C93500

Continuous cast

Product description	High-leaded tin bronze
Solids	1/2" to 13" O.D.
Tubes	1" to 16" O.D.
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

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

Similiar or equivalent specification

CDA	ASTM	SAE	AMS	Federal	Military	Other
C93500	B505 B505M B144-3C	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 (%)	Ni (%)[1,2]	Al (%)	S (%)	Sb (%)	Si (%)
83.00-86.00	8.00-10.00	4.30-6.00	2.00	0.20	1.50	1.00	0.005	0.08	0.30	0.005

Chemical composition according to ASTM B505/B505M-23

[1]In determining Cu min., Cu may be calculated as Cu + Ni. [2]Ni 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/in^3 at 68 $^\circ$F)
C93500	70	0.32

Mechanical properties

Tensile strength, min		Yield strength, at 0.5% extension under load, min		Elongation, in 2 in. or 50 mm, min	Brinell hardness (500 kg load)	Remarks
ksi	MPa	ksi	MPa	%	typical BHN	
30	207	16	110	12	60	

Mechanical properties according to ASTM B505/B505M-23

Physical properties

	US customary	Metric
Melting point – liquidus	1830 °F	999 °C
Melting point – solidus	1570 °F	854 °C
Density	0.32 lb/in³ at 68 °F	8.86 gm/cm³ 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/sq ft/ft hr/ °F at 68 °F	70.4 W/m at 20 °C
Coefficient of thermal expansion 68-392	9.9 · 10^{-6} per °F (68-392 °F)	17.1 · 10^{-6} per °C (20-200 °C)
Specific heat capacity	0.09 Btu/lb/ °F at 68 °F	377.1 J/kg at 20 °C
Modulas of elasticity in tension	14500 ksi	100000 MPa
Incipient melting	600 °F	316 °C
Magnetic permeability	1	1

Physical properties provided by CDA

Fabrication properties

Technique	Suitability
Soldering	Good
Brazing*	Good
Oxyacetylene welding	Not recommended
Gas shielded arc welding	Not recommended
Coated metal arc welding	Not recommended
Machinability rating	70

Fabrication properties provided by CDA

**Since brazing is performed within the hot-short range, strain must be avoided during brazing and cooling.*