DORMER

FORCE M
FORCE X
FORCE N

HIGH PERFORMANCE SOLID CARBIDE DRILLS

FORCE *M*
FORCE *X*

DORMER

FORCE

HIGH PERFORMANCE SOLID CARBIDE DRILLS

The Force program of solid carbide drills provides excellent levels of performance with outstanding economy.
The range consists of:

FORCE X – versatile solid carbide drills suitable for use in a wide range of materials.

FORCE M – Engineered to provide highest performance and process reliability when drilling Stainless Steels and Heat Resistant Alloys

NEW ***FORCE N*** – Recommended for high speed drilling operations in Wrought and Cast Aluminum Alloys specifically designed for chip control and enhanced chip evacuation

FORCE X FEATURES AND BENEFITS

- Premium micrograin carbide substrate with multi-layer TiAlN coating
- Problem solver providing high productivity and consistent performance and repeatability in multi material applications across diverse machine types and conditions which makes it the ideal choice for general engineering and sub-contract environments
- Modified 4-facet split point design which improves chip formation, strength and wear resistance. Excellent positional accuracy and chip control ensure superior hole quality, tolerance and surface finish
- CTW™ - Unique flute construction with a Continuously Thinned Web and rolled heel design
- Outstandingly economical with easier and multiple regrinding capabilities allowing huge increases in total tool life
- Higher productivity with higher drilling speeds and prolonged tool life
- DIN 6535HA Shanks (with h6 tolerance) to reduce run-out and vibration, improving performance and hole quality. Many diameters on “common shank” sizes to reduce tool holding costs.

FORCE M FEATURES AND BENEFITS

- Premium micrograin carbide substrate with multi-layer TiAlN coating
- Reliable performance with smooth cutting action to prevent the onset of work-hardening and built-up edge
- S-Shape 4-facet split point design with precise thin edge honing and a strong outer corner design.
- Facilitates excellent chip control and better force distribution allowing high penetration rates
- CTW™ - Unique flute construction with a Continuously Thinned Web and rolled heel design
- Exceptional tool life with stronger corner and cutting edges to withstand deformation wear
- DIN 6535HA Shanks (with h6 tolerance) to reduce run-out and vibration, improving performance and hole quality. Many diameters on “common shank” sizes to reduce tool holding costs.

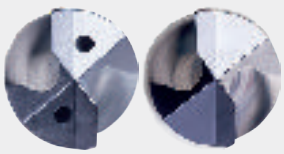
FORCE N FEATURES AND BENEFITS NEW

- Premium micrograin carbide substrate, with bright finish to facilitate chip evacuation
- Superior performance with high drilling speeds and long tool life makes it an economical solution for all types of aluminum from soft to abrasive grades
- Unique geometry with convex cutting edges, a 4-facet self-centering point, special web thinning and higher than standard helix angle
- Optimized design to greatly reduce thrust force improving hole quality and reducing exit burr which occurs when drilling softer materials
- DIN 6535HA Shanks (with h6 tolerance) to reduce run-out and vibration, improving performance and hole quality. Many diameters on “common shank” sizes to reduce tool holding costs.

FORCE

HIGH PERFORMANCE SOLID CARBIDE DRILLS

MULTI MATERIAL

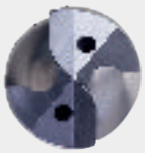


FORCE X

3xD & 5xD solid (R458, R454) & internal coolant (R457, R453)
- Fractional Ø 1/8" to Ø 3/4"
- Metric Ø 3mm to Ø 20mm
- Wire Gauge N1 to N30
- Letters A to Z

8xD internal coolant only (R459)
- Fractional Ø 1/8" to Ø 5/8"
- Metric Ø 3mm to Ø 16mm

STAINLESS STEEL



FORCE M

3xD & 5xD internal coolant only (R467, R463)
- Fractional Ø 1/8" to Ø 5/8"
- Metric Ø 3mm to Ø 16mm

8xD internal coolant only (R469)
- Fractional Ø 1/8" to Ø 5/8"
- Metric Ø 3mm to Ø 16mm

Available upon request
rfq@dormerpramet.com

ALUMINUM

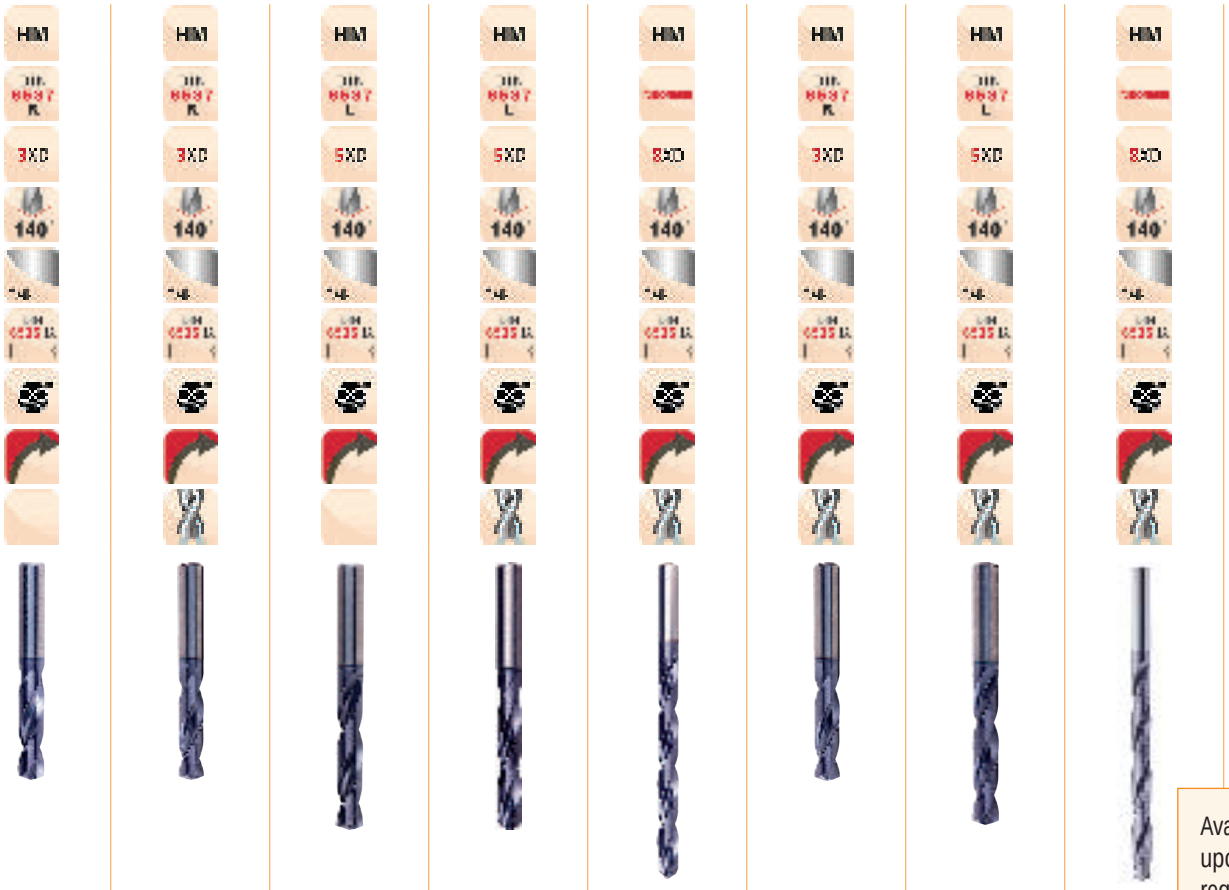
NEW

FORCE N

5xD (R445), 8xD (R448), up to 12xD internal coolant only
- Fractional Ø 1/8" to Ø 5/8"
- Metric Ø 3mm to Ø 16mm

Available upon request
rfq@dormerpramet.com

DORMER

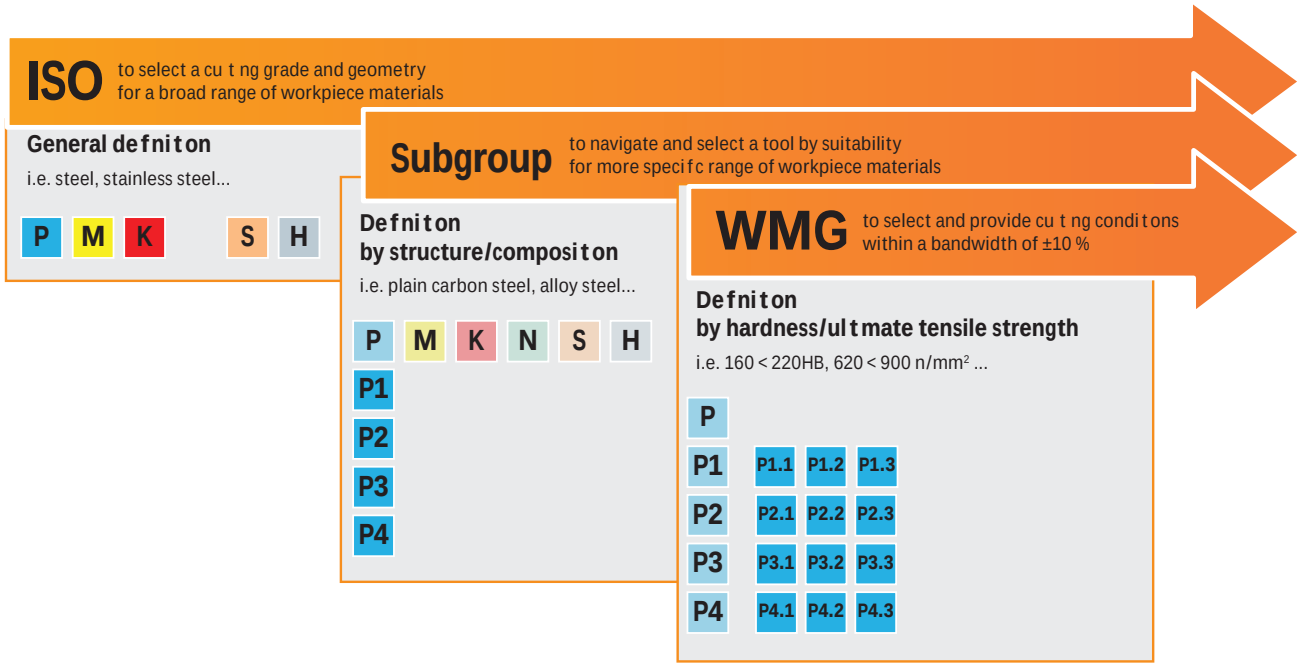


	R458	R457	R454	R453	R459	R467	R463	R469
	3.00 - 20.00	3.00 - 20.00	3.00 - 20.00	3.00 - 20.00	3.00 - 16.00	3.00 - 16.00	3.00 - 16.00	3.00 - 16.00
	FORCE X	*FORCE X*	*FORCE X*	*FORCE X*	*FORCE X*	*FORCE M*	*FORCE M*	*FORCE M*
P	P1	■	■	■	■	■			
	P2	■	■	■	■	■			
	P3	■	■	■	■	■			
	P4	■	■	■	■	■			
M	M1	◪	◪	◪	◪	◪	■	■	■
	M2	◪	◪	◪	◪	◪	■	■	■
	M3	◪	◪	◪	◪	◪	■	■	■
	M4	◪	◪	◪	◪	◪	■	■	■
K	K1	■	■	■	■	■			
	K2	■	■	■	■	■			
	K3	■	■	■	■	■			
	K4	■	■	■	■	■			
	K5	■	■	■	■	■			
N	N1	■	■	■	■	■			
	N2	■	■	■	■	■			
	N3	■	■	■	■	◪			
	N4								
	N5								
S	S1	◪	■	◪	■		■	■	■
	S2						◪	◪	◪
	S3						◪	◪	◪
	S4						◪	◪	◪
H	H1								
	H2	■	■	■	■				
	H3	■	■	■	■				
	H4	■	■	■	■				

Available upon request

■ Main application ◪ Secondary application

WORKPIECE MATERIAL GROUPS (WMG)



ABOUT DORMER PRAMET'S WORKPIECE MATERIAL CLASSIFICATION

Workpiece material groups ("WMG") are used to support easy and reliable selec ton of the right cu t ng tool and star tng values for machining condi tons in par tcular applica tons.

Dormer Pramet classi fes workpiece materials into six di ferent colored groups;

- **Blue**: Steel and cast steel (P-group)
- **Yellow**: Stainless steel (M-group)
- **Red**: Cast iron (K-group)
- **Green**: Non-ferrous metals (N-group)
- **Orange**: High-temperature alloys (S-group)
- **Grey**: Hardened materials (H-group)

Each of these are divided into subgroups based on their structure and/or composi ton. For example, P-group steel and cast steel is split into four subgroups, namely;

- P1 – **Free machining steel**
- P2 – **Plain carbon steel**
- P3 – **Alloy steel**
- P4 – **Tool steel**

A fnal division includes material proper tes, such as hardness and ul tmate tensile strength. This is to provide our customers with a complete tool recommenda ton, including star tng values for cu t ng speed and feed.

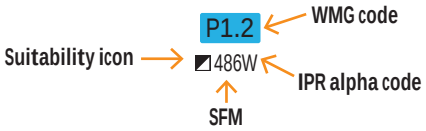
The table on the next page includes a descrip ton of each workpiece material group, as well as examples of commonly used designa tons.

HOW TO USE THE WMG CHART

To fnd speeds and feeds:

- Select the product you want in our catalog or brochure
- Find the appropriate ISO work material group (WMG) at the top of the page

  This will let you know if the tool is suitable for your opera ton and provides the speed (SFM) and alpha character for feed rate (IPR)
- Use the corresponding alpha character to fnd your cu t ng feed rate (IPR) in the chart provided in the WMG sec ton of the catalog or brochure (usually near the front of the publica ton)



DORMER

ISO		WMG (Workpiece Material Groups)			Hardness HB or HRC	Ultimate tensile strength Mpa	Examples of material (AISI-SAE, ASTM, UNS)	Old Dormer AMG	Old Pramet ISO
P	P1	P1.1	Free machining steel	sulfurized	< 240 HB	≤ 760	1108, 1109,1113, 1117, 1118, 1132, 1137, 1139, 1140, 1141…	1.1	P1
		P1.2	(carbon steels with increased machinability)	sulfurized and phosphorized	< 180 HB	≤ 620	1211, 1212, 1213, 1215…	1.1	P1
		P1.3		sulfurized/phosphorized and leaded	< 180 HB	≤ 550	12L13, 12L14, 12L15…	1.1	P1
	P2	P2.1	Plain carbon steel	containing <0.25%C	< 180 HB	≤ 620	1005, 1006, 1008, 1012, 1013, 1513, 1015, 1020, 1022, 1025, 1024, 1025	1.2	P2
		P2.2	(steels comprised of mainly iron and carbon)	containing <0.55%C	< 240 HB	≤ 830	1026, 1526, 1030, 1035, 1536, 1040, 1541, 1042, 1045, 1548, 1050, 1055	1.3	P2
		P2.3		containing >0.55%C	< 300 HB	≤ 1030	1059, 1060, 1561, 1064, 1565, 1065, 1070, 1074, 1078, 1080, 1086, 1090	1.5	P3
	P3	P3.1	Alloy steel	annealed	< 180 HB	≤ 620	1330 -1345…A2317, A2515…3140…4023 - 4047…4118, 4130 - 4137, 4140 - 4147, 4150, 4161… 4320, 4340… 4419, 4422, 4427… 4615 - 4626… 4718, 4720… 4815 - 4820… E50100	1.4	P3
		P3.2	(carbon steels with an alloying content ≤ 10%)	hardened and tempered	180 - 260 HB	> 620 ≤ 900		1.4	P3
		P3.3			260 - 360 HB	> 900 ≤ 1240		1.5	P4
	P4	P4.1	Tool steel	annealed	< 26 HRC	≤ 900	A-2, D4, F-1, H-13, P-2…	1.4	P3
		P4.2	(special alloy steel for tools, dies and molds)	hardened and tempered	26 - 39 HRC	> 900 ≤ 1240	1.1520, 1.1645, 1.2008, 1.2319, 1.2378…	1.5	P4
		P4.3			39 - 45 HRC	> 1250 ≤ 1450	100CrMo5, 38CrCoWV18-17-17, 40CrMoS4, X40CrMoV5-1	1.6	H1
M	M1	M1.1	Ferritic stainless steel		< 160 HB	≤ 520	405, 409, 429, 430, 430F, 434, 436, 439, 441, 442, 443, 444, 446	2.1	M1
		M1.2	(straight chromium non-hardenable alloys)		160 - 220 HB	> 520 ≤ 700	1.4516, 1.4002, 1.4589, 1.4595, 1.4017, 1.4590, 1.4749, 1.4713, 1.4724	2.1	M1
	M2	M2.1	Martensitic stainless steel	annealed	< 200 HB	≤ 670	403, 410, 420, 422, 455, 490 1.4000, 1.4021, 1.4024, 1.4028, 1.4031, 1.4034, 1.4110, 1.4122,1.4313,1.4418,1.4419, 1.4422, 1.4423, 1.4592, 1.4762	2.3	M2
		M2.2	(straight chromium hardenable alloys)	quenched and tempered	200 - 280 HB	> 670 ≤ 950		2.3	M2
		M2.3		precipitation-hardened	280 - 380 HB	> 950 ≤ 1300		2.4	M2
	M3	M3.1	Austenitic stainless steel		< 200 HB	≤ 750	201, 202, 204, 205, 301, 3012, 303, 304, 305, 308, 316, 317, 321, 347	2.2	M3
		M3.2	(chromium-nickel and chromium-nickel-manganese alloys)		200 - 260 HB	>750 ≤ 870	201L, 301L, 303Se, 304H, 304L, 304LN, 309Cb, 316Ti, 317LMN, 347H	2.2	M3
		M3.3			260 - 300 HB	> 870 ≤ 1040	1.4308, 1.4301, 1.4305, 1.4311, 1.4552, 1.4401, 1.4571, 1.4878, 1.4961	2.2	M3
	M4	M4.1	Austenitic-ferritic (DUPLEX) or super-austenitic stainless steel		< 300 HB	≤ 990	310MoLN, 314, 904L, 330, S32304, 1.4362, 1.4462, 1.4854.1.4529	2.3	M4
		M4.2	Precipitation hardening austenitic stainless steel		300 - 380 HB	≤ 1320	630, 632, 635, PH13-8Mo, 15-5PH, PH15-7Mo, S15500, S17400	2.4	M4
K	K1	K1.1	Gray iron (ASTM A48) or	ferritic or ferritic-pearlitic	< 180 HB	≤ 190	GG10, GG15, G1800, ASTM Grades 20 and 25	3.1	K1
		K1.2	Automotive Gray iron (ASTM A159)	ferritic-pearlictic or pearlitic	180 - 240 HB	> 190 ≤ 310	GG20, GG25, G2500, G3000, A48 Class 25 and 30	3.2	K1
		K1.3	(iron-carbon castings with a lamellar graphite microstructure)	pearlitic	240 - 280 HB	>310 ≤ 390	GG30, GG35, G3500, G4000, A48 Class 50	3.2	K1
	K2	K2.1	Malleable iron (ASTM A602)	ferritic	< 160 HB	≤ 400	GTS-35-10, GTW-35-04, GTW-S-38-12, GTW-40-05, A47 grade 22010	3.3	K2
		K2.2	(iron-carbon castings with a graphite-free microstructure)	ferritic or pearlitic	160 - 200 HB	> 400 ≤ 550	GTS-45-06, GTW45-07	3.3	K2
		K2.3		pearlitic	200 - 240 HB	> 550 ≤ 660	GTS55-04, GTS-65-02, GTS-70-02, 5.4204, KTB 550-04	3.4	K2
	K3	K3.1	Ductile iron (ASTM A536)	ferritic	< 180 HB	≤ 560	GGG-35,3, GGG-40, GGG-50, A439 types D-2C and D-3A	3.3	K3
		K3.2	(iron-carbon castings with a nodular graphite microsturcture)	ferritic or pearlitic	180 - 220 HB	> 560 ≤ 680	GGG-60, GGG-70, A476, SA-476	3.3	K4
		K3.3		pearlitic	220 - 260 HB	> 680 ≤ 800	GGG-80, A897 grade 1050/700/7, AD 1600, F34800	3.4	K4
	K4	K4.1	Austenitic gray iron (ASTM A436)		< 180 HB	≤ 610	GGG & GGL-NiMn 13 7, GGG & GGL-NiCr 20 3, 0.6652, 0.7652		
		K4.2	Austenitic ductile iron (ASTM A439 or ASTM A571)		< 240 HB	> 610 ≤ 840	GGL-NiSiCr 30 5 5, GGG-NiSiCCr 30 5 5, 0.6680, 0.7680		
		K4.3	Austempered ductile iron (ASTM A897)		< 280 HB	> 840 ≤ 980	A897 GRADE 1, A897 GRADE 2, A897 GRADE 3…		
		K4.4	(iron-carbon alloy castings with an ausferrite microstructure)		280 - 320 HB	> 980 ≤ 1130	EN-GJS-800-8, EN-GJS-800-10, EN-GJS-900-8, EN-GJS-1050-6, EN-GJS-1200-3		
		K4.5			320 - 360 HB	> 1130 ≤ 1280			
	K5	K5.1	Compacted graphite iron CGI (ASTM A842)	ferritic	< 180 HB		A842-300, 5.2100, 5.2200, EN-GJV-300, EN-GJV-350		
		K5.2	(iron-carbon castings with a vermicular graphite structure)	ferritic or pearlitic	180 - 220 HB		A842-300, 5.2100, EN-GJV-300, EN-GJV-350, -400, -450		
		K5.3		pearlitic	220 - 260 HB		EN-GJV-400, EN-GJV-450, EN-GJV-500		
N	N1	N1.1	Commercially pure wrought aluminum		< 60 HB	≤ 240	AI99.8, AI99.0Cu, AA1050, AA1100, AA1175, 3.0255, 3.0275, 3.0205	7.1	N1
		N1.2	Wrought aluminum alloys	half hard tempered	60 - 100 HB	> 240 ≤ 400	AlCu4MgSi, AlMn1Mg1, AA2017, AA3003, AA4043, 3.1325, 3.1355	7.1	N1
		N1.3		full hard tempered	100 - 150 HB	> 400 ≤ 590	AlMg1SiPb, AlZn6CuMgZn, AlZn5.5MgCu, AA6262, AA7050, 3.0517	7.2	N2
	N2	N2.1	Cast aluminum alloys		< 75 HB	≤ 240	G-AlCu4S, GAlSI5Cu1Mg, G-AlSi7Mg, A295.0, A355.0, LM11, LM21, LM25	7.3	N1
		N2.2			75 - 90 HB	> 240 ≤ 270	G-AlSi5Cu1Mg, G-AlSi7Mg, A242.0, A319.0, LM14, LM4, LM16	7.3	N1
		N2.3			90 - 140 HB	> 270 ≤ 440	G-AlCu4MgTi, G-AlCu4Ni2Mg2, A204.0, A771.0, LM30, LM24, ELT-204	7.3	N2
	N3	N3.1	Free-cutting copper-alloys materials with excellent machining properties				CuPb1P, CuSP, CuZn39Pb3, 2.1498, 2.1546, 2.0780, C18700, C79800, C34200	6.3	N3
		N3.2	Short-chip copper-alloys with good to moderate machining properties				CuNi3Si, CuZn40, CuZn40Al2, 2.0857, 2.0360, 2.0550, CZ109, CZ135, C28000	6.2	N3
		N3.3	Electrolytic copper and long-chip copper-alloys with moderate to poor machining properties				Cu-OFE, SF-Cu, CuNi2Be, 2.0070, 2.0090, 2.0855, C103, C10100,C12200	6.1	N4
	N4	N4.1	Thermoplastic polymers				Polyole□ne, PE, PP, Styrol, PS, SAN, ABS, PMMA, Acryl, PC	8.1	
		N4.2	Thermosetting polymers				Aramid, Epoxy, Fluoropolymer, Melamine, Mehacrylate, Phenolic, Polyester	8.2	
		N4.3	Reinforced polymers or composites				GFK, CFK, GMT, LFT, SMC, Kevlar, Honeycomb, Organo	8.3	
	N5	N5.1	Graphite				Extruded, Compression Molded and Isostatically Pressed	10.1	
S	S1	S1.1	Titanium or titanium alloys		< 200 HB	≤ 660	R50250, 3.7025, T35, 2TA1, R50400, 3.7035, 2TA2,	4.1	S1
		S1.2			200 - 280 HB	> 660 ≤ 950	TA6V, Ti-6Al-4V, Ti 10.2.3, Ti5553	4.2	S1
		S1.3			280 - 360 HB	> 950 ≤ 1200		4.3	S1
	S2	S2.1	Fe-based high-temperature alloys		< 200 HB	≤ 690	A-286, Discaloy, Haynes 556, Iconel 909, Greek Ascolloy		S2
		S2.2			200 - 280 HB	> 690 ≤ 970			S2
	S3	S3.1	Ni-based high-temperature alloys		< 280 HB	≤ 940	Inconel 718, 706 Waspalloy, Udimet 720, Inconel 625	5.2	S3
		S3.2			280 - 360 HB	> 940 ≤ 1200		5.3	S3
	S4	S4.1	Co-based high-temperature alloys		< 240 HB	≤ 800	Haynes 25, Stellite 21, 31		S4
		S4.2			240 - 320 HB	> 800 ≤ 1070			S4
H	H1	H1.1	Chilled cast iron		< 440 HB		GHK-CrNi 350, GHK-470, GHK-475		
	H2	H2.1	Hardened cast iron		< 55 HRC		GHK-500, GHK-530, EN-GJN-HV550, EN-GJN-HV600, EN-GJN-HV600(XCr11),		H2
		H2.2			> 55 HRC		EN-GJN-HV600(XCr14), EN-GJN-NH600(XCr18)		H2
	H3	H3.1	Hardened steel <55HRC		< 51 HRC		1026, 1526… 1059, 1060… 1090, 1330… A2317, A2515… 3140… 4023… 4118, 4130…E50100… 50B40, 50B44… 5120, 5130… A-2, D-4, F-1, H-13, P-2… 1.1520, 1.2319, 1.2378… 100CrMo5, 38CrCoWV18 17-17, 40CRMoS4, X40CrMoVS-1…	1.7	H3
		H3.2			51 - 55 HRC			1.7	H3
	H4	H4.1	Hardened steel >55HRC		55 - 59 HRC			1.8	H4
		H4.2			> 59 HRC			1.8	H4

HM

	Ø D (decimal inch)									
	0.1181	**0.1575**	**0.1969**	**0.2362**	**0.3150**	**0.3937**	**0.4724**	**0.5905**	**0.6299**	**0.7874**
E	0.0024	0.0028	0.0031	0.0036	0.0045	0.0055	0.0059	0.0068	0.0071	0.0085
F	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.0070	0.0080	0.0083	0.0098
G	0.0033	0.0038	0.0043	0.0050	0.0063	0.0075	0.0081	0.0091	0.0094	0.0110
T	0.0016	0.0020	0.0024	0.0028	0.0035	0.0043	0.0051	0.0063	0.0067	0.0075
U	0.0028	0.0031	0.0035	0.0042	0.0055	0.0067	0.0079	0.0088	0.0091	0.0094
V	0.0039	0.0045	0.0051	0.0060	0.0079	0.0098	0.0110	0.0122	0.0126	0.0134
W	0.0051	0.0059	0.0067	0.0079	0.0102	0.0130	0.0150	0.0165	0.0169	0.0177

Inches per Rev. (IPR)

How To Use This Chart to Find Cu t ng Feed Rate (IPR):

- Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code)
- Find the closest diameter for your cu t ng applica t on on the chart to f nd your IPR

FORCE X

DORMER

Mult-Applicaton, Short Length, Reinforced Shank

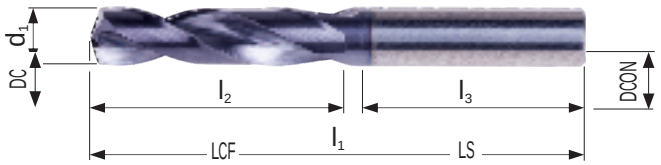
R458	P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3
	■469W	■524W	■544W	■400W	■354W	■311V	■347V	■282V	■236V	■206V	■177V	■144U	◪196U	◪167U	◪177U	◪144U	◪121T	◪108T	◪91T	◪85T
	M4.1	M4.2	K1.1	K1.2	K1.3	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5	K5.1	K5.2	K5.3	N1.1
	◪79T	◪69T	■289W	■213W	■161W	■256V	■210V	■167V	■230V	■177V	■141V	■213V	■161V	■118V	■98V	■85V	■239V	■180V	■138V	■656W
	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	S1.1	S1.2	S1.3	H1.1	H2.1	H2.2	H3.1	H3.2	H4.1	H4.2		
	■492W	■328W	■807V	■728V	■525V	■977V	■577V	■289V	◪144U	◪118U	◪105T	■148U	■85U	■79U	■98U	■79U	■66U	■56U		

Self centering 4-facet split point and CTW fute construcon for enhanced penetraon rate. TiAlN coang increases wear resistance and improves tool life at high RPM.

R457	P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3
	■587W	■656W	■679W	■502W	■443W	■390V	■436V	■351V	■295V	■259V	■220V	■180U	◪246V	◪210V	◪220V	◪180V	◪151U	◪134V	◪115V	◪105V
	M4.1	M4.2	K1.1	K1.2	K1.3	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5	K5.1	K5.2	K5.3	N1.1
	◪98U	◪85U	■361W	■266W	■200W	■321V	■262V	■210V	■285V	■220V	■177V	■266V	■200V	■148V	■125V	■105V	■298V	■226V	■174V	■820W
	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	S1.1	S1.2	S1.3	H1.1	H2.1	H2.2	H3.1	H3.2	H4.1	H4.2		
	■617W	■410W	■1010V	■909V	■656V	■1223W	■722W	■361W	■180V	■148V	■131U	■184U	■108U	■98U	■121U	■98U	■82U	■69U		

Coolant through clears chips away from the cu ng edge. Self centering 4-facet split point for enhanced penetraon rates. TiAlN coang increases surface hardness and improves tool life at high RPM.

High productvity in a wide range of materials



FORCE X	*FORCE X*
R458	**R457**
	
3.00 - 20.00	3.00 - 20.00

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R458	R457
	3.00	0.1181	20	62	36	6	0615324	0614884
	3.10	0.1220	20	62	36	6	0626443	0626115
1/8	3.18	0.1250	20	62	36	6	0624845	0624432
	3.20	0.1260	20	62	36	6	0626450	0626122
30	3.26	0.1283	20	62	36	6	0042267	0041833
	3.30	0.1299	20	62	36	6	0615331	0614891
	3.40	0.1339	20	62	36	6	0615348	0614907
29	3.45	0.1360	20	62	36	6	0042274	0041840
	3.50	0.1378	20	62	36	6	0615355	0614914
28	3.57	0.1406	20	62	36	6	0042281	0041857
9/64	3.57	0.1406	20	62	36	6	0625224	0624814
	3.60	0.1417	20	62	36	6	0626467	0626139
27	3.66	0.1441	20	62	36	6	0042298	0041864
	3.70	0.1457	20	62	36	6	0626474	0626146
26	3.73	0.1469	24	66	36	6	0626481	0041871
25	3.80	0.1496	24	66	36	6	0626498	0041888
24	3.86	0.1520	24	66	36	6	0042328	0041895
	3.90	0.1535	24	66	36	6	0626504	0626160

DORMER

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R458	R457
23	3.91	0.1539	24	66	36	6	0042335	0041901
5/32	3.97	0.1563	24	66	36	6	0625163	0624753
22	3.99	0.1571	24	66	36	6	0042342	0041918
	4.00	0.1575	24	66	36	6	0615362	0614921
21	4.04	0.1591	24	66	36	6	0042359	0041925
	4.05	0.1594	24	66	36	6	—	0626177
20	4.09	0.1610	24	66	36	6	0042366	0041932
	4.10	0.1614	24	66	36	6	0626511	0626184
	4.20	0.1654	24	66	36	6	0615379	0614938
19	4.22	0.1661	24	66	36	6	0042373	0041949
	4.30	0.1693	24	66	36	6	0615386	0614945
18	4.31	0.1697	24	66	36	6	0042380	0041956
11/64	4.37	0.1719	24	66	36	6	0624876	0624463
17	4.39	0.1728	24	66	36	6	0042397	0041963
	4.40	0.1732	24	66	36	6	0135013	0134832
	4.50	0.1772	24	66	36	6	0615393	0614952
16	4.50	0.1772	24	66	36	6	0042403	0041970
15	4.57	0.1799	24	66	36	6	0042410	0041987
	4.60	0.1811	24	66	36	6	0626528	0626191
14	4.62	0.1819	24	66	36	6	0042427	0041994
13	4.70	0.1850	24	66	36	6	0135020	0042007
3/16	4.76	0.1875	28	66	36	6	0625033	0624623
	4.80	0.1890	28	66	36	6	0135037	0134849
12	4.80	0.1890	28	66	36	6	0042441	0042014
11	4.85	0.1909	28	66	36	6	0042458	0042021
	4.90	0.1929	28	66	36	6	0135044	0622070
10	4.92	0.1937	28	66	36	6	0042465	0042038
9	4.98	0.1961	28	66	36	6	0042472	0042045
	5.00	0.1969	28	66	36	6	0615409	0614969
	5.05	0.1988	28	66	36	6	—	0626214
8	5.06	0.1992	28	66	36	6	0042489	0042052
	5.10	0.2008	28	66	36	6	0615416	0614976
7	5.11	0.2010	28	66	36	6	0042496	0042069
13/64	5.16	0.2031	28	66	36	6	0624890	0624487
6	5.18	0.2039	28	66	36	6	0042502	0042076
	5.20	0.2047	28	66	36	6	0135051	0134856
5	5.22	0.2055	28	66	36	6	0042519	0042083
	5.30	0.2087	28	66	36	6	7361260	7361237
4	5.31	0.2091	28	66	36	6	0042526	0042090
	5.40	0.2126	28	66	36	6	7361261	7361238
3	5.41	0.2130	28	66	36	6	0042533	0042106
	5.50	0.2165	28	66	36	6	0615423	0614983
7/32	5.56	0.2188	28	66	36	6	0625194	0624784
	5.60	0.2205	28	66	36	6	0626535	0626221
2	5.61	0.2209	28	66	36	6	0042540	0042113
	5.70	0.2244	28	66	36	6	0626542	0626238
1	5.79	0.2280	28	66	36	6	0042557	0042120
	5.80	0.2283	28	66	36	6	0626559	0626245
	5.90	0.2323	28	66	36	6	7361262	7361239
A	5.94	0.2339	28	66	36	6	0042564	0042137
15/64	5.95	0.2344	28	66	36	6	0624913	0624500
	6.00	0.2362	28	66	36	6	0615430	0614990
B	6.05	0.2380	34	79	36	8	7361263	7361240
	6.05	0.2382	34	79	36	8	—	0626252
	6.10	0.2402	34	79	36	8	0626566	0626269
C	6.15	0.2421	34	79	36	8	7361264	7361241
	6.20	0.2441	34	79	36	8	0135068	0134863
D	6.25	0.2461	34	79	36	8	0042571	0042144
	6.30	0.2480	34	79	36	8	0626573	0626276
1/4	6.35	0.2500	34	79	36	8	0624838	0624425
E	6.35	0.2500	34	79	36	8	7361265	7361242
	6.40	0.2520	34	79	36	8	0135075	0134870
	6.50	0.2559	34	79	36	8	0615447	0615003
F	6.53	0.2571	34	79	36	8	7361266	7361243
	6.60	0.2598	34	79	36	8	0626580	0626283
G	6.63	0.2610	34	79	36	8	7361267	7361244
	6.70	0.2638	34	79	36	8	0135082	0134887
17/64	6.75	0.2656	34	79	36	8	0624937	0624524

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R458	R457
H	6.76	0.2661	34	79	36	8	0042588	0042151
	6.80	0.2677	34	79	36	8	0615454	0615010
	6.90	0.2717	34	79	36	8	0615461	0615027
I	6.91	0.2720	34	79	36	8	7361268	7361245
	7.00	0.2756	34	79	36	8	0615478	0615034
J	7.04	0.2770	41	79	36	8	7361269	7361246
	7.10	0.2795	41	79	36	8	0626597	0626290
K	7.14	0.2811	41	79	36	8	7361270	7361247
9/32	7.14	0.2813	41	79	36	8	0625217	0624807
	7.20	0.2835	41	79	36	8	7361271	7361248
	7.30	0.2874	41	79	36	8	0626603	0626306
L	7.37	0.2902	41	79	36	8	0042595	0042168
	7.40	0.2913	41	79	36	8	0615485	0615041
M	7.49	0.2949	41	79	36	8	0042601	0042175
	7.50	0.2953	41	79	36	8	0615492	0615058
19/64	7.54	0.2969	41	79	36	8	0624951	0624548
	7.60	0.2992	41	79	36	8	0626610	0626313
N	7.67	0.3020	41	79	36	8	0042618	0042182
	7.70	0.3031	41	79	36	8	0135099	0134894
	7.80	0.3071	41	79	36	8	0626627	0626320
	7.90	0.3110	41	79	36	8	0135105	0134900
5/16	7.94	0.3125	41	79	36	8	0625156	0624746
	8.00	0.3150	41	79	36	8	0615508	0615065
O	8.03	0.3161	47	89	40	10	0042625	0042199
	8.05	0.3169	47	89	40	10	—	0626337
	8.10	0.3189	47	89	40	10	0626634	0626689
	8.20	0.3228	47	89	40	10	0135112	0134917
P	8.20	0.3228	47	89	40	10	7361272	7361249
	8.30	0.3268	47	89	40	10	7361273	7361250
21/64	8.33	0.3281	47	89	40	10	0624975	0624562
	8.40	0.3307	47	89	40	10	0135129	0134924
Q	8.43	0.3319	47	89	40	10	0042632	0042205
	8.50	0.3346	47	89	40	10	0615515	0615072
	8.60	0.3386	47	89	40	10	0615522	0615089
R	8.61	0.3390	47	89	40	10	7361274	7361251
	8.70	0.3425	47	89	40	10	0615539	0615096
11/32	8.73	0.3438	47	89	40	10	0624869	0624456
	8.80	0.3465	47	89	40	10	0626641	0626344
S	8.84	0.3480	47	89	40	10	7361275	7361252
	8.90	0.3504	47	89	40	10	7361276	0134931
	9.00	0.3543	47	89	40	10	0615546	0615102
T	9.09	0.3579	47	89	40	10	0042649	0042212
	9.10	0.3583	47	89	40	10	0626658	0626351
23/64	9.13	0.3594	47	89	40	10	0624999	0624586
	9.20	0.3622	47	89	40	10	7361277	7361253
	9.30	0.3661	47	89	40	10	0615553	0615119
U	9.35	0.3681	47	89	40	10	0042656	0042229
	9.40	0.3701	47	89	40	10	0135136	0134948
	9.50	0.3740	47	89	40	10	0615560	0615126
3/8	9.53	0.3750	47	89	40	10	0625057	0624647
V	9.58	0.3772	47	89	40	10	7361278	7361254
	9.60	0.3780	47	89	40	10	0626665	0626368
	9.70	0.3819	47	89	40	10	0135143	0629062
	9.80	0.3858	47	89	40	10	0626672	0626375
W	9.80	0.3858	47	89	40	10	7361279	7361255
	9.90	0.3898	47	89	40	10	0135150	0134955
25/64	9.92	0.3906	47	89	40	10	0625002	0624593
	10.00	0.3937	47	89	40	10	0615133	0614693
	10.05	0.3957	55	102	45	12	—	0625958
X	10.08	0.3969	55	102	45	12	0042663	0042236
	10.10	0.3976	55	102	45	12	0626382	0625965
	10.20	0.4016	55	102	45	12	0615140	0614709
Y	10.26	0.4039	55	102	45	12	0042670	0042243
	10.30	0.4055	55	102	45	12	0615157	0614716
13/32	10.32	0.4063	55	102	45	12	0624883	0624470
	10.40	0.4094	55	102	45	12	0615164	0614723
Z	10.49	0.4130	55	102	45	12	0042687	0042250
	10.50	0.4134	55	102	45	12	0615171	0614730

DORMER

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R458	R457
	10.60	0.4173	55	102	45	12	0626399	0625972
	10.70	0.4213	55	102	45	12	7361280	—
27/64	10.72	0.4219	55	102	45	12	0625019	0624609
	10.80	0.4252	55	102	45	12	0042694	7361256
	10.90	0.4291	55	102	45	12	7361281	—
	11.00	0.4331	55	102	45	12	0615188	0614747
	11.10	0.4370	55	102	45	12	7361282	—
7/16	11.11	0.4375	55	102	45	12	0625187	0624777
	11.20	0.4409	55	102	45	12	0615195	0614754
	11.30	0.4449	55	102	45	12	7361283	7361257
	11.40	0.4488	55	102	45	12	0135167	0134962
	11.50	0.4528	55	102	45	12	0615201	0614761
29/64	11.51	0.4531	55	102	45	12	0625026	0624616
	11.60	0.4567	55	102	45	12	0135174	0134979
	11.70	0.4606	55	102	45	12	7361284	—
	11.80	0.4646	55	102	45	12	0626405	0625989
	11.90	0.4685	55	102	45	12	7361285	—
15/32	11.91	0.4688	55	102	45	12	0624906	0624494
	12.00	0.4724	55	102	45	12	0615218	0614778
	12.05	0.4744	60	107	45	14	—	0625996
	12.10	0.4764	60	107	45	14	0626412	0626009
	12.20	0.4803	60	107	45	14	0615225	0614785
31/64	12.30	0.4844	60	107	45	14	0625064	0624654
	12.50	0.4921	60	107	45	14	0615232	0614792
	12.70	0.5000	60	107	45	14	0624821	0624418
1/2	12.70	0.5000	60	107	45	14	0626429	0626016
	12.80	0.5039	60	107	45	14	0135181	0134986
	13.00	0.5118	60	107	45	14	0615249	0614808
33/64	13.10	0.5156	60	107	45	14	0625071	0624661
	13.30	0.5236	60	107	45	14	7361286	7361258
17/32	13.49	0.5313	60	107	45	14	0624920	0624517
	13.50	0.5315	60	107	45	14	0615256	0614815
	13.80	0.5433	60	107	45	14	0135198	0134993
35/64	13.89	0.5469	60	107	45	14	0625088	0624678
	14.00	0.5512	60	107	45	14	0615263	0614822
	14.25	0.5610	65	115	48	16	0615270	0614839
9/16	14.29	0.5625	65	115	48	16	0625200	0624791
	14.50	0.5709	65	115	48	16	0615287	0614846
37/64	14.68	0.5781	65	115	48	16	0625095	0624685
	14.80	0.5827	65	115	48	16	0622032	0135006
	15.00	0.5906	65	115	48	16	0615294	0614853
19/32	15.08	0.5938	65	115	48	16	0624944	0624531
	15.10	0.5945	65	115	48	16	0626436	0626023
	15.30	0.6024	65	115	48	16	7361287	7361259
39/64	15.48	0.6094	65	115	48	16	0625101	0624692
	15.50	0.6102	65	115	48	16	0615300	0614860
	15.80	0.6220	65	115	48	16	0135204	0622049
5/8	15.88	0.6250	65	115	48	16	0625170	0624760
	16.00	0.6299	65	115	48	16	0615317	0614877
41/64	16.27	0.6406	73	123	48	18	0625118	0624708
	16.50	0.6496	73	123	48	18	0135211	0626030
21/32	16.67	0.6563	73	123	48	18	0624968	0624555
	17.00	0.6693	73	123	48	18	0135228	0626047
43/64	17.07	0.6720	73	123	48	18	0625125	0624715
11/16	17.46	0.6874	73	123	48	18	0624852	0624449
	17.50	0.6890	73	123	48	18	0135235	0626054
	17.80	0.7008	73	123	48	18	0135273	—
45/64	17.86	0.7031	73	123	48	18	0625132	0624722
	18.00	0.7087	73	123	48	18	0135280	0626061
23/32	18.26	0.7189	79	131	50	20	0624982	0624579
	18.50	0.7283	79	131	50	20	0135297	0626078
47/64	18.65	0.7343	79	131	50	20	0625149	0624739
	18.80	0.7402	79	131	50	20	—	0622056
	19.00	0.7480	79	131	50	20	0135327	0626085
3/4	19.05	0.7500	79	131	50	20	0625040	0624630
	19.50	0.7677	79	131	50	20	0135334	0626092
	19.80	0.7795	79	131	50	20	0135341	0622063
	20.00	0.7874	79	131	50	20	0135358	0626108

FORCE X SOLID CARBIDE DRILL

DORMER

Mult-Applicaton, Standard Length, Reinforced Shank

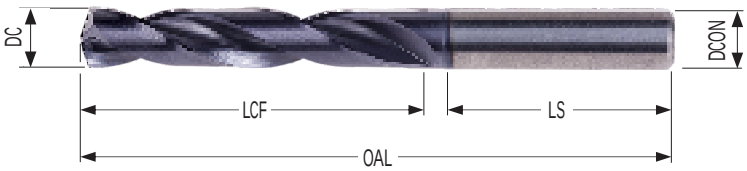
R454	P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3
	■440V	■492V	■508V	■377V	■331V	■292V	■328V	■262V	■223V	■194V	■164V	■134V	◪184U	◪157U	◪164U	◪134U	◪115T	◪102T	◪85T	◪79T
	M4.1	M4.2	K1.1	K1.2	K1.3	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5	K5.1	K5.2	K5.3	N1.1
	◪75T	◪66T	■272W	■200W	■151W	■243V	■197V	■157V	■213V	■164V	■134V	■200V	■151V	■112V	■95V	■79V	■223V	■171V	■131V	■617W
	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	S1.1	S1.2	S1.3	H1.1	H2.1	H2.2	H3.1	H3.2	H4.1	H4.2		
	■462W	■308W	■758V	■682V	■492V	■918V	■541V	■272V	◪134U	◪112U	◪98T	■138T	■82U	■75U	■92U	■75U	■62U	■52U		

Self centering 4-facet split point and CTW fute construcon for enhanced penetraon rate. TiAlN coang increases wear resistance, improves tool life at high RPM.

R453	P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3
	■558V	■623V	■646V	■476V	■420V	■371V	■413V	■335V	■282V	■246V	■210V	■171U	◪233V	◪200V	◪210V	◪171V	◪144U	◪128V	◪108V	◪98V
	M4.1	M4.2	K1.1	K1.2	K1.3	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5	K5.1	K5.2	K5.3	N1.1
	◪98U	◪85U	■361W	■266W	■200W	■321V	■262V	■210V	■285V	■220V	■177V	■266V	■200V	■148V	■125V	■105V	■298V	■226V	■174V	■820W
	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3	S1.1	S1.2	S1.3	H1.1	H2.1	H2.2	H3.1	H3.2	H4.1	H4.2		
	■617W	■410W	■1010V	■909V	■656V	■1223W	■722W	■361W	■180V	■148V	■131U	■184U	■108U	■98U	■121U	■98U	■82U	■69U		

Coolant through clears chips away from the cu ng edge. Self centering 4-facet split point and CTW fute construcon for enhanced penetraon rates. TiAlN coang increases surface hardness, improves tool life at high RPM.

High producvity in a wide range of materials



DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	FORCE X R454	FORCE X R453
								
							3.00 - 20.00	3.00 - 20.00
	3.00	0.1181	28	66	36	6	0614433	0614051
	3.10	0.1220	28	66	36	6	0625712	0625385
1/8	3.18	0.1250	28	66	36	6	0624029	0623619
	3.20	0.1260	28	66	36	6	0625729	0625392
30	3.26	0.1283	28	66	36	6	0041406	0040393
	3.30	0.1299	28	66	36	6	0614440	0616147
	3.40	0.1339	28	66	36	6	0614457	0614068
29	3.45	0.1360	28	66	36	6	0041413	0040409
	3.50	0.1378	28	66	36	6	0614464	0614075
28	3.57	0.1406	28	66	36	6	0041420	0040416
9/64	3.57	0.1406	28	66	36	6	0624401	0623992
	3.60	0.1417	28	66	36	6	0625736	0625408
27	3.66	0.1441	28	66	36	6	0041437	0040423
	3.70	0.1457	28	66	36	6	0625743	0625415
26	3.73	0.1469	36	74	36	6	0041444	0040430
25	3.80	0.1496	36	74	36	6	0625750	0625422
24	3.86	0.1520	36	74	36	6	0041468	0040454

DORMER

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R454	R453
	3.90	0.1535	36	74	36	6	0625767	0628911
23	3.91	0.1539	36	74	36	6	0041475	0040461
5/32	3.97	0.1563	36	74	36	6	0624340	0623930
22	3.99	0.1571	36	74	36	6	0041482	0040478
	4.00	0.1575	36	74	36	6	0614471	0614082
21	4.04	0.1591	36	74	36	6	0041499	0040485
	4.05	0.1594	36	74	36	6	—	0625439
20	4.09	0.1610	36	74	36	6	0041505	0040492
	4.10	0.1614	36	74	36	6	0625774	0625446
	4.20	0.1654	36	74	36	6	0614488	0616154
19	4.22	0.1661	36	74	36	6	0041512	0040508
	4.30	0.1693	36	74	36	6	0614495	0614099
18	4.31	0.1697	36	74	36	6	0041529	0040515
11/64	4.37	0.1719	36	74	36	6	0624050	0623640
17	4.39	0.1728	36	74	36	6	0041536	0040522
	4.40	0.1732	36	74	36	6	0134450	0134191
	4.50	0.1772	36	74	36	6	0614501	0614105
16	4.50	0.1772	36	74	36	6	0041543	0040539
15	4.57	0.1799	36	74	36	6	0041550	0040546
	4.60	0.1811	36	74	36	6	0625781	0625453
14	4.62	0.1819	36	74	36	6	0041567	0040553
13	4.70	0.1850	36	74	36	6	0625798	0625460
3/16	4.76	0.1875	44	82	36	6	0624210	0623800
12	4.80	0.1890	44	82	36	6	0134467	0134207
11	4.85	0.1909	44	82	36	6	0041598	0040584
	4.90	0.1929	44	82	36	6	0134474	0134214
10	4.92	0.1937	44	82	36	6	0041604	0040591
9	4.98	0.1961	44	82	36	6	0041611	0040607
	5.00	0.1969	44	82	36	6	0614518	0614112
	5.05	0.1988	44	82	36	6	—	0625477
8	5.06	0.1992	44	82	36	6	0041628	0040614
	5.10	0.2008	44	82	36	6	0614525	0614129
7	5.11	0.2010	44	82	36	6	0041635	0040621
13/64	5.16	0.2031	44	82	36	6	0624074	0623664
6	5.18	0.2039	44	82	36	6	0041642	0040638
	5.20	0.2047	44	82	36	6	0134481	0134221
5	5.22	0.2055	44	82	36	6	0041659	0040645
	5.30	0.2087	44	82	36	6	—	7361201
4	5.31	0.2091	44	82	36	6	0041666	0040652
	5.40	0.2126	44	82	36	6	—	7361202
3	5.41	0.2130	44	82	36	6	0041673	0040669
	5.50	0.2165	44	82	36	6	0614532	0614136
7/32	5.56	0.2188	44	82	36	6	0624371	0623961
	5.60	0.2205	44	82	36	6	0625804	0625484
2	5.61	0.2209	44	82	36	6	0041680	0040676
	5.70	0.2244	44	82	36	6	0625811	0625491
1	5.79	0.2280	44	82	36	6	0041697	0040683
	5.80	0.2283	44	82	36	6	0625828	0625507
	5.90	0.2323	44	82	36	6	—	7361203
A	5.94	0.2339	44	82	36	6	0041703	0040690
15/64	5.95	0.2344	44	82	36	6	0624098	0623688
	6.00	0.2362	44	82	36	6	0614549	0614143
B	6.05	0.2380	53	91	36	8	7361224	7361204
	6.05	0.2382	53	91	36	8	—	0625514
	6.10	0.2402	53	91	36	8	0625835	0625521
C	6.15	0.2421	53	91	36	8	7361225	7361205
	6.20	0.2441	53	91	36	8	0134498	0134238
D	6.25	0.2461	53	91	36	8	0041710	0040706
	6.30	0.2480	53	91	36	8	0625842	0625538
1/4	6.35	0.2500	53	91	36	8	0624012	0623602
E	6.35	0.2500	53	91	36	8	7361226	7361206
	6.40	0.2520	53	91	36	8	0134504	0134245
	6.50	0.2559	53	91	36	8	0614556	0614150
F	6.53	0.2571	53	91	36	8	7361227	7361207
	6.60	0.2598	53	91	36	8	0625859	0625545
G	6.63	0.2610	53	91	36	8	7361228	7361208

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R454	R453
	6.70	0.2638	53	91	36	8	0614563	0134252
17/64	6.75	0.2656	53	91	36	8	0624111	0623701
H	6.76	0.2661	53	91	36	8	0041727	0041291
	6.80	0.2677	53	91	36	8	0614570	0616116
	6.90	0.2717	53	91	36	8	0614587	0614167
I	6.91	0.2720	53	91	36	8	7361229	7361209
	7.00	0.2756	53	91	36	8	0614594	0614174
J	7.04	0.2772	53	91	36	8	7361230	7361210
	7.10	0.2795	53	91	36	8	0625866	0625552
K	7.14	0.2811	53	91	36	8	7361231	7361211
9/32	7.14	0.2813	53	91	36	8	0624395	0623985
	7.20	0.2835	53	91	36	8	—	7361212
	7.30	0.2874	53	91	36	8	0625873	0625569
L	7.37	0.2902	53	91	36	8	0041734	0041307
	7.40	0.2913	53	91	36	8	0614600	0616161
M	7.49	0.2949	53	91	36	8	0041741	0041314
	7.50	0.2953	53	91	36	8	0614617	0614181
19/64	7.54	0.2969	53	91	36	8	0624135	0623725
	7.60	0.2992	53	91	36	8	0625880	0625576
N	7.67	0.3020	53	91	36	8	0041758	0041321
	7.70	0.3031	53	91	36	8	0134511	0134306
	7.80	0.3071	53	91	36	8	0625897	0625583
	7.90	0.3110	53	91	36	8	0134528	0134313
5/16	7.94	0.3125	53	91	36	8	0624333	0623923
	8.00	0.3150	53	91	36	8	0614624	0614198
O	8.03	0.3161	61	103	40	10	0041765	0041338
	8.05	0.3169	61	103	40	10	—	0625590
	8.10	0.3189	61	103	40	10	0625903	0625606
	8.20	0.3228	61	103	40	10	0134535	0134320
P	8.20	0.3228	61	103	40	10	7361232	7361213
	8.30	0.3268	61	103	40	10	—	7361214
21/64	8.33	0.3281	61	103	40	10	0624159	0623749
	8.40	0.3307	61	103	40	10	0134542	0134337
Q	8.43	0.3319	61	103	40	10	0041772	0041345
	8.50	0.3346	61	103	40	10	0614631	0614204
	8.60	0.3386	61	103	40	10	0614648	0616178
R	8.61	0.3390	61	103	40	10	7361233	7361215
	8.70	0.3425	61	103	40	10	0614655	0614211
11/32	8.73	0.3438	61	103	40	10	0624043	0623633
	8.80	0.3465	61	103	40	10	0625910	0625613
S	8.84	0.3480	61	103	40	10	7361234	7361216
	8.90	0.3504	61	103	40	10	0134559	0134344
	9.00	0.3543	61	103	40	10	0614662	0614228
T	9.09	0.3579	61	103	40	10	0041789	0041352
	9.10	0.3583	61	103	40	10	0625927	0625620
23/64	9.13	0.3594	61	103	40	10	0624173	0623763
	9.20	0.3622	61	103	40	10	—	7361217
	9.30	0.3661	61	103	40	10	0614679	0616123
U	9.35	0.3681	61	103	40	10	0041796	0041369
	9.40	0.3701	61	103	40	10	0134566	0134351
	9.50	0.3740	61	103	40	10	0614686	0614235
3/8	9.53	0.3750	61	103	40	10	0624234	0623824
V	9.58	0.3772	61	103	40	10	7361235	7361218
	9.60	0.3780	61	103	40	10	0625934	0625637
	9.70	0.3819	61	103	40	10	0134573	0629055
	9.80	0.3858	61	103	40	10	0625941	0625644
W	9.80	0.3858	61	103	40	10	7361236	7361219
	9.90	0.3898	61	103	40	10	0134580	0134368
25/64	9.92	0.3906	61	103	40	10	0624180	0623770
	10.00	0.3937	61	103	40	10	0614242	0613870
	10.05	0.3957	70	118	45	12	—	0625231
X	10.08	0.3969	70	118	45	12	0041802	0041376
	10.10	0.3976	70	118	45	12	0625651	0625248
	10.20	0.4016	70	118	45	12	0614259	0613887
Y	10.26	0.4039	70	118	45	12	0041819	0041383
	10.30	0.4055	70	118	45	12	0614266	0613894

DORMER

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R454	R453
13/32	10.32	0.4063	70	118	45	12	0624067	0623657
	10.40	0.4094	70	118	45	12	0614273	0616130
Z	10.49	0.4130	70	118	45	12	0041826	0041390
	10.50	0.4134	70	118	45	12	0614280	0613900
	10.60	0.4173	70	118	45	12	0625668	0625255
27/64	10.72	0.4219	70	118	45	12	0624197	0623787
	10.80	0.4252	70	118	45	12	—	7361220
	11.00	0.4331	70	118	45	12	0614297	0613917
7/16	11.11	0.4375	70	118	45	12	0624364	0623954
	11.20	0.4409	70	118	45	12	0614303	0613924
	11.30	0.4449	70	118	45	12	—	7361221
	11.40	0.4488	70	118	45	12	0134597	0134375
	11.50	0.4528	70	118	45	12	0614310	0613931
29/64	11.51	0.4531	70	118	45	12	0624203	0623794
	11.60	0.4567	70	118	45	12	0134603	0134382
	11.80	0.4646	70	118	45	12	0625675	0625262
15/32	11.91	0.4688	70	118	45	12	0624081	0623671
	12.00	0.4724	70	118	45	12	0614327	0613948
	12.05	0.4744	76	124	45	14	—	0625279
	12.10	0.4764	76	124	45	14	0625682	—
	12.20	0.4803	76	124	45	14	0614334	0613955
31/64	12.30	0.4844	76	124	45	14	0624241	0623831
	12.50	0.4921	76	124	45	14	0614341	0613962
	12.70	0.5000	76	124	45	14	0625699	0625286
1/2	12.70	0.5000	76	124	45	14	0624005	0623596
	12.80	0.5039	76	124	45	14	0134610	0134399
	13.00	0.5118	76	124	45	14	0614358	0613979
33/64	13.10	0.5156	76	124	45	14	0624258	0623848
	13.30	0.5236	76	124	45	14	—	7361222
17/32	13.49	0.5313	76	124	45	14	0624104	0623695
	13.50	0.5315	76	124	45	14	0614365	0613986
	13.80	0.5433	76	124	45	14	0134627	0134405
35/64	13.89	0.5469	76	124	45	14	0624265	0623855
	14.00	0.5512	76	124	45	14	0614372	0613993
	14.25	0.5610	82	133	48	16	0614389	0614006
9/16	14.29	0.5625	82	133	48	16	0624388	0623978
	14.50	0.5709	82	133	48	16	0614396	0614013
37/64	14.68	0.5781	82	133	48	16	0624272	0623862
	14.80	0.5827	82	133	48	16	0134634	0134412
	15.00	0.5906	82	133	48	16	0614402	0614020
19/32	15.08	0.5938	82	133	48	16	0624128	0623718
	15.10	0.5945	82	133	48	16	0625705	0625293
	15.30	0.6024	82	133	48	16	—	7361223
39/64	15.48	0.6094	82	133	48	16	0624289	0623879
	15.50	0.6102	82	133	48	16	0614419	0614037
	15.80	0.6220	82	133	48	16	0134641	0134429
5/8	15.88	0.6250	82	133	48	16	0624357	0623947
	16.00	0.6299	82	133	48	16	0614426	0614044
41/64	16.27	0.6406	91	143	48	18	0624296	0623886
	16.50	0.6496	91	143	48	18	0134658	0625309
21/32	16.67	0.6563	91	143	48	18	0624142	0623732
	17.00	0.6693	91	143	48	18	0134665	0625316
43/64	17.07	0.6720	91	143	48	18	0624302	0623893
11/16	17.46	0.6874	91	143	48	18	0624036	0623626
	17.50	0.6890	91	143	48	18	0134672	0625323
	17.80	0.7008	91	143	48	18	0134689	0134436
45/64	17.86	0.7031	91	143	48	18	0624319	0623909
	18.00	0.7087	91	143	48	18	0134696	0625330
23/32	18.26	0.7189	99	143	48	20	0624166	0623756
23/32	18.26	0.7189	99	153	50	20	0134702	0623756
	18.50	0.7283	99	153	50	20	0134702	0625347
47/64	18.65	0.7343	99	153	50	20	0624326	0623916
	19.00	0.7480	99	153	50	20	0134719	0625354
3/4	19.05	0.7500	99	153	50	20	0624227	0623817
	19.50	0.7677	99	153	50	20	0134726	0625361
	19.80	0.7795	99	153	50	20	0134733	0134443
	20.00	0.7874	99	153	50	20	0134740	0625378

FORCE X SOLID CARBIDE DRILL

DORMER

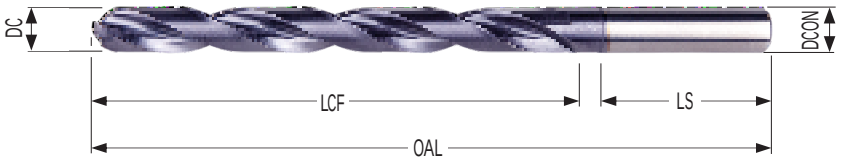
Mult-Applicaton, 8xD, Reinforced Shank

R459	P1.1	P1.2	P1.3	P2.1	P2.2	P2.3	P3.1	P3.2	P3.3	P4.1	P4.2	P4.3	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3
	■469V	■525V	■544V	■400V	■354U	■312U	■348U	■282U	■236U	■207U	■177U	■144T	◪197V	◪167V	◪177V	◪144V	◪121U	◪108V	◪91V	◪85V
	M4.1	M4.2	K1.1	K1.2	K1.3	K2.1	K2.2	K2.3	K3.1	K3.2	K3.3	K4.1	K4.2	K4.3	K4.4	K4.5	K5.1	K5.2	K5.3	N1.1
	◪79U	◪69U	■289W	■213W	■161W	■256V	■210V	■167V	■230V	■177V	■141V	■213V	■161V	■118V	■98V	■85V	■239V	■180V	■138V	◪656W
	N1.2	N1.3	N2.1	N2.2	N2.3	N3.1	N3.2	N3.3												
	◪492W	■328W	■807V	■728V	■525V	◪977V	◪577V	◪289V												

HM | DORMER | 8XD | 140° | TiAlN | DIN 6535-HA

Coolant through clears chips away from the cu t ng edge. Self centering 4-facet split point and CTW f ute construc t on for enhanced penetra t on rates. TiAlN coa t ng increases surface hardness, improves tool life at high RPM.

High productivity in a wide range of materials



FORCE X

R459

3.00 - 16.00

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R459
	3.00	0.1181	37	79	36	6	46718973
	3.10	0.1220	37	79	36	6	46718974
1/8	3.18	0.1250	37	79	36	6	46718975
	3.20	0.1260	37	79	36	6	46718976
	3.30	0.1299	37	79	36	6	46718977
	3.40	0.1339	37	79	36	6	46718978
	3.50	0.1378	37	79	36	6	46718979
9/64	3.57	0.1406	37	79	36	6	46718990
	3.60	0.1417	37	79	36	6	46718991
	3.70	0.1457	37	79	36	6	46718992
	3.80	0.1496	48	90	36	6	46718993
	3.90	0.1535	48	90	36	6	46718994
5/32	3.97	0.1563	48	90	36	6	46718995
	4.00	0.1575	48	90	36	6	46718996
	4.10	0.1614	48	90	36	6	46718997
	4.20	0.1654	48	90	36	6	46718998
	4.30	0.1693	48	90	36	6	46718999
11/64	4.37	0.1719	48	90	36	6	46719000
	4.40	0.1732	48	90	36	6	46719001
	4.50	0.1772	48	90	36	6	46719002
	4.60	0.1811	48	90	36	6	46719003
	4.70	0.1850	62	104	36	6	46719004
3/16	4.76	0.1875	62	104	36	6	46719005
	4.80	0.1890	62	104	36	6	46719006
	4.90	0.1929	62	104	36	6	46719007
	5.00	0.1969	62	104	36	6	46719008
	5.10	0.2008	62	104	36	6	46719009
13/64	5.16	0.2031	62	104	36	6	46719010

DORMER

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R459
	5.20	0.2047	62	104	36	6	46719011
	5.30	0.2087	62	104	36	6	46719012
	5.40	0.2126	62	104	36	6	46719013
	5.50	0.2165	62	104	36	6	46719014
7/32	5.56	0.2188	62	104	36	6	46719015
	5.60	0.2205	62	104	36	6	46719016
	5.70	0.2244	62	104	36	6	46719017
	5.80	0.2283	62	104	36	6	46719018
	5.90	0.2323	62	104	36	6	46719019
15/64	5.95	0.2344	62	104	36	6	46719020
	6.00	0.2362	62	104	36	6	46719021
	6.10	0.2402	84	126	36	8	46719022
	6.20	0.2441	84	126	36	8	46719023
	6.30	0.2480	84	126	36	8	46719024
1/4	6.35	0.2500	84	126	36	8	46719025
	6.40	0.2520	84	126	36	8	46719026
	6.50	0.2559	84	126	36	8	46719027
	6.60	0.2598	84	126	36	8	46719028
	6.70	0.2638	84	126	36	8	46719029
17/64	6.75	0.2656	84	126	36	8	46719030
	6.80	0.2677	84	126	36	8	46719031
	6.90	0.2717	84	126	36	8	46719032
	7.00	0.2756	84	126	36	8	46719033
	7.10	0.2795	84	126	36	8	46719034
9/32	7.14	0.2813	84	126	36	8	46719035
	7.20	0.2835	84	126	36	8	46719036
	7.30	0.2874	84	126	36	8	46719037
	7.40	0.2913	84	126	36	8	46719038
	7.50	0.2953	84	126	36	8	46719039
19/64	7.54	0.2969	84	126	36	8	46719040
	7.60	0.2992	84	126	36	8	46719041
	7.70	0.3031	84	126	36	8	46719042
	7.80	0.3071	84	126	36	8	46719043
	7.90	0.3110	84	126	36	8	46719044
5/16	7.94	0.3125	84	126	36	8	46719045
	8.00	0.3150	84	126	36	8	46719046
	8.10	0.3189	106	152	40	10	46719047
	8.20	0.3228	106	152	40	10	46719048
	8.30	0.3268	106	152	40	10	46719049
21/64	8.33	0.3281	106	152	40	10	46719050
	8.40	0.3307	106	152	40	10	46719051
	8.50	0.3346	106	152	40	10	46719052
	8.60	0.3386	106	152	40	10	46719053
	8.70	0.3425	106	152	40	10	46719054
11/32	8.73	0.3438	106	152	40	10	46719055
	8.80	0.3465	106	152	40	10	46719056
	8.90	0.3504	106	152	40	10	46719057
	9.00	0.3543	106	152	40	10	46719058
	9.10	0.3583	106	152	40	10	46719059
23/64	9.13	0.3594	106	152	40	10	46719060
	9.20	0.3622	106	152	40	10	46719061
	9.30	0.3661	106	152	40	10	46719062
	9.40	0.3701	106	152	40	10	46719063
	9.50	0.3740	106	152	40	10	46719064
3/8	9.53	0.3750	106	152	40	10	46719065
	9.60	0.3780	106	152	40	10	46719066
	9.70	0.3819	106	152	40	10	46719067
	9.80	0.3858	106	152	40	10	46719068
	9.90	0.3898	106	152	40	10	46719069
25/64	9.92	0.3906	106	152	40	10	46719070
	10.00	0.3937	106	152	40	10	46719071
	10.20	0.4016	128	180	45	12	46719072
	10.30	0.4055	128	180	45	12	46719073
13/32	10.32	0.4063	128	180	45	12	46719074
	10.40	0.4094	128	180	45	12	46719075

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R459
	10.50	0.4134	128	180	45	12	46719076
27/64	10.72	0.4219	128	180	45	12	46719077
	10.80	0.4252	128	180	45	12	46719078
	11.00	0.4331	128	180	45	12	46719079
7/16	11.11	0.4375	128	180	45	12	46719080
	11.20	0.4409	128	180	45	12	46719081
	11.30	0.4449	128	180	45	12	46719082
	11.50	0.4528	128	180	45	12	46719083
29/64	11.51	0.4531	128	180	45	12	46719084
	11.80	0.4646	128	180	45	12	46719085
15/32	11.91	0.4688	128	180	45	12	46719086
	12.00	0.4724	128	180	45	12	46719087
	12.20	0.4803	151	202	48	14	46719088
31/64	12.30	0.4844	151	202	48	14	46719089
	12.50	0.4921	151	202	48	14	46719090
1/2	12.70	0.5000	151	202	48	14	46719091
	12.80	0.5039	151	202	48	14	46719092
	13.00	0.5118	151	202	48	14	46719093
33/64	13.10	0.5156	151	202	48	14	46719094
17/32	13.49	0.5313	151	202	48	14	46719095
	13.50	0.5315	151	202	48	14	46719096
35/64	13.89	0.5469	151	202	48	14	46719097
	14.00	0.5512	151	202	48	14	46719098
	14.25	0.5610	172	227	48	16	46719099
9/16	14.29	0.5625	172	227	48	16	46719100
	14.50	0.5709	172	227	48	16	46719101
37/64	14.68	0.5781	172	227	48	16	46719102
	15.00	0.5906	172	227	48	16	46719103
19/32	15.08	0.5938	172	227	48	16	46719104
	15.10	0.5945	172	227	48	16	46719105
39/64	15.48	0.6094	172	227	48	16	46719106
	15.50	0.6102	172	227	48	16	46719107
5/8	15.88	0.6250	172	227	48	16	46719108
	16.00	0.6299	172	227	48	16	46719109

FORCE *M*

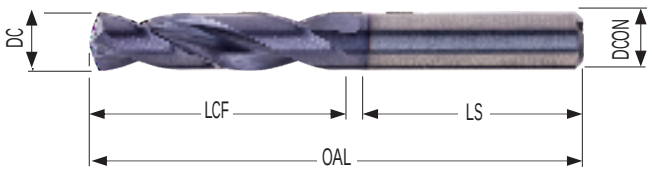
FORCE M SOLID CARBIDE DRILL

DORMER

Mul t-Applica t on, Short length, Reinforced Shank

R467	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3	M4.1	M4.2	S1.1	S1.2	S1.3	S2.1	S2.2	S3.1	S3.2	S4.1	S4.2
	■384G	■325G	■341G	■279G	■233E	■285G	■246G	■223F	■197F	■171E	■180V	■148V	■131U	◪197U	◪184U	◪148U	◪131U	◪115U	◪105U

Self-centering 4-facet split point and CTW f ute construc t on for enhanced penetra t on rate speci f cally designed for Stainless Steel (ISO-M) materials. TiAlN coa t ng increases wear resistance and improves tool life. Coolant through combined with an advanced point geometry prevents premature wear of the cu t ng edges. Length designed for 3 x Diameter drilling depths.



FORCE *M*

R467

3.00 - 16.00

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R467
	3.00	0.1181	20	62	36	6	7625100
	3.10	0.1220	20	62	36	6	7625101
1/8	3.18	0.1250	20	62	36	6	7625102
	3.20	0.1260	20	62	36	6	7625103
	3.30	0.1299	20	62	36	6	7625104
	3.40	0.1339	20	62	36	6	7625105
29	3.45	0.1360	20	62	36	6	7625106
	3.50	0.1378	20	62	36	6	7625107
9/64	3.57	0.1406	20	62	36	6	7625108
	3.60	0.1417	20	62	36	6	7625109
	3.70	0.1457	20	62	36	6	7625110
	3.80	0.1496	24	66	36	6	7625111
	3.90	0.1535	24	66	36	6	7625112
5/32	3.97	0.1563	24	66	36	6	7625113
	4.00	0.1575	24	66	36	6	7625114
	4.05	0.1594	24	66	36	6	7625115
	4.10	0.1614	24	66	36	6	7625116
	4.20	0.1654	24	66	36	6	7625117
	4.30	0.1693	24	66	36	6	7625118
11/64	4.37	0.1719	24	66	36	6	7625119
	4.40	0.1732	24	66	36	6	7625120
	4.50	0.1772	24	66	36	6	7625121
	4.60	0.1811	24	66	36	6	7625122
	4.70	0.1850	24	66	36	6	7625123
3/16	4.76	0.1875	28	66	36	6	7625124
	4.80	0.1890	28	66	36	6	7625125
	4.90	0.1929	28	66	36	6	7625126
	5.00	0.1969	28	66	36	6	7625127

DORMER

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R467
	5.05	0.1988	28	66	36	6	7625128
	5.10	0.2008	28	66	36	6	7625129
7	5.11	0.2010	28	66	36	6	7625130
13/64	5.16	0.2031	28	66	36	6	7625131
	5.20	0.2047	28	66	36	6	7625132
5	5.22	0.2055	28	66	36	6	7625133
	5.30	0.2087	28	66	36	6	7625134
	5.40	0.2126	28	66	36	6	7625135
	5.50	0.2165	28	66	36	6	7625136
7/32	5.56	0.2188	28	66	36	6	7625137
	5.60	0.2205	28	66	36	6	7625138
	5.70	0.2244	28	66	36	6	7625139
	5.80	0.2283	28	66	36	6	7625140
	5.90	0.2323	28	66	36	6	7625141
15/64	5.95	0.2344	28	66	36	6	7625142
	6.00	0.2362	28	66	36	6	7625143
	6.05	0.2382	34	79	36	8	7625144
	6.10	0.2402	34	79	36	8	7625145
	6.20	0.2441	34	79	36	8	7625146
	6.30	0.2480	34	79	36	8	7625147
1/4	6.35	0.2500	34	79	36	8	7625148
	6.40	0.2520	34	79	36	8	7625149
	6.50	0.2559	34	79	36	8	7625150
	6.60	0.2598	34	79	36	8	7625151
	6.70	0.2638	34	79	36	8	7625152
17/64	6.75	0.2656	34	79	36	8	7625153
	6.80	0.2677	34	79	36	8	7625154
	6.90	0.2717	34	79	36	8	7625155
	7.00	0.2756	34	79	36	8	7625156
	7.10	0.2795	41	79	36	8	7625157
9/32	7.14	0.2813	41	79	36	8	7625158
	7.20	0.2835	41	79	36	8	7625159
	7.30	0.2874	41	79	36	8	7625160
	7.40	0.2913	41	79	36	8	7625161
	7.50	0.2953	41	79	36	8	7625162
19/64	7.54	0.2969	41	79	36	8	7625163
	7.60	0.2992	41	79	36	8	7625164
	7.70	0.3031	41	79	36	8	7625165
	7.80	0.3071	41	79	36	8	7625166
	7.90	0.3110	41	79	36	8	7625167
5/16	7.94	0.3125	41	79	36	8	7625168
	8.00	0.3150	41	79	36	8	7625169
	8.05	0.3169	47	89	40	10	7625170
	8.10	0.3189	47	89	40	10	7625171
	8.20	0.3228	47	89	40	10	7625172
	8.30	0.3268	47	89	40	10	7625173
21/64	8.33	0.3281	47	89	40	10	7625174
	8.40	0.3307	47	89	40	10	7625175
	8.50	0.3346	47	89	40	10	7625176
	8.60	0.3386	47	89	40	10	7625177
	8.70	0.3425	47	89	40	10	7625178
11/32	8.73	0.3438	47	89	40	10	7625179
	8.80	0.3465	47	89	40	10	7625180
	8.90	0.3504	47	89	40	10	7625181
	9.00	0.3543	47	89	40	10	7625182
	9.10	0.3583	47	89	40	10	7625183
23/64	9.13	0.3594	47	89	40	10	7625184
	9.20	0.3622	47	89	40	10	7625185
	9.30	0.3661	47	89	40	10	7625186
	9.40	0.3701	47	89	40	10	7625187
	9.50	0.3740	47	89	40	10	7625188
3/8	9.53	0.3750	47	89	40	10	7625189
	9.60	0.3780	47	89	40	10	7625190
	9.70	0.3819	47	89	40	10	7625191
	9.80	0.3858	47	89	40	10	7625192

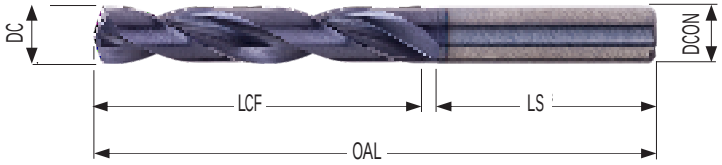
DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R467
	9.90	0.3898	47	89	40	10	7625193
25/64	9.92	0.3906	47	89	40	10	7625194
	10.00	0.3937	47	89	40	10	7625195
	10.05	0.3957	55	102	45	12	7625196
	10.10	0.3976	55	102	45	12	7625197
	10.20	0.4016	55	102	45	12	7625198
	10.30	0.4055	55	102	45	12	7625199
13/32	10.32	0.4063	55	102	45	12	7625200
	10.40	0.4094	55	102	45	12	7625201
	10.50	0.4134	55	102	45	12	7625202
	10.60	0.4173	55	102	45	12	7625203
27/64	10.72	0.4219	55	102	45	12	7625204
	10.80	0.4252	55	102	45	12	7625205
	10.90	0.4291	55	102	45	12	7625206
	11.00	0.4331	55	102	45	12	7625207
7/16	11.11	0.4375	55	102	45	12	7625208
	11.20	0.4409	55	102	45	12	7625209
	11.30	0.4449	55	102	45	12	7625210
	11.40	0.4488	55	102	45	12	7625211
	11.50	0.4528	55	102	45	12	7625212
29/64	11.51	0.4531	55	102	45	12	7625213
	11.60	0.4567	55	102	45	12	7625214
	11.80	0.4646	55	102	45	12	7625215
15/32	11.91	0.4688	55	102	45	12	7625216
	12.00	0.4724	55	102	45	12	7625217
	12.05	0.4744	60	107	45	14	7625218
	12.10	0.4764	60	107	45	14	7625219
	12.20	0.4803	60	107	45	14	7625220
31/64	12.30	0.4844	60	107	45	14	7625221
	12.50	0.4921	60	107	45	14	7625222
1/2	12.70	0.5000	60	107	45	14	7625223
	12.70	0.5000	60	107	45	14	7625224
	12.80	0.5039	60	107	45	14	7625225
	13.00	0.5118	60	107	45	14	7625226
33/64	13.10	0.5156	60	107	45	14	7625227
	13.30	0.5236	60	107	45	14	7625228
17/32	13.49	0.5313	60	107	45	14	7625229
	13.50	0.5315	60	107	45	14	7625230
	13.80	0.5433	60	107	45	14	7625231
35/64	13.89	0.5469	60	107	45	14	7625232
	14.00	0.5512	60	107	45	14	7625233
	14.25	0.5610	65	115	48	16	7625234
9/16	14.29	0.5625	65	115	48	16	7625235
	14.50	0.5709	65	115	48	16	7625236
37/64	14.68	0.5781	65	115	48	16	7625237
	14.80	0.5827	65	115	48	16	7625238
	15.00	0.5906	65	115	48	16	7625239
19/32	15.08	0.5938	65	115	48	16	7625240
	15.10	0.5945	65	115	48	16	7625241
	15.30	0.6024	65	115	48	16	7625242
39/64	15.48	0.6094	65	115	48	16	7625243
	15.50	0.6102	65	115	48	16	7625244
	15.80	0.6220	65	115	48	16	7625245
5/8	15.88	0.6250	65	115	48	16	7625246
	16.00	0.6299	65	115	48	16	7625247

DORMER FORCE M SOLID CARBIDE DRILL

Mult-Applicaton, Standard length, Reinforced Shank

R463	M1.1	M1.2	M2.1	M2.2	M2.3	M3.1	M3.2	M3.3	M4.1	M4.2	S1.1	S1.2	S1.3	S2.1	S2.2	S3.1	S3.2	S4.1	S4.2
	■ 384G	■ 325G	■ 341G	■ 279G	■ 233E	■ 285G	■ 246G	■ 223F	■ 197F	■ 171E	■ 180V	■ 148V	■ 131U	◪ 197U	◪ 184U	◪ 148U	◪ 131U	◪ 115U	◪ 105U

Self-centering 4-facet split point and CTW fute construcon for enhanced penetraon rate speci fcally designed for Stainless Steel (ISO-M) materials. TiAlN coang increases wear resistance and improves tool life. Coolant through combined with an advanced point geometry prevents premature wear of the cu t ng edges. Length designed for 5 x Diameter drilling depths.



FORCE M

R463

NEW

3.00 - 16.00

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R463
	3.00	0.1181	28	66	36	6	7624913
	3.10	0.1220	28	66	36	6	7624914
1/8	3.18	0.1250	28	66	36	6	7624915
	3.20	0.1260	28	66	36	6	7624916
	3.30	0.1299	28	66	36	6	7624917
	3.40	0.1339	28	66	36	6	7624918
29	3.45	0.1360	28	66	36	6	7624919
	3.50	0.1378	28	66	36	6	7624960
9/64	3.57	0.1406	28	66	36	6	7624961
	3.60	0.1417	28	66	36	6	7624962
	3.70	0.1457	28	66	36	6	7624963
	3.80	0.1496	36	74	36	6	7624964
	3.90	0.1535	36	74	36	6	7624965
5/32	3.97	0.1563	36	74	36	6	7624966
	4.00	0.1575	36	74	36	6	7624967
	4.05	0.1594	36	74	36	6	7624968
	4.10	0.1614	36	74	36	6	7624969
	4.20	0.1654	36	74	36	6	7624970
	4.30	0.1693	36	74	36	6	7624971
11/64	4.37	0.1719	36	74	36	6	7624972
	4.40	0.1732	36	74	36	6	7624973
	4.50	0.1772	36	74	36	6	7624974
	4.60	0.1811	36	74	36	6	7624975
	4.70	0.1850	36	74	36	6	7624976
3/16	4.76	0.1875	44	82	36	6	7624977
	4.80	0.1890	44	82	36	6	7624978
	4.90	0.1929	44	82	36	6	7624979
	5.00	0.1969	44	82	36	6	7624980
	5.05	0.1988	44	82	36	6	7624981
	5.10	0.2008	44	82	36	6	7624982

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R463
7	5.11	0.2010	44	82	36	6	7624983
13/64	5.16	0.2031	44	82	36	6	7624984
	5.20	0.2047	44	82	36	6	7624985
5	5.22	0.2055	44	82	36	6	7624986
	5.30	0.2087	44	82	36	6	7624987
	5.40	0.2126	44	82	36	6	7624988
	5.50	0.2165	44	82	36	6	7624989
7/32	5.56	0.2188	44	82	36	6	7624990
	5.60	0.2205	44	82	36	6	7624991
	5.70	0.2244	44	82	36	6	7624992
	5.80	0.2283	44	82	36	6	7624993
	5.90	0.2323	44	82	36	6	7624994
15/64	5.95	0.2344	44	82	36	6	7624995
	6.00	0.2362	44	82	36	6	7624996
	6.05	0.2382	53	91	36	8	7624997
	6.10	0.2402	53	91	36	8	7624998
	6.20	0.2441	53	91	36	8	7624999
	6.30	0.2480	53	91	36	8	7625000
1/4	6.35	0.2500	53	91	36	8	7625001
	6.40	0.2520	53	91	36	8	7625002
	6.50	0.2559	53	91	36	8	7625003
	6.60	0.2598	53	91	36	8	7625004
	6.70	0.2638	53	91	36	8	7625005
17/64	6.75	0.2656	53	91	36	8	7625006
	6.80	0.2677	53	91	36	8	7625007
	6.90	0.2717	53	91	36	8	7625008
	7.00	0.2756	53	91	36	8	7625009
	7.10	0.2795	53	91	36	8	7625010
9/32	7.14	0.2813	53	91	36	8	7625011
	7.20	0.2835	53	91	36	8	7625012
	7.30	0.2874	53	91	36	8	7625013
	7.40	0.2913	53	91	36	8	7625014
	7.50	0.2953	53	91	36	8	7625015
19/64	7.54	0.2969	53	91	36	8	7625016
	7.60	0.2992	53	91	36	8	7625017
	7.70	0.3031	53	91	36	8	7625018
	7.80	0.3071	53	91	36	8	7625019
	7.90	0.3110	53	91	36	8	7625020
5/16	7.94	0.3125	53	91	36	8	7625021
	8.00	0.3150	53	91	36	8	7625022
	8.05	0.3169	61	103	40	10	7625023
	8.10	0.3189	61	103	40	10	7625024
	8.20	0.3228	61	103	40	10	7625025
	8.30	0.3268	61	103	40	10	7625026
21/64	8.33	0.3281	61	103	40	10	7625027
	8.40	0.3307	61	103	40	10	7625028
	8.50	0.3346	61	103	40	10	7625029
	8.60	0.3386	61	103	40	10	7625030
	8.70	0.3425	61	103	40	10	7625031
11/32	8.73	0.3438	61	103	40	10	7625032
	8.80	0.3465	61	103	40	10	7625033
	8.90	0.3504	61	103	40	10	7625034
	9.00	0.3543	61	103	40	10	7625035
	9.10	0.3583	61	103	40	10	7625036
23/64	9.13	0.3594	61	103	40	10	7625037
	9.20	0.3622	61	103	40	10	7625038
	9.30	0.3661	61	103	40	10	7625039
	9.40	0.3701	61	103	40	10	7625040
	9.50	0.3740	61	103	40	10	7625041
3/8	9.53	0.3750	61	103	40	10	7625042
	9.60	0.3780	61	103	40	10	7625043
	9.70	0.3819	61	103	40	10	7625044
	9.80	0.3858	61	103	40	10	7625045
	9.90	0.3898	61	103	40	10	7625046
25/64	9.92	0.3906	61	103	40	10	7625047

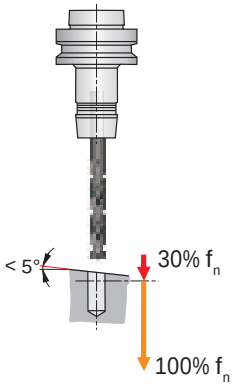
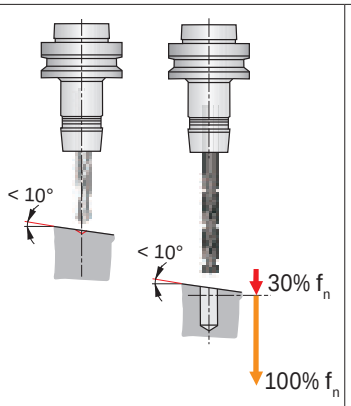
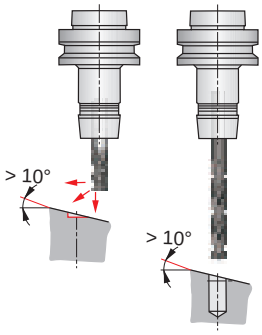
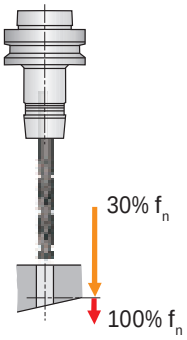
DORMER

DC [inch]	DC [mm]	DC decimal [inch]	LCF [mm]	OAL [mm]	LS [mm]	DCON [mm]	R463
	10.00	0.3937	61	103	40	10	7625048
	10.05	0.3957	70	118	45	12	7625049
	10.10	0.3976	70	118	45	12	7625050
	10.20	0.4016	70	118	45	12	7625051
	10.30	0.4055	70	118	45	12	7625052
13/32	10.32	0.4063	70	118	45	12	7625053
	10.40	0.4094	70	118	45	12	7625054
	10.50	0.4134	70	118	45	12	7625055
	10.60	0.4173	70	118	45	12	7625056
27/64	10.72	0.4219	70	118	45	12	7625057
	10.80	0.4252	70	118	45	12	7625058
	10.90	0.4291	70	118	45	12	7625059
	11.00	0.4331	70	118	45	12	7625060
7/16	11.11	0.4375	70	118	45	12	7625061
	11.20	0.4409	70	118	45	12	7625062
	11.30	0.4449	70	118	45	12	7625063
	11.40	0.4488	70	118	45	12	7625064
	11.50	0.4528	70	118	45	12	7625065
29/64	11.51	0.4531	70	118	45	12	7625066
	11.60	0.4567	70	118	45	12	7625067
	11.80	0.4646	70	118	45	12	7625068
15/32	11.91	0.4688	70	118	45	12	7625069
	12.00	0.4724	70	118	45	12	7625070
	12.05	0.4744	76	124	45	14	7625071
	12.20	0.4803	76	124	45	14	7625072
31/64	12.30	0.4844	76	124	45	14	7625073
	12.50	0.4921	76	124	45	14	7625074
1/2	12.70	0.5000	76	124	45	14	7625075
	12.70	0.5000	76	124	45	14	7625076
	12.80	0.5039	76	124	45	14	7625077
	13.00	0.5118	76	124	45	14	7625078
33/64	13.10	0.5156	76	124	45	14	7625079
	13.30	0.5236	76	124	45	14	7625080
17/32	13.49	0.5313	76	124	45	14	7625081
	13.50	0.5315	76	124	45	14	7625082
	13.80	0.5433	76	124	45	14	7625083
35/64	13.89	0.5469	76	124	45	14	7625084
	14.00	0.5512	76	124	45	14	7625085
	14.25	0.5610	82	133	48	16	7625086
9/16	14.29	0.5625	82	133	48	16	7625087
	14.50	0.5709	82	133	48	16	7625088
37/64	14.68	0.5781	82	133	48	16	7625089
	14.80	0.5827	82	133	48	16	7625090
	15.00	0.5906	82	133	48	16	7625091
19/32	15.08	0.5938	82	133	48	16	7625092
	15.10	0.5945	82	133	48	16	7625093
	15.30	0.6024	82	133	48	16	7625094
39/64	15.48	0.6094	82	133	48	16	7625095
	15.50	0.6102	82	133	48	16	7625096
	15.80	0.6220	82	133	48	16	7625097
5/8	15.88	0.6250	82	133	48	16	7625098
	16.00	0.6299	82	133	48	16	7625099

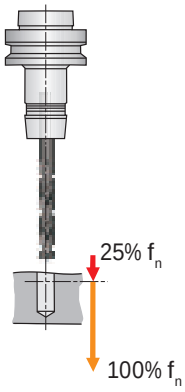
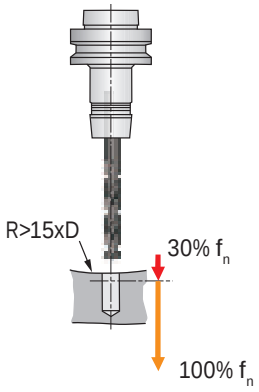
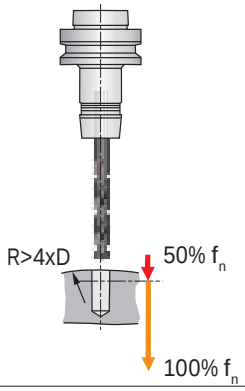
Force M 8xD also available as a special order

PRACTICAL MACHINING RECOMMENDATIONS

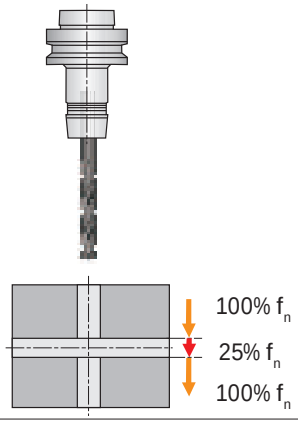
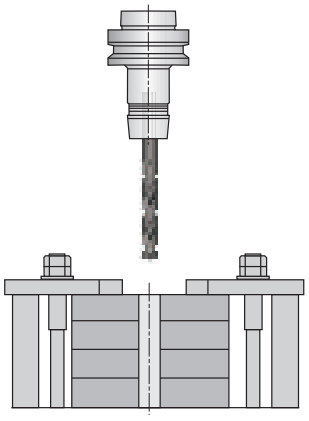
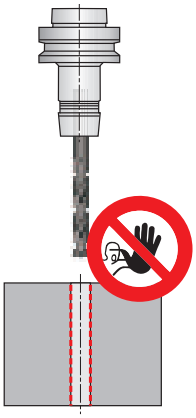
DRILLING INCLINED SURFACES

			
Enter with reduced feed	**Spot** before drilling **Enter** with reduced feed	**Mill** a flat surface before drilling	**Exit** with reduced feed

DRILLING IRREGULAR SURFACES

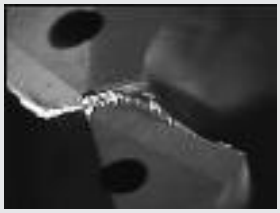
		
Reduce feed	**Reduce** feed	**Reduce** feed

DRILLING IRREGULAR SURFACES

		
Reduce feed	**Use** industrial paper (approx. 0.5-1 mm thick) placed between the plates	This operation is **NOT** recommended

PRACTICAL MACHINING RECOMMENDATIONS

FAILURE MODES

PROBLEM	CAUSE	SOLUTION
Built Up Edge 	1. Too low cu t ng speed and edge temperature 2. Too large neg. land 3. No coa t ng 4. Too low percentage of oil in the cu t ng fuid	1. Increase cu t ng speed or use external cu t ng fuid 2. Sharper cu t ng edge 3. Coa t ng on the edge 4. Increase the percentage of oil in the cu t ng fuid
Chipping on Outer Corners 	1. Unstable fxturing 2. TIR too large 3. Intermi t ent cu t ng 4. Insu f cient cu t ng fuid (Thermal cracking) 5. Unstable tool holding	1. Check fxture 2. Check radial run-out 3. Lower the feed 4. Check cu t ng fuid supply 5. Check the tool holder
Excess Wear on Cu t ng Edge 	1. Cu t ng speed too high 2. Feed too low 3. Grade too so f 4. Lack of cu t ng fuid	1. Lower the cu t ng speed 2. Increase the feed 3. Change to harder grade 4. Check for proper cu t ng fuid supply
Chipping on Cu t ng Edges 	1. Unstable condi t ons 2. Maximum allowed wear exceeded 3. Grade too hard	1. Check the setup 2. Replace drill sooner 3. Change to so f er grade
Excess Wear on Cylindrical Lands 	1. TIR too large 2. Cu t ng fuid too weak 3. Cu t ng speed too high 4. Abrasive material	1. Check the radial runout 2. Use neat oil or stronger emulsion 3. Lower cu t ng speed 4. Change to harder grade
Excess Wear on Chisel Edge 	1. Cu t ng speed too low 2. Feed too high 3. Chisel edge too small	1. Increase cu t ng speed 2. Lower feed 3. Check dimensions

SIMPLY RELIABLE

As a professional you can judge the quality of work by just looking at the chip. Our chip is a clean and uncomplicated shape that in itself tells a story. It is a clear and consistent signal and that's why we use it as a symbol for being **Simply Reliable**.

Argentina
T: 54 (11) 6777-6777
info.ar@dormerpramet.com

Austria
T: +31 10 2080 240
info.at@dormerpramet.com

Belgium & Luxembourg
T: +32 3 440 59 01
info.be@dormerpramet.com

Brazil
T: +55 11 5660 3000
info.br@dormerpramet.com

Canada
T: (888) 336 7637
En Français: (888) 368 8457
cs.canada@dormerpramet.com

China
T: +86 21 2416 0508
info.cn@dormerpramet.com

Croatia
T: +385 98 407 489
info.hr@dormerpramet.com

Czech Republic
T: +420 583 381 111
info.cz@dormerpramet.com

Denmark
T: 808 82106
info.se@dormerpramet.com

Finland
T: 0205 44 7003
info.f@dormerpramet.com

France
T: +33 (0)2 47 62 57 01
info.fr@dormerpramet.com

Germany
T: +49 9131 933 08 70
info.de@dormerpramet.com

Hungary
T: +36-96 / 522-846
info.hu@dormerpramet.com

India
T: +91 11 4601 5686
info.in@dormerpramet.com

Italy
T: +39 02 30 70 54 44
info.it@dormerpramet.com

Kazakhstan
T: +7 771 305 11 45
info.kz@dormerpramet.com

Mexico
T: +52 (555) 7293981
cs.mexico@dormerpramet.com

Netherlands
T: +31 10 2080 240
info.nl@dormerpramet.com

Norway
T: 800 10 113
info.se@dormerpramet.com

Poland
T: +48 32 78-15-890
info.pl@dormerpramet.com

Portugal
T: +351 21 424 54 21
info.pt@dormerpramet.com

Romania
T: +4(0)730 015 885
info.ro@dormerpramet.com

Russia
T: +7 (495) 775 10 28
info.ru@dormerpramet.com

Slovakia
T: +421 (41) 764 54 60
info.sk@dormerpramet.com

Slovenia
T: +385 98 407 489
info.si@dormerpramet.com

Spain
T: +34 935717722
info.es@dormerpramet.com

Sweden
responsible for **Iceland**
T: +46 35 16 52 96
info.se@dormerpramet.com

Switzerland
T: +31 10 2080 240
info.ch@dormerpramet.com

Turkey
T: +90 533 212 45 47
info.tr@dormerpramet.com

Ukraine
T: +38 056 736 30 21
info.ua@dormerpramet.com

United Kingdom
responsible for **Ireland**
T: 0870 850 4466
info.uk@dormerpramet.com

United States of America
T: (800) 877-3745
cs@dormerpramet.com

Other countries

South America
T: +55 11 5660 3000
info.br@dormerpramet.com

Adria
T: +420 583 381 527
info.rcee@dormerpramet.com

Rest of the World
Dormer Pramet International UK
T: +44 1246 571338
info.int@dormerpramet.com

Dormer Pramet International CZ
T: +420 583 381 520
info.int.cz@dormerpramet.com

7 320760 927250

2.2020

EDP# 7940247

www.dormerpramet.com
youtube.com/dormerpramet
facebook.com/dormerprametsocial
linkedin.com/company/dormerpramet
twitter.com/dormerpramet
instagram.com/dormerprametsocial

DORMER PRAMET