



Material Data Sheet

875

Copper Silicon (Silicon Bronze and Silicon Brass)

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

	Cu*	Sn	Pb	Zn	Fe	Al	Si	Mn	Mg	Ni	S
Min/Max	79.0 min.	-	.50	12.0-16.0	-	.50	3.0-5.0	-	-	-	-
Nominal	82.0	-	-	14.0	-	-	4.0	-	-	-	-

*Cu + Sum of Named Elements. 99.5% min.

Applicable Specifications

Process or Ingot	Specification
Sand	ASTM B 584, B 763

Fabrication Practices

Joining Technique	Suitability
Soldering	Not Recommended
Brazing	Fair
Oxyacetylene Welding	Fair
Gas Shielded Arc Welding	Fair
Coated Metal Arc Welding	Not Recommended

Physical Properties

	US Customary	Metric
Melting Point - Liquidus	1680 F	916 C
Melting Point - Solidus	1510 F	821 C
Density	0.299 lb/in ³ at 68 F	8.28 gm/cm ³ @ 20 C
Specific Gravity	8.28	8.28
Electrical Resistivity	154.2 ohms-cmil/ft @ 68 F	25.64 microhm-cm @ 20 C
Electrical Conductivity	6 %IACS @ 68 F	0.039 MegaSiemens/cm @ 20 C
Thermal Conductivity	16.0 Btu · ft/(hr · ft ² · °F) at 68F	27.7 W/m · °K at 20 C
Coefficient of Thermal Expansion	10.9 · 10 ⁻⁶ per °F (68-572 F)	19.6 · 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	15400 ksi	106000 MPa

Heat Treatment

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

Cannot be strengthened by heat treatment

Machinability Rating: 50
(C36000, Free Cutting Brass = 100)

Typical Uses:

Bearings
Gears
Impellers
Small Boat Propellers
Valve Stems
Rocker Arms

Mechanical Properties

		US Customary	Metric	Applicable Specification
Tensile Strength	Minimum	60 ksi	414 MPa	ASTM B 584, B 763
	Typical	67 ksi	462 MPa	
Yield Strength (0.5% Ext. under load)	Minimum	24 ksi	165 MPa	ASTM B 584, B 763, SAE J462
	Typical	30 ksi	207 Mpa	
Elongation	Minimum	16 %, in 2 in.	16 %, in 51 mm	ASTM B 584, B 763, SAE J462-A
	Typical	21 %, in 2 in.	21 %, in 51 mm	
Brinell Hardness (500 kg load)	Typical	115	115	
	(3,000 kg load)	Typical	134	134

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