

Bronze C93200

Standard-stocked product	Continuous cast
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Product description	Bronze C93200
Solids	3/8" to 13" O.D.
Tubes	1" to 16" O.D.
Rectangles	Up to 20"
Standard lengths	105"
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

Automotive fittings

Fasteners

Washers

Industrial

Bearings, bearings for cranes, bushings, diesel engine wrist pin bushings, fittings, forging press toggle lever bearings, fuel pump bushings, general purpose bushings, hydraulic press main lining, hydraulic press stuffing box, insert bearings, linkage bushings for presses, machine parts, machine tool bearings, main spindle bearings, pump fixtures, pump impellers, pumps, roll neck bearings, rolling mill bearings, thrust washers, trunion bearings, water pump bushings

Similar or equivalent specification

CDA	ASTM	SAE	AMS	Federal	Military	Other
C93200	B505 B505M	J461 J462		QQ-C-390, E7 QQ-B-1005, Comp 12	MIL-B-11553, Comp 12	Bearing bronze

Chemical composition

Cu (%) ¹	Pb (%)	Sn (%)	Zn (%)	Fe (%)	P (%)	Ni (%) ^{1,2}	Al (%)	S (%)	Sb (%)	Si (%)
81.00-85.00	6.00-8.00	6.30-7.50	2.00-4.00	0.20	1.50	1.00	0.005	0.08	0.35	0.005

Chemical composition according to ASTM B505/B505M-23

¹In determining Cu min., Cu may be calculated as Cu + Ni. ²Ni 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 °F)
C93200	70	0.322

C93200 continued

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	
35	241	20	138	10	65	

Mechanical properties according to ASTM B505/B505M-23

Physical properties

	US customary	Metric
Melting point – liquidus	1790 °F	977 °C
Melting point – solidus	1570 °F	854 °C
Density	0.322 lb/in ³ at 68 °F	8.91 gm/cm ³ at 20 °C
Specific gravity	8.91	8.91
Electrical conductivity	12% IACS at 68 °F	0.07 MegaSiemens/cm at 20 °C
Thermal conductivity	33.6 Btu/sq ft/ft hr/°F at 68 °F	58.2 W/m at 20 °C
Coefficient of thermal expansion 68-212	10 · 10 ⁻⁶ per °F (68-212 °F)	17.3 · 10 ⁻⁶ per °C (20-100 °C)
Specific heat capacity	0.09 Btu/lb/°F at 68 °F	377.1 J/kg at 20 °C
Modulus of elasticity in tension	14500 ksi	100000 MPa

Physical properties provided by CDA

Fabrication properties

Technique	Suitability
Soldering	Excellent
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.

Casting characteristics

Casting attribute	Level
Casting yield	High
Drossing	Low
Effect of section size	Medium
Fluidity	Medium
Gassing	Medium
Patternmakers shrinkage (inches per foot)	7/32
Shrinkage in solidification	Low

Casting characteristics provided by CDA