

C94700

Cast

Product Description:	Nickel-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

Electrical circuit breaker parts

Industrial bearings, feeding mechanisms, gears, nozzles, piston cylinders, shift forks, valve components, wear guides

Note: Also available in a heat-treated condition.

Similar or Equivalent Specification

CDA	ASTM	SAE	AMS	Federal	Military	Other
C94700	B505 B505M B947 B292-A	J461 J462		QQ-C-390, F2		Cast Nickel-Tin Bronze

Chemical Composition

Cu%	Pb% ¹	Sn%	Zn%	Fe%	P%	Ni% ²	Al%	Mn%	S%	Sb%	Si%
85.00- 90.00	0.09	4.50- 6.00	1.00- 2.50	0.25	0.05	4.50- 6.00	0.005	0.20	0.05	0.15	0.005

Chemical Composition according to ASTM B505/B505M-18

¹It is possible that the mechanical requirements of Copper Alloy UNS No. C94700 in the heat-treated condition will not be attained if the lead content exceeds 0.01%.

²Ni value includes Co.

Note: Cu + Sum of Named Elements, 98.7% min. Single values represent maximums.

Machinability

Copper Alloy UNS No.	Machinability Rating	Density (lb/in ³ at 68 °F)
C94700	30	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	
45	310	20	138	25	85	

Mechanical Properties according to ASTM B505/B505M-18

Physical Properties

	US Customary	Metric
Melting Point – Liquidus	1880 °F	1027 °C
Melting Point – Solidus	1660 °F	904 °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	12% IACS at 68 °F	0.07 MegaSiemens/cm at 20 °C
Thermal Conductivity	31.2 Btu/sq ft/ft hr/°F at 68 °F	54 W/m at 20 °C
Coefficient of Thermal Expansion 68-392	10.9 · 10 ⁻⁶ per °F (68-392 °F)	18.8 · 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
Modulus of Elasticity in Tension	15000 ksi	103400 MPa

Physical Properties provided by CDA

Fabrication Properties

Technique	Suitability
Soldering	Excellent
Brazing*	Excellent
Oxyacetylene Welding	Fair
Gas Shielded Arc Welding	Good
Coated Metal Arc Welding	Good
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	Min*	Max*	Value*	Time**	Medium
Stress Relief			500		
Solution Treatment	1425	1475		2	Water
Precipitation Treatment			580	5	Air

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.