

C93500

Cast

Product Description:	High-Leaded Tin Bronze
Solids:	½" to 13" OD
Tubes:	1" to 16" OD
Rectangles:	Up to 20"
Standard Lengths:	144"
Shape/Form:	semi-finished, mill stock or near-net shapes, anode, bar stock, billet/bloom, squares, hex, plate, profile or structural shape, flats/rectangular bar

Typical Uses

Automotive backing for Babbitt-lined bearings

Industrial mild acidic applications, corrosion-resistant castings, high-speed/light-load bushings, bearings, pump impellers

Similar or Equivalent Specification

CDA	ASTM	ASARCON	SAE	AMS	FEDERAL	MILITARY	OTHER
C93500	B505 B505M B144-3C	59	66 J461 J462		QQ-C-390, E9 QQ-B-1005, COMP 14	MIL-B-11553, COMP 14	

Chemical Composition

Cu% ¹	Pb%	Sn%	Zn%	Fe%	P% ²	Ni% ³	Al%	S%	Sb%	Si%
83.00- 86.00	8.00- 10.00	4.30- 6.00	2.00	0.20	0.05	1.00	0.005	0.08	0.30	0.005

Chemical Composition according to ASTM B505/B505M-14

¹In determining Cu min., Cu may be calculated as Cu + Ni.

²For continuous castings, P shall be 1.5% max.

³Ni value includes Co.

Note: Cu + Sum of Named Elements, 99.0% min. Single values represent maximums.

Machinability

Copper Alloy UNS No.	Machinability Rating	Density (lb/cu in at 68° F)
C93500	70	0.320



Mechanical Properties

C93500 continued

Tensile Strength, min		Yield Strength, at .5% extension under load min		Elongation, in 2 in. or 50 mm min	Brinell Hardness	Remarks
ksi	MPa	ksi	MPa	%	typical BHN	
30	207	16	110	12	60 (500 kg)	

Mechanical Properties according to ASTM B505/B505M-14

Physical Properties

	US Customary	Metric
Melting Point – Liquidus	1830° F	999° C
Melting Point – Solidus	1570° F	854° C
Incipient Melting	600° F	316° C
Density	0.320 lb/in ³ at 68° F	8.86 gm/cm ³ at 20° C
Specific Gravity	8.86	8.86
Electrical Conductivity	15% IACS at 68° F	0.088 MegaSiemens/cm at 20° C
Thermal Conductivity	40.7 Btu · ft/(hr · ft ² · °F) at 68° F	70.4 W/m at 20° C
Coefficient of Thermal Expansion	9.9 · 10 ⁻⁶ per °F (68°-392° F)	17.1 · 10 ⁻⁶ per °C (20°-200° C)
Specific Heat Capacity	0.090 Btu/lb/°F at 68° F	377.1 J/kg at 293° C
Modulus of Elasticity in Tension	14500 ksi	100000 MPa
Magnetic Permeability	1	1

Physical Properties provided by CDA

Fabrication Properties

Joining Technique	Suitability
Soldering	Good
Brazing	Good
Oxyacetylene Welding	Not Recommended
Gas Shielded Arc Welding	Not Recommended
Coated Metal Arc Welding	Not Recommended

Fabrication Properties provided by CDA

Thermal Properties

Treatment	Temp./Time - US	Temp./Time - SI
Stress Temperature	500	260
Solution Minimum		
Solution Maximum		
Solution Time	0.0	
Solution Medium		
Precipitation Value		
Precipitation Time		
Precipitation Medium		
Annealing Minimum		
Annealing Maximum		
Annealing Time		
Hot Treatment Minimum		
Hot Treatment Maximum		

Thermal Properties provided by CDA

