

C90500

Continuous Cast • GreenAlloys™

Product Description:	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	clamps
Building	heavy construction equipment
Electrical	connectors
Fasteners	nuts
Industrial	bearings, bushings, expansion bearings, finishing dies for wood pulp industry, gear blanks, gears, piston rings, pump bodies, pump impellers, seal rings, valve bodies, valves, worm gears
Plumbing	steam fittings, water conditioners

Similar or Equivalent Specification

CDA	ASTM	SAE	AMS	Federal	Military	Other
C90500	B505 B505M B22 B22M B143-1A	62 J461 J462	4845	QQ-C-390, D6 QQ-B-1005, Comp 16	MIL-B-11553, Comp 16	Gun Metal

Chemical Composition

Cu% ¹	Pb%	Sn%	Zn%	Fe%	P%	Ni% ^{1,2}	Al%	S%	Sb%	Si%
86.00- 89.00	0.30	9.00- 11.00	1.00- 3.00	0.20	1.50	1.00	0.005	0.05	0.20	0.005

Chemical Composition according to ASTM B505/B505M-18

¹In determining Cu min., Cu may be calculated as Cu + Ni. ²Ni value includes Co.
Note: Cu + Sum of Named Elements, 99.7% min. Single values represent maximums.

Machinability

Copper Alloy UNS No.	Machinability Rating	Density (lb/in ³ at 68 ° F)
C90500	30	0.315

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	
44	303	25	172	10	75	

Mechanical Properties according to ASTM B505/B505M-18

Physical Properties

	US Customary	Metric
Melting Point – Liquidus	1830 ° F	999 ° C
Melting Point – Solidus	1570 ° F	854 ° C
Density	0.315 lb/in ³ at 68 ° F	8.72 gm/cm ³ at 20 ° C
Specific Gravity	8.72	8.72
Electrical Conductivity	11% IACS at 68 ° F	0.064 MegaSiemens/cm at 20 ° C
Thermal Conductivity	43.2 Btu/sq ft/ft hr/° F at 68 ° F	74.8 W/m at 20 ° C
Coefficient of Thermal Expansion 68-572	11 · 10 ⁻⁶ per ° F (68-572 ° F)	19.8 · 10 ⁻⁶ per ° C (20-300 ° C)
Specific Heat Capacity	0.09 Btu/lb/° F at 68 ° F	377.1 J/kg at 20 ° C
Modulus of Elasticity in Tension	15000 ksi	103400 MPa
Magnetic Permeability	1	1

Physical Properties provided by CDA

Fabrication Properties

Technique	Suitability
Soldering	Excellent
Brazing*	Good
Oxyacetylene Welding	Fair
Gas Shielded Arc Welding	Fair
Coated Metal Arc Welding	Fair
Machinability Rating	30

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.