

ALLOY DATASHEET

C87850 Silicon Bronze

Copper-Silicon Casting Alloy · Lead-Free Bearing & Fitting Bronze

UNS C87850	LEAD-FREE	ASTM B505 / B584 / B806	NSF/ANSI 61 & 372
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Description

C87850 is a lead-free, high-silicon copper alloy (silicon bronze / silicon brass family) developed as a low-lead alternative to traditional leaded red brasses such as C83600. It combines good strength, excellent castability, and strong resistance to dezincification and general corrosion with fabrication characteristics well suited to sand, permanent mold, and continuous casting. Its low lead content allows it to meet low-lead potable water requirements, making it a popular choice for plumbing fittings, valve bodies, and marine hardware, as well as wear-resistant bushings, bearings, gears, and thrust washers.

Chemical Composition (%)

Element	Cu	Si	Zn	Sn	Pb	Fe	Ni	Mn	Sb	P
Min	74.0	2.7	Rem	—	—	—	—	—	—	0.05
Max	78.0	3.4	Rem	0.30	0.09	0.10	0.20	0.10	0.10	0.20

Cu + sum of named elements 99.5% min. Zn reported as remainder. Composition per ASTM B505/B584.

Mechanical Properties

Casting Method	Tensile Strength (ksi)	Yield Strength 0.5% Ext (ksi)	Elongation (% in 2 in.)	Hardness
Continuous Cast (M07)	65 min	25 min	8 min	103 HB min (500 kgf)
Permanent Mold Cast (M05)	—	32 min / 34 typ	16 min / 21 typ	70 min / 74 typ HRB
Sand Cast (M01)	59 min / 63 typ	22 min / 26 typ	16 min / 25 typ	78 typ HRB

Properties measured at room temperature, 68°F (20°C). Source: Copper Development Association.

Physical Properties

Property	Value
Melting Point – Liquidus	1616°F (880°C)
Melting Point – Solidus	1571°F (855°C)
Density	0.30 lb/in ³ (8.30 g/cm ³) at 68°F
Electrical Conductivity	8% IACS at 68°F
Thermal Conductivity	21.8 Btu/sq ft/ft hr/°F at 68°F
Coefficient of Thermal Expansion (68–212°F)	10.3 x 10 ⁻⁶ per °F
Coefficient of Thermal Expansion (68–572°F)	10.4 x 10 ⁻⁶ per °F
Specific Heat Capacity	0.09 Btu/lb/°F at 68°F
Modulus of Elasticity in Tension	15,200 ksi

Fabrication Properties

Technique	Suitability
Soldering	Excellent
Brazing	Excellent
Oxyacetylene Welding	Good
Spot Welding	Good
Seam Welding	Good
Butt Welding	Good
Cold Working	Poor
Hot Forming	Excellent
Machinability Rating (C36000 = 100)	70

Casting Characteristics

Attribute	Rating
Fluidity	High
Casting Yield	Medium
Drossing Tendency	Low
Gassing Tendency	Low
Effect of Section Size	Medium
Shrinkage During Solidification	Medium
Patternmaker's Shrinkage	3/16 in. per ft

Applicable Specifications

Product Form	System Standard	Title
Continuous Cast	ASTM B505/B505M	Copper Base Alloy Continuous Castings
Permanent Mold Cast	ASTM B806	Permanent Mold Castings
Sand Cast	ASTM B584	Copper Alloy Sand Castings for General Applications
Ingot	ASTM B30	Copper Base Alloys in Ingot Form

C87850 also meets NSF/ANSI 61 and NSF/ANSI 372 requirements for low-lead potable water contact, and complies with California AB 1953 and Vermont Act 193 lead-content limits for plumbing components.

Typical Applications

- Valve bodies and stems for water service
- Plumbing fittings, faucets, and water meter cases
- Marine hardware and shipboard fittings
- Bearings, bushings, and thrust washers
- Gears, worm gears, and wear plates
- Low-lead / lead-free replacement for C83600 (85-5-5-5 red brass)

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Data compiled from published Copper Development Association (CDA) alloy property records for C87850. Values are nominal/typical or stated minimums as indicated and are intended for general engineering reference. Actual properties can vary with casting method, section size, and foundry practice — consult your supplier's certified test reports for design-critical applications.