Recommended Cutting Data MPDCS/MXDSR/MXDCR/MXDCL Series - Inch

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		5	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	300	-	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12							
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		5	130	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	300	-	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12							
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		5	120	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	250	-	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12							
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	MXDSR		5	140	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	300	-	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12							
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		5	125	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	230	-	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12							
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	MXDSR		5	60	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2	60	-	.0004	.0007	.0009	.0011	.0014
			MXDCR		5							
			MXDCL		12							
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy, Waspeloy	S	up to 40 Rc	MXDSR		5	60	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2	80	-	.0004	.0007	.0009	.0011	.0014
			MXDCR		5							
			MXDCL		12							
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S	up to 40 Rc	MXDSR		5	70	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2	175	-	.0010	.0015	.0020	.0025	.0030
			MXDCR		5							
			MXDCL		12							

Safety Note

Always wear the appropriate personal protective equipment such as safety glasses and protective clothing when using solid carbide or HSS cutting tools. Machines should be fully guarded.

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

Recommended Cutting Data MPDCS/MXDSR/MXDCR/MXDCL Series - Inch 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		5	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2							
			MXDCR		5	325	-	.0010	.0015	.0020	.0025	.0030
			MXDCL		12							
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		5	150	.0005	.0010	.0015	.0020	.0025	.0030
			MPDCS		2							
			MXDCR		5	250	-	.0010	.0015	.0020	.0025	.0030
			MXDCL		12							
Hardened Steels A2/52100	H	45 to 55 Rc	MXDSR		5	50	.0002	.0004	.0007	.0009	.0011	.0014
			MPDCS		2							
			MXDCR		5	80	-	.0004	.0007	.0009	.0011	.0014
			MXDCL		12							

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.

Machine Requirements:

High pressure pump system (1,000 psi/68.9 bar)
Coolant filtration of 10 microns or better
Machine runout of .0004" (.01mm) Max.

For best MXDCL performance, the following steps are recommended:

- When Drilling with the MXDCL, drill a pilot hole up to 1.5 x diameter deep using a MPDCS drill.
- Insert MXDCL into pilot hole at a low speed (500-1000 RPM) stopping short of the pilot hole bottom.
- Start coolant flow and increase speed to recommended RPM.
- Under optimal conditions, feed to full depth without pecking. Some cases may require 1-4 pecks to reach full depth.

(to prevent drill whip and corner damage, do not retract all the way out of hole while pecking)

- After reaching desired depth, reduce speed (500-1000 RPM) before retracting from hole.

Recommended Cutting Data MPDCS/MXDSR/MXDCR/MXDCL Series - Metric

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		5	45	.013	.025	.038	.050	.063	.076
			MPDCS		2	90	-	.025	.038	.050	.063	.076
			MXDCR		5							
			MXDCL		12							
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		5	40	.013	.025	.038	.050	.063	.076
			MPDCS		2	90	-	.025	.038	.050	.063	.076
			MXDCR		5							
			MXDCL		12							
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		5	35	.013	.025	.038	.050	.063	.076
			MPDCS		2	75	-	.025	.038	.050	.063	.076
			MXDCR		5							
			MXDCL		12							
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	MXDSR		5	40	.013	.025	.038	.050	.063	.076
			MPDCS		2	90	-	.025	.038	.050	.063	.076
			MXDCR		5							
			MXDCL		12							
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		5	38	.013	.025	.038	.050	.063	.076
			MPDCS		2	70	-	.025	.038	.050	.063	.076
			MXDCR		5							
			MXDCL		12							
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	MXDSR		5	18	.005	.010	.018	.023	.028	.036
			MPDCS		2	18	-	.010	.018	.023	.028	.036
			MXDCR		5							
			MXDCL		12							
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy' Waspeloy	S	up to 40 Rc	MXDSR		5	18	.005	.010	.018	.023	.028	.036
			MPDCS		2	24	-	.010	.018	.023	.028	.036
			MXDCR		5							
			MXDCL		12							
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S	up to 40 Rc	MXDSR		5	20	.013	.025	.038	.050	.063	.076
			MPDCS		2	55	-	.025	.038	.050	.063	.076
			MXDCR		5							
			MXDCL		12							

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Recommended Cutting Data MPDCS/MXDSR/MXDCR/MXDCL Series - Metric continued

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			MPDCS		2	100	-	.025	.038	.050	.063	.076
			MXDCR		5							
			MXDCL		12							
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		5	45	.013	.025	.038	.050	.063	.076
			MPDCS		2	75	-	.025	.038	.050	.063	.076
			MXDCR		5							
			MXDCL		12							
Hardened Steels A2/52100	H	45 to 55 Rc	MXDSR		5	15	.005	.010	.018	.023	.028	.036
			MPDCS		2	25	-	.010	.018	.023	.028	.036
			MXDCR		5							
			MXDCL		12							

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.

Machine Requirements:

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- When Drilling with the MXDCL, drill a pilot hole up to 1.5 x diameter deep using a MPDCS drill.
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- Start coolant flow and increase speed to recommended RPM.
- Under optimal conditions, feed to full depth without pecking. Some cases may require 1-4 pecks to reach full depth.
(to prevent drill whip and corner damage, do not retract all the way out of hole while pecking)
- After reaching desired depth, reduce speed (500-1000 RPM) before retracting from hole.

Made In USA

ISO 9001:2008 Certified