












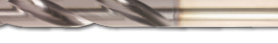

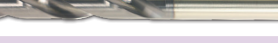


**DRILLS**

	SERIES	PAGE	COATING	DESCRIPTION
1160, 1180		17	ALUMASTAR	3 flute, High performance
1520, 1205		65, 73	BRIGHT	2 flute, General purpose
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose
1800H		88	HARDLUBE	2 flute, Parabolic


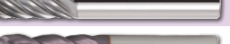










**END MILLS**

	SERIES	PAGE	COATING	DESCRIPTION
143M, 143R		122, 126	ALUMASTAR	High velocity, 3 flute, High metal removal rate
142B		121	ALUMASTAR	High velocity, 2 flute, High metal removal rate
142M, 142R		118, 119	ALUMASTAR	High velocity, 2 flute, High metal removal rate
242M, 842M		129	BRIGHT	High performance, 2 flute, For 3000-8000 RPM
ARC		114	BRIGHT	High performance, 3 flute, Staggered helix rougher
253M, 853M		132	BRIGHT	High performance, 3 flute, Profiling and finishing
253MC		134	TiCN	High performance, 3 flute, Profiling and finishing
220M, 820M		202	BRIGHT	2 flute, General purpose, Square end
220MC		205	TiCN	2 flute, General purpose, Square end
320M, 920M		215	BRIGHT	2 flute, General purpose, Ball end
320MC		218	TiCN	2 flute, General purpose, Ball end









**DRILLS**

SERIES		PAGE	COATING	DESCRIPTION
1510H		62	HARDLUBE	2 flute, General purpose, Slow spiral
1550H, 1250H, 1850H		23	AlTiN-Based	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		29	AlTiN-Based	2 flute, High performance, Common shank
1580H, 1280H		33	AlTiN-Based	2 flute, High performance
1580KD, 1280KD		38	AlTiN-Based	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		45	AlTiN-Based	2 flute, High performance, Coolant fed
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose
1160, 1180		17	ALUMASTAR	3 flute, High performance





**END MILLS**

SERIES		PAGE	COATING	DESCRIPTION
V4		151	AlCrN	High performance, 4 flute, Variable helix
V5		156	AlCrN	High performance, 5 flute, Variable helix
VX-7		164	AlCrN-Based	High performance, 7 flute, Staggered flute
VRX		167	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		177	AlTiN	High performance, 6 flute, Staggered flute
TMS, TMR		144, 146	AlCrN	High performance, Multiple flute finisher
VHM		116	AlTiN	High performance, 4 flute, Staggered flute rougher
255MA, 855MA		136	AlTiN	High performance, 5 flute
255RA, 855RA		141	AlTiN	High performance, 5 flute, Corner radius
242M, 842M		129	BRIGHT	High performance, 2 flute, For 3000-8000 RPM
246MA, 846MA		143	AlTiN	High performance, 6 flute, Finisher
253MA, 853MA		130	AlTiN	High performance, 3 flute, Profiling and finishing
223MA, 823MA		206	TiAlN	3 flute, General purpose, Square end
230MA, 830MA		206	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		212	TiAlN	4 flute, General purpose, Corner radius
323MA, 923MA		219	TiAlN	3 flute, General purpose, Ball end
330MA, 930MA		219	TiAlN	4 flute, General purpose, Ball end









**STAINLESS  
STEEL****DRILLS**

	SERIES	PAGE	COATING	DESCRIPTION
1510H		62	HARDLUBE	2 flute, General purpose, Slow spiral
1550H, 1250H, 1850H		23	AlTiN-Based	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		29	AlTiN-Based	2 flute, High performance, Common shank
1580H, 1280H		33	AlTiN-Based	2 flute, High performance
1580KD, 1280KD		38	AlTiN-Based	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		45	AlTiN-Based	2 flute, High performance, Coolant fed
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose
1160, 1180		17	ALUMASTAR	3 flute, High performance

**END MILLS**

	SERIES	PAGE	COATING	DESCRIPTION
V4		151	AlCrN	High performance, 4 flute, Variable helix
V5		156	AlCrN	High performance, 5 flute, Variable helix
VX-7		164	AlCrN-Based	High performance, 7 flute, Staggered flute
VRX		167	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		177	AlTiN	High performance, 6 flute, Staggered flute
253MA, 853MA		130	AlTiN	High performance, 3 flute, Profiling and finishing
255MA, 855MA		136	AlTiN	High performance, 5 flute, Square end
255RA, 855RA		141	AlTiN	High performance, 5 flute, Corner radius
VHM		116	AlTiN	High performance, 4 flute, Staggered flute rougher
ARC		114	BRIGHT	High performance, 3 flute, Staggered helix rougher
TMS, TMR		144, 146	AlCrN	High performance, Multiple flute finisher
253MC		134	TiCN	High performance, 3 flute, Profiling and finishing
246MA, 846MA		143	AlTiN	High performance, 6 flute, Finisher, Square end
223MA, 823MA		206	TiAlN	3 flute, General purpose, Square end
230MA, 830MA		206	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		212	TiAlN	4 flute, General purpose, Corner radius
323MA, 923MA		219	TiAlN	3 flute, General purpose, Ball end
330MA, 930MA		219	TiAlN	4 flute, General purpose, Ball end

**DRILLS**







SERIES		PAGE	COATING	DESCRIPTION
1510H		62	HARDLUBE	2 flute, General purpose, Slow spiral
1550H, 1250H, 1850H		23	AlTiN-Based	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		29	AlTiN-Based	2 flute, High performance, Common shank
1580H, 1280H		33	AlTiN-Based	2 flute, High performance
1580KD, 1280KD		38	AlTiN-Based	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		45	AlTiN-Based	2 flute, High performance, Coolant fed
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose
1120H, 1100H		71, 86	HARDLUBE	3 flute, General purpose

**END MILLS**

SERIES		PAGE	COATING	DESCRIPTION
V5		156	AlCrN	High performance, 5 flute, Variable helix
V4		151	AlCrN	High performance, 4 flute, Variable helix
VRX		167	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		177	AlTiN	High performance, 6 flute, Staggered flute
VX-7		164	AlCrN-Based	High performance, 7 flute, Staggered flute
VHM		116	AlTiN	High performance, 4 flute, Staggered flute rougher
255MA, 855MA		136	AlTiN	High performance, 5 flute, Square end
255RA, 855RA		141	AlTiN	High performance, 5 flute, Corner radius
246MA, 846MA		143	AlTiN	High performance, 6 flute, Finisher, Square end
TMS, TMR		144, 146	AlCrN	High performance, Multiple flute finisher
230MA, 830MA		206	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		212	TiAlN	4 flute, General purpose, Corner radius
330MA, 930MA		219	TiAlN	4 flute, General purpose, Ball end

Recommended tools for:

**BRASS, BRONZE,  
COPPER, MAGNESIUM****DRILLS**

	SERIES	PAGE	COATING	DESCRIPTION
1160, 1180		17	ALUMASTAR	3 flute, High performance
1510H		62	HARDLUBE	2 flute, General purpose, Slow spiral
1520, 1205		65, 73	BRIGHT	2 flute, General purpose
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose
1500H		57	HARDLUBE	2 flute, Straight flute
1800H		88	HARDLUBE	2 flute, Parabolic

**END MILLS**









	SERIES	PAGE	COATING	DESCRIPTION
143M, 143R		122, 126	ALUMASTAR	High velocity, 3 flute, High metal removal rate
142B		121	ALUMASTAR	High velocity, 2 flute, High metal removal rate
142M, 142R		118, 119	ALUMASTAR	High velocity, 2 flute, High metal removal rate
ARC		114	BRIGHT	High performance, 3 flute, Staggered helix rougher
242M, 842M		129	BRIGHT	High performance, 2 flute, For 3000-8000 RPM
253M, 853M		132	BRIGHT	High performance, 3 flute, Profiling and finishing
253MC		134	TiCN	High performance, 3 flute, Profiling and finishing
220M, 820M		202	BRIGHT	2 flute, General purpose, Square end
220MC		205	TiCN	2 flute, General purpose, Square end
320M, 920M		215	BRIGHT	2 flute, General purpose, Ball end
320MC		218	TiCN	2 flute, General purpose, Ball end










# HARDENED TOOL STEELS

(generally over 45 Rc)

## DRILLS

	SERIES	PAGE	COATING	DESCRIPTION
1500H		57	HARDLUBE	2 flute, Straight flute
1510H		62	HARDLUBE	2 flute, General purpose, Slow spiral
1550H, 1250H, 1850H		23	AlTiN-Based	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		29	AlTiN-Based	2 flute, High performance, Common shank
1580H, 1280H		33	AlTiN-Based	2 flute, High performance
1580KD, 1280KD		38	AlTiN-Based	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		45	AlTiN-Based	2 flute, High performance, Coolant fed
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose

## END MILLS







	SERIES	PAGE	COATING	DESCRIPTION
H-45		182	AlTiN	High performance, High feed, Ball end
350MX, 950MX		183	AlTiN	High performance, High Rc finisher, Die mold
545MA		179	AlTiN	High performance, High Rc finisher, Square end
545RA		180	AlTiN	High performance, High Rc finisher, Corner radius
545BA		181	AlTiN	High performance, High Rc finisher, Ball end
VRX		167	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		177	AlTiN	High performance, 6 flute, Staggered flute
230MA, 830MA		206	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		212	TiAlN	4 flute, General purpose, Corner radius
330MA, 930MA		219	TiAlN	4 flute, General purpose, Ball end

Recommended tools for:

# COMPOSITE MATERIALS

(Graphite, Plastics, Carbon Fiber)



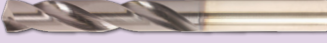

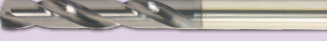
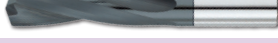


## DRILLS

	SERIES	PAGE	COATING	DESCRIPTION
1160, 1180		17	ALUMASTAR	3 flute, High performance
154MA		107	TiAIN	4 flute, Center cutting angle
1510H		62	HARDLUBE	2 flute, General purpose, Slow spiral
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose
1800H		88	HARDLUBE	2 flute, Parabolic
1500H		57	HARDLUBE	2 flute, Straight flute








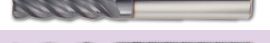




## END MILLS

	SERIES	PAGE	COATING	DESCRIPTION
210D		184	DIAMOND	4 flute, Square end
310D		186	DIAMOND	4 flute, Ball end
210RD		185	DIAMOND	4 flute, Corner radius
143M, 143R		122, 126	ALUMASTAR	High velocity, 3 flute, High metal removal rate
142M, 142R		118, 119	ALUMASTAR	High velocity, 2 flute, High metal removal rate
142B		121	ALUMASTAR	High velocity, 2 flute, High metal removal rate
253M, 853M		132	BRIGHT	High performance, 3 flute, Profiling and finishing
253MC		134	TiCN	High performance, 3 flute, Profiling and finishing
255MC		140	TiCN	High performance, 5 flute, Profiling and finishing
220MC		205	TiCN	2 flute, General purpose, Square end
320MC		218	TiCN	2 flute, General purpose, Ball end
154M, 154MA		106, 107	BRIGHT/TiAIN	4 flute, Drill/Mill, Center cutting to a point
152M, 152MA		104, 105	BRIGHT/TiAIN	2 flute, Drill/Mill, Center cutting to a point

**CARBON STEELS,  
MEDIUM ALLOY STEELS***(generally under 45 Rc)***DRILLS**



SERIES		PAGE	COATING	DESCRIPTION
1580HD		29	AlTiN-Based	2 flute, High performance, Common shank
1550H, 1250H, 1850H		23	AlTiN-Based	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580H, 1280H		33	AlTiN-Based	2 flute, High performance
1580KD, 1280KD		38	AlTiN-Based	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		45	AlTiN-Based	2 flute, High performance, Coolant fed
1510H		62	HARDLUBE	2 flute, General purpose, Slow spiral
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose
1160, 1180		17	ALUMASTAR	3 flute, High performance

**END MILLS**









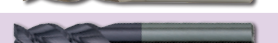
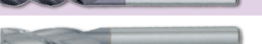


SERIES		PAGE	COATING	DESCRIPTION
V4		151	AlCrN	High performance, 4 flute, Variable helix
V5		156	AlCrN	High performance, 5 flute, Variable helix
VX-7		164	AlCrN-Based	High performance, 7 flute, Staggered flute
VRX		167	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		177	AlTiN	High performance, 6 flute, Staggered flute
VHM		116	AlTiN	High performance, 4 flute, Staggered flute rougher
255MA, 855MA		136	AlTiN	High performance, 5 flute
255RA, 855RA		141	AlTiN	High performance, 5 flute, Corner radius
253MA, 853MA		130	AlTiN	High performance, 3 flute, Profiling and finishing
230MA, 830MA		206	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		212	TiAlN	4 flute, General purpose, Corner radius
330MA, 930MA		219	TiAlN	4 flute, General purpose, Ball end



*DRILLS*

SERIES		PAGE	COATING	DESCRIPTION
1120H, 1100H		71, 86	HARDLUBE	3 flute, General purpose
1520H, 1205H		68, 76	HARDLUBE	2 flute, General purpose
1510H		62	HARDLUBE	2 flute, General purpose, Slow spiral
1580H, 1280H		33	AlTiN-Based	2 flute, High performance
1550H, 1250H, 1850H		23	AlTiN-Based	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		29	AlTiN-Based	2 flute, High performance, Common shank
1580KH, 1280KH, 1880KH		45	AlTiN-Based	2 flute, High performance, Coolant fed
1580KD, 1280KD		38	AlTiN-Based	2 flute, High performance, Coolant fed, Common shank

*END MILLS*

SERIES		PAGE	COATING	DESCRIPTION
VRX		167	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		177	AlTiN	High performance, 6 flute, Staggered flute
V4		151	AlCrN	High performance, 4 flute, Variable helix
V5		156	AlCrN	High performance, 5 flute, Variable helix
VX-7		164	AlCrN-Based	High performance, 7 flute, Staggered flute
255MA, 855MA		136	AlTiN	High performance, 5 flute, Square end
255RA, 855RA		141	AlTiN	High performance, 5 flute, Corner radius
143M, 143R		122, 126	ALUMASTAR	High velocity, 3 flute, High metal removal rate
253MA, 853MA		130	AlTiN	High performance, 3 flute, Profiling and finishing
230MC		205	TiCN	4 flute, General purpose, Square end
230MA, 830MA		206	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		212	TiAlN	4 flute, General purpose, Corner radius