



Material Data Sheet 911

Copper-Tin (Tin Bronze)

Chemical Composition

(% max, unless shown as range or min.)

	Cu*	Sn	Pb	Zn	Fe	Sb	Ni	S	P	Al	Si	Mn
Min/Max	82.0-85.0	15.0-17.0	.25	.25	.25	.20	.50	.05	1.0	.005	.005	-
Nominal	83.5	16.0	-	-	-	-	-	-	-	-	-	-

*Cu + Sum of Named Elements, 99.4% min.

In determining Cu min., Cu may be calculated as Cu + Ni

Applicable Specifications

Process or Ingot	Specification
Sand	ASTM B 22

Fabrication Practices

Joining Technique	Suitability
Soldering	Excellent
Brazing	Good
Oxyacetylene Welding	Fair
Gas Shielded Arc Welding	Fair
Coated Metal Arc Welding	Fair

Physical Properties

	US Customary	Metric
Melting Point - Liquidus	1742 F	950 C
Melting Point - Solidus	1505 F	818 C
Electrical Resistivity	122.8 ohms-cmil/ft @ 68 F	20.41 microhm-cm @ 20 C
Electrical Conductivity	8 %IACS @ 68 F	0.049 MegaSiemens/cm @ 20 C
Specific Heat Capacity	0.09 Btu/lb/°F at 68 F	377.1 J/kg · °K at 293 K
Modulus of Elasticity in Tension	15,000 ksi	10,3400 MPa

Heat Treatment

Stress Relieving:
500° F (260C) for 1h/in. of Section Thickness

Cannot be strengthened by heat treatment

Machinability Rating: 20
(C36000, Free Cutting Brass = 100)

Typical Uses:

Bearings and Bushings
Bridge Plates in contact with hardened steel disks
not over 2.5 ksi pressure
Piston Rings

Mechanical Properties

		US Customary	Metric	Applicable Specification
Tensile Strength	Typical	35 ksi	241 MPa	
Yield Strength (0.5% Ext. under load)	Typical	25 ksi	172 MPa	
Proportional Limit	Typical	16 ksi	110 MPa	
Elongation	Typical	2 %, in 2 in.	2 %, in 51 mm	
Brinell Hardness (300kg load)	Typical	135	135	
Compression Deformation Limit	Minimum	18 ksi	125 MPa	ASTM B 22

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