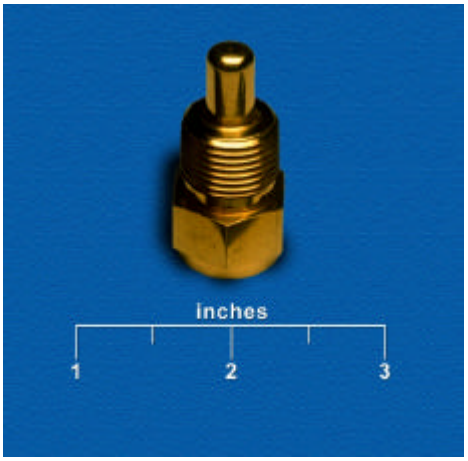
APPLICATION DATA SHEET

APPLICATION	Underwater Pump Assembly
SPECIAL FEATURES	Teflon Coated
PART WEIGHT	0.11 lb (Brass)
BRASS RAW MATERIAL PREMIUM	23% (Including Turnings Allowance)
CYCLETIME (C360 BRASS)	4.5 sec (641 pieces per hour @ 80% Efficiency)
CYCLETIME (12L14 STEEL)	8.0 sec (315 pieces per hour @ 70% Efficiency)
PRODUCTIVITY GAIN USING BRASS	102%
NET COST SAVINGS (BRASS VS. BARE STEEL)	3% = $6.87 per 1000



FITTING BODY

A CASE OF REVERSE ENGINEERING

Sometimes materials selection decisions can be changed long after a part has been in production. That's the case with this fitting body, which forms part of an underwater pump assembly. It was made for many years using tellurium-treated leaded steel because its design required high machinability. One alert screw machine shop recognized that still higher machinability, and maybe some cost reductions, could be gained by switching from steel to Free-Cutting Brass, Copper Alloy 360 (UNS C36000). The screw machine shop brought a test run to the customer, the customer recognized the quality of the product, changed the specs to brass and gave the enterprising machine shop the order. Today, many hundreds of thousands of parts later, the fitting is still being made from brass. Brass can be cost-competitive with steel because its machinability is so much higher than steel's-about *five times* higher, in fact. And brass turnings are worth a lot of money; when recycled, they greatly reduce brass's net cost to the customer.

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.

One more thing: this fitting body must be Teflon-coated, whether it's made from steel or brass. This presents no problem, as brass readily accepts most commercial coatings and finishes, Teflon included.

Copper Development Association Inc.
260 Madison Avenue New York, NY 10016
(212) 251-7200 www.copper.org