

C 903 Tin Bronze

Bronze Family: Tin Bronze

903
Color
Code

C 903 Tin Bronze is a hard, strong alloy with good corrosion resistance, high wear resistance and moderate machinability. C 903 is used as gears, pump components, marine fittings, valves and for potable water applications.

Equivalent Specifications			
ASTM B505/B505M (Copper Alloy UNS No. 90300 Continuous Cast)			
Reference Specifications			
SAE	Federal Specification	Military Specification	ASTM
SAE J461 SAE J462	QQ-C-390	MIL-C-11866	ASTM B271 (Centrifugal Casting)

Equivalent specifications are verified and updated annually.
Specifications shown are current as of May 4, 2010.

Available from stock
at Morgan Bronze in:

Rounds



Chemical Composition (%)**										
Cu	Sn	Ni*	Pb	Zn	Sb	Fe	P	S	Al	Si
86.0 – 89.0***	7.50 – 9.0	1.00 max.	0.30 max.	3.0 – 5.0	0.20 max.	0.20 max.	1.50 max.	0.05 max.	0.005 max.	0.005 max.
Sum of all named elements = 99.4%										
Mechanical Properties										
	English		Metric							
Tensile Strength, min.	44 ksi		303 MPa							
Yield Strength, min.	22 ksi		152 MPa							
Elongation in 2 in. or 50 mm, min.	18%		18%							

* Nickel including Cobalt

** Values shown pertain to ASTM B505/505M only

*** In determining copper minimum, copper may be calculated as copper plus nickel.

Machinability Rating 30 (Free Cutting Brass = 100)

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(continued)

Physical Properties		
	English	Metric
Melting Point – Liquidus	1832°F	1000°C
Melting Point – Solidus	1570°F	854°C
Density	0.318 lb/in ³ at 68°F	8.80 gm/cm ³ @ 20°C
Specific Gravity	8.80	8.80
Electrical Conductivity	12 %IACS @ 68°F	0.069 MegaSiemens/cm @ 20°C
Thermal Conductivity	43.20 Btu · ft/(hr · ft ² · °F) @ 68°F	74.8 W/m · °K @ 20°C
Coefficient of Thermal Expansion	10 · 10 ⁻⁶ per °F (68-392°F)	18.0 · 10 ⁻⁶ per °C (20-200 C)
Specific Heat Capacity	0.090 Btu/lb/°F @ 68°F	377.1 J/kg · °K @ 293°K
Modulus of Elasticity in Tension	14,000 ksi	96,500 MPa

Physical Properties provided by CDA

Fabrication Practices		Thermal Properties	
Soldering	Excellent	Stress Relieving Temperatures	500° F or 260° C
Brazing	Good		
Oxyacetylene Welding	Fair	Time @ Temperature	1 Hr. per inch of wall thickness
Gas Shielded Arc Welding	Fair		
Coated Metal Arc Welding	Fair	Responds to Heat Treatment	No

Fabrication Practices provided by CDA

Thermal Properties provided by CDA

DISCLAIMER:

The Physical, Fabrication and Thermal Properties shown here represent reasonable approximations suitable for general engineering use. Due to commercial variations in compositions and to manufacturing limitations, they should not be used for specification purposes. See applicable ASTM International specification references.