



## TYPICAL USES

**Automotive** Automotive Fittings  
**Fasteners** Washers  
**Industrial** Thrust Washers, Pumps, Bushings, Machine Parts, Main Spindle Bearings, Machine Tool Bearings, Bearings for Cranes, Trunion Bearings, Roll Neck Bearings, Rolling Mill Bearings, Linkage Bushings for Presses, Fuel Pump Bushings, Water Pump Bushings, Diesel Engine Wrist Pin Bushings, Forging Press Toggle Lever Bearings, Hydraulic Press Stuffing Box, Hydraulic Press Main Lining, Pump Impellers, General Purpose Bushings, Fittings, Pump Fixtures, Insert Bearings, Bearings

**Bronze Family:** Leaded Tin Bronze  
**Solids:** ½” to 13” OD  
**Tubes:** 1” to 16” OD  
**Rectangles:** Up to 20”  
**Standard Lengths:** 144”

## SIMILAR OR EQUIVALENT SPECIFICATION

CDA	ASTM	ASARCON	SAE	AMS	FEDERAL	INGOT	MILITARY	OTHER
C93200	ASTM B505	77	SAE 660 SAE J461 SAE J462		QQ-C-390 B Type III	315	MIL-B-11553 COMP. 12	

## CHEMICAL COMPOSITION

Alloy	Cu%	Sn%	Pb%	Zn%	Fe%	Ni%	Sb%	P%	S%	Al%	Mn%	Si%
C93200	81.00- 85.00	6.30- 7.50	6.00- 8.00	2.00- 4.00	0.20	1.00*	0.35	1.5	0.08	0.005	N/A	0.005

Chemical Composition according to ASTM B505-08

Note: Single values represent maximums.

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

## MACHINABILITY

Alloy	Machinability Rating	Density (lb/cu in.)
C93200	70	0.322

## MECHANICAL PROPERTIES

Tensile Strength, min		Yield Strength, at .5% extension under load min		Elongation in 2 in. or 50 mm min, %	Brinell Hardness, min	Remarks
ksi	MPa	ksi	MPa			
35	241	20	138	10		

Mechanical Properties according to ASTM B505-08

## PHYSICAL PROPERTIES

ALLOY: C93200 CONTINUED

	US Customary	Metric
Melting Point - Liquidus	1790 F	977 C
Melting Point - Solidus	1570 F	854 C
Density	0.322 lb/in <sup>3</sup> at 68 F	8.91 gm/cm <sup>3</sup> @ 20 C
Specific Gravity	8.910	8.91
Electrical Resistivity	85.90 ohms-cmil/ft @ 68 F	14.29 microhm-cm @ 20 C
Electrical Conductivity	12 %IACS @ 68 F	0.07 MegaSiemens/cm @ 20 C
Thermal Conductivity	33.60 Btu · ft/(hr · ft <sup>2</sup> ·oF)at 68F	58.2 W/m · oK at 20 C
Coefficient of Thermal Expansion	10 ·10 <sup>-6</sup> per oF (68-212 F)	18.0 ·10 <sup>-6</sup> per oC (20-100 C)
Specific Heat Capacity	0.090 Btu/lb/oF at 68 F	377.1 J/kg · oK at 293 K
Modulus of Elasticity in Tension	14500 ksi	100000 MPa

Physical Properties provided by CDA

## FABRICATION PRACTICES

Joining Technique	Suitability
Soldering	Excellent
Brazing	Good
Oxyacetylene Welding	Not Recommended
Gas Shield 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	None	
Precipitation Value		
Precipitation Time		
Precipitation Medium	None	
Annealing Minimum		
Annealing Maximum		
Annealing Time		
Hot Works Minimum		
Hot Works Maximum		

Thermal Properties provided by CDA