

# Twister® Micro XD Drill

## MPDCS / MXDSR / MXDCR / MXDCL Series Recommended Cutting Data - Inch 5xD, Solid Drilling and 2xD, 5xD, & 12xD, Coolant-Fed Drilling

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	vc-SFM	Drill Diameter (mm)					
							0.5	1.0	1.5	2.0	2.5	2.95
							f - IPR					
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	MXDSR		5x	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2x	300	—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5x	300		.0007	.0010	.0013	.0017	.0020
			MXDCL		12x	260		.0007	.0010	.0013	.0017	.0020
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	MXDSR		5x	130	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2x	300	—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5x	300		.0007	.0010	.0013	.0017	.0020
			MXDCL		12x	260		.0007	.0010	.0013	.0017	.0020
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	MXDSR		5x	120	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2x	250	—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5x	250		.0007	.0010	.0013	.0017	.0020
			MXDCL		12x	230		.0007	.0010	.0013	.0017	.0020
Hardened Steels A2 / 52100	H	45 to 55 Rc	MXDSR		5x	50	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2x	80	—	.0004	.0007	.0009	.0011	.0014
			MXDCR		5x	80		.0002	.0004	.0006	.0008	.0010
			MXDCL		12x	80		.0002	.0004	.0006	.0008	.0010
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	MXDSR		5x	140	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2x	300	—	.0010	.0015	.0020	.0025	.0030
			MXDCR		5x	300		.0007	.0010	.0013	.0017	.0020
			MXDCL		12x	260		.0007	.0010	.0013	.0017	.0020
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	MXDSR		5x	125	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2x	230	—	.0008	.0012	.0016	.0020	.0023
			MXDCR		5x	230		.0007	.0010	.0013	.0017	.0020
			MXDCL		12x	230		.0007	.0010	.0013	.0017	.0020
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	MXDSR		5x	60	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2x	80	—	.0004	.0007	.0009	.0011	.0014
			MXDCR		5x	80		.0002	.0004	.0006	.0008	.0010
			MXDCL		12x	80		.0002	.0004	.0006	.0008	.0010

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

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### MPDCS / MXDSR / MXDCR / MXDCL Series Recommended Cutting Data - Inch 5xD, Solid Drilling and 2xD, 5xD, & 12xD, Coolant-Fed Drilling *Continued*

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	vc-SFM	Drill Diameter (mm)					
							0.5	1.0	1.5	2.0	2.5	2.95
							f - IPR					
Cast Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	MXDSR		5x	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2x							
			MXDCR		5x	325	—	.0010	.0015	.0020	.0025	.0030
			MXDCL		12x							
Cast Iron - Ductile & Malleable CGI: 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	MXDSR		5x	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2x							
			MXDCR		5x	250	—	.0010	.0015	.0020	.0025	.0030
			MXDCL		12x							
Titanium 6Al-4V	S	up to 40 Rc	MXDSR		5x	70	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2x							
			MXDCR		5x	230	—	.0004	.0006	.0008	.0010	.0012
			MXDCL		12x							
High Temp Alloys Inconel / Hastelloy / Waspeloy / Nickel Based Alloys - Monel	S	up to 40 Rc	MXDSR		5x	60	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2x							
			MXDCR		5x	155	—	.0004	.0006	.0008	.0010	.0012
			MXDCL		12x							

Drills - Technical Information  
Series MPDCS / MXDSR / MXDCR / MXDCL

#### Recommended Peck Depths For MXDSR Solid Drilling by Diameter\*

Diameter	Peck Depth
0.50 mm	.2 x Diameter
1.00 mm	.3 x Diameter
1.50 mm	.6 x Diameter
2.00 mm	.8 x Diameter
2.50 mm	1.0 x Diameter
2.95 mm	3.0 x Diameter

\*Peck depths can vary by material type.

Recommended Machine Requirements  
High Pressure Pump System (1,000 psi / 68.9 bar)  
Coolant filtration of 10 microns or better  
Total runout of .0004" (.01mm) Max. at drill tip

For best MXDCL performance, the following steps are recommended:

- When Drilling with the MXDCL, drill a pilot hole 1.5 - 2 x diameter deep using a MPDCS drill.
- Insert MXDCL into pilot hole at a low speed (300-500 RPM) stopping short of the pilot hole bottom.
- Start coolant flow and increase speed to recommended RPM.
- Feed to full depth. (Pecking may be required for standard coolant pressure. Follow the MXDSR peck depth chart. To prevent drill whip and corner damage, do not retract all the way out of hole while pecking.)
- After reaching desired depth, reduce speed (300-500 RPM) before retracting from the hole at a feed of 2-4 times the drilling feed.

**Note: Under optimal conditions (high pressure coolant), one shot drilling may be accomplished with the MXDCL.**

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

# Twister<sup>®</sup> Micro XD Drill

## MPDCS / MXDSR / MXDCR / MXDCL Series Recommended Cutting Data - Metric 5xD, Solid Drilling and 2xD, 5xD, & 12xD, Coolant-Fed Drilling

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	vc-m/min.	Drill Diameter (mm)					
							0.5	1.0	1.5	2.0	2.5	2.95
							f - mm/Rev					
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	MXDSR		5x	45	.013	.025	.038	.051	.064	.076
			MPDCS		2x	90	—	.025	.038	.051	.064	.076
			MXDCR		5x	80		.017	.026	.034	.043	.050
			MXDCL		12x	80						
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	MXDSR		5x	40	.013	.025	.038	.051	.064	.076
			MPDCS		2x	90	—	.025	.038	.051	.064	.076
			MXDCR		5x	80		.017	.026	.034	.043	.050
			MXDCL		12x	80						
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	MXDSR		5x	35	.013	.025	.038	.051	.064	.076
			MPDCS		2x	75	—	.025	.038	.051	.064	.076
			MXDCR		5x	70		.017	.026	.034	.043	.050
			MXDCL		12x	70						
Hardened Steels A2 / 52100	H	45 to 55 Rc	MXDSR		5x	15	.005	.010	.018	.023	.028	.036
			MPDCS		2x	25	—	.010	.018	.023	.028	.036
			MXDCR		5x	25		.005	.010	.015	.020	.025
			MXDCL		12x	25						
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	MXDSR		5x	40	.013	.025	.038	.051	.064	.076
			MPDCS		2x	90	—	.025	.038	.051	.064	.076
			MXDCR		5x	80		.017	.026	.034	.043	.050
			MXDCL		12x	80						
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	MXDSR		5x	38	.013	.025	.038	.051	.064	.076
			MPDCS		2x	70	—	.020	.030	.040	.050	.059
			MXDCR		5x	70		.017	.026	.034	.043	.050
			MXDCL		12x	70						
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	MXDSR		5x	18	.005	.010	.018	.023	.028	.036
			MPDCS		2x	25	—	.010	.018	.023	.028	.036
			MXDCR		5x	25		.005	.010	.015	.020	.025
			MXDCL		12x	25						

**Drills - Technical Information**  
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			MPDCS		2x							
			MXDCR		5x	100	—	.025	.038	.051	.064	.076
			MXDCL		12x							
Cast Iron - Ductile & Malleable CGI: 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	MXDSR		5x	45	.013	.025	.038	.051	.064	.076
			MPDCS		2x							
			MXDCR		5x	75	—	.025	.038	.051	.064	.076
			MXDCL		12x							
Titanium 6Al-4V	S	up to 40 Rc	MXDSR		5x	20	.013	.025	.038	.051	.064	.076
			MPDCS		2x							
			MXDCR		5x	70	—	.010	.015	.020	.025	.030
			MXDCL		12x							
High Temp Alloys Inconel / Hastelloy / Waspeloy / Nickel Based Alloys - Monel	S	up to 40 Rc	MXDSR		5x	18	.005	.010	.018	.023	.028	.036
			MPDCS		2x							
			MXDCR		5x	47	—	.010	.015	.020	.025	.030
			MXDCL		12x							

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Series MPDCS / MXDSR / MXDCR / MXDCL

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