

C90500

Continuous cast	GreenAlloys™
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Product description	Tin bronze
Solids	1/2" 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-IA	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-23

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.

C90500 continued

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-23

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 (68-212 °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.

Casting characteristics

Casting attribute	Level
Casting yield	Medium
Drossing	Low
Effect of section size	High
Fluidity	Medium
Gassing	Medium
Patternmakers shrinkage (inches per foot)	3/16
Shrinkage in solidification	Medium

Casting characteristics provided by CDA