

C91700

Cast

Product Description:	High Tin Bronze
Solids:	1" to 6" O.D.
Tubes:	1" to 6" O.D.
Rectangles:	Up to 10"
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

Industrial gears, heavy load/relatively low-speed bearings, worm gears, worm wheels

Similar or Equivalent Specification

CDA	ASTM	SAE	AMS	Federal	Military	Other
C91700	B427					Nickel Gear Bronze

Chemical Composition

Cu% ¹	Pb%	Sn%	Zn%	Fe%	P%	Ni% ²	Al%	S%	Sb%	Si%
84.00- 87.00	0.25	11.30- 12.50	0.25	0.20	0.30	1.20- 2.00	0.005	0.05	0.20	0.005

Chemical Composition according to ASTM B427-09(2015)

¹In determining Cu min., Cu may be calculated as Cu + Ni. ²Ni value includes Co.
Note: Cu + Sum of Named Elements, 99.4% min. Single values represent maximums.

Machinability

Copper Alloy UNS No.	Machinability Rating	Density (lb/in ³ at 68 °F)
C91700	20	0.316



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	22	152	10	85	

Physical Properties

	US Customary	Metric
Melting Point – Liquidus	1859 °F	1015 °C
Melting Point – Solidus	1563 °F	851 °C
Density	0.316 lb/in ³ at 68 °F	8.75 gm/cm ³ at 20 °C
Specific Gravity	8.75	8.75
Electrical Conductivity	10% IACS at 68 °F	0.058 MegaSiemens/cm at 20 °C
Thermal Conductivity	40.8 Btu/sq ft/ft hr/°F at 68 °F	70.6 W/m at 20 °C
Coefficient of Thermal Expansion 68-392	9 · 10 ⁻⁶ per °F (68-392 °F)	15.5 · 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
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	20

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.