





DRILLS

SERIES		PAGE	COATING	DESCRIPTION
1160, 1180		20	ALUMASTAR	3 flute, High performance
1520, 1205		69	BRIGHT	2 flute, General purpose
1520H, 1205H		75	DURANA	2 flute, General purpose
1800H		92	DURANA	2 flute, Parabolic



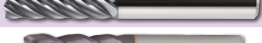




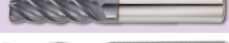





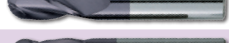



END MILLS

SERIES		PAGE	COATING	DESCRIPTION
A3		118	BRIGHT	High velocity, 3 flute, High metal removal rate
143M, 143R		127, 130	ALUMASTAR	High velocity, 3 flute, High metal removal rate
142B		126	ALUMASTAR	High velocity, 2 flute, High metal removal rate
142M, 142R		123, 124	ALUMASTAR	High velocity, 2 flute, High metal removal rate
242M, 842M		179	BRIGHT	High performance, 2 flute, For 3000-8000 RPM
ARC		114	BRIGHT	High performance, 3 flute, Staggered helix rougher
253M, 853M		182	BRIGHT	High performance, 3 flute, Profiling and finishing
253MC		184	TiCN	High performance, 3 flute, Profiling and finishing
220M, 820M		218	BRIGHT	2 flute, General purpose, Square end
220MC		221	TiCN	2 flute, General purpose, Square end
320M, 920M		230	BRIGHT	2 flute, General purpose, Ball end
320MC		233	TiCN	2 flute, General purpose, Ball end

DRILLS

SERIES		PAGE	COATING	DESCRIPTION
1510H		66	DURANA	2 flute, General purpose, Slow spiral
1550H, 1250H, 1850H		25	ALTINOS	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		31	ALTINOS	2 flute, High performance, Common shank
1580H, 1280H		34	ALTINOS	2 flute, High performance
1580KD, 1280KD, 1880KD		39	ALTINOS	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		49	ALTINOS	2 flute, High performance, Coolant fed
HTD 12		17	ALTINOS	2 flute, High performance, Coolant fed, Double margin, Common shank
1520H, 1205H		75	DURANA	2 flute, General purpose
1160, 1180		20	ALUMASTAR	3 flute, High performance

END MILLS



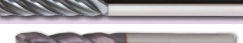












SERIES		PAGE	COATING	DESCRIPTION
V4		141	AlCrN	High performance, 4 flute, Variable helix
V5		154	AlCrN	High performance, 5 flute, Variable helix
VX-7		162	ALCRONOS	High performance, 7 flute, Staggered flute
VRX		166	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		176	AlTiN	High performance, 6 flute, Staggered flute
TMS, TMR		134, 136	AlCrN	High performance, Multiple flute finisher
VHM		116	AlTiN	High performance, 4 flute, Staggered flute rougher
255MA, 855MA		186	AlTiN	High performance, 5 flute, Square end
255RA, 855RA		191	AlTiN	High performance, 5 flute, Corner radius
242M, 842M		179	BRIGHT	High performance, 2 flute, For 3000-8000 RPM
246MA, 846MA		193	AlTiN	High performance, 6 flute, Finisher
253MA, 853MA		180	AlTiN	High performance, 3 flute, Profiling and finishing
223MA, 823MA		222	TiAlN	3 flute, General purpose, Square end
230MA, 830MA		222	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		227	TiAlN	4 flute, General purpose, Corner radius
323MA, 923MA		234	TiAlN	3 flute, General purpose, Ball end
330MA, 930MA		234	TiAlN	4 flute, General purpose, Ball end

ISO Material Group: **M**

DRILLS

SERIES		PAGE	COATING	DESCRIPTION
1510H		66	DURANA	2 flute, General purpose, Slow spiral
1550H, 1250H, 1850H		25	ALTINOS	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		31	ALTINOS	2 flute, High performance, Common shank
1580H, 1280H		34	ALTINOS	2 flute, High performance
1580KD, 1280KD, 1880KD		39	ALTINOS	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		49	ALTINOS	2 flute, High performance, Coolant fed
HTD 12		17	ALTINOS	2 flute, High performance, Coolant fed, Double margin, Common shank
1520H, 1205H		75	DURANA	2 flute, General purpose









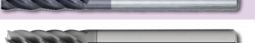
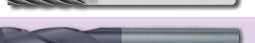
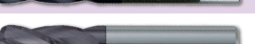


END MILLS

SERIES		PAGE	COATING	DESCRIPTION
V4		141	AlCrN	High performance, 4 flute, Variable helix
V5		154	AlCrN	High performance, 5 flute, Variable helix
VX-7		162	ALCRONOS	High performance, 7flute, Staggered flute
VRX		166	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		176	AlTiN	High performance, 6 flute, Staggered flute
253MA, 853MA		180	AlTiN	High performance, 3 flute, Profiling and finishing
255MA, 855MA		186	AlTiN	High performance, 5 flute, Square end
255RA, 855RA		191	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		134, 136	AlCrN	High performance, Multiple flute finisher
253MC		184	TiCN	High performance, 3 flute, Profiling and finishing
246MA, 846MA		193	AlTiN	High performance, 6 flute, Finisher, Square end
223MA, 823MA		222	TiAlN	3 flute, General purpose, Square end
230MA, 830MA		222	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		227	TiAlN	4 flute, General purpose, Corner radius
323MA, 923MA		234	TiAlN	3 flute, General purpose, Ball end
330MA, 930MA		234	TiAlN	4 flute, General purpose, Ball end


DRILLS

SERIES		PAGE	COATING	DESCRIPTION
1510H		66	DURANA	2 flute, General purpose, Slow spiral
1550H, 1250H, 1850H		25	ALTINOS	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		31	ALTINOS	2 flute, High performance, Common shank
1580H, 1280H		34	ALTINOS	2 flute, High performance
1580KD, 1280KD, 1880KD		39	ALTINOS	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		49	ALTINOS	2 flute, High performance, Coolant fed
HTD 12		17	ALTINOS	2 flute, High performance, Coolant fed, Double margin, Common shank
1520H, 1205H		75	DURANA	2 flute, General purpose


END MILLS

SERIES		PAGE	COATING	DESCRIPTION
V5		154	AlCrN	High performance, 5 flute, Variable helix
V4		141	AlCrN	High performance, 4 flute, Variable helix
VRX		166	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		176	AlTiN	High performance, 6 flute, Staggered flute
VX-7		162	ALCRONOS	High performance, 7 flute, Staggered flute
VHM		116	AlTiN	High performance, 4 flute, Staggered flute rougher
255MA, 855MA		186	AlTiN	High performance, 5 flute, Square end
255RA, 855RA		191	AlTiN	High performance, 5 flute, Corner radius
246MA, 846MA		193	AlTiN	High performance, 6 flute, Finisher, Square end
TMS, TMR		134, 136	AlCrN	High performance, Multiple flute finisher
230MA, 830MA		222	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		227	TiAlN	4 flute, General purpose, Corner radius
330MA, 930MA		234	TiAlN	4 flute, General purpose, Ball end

DRILLS

	SERIES	PAGE	COATING	DESCRIPTION
1160, 1180		20	ALUMASTAR	3 flute, High performance
1510H		66	DURANA	2 flute, General purpose, Slow spiral
1520, 1205		69	BRIGHT	2 flute, General purpose
1520H, 1205H		75	DURANA	2 flute, General purpose
1500H		61	DURANA	2 flute, Straight flute
1800H		92	DURANA	2 flute, Parabolic

END MILLS

	SERIES	PAGE	COATING	DESCRIPTION
143M, 143R		127, 130	ALUMASTAR	High velocity, 3 flute, High metal removal rate
142B		126	ALUMASTAR	High velocity, 2 flute, High metal removal rate
142M, 142R		123, 124	ALUMASTAR	High velocity, 2 flute, High metal removal rate
ARC		114	BRIGHT	High performance, 3 flute, Staggered helix rougher
242M, 842M		179	BRIGHT	High performance, 2 flute, For 3000-8000 RPM
253M, 853M		182	BRIGHT	High performance, 3 flute, Profiling and finishing
253MC		184	TiCN	High performance, 3 flute, Profiling and finishing
220M, 820M		218	BRIGHT	2 flute, General purpose, Square end
220MC		221	TiCN	2 flute, General purpose, Square end
320M, 920M		230	BRIGHT	2 flute, General purpose, Ball end
320MC		233	TiCN	2 flute, General purpose, Ball end

Recommended for: **HARDENED TOOL STEELS**
(generally over 45 Rc)

ISO Material Group: **P**

RECOMMENDED
TOOLS

DRILLS

SERIES	PAGE	COATING	DESCRIPTION
1500H 	61	DURANA	2 flute, Straight flute
1510H 	66	DURANA	2 flute, General purpose, Slow spiral
1550H, 1250H, 1850H 	25	ALTINOS	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD 	31	ALTINOS	2 flute, High performance, Common shank
1580H, 1280H 	34	ALTINOS	2 flute, High performance
1580KD, 1280KD, 1880KD 	39	ALTINOS	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH 	49	ALTINOS	2 flute, High performance, Coolant fed
HTD 12 	17	ALTINOS	2 flute, High performance, Coolant fed, Double margin, Common shank
1520H, 1205H 	75	DURANA	2 flute, General purpose






END MILLS

SERIES	PAGE	COATING	DESCRIPTION
H-45 	197	DURANA	High performance, High feed, Corner radius
350MX, 950MX 	198	DURANA	High performance, High Rc finisher, Die mold
545MA 	194	DURANA	High performance, High Rc finisher, Square end
545RA 	195	DURANA	High performance, High Rc finisher, Corner radius
545BA 	196	DURANA	High performance, High Rc finisher, Ball end
VRX 	166	AlTiN	High performance, 4 flute, Staggered flute
VRX-6 	176	AlTiN	High performance, 6 flute, Staggered flute
230MA, 830MA 	222	TiAlN	4 flute, General purpose, Square end
230RA, 830RA 	227	TiAlN	4 flute, General purpose, Corner radius
330MA, 930MA 	234	TiAlN	4 flute, General purpose, Ball end

Recommended for: **COMPOSITE MATERIALS**
(Graphite, Plastics, Carbon Fiber)

ISO Material Group: **O**

DRILLS

	SERIES	PAGE	COATING	DESCRIPTION
1160, 1180		20	ALUMASTAR	3 flute, High performance
154MA		111	TiAIN	4 flute, Center cutting angle
1510H		66	DURANA	2 flute, General purpose, Slow spiral
1520H, 1205H		75	DURANA	2 flute, General purpose
1800H		92	DURANA	2 flute, Parabolic
1500H		61	DURANA	2 flute, Straight flute

END MILLS


	SERIES	PAGE	COATING	DESCRIPTION
210D		199	DIAMOND	4 flute, Square end
310D		201	DIAMOND	4 flute, Ball end
210RD		200	DIAMOND	4 flute, Corner radius
143M, 143R		127, 130	ALUMASTAR	High velocity, 3 flute, High metal removal rate
142M, 142R		123, 124	ALUMASTAR	High velocity, 2 flute, High metal removal rate
142B		126	ALUMASTAR	High velocity, 2 flute, High metal removal rate
253M, 853M		182	BRIGHT	High performance, 3 flute, Profiling and finishing
253MC		184	TiCN	High performance, 3 flute, Profiling and finishing
255MC		190	TiCN	High performance, 5 flute, Profiling and finishing
220MC		221	TiCN	2 flute, General purpose, Square end
320MC		233	TiCN	2 flute, General purpose, Ball end
154M, 154MA		110, 111	BRIGHT/TiAIN	4 flute, Drill/Mill, Center cutting to a point
152M, 152MA		108, 109	BRIGHT/TiAIN	2 flute, Drill/Mill, Center cutting to a point

Recommended for: **CARBON STEELS, MEDIUM ALLOY STEELS**
(generally under 45 Rc)








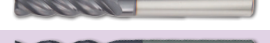




ISO Material Group: **P**

RECOMMENDED
TOOLS

DRILLS

SERIES		PAGE	COATING	DESCRIPTION
1580HD		31	ALTINOS	2 flute, High performance, Common shank
1550H, 1250H, 1850H		25	ALTINOS	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580H, 1280H		34	ALTINOS	2 flute, High performance
1580KD, 1280KD, 1880KD		39	ALTINOS	2 flute, High performance, Coolant fed, Common shank
1580KH, 1280KH, 1880KH		49	ALTINOS	2 flute, High performance, Coolant fed
HTD 12		17	ALTINOS	2 flute, High performance, Coolant fed, Double margin, Common shank
1510H		66	DURANA	2 flute, General purpose, Slow spiral
1520H, 1205H		75	DURANA	2 flute, General purpose









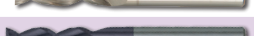
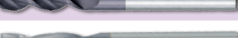


END MILLS

SERIES		PAGE	COATING	DESCRIPTION
V4		141	AlCrN	High performance, 4 flute, Variable helix
V5		154	AlCrN	High performance, 5 flute, Variable helix
VX-7		162	ALCRONOS	High performance, 7 flute, Staggered flute
VRX		166	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		176	AlTiN	High performance, 6 flute, Staggered flute
VHM		116	AlTiN	High performance, 4 flute, Staggered flute rougher
255MA, 855MA		186	AlTiN	High performance, 5 flute, Square end
255RA, 855RA		191	AlTiN	High performance, 5 flute, Corner radius
253MA, 853MA		180	AlTiN	High performance, 3 flute, Profiling and finishing
230MA, 830MA		222	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		227	TiAlN	4 flute, General purpose, Corner radius
330MA, 930MA		234	TiAlN	4 flute, General purpose, Ball end

DRILLS

	SERIES	PAGE	COATING	DESCRIPTION
1120H, 1100H		81	DURANA	3 flute, General purpose
1520H, 1205H		75	DURANA	2 flute, General purpose
1510H		66	DURANA	2 flute, General purpose, Slow spiral
1580H, 1280H		34	ALTINOS	2 flute, High performance
1550H, 1250H, 1850H		25	ALTINOS	2 flute, High performance, Small diameter, 1/8" or 3mm shank
1580HD		31	ALTINOS	2 flute, High performance, Common shank
1580KH, 1280KH, 1880KH		49	ALTINOS	2 flute, High performance, Coolant fed
1580KD, 1280KD, 1880KD		39	ALTINOS	2 flute, High performance, Coolant fed, Common shank

END MILLS

	SERIES	PAGE	COATING	DESCRIPTION
VRX		166	AlTiN	High performance, 4 flute, Staggered flute
VRX-6		176	AlTiN	High performance, 6 flute, Staggered flute
V4		141	AlCrN	High performance, 4 flute, Variable helix
V5		154	AlCrN	High performance, 5 flute, Variable helix
VX-7		162	ALCRONOS	High performance, 7 flute, Staggered flute
255MA, 855MA		186	AlTiN	High performance, 5 flute, Square end
255RA, 855RA		191	AlTiN	High performance, 5 flute, Corner radius
143M, 143R		127, 130	ALUMASTAR	High velocity, 3 flute, High metal removal rate
253MA, 853MA		180	AlTiN	High performance, 3 flute, Profiling and finishing
230MC		221	TiCN	4 flute, General purpose, Square end
230MA, 830MA		222	TiAlN	4 flute, General purpose, Square end
230RA, 830RA		227	TiAlN	4 flute, General purpose, Corner radius