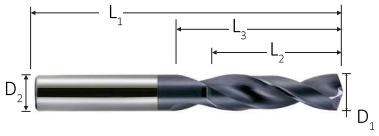
Various Material



2 Flute • 140° point WITHOUT coolant hole drill

Carbide | 2 | Center Cutting | 25° | nACo | +.0000 -.0005 | DRILL POINT | HRc <48 | P K M S

- Designed for use most Ferrous Materials
- Has a Self-Centering drill point
- Unique geometry & honed edge prep minimizes need for pecking
- Proprietary nACo coating provides extended tool life over conventional coatings

Series: MDR

DIAMETER D_1		SHK D_2	DRILL LENGTH L_2	FLUTE LENGTH L_3	OAL L_1	PART NAME	nACo EDP
3/64	0.0469	1/8	0.2810	0.3520	1-1/2	MDR-3/64	14257
# 55	0.0520	1/8	0.3090	0.3870	1-1/2	MDR-55	14258
# 54	0.0550	1/8	0.3250	0.4060	1-1/2	MDR-54	14259
1.5mm	0.0591	3mm	8.8mm	11mm	38mm	MDR-1.5MM	14309
# 53	0.0595	1/8	0.3480	0.4350	1-1/2	MDR-53	14260
1/16	0.0625	1/8	0.3630	0.4530	1-1/2	MDR-1/16	10292
# 52	0.0635	1/8	0.3650	0.4560	1-1/2	MDR-52	14261
# 50	0.0700	1/8	0.3990	0.4990	2	MDR-50	14262
# 49	0.0730	1/8	0.4120	0.5160	2	MDR-49	14263
# 48	0.0760	1/8	0.4260	0.5320	2	MDR-48	14264
5/64	0.0781	1/8	0.4330	0.5420	2	MDR-5/64	14265
2mm	0.0787	3mm	10.9mm	13.5mm	38mm	MDR-2MM	14310
# 46	0.0810	1/8	0.4460	0.5570	2	MDR-46	14266
# 45	0.0820	1/8	0.4470	0.5590	2	MDR-45	14267
# 44	0.0860	1/8	0.4640	0.5810	2	MDR-44	14268
# 43	0.0890	1/8	0.4760	0.5950	2	MDR-43	14269
# 42	0.0935	1/8	0.4960	0.6190	2	MDR-42	14270
3/32	0.0938	1/8	0.4920	0.6160	2	MDR-3/32	10294
# 41	0.0960	1/8	0.4990	0.6240	2	MDR-41	14271
# 40	0.0980	1/8	0.5050	0.6310	2	MDR-40	14272
2.5mm	0.0984	3mm	12.5mm	15.5mm	38mm	MDR-2.5MM	14311
# 39	0.0995	1/8	0.5070	0.6340	2	MDR-39	14273
# 38	0.1015	1/8	0.5130	0.6410	2	MDR-38	14274
# 37	0.1040	1/8	0.5200	0.6500	2	MDR-37	14275
# 36	0.1065	1/8	0.5270	0.6590	2	MDR-36	14276
7/64	0.1094	1/8	0.5360	0.6700	2	MDR-7/64	14277
#32	0.1160	1/8	0.5630	0.7040	2	MDR-32	14566
3mm	0.1181	3mm	14.1mm	17.5mm	38mm	MDR-3MM	10290
# 31	0.1200	1/8	0.5820	0.7280	2	MDR-31	14278
1/8	0.1250	1/8	0.6000	0.7500	2	MDR-1/8	14279
# 30	0.1285	3/16	0.6100	0.7630	2	MDR-30	14280
# 29	0.1360	3/16	0.6390	0.7990	2	MDR-29	14281
3.5mm	0.1378	4mm	15.6mm	19.5mm	50mm	MDR-3.5MM	14312
# 28	0.1405	3/16	0.6530	0.8170	2	MDR-28	14282
9/64	0.1406	3/16	0.6470	0.8080	2	MDR-9/64	14283
# 25	0.1495	3/16	0.6800	0.8500	2.5	MDR-25	14284
5/32	0.1562	3/16	0.7030	0.8790	2.5	MDR-5/32	14285
4mm	0.1575	4mm	16.8mm	21mm	50mm	MDR-4MM	14313
# 21	0.1590	3/16	0.7080	0.8840	2.5	MDR-21	14286

Speed & Feed: page 164

sizes continued on next page

2 FLUTE • 140° POINT WITHOUT COOLANT HOLE DRILL

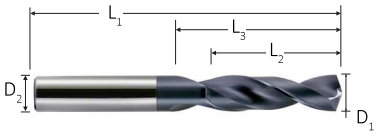
SERIES: MDR

DIAMETER D_1		SHK D_2	DRILL LENGTH L_2	FLUTE LENGTH L_3	OAL L_1	PART NAME	nACo EDP
# 20	0.1610	3/16	0.6440	0.8050	2.5	MDR-20	14287
11/64	0.1719	3/16	0.6880	0.8600	2.5	MDR-11/64	14288
16	0.1770	3/16	0.7080	0.8850	2.5	MDR-16	14289
4.5mm	0.1772	5mm	18mm	22.5mm	50mm	MDR-4.5MM	14314
3/16	0.1875	3/16	0.7500	0.9380	2.5	MDR-3/16	14290
11	0.1910	1/4	0.7640	0.9550	2.5	MDR-11	14291
10	0.1935	1/4	0.7740	0.9680	2.5	MDR-10	14292
5mm	0.1969	5mm	20mm	25mm	50mm	MDR-5MM	14315
7	0.2010	1/4	0.8040	1.0050	2.5	MDR-7	14293
13/64	0.2031	1/4	0.8120	1.0160	2.5	MDR-13/64	14294
5	0.2055	1/4	0.8220	1.0280	2.5	MDR-5	14295
3	0.2130	1/4	0.8520	1.0650	2.5	MDR-3	14296
7/32	0.2188	1/4	0.8750	1.0940	2.5	MDR-7/32	14297
15/64	0.2344	1/4	0.9380	1.1720	2.5	MDR-15/64	14298
6mm	0.2362	6mm	24mm	30mm	63mm	MDR-6MM	14316
1/4	0.2500	1/4	1	1.25	2.5	MDR-1/4	10296
6.5mm	0.2559	8mm	26mm	33mm	75mm	MDR-6.5MM	19810
F	0.2570	5/16	1.0280	1.2850	3	MDR-F	14299
17/64	0.2656	5/16	1.0620	1.3280	3	MDR-17/64	14300
I	0.2720	5/16	1.0880	1.3600	3	MDR-I	14301
7mm	0.2756	8mm	28mm	35mm	75mm	MDR-7MM	14317
9/32	0.2812	5/16	1.1250	1.4060	3	MDR-9/32	14302
7.5mm	0.2953	8mm	30mm	38mm	75mm	MDR-7.5MM	19811
19/64	0.2969	5/16	1.1880	1.4840	3	MDR-19/64	19793
5/16	0.3125	5/16	1.2500	1.5630	3	MDR-5/16	10298
8mm	0.3150	8mm	32mm	40mm	75mm	MDR-8MM	14318
21/64	0.3281	3/8	1.3130	1.5750	3	MDR-21/64	19794
Q	0.3320	3/8	1.3280	1.5940	3	MDR-Q	19795
8.5mm	0.3346	10mm	34mm	41mm	100mm	MDR-8.5MM	19812
11/32	0.3438	3/8	1.3750	1.6500	3	MDR-11/32	14303
9mm	0.3543	10mm	36mm	43mm	100mm	MDR-9MM	14319
23/64	0.3594	3/8	1.4380	1.7250	3	MDR-23/64	19796
U	0.3680	3/8	1.4720	1.7660	3	MDR-U	19797
9.5mm	0.3740	10mm	38mm	45mm	100mm	MDR-9.5MM	19813
3/8	0.3750	3/8	1.5000	1.8	3	MDR-3/8	10302
25/64	0.3906	7/16	1.5630	1.9	4	MDR-25/64	19798
10mm	0.3937	10mm	40mm	47mm	100mm	MDR-10MM	14320
13/32	0.4063	7/16	1.6250	1.8690	4	MDR-13/32	19799
10.5mm	0.4134	12mm	42mm	48mm	100mm	MDR-10.5MM	19814
27/64	0.4219	7/16	1.6880	1.9410	4	MDR-27/64	19800
11mm	0.4331	12mm	44mm	49mm	100mm	MDR-11MM	19815
7/16	0.4375	7/16	1.7500	2.0130	4	MDR-7/16	14304
11.5mm	0.4528	12mm	46mm	51mm	100mm	MDR-11.5MM	19816
29/64	0.4531	1/2	1.8130	1.9940	4	MDR-29/64	19801
12mm	0.4724	12mm	48mm	53mm	100mm	MDR-12MM	14321
31/64	0.4844	1/2	1.9380	2.1310	4	MDR-31/64	19802

Speed & Feed: page 164

sizes continued on next page

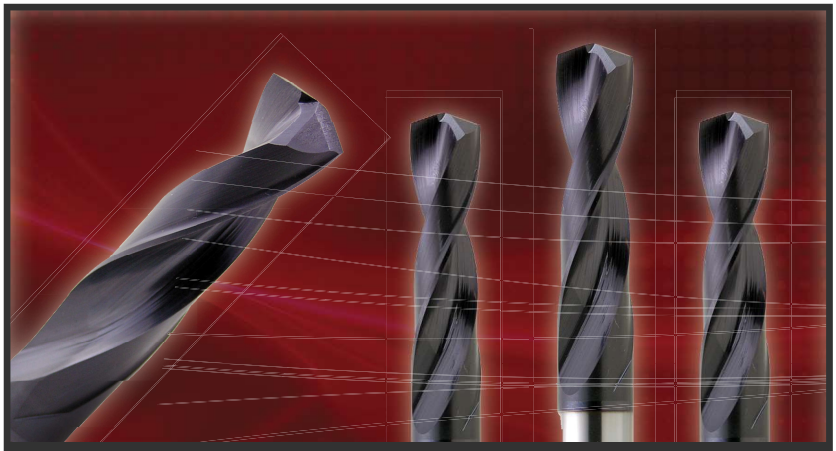
2 FLUTE • 140° POINT WITHOUT COOLANT HOLE DRILL



SERIES: MDR

DIAMETER D_1		SHK D_2	DRILL LENGTH L_2	FLUTE LENGTH L_3	OAL L_1	PART NAME	nACo EDP
12.5mm	0.4921	14mm	50mm	56mm	100mm	MDR-12.5MM	19817
1/2	0.5000	1/2	2.0000	2.2	4	MDR-1/2	14305
13mm	0.5118	14mm	52mm	58mm	100mm	MDR-13MM	19818
33/64	0.5156	9/16	2.0630	2.2690	4	MDR-33/64	19803
17/32	0.5313	9/16	2.1250	2.3380	4	MDR-17/32	19804
13.5mm	0.5315	14mm	54mm	60mm	100mm	MDR-13.5MM	19819
35/64	0.5469	9/16	2.1880	2.4060	4	MDR-35/64	19805
14mm	0.5512	14mm	56mm	62mm	100mm	MDR-14MM	19151
9/16	0.5625	9/16	2.2500	2.4750	4	MDR-9/16	14306
37/64	0.5781	5/8	2.3130	2.5440	5	MDR-37/64	19806
15mm	0.5906	16mm	60mm	66mm	127mm	MDR-15MM	19152
19/32	0.5938	5/8	2.3750	2.6130	5	MDR-19/32	19807
5/8	0.6250	5/8	2.5000	2.7500	5	MDR-5/8	14307
16mm	0.6299	16mm	64mm	70mm	127mm	MDR-16MM	19153
21/32	0.6563	3/4	2.4280	2.6710	5	MDR-21/32	19808
11/16	0.6875	3/4	2.5440	2.7980	5	MDR-11/16	19809
3/4	0.7500	3/4	2.7750	3.0530	5	MDR-3/4	14308

Speed & Feed: page 164



High Performance drills don't have to "break your bank!" Melin's MDR Series delivers the volume and accuracy of holes you want at a lower cost per tool!

Speed & Feed Information

Series: CDR & MDR

MATERIAL	MATERIAL HARDNESS	RECOMMENDED SFM		CUTTING DIAMETER					
		NON-COOLANT	COOLANT FED	1/16" - 1/8"	1/8" -1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 5/8"	5/8" - 3/4"
				INCH PER REV (IPR)					
STAINLESS STEELS	**ISO-M**								
Precipitation									
13-8, 15-5, 17-4PH	Under 35 Rc	225	300	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0040 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
Austenitic									
302, 303, 304L, 316L	Under 35 Rc	125	175	.0005 - .0010	.0010 - .0015	.0015 - .0020	.0020 - .0030	.0030 - .0040	.0025 - .0040
	Over 35 Rc	80	100	.0001 - .0003	.0003 - .0010	.0010 - .0015	.0015 - .0025	.0025 - .0035	.0020 - .0040
Martensitic									
403, 410, 416	Under 35 Rc	225	300	.0007 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0040 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
HIGH TEMP ALLOYS	**ISO-S**								
Cobalt Base									
Stellite, Haynes 25, 188, X-40	Under 35 Rc	185	225	.0005 - .0010	.0010 - .0020	.0020 - .0030	.0025 - .0035	.0030 - .0040	.0035 - .0055
	Over 35 Rc	125	180	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0020 - .0030	.0025 - .0035	.0030 - .0045
Nickel Base									
Inconel 600, 625, 718, Nickel 200	Under 35 Rc	150	225	.0005 - .0010	.0010 - .0020	.0020 - .0030	.0025 - .0035	.0030 - .0040	.0035 - .0055
Monel 400, 405, K-Monel, Inconel 600	Over 35 Rc	125	180	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0020 - .0030	.0025 - .0035	.0030 - .0045
Iron Base									
Incoloy 800-802, Multimet N-155	Under 35 Rc	200	300	.0007 - .0015	.0015 - .0025	.0025 - .0030	.0025 - .0035	.0035 - .0045	.0035 - .0055
	Over 35 Rc	150	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0030 - .0045
STEELS	**ISO-P**								
High Strength Steels									
4140, 4340, 52100	Under 35 Rc	200	300	.0007 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0045 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
High Alloy Steels - Mold & Die									
A-2, P20, 01, 02, D2, H-13	Under 35 Rc	200	300	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0045 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
Medium Alloy Steels									
200, 250, 300, 8620	Under 35 Rc	200	300	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0045 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
Low Alloy Steels-Maraging									
10XX, 11XX, 13XX	Under 35 Rc	200	300	.0007 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045	.0045 - .0055
	Over 35 Rc	175	240	.0002 - .0005	.0005 - .0015	.0015 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0045
CAST IRONS	**ISO-K**								
Ductile Iron									
Ductile Cast Iron		250	350	.0013 - .0025	.0025 - .0035	.0035 - .0045	.0035 - .0045	.0045 - .0055	.0065 - .0075
Cast Iron									
Grey Cast Iron		250	400	.0013 - .0025	.0025 - .0035	.0035 - .0045	.0035 - .0045	.0045 - .0055	.0065 - .0075
TITANIUM	**ISO-S**								
Titanium Alloys									
6AL-4V, ASTM 1, 2, 3, 6AL-2S									
For 5553, decrease SFM and IPM by 25%		225	350	.0005 - .0010	.0010 - .0020	.0020 - .0030	.0025 - .0035	.0030 - .0040	.0035 - .0055
COPPER	**ISO-N**								
Copper Alloys		300	400	.0015 - .0025	.0025 - .0035	.0035 - .0045	.0035 - .0045	.0045 - .0055	.0065 - .0075
BRASS	**ISO-N**								
Short Chips		300	400	.0015 - .0035	.0035 - .0045	.0045 - .0055	.0065 - .0075	.0085 - .0095	.0085 - .0095
Long Chips		200	300	.0015 - .0025	.0025 - .0035	.0035 - .0045	.0055 - .0065	.0075 - .0085	.0075 - .0085
BRONZE	**ISO-N**								
Short Chips		200	300	.0015 - .0025	.0025 - .0035	.0035 - .0045	.0035 - .0045	.0055 - .0065	.0075 - .0085
Long Chips		150	250	.0007 - .0015	.0015 - .0025	.0025 - .0035	.0025 - .0035	.0045 - .0055	.0065 - .0075
MAGNESIUM	**ISO-N**								
		300	400	.0020 - .0035	.0035 - .0045	.0045 - .0055	.0065 - .0075	.0085 - .0095	.0085 - .0095
ALUMINUM	**ISO-N**								
6061-T6, 7075		400	500	.0020 - .0035	.0035 - .0045	.0045 - .0055	.0065 - .0075	.0085 - .0095	.0085 - .0095
Die Cast		300	400	.0015 - .0025	.0025 - .0035	.0035 - .0045	.0055 - .0065	.0075 - .0085	.0075 - .0085

Note: All technical data provided are suggested starting points. They may be increase or decreased depending on machine condition, depth of cut, finish required, coolant, etc. Call our Technical Service Team with questions

SERIES: CDR & MDR (METRIC)

MATERIAL	MATERIAL HARDNESS	RECOMMENDED M/MIN		CUTTING DIAMETER - METRIC					
		NON-COOLANT	COOLANT FED	1.5MM-3MM	3MM-6.5MM	6.5MM-10MM	10MM-13MM	13MM-16MM	16MM-20MM
		(M/MIN)	(M/MIN)	MILLIMETERS PER REV (MMPR)					
STAINLESS STEELS	**ISO-M**								
Precipitation									
13-8, 15-5, 17-4PH	Under 35 Rc	68	90	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-1143	.1016-.1397
	Over 35 Rc	53	73	.0050-.0203	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143
Austenitic									
302, 303, 304L, 316L	Under 35 Rc	38	53	.0127-.0254	.0254-.0381	.0381-.0508	.0508-.0762	.0762-.1016	.0635-.1016
	Over 35 Rc	24	30	.0025-.0076	.0076-.0254	.0254-.0381	.0381-.0635	.0635-.0889	.0508-.1016
Martensitic									
403, 410, 416	Under 35 Rc	67	90	.0177-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1016	.1016-.1397
	Over 35 Rc	53	73	.0058-.0127	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143
HIGH TEMP ALLOYS	**ISO-S**								
Cobalt Base									
Stellite, Haynes 25, 188, X-40	Under 35 Rc	56	69	.0127-.0254	.0254-.0508	.0508-.0762	.0635-.0889	.0762-.1016	.0889-.1397
	Over 35 Rc	38	55	.0050-.0254	.0127-.0381	.0381-.0635	.0508-.0762	.0635-.0889	.0762-.1016
Nickel Base									
Inconel 600, 625, 718, Nickel 200	Under 35 Rc	45	69	.0127-.0254	.0254-.0508	.0508-.0762	.0635-.0889	.0762-.1143	.0889-.1397
Monel 400, 405, K-Monel, Inconel 600	Over 35 Rc	38	55	.0050-.0127	.0127-.0381	.0381-.0635	.0508-.0762	.0635-.0889	.0762-.1143
Iron Base									
Incoloy 800-802, Multimet N-155	Under 35 Rc	60	90	.0177-.0381	.0381-.0635	.0635-.0762	.0635-.0889	.0889-.1143	.0889-.1397
	Over 35 Rc	45	73	.0050-.0127	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0762-.1143
STEELS	**ISO-P**								
High Strength Steels									
4140, 4340, 52100	Under 35 Rc	60	90	.0177-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1143-.1397
	Over 35 Rc	53	73	.0050-.0127	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143
High Alloy Steels - Mold & Die									
A-2, P20, 01, 02, D2, H-13	Under 35 Rc	60	90	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1143-.1397
	Over 35 Rc	53	73	.0050-.0127	.0127-.0381	.0281-.0635	.0635-.0762	.0762-.0889	.0889-.1143
Medium Alloy Steels									
200, 250, 300, 8620	Under 35 Rc	60	90	.0127-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1143-.1397
	Over 35 Rc	53	73	.0050-.0127	.0127-.0381	.0281-.0635	.0635-.0762	.0762-.0889	.0889-.1143
Low Alloy Steels-Maraging									
10XX, 11XX, 13XX	Under 35 Rc	60	90	.0177-.0381	.0381-.0635	.0635-.0762	.0762-.0889	.0889-.1143	.1143-.1397
	Over 35 Rc	53	73	.0050-.0127	.0127-.0381	.0281-.0635	.0635-.0762	.0762-.0889	.0889-.1143
CAST IRONS	**ISO-K**								
Ductile Iron									
Ductile Cast Iron		76	106	.0330-.0635	.0635-.0889	.0889-.1143	.0889-.1143	.1143-.1397	.1651-.1905
Cast Iron									
Grey Cast Iron		76	122	.0330-.0635	.0635-.0889	.0889-.1143	.0889-.1143	.1143-.1397	.1651-.1905
TITANIUM	**ISO-S**								
Titanium Alloys									
6AL-4V, ASTM 1, 2, 3, 6AL-2S									
For 5553, decrease SFM and IPM by 25%		68	106	.0127-.0254	.0254-.0508	.0508-.0672	.0635-.0889	.0762-.1016	.0889-.1397
COPPER	**ISO-N**								
Copper Alloys									
		90	122	.0381-.0635	.0635-.0889	.0889-.1143	.0889-1143	.1143-.1397	.1651-.1905
BRASS	**ISO-N**								
Short Chips		90	122	.0381-.0889	.0889-.1143	.1143-.1397	.1651-1905	.2159-.2413	.2519-.2413
Long Chips		60	90	.0254-.0635	.0635-.0889	.0889-.1143	.1397-.1651	.1905-.2159	.1905-.2159
BRONZE	**ISO-N**								
Short Chips		60	90	.0254-.0635	.0635-.0889	.0889-.1143	.0889-.1143	.1397-.1651	.1905-.2159
Long Chips		45	76	.0177-.0381	.0381-.0635	.0365-.0889	.0635-.0889	.1143-.1397	.1651-.1905
MAGNESIUM	**ISO-N**								
		90	122	.0580-.0889	.0889-.1143	.1143-.1397	.1651-1905	.2159-.2413	.2159-.2413
ALUMINUM	**ISO-N**								
6061-T6, 7075		122	152	.0580-.0889	.0889-.1143	.1143-.1397	.1651-.1905	.2159-.2431	.2159-.2413
Die Cast		90	122	.0254-.0635	.0635-.0889	.0889-.1143	.1397-.1651	.1905-.2159	1905-.2159

Note: All technical data provided are suggested starting points. They may be increase or decreased depending on machine condition, depth of cut, finish required, coolant, etc. Call our TECHNICAL SERVICE Team with questions