NWB®

High Performance Bearing Technology

C63000 NICKEL ALUMINUM BRONZE (AMS 4640)



Nickel Aluminum Bronze contains 5% nickel and is heat treatable. Available in both rod and forged form, it is intended for applications that require combinations of corrosion resistance, excellent bearing properties at considerable loads, and extremely high strength both at room and elevated temperatures.

Alternative Specifications

ASTM B-150, B-124, B-171, B-283
AMS 4640-G
SAE J463
QQ-C-465

Physical Properties

Melting Point - Liquidus	1930 F
Melting Point - Solidus	1895 F
Density	0.247 lb/in^3 at 68 F
Specific Gravity	7.58
Electrical Resistivity	116.0 ohms-cmil/ft at 68 F
Electrical Conductivity	7 %IACS at 68 F
Thermal Conductivity	22.6 Btu · ft/(hr · ft2·°F) at 68F
Coefficient of Thermal Expansion	9.0 ·10^{-6} per °F (68-572 F)
Modulus of Elasticity in Tension	17500 ksi
Modulus of Rigidity	6400 ksi
Machinability Rating	30%

Room Temp Tensile & Hardness Data

FORM	TEMPER	SECTION SIZE (INCHES)	TENSILE (KSI) MIN	YIELD (KSI) MIN	ELONGATION IN HD MIN	BRINELL (3000 KG)
ROD	HOT OR COLD	up to 1.0	110	68	10	201-248
	FINISHED AND HEAT TREATED	to 2.0	110	60	10	201-248
		to 3.0	105	55	10	187-241
		3.0 to 12.0	100	50	10	187-241
		12.0 Plus	80	40	17	148-178
FORGING	HEAT TREATED	-	85	42.5	10	201-248

Typical Uses

Oil & Gas

Valve Stems, Pump Shafts, Seal Glands, BOP Parts

Aerospace

Landing Gear Bushings & Bearings, Flap Bushings, Actuator Parts, Strut Bushings

Automotive

Valve Guides, Valve Seats

Other Industrial

Balls, Gears, Cams, Shafting, Condenser Tube for Power Stations and Desalting Units, Valve Seats, Valve Guides, Pump Shafts, Structural Members, Tanks, Heat Exchanger Headers, Heat Exchanger Flanges, Bearings, Bushings, Valve Balls, Hydraulic Bushings for Earth Moving Equipment, Corrosion Resistant Articles, Aircraft Parts, Welded Piping Systems, Plunger Tips, Pump Parts, Plunger Tips

Marine

Pump Parts, Bolts, Ship Propellers, Propeller Nuts, Shafts

Chemical Composition

	Cu[(1)]	Al	Fe	Mn	Ni[(2)]	Si	Sn	Zn
min/max	Rem	9.0-11.0	2.0-4.0	1.5	4.0-5.5	.25	.20	.30
nominal	82.0	10.0	3.0	-	5.0	-	-	-

(1) Cu value includes Ag.
(2) Ni value includes Co.
NOTE: Cu +(sum of named elements) = 99.5% min.

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