



# Material Data Sheet 862

## Manganese Bronze (High Strength Yellow Brass)

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

	Cu*	Sn	Pb	Zn	Fe	Ni	Al	Mn	Si
<b>Min/Max</b>	<b>60.0-66.0</b>	<b>.20</b>	<b>.20</b>	<b>22.0-28.0</b>	<b>2.0-4.0</b>	<b>1.0</b>	<b>3.0-4.9</b>	<b>2.5-5.0</b>	<b>-</b>
<b>Nominal</b>	<b>63.0</b>	<b>-</b>	<b>-</b>	<b>25.0</b>	<b>3.0</b>	<b>-</b>	<b>4.0</b>	<b>3.7</b>	<b>-</b>

\*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	ASTM B 584, B 763 SAE J461, J462

### Fabrication Practices

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

### Physical Properties

	US Customary	Metric
Melting Point - Liquidus	1725 F	941 C
Melting Point - Solidus	1650 F	899 C
Density	0.288 lb/in <sup>3</sup> at 68 F	7.97 gm/cm <sup>3</sup> @ 20 C
Specific Gravity	7.97	7.97
Electrical Resistivity	136.7 ohms-cmil/ft @ 68 F	22.73 microhm-cm @ 20 C
Electrical Conductivity	8 %IACS @ 68 F	0.044 MegaSiemens/cm @ 20 C
Thermal Conductivity	20.5 Btu · ft/(hr · ft <sup>2</sup> · °F) at 68F	35.5 W/m · °K at 20 C
Coefficient of Thermal Expansion	12.0 · 10 <sup>-6</sup> per °F (68-572 F)	21.6 · 10 <sup>-6</sup> 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*	1.24	1.24
Poisson's Ratio	0.31	0.31

### 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 & Bushings  
Gears  
Marine Castings  
Marine Racing Propellers  
Gun Mounts

### Mechanical Properties

		US Customary	Metric	Applicable Specification
Tensile Strength	Minimum	90 ksi	621 MPa	ASTM B 271, B 584, B 763 SAE J462
	Minimum	90 ksi	620 MPa	
	Typical	95 ksi	655 MPa	
Yield Strength (0.5% Ext. under load) (0.2% Offset)	Minimum	45 ksi	310 MPa	ASTM B 271, B 584, B 763 SAE J 462
	Typical	48 ksi	331 MPa	
	Minimum	45 ksi	310 MPa	
Elongation	Minimum	18 %, in 2 in.	18 %, in 51 mm	ASTM B 271, B 584, B 763 SAE J 462
	Typical	20 %, in 2 in.	20 %, in 51 mm	
Brinell Hardness (3,000 kg load)				
	Typical	180	180	

6300 West Ridge Road, Erie, PA 16506

Phone: 814-838-8602 • Fax: 814-838-8917 • Sales@ErieBronze.com