

Physical Properties

	US Customary	Metric
Melting Range, Liquidus	1725 F	941 C
	Solidus	1650 F
Density	0.288 lb/in. ³ at 68 F	7.97 g/cm ³ at 20 C
Specific Gravity	7.97	7.97
Electrical Resistivity	136.7 ohm•cmil/ft at 68 F	22.7 microhm-cm at 20 C
Coefficient of Thermal Expansion	12.0 10 ⁻⁶ per°F (68-572 F)	21.6 10 ⁻⁶ per°C (20-300 C)
Magnetic Permeability (F.S.=16kA/m)	1.24	1.24
Thermal Conductivity	20.5 Btu•ft/(hr•ft ² •F) at 68 F	35.5 W/m•K at 20 C
Electrical Conductivity	8 %IACS at 68 F	0.044 Siemens/cm at 20 C
Specific Heat Capacity	0.09 Btu/lb/°F at 68 F	377 J/kg•K at 20 C
Modulus of Elasticity in Tension	15,000 ksi	103,400 MPa

Mechanical Properties*

<i>M01 - AS SAND CAST</i>		US Customary	Metric	Applicable Specifications	
Tensile Strength	Minimum	90 ksi	621 MPa	ASTM B 271, B 584, B 763	
	Minimum	90 ksi	620 MPa	SAE J462	
	Typical	95 ksi	655 MPa		
Yield Strength	0.5% Ext. under load	Minimum	45 ksi	310 MPa	ASTM B 271, B 584, B 763
		Typical	48 ksi	331 MPa	
	0.2% Offset	Minimum	45 ksi	310 MPa	SAE J 462
Elongation	Minimum	18 %, in 2 in.	18 %, in 51 mm	ASTM B 271, B 584, B 763; SAE J462	
	Typical	20 %, in 2 in.	20 %, in 51 mm		
Brinell Hardness					
3000 kg load	Typical	180	180		
Compressive Strength					
0.001 in. set/in.	Typical	50 ksi	345 MPa		
Impact Strength					
Izod	Typical	12 ft-lb	16 J		

<i>M02 - AS CENTRIFUGAL CAST</i>		US Customary	Metric	Applicable Specifications
Tensile Strength	Minimum	90 ksi	620 MPa	SAE J462
Yield Strength				
0.2% Offset	Minimum	45 ksi	310 MPa	SAE J462
Elongation	Minimum	18 %, in 2 in.	18 %, in 51 mm	SAE J462

<i>M07 - AS CONTINUOUS CAST</i>		US Customary	Metric	Applicable Specifications
Tensile Strength	Minimum	90 ksi	621 MPa	ASTM B 505
	Minimum	90 ksi	620 MPa	SAE J462
Yield Strength				
0.5% Ext. under load	Minimum	45 ksi	310 MPa	ASTM B 505
0.2% Offset	Minimum	45 ksi	310 MPa	SAE J462
Elongation	Minimum	18 %, in 2 in.	18 %, in 51 mm	ASTM B 505; SAE J462

* For alloys listed under SAE J462, suffix symbols are to distinguish between two or more sets of mechanicals properties, heat treatments, conditions, etc., as applicable. See Society of Automotive Engineers Inc., SAE Handbook, Vol. 1 Materials, 1989, Warrendale, PA 15096.

Manganese Bronze (High Strength Yellow Brass) C86200

Chemical Composition

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

	Cu ⁽¹⁾⁽²⁾	Sn	Pb	Zn	Fe	Ni (incl Co)	Al	Mn	Si
Min./Max.	60.0-66.0	.20	.20	22.0-28.0	2.0-4.0	1.0	3.0-4.9	2.5-5.0	-
Nominal	63.0	-	-	25.0	3.0	-	4.0	3.7	-

1. In determining Cu min., Cu may be calculated as Cu + Ni.

2. Cu + Sum of Named Elements, 99.0% min.

Applicable Specifications

Process or Ingot	Specification	
Centrifugal	ASTM	B 271
	SAE	J461, J462
Continuous	ASTM	B 505
	SAE	J461, J462
Ingot	ASTM	B 30
	FEDERAL	QQ-C-523
	INGOT	423
Precision	MILITARY	MIL-C-11866
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

Machinability Rating: 30

(C36000, Free Cutting Brass = 100)

Typical Uses

Bearings and Bushings
Gears
Marine Castings
Marine Racing Propellers
Gun Mounts

Casting Characteristics

Characteristic	Value
Effect of Section Size	Small
Patternmakers Shrinkage	1/4 in./ft
Drossing	High
Gassing	Low
Fluidity	Medium
Shrinkage	High
Casting Yield	Low

Heat Treatment

Stress Relieving: 500 F (260 C) for 1h/in. of Section Thickness
Cannot be Strengthened by Heat Treatment