

# C 630 Nickel Aluminum Bronze

Per AMS 4640

Bronze Family: Aluminum Bronze



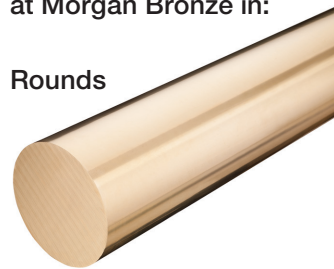
**C 630 Nickel Aluminum Bronze** is an extruded aluminum bronze that contains nickel, and is alloyed for exceptional strength and toughness. It's used where higher mechanical properties are required. It's used in equipment for the energy markets, in aircraft, marine and a host of other industrial applications. It finds use as valve stems, high strength bushings, valve guides and seats, gears, cams, ship propellers, as well as propeller nuts and shafts.

Equivalent Specifications
AMS 4640
Reference Specifications
ASTM B150
QQ-C-450
SAE J461; SAE J463
Copper Alloy UNS NO. 63000

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*	Al	Ni	Fe	Mn	Zn	Sn	Si
Remainder	9.0 - 11.0	4.0 - 5.5	2.0 - 4.0	1.5 max.	0.30 max.	0.20 max.	0.25 max.
*Copper + Silver Copper + Silver + Sum of all named elements = 99.5%							
Mechanical Properties							
Minimum Tensile Properties, Inch/Pound Units							
Temper HR50							
Nominal Diameter		Tensile Strength	Yield Strength*	Elongation**			
Inches		ksi	ksi	%			
Up to 1.00, incl		110	68.0	10			
Over 1.00 to 2.00, incl		110	60.0	10			
Over 2.00 to 3.00, incl		105	55.0	10			
Over 3.00 to 5.00, incl		100	50.0	10			

\* Yield Strength at 0.5% Extension under Load

\*\*Elongation in 4D

Chemical Composition and Mechanical Properties shown pertain to AMS 4640 only.

Chemical and Mechanical Properties shown for C 630 are per AMS 4640 and apply to bars up to 5" diameter incl. Sizes over 5" diameter conform to ASTM B 150/B 150M – standard strength. Contact our sales department for clarification.

Phone: 847-526-6000

Toll Free: 800-445-9970

Fax: 847-438-6600

Email: [info@morganbronze.com](mailto:info@morganbronze.com)





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(continued)

**Machinability Rating 30 (Free Cutting Brass = 100)**

Physical Properties		
	English	Metric
Melting Point – Liquidus	1930° F	1054° C
Melting Point – Solidus	1895° F	1035° C
Density	0.274 lb/in <sup>3</sup> at 68° F	7.58 gm/cm <sup>3</sup> @ 20° C
Specific Gravity	7.580	7.58
Electrical Resistivity (Annealed)	116 ohms-cmil/ft @ 68°F	19.28 microhm-cm @ 20° C
Electrical Conductivity (Annealed)	7% IACS @ 68° F	0.041 MegaSiemens/cm @ 20° C
Thermal Conductivity	22.60 Btu · ft/(hr · ft <sup>2</sup> ·°F) @ 68° F	39.1 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	0.090 Btu/lb/°F @ 68°F	377.1 J/kg · °K @293 K
Modulus of Elasticity in Tension	17,500 ksi	121,000 MPa

Physical Properties provided by CDA

Fabrication Practices			
Soldering	Not Recommended	Capacity for Being Cold Worked	Poor
Brazing	Fair	Capacity for Being Hot Formed	Good
Oxyacetylene Welding	Not Recommended	Hot Forgeability Rating (Forging Brass = 100)	75
Gas Shielded Arc Welding	Good		
Coated Metal Arc Welding	Good	Hot Working Temperature	1450-1700° F or 788-927° C
Resistance Welding – Spot	Good	Annealing Temperature	1100-1300° F or 594-705° C
Resistance Welding – Seam	Good		
Resistance Welding – Butt	Good		

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.