

**TOOL RECOMMENDATIONS**

Aluminum	4
Titanium	5
Stainless Steel	6
Cobalt, Nickel, Iron-Based Alloys	7
Brass, Bronze, Copper, Magnesium	8
Hardened Tool Steels	9
Composite Materials	10
Carbon Steels, Medium Alloy Steels	11

**DRILLS - HIGH PERFORMANCE**

1180	3 Flute	5xD	30° Helix	ALUMASTAR Coated	12
1580H	2 Flute	3xD	30° Helix	HARDLUBE Coated	14
NEW 1580HD	2 Flute	3xD	30° Helix	HELICA Coated	17
NEW 1580KD	2 Flute	3xD	30° Helix	Coolant Fed - HELICA Coated	20
NEW 1580KH	2 Flute	3xD	30° Helix	Coolant Fed - HELICA Coated	23
1280H	2 Flute	5xD	30° Helix	HARDLUBE Coated	25
1280KH	2 Flute	5xD	30° Helix	Coolant Fed - HELICA Coated	28
NEW 1280KD	2 Flute	5xD	30° Helix	Coolant Fed - HELICA Coated	30
1880KH	2 Flute	7xD	30° Helix	Coolant Fed - HELICA Coated	33

**DRILLS**

1510	2 Flute	3xD	15° Helix		36
1510H	2 Flute	3xD	15° Helix	HARDLUBE Coated	39
1520	2 Flute	3xD	25° Helix		42
1520H	2 Flute	3xD	25° Helix	HARDLUBE Coated	45
1205	2 Flute	5xD	25° Helix		48
1205H	2 Flute	5xD	25° Helix	HARDLUBE Coated	51
1200	2 Flute	5xD	25° Helix		54
1200H	2 Flute	5xD	25° Helix	HARDLUBE Coated	57
1120	3 Flute	3xD	25° Helix		60
1120H	3 Flute	3xD	25° Helix	HARDLUBE Coated	62
1100	3 Flute	5xD	25° Helix		64
1100H	3 Flute	5xD	25° Helix	HARDLUBE Coated	66
1500	2 Flute	3xD	Straight	Hard Metal	68
1500H	2 Flute	3xD	Straight	Hard Metal - HARDLUBE Coated	70
1700	2 Flute	3.5xD	Straight	Double Margin	72
1700K	2 Flute	6xD	Straight	Double Margin/Coolant Fed	73
1800H	2 Flute	8xD	35° Helix	Parabolic - HARDLUBE Coated	74
4000	4 Flute		30° Helix	Core	76
1600	2 Flute		25° Helix	N/C Spotting	77
1400	2 Flute		10° Helix	Combined Drill/Countersink	78
1300	2 Flute		Straight	Spade	79

**END MILLS - HIGH PERFORMANCE**

142M	2 Flute	Square	41° Helix	ALUMASTAR Coated	80
142B	2 Flute	Ball	41° Helix	ALUMASTAR Coated	81
143M	3 Flute	Square	38° Helix	ALUMASTAR Coated	82
143R	3 Flute	Radius	38° Helix	ALUMASTAR Coated	84
242M/842M	2 Flute	Square	45° Helix		86
253MA/853MA	3 Flute	Square	50° Helix	X.CEED Coated	87
253M/853M	3 Flute	Square	50° Helix		89
253MC	3 Flute	Square	50° Helix	TiCN Coated	91
255MA/855MA	5 Flute	Square	45° Helix	X.CEED Coated	92
255M/855M	5 Flute	Square	45° Helix		94
255MC	5 Flute	Square	45° Helix	TiCN Coated	96
255RA/855RA	5 Flute	Radius	45° Helix	X.CEED Coated	97
263M/863M	3 Flute	Square	60° Helix		99
263MC	3 Flute	Square	60° Helix	TiCN Coated	99
263MA/863MA	3 Flute	Square	60° Helix	X.CEED Coated	99
246M/846M	6 Flute	Square	40° Helix		100
246MC	6 Flute	Square	40° Helix	TiCN Coated	100
246MA/846MA	6 Flute	Square	40° Helix	X.CEED Coated	100
VHM	4 Flute	Chamfer	30° Helix	X.CEED Coated	101
NEW VRX	4 Flute	Square	41° Helix	X.CEED Coated	102
VRX	4 Flute	Radius	41° Helix	X.CEED Coated	103
VRX	4 Flute	Ball	41° Helix	X.CEED Coated	107
545MA	4/5 Flute	Square	45° Helix	X.CEED Coated	108
545RA	4/5 Flute	Radius	45° Helix	X.CEED Coated	109
545BA	4/5 Flute	Ball	45° Helix	X.CEED Coated	110
350MX/950MX	2 Flute	Ball	15° Helix	X.CEED Coated	111
210D	4 Flute	Square	30° Helix	DIAMOND Coated	112
210RD	4 Flute	Radius	30° Helix	DIAMOND Coated	113
310D	4 Flute	Ball	30° Helix	DIAMOND Coated	114
610D	4 Flute	Square	30° Helix	DIAMOND Coated	115
710D	4 Flute	Ball	30° Helix	DIAMOND Coated	116

**END MILLS - STUB LENGTH**

160M/860M	2 Flute	Square	30° Helix		118
170M/870M	4 Flute	Square	30° Helix		118
160MA/860MA	2 Flute	Square	30° Helix	TiALN Coated	120
170MA/870MA	4 Flute	Square	30° Helix	TiALN Coated	120
180M/980M	2 Flute	Ball	30° Helix		121
190M/990M	4 Flute	Ball	30° Helix		121
180MA/980MA	2 Flute	Ball	30° Helix	TiALN Coated	122
190MA/990MA	4 Flute	Ball	30° Helix	TiALN Coated	122
165M/865M	2 Flute	Square	30° Helix	Double End	123
175M/875M	4 Flute	Square	30° Helix	Double End	123
165MA/865MA	2 Flute	Square	30° Helix	Double End - TiALN Coated	124
175MA/875MA	4 Flute	Square	30° Helix	Double End - TiALN Coated	124
185M/985M	2 Flute	Ball	30° Helix	Double End	125
195M/995M	4 Flute	Ball	30° Helix	Double End	125
185MA/985MA	2 Flute	Ball	30° Helix	Double End - TiALN Coated	126
195MA/995MA	4 Flute	Ball	30° Helix	Double End - TiALN Coated	126

**END MILLS - STANDARD LENGTH**

220M/820M	2 Flute	Square	30° Helix		127
223M/823M	3 Flute	Square	30° Helix		127
230M/830M	4 Flute	Square	30° Helix		127
220MT	2 Flute	Square	30° Helix	TiN Coated	129
230MT	4 Flute	Square	30° Helix	TiN Coated	129
220MC	2 Flute	Square	30° Helix	TiCN Coated	130
223MC	3 Flute	Square	30° Helix	TiCN Coated	130
230MC	4 Flute	Square	30° Helix	TiCN Coated	130
220MA/820MA	2 Flute	Square	30° Helix	TiALN Coated	131
223MA/823MA	3 Flute	Square	30° Helix	TiALN Coated	131
230MA/830MA	4 Flute	Square	30° Helix	TiALN Coated	131
220R	2 Flute	Radius	30° Helix		133
230R	4 Flute	Radius	30° Helix		133
220RA	2 Flute	Radius	30° Helix	TiALN Coated	135
230RA/830RA	4 Flute	Radius	30° Helix	TiALN Coated	135
320M/920M	2 Flute	Ball	30° Helix		138
323M/923M	3 Flute	Ball	30° Helix		138
330M/930M	4 Flute	Ball	30° Helix		138
320MT	2 Flute	Ball	30° Helix	TiN Coated	140
330MT	4 Flute	Ball	30° Helix	TiN Coated	140
320MC	2 Flute	Ball	30° Helix	TiCN Coated	141
323MC	3 Flute	Ball	30° Helix	TiCN Coated	141
330MC	4 Flute	Ball	30° Helix	TiCN Coated	141
320MA/920MA	2 Flute	Ball	30° Helix	TiALN Coated	142
323MA/923MA	3 Flute	Ball	30° Helix	TiALN Coated	142
330MA/930MA	4 Flute	Ball	30° Helix	TiALN Coated	142
222M	2 Flute	Square	Straight		144
234M	4 Flute	Square	Straight		144
322M	2 Flute	Ball	Straight		144
334M	4 Flute	Ball	Straight		144
273M	3 Flute	Square	30° Helix	Tapered	145
373M	3 Flute	Ball	30° Helix	Tapered	145
280M	2 Flute	Square	30° Helix	N/C Tolerance	146
290M	4 Flute	Square	30° Helix	N/C Tolerance	146
380M	2 Flute	Ball	30° Helix	N/C Tolerance	146
390M	4 Flute	Ball	30° Helix	N/C Tolerance	146
425M	2 Flute	Square	30° Helix	Double End/3/8" Shank	147
435M	4 Flute	Square	30° Helix	Double End/3/8" Shank	147
425MA	2 Flute	Square	30° Helix	Double End/3/8" Shank/TiALN	147
435MA	4 Flute	Square	30° Helix	Double End/3/8" Shank/TiALN	147
525M	2 Flute	Ball	30° Helix	Double End/3/8" Shank	148
535M	4 Flute	Ball	30° Helix	Double End/3/8" Shank	148
525MA	2 Flute	Ball	30° Helix	Double End/3/8" Shank/TiALN	148
535MA	4 Flute	Ball	30° Helix	Double End/3/8" Shank/TiALN	148
420M	2 Flute	Square	30° Helix	Double End	149
430M/450M	4 Flute	Square	30° Helix	Double End	149
420MA	2 Flute	Square	30° Helix	Double End/TiALN Coated	150
430MA/450MA	4 Flute	Square	30° Helix	Double End/TiALN Coated	150
520M	2 Flute	Ball	30° Helix	Double End	151
530M	4 Flute	Ball	30° Helix	Double End	151
520MA	2 Flute	Ball	30° Helix	Double End/TiALN Coated	152
530MA	4 Flute	Ball	30° Helix	Double End/TiALN Coated	152

**END MILLS - EXTRA LENGTH**

620M/640M	2 Flute	Square	30° Helix		153
623M/643M	3 Flute	Square	30° Helix		153
630M/650M	4 Flute	Square	30° Helix		153
620MC	2 Flute	Square	30° Helix	TiCN Coated	155
623MC	3 Flute	Square	30° Helix	TiCN Coated	155
630MC	4 Flute	Square	30° Helix	TiCN Coated	155
620MA/640MA	2 Flute	Square	30° Helix	TiALN Coated	156
623MA/643MA	3 Flute	Square	30° Helix	TiALN Coated	156
630MA/650MA	4 Flute	Square	30° Helix	TiALN Coated	156
630R	4 Flute	Radius	30° Helix		158
630RA	4 Flute	Radius	30° Helix	TiALN Coated	161
720M/740M	2 Flute	Ball	30° Helix		164
723M/743M	3 Flute	Ball	30° Helix		164
730M/750M	4 Flute	Ball	30° Helix		164
720MC	2 Flute	Ball	30° Helix	TiCN Coated	166
723MC	3 Flute	Ball	30° Helix	TiCN Coated	166
730MC	4 Flute	Ball	30° Helix	TiCN Coated	166
720MA/740MA	2 Flute	Ball	30° Helix	TiALN Coated	167
723MA/743MA	3 Flute	Ball	30° Helix	TiALN Coated	167
730MA/750MA	4 Flute	Ball	30° Helix	TiALN Coated	167

**ROTARY FILES**

1/4" Diameter	Standard Shapes	Steel Shank	170
3/16" Diameter		Solid Carbide	182
1/4" Diameter		1/8" Diameter Steel Shank	183
1/8" Diameter		Solid Carbide	184
Grinding Burrs			185

**REAMERS**

RES	Standard Reamers	186
	Special Reamers	187

**CENTERLESS GROUND BLANKS**

2200M			188
2220M	Engraving	Split Single End	189
2230M	Engraving	Split Double End	190

**TECHNICAL DATA**