

ASTM B150: C63000 / AMS4640 is one of the most commonly used American grades of nickel aluminium bronze. Containing around 10% aluminium, 5% nickel and 3% iron the alloy offers an inherent high strength and hardness combined with a very good toughness and an excellent resistance to wear, shock and abrasion.

The C63000 / AMS4640 also offers a very good corrosion, erosion and cavitation resistance in seawater and brackish water together with a good resistance to dilute sulphuric, hydrochloric and non-oxidising acids. It also has a very good galling resistance and also offers a high retention of mechanical properties at elevated temperatures.

The C63000 is generally sourced by Holme Dodsworth to the high strength HR50 condition to meet the requirements of AMS4640 grade.

Related Specifications

ASTM B150: C63000	ASTM B171: C63000
AMS4640	BSEN12163: CW307G

Chemical Composition

Copper	Rem
Aluminium	9.0 - 11.0%
Nickel	4.0 - 5.5%
Iron	2.0 - 4.0%
Manganese	1.50% max
Silicon	0.25% max
Tin	0.20% max
Zinc	0.30% max

Minimum Mechanical Properties for ASTM B150: C63000 HR50 (high strength) / AMS4640

Diameter	25mm and under	25-50mm incl.	50-80mm
UTS	760 N/mm ²	760 N/mm ²	725 N/mm ²
0.2% Proof Strength	470 N/mm ²	415 N/mm ²	380 N/mm ²
Elongation	10%	10%	10%
Hardness	Up to 50.8mm 201-248 HB	50.8mm – 127mm 187-241 HB	

Key Features

- Very Good Strength and Toughness
- High resistance to corrosion and erosion
- Retention of properties at cryogenic temperatures
- Excellent resistance to shock, wear and abrasion
- Spark resistance

Typical Physical Properties

Density	7.58 gm/cm ³
Melting Point	1035-1054°C
Annealing Temperature	600-700°C
Thermal Conductivity	38-46 W/m°C
Coefficient of Thermal Expansion 20-300°C	16.2 x 10 ⁻⁶
Electrical Conductivity 20°C	7-9% IACS

Fabrication Properties

Stress Relieving temperature	300-400°C
Hot working temperature	850 - 975°C
Hot formability	Good
Cold Formability	Limited
Machinability Rating	20%

Joining Methods

Soldering	Not recommended
Brazing	Fair
MIG Welding	Good
TIG Welding	Good
Resistance Welding	Good

Typical Applications:

Typical applications for the C63000 material includes marine fasteners, hardware and fittings, aerospace landing gear components, thrust washers, gears, control bushes, faucet balls, springs & worm wheels, Non-sparking safety tooling, valve stems and seats, wear plates, welding clamps, valve spindles and components, fasteners and bearing bushes.

This technical information is given by Holme Dodsworth Metals without charge and the user shall employ such information at their own discretion and risk. For more detailed technical advice on temper selection, fabrication, joining, machining, physical and mechanical data please contact us as space does not permit the listing of every feature of the material.