

Material Data Sheet 954

Copper-Aluminum-Iron-Nickel (Aluminum Bronze)

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

	Cu*	Pb	Fe	Ni	Al	Mn	Mg	Si	Zn	Sn
Min/Max	83.0 min.	-	3.0-5.0	1.5	10.0-11.5	.50	-	-	-	-
Nominal	83.2	-	4.0	-	10.8	-	-	-	-	-

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

Applicable Specifications

Process or Ingot	Specification
Sand	ASME SB148
	ASTM B 148, B 763
	SAE J461, J462

Fabrication Practices

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

Physical Properties

	US Customary	Metric
Melting Point - Liquidus	1900 F	1038 C
Melting Point - Solidus	1880 F	1027 C
Density	0.269 lb/in ³ @ 68 F	7.45 gm/cm ³ @ 20 C
Specific Gravity	7.45	7.45
Electrical Resistivity	80.2 ohms-cmil/ft @ 68 F	13.33 microhm-cm @ 20 C
Electrical Conductivity	13 %IACS @ 68 F	0.075 MegaSiemens/cm @ 20 C
Thermal Conductivity	33.9 Btu · ft/(hr · ft ² · °F) at 68 F	58.7 W/m · °K at 20 C
Coefficient of Thermal Expansion	9.0 · 10 ⁻⁶ per °F (68-572 F)	16.2 · 10 ⁻⁶ per °C (20-300 C)
Specific Heat Capacity	0.1 Btu/lb/°F at 68 F	419.0 J/kg · °K at 293 K
Modulus of Elasticity in Tension	15500 ksi	107000 MPa
Magnetic Permeability	1.27	1.27

Heat Treatment

Stress Relieving:
600° F (315C) for 1h/in. of Section Thickness

Solution Anneal:
1600°-1675° F (880-915 C) 1h/WQ

Tempering:
1150°-1225° F (620-665C) for 1h/AC

This alloy may be sensitive to water-quench cracking in heavy casting sections. Oil quenching or forced-air cooling may be preferred.

Machinability Rating: 60
(C36000, Free Cutting Brass = 100)

Mechanical Properties

		US Customary	Metric	Applicable Specification
Tensile Strength	Minimum	75 ksi	517 MPa	ASME SB148, ASTM B 148, B 763 SAE J462-A
	Minimum	75 ksi	515 MPa	
	Typical	85 ksi	586 MPa	
Yield Strength (0.5% Ext. under load)	Minimum	30 ksi	207 MPa	ASME SB148, ASTM B 148, B 763 SAE J462-A
	Minimum	30 ksi	205 MPa	
	Typical	35 ksi	241 MPa	
Elongation	Minimum	12 %, in 2 in.	12 %, in 51 mm	ASTM B 148, B 763, SAE J462-A
	Typical	18 %, in 2 in.	18 %, in 51 mm	
Brinell Hardness (3,000 kg load)	Minimum	150	150	ASTM B 148, B 763
	Typical	170	170	

Typical Uses:
Bearings and Bushings
Spur Gears
Gears
Pickling Hooks and Baskets
Worms
Valve Components