

APPLICATION DATA SHEET

COPPER BRASS BRONZE

FREE-CUTTING BRASS FOR LOWER SCREW MACHINE PRODUCT COST

APPLICATION	HVAC
SPECIAL FEATURES	Costly Deep-Hole Drilling
PART WEIGHT	0.039 pounds (Brass)
BRASS RAW MATERIAL PREMIUM	40% (Including Turnings Allowance)
CYCLETIME (C360 BRASS)	3.7 sec (781 pieces/hr @ 80% Efficiency)
CYCLETIME (12L14 STEEL)	8.3 sec (304 pieces/hr @ 70% Efficiency)
PRODUCTIVITY GAIN USING BRASS	157%
NET COST SAVINGS (BRASS VS. BARE STEEL)	22%, \$35.17 per 1000
NET COST SAVINGS (BRASS VS. PLATED STEEL)*	26%, \$43.90 per 1000
*Zinc/chromate; assumes 0% plating rejects.	



HVAC HEATING ELEMENT HOUSING

LEADED STEEL PART NOW FREE-CUTTING BRASS

This housing for an HVAC heating element is a precision product that must be strong and corrosion resistant. Now made from Free-Cutting Brass, Copper Alloy 360 (UNS C36000), the fitting takes less than four seconds to machine on an Acme-Gridley RA6. Its relatively deep hole and outside threads could make the part difficult and expensive to produce. In fact when this fitting was formerly made from 12L14 leaded steel it took more than twice as long to machine and cost 22% more than it now does in brass.

Automatic screw machine parts often cost less in brass than steel. Why? One reason is that typical screw machine parts require a lot of machining-for this HVAC housing, about 66% of the starting stock ends up as turnings. These brass turnings have a high recycle value, which is always credited against the raw material cost, by the screw machine house. But the main reason brass parts cost less is that Free-Cutting Brass machines so much faster than leaded steel; the better machinability of brass resulted in a 157% productivity gain for the fitting shown above. Remember, when you're buying screw machine parts you're really paying for machine time. The faster the cut, the lower the cost.

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 almost one-half of all screw machine products, brass can be substituted for leaded steel without any sacrifice in strength or safety.

ELIMINATE PLATING COSTS

Ordinary zinc/chromate plating typically adds between 11 and 16 cents per pound to the cost of steel screw machine products. And it's difficult to insure uniformity when plating threads, sharp corners or deep holes. Now that this housing is made from Free-Cutting Brass, it doesn't have to be plated. Brass's natural corrosion resistance uniformly protects the entire surface.

