

MACHINING RECOMMENDATIONS FOR COPPER BASED ALLOYS

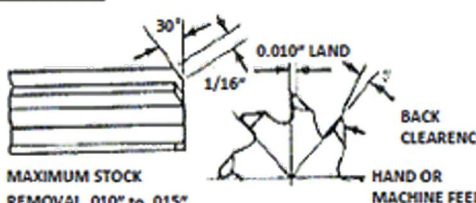
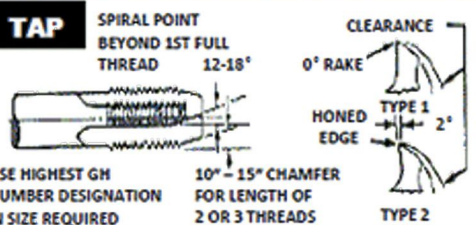
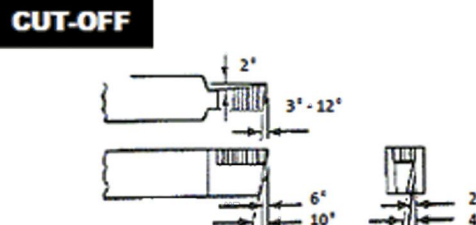


ARGENMETAL
BRONZES FOR LIFE

GROUP	ALLOY DESIGNATION
I	AG 160 A 200
II	AG120 AG 160
III	AG120 AG200 AG240
IV	AG200 AG240 AG280
V	AG300 AG360

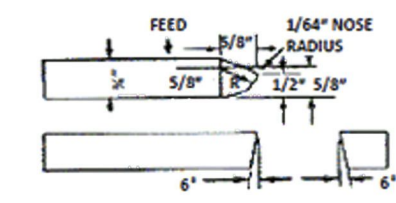
TOOL DATA-SPEEDS and FEEDS Conventional equipment with standard motors

TOOL DESCRIPTION	DATA	ALLOY TOOL GROUPS					
		I	II	III	IV	V	
TURNING <p>CARBIDE INSERT 5° HONE CUTTING EDGE POSITIVE TYPE 1 POSITIVE TYPE 2</p> <p>CEMENTED CARBIDE 15° CHIP BREAKER 1/32" NOSE RADIUS 6" 10" 6" 10"</p>	ROUGHING	SFM FPR	350 .011	300 .011	300 .011	250 .011	400 .005
	SEMI-FINISHING	SFM FPR	850 .011	850 .011	700 .009	700 .009	500 .005
	FINISHING TO 32 RMS	SFM FPR	1150 .006	1150 .006	950 .004	950 .004	750 .004
	SIDE RAKE	A	0-3°	0-3°	0-3°	6-8°	See dwg
	LAND	B	-	1/32 - 1/16	-	-	
	LAND RAKE	C	-	0-3°	-	-	
	SPEED, FEED*		SAME AS CARBIDE INSERTS				
	RAKE TYPE		2	2	2	2	See dwg
	RECOMMENDED GRADES OF CARBIDE		ROUGH	SEMI-FINISH		FINISH	ALLOY GROUP
			Cut	Carbide	Cut	Carbide	
1/4			C-1	1/16	C-12	ALL ALLOYS	
1/4			C-11	1/16	C-12		
1/4	C-5	1/16	C-12	ALL ALLOYS			
3/32	C-3	1/64	C-3				
DRILL <p>TYPE 2 SLIGHTLY FLAT TO POSITIVE TYPE 3 SLIGHTLY POSITIVE HONED EDGE TYPE 4 1/32" HONED EDGE</p> <p>GRIND SIDE WEB 1/32" OFF CENTER (ROUGH ONLY) ALL DRILLS MUST HAVE POLISHED FLUTES (NO COATING)</p>	SPEED*	175	175	150	125	60	
	FEED*	.011	.011	.011	.011	.007	
	A (lip clearance)	12°	12°	12°	12°	12°	
	B (included angle)	118°	118°	118°	118°	118°	
	TYPE FACE	2	2	2	3	1	
	FLUTE TO 1/2" 1/2" UP	STD	STD	STD	Fast spiral	STD	
	STD	STD	STD	STD	Fast spiral		
MILL <p>PROFILE, FORM, PLAIN, HELICAL & END 0° RAKE ANGLE 3° SIDE CLEARANCE</p> <p>PROFILE-SHARPER ON PERIPHERY FORM-SHARPER ON FACE</p>	FACE OR SLAB SPEED*	500	500	400	400	Use specially constructed heavy duty cutters, electroplated	
	FEED* PER TOOTH	1/4" CUT	.009	.009	.009		.009
	0.005-0.10" CUT						
	FORM, SIDE, KEY END		.007	.007	.007		.007
	SAW SPEED*		400	400	300		300
	FEED/TOOTH 1/16" CUT		.003	.003	.003		.002

TOOL DESCRIPTION	DATA	ALLOY TOOL GROUPS				
		I	II	III	IV	V
REAM  <p>MAXIMUM STOCK REMOVAL .010" to .015"</p> <p>HAND OR MACHINE FEED</p>	SPEED* FEED* TO 1/2" DIA. 1/2" UP TYPE FLUTE	100 .016 .020 STD	100 .016 .020 STD	75 .011 .016 STD	75 .011 .016 STD	NOT RECOMMENDED
TAP  <p>USE HIGHEST GH NUMBER DESIGNATION IN SIZE REQUIRED</p> <p>10" - 15" CHAMFER FOR LENGTH OF 2 OR 3 THREADS</p>	SPEED* 3-7 1/2 THREAD/IN. 8-15 16-24 25 UP TYPE FACE	40 80 100 150 1	12 25 45 60 1	12 25 45 60 1	12 25 45 60 1	8 10 15 20 See dwg
CUT-OFF 	SPEED* FEED*	300 .008	300 .008	250 .0055	250 .0055	200 .004

*SPEED denotes surface Feed per Minute (SFM)
 *FEED feed per Revolution in inches (FPR)

TURN GROUPS V




DRILL GROUPS V

HONED EDGE 5° TO 30° NEGATIVE UP

GRIND ONE SIDE 1/32" OFF CENTER (ROUGH)

12°
3° RELIEF

DRILLS MUST BE CARBIDE TIPPED AND HAVE POLISHED FLUTES (NO COATING)



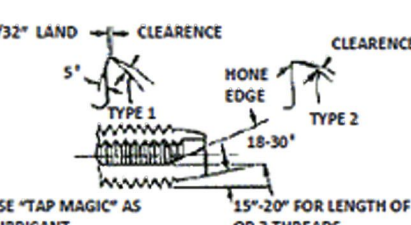
TAP (HSS) GROUPS V

IT REQUIRES 3 TAPS TO THREAD HOLE
 1 TAP ROUGH TYPE 1 LOWEST GH DESIGNATION
 1 TAP SEMI-FIN 1 LOWEST GH DESIGNATION
 1 TAP FINISH TYPE 2 HIGHEST GH DESIGNATION

1/32" LAND
 CLEARANCE
 5°
 TYPE 1
 HONE EDGE
 18-30°
 TYPE 2
 CLEARANCE

USE "TAP MAGIC" AS LUBRICANT

15"-20" FOR LENGTH OF 2 OR 3 THREADS



COOLANT AND CUTTING OIL RECOMMENDATIONS

COOLANT: All operations may be performed with soluble oil 1 part to 50 parts water, applied as a spray mist. Tapping is done with "TAP MAGIC" or equivalent.

CUTTING OIL: Not recommended when machining copper alloys except on screw machine operations where it performs as a coolant and lubricant. To prevent metal oxidation, finished parts MUST be cleaned with a detergent type solvent.

GRINDING RECOMMENDATIONS

Most of the aluminum bronze alloys are relatively easy to grind, with variations due to differences in hardness. Of utmost importance is the selection of the correct grinding wheel. Both silicon carbide and aluminium oxide wheels can be used, with the aluminium oxide wheels preferred for those alloys with a hardness of Rockwell C27 and up. AS a general rule, the selection of the grinding wheel is best left to the wheel manufacturer since so many variables must be considered. Emulsions of soluble oil and water are satisfactory grinding fluids.



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