

# C93800

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## Material

**Notes:** Casting methods recommended for this alloy: Centrifugal, Continuous, Permanent Mold, and Sand.

**Applications:** Bearings for general service and moderate pressures, pump impellers and bodies for use in acid mine water.

Classified under: High-leaded tin bronzes. ASTM B66; ASTM B584; formerly ASTM B144-3D

Typical data for sand-cast test bars. Alloy does not respond to heat treating

**Key Words:** High lead tin bronze, ASTM B66, ASTM B584, ASTM B144-3D

Physical Properties	Metric	English	Comments
Density	9.25 g/cc	0.334 lb/in <sup>3</sup>	
Mechanical Properties	Metric	English	Comments
Hardness, Brinell	55	55	
Tensile Strength, Ultimate	205 MPa	29700 psi	
Tensile Strength, Yield	110 MPa @Strain 0.500 %	16000 psi @Strain 0.500 %	
Elongation at Break	18 %	18 %	in 50 mm
Modulus of Elasticity	72.4 GPa	10500 ksi	
Compressive Strength	83.0 MPa	12000 psi	at permanent set of 0.1%
	260 MPa	37700 psi	at permanent set of 10%
Fatigue Strength	69.0 MPa @# of Cycles 1.00e+8	10000 psi @# of Cycles 1.00e+8	Reverse Bending
Machinability	80 %	80 %	UNS C36000 (free-cutting brass) = 100%
Izod Impact	7.00 J	5.16 ft-lb	
Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00001599 ohm-cm @Temperature 20.0 °C	0.00001599 ohm-cm @Temperature 68.0 °F	
Magnetic Permeability	1.0	1.0	
Thermal Properties	Metric	English	Comments
CTE, linear	18.5 µm/m-°C @Temperature 20.0 - 205 °C	10.3 µin/in-°F @Temperature 68.0 - 401 °F	
Specific Heat	0.376 J/g-°C	0.0899 BTU/lb-°F	

## Capacity

Thermal Conductivity	52.0 W/m-K @Temperature 20.0 °C	361 BTU-in/hr-ft <sup>2</sup> -°F @Temperature 68.0 °F
Melting Point	855 - 945 °C	1570 - 1730 °F
Solidus	855 °C	1570 °F
Liquidus	945 °C	1730 °F

<b>Processing Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Annealing Temperature	260 °C	500 °F	Stress-Relieving Temperature

<b>Component Elements Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Antimony, Sb	<= 0.70 %	<= 0.70 %	
Copper, Cu	75 - 79 %	75 - 79 %	
Iron, Fe	<= 0.15 %	<= 0.15 %	
Lead, Pb	13 - 16 %	13 - 16 %	
Nickel, Ni	<= 0.70 %	<= 0.70 %	
Phosphorous, P	<= 0.050 %	<= 0.050 %	
Silicon, Si	<= 0.0030 %	<= 0.0030 %	
Sulfur, S	<= 0.080 %	<= 0.080 %	
Tin, Sn	6.3 - 7.5 %	6.3 - 7.5 %	
Zinc, Zn	<= 0.70 %	<= 0.70 %	