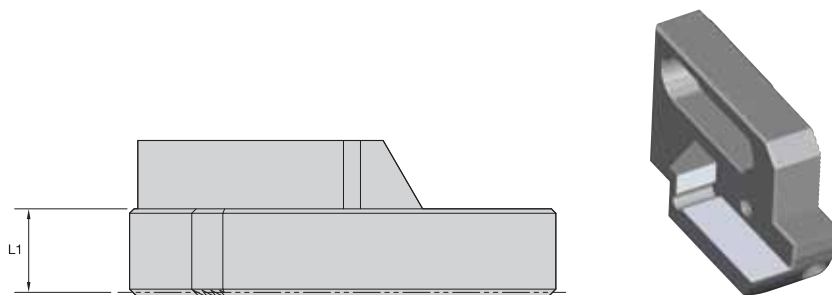
order number	catalogue number	BR1 bore range	D	L1	kg
2005574	12600020000	200.000-280.000	40	50,6	2,00
2005602	12600027800	278.000-360.000	40	50,6	2,80
2005656	12600035800	358.000-440.000	40	61,6	2,50
2005722	12600043800	438.000-520.000	40	61,6	3,50

NOTE: Use of ISO cartridges SCLCL12CA12, STGCL12CA16, or SSRCL12CA12 is recommended.





■ Spare Parts

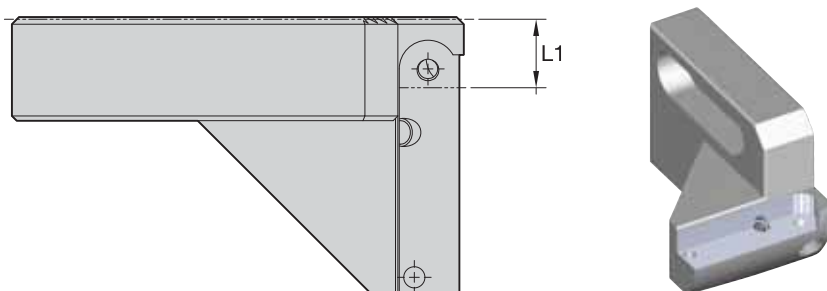
catalogue number	fixing screw	fixing screw	disc washer	hex wrench
12600020000	12147739900	12147625400	12147600300	12147666700
12600027800	12147739900	12147625400	12147600300	12147666700
12600035800	12147739900	12147625400	12147600300	12147666700
12600043800	12147739900	12147625400	12147600300	12147666700








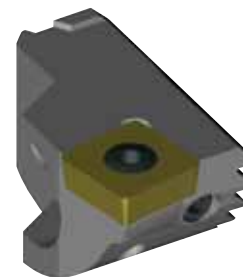
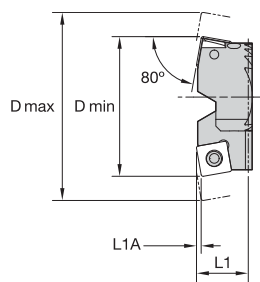
■ Slide for ISO Cartridges

order number	catalogue number	L1	fixing screw	adjusting screw	hex wrench	hex wrench
2005576	12614020100	19,4				
			12147625200	12147739800	12148041300	12148041200



■ Slide for Micro-Adjustable Cartridges





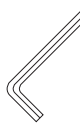
order number	catalogue number	L1	fixing screw	adjusting screw	hex wrench
3860905	SMAC200	13,9			
			12147519100	12147739800	12148041200



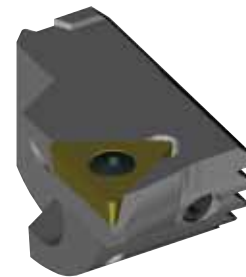
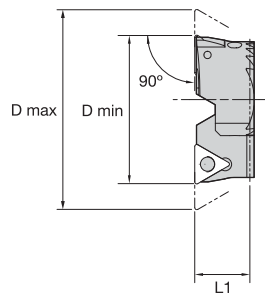
■ 80° Lead Insert Holder • S-Style

order number	catalogue number	D min	D max	L1	L1A	gage insert
2005620	12626003000	30,00	39,00	12,35	1,30	SP..0703..
2005676	12626004000	39,00	50,00	16,30	1,50	SC../SP..09T3..
2005814	12626005000	50,00	67,00	21,80	2,10	SC../SP..1204..
2005941	12626006700	67,00	88,00	24,30	2,10	SC../SP..1204..

■ Spare Parts

catalogue number	 clamping screw	 adjusting screw	 adjusting screw	Nm	 Torx wrench	 hex wrench
12626003000	12148067200	12148069600	—	1,0	12148086600	12148040900
12626004000	12148038800	12148069600	—	3,0	12148082400	12148040900
12626005000	12148007200	12147602200	—	3,5	12148099400	12148041000
12626006700	12148007200	—	12147665000	3,5	12148099400	12148041100





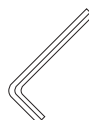


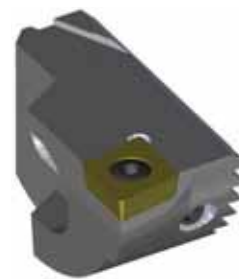
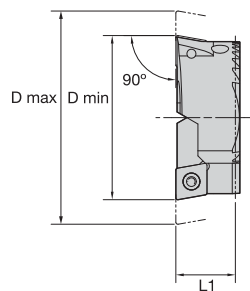


■ 90° Lead Insert Holder • T-Style

order number	catalogue number	D min	D max	L1	gage insert
2005674	12625804000	39,00	50,00	16,30	TC../TP..1102..
2005802	12625805100	50,00	67,00	21,80	TC../TP..16T3..
2005939	12625806800	67,00	88,00	24,30	TC../TP..16T3..

■ Spare Parts






catalogue number	 clamping screw	 adjusting screw	 adjusting screw	Nm	 Torx wrench	 hex wrench
12625804000	12148068700	12148069600	—	1,0	12148086600	12148040900
12625805100	12148038800	12147602200	—	3,0	12148099400	12148041000
12625806800	12148038800	—	12147665000	3,5	12148099400	12148041100

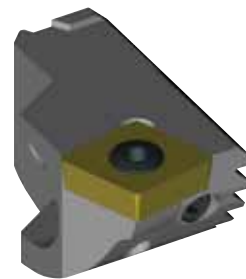
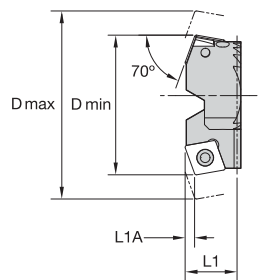


■ 90° Lead Insert Holder • C-Style

order number	catalogue number	D min	D max	L1	gage insert
2005580	12625702200	22,50	30,00	12,05	CC../CP..0602..
2005618	12625703000	30,00	39,00	12,35	CC../CP..0602..
2005673	12625704000	39,00	50,00	16,30	CC../CP..09T3..
2005801	12625705000	50,00	67,00	21,80	CC../CP..1204..
2005938	12625706700	67,00	88,00	24,30	CC../CP..1204..
2006041	12625708986	88,00	115,00	36,30	CC../CP..1204..

■ Spare Parts





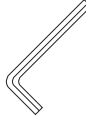
catalogue number	 clamping screw	 adjusting screw	 adjusting screw	Nm	 Torx wrench	 hex wrench
12625702200	12148086600	12147579300	—	1,0	12148086600	12148046000
12625703000	12148086600	12148069600	—	1,0	12148086600	12148040900
12625704000	12148082400	12148069600	—	3,0	12148082400	12148040900
12625705000	12148099400	12147602200	—	3,5	12148099400	12148041000
12625706700	12148099400	—	12147665000	3,5	12148099400	12148041100
12625708900	12148099400	12148541600	—	3,5	12148099400	12148041100



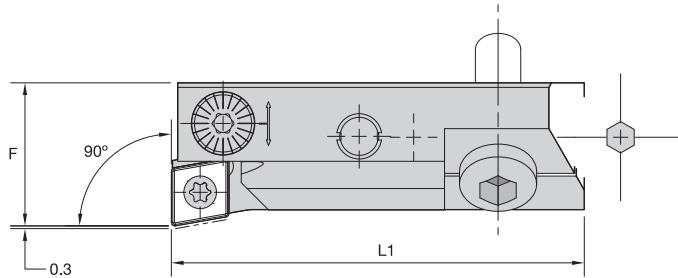
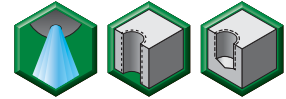
■ 70° Lead Insert Holder • C-Style

order number	catalogue number	D min	D max	L1	L1A	gage insert
2005581	12625902200	22,50	30,00	12,35	1,60	CC../CP..0602..
2005619	12625903000	30,00	39,00	12,35	1,60	CC../CP..0602..
2005675	12625904000	39,00	50,00	16,30	2,30	CC../CP..09T3..
2005813	12625905000	50,00	67,00	21,80	3,10	CC../CP..1204..
2005940	12625906700	67,00	88,00	24,30	3,10	CC../CP..1204..
2006054	12625908986	88,00	115,00	36,30	3,10	CC../CP..1204..

■ Spare Parts

catalogue number	 clamping screw	 adjusting screw	 adjusting screw	Nm	 Torx wrench	 hex wrench
12625902200	12148068700	12147579300	—	1,0	12148086600	12148046000
12625903000	12148068700	12148069600	—	1,0	12148086600	12148040900
12625904000	—	12148069600	—	3,0	12148082400	12148040900
12625905000	12148007200	12147602200	—	3,5	12148099400	12148041000
12625906700	12148007200	—	12147665000	3,5	12148099400	12148041100
12625908900	—	12147602200	—	3,5	12148099400	12148041100

- All cartridges have internal coolant supply directed to the cutting edge.
- 0,01mm diameter adjustment within a range of 0,3mm.
- Radial adjustment without influence on axial position.
- Axial adjustment range of 1mm.

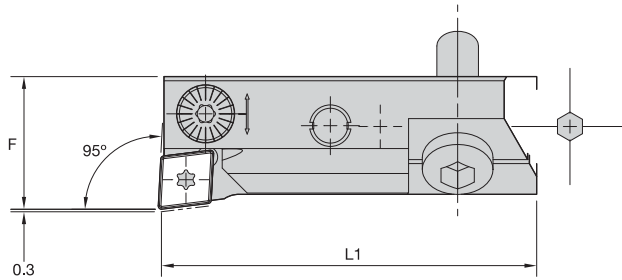
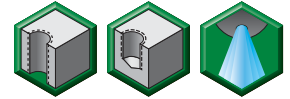


■ 90° Lead Micro-Adjustable Cartridge • C-Style

order number	catalogue number	F	L1	gage insert	insert clamping screw	Torx wrench	Nm
3860908	MASCFCR09CA06F	16,00	45,50	CC..0602..	12148068700	12148086600	1,0



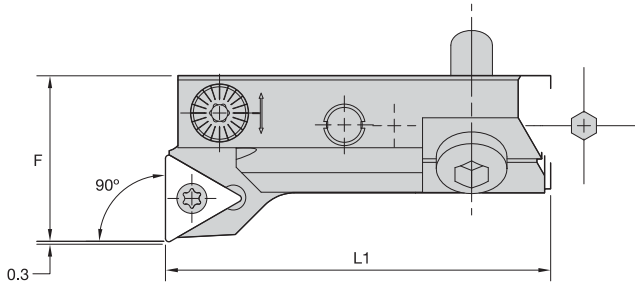
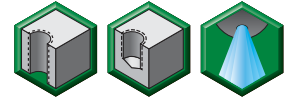
- All cartridges have internal coolant supply directed to the cutting edge.
- 0,01mm diameter adjustment within a range of 0,3mm.
- Radial adjustment without influence on axial position.
- Axial adjustment range of 1mm.



■ 95° Lead Micro-Adjustable Cartridge • C-Style

order number	catalogue number	F	L1	gage insert	insert clamping screw	Torx wrench	Nm
3860909	MASCLCR09CA06F	16,00	45,50	CC..0602..	12148068700	12148086600	1,0

- All cartridges have internal coolant supply directed to the cutting edge.
- 0,01mm diameter adjustment within a range of 0,3mm.
- Radial adjustment without influence on axial position.
- Axial adjustment range of 1mm.

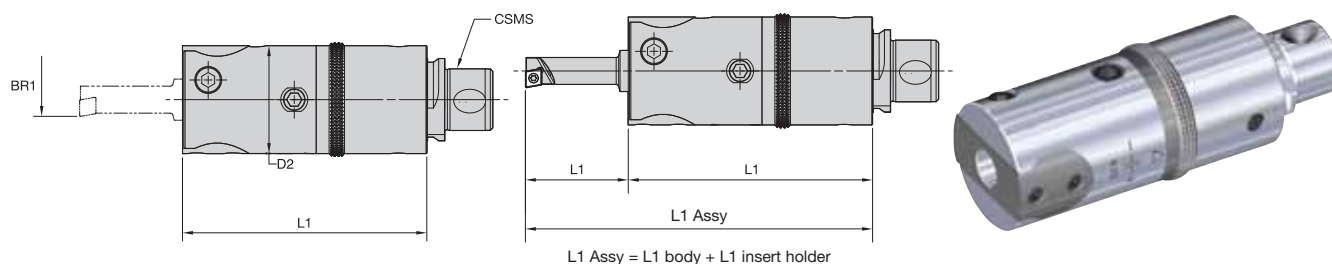
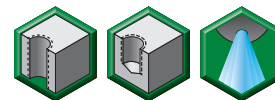


■ 90° Lead Micro-Adjustable Cartridge • T-Style

order number	catalogue number	F	L1	gage insert	insert clamping screw	Torx wrench	Nm
3860910	MASTFCR09CA11F	20,00	45,50	TC..1102..	12148068700	12148086600	1,0



- 0,01mm diameter adjustment.
- Basic body shipped without boring bars.



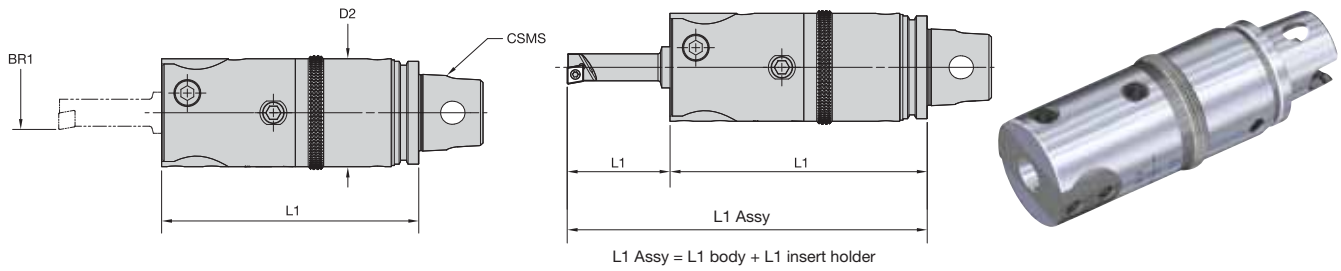
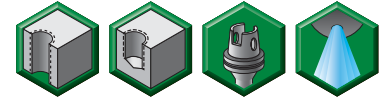
■ **FBHBB • RFX Series Shank**

order number	catalogue number	BR1 bore range	D2	L1	CSMS system size	kg
3860906	RFX420FBHBB006022	6,000-22,000	42,00	95,00	RFX420	1,10

■ **Spare Parts**

catalogue number	front clamping screw 1	front clamping screw 2	adjustment locking screw	hex wrench	hex wrench
RFX420FBHBB006022	12148068700	12148042400	12147680500	12148041100	12148041300

- 0,01mm diameter adjustment.
- Basic body shipped without boring bars.



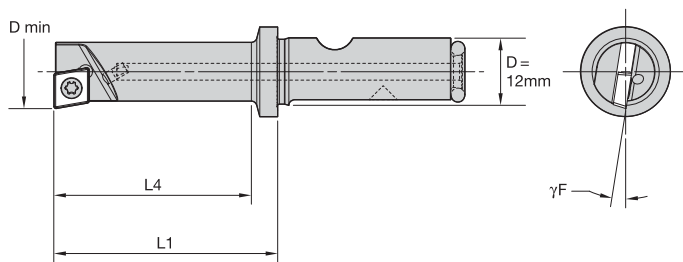
■ FBHBB KM-TS™ Series Shank

order number	catalogue number	BR1 bore range	D2	L1	CSMS system size	kg
3860907	KM40TSFBHBB006022	6,000-22,000	42,00	105,00	KM40TS	1,10

■ Spare Parts

catalogue number	front clamping screw 1	front clamping screw 2	adjustment locking screw	hex wrench	hex wrench
KM40TSFBHBB006022	12147617400	12148042400	12147680500	12148041100	12148041300

- All boring bars have internal coolant supply directed to the cutting edge.



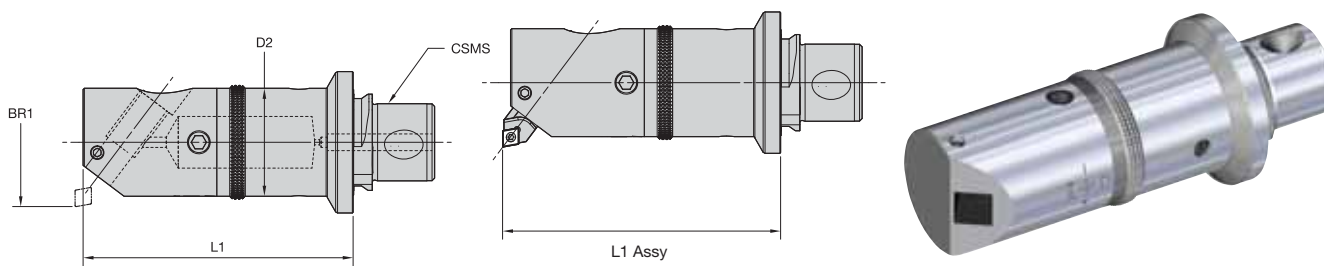
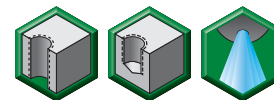
■ Boring Bars for Precision Fine Boring Heads (FBHBB)

order number	catalogue number	D min	D max	L1	L4	γF°	kg
2005954	12627006200	6,00	8,00	30,00	24,00	-5.00	0,10
2006015	12627008200	8,00	10,00	30,00	25,00	-3.00	0,10
2005499	12627010200	10,00	13,00	35,00	30,00	-11.00	0,10
2005542	12627013200	13,00	16,00	40,00	35,00	-9.00	0,10
2005558	12627016200	16,00	19,00	45,00	40,00	-6.00	0,10
2005573	12627019300	19,00	22,00	55,00	55,00	-6.00	0,20

■ Spare Parts

catalogue number	gage insert	clamping screw	Torx wrench	Nm
12627006200	CP..04T1..	12148005800	12148005900	0,3
12627008200	CP..04T1..	12148005800	12148005900	0,3
12627010200	CC../CP..0602..	12148068700	12148086600	1,0
12627013200	CC../CP..0602..	12148068700	12148086600	1,0
12627016200	CC../CP..0602..	12148068700	12148086600	1,0
12627019300	CC../CP..0602..	12148068700	12148086600	1,0

- 0,01mm diameter adjustment.
- Basic body shipped without boring bars.



■ FBH • RFX Series Shank

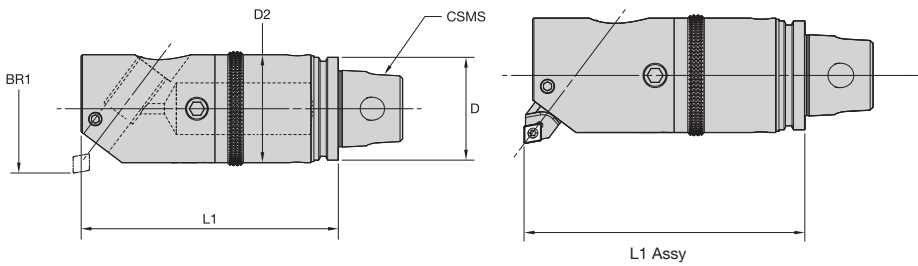
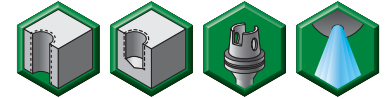
order number	catalogue number	BR1 bore range	D2	L1	L1 Assy	CSMS system size	kg
3861143	RFX185FBH022029	22,000-29,000	18,50	55,00	56,00	RFX185	0,20
3861144	RFX245FBH029038	29,000-38,000	24,50	60,00	62,00	RFX245	0,20
3861145	RFX320FBH038050	38,000-50,000	32,00	75,00	77,00	RFX320	0,50
3861146	RFX420FBH050065	50,000-65,000	42,00	95,00	98,00	RFX420	1,10
3861147	RFX550FBH065088	65,000-88,000	55,00	115,00	120,00	RFX550	2,10
3861148	RFX720FBH088115	88,000-115,000	72,00	155,00	160,00	RFX720	4,90

■ Spare Parts

catalogue number	adjusting screw	adjustment locking screw	fixing screw	wedge	hex wrench	hex wrench
RFX185FBH022029	12147620000	12147680200	12346292100	12147621100	12148041100	12148040900
RFX245FBH029038	12147620000	12147680300	12346292200	12147621200	12148041100	12148040900
RFX320FBH038050	12147620300	12147680400	12147622300	12147621300	12148041200	12148041000
RFX420FBH050065	12147620400	12147680500	12148575900	12147621400	12148041300	12148041100
RFX550FBH065088	12147620500	12147680600	12148087100	12147621500	12148041400	12148041100
RFX720FBH088115	12147620600	12147680700	12148087100	12147621600	12148079000	—



- 0,01mm diameter adjustment.
- Basic body shipped without boring bars.

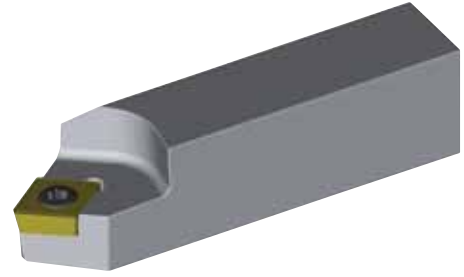
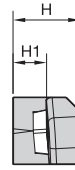
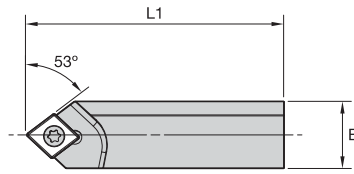


■ FBH • KM™ Series Shank

order number	catalogue number	BR1 bore range	D2	L1	L1 Assy	CSMS system size	kg
3861123	KM32TSFBH022029	22,000-29,000	18,50	60,00	62,00	KM32TS	0,20
3861124	KM32TSFBH029038	29,000-38,000	24,50	70,00	72,00	KM32TS	0,20
3861125	KM32TSFBH038050	38,000-50,000	32,00	80,00	82,00	KM32TS	0,50
3861126	KM40TSFBH029038	29,000-38,000	24,50	90,00	92,00	KM40TS	0,50
3861127	KM40TSFBH038050	38,000-50,000	32,00	100,00	103,00	KM40TS	0,90
3861128	KM40TSFBH050065	50,000-65,000	42,00	105,00	108,00	KM40TS	1,10
3861129	KM50TSFBH050065	50,000-65,000	42,00	110,00	115,00	KM50TS	1,20
3861130	KM50TSFBH065088	65,000-88,000	55,00	125,00	130,00	KM50TS	1,70
3861131	KM63TSFBH065088	65,000-88,000	55,00	130,00	135,00	KM63TS	2,50
3861132	KM63TSFBH088115	88,000-115,000	63,00	130,00	135,00	KM63TS	2,00

■ Spare Parts

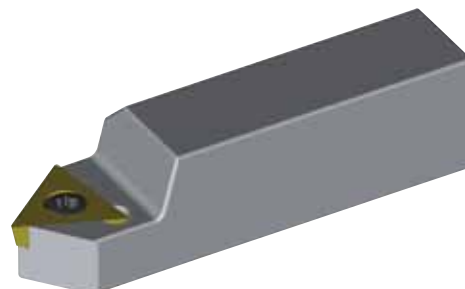
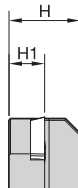
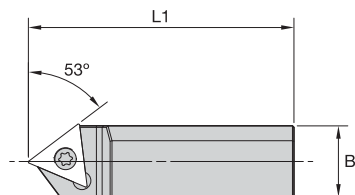
catalogue number	adjusting screw	adjustment locking screw	fixing screw	wedge	hex wrench	hex wrench
KM32TSFBH022029	12147620000	12147680200	12346292100	12147621100	12148041100	12148040900
KM32TSFBH029038	12147620000	12147680300	12346292200	12147621200	12148041100	12148040900
KM32TSFBH038050	12147620300	12147680400	12147622300	12147621300	12148041200	12148041000
KM40TSFBH029038	12147620000	12147680300	12346292200	12147621200	12148041100	12148040900
KM40TSFBH038050	12147620300	12147680400	12147622300	12147621300	12148041200	12148041000
KM40TSFBH050065	12147620400	12147680500	12148575900	12147621400	12148041100	12148041300
KM50TSFBH050065	12147620400	12147680500	12148575900	12147621400	12148041100	12148041300
KM50TSFBH065088	12147620500	12147680600	12148087100	12147621500	12148041200	12148041400
KM63TSFBH065088	12147620500	12147680600	12148087100	12147621500	12148041200	12148041400
KM63TSFBH088115	12147620600	12147680700	12148087100	12147621600	12148041200	12148079000





■ Precision Head Insert Holder • C-Style

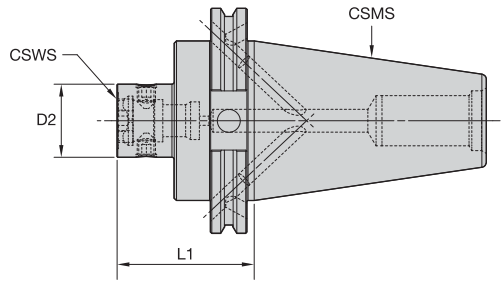
order number	catalogue number	D min	D max	L1	H	H1	B	gage insert	clamping screw	Torx wrench	Nm
2004781	12627270300	22,00	29,00	19,00	8,00	4,50	8,00	CC../CP..0602..	12148068700	12148086600	1,0
2004782	12627275300	29,00	38,00	27,00	8,00	4,50	8,00	CC../CP..0602..	12148068700	12148086600	1,0
2004133	12627270700	38,00	50,00	35,00	10,00	5,50	10,00	CC../CP..0602..	12148068700	12148086600	1,0
2004140	12627276500	50,00	65,00	46,00	12,00	6,50	12,00	CC../CP..0602..	12148068700	12148086600	1,0
2004161	12627277700	65,00	88,00	60,00	16,00	8,00	16,00	CC../CP..09T3..	12148038800	12148082400	3,0
2004177	12627278700	88,00	115,00	84,00	16,00	8,00	16,00	CC../CP..09T3..	12148038800	12148082400	3,0





■ Precision Head Insert Holder • T-Style

order number	catalogue number	D min	D max	L1	H	H1	B	gage insert	clamping screw	Torx wrench	Nm
2004134	12627270800	38,00	50,00	35,00	10,00	5,50	10,00	TC../TP..1102..	 12148068700	 12148086600	1,0
2004141	12627276800	50,00	65,00	46,00	12,00	6,50	12,00	TC../TP..1102..	12148068700	12148086600	1,0
2004162	12627277800	65,00	88,00	60,00	16,00	8,00	16,00	TC../TP..1102..	12148038800	12148082400	3,0
2004178	12627278800	86,00	115,00	84,00	16,00	8,00	16,00	TC../TP..1102..	12148038800	12148082400	3,0



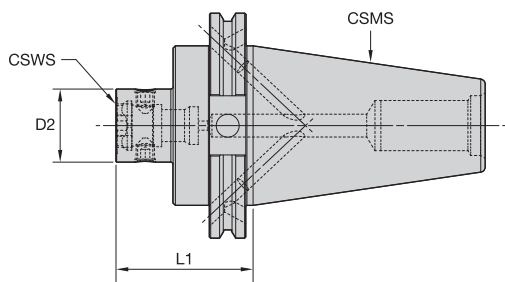
■ RFX • CV40 Taper Shank Form B/AD

order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3860896	CV40BRFX185236	CV40	RFX185	18,5	60,0	1,1	RFX185LS	12148041100	6,0
3860897	CV40BRFX245236	CV40	RFX245	24,5	60,0	1,1	RFX245LS	12148041100	8,0
3860898	CV40BRFX320236	CV40	RFX320	32,0	60,0	1,1	RFX320LS	12148041200	14,0
3860899	CV40BRFX420236	CV40	RFX420	42,0	60,0	1,1	RFX420LS	12148041300	16,0
3860900	CV40BRFX550256	CV40	RFX550	55,0	65,0	1,2	RFX550LS	12148041400	20,0

NOTE: Lock screws included. Order retention knobs separately.

Hole Finishing

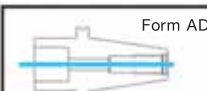








	Form AD					
	Form B					
			40	(2x) MS2221S	2,5mm	
			50	(2x) MS1296S	3mm	

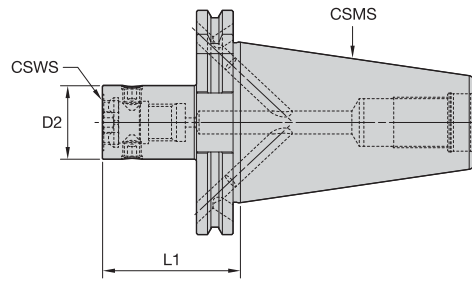


■ **RFX • CV50 Taper Shank Form B/AD**

order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3860901	CV50BRFX320236	CV50	RFX320	32,0	60,0	3,1	RFX320LS	12148041200	12,0
3860902	CV50BRFX420236	CV50	RFX420	42,0	60,0	3,2	RFX420LS	12148041300	20,0
3860903	CV50BRFX550236	CV50	RFX550	55,0	60,0	3,4	RFX550LS	12148041400	25,0
3860904	CV50BRFX720276	CV50	RFX720	72,0	70,0	3,6	RFX720LS	12148041400	25,0

NOTE: Lock screws included. Order retention knobs separately.

					
Form AD					
			40	(2x) MS2221S	2,5mm
Form B			50	(2x) MS1296S	3mm

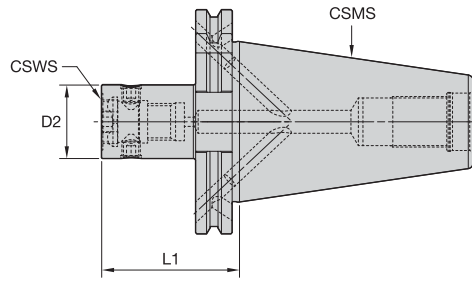


■ RFX • DV40 Taper Shank Form B/AD

order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3860696	DV40BRFX185060M	DV40	RFX185	18,5	60,0	1,1	RFX185LS	12148041100	6,0
3860697	DV40BRFX245060M	DV40	RFX245	24,5	60,0	1,1	RFX245LS	12148041100	8,0
3860698	DV40BRFX320060M	DV40	RFX320	32,0	60,0	1,1	RFX320LS	12148041200	14,0
3860699	DV40BRFX420060M	DV40	RFX420	42,0	60,0	1,1	RFX420LS	12148041300	16,0
3860700	DV40BRFX550065M	DV40	RFX550	55,0	65,0	1,2	RFX550LS	12148041400	20,0

NOTE: Lock screws included. Order retention knobs separately.






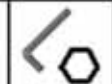



<p>Form AD</p>					
<p>Form B</p>			40	(2x) MS2221S	2,5mm
			50	(2x) MS1296S	3mm

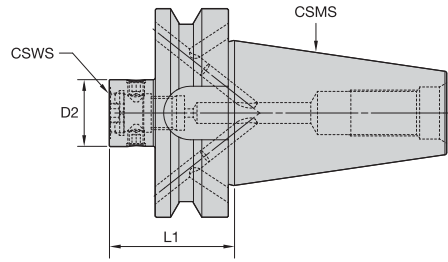


■ RFX • DV50 Taper Shank Form B/AD

order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3860701	DV50BRFX320060M	DV50	RFX320	32,0	60,0	3,1	RFX320LS	12148041200	14,0
3860702	DV50BRFX420060M	DV50	RFX420	42,0	60,0	3,2	RFX420LS	12148041300	16,0
3860853	DV50BRFX550060M	DV50	RFX550	55,0	60,0	3,4	RFX550LS	12148041400	20,0
3860854	DV50BRFX720065M	DV50	RFX720	72,0	65,0	3,6	RFX720LS	12148041400	20,0

NOTE: Lock screws included. Order retention knobs separately.

 <p>Form AD</p>					
 <p>Form B</p>			<p>40</p>	<p>(2x) MS2221S</p>	<p>2,5mm</p>
			<p>50</p>	<p>(2x) MS1296S</p>	<p>3mm</p>



■ RFX • BT40 Taper Shank Form B/AD

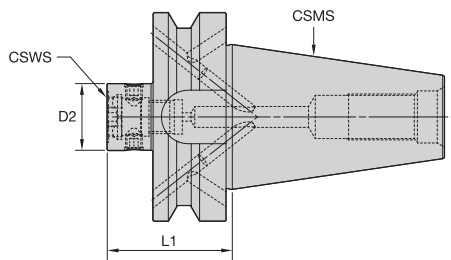
order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3860676	BT40BRFX185060M	BT40	RFX185	18,5	60,0	1,0	RFX185LS	12148041100	8,0
3860677	BT40BRFX245060M	BT40	RFX245	24,5	60,0	1,1	RFX245LS	12148041100	8,0
3860678	BT40BRFX320060M	BT40	RFX320	32,0	60,0	1,1	RFX320LS	12148041200	12,0
3860679	BT40BRFX420060M	BT40	RFX420	42,0	60,0	1,2	RFX420LS	12148041300	20,0
3860680	BT40BRFX550065M	BT40	RFX550	55,0	65,0	1,3	RFX550LS	12148041400	25,0

NOTE: Lock screws included. Order retention knobs separately.



Hole Finishing

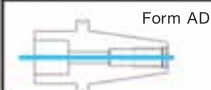







	Form AD					
	Form B					
			40	(2x) MS2221S	2,5mm	
			50	(2x) MS1296S	3mm	

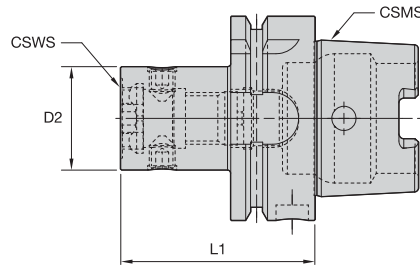


■ RFX • BT50 Taper Shank Form B/AD

order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3860681	BT50BRFX320060M	BT50	RFX320	32,0	60,0	3,5	RFX320LS	12148041200	14,0
3860682	BT50BRFX420060M	BT50	RFX420	42,0	60,0	3,9	RFX420LS	12148041300	16,0
3860693	BT50BRFX550065M	BT50	RFX550	55,0	65,0	4,2	RFX550LS	12148041400	25,0
3860694	BT50BRFX720070M	BT50	RFX720	72,0	70,0	4,5	RFX720LS	12148041400	25,0

NOTE: Lock screws included. Order retention knobs separately.

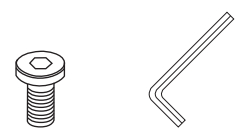
 <p>Form AD</p>				
 <p>Form B</p>			<p>40</p> <p>50</p>	<p>(2x) MS2221S 2,5mm</p> <p>(2x) MS1296S 3mm</p>

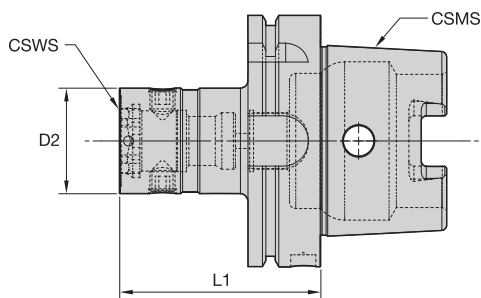


■ RFX • HSK63 Form A

order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3860549	HSK63ARFX185060M	HSK63A	RFX185	18,5	60,0	0,7	RFX185LS	12148041100	6,0
3860550	HSK63ARFX245060M	HSK63A	RFX245	24,5	60,0	0,7	RFX245LS	12148041100	8,0
3860551	HSK63ARFX320060M	HSK63A	RFX320	32,0	60,0	0,8	RFX320LS	12148041200	14,0
3860552	HSK63ARFX420070M	HSK63A	RFX420	42,0	70,0	1,0	RFX420LS	12148041300	16,0
3860623	HSK63ARFX550080M	HSK63A	RFX550	55,0	80,0	1,4	RFX550LS	12148041400	20,0
3860624	HSK63ARFX720095M	HSK63A	RFX720	72,0	95,0	2,0	RFX720LS	12148041400	20,0

NOTE: Lock screws included. HSK coolant unit and wrench are available but must be ordered separately.

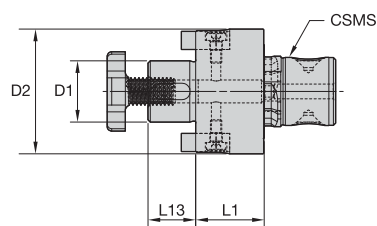




■ RFX • HSK100 Form A

order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3881208	HSK100ARFX420080M	HSK100A	RFX420	42,0	80,0	1,0	RFX420LS	12148041300	20,0
3881209	HSK100ARFX550090M	HSK100A	RFX550	55,0	90,0	2,2	RFX550LS	12148041400	25,0
3881210	HSK100ARFX720105M	HSK100A	RFX720	72,0	105,0	2,5	RFX720LS	12148041400	25,0

NOTE: Lock screws included. HSK coolant unit and wrench are available but must be ordered separately.



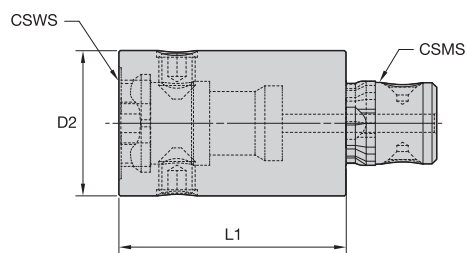
■ **CS-RFX Adaptor • Lock Screw Design**

order number	catalogue number	CSMS system size	D1	D2	L1	L13	kg
3860547	RFX550CS27030M	RFX550	27,0	55,0	30,0	21,0	0,9
3860548	RFX720CS40035M	RFX720	40,0	72,0	35,0	27,0	1,8

■ **Spare Parts**

catalogue number	lock screw
RFX550CS27030M	12147522400
RFX720CS40035M	KLS40M

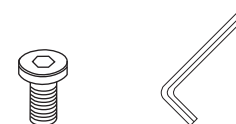


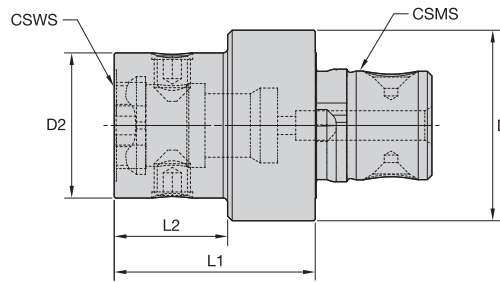


■ RFX Extensions

order number	catalogue number	CSMS system size	CSWS system size	D2	L1	kg	lock screw	hex wrench	Nm
3860450	RFX185RFX185030M	RFX185	RFX185	18,5	30,0	0,1	RFX185LS	12148041100	6,0
3860451	RFX245RFX245035M	RFX245	RFX245	24,5	35,0	0,2	RFX245LS	12148041100	8,0
3860452	RFX320RFX320050M	RFX320	RFX320	32,0	50,0	0,3	RFX320LS	12148041200	14,0
3860473	RFX420RFX420060M	RFX420	RFX420	42,0	60,0	0,8	RFX420LS	12148041300	16,0
3860474	RFX550RFX550090M	RFX550	RFX550	55,0	90,0	1,6	RFX550LS	12148041400	20,0
3860475	RFX720RFX720100M	RFX720	RFX720	72,0	100,0	3,1	RFX720LS	12148041400	25,0

NOTE: Lock screws included.





■ RFX Reducers

order number	catalogue number	CSMS system size	CSWS system size	D	D2	L1	L2	kg	lock screw	hex wrench	Nm
3860419	RFX320RFX185030M	RFX320	RFX185	32,0	18,5	30,0	15,0	0,2	RFX185LS	12148041100	6,0
3860420	RFX320RFX245040M	RFX320	RFX245	32,0	24,5	40,0	25,0	0,2	RFX245LS	12148041100	8,0
3860421	RFX420RFX185035M	RFX420	RFX185	42,0	18,5	35,0	15,0	0,4	RFX185LS	12148041100	6,0
3860422	RFX420RFX245045M	RFX420	RFX245	42,0	24,5	45,0	25,0	0,4	RFX245LS	12148041100	8,0
3860443	RFX420RFX320045M	RFX420	RFX320	42,0	32,0	45,0	25,0	0,6	RFX320LS	12148041200	14,0
3860444	RFX550RFX185040M	RFX550	RFX185	55,0	18,5	40,0	15,0	0,7	RFX185LS	12148041100	6,0
3860445	RFX550RFX245050M	RFX550	RFX245	55,0	24,5	50,0	25,0	0,8	RFX245LS	12148041100	8,0
3860446	RFX550RFX320050M	RFX550	RFX320	55,0	32,0	50,0	25,0	0,8	RFX320LS	12148041200	14,0
3860447	RFX550RFX420055M	RFX550	RFX420	55,0	42,0	55,0	30,0	0,9	RFX420LS	12148041300	16,0
3860448	RFX720RFX420060M	RFX720	RFX420	72,0	42,0	60,0	30,0	1,6	RFX420LS	12148041300	16,0
3860449	RFX720RFX550060M	RFX720	RFX550	72,0	55,0	60,0	30,0	1,8	RFX550LS	12148041400	20,0

NOTE: Lock screws included.



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Customer Application Support (CAS)

EXTREME **CHALLENGES.**
EXTREME **RESULTS.**

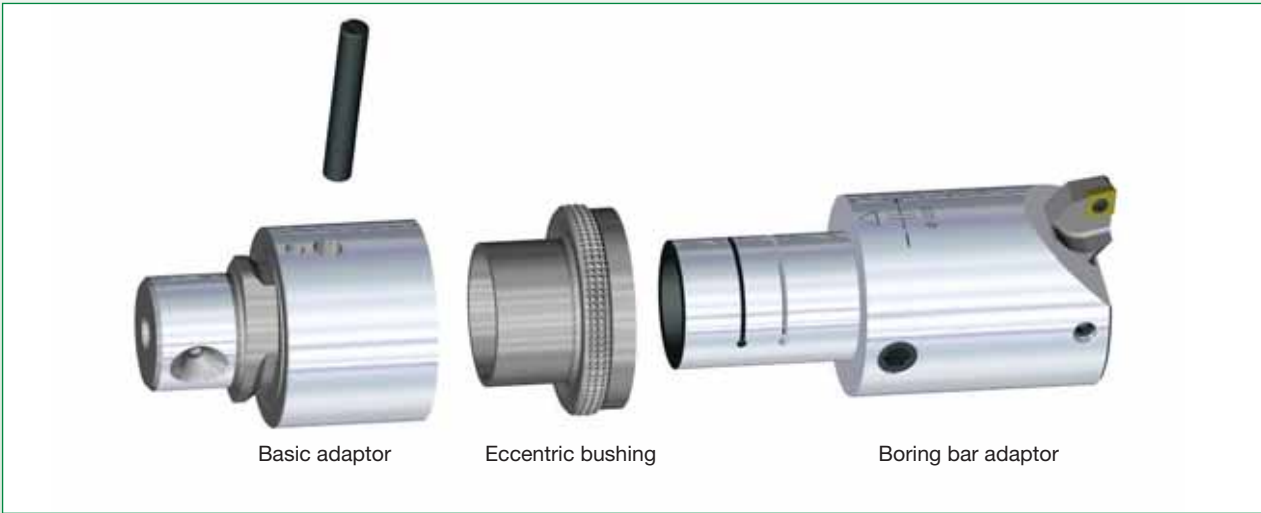
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WIDIA 

Design Principle



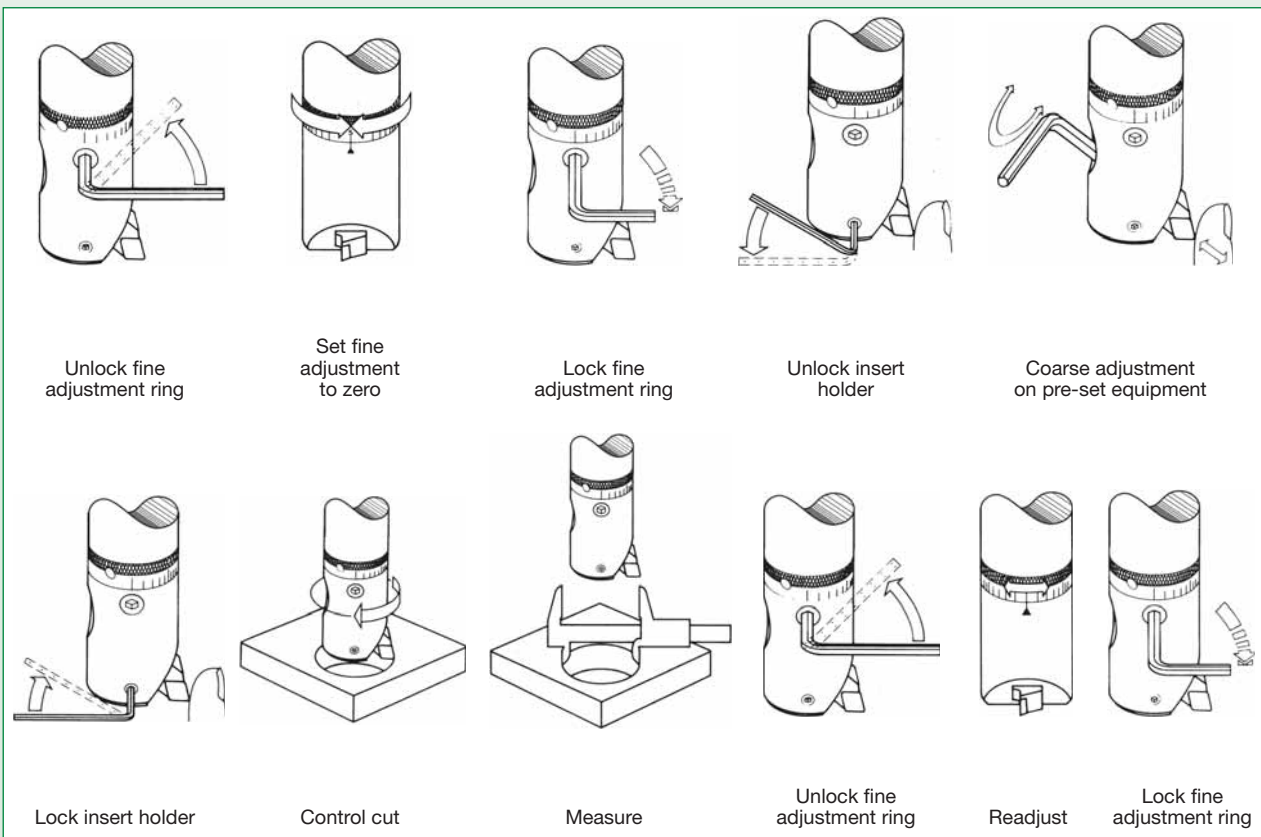
Eccentric bushing for fine adjustment

Regular fine boring heads have a threaded spindle as an adjustment mechanism. In this situation, spindle inaccuracy can cause backlash and require extra effort during setup. The ROTAFLEX eccentric bushing is easy to use, and machining forces are transmitted via a larger surface, ensuring a consistent diameter during machining.

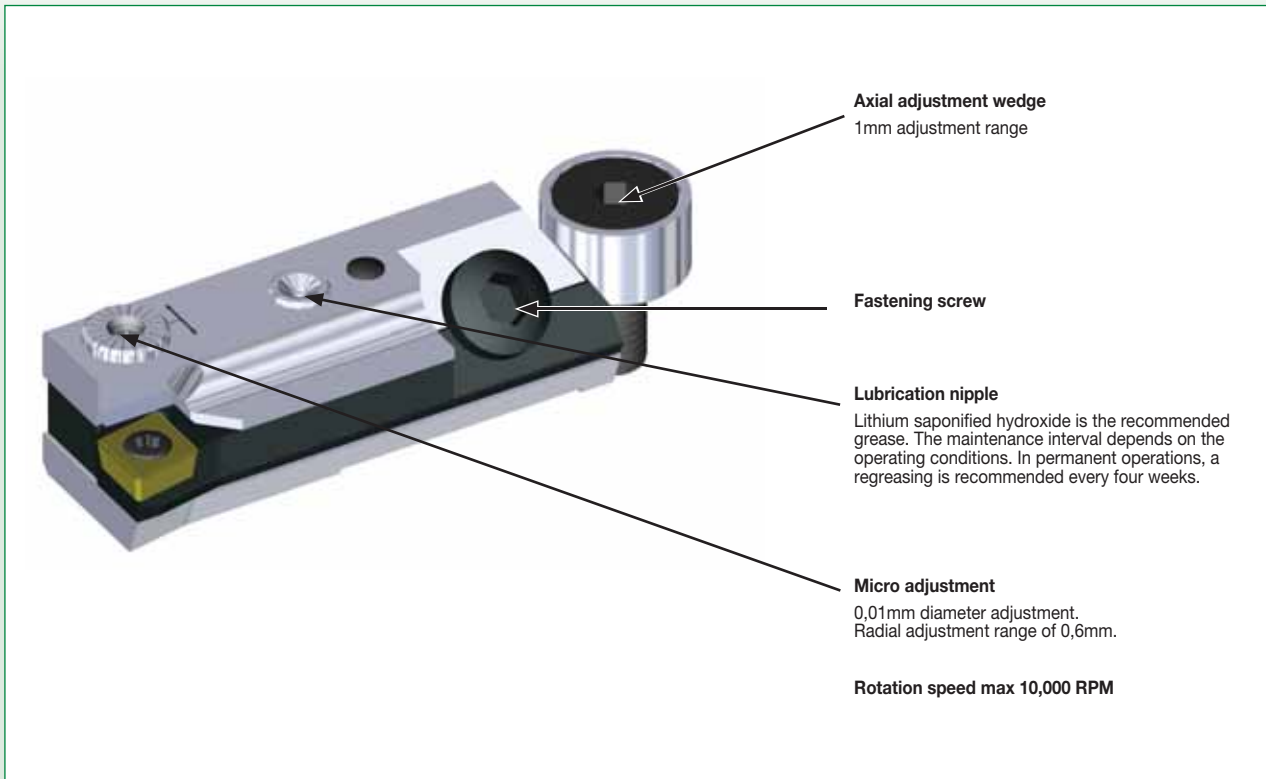


After rough adjustment of the insert holder, the easy-to-read scale enables fine adjustment to reach precisely the diameter needed. Here, no parallax errors occur when reading the scale.

Adjustment

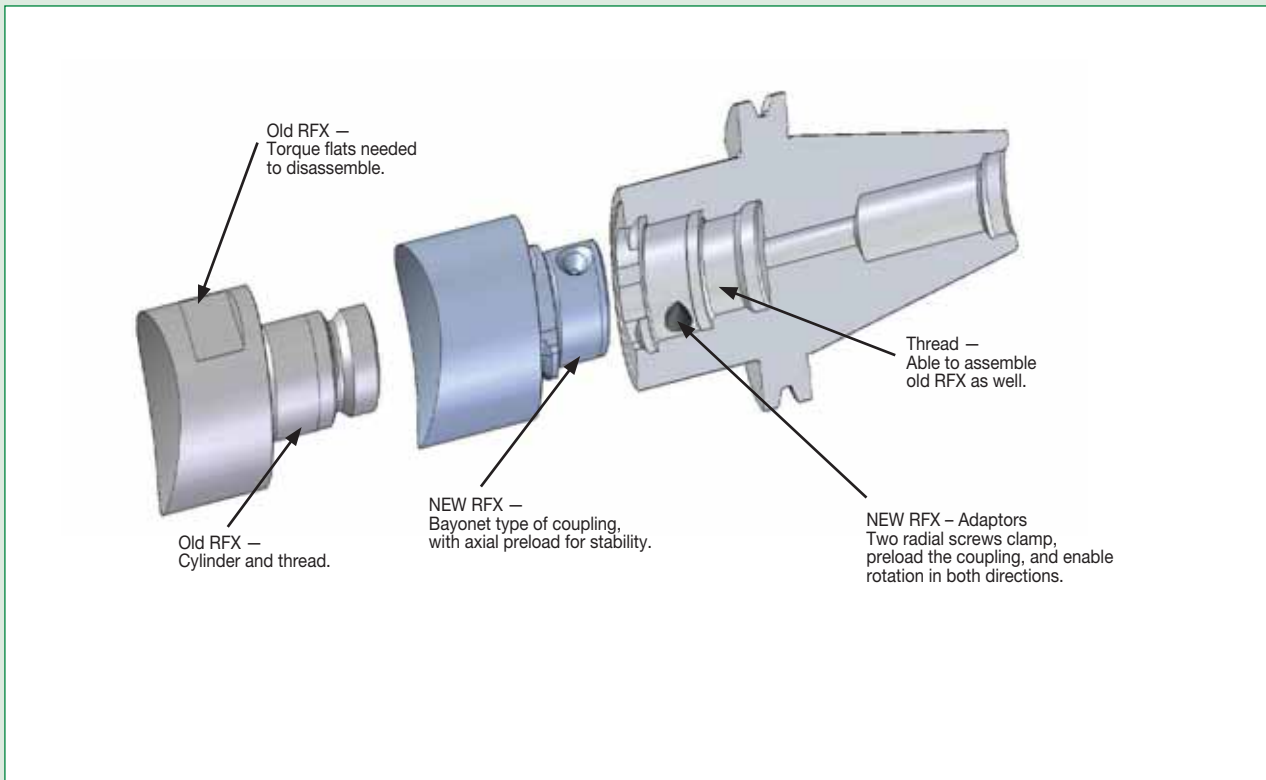


Application Hints • Micro-Adjustable Cartridges



Application Hints • RFX Coupling

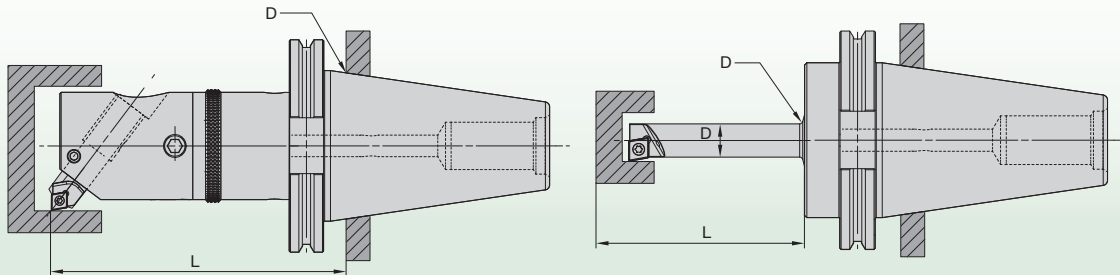
Old RFX screw-type coupling can be mounted into new RFX bayonet-type adaptors as well.



General Application Hints

- Identify your critical diameter (D).
- Identify the maximum distance cutting edge (L) to critical diameter.

Here are some examples:



Refer to this table for first investigation of application:

Type of Tooling	Stable	Unstable	Tests Necessary
Twin Cutter Solid Tools	<3,5 x D	3,5–6,5 x D	>6,5 x D
Twin Cutter Bridge Tools	<3,5 x D	3,5–6,5 x D	>6,5 x D
Fine-Boring Heads with Boring Bar (FBHBB)	<3,5 x D	3,5–5,0 x D	>5,0 x D
Fine-Boring Heads (FBH)	<3,5 x D	3,5–5,0 x D	>5,0 x D
Fine-Boring Bridge Tools	<3,5 x D	3,5–5,0 x D	>5,0 x D
	Function of the tool is expected without issues within recommended cutting data.	Application may require reduced feeds and/or speeds compared to stable conditions.	Machining test may be required to identify cutting data.

Causes of and remedies for rough and fine boring problems

It is generally assumed that the tools have been properly mounted as per the technical recommendations in this catalogue.

Problem	Cause	Possible Remedy
Vibration tendency	<ol style="list-style-type: none"> 1. Overhang 2. Choice of insert 3. Cutting data 	<ul style="list-style-type: none"> • Adjust L/D ratio • Select 90° lead angle on rough boring tools • Select inserts with positive geometry • Select inserts with smaller corner radius • Reduce depth of cut • Increase feed
Slight chatter marks on surface	<ol style="list-style-type: none"> 1. Choice of insert 2. Cutting data 3. Machining environment 	<ul style="list-style-type: none"> • Select 90° lead angle • Select ground inserts with small edge preparation • Select inserts with smaller corner radius • Increase feed • Increase coolant
Conical bores	<ol style="list-style-type: none"> 1. Choice of insert 2. Cutting data 3. Machining environment 	<ul style="list-style-type: none"> • Select a more wear-resistant insert grade • Increase cutting speed • Check whether all screws have been tightened to recommended torque

Inserts Overview

Geometry	Application	ANSI catalogue number	ISO catalogue number	P			M		K		S	
				WP15CT	WP25CT	WP35CT	WM15CT	WM25CT	WK05CT	WK20CT	WS10PT	WS25PT
	CCMT-FP • Fine Finishing	CCMT2151FP	CCMT060204FP	•	•		•	•		•	•	•
		CCMT3251FP	CCMT09T304FP	•	•		•	•		•	•	•
	CCMT-MU • Medium to Finishing	CCMT2152MU	CCMT060208MU					•		•		
		CCMT3251MU	CCMT09T304MU	•	•			•	•	•	•	•
		CCMT3252MU	CCMT09T308MU	•	•	•		•		•	•	•
		CCMT432MU	CCMT120408MU	•	•			•		•		•
	CCMT-MP • Roughing to Medium	CCMT2151MP	CCMT060204MP	•	•		•	•		•	•	
		CCMT3251MP	CCMT09T304MP	•	•		•	•		•	•	
		CCMT3252MP	CCMT09T308MP	•	•		•	•		•	•	
		CCMT432MP	CCMT120408MP	•	•		•	•		•	•	
		CCMT433MP	CCMT120412MP		•			•	•		•	

Hole Finishing Capabilities and Custom Solutions



With our state-of-the-art CNC equipment and engineering processes, we can design complex geometries for reaming and countersinking. Special countersinks for pre-working and finishing operations minimise machine time and rationalise production. Our custom solution reamers deliver proven performance in applications that demand high surface qualities, narrow fit, alignment tolerances, and long tool life.

Hole Finishing Custom Solution Tool Styles:

- Reaming
- Boring
- Countersinking
- PCD Round Tools

Hole Finishing Capabilities and Custom Solution Services

- Development, design, and production of different types of cutting tools for reaming, boring, and countersinking.
- Services provided by one engineering department fully integrated with all WIDIA™ focused factories.
- Capabilities with all common cutting materials such as high-speed steel (HSS-E), powdered metal, solid carbide, carbide-tipped, cermet, and PCD, with or without internal coolant.
- Complete tool competence from one source, from construction, application engineering, development, and production through tool reconditioning services.

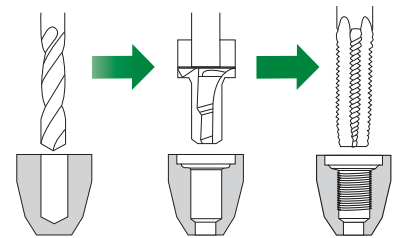


Port Contour Cutters •
For Fluid-Powered Standard Ports

Port Contour Cutters



- Each component has entry and exit points for the fluid involved called ports.
- Port shapes and forms are standardised.
- WIDIA™ offers porting tools to finish these ports in one-shot operations.



Standard Port	Available Cutters
JDS-G173.1	169-0XXX WITH GROOVE & 169-1XXX WITHOUT GROOVE & 269-0XXX WITH GROOVE & 269-1XXX WITHOUT GROOVE
AS5202	169-0XXX WITH GROOVE & 169-1XXX WITHOUT GROOVE & 269-0XXX WITH GROOVE & 269-1XXX WITHOUT GROOVE
ISO-6149-1	169-0XXX WITH GROOVE & 169-1XXX WITHOUT GROOVE & 269-0XXX WITH GROOVE & 269-1XXX WITHOUT GROOVE
SAE J2241/1	169-0XXX WITH GROOVE & 169-1XXX WITHOUT GROOVE & 269-0XXX WITH GROOVE & 269-1XXX WITHOUT GROOVE
NPTF/NPT	186, 187 & 287
MS 16142	163, 253, 263, 267, 367 & 467
CAT.IE2554	163, 253, 263, 267, 367 & 467
SAE J1926-1	163, 253, 263, 267, 367 & 467
BSPP/BSPF	265
AS1300	RCT SERIES/CUSTOM SOLUTION
MS33659	164, 264 & 268
AND10050	164, 264 & 268
ISO-1179-1	255 STD. LGHT. & 265 EXT. LGTH. REAMER
DIN-3852-2	225 SMALL, 235 LARGE & 245 EXT. LGTH. REAMER

Port Contour Cutters

- Dura-bar 65-45-12.
- Component: General cavity.
- Ream SAE#8.
- Surface finish below Ra 32 (inch).

CHALLENGE

- Cermet-tipped port cutting tool.

SOLUTION

- 2100 RPM–20 IPM.
- Flood coolant.
- Machining centre.

CUTTING DATA

- Surface finish of 7–15 RA (inch).

RESULT

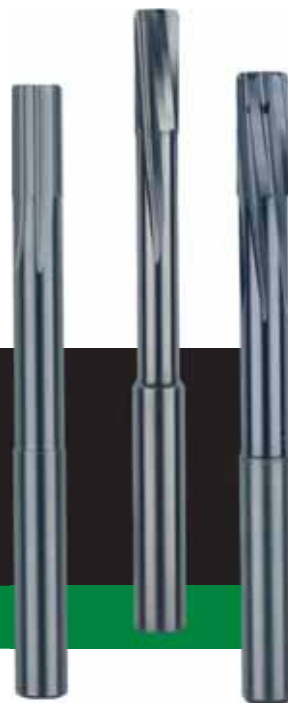
- Increase productivity by one-shot finishing of port.

BENEFIT



Custom Solutions •
Countersinking and Reaming

Reamer Custom Solutions



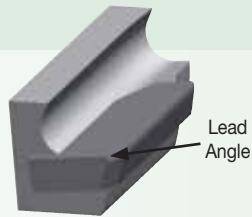
With our state-of-the-art equipment and engineering processes, we can design complex geometries for reaming and countersinking. Special countersinks for pre-working and finishing operations minimise machining time and rationalise production. Our custom solution reamers deliver proven performance in applications that demand high surface qualities, narrow fit, alignment tolerances, and long tool life.



Diameter

- 1,4–50mm (.055–1.968").
- Up to tolerance IT6 depending on application.
- Diameter steps.

Leads

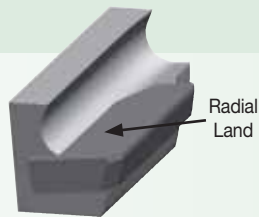


- 25–90° leads for smoother cutting or better positioning.
- Double leads for better surface quality.
- Radius leads for optimal CI machining.

Grades

- Various grades available tailored to your specific application.

Radial Land



- Cylindrical for better guiding and form.
- Upsharp (no land) for best surface finishes and less passive forces.
- Narrow land to reduce forces.

TRM – TOP REAM MODULAR

- Tube holes \varnothing 25,25mm (.994").
- Tolerance range 100 μ m.
- Alloy steel, long-chipping.
- Machining center with internal coolant.

CHALLENGE

- Six cutting edges.
- Coated cermet.
- Standard 5 x D body clamped into hydraulic chuck.

SOLUTION

- $v_c = 90$ m/min (295 SFM).
- $f = 0,48$ mm/rev (.019 IPR).

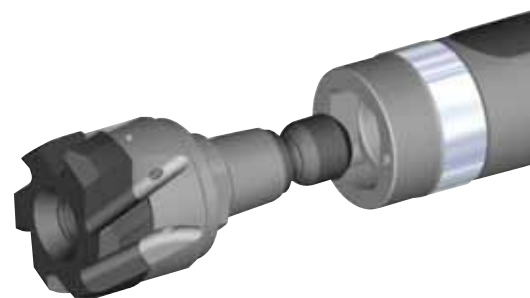
CUTTING DATA

- After more than 30 minutes only minor wear visible.

RESULT

- Reduction of machining time in total to less than 60 minutes per plate with 180 holes.
- Predictable tool life as only 2 μ m diameter deviation after 30 minutes tool life.

BENEFIT



PCD STEP REAMER

- Bearing bore \varnothing 130mm.
- Tolerance range 25 μ m S6.
- Aluminium AISi8Cu3.
- Varying depth of cut ca. 0,5–5mm.
- Machining centre with internal coolant.

CHALLENGE

- PCD tipped, steel-based tool with HSK interface and internal coolant.
- Six effective cutting and chamfering teeth in positive cutting position.

SOLUTION

- $vc = 350$ m/min (1.148 SFM).
- $f = 0,60$ mm/rev (.024 IPR).

CUTTING DATA

- Tool life increase versus previous solution.
- Surface finish Ra 0.2 μ m.

RESULT

- Secure process.
- Most productive solution at large diameter.
- Very long tool life.
- Reconditionable.

BENEFIT

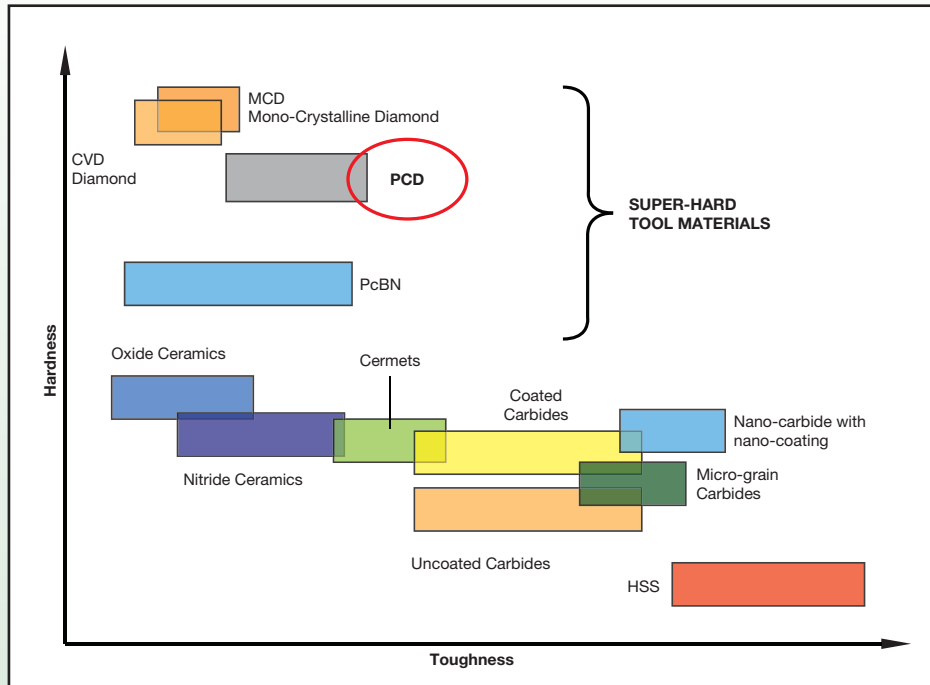


Highly uneven flute design reduces vibrations.



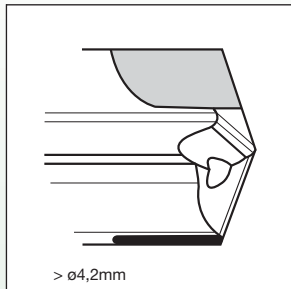
PCD • Round Tools for Holemaking

Cutting Materials • Hardness vs. Toughness



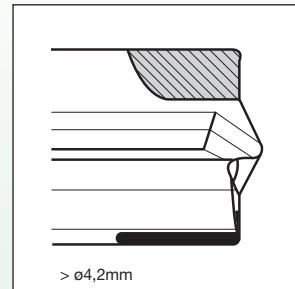
WIDIA™ PCD Drill-Pointed Geometries

Type: **CT**
Corner tipped



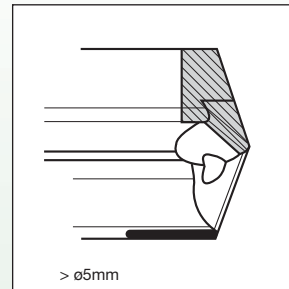
For general applications.

Type: **CTE**
Corner tipped with centre point



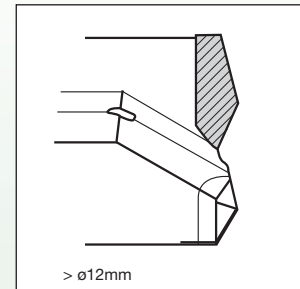
For precasted bores.

Type: **SW**
Sandwich



For highly abrasive materials.

Type: **MT**
For body = steel

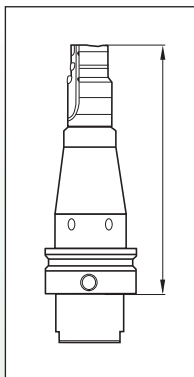


For breaking through the casting skin.

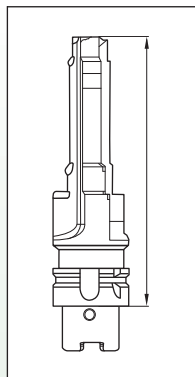
Non-Ferrous Materials

N2	Low-Silicon Aluminium Alloys (Hypoeutectic <12.2% Si) and Magnesium Alloys
N3	High-Silicon Aluminium Alloys (Hypereutectic >12.2% Si) and Magnesium Alloys
N4	Copper, Brass, Zinc-Based Materials
N5	Nylon, Plastics, Rubber, Phenolics, Resins, Fibreglass, Glass
N6	Carbon and Graphite Composites: Brush Alloys, Kevlar, Graphite
N7	MMCs — Aluminium Based Metal Matrix Composites

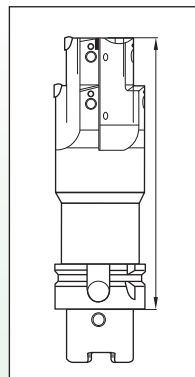
WIDIA™ PCD Styles for Reamers/CS



PKD ST —
Steel Shank



PKD STM —
Monoblock



PKD STMJ —
Adjustable
Cutting Edges

PKD SC —
Solid Carbide
Shank

Material	Coolant Style Grade	Coolant Style Grade	Coolant Style Grade
Al <7%	MQL, Emulsion	PCD SC PCD STM PCD STMU	WBK45U
Al <12%	MQL, Emulsion		WBK45U
Al <12%	Emulsion	PCD SC	WBK45U
Mg Alloys	Emulsion	PCD SC	WBK45U
CFK	Dry	PCD SC	WBK45U