

C89835 Lead-Free Bismuth Tin Bronze

89835
Color
Code

Bronze Family: Copper Bismuth

Bismuth Tin Bronze Alloy, C89835 is a lead-free replacement for C93200, C84400, and C83600. It is compliant with the “Reduction of Lead in Drinking Water Act”. This lead free alloy is used for faucets, pump components, water pump impellers, and pipe fittings in applications where potable water is concerned. C89835 retains 70% machinability with the addition of bismuth in place of lead. This lead free, bismuth alloy is continuous cast and available in rounds and tube.

The “Reduction of Lead in Drinking Water Act”, was passed by Congress on 1/4/11 with an effective date of 1/4/14. The term lead-free as it pertains to C89835, calls out for “not more than a weighted average of .25% lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures”.

Other terms for this alloy are: C89835, lead free bronze, bismuth bronze, lead-free bismuth bronze, bismuth tin bronze, lead-free bismuth tin bronze.

Related products: C93200; C83600; C84400

Reference Specifications				
SAE	Federal Specification	Military Specification	Ingot Number	CDA
				C89835

Equivalent specifications are verified and updated annually. Specifications shown are current as of May 4, 2018.

Chemical Composition (%)**											
Cu	Sn	Pb	Zn	Fe	Ni*	Sb	P	S	Al	Bi	Si
85.0 – 89.0***	6.0 – 7.5	0.09	2.0 – 4.0	0.20 max.	1.00* max.	0.35 max.	0.10 max.	0.08 max.	0.005 max.	1.7 - 2.7	0.005 max.

Sum of all named elements = 99.0%

Mechanical Properties		
	English	Metric
Tensile Strength, min.	30 ksi	207 MPa
Yield Strength, min.	14 ksi	97 MPa
Elongation in 2 in. or 50 mm, min.	6%	6%

** Values shown pertain to ASTM B505/505M only. Values for ASTM B271 differ slightly. Contact our QA department for clarification.

* Nickel including Cobalt

*** In determining copper minimum, copper may be calculated as copper plus nickel.

Machinability Rating 70 (Free Cutting Brass = 100)

Available from stock at Morgan Bronze in:

Rounds



Tubes



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(continued)

Physical Properties		
	English	Metric
Melting Point – Liquidus	1855°F	1012°C
Melting Point – Solidus	1445°F	785°C
Density	0.321 lb/in ³ at 68°F	8.89 gm/cm ³ @ 20°C
Specific Gravity	8.89	8.89
Electrical Conductivity	14.5% IACS @ 68°F	0.084 MegaSiemens/cm @ 20°C
Thermal Conductivity	38.0 Btu · ft/(hr · ft ² · °F) @ 68°F	65.8 W/m · °K @ 20°C
Coefficient of Thermal Expansion	10 · 10 ⁻⁶ per °F (68-392°F)	17.3 · 10 ⁻⁶ per °C (20°-200° C)
Specific Heat Capacity	0.093 Btu/lb/°F @ 68°F	389.6 J/kg · °K @ 293°K
Modulus of Elasticity in Tension	16,900 ksi	116,522 MPa

Physical Properties provided by CDA

Fabrication Practices	
Soldering	Excellent
Brazing	Good
Oxyacetylene Welding	Not Recommended
Gas Shielded Arc Welding	Not Recommended
Coated Metal Arc Welding	Not Recommended

Fabrication Practices provided by CDA

DISCLAIMER:

The Physical, Fabrication and Thermal Properties shown here represent reasonable approximations suitable for general engineering use. Due to commercial variations in compositions and to manufacturing limitations, they should not be used for specification purposes. See applicable ASTM International specification references.