

# C94700

## Continuous cast

Product description	Nickel-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

### 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 (%) <sup>1</sup>	Sn (%)	Zn (%)	Fe (%)	P (%)	Ni (%) <sup>2</sup>	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-23

<sup>1</sup>It 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%.  
<sup>2</sup>Ni 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 <sup>3</sup> 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-23

## Physical properties

	US customary	Metric
Melting point – liquidus	1880 °F	1027 °C
Melting point – solidus	1660 °F	904 °C
Density	0.32 lb/in <sup>3</sup> at 68 °F	8.86 gm/cm <sup>3</sup> 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 <sup>-6</sup> per °F (68-392 °F)	18.8 · 10 <sup>-6</sup> 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.

## Casting characteristics

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

Casting characteristics provided by CDA