

APPLICATION DATA SHEET

COPPER BRASS BRONZE

FREE-CUTTING BRASS FOR LOWER SCREW MACHINE PRODUCT COST

APPLICATION	Garden Equipment
SPECIAL FEATURES	Savings From Plating; Productivity
PART WEIGHT	0.012 lb. (Brass)
BRASS RAW MATERIAL PREMIUM	32% (Including Turnings Allowance)
CYCLETIME (C360 BRASS)	3.75 sec (768 pieces per hour @ 80% Efficiency)
CYCLETIME (12L14 STEEL)	5.5 sec (458 pieces per hour @ 70% Efficiency)
PRODUCTIVITY GAIN USING BRASS	68%
NET COST SAVINGS (BRASS VS.PLATED STEEL) *	12% = \$4.60 per 1000
*Zinc/chromate; assumes 0% plating rejects.	



KNOB INSERT

THE VALUE OF HIGH MACHINABILITY

This knob insert combines forming, drilling, tapping and knurling, so it has to be made from a material with very high machinability. Free-Cutting Brass, Copper Alloy 360 (UNS 36000) has the high level of machinability needed to make this product reliably and economically.

The insert used to be made from 12L14 leaded steel. With its relatively small size, it was being run at maximum speed on a Davenport. The limiting operation was the internal, bottomed thread: driving and reversing the tap was time-consuming with steel. Changing to Free-Cutting Brass speeded up the tapping operation significantly. In fact, high speed tapping was the main reason for the healthy 32% (1.75 sec.) decrease in cycle time when the insert was switched from steel to Free-Cutting Brass.

ELIMINATE PLATING COSTS

Added benefits gained by changing from steel to Free-Cutting Brass included a noticeably finer surface finish (very evident on the threads) and, even more important, eliminating the need for plating. Brass has a natural corrosion resistance so it ordinarily doesn't have to be plated. Plating costs money and it can be a source of rejects. Being able to eliminate zinc/chromate plating on this knob insert saved \$1.94 per thousand pieces.

BRASS IS AS STRONG AS STEEL

Many designers don't realize that the strength of half-hard Free-Cutting Brass and cold-reduced 12L14 leaded steel (the most common conditions for screw machine parts) overlap the same range. Here are the published nominal values:

MATERIAL	TENSILE PROPERTIES	
	YIELD STRENGTH	ULTIMATE STRENGTH
C36000	45 ksi	58 ksi
Hot Rolled 12L14	34 ksi	57 ksi
Cold Drawn 12L14	60 ksi	78 ksi

That means that for this knob insert, and for almost one-half of all screw machine products, brass can be substituted for leaded steel without any sacrifice in strength or safety.

