

# C 95510 Heat Treated Ni. Aluminum Bronze Per AMS 4880

Bronze Family: Nickel Aluminum Bronze



**C 95510 Heat Treated Nickel Aluminum Bronze** is one of the highest strength nickel-bearing aluminum bronzes. It exhibits excellent yield, compressive strength, high hardness and adequate elongation. It is a good bearing material suitable for heavy duty and high impact applications. It exhibits excellent corrosion resistance, heat resistance, good machinability and weldability. Its additional strength is achieved through heat treating. It is used as heavy duty bushings and bearings, gears, and wear parts. It finds use in marine applications as well as pump parts, machine tool parts, aircraft parts and military applications. It is specified most often as bearing components in aircraft landing gear.

Equivalent Specifications				
AMS 4880				
Reference Specifications				
SAE	Federal Specification	Military Specification	CDA	ASTM
SAE J461 SAE J462	QQ-C-390	MIL-B-16033 Class 4	C95510	ASTM B505 ASTM B271

Equivalent specifications are verified and updated monthly. Specifications shown are current as of the revision date below.  
Current revision date: 05/04/10

Chemical Composition (%)**						
Cu	Fe	Al	Ni	Mn	Zn	Sn
78.0 min	2.0 – 3.5	9.7 - 10.9	4.5 – 5.5*	1.50 max.	0.30 max.	0.20 max.

Sum of all named elements = 99.8%

Mechanical Properties** Centrifugal Castings		
Separately Cast Coupons	English	Metric
Tensile Strength, min.	105 ksi	724 MPa
Yield Strength@ 0.2% Offset, min.	62.5 ksi	431 MPa
Elongation in 4D	9%	9%
Specimens Cut From Centrifugal Castings 1.0" and Under	English	Metric
Tensile Strength, min.	105 ksi	724 MPa
Yield Strength@ 0.2% Offset, min.	62.5 ksi	431 MPa
Elongation in 4D	9%	9%
Specimens Cut From Centrifugal Castings Over 1.0"	English	Metric
Tensile Strength, min.	95.0 ksi	655 MPa
Yield Strength@ 0.2% Offset, min.	50.0 ksi	345 MPa
Elongation in 4D	8%	8%

\*Nickel including Cobalt

\*\* Values shown pertain to AMS 4880D only

Available from stock at Morgan Bronze in:

Tubes





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Mechanical Properties** Continuous Castings		
Specimens Cut From Continuous Castings Under 4.0"	English	Metric
Tensile Strength, min.	105 ksi	724 MPa
Yield Strength@ 0.2% Offset, min.	62.5 ksi	431 MPa
Elongation in 4D	9%	9%
Specimens Cut From Continuous Castings Over 4.0"	English	Metric
Tensile Strength, min.	95.0 ksi	655 MPa
Yield Strength@ 0.2% Offset, min.	56.0 ksi	386 MPa
Elongation in 4D	9%	9%

\*Nickel including Cobalt

\*\* Values shown pertain to AMS 4880D only

## Machinability Rating 50 (Free Cutting Brass = 100)

Physical Properties		
	English	Metric
Melting Point – Liquidus	1930° F	1054° C
Melting Point – Solidus	1900° F	1038° C
Density	0.272 lb/in <sup>3</sup> at 68° F	7.53 gm/cm <sup>3</sup> @ 20° C
Specific Gravity	7.530	7.53
Electrical Resistivity	122.80 ohms-cmil/ft @ 68°F	20.41 microhm-cm @ 20° C
Electrical Conductivity	8% IACS @ 68° F	0.049 MegaSiemens/cm @ 20° C
Thermal Conductivity	24.20 Btu · ft/(hr · ft <sup>2</sup> ·°F) @ 68° F	41.9 W/m · °K @ 20° C
Coefficient of Thermal Expansion	9 · 10 <sup>-6</sup> per °F (68-572° F)	16.2 · 10 <sup>-6</sup> per °C (20-300° C)
Specific Heat Capacity	0.10 Btu/lb/°F @ 68°F	419.0 J/kg · °K @293 K
Modulus of Elasticity in Tension	16,000 ksi	110,000 MPa

Physical Properties provided by CDA

Fabrication Practices		Thermal Properties	
Soldering	Good	Time @ Temperature	1 Hr. per inch of wall thickness
Brazing	Fair	Responds to Heat Treatment	Yes
Oxyacetylene Welding	Not Recommended		
Gas Shielded Arc Welding	Good	Solution Heat Treating Temperature	1600-1700° F or 871-927° C
Coated Metal Arc Welding	Good	Time @ Temperature	Not less than 2 Hr.
		Quenching Medium	Water
		Annealing Temperature	1100°-1200° F or 593°-649° C
		Time @ Temperature	Not less than 2 hr.

Fabrication Practices 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.

Thermal Properties provided by SAE

