

## Twister X<sup>®</sup>D<sup>®</sup> Xtreme Drilling

2XDSS / 2XDSR / 2XDSCS / 2XDSCR / 2XDCL Series ≤ 1/4  
 Recommended Cutting Data- Inch  
 3xD & 5xD, Solid Drilling and 3xD, 5xD & 7+xD, Coolant-Fed Drilling

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	Drill Diameter (Inch)						Drill Diameter (Inch)						
						1/64	1/16	1/8	5/32	3/16	1/4	1/64	1/16	1/8	5/32	3/16	1/4	
						vc - SFM						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	2XDSS	●	3x			390	380	370	360	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDSR		5x	405	400	390	380	370	360							
			2XDSCS	●	3x			660	650	640	630							
			2XDSCR		5x			660	650	640	630			.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDCL		7+x			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	2XDSS	●	3x			330	320	310	300	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDSR		5x	350	340	330	320	310	300							
			2XDSCS	●	3x			575	550	540	500							
			2XDSCR		5x			575	550	540	500			.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDCL		7+x			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	2XDSS	●	3x			200	190	190	185	.0004-.0008	.0008-.0012	.0014-.0030	.0024-.0040	.003-.005	.0035-.0060	
			2XDSR		5x	210	200	200	190	190	185							
			2XDSCS	●	3x			250	240	230	220							
			2XDSCR		5x			250	240	230	220			.0014-.0030	.0024-.0040	.003-.005	.0035-.0060	
			2XDCL		7+x			225	220	215	205							
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	2XDSS	●	3x			350	340	330	320	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDSR		5x	360	355	350	340	330	320							
			2XDSCS	●	3x			550	500	475	450							
			2XDSCR		5x			550	500	475	450			.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDCL		7+x			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	2XDSS	●	3x			140	135	130	125	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDSR		5x	150	145	140	135	130	125							
			2XDSCS	●	3x			300	290	280	270							
			2XDSCR		5x			300	290	280	270			.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDCL		7+x			280	270	260	250							
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316L, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	2XDSS	●	3x			140	130	120	110	.0004-.0012	.001-.002	.0020-.0033	.0024-.0035	.0030-.0043	.0031-.0050	
			2XDSR		5x	160	150	140	130	120	110							
			2XDSCS	●	3x			265	250	240	230							
			2XDSCR		5x			265	250	240	230			.0020-.0033	.0024-.0035	.0030-.0043	.0031-.0050	
			2XDCL		7+x			190	180	170	160							
High Temp Alloys Nimonic, Inconel, Monel, Hastelloy	S	up to 42 Rc	2XDSS	●	3x			85	80	75	70	.0004-.0012	.001-.002	.0014-.0033	.0016-.0035	.002-.004	.0023-.0043	
			2XDSR		5x	100	90	85	80	75	70							
			2XDSCS	●	3x			115	100	95	90							
			2XDSCR		5x			115	100	95	90			.0014-.0033	.0016-.0035	.002-.004	.0023-.0043	
			2XDCL		7+x			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	up to 42 Rc	2XDSS	●	3x			130	125	120	115	.0004-.0012	.001-.002	.003-.004	.004-.006	.005-.007	.0055-.0080	
			2XDSR		5x	150	140	130	125	120	115							
			2XDSCS	●	3x			230	220	210	200							
			2XDSCR		5x			230	220	210	200			.003-.004	.004-.005	.005-.007	.0055-.0080	
			2XDCL		7+x			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	2XDSS	●	3x			480	470	460	430	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDSR		5x	500	490	480	470	460	430							
			2XDSCS	●	3x			660	640	620	600							
			2XDSCR		5x			660	640	620	600			.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDCL		7+x			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	2XDSS	●	3x			280	270	260	250	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDSR		5x	300	290	280	270	260	250							
			2XDSCS	●	3x			400	480	460	440							
			2XDSCR		5x			400	480	460	440			.003-.005	.004-.006	.005-.007	.0055-.0080	
			2XDCL		7+x			350	340	330	320							

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



## 2XDSS / 2XDSR / 2XDSCS / 2XDSCR / 2XDCL Series ≥ 5/16

### Recommended Cutting Data - Inch

3xD & 5xD, Solid Drilling and 3xD, 5xD & 7+xD, Coolant-Fed Drilling

Workpiece Material Group	I S O	Hardness	Tool Series	T Y P E	D E P T H	Drill Diameter (Inch)						Drill Diameter (Inch)						
						5/16	3/8	1/2	9/16	5/8	3/4	5/16	3/8	1/2	9/16	5/8	3/4	
						vc - SFM						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	2XDSS	●	3x	350	340	320	300	275	265	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDSR		5x	350	340	320	300	275	265							
			2XDSCS	●●	3x	620	600	575	550	525	500							
			2XDSCR		5x	620	600	575	550	525	500	.006-.009	.007-.010	.009-.011	.009-.014	.010-.014	.011-.015	
			2XDCL		7+x	520	500	480	460	440	430							
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	2XDSS	●	3x	290	280	270	265	260	260	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDSR		5x	290	280	270	265	260	260							
			2XDSCS	●●	3x	475	450	425	400	325	315							
			2XDSCR		5x	475	450	425	400	325	315	.006-.009	.007-.010	.009-.011	.009-.014	.010-.014	.011-.015	
			2XDCL		7+x	375	350	325	315	300	280							
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	2XDSS	●	3x	185	180	180	175	175	170	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDSR		5x	185	180	180	175	175	170							
			2XDSCS	●●	3x	210	210	200	200	190	190							
			2XDSCR		5x	210	210	200	200	190	190	.006-.009	.007-.010	.009-.011	.009-.014	.010-.014	.011-.015	
			2XDCL		7+x	200	190	190	180	180	170							
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	2XDSS	●	3x	310	300	275	250	225	200	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDSR		5x	310	300	275	250	225	200							
			2XDSCS	●●	3x	400	390	380	370	330	320							
			2XDSCR		5x	400	390	380	370	330	320	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDCL		7+x	375	370	350	325	310	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	2XDSS	●	3x	120	115	110	105	100	95	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDSR		5x	120	115	110	105	100	95							
			2XDSCS	●●	3x	260	250	240	240	230	220							
			2XDSCR		5x	260	250	240	240	230	220	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDCL		7+x	240	230	220	220	200	200							
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	2XDSS	●	3x	110	105	105	100	100	95	.003-.006	.005-.009	.007-.010	.008-.010	.009-.011	.009-.013	
			2XDSR		5x	110	105	105	100	100	95							
			2XDSCS	●●	3x	220	200	190	180	170	155							
			2XDSCR		5x	220	200	190	180	170	155	.003-.006	.005-.009	.007-.010	.008-.010	.009-.011	.009-.013	
			2XDCL		7+x	150	140	130	130	125	125							
High Temp Alloys Nimonic, Inconel, Monel, Hastelloy	S	up to 42 Rc	2XDSS	●	3x	65	60	55	50	45	40	.003-.005	.004-.006	.005-.007	.005-.008	.006-.008	.009-.010	
			2XDSR		5x	65	60	55	50	45	40							
			2XDSCS	●●	3x	85	85	80	80	75	75							
			2XDSCR		5x	85	85	80	80	75	75	.003-.005	.004-.006	.005-.007	.005-.008	.006-.008	.009-.010	
			2XDCL		7+x	90	90	85	85	75	75							
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	2XDSS	●	3x	110	105	100	100	90	90	.006-.009	.007-.010	.008-.011	.008-.010	.010-.014	.011-.015	
			2XDSR		5x	110	105	100	100	90	90							
			2XDSCS	●●	3x	190	180	170	160	150	150							
			2XDSCR		5x	190	180	170	160	150	150	.006-.009	.007-.010	.008-.011	.008-.010	.010-.014	.011-.015	
			2XDCL		7+x	160	150	140	130	120	120							
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	2XDSS	●	3x	410	400	390	370	360	350	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDSR		5x	410	400	390	370	360	350							
			2XDSCS	●●	3x	580	560	550	550	525	500							
			2XDSCR		5x	580	560	550	550	525	500	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDCL		7+x	460	450	440	430	410	400							
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	2XDSS	●	3x	240	230	220	210	200	190	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015	
			2XDSR		5x	240	230	220	210	200	190							
			2XDSCS	●●	3x	400	375	350	300	275	250							
			2XDSCR		5x	400	375	350	300	275	250	.006-.009	.007-.010	.011-.014	.014-.014	.014-.015		
			2XDCL		7+x	300	270	250	240	220	200	.006-.009	.007-.010	.011-.014	.014-.014	.015-.015		

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

## Twister X<sup>®</sup>D<sup>®</sup> Xtreme Drilling

2XDSS / 2XDSSR / 2XDSCS / 2XDSCR / 2XDCL Series  
 ≤ 6mm Recommended Cutting Data - **Metric**  
 3xD & 5xD, Solid Drilling and 3xD, 5xD & 7+xD, Coolant-Fed Drilling

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	Drill Diameter (mm)						Drill Diameter (mm)					
						0.05	1.5	3	4	5	6	0.05	1.5	3	4	5	6
						vc - m/min						f - mm/Rev					
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 1108, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	2XDSS		3x			119	116	113	110	.025-	.051-	.076-	.102-	.127-	.127-
			2XDSSR		5x	123	122	119	116	113	110	.051	.076	.127	.152	.178	.203
			2XDSCS		3x			201	198	195	192			.076-	.102-	.127-	.127-
			2XDSCR		5x			201	198	195	192			.127	.152	.178	.203
			2XDCL		7+x			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	2XDSS		3x			101	98	94	91	.025-	.051-	.076-	.102-	.127-	.127-
			2XDSSR		5x	107	104	101	98	94	91	.051	.076	.127	.152	.178	.203
			2XDSCS		3x			175	168	165	152			.076-	.102-	.127-	.127-
			2XDSCR		5x			175	168	165	152			.127	.152	.178	.203
			2XDCL		7+x			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	2XDSS		3x			61	58	58	56	.010-	.020-	.036-	.061-	.076-	.089-
			2XDSSR		5x	64	61	61	58	58	56	.020	.030	.076	.102	.127	.152
			2XDSCS		3x			76	73	70	67			.036-	.061-	.076-	.089-
			2XDSCR		5x			76	73	70	67			.076	.102	.127	.152
			2XDCL		7+x			69	67	66	62						
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	2XDSS		3x			107	104	101	98	.025-	.051-	.076-	.102-	.127-	.127-
			2XDSSR		5x	125	120	107	104	101	98	.051	.076	.127	.152	.178	.203
			2XDSCS		3x			168	152	145	137			.076-	.102-	.127-	.127-
			2XDSCR		5x			168	152	145	137			.127	.152	.178	.203
			2XDCL		7+x			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	2XDSS		3x			43	41	40	38	.025-	.051-	.076-	.102-	.127-	.127-
			2XDSSR		5x	50	48	43	41	40	38	.051	.076	.127	.152	.178	.203
			2XDSCS		3x			91	88	85	82			.076-	.102-	.127-	.127-
			2XDSCR		5x			91	88	85	82			.127	.152	.178	.203
			2XDCL		7+x			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	2XDSS		3x			43	40	37	34	.010-	.025-	.051-	.061-	.089-	.076-
			2XDSSR		5x	49	46	43	40	37	34	.030	.051	.076	.089	.102	.127
			2XDSCS		3x			81	76	73	70			.051-	.061-	.089-	.076-
			2XDSCR		5x			81	76	73	70			.076	.089	.102	.127
			2XDCL		7+x			58	55	52	49						
High Temp Alloys Nimonic, Inconel, Monel, Hastelloy	S	up to 42 Rc	2XDSS		3x			26	24	23	21	.010-	.025-	.036-	.036-	.051-	.061-
			2XDSSR		5x	30	27	26	24	23	21	.030	.051	.089	.089	.102	.127
			2XDSCS		3x			35	30	29	27			.036-	.036-	.051-	.061-
			2XDSCR		5x			35	30	29	27			.089	.089	.102	.127
			2XDCL		7+x			30	30	29	29						
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr-4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S	up to 42 Rc	2XDSS		3x			40	38	37	35	.010-	.025-	.076-	.102-	.127-	.140-
			2XDSSR		5x	46	43	40	38	37	35	.030	.051	.102	.152	.178	.229
			2XDSCS		3x			70	67	64	61			.076-	.102-	.127-	.140-
			2XDSCR		5x			70	67	64	61			.127	.152	.178	.229
			2XDCL		7+x			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	2XDSS		3x			146	143	140	131	.025-	.051-	.076-	.102-	.127-	.127-
			2XDSSR		5x	152	149	146	143	140	131	.051	.076	.127	.152	.178	.203
			2XDSCS		3x			201	195	189	183			.076-	.102-	.127-	.127-
			2XDSCR		5x			201	195	189	183			.127	.152	.178	.203
			2XDCL		7+x			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	2XDSS		3x			85	82	79	76	.025-	.051-	.076-	.102-	.127-	.127-
			2XDSSR		5x	91	88	85	82	79	76	.051	.076	.127	.152	.178	.203
			2XDSCS		3x			122	146	140	134			.076-	.102-	.127-	.127-
			2XDSCR		5x			122	146	140	134			.127	.152	.178	.203
			2XDCL		7+x			107	104	101	98						

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



**2XDSS / 2XDSSR / 2XDSCS / 2XDSCR / 2XDCL Series**  
**≥ 8mm Recommended Cutting Data - Metric**  
**3xD & 5xD, Solid Drilling and 3xD, 5xD & 7+xD, Coolant-Fed Drilling**

Workpiece Material Group	ISO	Hardness	Tool Series	TYPE	DEPTH	Drill Diameter (mm)							Drill Diameter (mm)						
						8	10	12	14	16	18	20	8	10	12	14	16	18	20
						vc - m/min							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	2XDSS	●	3x	107	104	98	91	84	81	77	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37	
			2XDSSR		5x	107	104	98	91	84	81	77							
			2XDSCS		●	3x	189	183	175	168	160	152	145						
			2XDSCR			5x	189	183	175	168	160	152	145	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37
			2XDCL			7x	158	152	146	140	134	131	125						
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	2XDSS	●	3x	88	85	82	81	79	79	75	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37	
			2XDSSR		5x	88	85	82	81	79	79	75							
			2XDSCS		●	3x	145	137	130	122	99	96	92						
			2XDSCR			5x	145	137	130	122	99	96	92	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37
			2XDCL			7x	114	107	99	96	91	85	81						
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	2XDSS	●	3x	56	55	55	53	53	52	49	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37	
			2XDSSR		5x	56	55	55	53	53	52	49							
			2XDSCS		●	3x	64	64	61	61	58	58	55						
			2XDSCR			5x	64	64	61	61	58	58	55	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37
			2XDCL			7x	61	58	58	55	55	52	49						
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	2XDSS	●	3x	94	91	84	76	69	61	55	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37	
			2XDSSR		5x	94	91	84	76	69	61	55							
			2XDSCS		●	3x	122	119	116	113	101	98	94						
			2XDSCR			5x	122	119	116	113	101	98	94	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37
			2XDCL			7x	114	113	107	99	94	91	87						
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	2XDSS	●	3x	37	35	34	32	30	29	28	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37	
			2XDSSR		5x	37	35	34	32	30	29	28							
			2XDSCS		●	3x	79	76	73	73	70	67	64						
			2XDSCR			5x	79	76	73	73	70	67	64	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37
			2XDCL			7x	73	70	67	67	61	61	58						
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13- 8Mo, Nitronics	M	over 28 Rc	2XDSS	●	3x	34	32	32	30	30	29	27	.11-15	.13-23	.18-25	.21-27	.22-31	.25-37	
			2XDSSR		5x	34	32	32	30	30	29	27							
			2XDSCS		●	3x	67	61	58	55	52	47	45						
			2XDSCR			5x	67	61	58	55	52	47	45	.11-15	.13-23	.18-25	.21-27	.22-31	.25-37
			2XDCL			7x	46	43	40	40	38	38	36						
High Temp Alloys Nimonic, Inconel, Monel, Hastelloy	S	up to 42 Rc	2XDSS	●	3x	20	18	17	15	14	12	11	.08-13	.11-15	.12-17	.14-19	.16-25	.18-24	
			2XDSSR		5x	20	18	17	15	14	12	11							
			2XDSCS		●	3x	26	26	24	24	23	23	22	.09-13	.11-15	.12-17	.14-19	.16-25	.18-24
			2XDSCR			5x	26	26	24	24	23	23	22						
			2XDCL			7x	27	27	26	26	23	23	22						
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	2XDSS	●	3x	34	32	30	30	27	27	25	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37	
			2XDSSR		5x	34	32	30	30	27	27	25							
			2XDSCS		●	3x	55	55	52	49	46	46	44						
			2XDSCR			5x	55	55	52	49	46	46	44	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37
			2XDCL			7x	49	46	43	40	37	37	35						
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	2XDSS	●	3x	125	122	119	113	110	107	102	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37	
			2XDSSR		5x	125	122	119	113	110	107	102							
			2XDSCS		●	3x	177	171	168	168	160	152	145						
			2XDSCR			5x	177	171	168	168	160	152	145	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37
			2XDCL			7x	140	137	134	131	125	122	117						
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	2XDSS	●	3x	73	70	67	64	61	58	55	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37	
			2XDSSR		5x	73	70	67	64	61	58	55							
			2XDSCS		●	3x	122	114	107	91	84	76	72						
			2XDSCR			5x	122	114	107	91	84	76	72	.16-24	.18-27	.21-31	.22-35	.25-38	.30-37
			2XDCL			7x	91	82	76	73	67	61	58						

**Drills - Technical Information**  
Series 2XDSS / 2XDSSR / 2XDSCS / 2XDSCR / 2XDCL

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