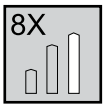
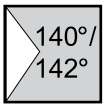
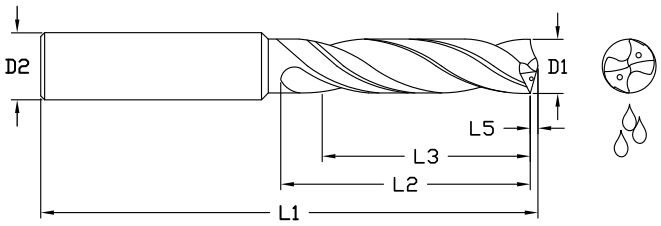
Cyclone Series CXDCL



Designed for high performance drilling in a broad range of materials.



Larger Sizes Now Available!

ALtima® Plus		Diameter				Shank	OAL	Flute Length	Drill Length Ref.	Point Length
		D1 (m7)				D2 (h6)	L1	L2	L3	L5
Tool No.	EDP	Inch	Letter/ Wire	mm	Decimal	mm	mm	mm	mm	mm
CXDCLM0300AP	07226			3.0	.1181	3	81	33	25	0.46
CXDCL1200AP	07227		#31	3.05	.1200	4	92	44	33	0.48
CXDCLM0310AP	07098			3.1	.1220	4	92	44	33	0.48
CXDCL1250AP	07099	1/8		3.18	.1250	4	92	44	33	0.48
CXDCLM0320AP	07100			3.2	.1260	4	92	44	33	0.50
CXDCLM0325AP	07101			3.25	.1280	4	92	44	33	0.51
CXDCL1285AP	07102		#30	3.26	.1285	4	92	44	33	0.51
CXDCLM0330AP	07103			3.3	.1299	4	92	44	33	0.51
CXDCLM0340AP	07104			3.4	.1339	4	92	44	33	0.53
CXDCL1360AP	07105		#29	3.45	.1360	4	92	44	33	0.53
CXDCLM0350AP	07106			3.5	.1378	4	92	44	33	0.54
CXDCL1406AP	07107	9/64		3.57	.1406	4	92	44	33	0.56
CXDCLM0360AP	07108			3.6	.1417	4	92	44	33	0.56
CXDCLM0370AP	07109			3.7	.1457	4	92	44	33	0.57
CXDCL1496AP	07110		#25	3.8	.1496	4	92	44	33	0.59
CXDCL1520AP	07111		#24	3.86	.1520	4	92	44	33	0.60
CXDCLM0390AP	07112			3.9	.1535	4	92	44	33	0.60
CXDCL1562AP	07113	5/32		3.97	.1562	4	92	44	33	0.61
CXDCLM0400AP	07114			4.0	.1575	4	92	44	33	0.62
CXDCL1590AP	07115		#21	4.04	.1590	5	100	45	34	0.63
CXDCLM0410AP	07116			4.1	.1614	5	100	45	34	0.64
CXDCLM0420AP	07117			4.2	.1654	5	100	45	34	0.65
CXDCLM0430AP	07118			4.3	.1693	5	100	45	34	0.67
CXDCL1719AP	07119	11/64		4.37	.1719	5	100	45	34	0.68
CXDCLM0440AP	07120			4.4	.1732	5	100	45	34	0.68
CXDCLM0450AP	07121			4.5	.1772	5	100	45	34	0.70
CXDCLM0460AP	07122			4.6	.1811	5	100	45	34	0.71
CXDCLM0465AP	07123			4.65	.1831	5	100	45	34	0.72
CXDCLM0470AP	07124			4.7	.1850	5	100	45	34	0.73
CXDCL1875AP	07125	3/16		4.76	.1875	5	100	45	34	0.74

Inch	
D1	Tolerance (m7)
.0000 - .1181	+.00008/+.00047
.1182 - .2362	+.00016/+.00063
.2363 - .3937	+.00024/+.00083
.3938 - .5000	+.00027/+.00098

Inch	
D2	Tolerance (h6)
.0000 - .1181	+0/-.00024
.1182 - .2362	+0/-.00031
.2363 - .3937	+0/-.00035
.3938 - .5000	+0/-.00043

Metric (mm)	
D1	Tolerance (m7)
0 - 3.0	+.002/+.012
3.01 - 6.0	+.004/+.016
6.01 - 10.0	+.006/+.021
10.01 - 12.7	+.007/+.025

Metric (mm)	
D2	Tolerance (h6)
0 - 3.0	+0/-.006
3.01 - 6.0	+0/-.008
6.01 - 10.0	+0/-.009
10.01 - 12.7	+0/-.011

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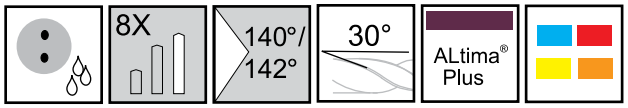
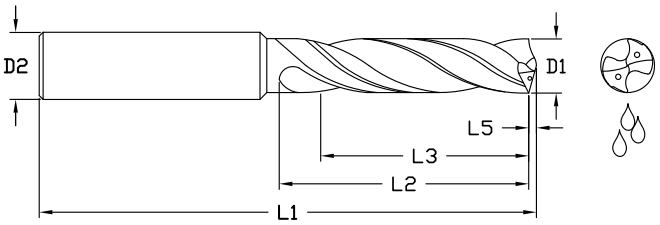
Series CXDCL Continued





ALtima® Plus		Diameter D1 (m7)				Shank D2 (h6)	OAL L1	Flute Length L2	Drill Length Ref. L3	Point Length L5
Tool No.	EDP	Inch	Letter/ Wire	mm	Decimal	mm	mm	mm	mm	mm
CXDCLM0480AP	07126			4.8	.1890	5	100	50	38	0.74
CXDCLM0490AP	07127			4.9	.1929	5	100	50	38	0.76
CXDCLM0500AP	07128			5.0	.1968	5	100	50	38	0.77
CXDCLM0510AP	07129			5.1	.2008	6	100	57	43	0.79
CXDCL2031AP	07130	13/64		5.16	.2031	6	100	57	43	0.79
CXDCLM0520AP	07131			5.2	.2047	6	100	57	43	0.81
CXDCLM0530AP	07132			5.3	.2087	6	100	57	43	0.82
CXDCLM0540AP	07133			5.4	.2126	6	100	57	43	0.84
CXDCLM0550AP	07134			5.5	.2165	6	100	57	43	0.85
CXDCL2187AP	07135	7/32		5.56	.2187	6	100	57	43	0.86
CXDCLM0560AP	07136			5.6	.2205	6	100	57	43	0.86
CXDCL2210AP	07137		#2	5.61	.2210	6	100	57	43	0.86
CXDCLM0570AP	07138			5.7	.2244	6	100	57	43	0.88
CXDCLM0580AP	07139			5.8	.2283	6	100	57	43	0.90
CXDCLM0590AP	07140			5.9	.2323	6	100	57	43	0.91
CXDCL2344AP	07141	15/64		5.95	.2344	6	100	57	43	0.91
CXDCLM0600AP	07142			6.0	.2362	6	100	57	43	0.93
CXDCLM0610AP	07143			6.1	.2402	8	118	76	57	0.95
CXDCL2420AP	07144		C	6.15	.2420	8	118	76	57	0.95
CXDCLM0620AP	07145			6.2	.2441	8	118	76	57	0.96
CXDCL2460AP	07146		D	6.25	.2460	8	118	76	57	0.97
CXDCLM0630AP	07147			6.3	.2480	8	118	76	57	0.98
CXDCL2500AP	07148	1/4		6.35	.2500	8	118	76	57	0.99
CXDCLM0640AP	07149			6.4	.2520	8	118	76	57	0.99
CXDCLM0650AP	07150			6.5	.2559	8	118	76	57	1.01
CXDCL2570AP	07151		F	6.53	.2570	8	118	76	57	1.03
CXDCLM0660AP	07152			6.6	.2598	8	118	76	57	1.03
CXDCL2610AP	07153		G	6.63	.2610	8	118	76	57	1.03
CXDCLM0670AP	07154			6.7	.2638	8	118	76	57	1.04
CXDCL2656AP	07155	17/64		6.75	.2656	8	118	76	57	1.04
CXDCLM0680AP	07156			6.8	.2677	8	118	76	57	1.05
CXDCLM0690AP	07157			6.9	.2717	8	118	76	57	1.07
CXDCLM0700AP	07158			7.0	.2756	8	118	76	57	1.08
CXDCLM0710AP	07159			7.1	.2795	8	118	76	57	1.10
CXDCL2812AP	07160	9/32		7.14	.2812	8	118	76	57	1.12
CXDCLM0720AP	07161			7.2	.2835	8	118	76	57	1.12
CXDCLM0730AP	07162			7.3	.2874	8	118	76	57	1.13
CXDCLM0740AP	07163			7.4	.2913	8	118	76	57	1.15
CXDCLM0750AP	07164			7.5	.2953	8	118	76	57	1.16
CXDCL2969AP	07165	19/64		7.54	.2969	8	118	76	57	1.17

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Series CXDCL Continued

ALtima® Plus		Diameter D1 (m7)				Shank D2 (h6)	OAL L1	Flute Length L2	Drill Length Ref. L3	Point Length L5
Tool No.	EDP	Inch	Letter/ Wire	mm	Decimal	mm	mm	mm	mm	mm
CXDCLM0760AP	07166			7.6	.2992	8	118	76	57	1.18
CXDCLM0770AP	07167			7.7	.3031	8	118	76	57	1.19
CXDCLM0780AP	07168			7.8	.3071	8	118	76	57	1.21
CXDCLM0790AP	07169			7.9	.3110	8	118	76	57	1.22
CXDCL3125AP	07170	5/16		7.94	.3125	8	118	76	57	1.22
CXDCLM0800AP	07171			8.0	.3150	8	118	76	57	1.24
CXDCLM0810AP	07172			8.1	.3189	10	139	87	65	1.26
CXDCLM0820AP	07173			8.2	.3228	10	139	87	65	1.27
CXDCLM0830AP	07174			8.3	.3268	10	139	87	65	1.29
CXDCL3281AP	07175	21/64		8.33	.3281	10	139	87	65	1.30
CXDCLM0840AP	07176			8.4	.3307	10	139	87	65	1.31
CXDCL3320AP	07177		Q	8.43	.3320	10	139	87	65	1.31
CXDCLM0850AP	07178			8.5	.3346	10	139	87	65	1.32
CXDCLM0860AP	07179			8.6	.3386	10	139	87	65	1.33
CXDCLM0870AP	07180			8.7	.3425	10	139	87	65	1.35
CXDCL3438AP	07181	11/32		8.73	.3438	10	139	87	65	1.35
CXDCLM0880AP	07182			8.8	.3465	10	139	87	65	1.36
CXDCLM0890AP	07183			8.9	.3504	10	139	87	65	1.38
CXDCLM0900AP	07184			9.0	.3543	10	139	87	65	1.39
CXDCLM0910AP	07185			9.1	.3583	10	139	95	71	1.41
CXDCL3594AP	07186	23/64		9.13	.3594	10	139	95	71	1.42
CXDCLM0920AP	07187			9.2	.3622	10	139	95	71	1.43
CXDCLM0925AP	07188			9.25	.3642	10	139	95	71	1.43
CXDCLM0930AP	07189			9.3	.3661	10	139	95	71	1.44
CXDCL3680AP	07190		U	9.35	.3680	10	139	95	71	1.45
CXDCLM0940AP	07191			9.4	.3701	10	139	95	71	1.46
CXDCLM0950AP	07192			9.5	.3740	10	139	95	71	1.47
CXDCL3750AP	07193	3/8		9.52	.3750	10	139	95	71	1.47
CXDCLM0960AP	07194			9.6	.3780	10	139	95	71	1.49
CXDCLM0970AP	07195			9.7	.3819	10	139	95	71	1.50
CXDCL3858AP	07196		W	9.8	.3858	10	139	95	71	1.52
CXDCLM0990AP	07197			9.9	.3898	10	139	95	71	1.53
CXDCL3906AP	07198	25/64		9.92	.3906	10	139	95	71	1.55
CXDCLM1000AP	07199			10.0	.3937	10	139	95	71	1.55
CXDCLM1010AP	07200			10.1	.3976	12	155	106	80	1.56
CXDCLM1020AP	07201			10.2	.4016	12	155	106	80	1.58
CXDCLM1030AP	07202			10.3	.4055	12	155	106	80	1.60
CXDCL4062AP	07203	13/32		10.32	.4062	12	155	106	80	1.60
CXDCLM1040AP	07204			10.4	.4094	12	155	106	80	1.61
CXDCLM1050AP	07205			10.5	.4134	12	155	106	80	1.63
CXDCLM1060AP	07206			10.6	.4173	12	155	106	80	1.64
CXDCLM1070AP	07207			10.7	.4213	12	155	106	80	1.66
CXDCL4219AP	07208	27/64		10.72	.4219	12	155	106	80	1.65
CXDCLM1080AP	07209			10.8	.4252	12	155	106	80	1.67
CXDCLM1090AP	07210			10.9	.4291	12	155	106	80	1.69

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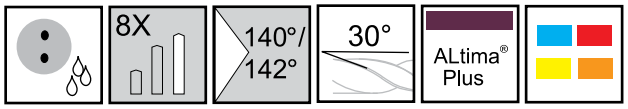
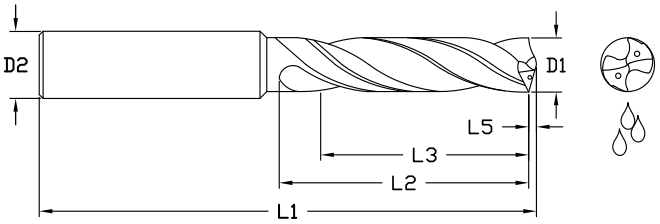
Series CXDCL Continued





	ALtima® Plus		Diameter D1 (m7)				Shank D2 (h6)	OAL L1	Flute Length L2	Drill Length Ref. L3	Point Length L5
	Tool No.	EDP	Inch	Letter/ Wire	mm	Decimal	mm	mm	mm	mm	mm
	CXDCLM1100AP	07211			11.0	.4331	12	155	106	80	1.70
	CXDCLM1110AP	07212			11.1	.4370	12	163	114	86	1.72
	CXDCL4375AP	07213	7/16		11.11	.4375	12	163	114	86	1.73
	CXDCLM1120AP	07214			11.2	.4409	12	163	114	86	1.74
	CXDCLM1130AP	07215			11.3	.4449	12	163	114	86	1.75
	CXDCLM1140AP	07216			11.4	.4488	12	163	114	86	1.77
	CXDCLM1150AP	07217			11.5	.4527	12	163	114	86	1.78
	CXDCLM1160AP	07218			11.6	.4567	12	163	114	86	1.80
	CXDCLM1170AP	07219			11.7	.4606	12	163	114	86	1.81
	CXDCLM1180AP	07220			11.8	.4646	12	163	114	86	1.83
	CXDCLM1190AP	07221			11.9	.4685	12	163	114	86	1.84
	CXDCL4688AP	07222	15/32		11.91	.4688	12	163	114	86	1.85
	CXDCLM1200AP	07223			12.0	.4724	12	163	114	86	1.86
New	CXDCLM1210AP	07228			12.1	.4764	14	182	133	112	1.87
	CXDCL4844AP	07224	31/64		12.3	.4844	14	182	133	112	1.91
New	CXDCLM1250AP	07229			12.5	.4921	14	182	133	112	1.93
	CXDCL5000AP	07225	1/2		12.7	.5000	14	182	133	112	1.95
New	CXDCLM1280AP	07230			12.8	.5039	14	182	133	112	1.98
New	CXDCLM1290AP	07231			12.9	.5079	14	182	133	112	1.99
New	CXDCLM1300AP	07232			13.0	.5118	14	182	133	112	2.01
New	CXDCL5156AP	07233	33/64			.5156	14	182	133	112	2.03
New	CXDCL5312AP	07234	17/32			.5312	14	182	133	112	2.09
New	CXDCLM1350AP	07235			13.5	.5315	14	182	133	112	2.09
New	CXDCLM1370AP	07236			13.7	.5394	14	182	133	112	2.12
New	CXDCL5469AP	07237	35/64			.5469	14	182	133	112	2.16
New	CXDCLM1400AP	07238			14.0	.5512	14	182	133	112	2.16
New	CXDCL5625AP	07239	9/16			.5625	16	204	152	128	2.22
New	CXDCLM1450AP	07240			14.5	.5709	16	204	152	128	2.24
New	CXDCLM1470AP	07241			14.7	.5787	16	204	152	128	2.27
New	CXDCLM1500AP	07242			15.0	.5906	16	204	152	128	2.32
New	CXDCL5938AP	07243	19/32			.5938	16	204	152	128	2.34
New	CXDCLM1530AP	07244			15.3	.6024	16	204	152	128	2.36
New	CXDCLM1550AP	07245			15.5	.6102	16	204	152	128	2.39
New	CXDCLM1570AP	07246			15.7	.6181	16	204	152	128	2.43
New	CXDCL6250AP	07247	5/8			.6250	16	204	152	128	2.46
New	CXDCLM1600AP	07248			16.0	.6299	16	204	152	128	2.47

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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.

cyclone

Recommended Cutting Data CXD ≤ 1/4 - Inch

For applications in aluminum, brass and copper alloys use CDA series cutting data on page 142.

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	Drill Diameter vc - SFM 1/8	5/32	3/16	1/4	Drill Diameter f - IPR 1/8	5/32	3/16	1/4
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	CXDSS		3	390	380	370	360	.003-.005	.004-.006	.005-.007	.0055-.0080
			CXDSR		5	390	380	370	360				
			CXDCS		3	660	650	640	630				
			CXDCR		5	660	650	640	630				
			CXDCL		8	595	580	560	540				
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	CXDSS		3	330	320	310	300	.003-.005	.004-.006	.005-.007	.0055-.008
			CXDSR		5	330	320	310	300				
			CXDCS		3	575	550	540	500				
			CXDCR		5	575	550	540	500				
			CXDCL		8	430	420	410	400				
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	CXDSS		3	200	190	190	185	.0014-.0030	.0024-.0040	.003-.005	.0035-.006
			CXDSR		5	200	190	190	185				
			CXDCS		3	250	240	230	220				
			CXDCR		5	250	240	230	220				
			CXDCL		8	225	220	215	205				
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	CXDSS		3	350	340	330	320	.003-.005	.004-.006	.005-.007	.0055-.008
			CXDSR		5	350	340	330	320				
			CXDCS		3	550	500	475	450				
			CXDCR		5	550	500	475	450				
			CXDCL		8	450	425	400	380				
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	CXDSS		3	140	135	130	125	.003-.005	.004-.006	.005-.007	.0055-.008
			CXDSR		5	140	135	130	125				
			CXDCS		3	300	290	280	270				
			CXDCR		5	300	290	280	270				
			CXDCL		8	280	270	260	250				
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	CXDSS		3	140	130	120	110	.0020-.0033	.0024-.0035	.0030-.0043	.0031-.005
			CXDSR		5	140	130	120	110				
			CXDCS		3	265	250	240	230	.0020-.0033	.0024-.0035	.0030-.0042	.0031-.005
			CXDCR		5	265	250	240	230				
			CXDCL		8	190	180	170	160				
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy	S	up to 42 Rc	CXDSS		3	85	80	75	70	.0014-.0033	.0016-.0035	.002-.004	.0023-.0043
			CXDSR		5	85	80	75	70				
			CXDCS		3	115	100	95	90				
			CXDCR		5	115	100	95	90				
			CXDCL		8	100	100	95	95				
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S		CXDSS		3	130	125	120	115	.003-.004	.004-.006	.005-.007	.0055-.008
			CXDSR		5	130	125	120	115				
			CXDCS		3	230	220	210	200				
			CXDCR		5	230	220	210	200				
			CXDCL		8	210	190	180	170				
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	CXDSS		3	480	470	460	430	.003-.005	.004-.006	.005-.007	.0055-.008
			CXDSR		5	480	470	460	430				
			CXDCS		3	660	640	620	600				
			CXDCR		5	660	640	620	600				
			CXDCL		8	500	490	480	470				
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	CXDSS		3	280	270	260	250				
			CXDSR		5	280	270	260	250				
			CXDCS		3	400	480	460	440				
			CXDCR		5	400	480	460	440				
			CXDCL		8	350	340	330	320				

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

Recommended Cutting Data CXD ≥ 5/16 - Inch

For applications in aluminum, brass and copper alloys use CDA series cutting data on page 142.

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	Drill Diameter vc - SFM 5/16	3/8	1/2	9/16	5/8	3/4	Drill Diameter f - IPR 5/16	3/8	1/2	9/16	5/8	3/4
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	CXDSS		3	350	340	320	300	275	265	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDSR		5	350	340	320	300	275							
			CXDCS		3	620	600	575	550	525		.006-.009	.007-.010	.009-.011	.009-.014	.010-.014	.011-.015
			CXDCR		5	620	600	575	550	525	500						
			CXDCL		8	520	500	480	460	440							
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	CXDSS		3	290	280	270	265	260	260	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDSR		5	290	280	270	265	260							
			CXDCS		3	475	450	425	400	325		.006-.009	.007-.010	.009-.011	.009-.014	.010-.014	.011-.015
			CXDCR		5	475	450	425	400	325	315						
			CXDCL		8	375	350	325	305	250							
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	CXDSS		3	185	180	180	175	175	170	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDSR		5	185	180	180	175	175							
			CXDCS		3	210	210	200	200	190		.006-.009	.007-.010	.009-.011	.009-.014	.010-.014	.011-.015
			CXDCR		5	210	210	200	200	190	190						
			CXDCL		8	200	190	190	190	180							
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	CXDSS		3	310	300	275	250	225	200	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDSR		5	310	300	275	250	225							
			CXDCS		3	400	390	380	370	330		.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDCR		5	400	390	380	370	330	320						
			CXDCL		8	375	370	350	340	300							
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	CXDSS		3	120	115	110	105	100	95	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDSR		5	120	115	110	105	100							
			CXDCS		3	260	250	240	240	230		.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDCR		5	260	250	240	240	230	220						
			CXDCL		8	240	230	220	220	210							
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	CXDSS		3	110	105	105	100	100	95	.003-.006	.005-.009	.007-.009	.008-.010	.009-.011	.009-.013
			CXDSR		5	110	105	105	100	100							
			CXDCS		3	220	200	190	180	170		.003-.006	.005-.009	.007-.009	.008-.010	.009-.011	.009-.013
			CXDCR		5	220	200	190	180	170	155						
			CXDCL		8	150	140	130	125	120							
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy	S	up to 42 Rc	CXDSS		3	65	60	55	50	45	40	.003-.005	.004-.006	.005-.007	.005-.008	.006-.008	.009-.010
			CXDSR		5	65	60	55	50	45							
			CXDCS		3	85	85	80	80	75		.003-.005	.004-.006	.005-.007	.005-.008	.006-.008	.009-.010
			CXDCR		5	85	85	80	80	75	75						
			CXDCL		8	80	80	75	75	70							
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 42 Rc	CXDSS		3	110	105	100	100	90	90	.006-.009	.007-.010	.008-.011	.008-.010	.010-.014	.011-.015
			CXDSR		5	110	105	100	100	90							
			CXDCS		3	190	180	170	160	150		.006-.009	.007-.010	.008-.011	.008-.010	.010-.014	.011-.015
			CXDCR		5	190	180	170	160	150	150						
			CXDCL		8	160	150	140	130	125							
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	CXDSS		3	410	400	390	370	360	350	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDSR		5	410	400	390	370	360							
			CXDCS		3	580	560	550	550	525		.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDCR		5	580	560	550	550	525	500						
			CXDCL		8	460	450	440	440	420							
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	CXDSS		3	240	230	220	210	200	190	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDSR		5	240	230	220	210	200							
			CXDCS		3	400	375	350	300	275		.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
			CXDCR		5	400	375	350	300	275	250						
			CXDCL		8	300	270	250	220	200							

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

Recommended Cutting Data CXD ≤ 6mm - Metric

For applications in aluminum, brass and copper alloys, use CDA series cutting data on page 143.

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	Drill Diameter (mm) vc - m/min 3	4	5	6	Drill Diameter (mm) f - mm/Rev 3	4	5	6
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	CXDSS		3	119	116	113	110	.076-.127	.102-.152	.127-.178	.127-.203
			CXDSR		5	119	116	113	110				
			CXDCS		3	201	198	195	192	.076-.127	.102-.152	.127-.178	.127-.203
			CXDCR		5	201	198	195	192				
			CXDCL		8	181	177	171	165				
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	CXDSS		3	101	98	94	91	.076-.127	.102-.152	.127-.178	.127-.203
			CXDSR		5	101	98	94	91				
			CXDCS		3	175	168	165	152	.076-.127	.102-.152	.127-.178	.127-.203
			CXDCR		5	175	168	165	152				
			CXDCL		8	131	128	125	122				
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	CXDSS		3	61	58	58	56	.036-.076	.061-.102	.076-.127	.089-.152
			CXDSR		5	61	58	58	56				
			CXDCS		3	76	73	70	67	.036-.076	.061-.102	.076-.127	.089-.152
			CXDCR		5	76	73	70	67				
			CXDCL		8	69	67	66	62				
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	CXDSS		3	107	104	101	98	.076-.127	.102-.152	.127-.178	.127-.203
			CXDSR		5	107	104	101	98				
			CXDCS		3	168	152	145	137	.076-.127	.102-.152	.127-.178	.127-.203
			CXDCR		5	168	152	145	137				
			CXDCL		8	137	130	122	116				
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	CXDSS		3	43	41	40	38	.076-.127	.102-.152	.127-.178	.127-.203
			CXDSR		5	43	41	40	38				
			CXDCS		3	91	88	85	82	.076-.127	.102-.152	.127-.178	.127-.203
			CXDCR		5	91	88	85	82				
			CXDCL		8	85	82	79	76				
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	CXDSS		3	43	40	37	34	.051-.076	.061-.089	.089-.102	.076-.127
			CXDSR		5	43	40	37	34				
			CXDCS		3	81	76	73	70	.051-.076	.061-.089	.089-.102	.076-.127
			CXDCR		5	81	76	73	70				
			CXDCL		8	58	55	52	49				
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy	S	up to 42 Rc	CXDSS		3	26	24	23	21	.036-.089	.036-.089	.051-.102	.061-.127
			CXDSR		5	26	24	23	21				
			CXDCS		3	35	30	29	27	.036-.089	.036-.089	.051-.102	.061-.127
			CXDCR		5	35	30	29	27				
			CXDCL		8	30	30	29	29				
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 42 Rc	CXDSS		3	40	38	37	35	.076-.102	.102-.152	.127-.178	.140-.229
			CXDSR		5	40	38	37	35				
			CXDCS		3	70	67	64	61	.076-.102	.102-.152	.127-.178	.140-.229
			CXDCR		5	70	67	64	61				
			CXDCL		8	64	58	55	52				
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	CXDSS		3	146	143	140	131	.076-.127	.102-.152	.127-.178	.127-.203
			CXDSR		5	146	143	140	131				
			CXDCS		3	201	195	189	183	.076-.127	.102-.152	.127-.178	.127-.203
			CXDCR		5	201	195	189	183				
			CXDCL		8	152	149	146	143				
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	CXDSS		3	85	82	79	76	.076-.127	.102-.152	.127-.178	.127-.203
			CXDSR		5	85	82	79	76				
			CXDCS		3	122	146	140	134	.076-.127	.102-.152	.127-.178	.127-.203
			CXDCR		5	122	146	140	134				
			CXDCL		8	107	104	101	98				

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

Recommended Cutting Data CXD ≥ 8mm - Metric

For applications in aluminum, brass and copper alloys, use CDA series cutting data on page 143.

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	Drill Diameter (mm) vc - m/min 8	10	12	14	16	18	20	Drill Diameter (mm) f - mm/Rev 8	10	12	14	16	18	20
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	CXDSS		3	107	104	98	91	84	81	77	.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDSR		5	107	104	98	91	84	81								
			CXDCS		3	189	183	175	168	160	152		.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDCR		5	189	183	175	168	160	152	145							
			CXDCL		8	158	152	146	140	134									
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	CXDSS		3	88	85	82	81	79	79	75	.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDSR		5	88	85	82	81	79	79								
			CXDCS		3	145	137	130	122	99	96		.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDCR		5	145	137	130	122	99	96	92							
			CXDCL		8	114	107	99	93	76									
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	CXDSS		3	56	55	55	53	53	52	49	.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDSR		5	56	55	55	53	53	52								
			CXDCS		3	64	64	61	61	58	58		.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDCR		5	64	64	61	61	58	58	55							
			CXDCL		8	61	58	58	58	55									
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	CXDSS		3	94	91	84	76	69	61	55	.16-.24	.18-.27	.21-.31	.22-.35	.25-.36	.28-.38	.30-.37
			CXDSR		5	94	91	84	76	69	61								
			CXDCS		3	122	119	116	113	101	98		.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDCR		5	122	119	116	113	101	98	94							
			CXDCL		8	114	113	107	104	91									
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	CXDSS		3	37	35	34	32	30	29	28	.16-.24	.18-.27	.21-.31	.22-.35	.25-.36	.28-.38	.30-.37
			CXDSR		5	37	35	34	32	30	29								
			CXDCS		3	79	76	73	73	70	67		.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDCR		5	79	76	73	73	70	67	64							
			CXDCL		8	73	70	67	67	64									
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	CXDSS		3	34	32	32	30	30	29	27	.11-.15	.13-.23	.18-.25	.21-.27	.22-.31	.25-.33	.30-.37
			CXDSR		5	34	32	32	30	30	29								
			CXDCS		3	67	61	58	55	52	47		.11-.15	.13-.23	.18-.25	.21-.27	.22-.31	.25-.33	.30-.37
			CXDCR		5	67	61	58	55	52	47	45							
			CXDCL		8	46	43	40	38	36									
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy	S	up to 42 Rc	CXDSS		3	20	18	17	15	14	12	11	.08-.13	.11-.15	.12-.17	.14-.19	.16-.21	.18-.25	.17-.24
			CXDSR		5	20	18	17	15	14	12								
			CXDCS		3	26	26	24	24	23	23		.09-.13	.11-.15	.12-.17	.14-.19	.16-.21	.18-.25	.17-.24
			CXDCR		5	26	26	24	24	23	23	22							
			CXDCL		8	24	24	23	23	21									
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 42 Rc	CXDSS		3	34	32	30	30	27	27	25	.16-.24	.18-.27	.21-.31	.22-.35	.25-.36	.28-.38	.30-.37
			CXDSR		5	34	32	30	30	27	27								
			CXDCS		3	55	55	52	49	46	46		.16-.24	.18-.27	.21-.31	.22-.35	.25-.36	.28-.38	.30-.37
			CXDCR		5	55	55	52	49	46	46	44							
			CXDCL		8	49	46	43	40	38									
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	CXDSS		3	125	122	119	113	110	107	102	.16-.24	.18-.27	.21-.31	.22-.35	.25-.36	.28-.38	.30-.37
			CXDSR		5	125	122	119	113	110	107								
			CXDCS		3	177	171	168	168	160	152		.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXCDR		5	177	171	168	168	160	152	145							
			CXDCL		8	140	137	134	134	128									
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	CXDSS		3	73	70	67	64	61	58	55	.16-.24	.18-.27	.21-.31	.22-.35	.25-.36	.28-.38	.30-.37
			CXDSR		5	73	70	67	64	61	58								
			CXDCS		3	122	114	107	91	84	76		.16-.24	.18-.27	.21-.31	.22-.35	.25-.35	.28-.38	.30-.37
			CXDCR		5	122	114	107	91	84	76	72							
			CXDCL		8	91	82	76	67	61									

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

For product information, call your local distributor.