C93700

Cast

Product Description: High-Leaded Tin Bronze

Solids: ½" to 10" 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

Builders Hardware	brackets
Fasteners	nuts, washers for engines
Industrial	applications requiring acid resistance to sulphite fluids, bearing plates, bearings, bushings, bushings for high speed and heavy pressure, corrosion-resistant castings, crank shafts, high speed/heavy load bearings, impellers, machine parts, parts for steel mill maintenance, pressure-tight castings, pumps, slide guides for steel mills
Marine	large bearings for ships

Similar or Equivalent Specification

CDA	ASTM	SAE	AMS	Federal	Military	Other
C93700	B505 B505M	J461 J462		QQ-C-390, E10	MIL-B-11553, Comp 23	Bearing Bronze 80-10-10 Bronze

Chemical Composition

Cu%	Pb%	Sn%	Zn%	Fe%[1]	P%	Ni%[2]	Al%	S%	Sb%	Si%
78.00- 82.00	8.00- 11.00	9.00- 11.00	0.80	0.70	1.50	0.50	0.005	0.08	0.50	0.005

Chemical Composition according to ASTM B505/B505M-18

[1]Fe shall be 0.35% max, when used for steel-backed bearings. [2]Ni value includes Co.
Note: Cu + Sum of Named Elements, 99.0% min. Single values represent maximums.

RANDALL

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Machinability

Copper Alloy UNS No.	Machinability Rating	Density (lb/in^3 at 68 ˚F)
C93700	80	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	
35	241	20	138	6	60	

Mechanical Properties according to ASTM B505/B505M-18

Physical Properties

	US Customary	Metric
Melting Point – Liquidus	1705 ˚F	929 ˚C
Melting Point – Solidus	1403 ˚F	762 ˚C
Density	0.32 lb/in^3 at 68 ˚F	8.86 gm/cm^3 at 20 ˚C
Specific Gravity	8.86	8.86
Electrical Conductivity	10% IACS at 68 ˚F	0.059 MegaSiemens/cm at 20 ˚C
Thermal Conductivity	27.1 Btu/sq ft/ft hr/˚F at 68 ˚F	46.9 W/m at 20 ˚C
Coefficient of Thermal Expansion 68-392	10.3 · 10^{-6} per ˚F (68-392 ˚F)	17.8 · 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	11000 ksi	75800 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	80

Fabrication Properties provided by CDA

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

Thermal Properties

Treatment	Value*	Time**
Stress Relief	500	
Solution Treatment		0

Thermal Properties provided by CDA

*Temperature is measured in Fahrenheit. **For Stress Relief, Solution Treatment and Annealing - Time is measured in hours/inch of thickness. For Precipitation Heat Treatment - Time is measured in hours.