



Material Data Sheet

905

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	86.0-89.0	9.0-11.0	.30	1.0-3.0	.20	.20	1.0	.05	.05	.005	.005	-
Nominal	87.5	10.1	-	2.0	-	-	-	-	-	-	-	-

*Cu + Sum of Named Elements, 99.7% min.
In determining Cu min., Cu may be calculated as Cu + Ni

Applicable Specifications

Process or Ingot	Specification
Sand	AMS 4845
	ASTM B 22, B 584, B 763
	SAE J461, J462

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	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 @ 20 C
Specific Gravity	8.72	8.72
Electrical Resistivity	94.0 ohms-cmil/ft @ 68 F	15.63 microhm-cm @ 20 C
Electrical Conductivity	11 %IACS @ 68 F	0.064 MegaSiemens/cm @ 20 C
Thermal Conductivity	43.2 Btu · ft/(hr · ft ² · °F) at 68F	74.8 W/m · °K at 20 C
Coefficient of Thermal Expansion	11.0 · 10 ⁻⁶ per °F (68-572 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 · °K at 293 K
Modulus of Elasticity in Tension	15000 ksi	103400 MPa
Magnetic Permeability	1.0	1.0

Heat Treatment

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

Cannot be strengthened by heat treatment

Machinability Rating: 30
(C36000, Free Cutting Brass = 100)

Typical Uses:

- Bearings and Bushings
- Nuts
- Seal Rings
- Worm Gears
- Bridge Parts and Expansion Bearings
- Gears
- Piston Rings
- Pump Impellers
- Steam Fittings
- Valve Components

Mechanical Properties

		US Customary	Metric	Applicable Specification
Tensile Strength	Minimum	40 ksi	275 MPa	ASTM B 22
	Minimum	40 ksi	276 MPa	ASTM B 584, B 763
	Minimum	40 ksi	275 MPa	SAE J462-A
	Typical	45 ksi	310 MPa	
Yield Strength (0.5% Ext. under load)	Minimum	18 ksi	125 MPa	ASTM B 22
	Minimum	18 ksi	124 MPa	ASTM B 584, B 763
	Minimum	18 ksi	125 MPa	SAE J462-A
	Typical	22 ksi	152 MPa	
Elongation	Minimum	20 %, in 2 in.	20 %, in 51 mm	ASTM B 22, B 584, B 763, SAE J462-A
	Typical	25 %, in 2 in.	25 %, in 51 mm	
Brinell Hardness (500kg load)	Typical	75	75	

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