



Material Data Sheet

865

Manganese Bronze (High Strength Yellow Brass)

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

	Cu*	Sn	Pb	Zn	Fe	Ni	Al	Mn	Si
Min/Max	55.0-60.0	1.0	.40	36.0-42.0	.40-2.0	1.0	.50-1.5	.10-1.5	-
Nominal	58.0	.5	-	39.0	1.2	-	1.0	.8	-

*In determining Cu min., Cu may be calculated as Cu + Ni, Cu + Sum of Named Elements. 99.0% min.

Applicable Specifications

Process or Ingot	Specification
Sand	AMS 4860
	ASTM B 584, B 763
	SAE J461, J462

Fabrication Practices

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

Physical Properties

	US Customary	Metric
Melting Point - Liquidus	1616 F	880 C
Melting Point - Solidus	1583 F	862 C
Density	0.301 lb/in ³ @ 68 F	8.33 gm/cm ³ @ 20 C
Specific Gravity	8.33	8.33
Electrical Resistivity	47.0 ohms-cmil/ft @ 68 F	7.81 microhm-cm @ 20 C
Electrical Conductivity	22 %IACS @ 68 F	0.128 MegaSiemens/cm @ 20 C
Thermal Conductivity	49.6 Btu · ft/(hr · ft ² · °F) at 68F	85.8 W/m · °K at 20 C
Coefficient of Thermal Expansion	11.3 · 10 ⁻⁶ per °F (68-212 F)	20.3 · 10 ⁻⁶ per °C (20-100 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*	1.09	1.09

Heat Treatment

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

Cannot be strengthened by heat treatment

Machinability Rating: 26
(C36000, Free Cutting Brass = 100)

Typical Uses:

Brackets
Gears
Lever Arms
Machinery Parts Requiring Strength and Toughness
Salt and Fresh Water Propellers
Valve Stems

Mechanical Properties

		US Customary	Metric	Applicable Specification
Tensile Strength	Minimum	65 ksi	448 MPa	ASTM B 584, B 763
	Typical	71 ksi	490 MPa	
Yield Strength (0.5% Ext. under load)	Minimum	25 ksi	172 MPa	ASTM B 584, B 763
	Typical	29 ksi	200 MPa	
Elongation	Minimum	20 %, in 2 in.	20 %, in 51 mm	ASTM B 584, B 763
	Typical	30 %, in 2 in.	30 %, in 51 mm	
Brinell Hardness (500kg load)	Typical	100	100	
	(3,000 kg load)	Typical	130	130

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