

Series US220 - Aluminum Alloys & Non-Ferrous Materials

Material Designation		SFM [ft/min]	ae max [inch]	ap max [inch]	Chip Load Per Tooth [inch]					
					1/8"	3/16" 1/4" 5/16"	3/8" 7/16"	1/2" 5/8"	3/4"	1"
Aluminium	Non-Alloy	1968	1xØ	1xØ	0.0016	0.0024	0.0031	0.0059	0.0079	0.0089
	Wrought Alloy Non-Hardened	1968	1xØ	1xØ	0.0016	0.0024	0.0031	0.0059	0.0079	0.0089
	Wrought Alloy Hardened	1968	1xØ	1xØ	0.0016	0.0024	0.0031	0.0059	0.0079	0.0089
	Casting Alloy < 6% Si	1575	1xØ	1xØ	0.0016	0.0024	0.0031	0.0059	0.0079	0.0089
	Casting Alloy 6-12% Si	1181	1xØ	1xØ	0.0012	0.0020	0.0028	0.0047	0.0067	0.0083
	Casting Alloy > 6% Si	787	1xØ	1xØ	0.0012	0.0020	0.0028	0.0047	0.0067	0.0083
Magnesium	Wrought Alloy	722	1xØ	1xØ	0.0012	0.0020	0.0028	0.0047	0.0067	0.0083
	Casting Alloy	656	1xØ	1xØ	0.0012	0.0020	0.0028	0.0047	0.0067	0.0083
Copper	Non-Alloy	558	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Wrought Alloy Non-Hardened	509	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Wrought Alloy Hardened	394	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	CuNi-Alloy	492	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	CuNiZn-Alloy Long-Chipping	394	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	CuNiZn-Alloy Short-Chipping	492	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
CuZn (Brass)	Long-Chipping	591	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	787	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
CuSn (Bronze)	Long-Chipping	492	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	558	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
CuAlFe (Ampco)	Long-Chipping	180	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	230	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055

Series US362 - Aluminum Alloys & Non-Ferrous Materials

Material Designation		SFM [ft/min]	ae max [inch]	ap max [inch]	Chip Load Per Tooth [inch]					
					1/8"	3/16" 1/4" 5/16"	3/8" 7/16"	1/2" 5/8"	3/4"	1"
Aluminium	Non-Alloy	1968	1xØ	1xØ	0.0014	0.0024	0.0028	0.0035	0.0047	0.0055
	Wrought Alloy Non-Hardened	1968	1xØ	1xØ	0.0014	0.0024	0.0028	0.0035	0.0047	0.0055
	Wrought Alloy Hardened	1968	1xØ	1xØ	0.0014	0.0024	0.0028	0.0035	0.0047	0.0055
	Casting Alloy < 6% Si	1575	1xØ	1xØ	0.0014	0.0024	0.0028	0.0035	0.0047	0.0055
	Casting Alloy 6-12% Si	1181	1xØ	1xØ	0.0012	0.0020	0.0028	0.0047	0.0067	0.0083
	Casting Alloy > 6% Si	787	1xØ	1xØ	0.0012	0.0020	0.0028	0.0047	0.0067	0.0083
Magnesium	Wrought Alloy	722	1xØ	1xØ	0.0012	0.0020	0.0028	0.0047	0.0067	0.0083
	Casting Alloy	656	1xØ	1xØ	0.0012	0.0020	0.0028	0.0047	0.0067	0.0083
Copper	Non-Alloy	558	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Wrought Alloy Non-Hardened	509	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Wrought Alloy Hardened	394	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	CuNi-Alloy	492	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	CuNiZn-Alloy Long-Chipping	394	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	CuNiZn-Alloy Short-Chipping	492	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
CuZn (Brass)	Long-Chipping	591	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	787	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
CuSn (Bronze)	Long-Chipping	492	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	558	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
CuAlFe (Ampco)	Long-Chipping	180	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	230	1xØ	1xØ	0.0008	0.0016	0.0024	0.0031	0.0047	0.0055

Series 109 - Aluminum Alloys & Non-Ferrous Materials

Material Designation		SFM [ft/min]	ae max. [inch]	ap max [inch]	Chip Load Per Tooth [inch]					
					1/8"	3/16" 1/4" 5/16"	3/8" 7/16"	1/2" 5/8"	3/4"	1"
Aluminium	Non-Alloy	1230	0.05xØ	1.4xØ	0.0008	0.0016	0.002	0.0041	0.0048	0.0055
	Wrought Alloy Non-Hardened	1230	0.05xØ	1.4xØ	0.0008	0.0016	0.002	0.0041	0.0048	0.0055
	Wrought Alloy Hardened	1230	0.05xØ	1.4xØ	0.0008	0.0016	0.002	0.0041	0.0048	0.0055
	Casting Alloy < 6% Si	984	0.05xØ	1.4xØ	0.0008	0.0016	0.002	0.0041	0.0048	0.0055
	Casting Alloy 6-12% Si	738	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	Casting Alloy > 6% Si	517	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
Magnesium	Wrought Alloy	492	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	Casting Alloy	418	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048

* Feeds and Speeds are starting points for Overall Lengths of 4" and shorter.
 For End Mills with Overall Lengths over 4" decrease the Feeds and Speeds.

Series 109 - Aluminum Alloys & Non-Ferrous Materials (Continued)										
Material Designation		SFM [ft/min]	ae max. [inch]	ap max [inch]	Chip Load Per Tooth [inch]					
					1/8"	3/16" 1/4" 5/16"	3/8" 7/16"	1/2" 5/8"	3/4"	1"
Copper	Non-Alloy	369	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	Wrought Alloy Non-Hardened	344	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	Wrought Alloy Hardened	271	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	CuNi-Alloy	320	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	CuNiZn-Alloy Long-Chipping	271	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	CuNiZn-Alloy Short-Chipping	320	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
CuZn (Brass)	Long-Chipping	369	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	Short-Chipping	517	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
CuSn (Bronze)	Long-Chipping	320	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	Short-Chipping	344	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
CuAlFe (Ampco)	Long-Chipping	148	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048
	Short-Chipping	172	0.05xØ	1.4xØ	0.0006	0.0008	0.0012	0.0034	0.0041	0.0048

Series 102 / 119 - Aluminum Alloys & Non-Ferrous Materials										
Material Designation		SFM [ft/min]	ae max. [inch]	ap max [inch]	Chip Load Per Tooth [inch]					
					1/8"	3/16" 1/4" 5/16"	3/8" 7/16"	1/2" 5/8"	3/4"	1"
Aluminium	Non-Alloy	1230	1xØ	1xØ	0.001	0.0017	0.0028	0.0035	0.0047	0.0055
	Wrought Alloy Non-Hardened	1230	1xØ	1xØ	0.001	0.0017	0.0028	0.0035	0.0047	0.0055
	Wrought Alloy Hardened	1230	1xØ	1xØ	0.001	0.0017	0.0028	0.0035	0.0047	0.0055
	Casting Alloy < 6% Si	984	1xØ	1xØ	0.001	0.0017	0.0028	0.0035	0.0047	0.0055
	Casting Alloy 6-12% Si	738	1xØ	1xØ	0.0008	0.0014	0.0028	0.0047	0.0067	0.0083
	Casting Alloy > 6% Si	517	1xØ	1xØ	0.0008	0.0014	0.0028	0.0047	0.0067	0.0083
Magnesium	Wrought Alloy	492	1xØ	1xØ	0.0008	0.0014	0.0028	0.0047	0.0067	0.0083
	Casting Alloy	418	1xØ	1xØ	0.0008	0.0014	0.0028	0.0047	0.0067	0.0083
Copper	Non-Alloy	369	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
	Wrought Alloy Non-Hardened	344	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
	Wrought Alloy Hardened	271	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
	CuNi-Alloy	320	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
	CuNiZn-Alloy Long-Chipping	271	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
	CuNiZn-Alloy Short-Chipping	320	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
CuZn (Brass)	Long-Chipping	369	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	517	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
CuSn (Bronze)	Long-Chipping	320	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	344	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
CuAlFe (Ampco)	Long-Chipping	148	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055
	Short-Chipping	172	1xØ	1xØ	0.0006	0.0011	0.0024	0.0031	0.0047	0.0055

Series US376 - Aluminum Alloys & Non-Ferrous Materials										
Material Designation		SFM [ft/min]	ae max [inch]	ap max [inch]	Chip Load Per Tooth [inch]					
					1/8"	3/16" 1/4" 5/16"	3/8" 7/16"	1/2" 5/8"	3/4"	1"
Aluminium	Non-Alloy	1640	0.05xØ	2xØ	0.0008	0.0016	0.0020	0.0024	0.0028	0.0031
	Wrought Alloy Non-Hardened	1640	0.05xØ	2xØ	0.0008	0.0016	0.0020	0.0024	0.0028	0.0031
	Wrought Alloy Hardened	1640	0.05xØ	2xØ	0.0008	0.0016	0.0020	0.0024	0.0028	0.0031
	Casting Alloy < 6% Si	1312	0.05xØ	2xØ	0.0008	0.0016	0.0020	0.0024	0.0028	0.0031
	Casting Alloy 6-12% Si	984	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	Casting Alloy > 6% Si	689	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
Magnesium	Wrought Alloy	656	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	Casting Alloy	558	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
Copper	Non-Alloy	492	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	Wrought Alloy Non-Hardened	459	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	Wrought Alloy Hardened	361	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	CuNi-Alloy	427	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	CuNiZn-Alloy Long-Chipping	361	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	CuNiZn-Alloy Short-Chipping	427	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
CuZn (Brass)	Long-Chipping	492	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	Short-Chipping	689	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
CuSn (Bronze)	Long-Chipping	427	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	Short-Chipping	459	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
CuAlFe (Ampco)	Long-Chipping	197	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028
	Short-Chipping	230	0.05xØ	2xØ	0.0006	0.0008	0.0012	0.0020	0.0024	0.0028

* Feeds and Speeds are starting points for Overall Lengths of 4" and shorter.
For End Mills with Overall Lengths over 4" decrease the Feeds and Speeds.