Alloy 833 Data Sheet

Quick Facts

- Nickel Iron Aluminium Bronze
- High strength that is retained up to 400°C (752°F)
- Superior corrosion resistance in marine environments
- Immune to chloride stress corrosion cracking
- Very good wear and abrasion resistance
- Retention of properties at cryogenic temperatures
- Defence Standard Alloy, formally Naval Engineering Standard NES 833
- Supplied ultrasonically tested

Alloy 833 is a two-phase aluminium bronze with additions of iron and nickel to increase its strength. The nickel content needs to be higher than the iron content to improve overall corrosion resistance of the alloy by eliminating deleterious phases in the microstructure.

It has high corrosion resistance particularly in marine environments. It is immune to chloride stress corrosion cracking and also has excellent resistance to cavitation erosion.

It is resistant to high temperature scaling up to 1000°C (1832°F) and strength and hardness is retained up to around 400°C (752°F).

Typical Applications

Alloy 833 is primarily used in the marine and offshore industries, typical applications being fasteners, pump and valve components, pipe and deck fittings, heat exchangers, couplings, worm wheels and gears, bushes, washes and weapon handling systems.

Stock Range

We stock a comprehensive range of round bar sizes between 25.4mm (1”) – 285mm (11.1/4”) diameter, other sizes are available on request. We can also supply flat bar, rings, blocks and slabs.

Primarily manufactured in Europe

Industry Specifications

- DEF Stan 02-833 Part 2 Issue 4 Grade 1
- NES 833 Part 2 Issue 2 Grade 1
- DGS 1043
- CW307G (not an exact equivalent)

Material may also be supplied to Customer specifications, subject to enquiry

Chemical Analysis

Typical analysis:

	Al	Mn	Si	Ni	Cu	Fe	-
Min	8.5	-	-	4.0	-	4.0	%
Max	10.0	0.5	0.10	5.5	BAL	5.0	%

Material Condition

Bars below 30mm diameter are supplied in the heat-treated condition to eliminate microstructural phases that are likely to give rise to selective corrosion in a sea water environment. Due to the slower cooling rate of section sizes above 30mm diameter, these microstructural phases are unlikely to be present.

Rolled and forged sections 30mm and below are heat treated to 740°C +/-20°C (1364°F +/-68°F) followed by air cooling.

All material is supplied fully UST tested in accordance with DEF STAN 02 729 part 5 and NDT/02/05.

Mechanical Properties

Typical Properties for 25-100mm dia:

Tensile MPA (PSI) min	Yield (0.2% offset), MPA (PSI) Min	Elongation 5.65 √ So min%	Hardness Vickers HV	Izod Joules min
635 (92,100)	295 (40,500)	17	170-200	24

Physical Properties

Typical properties at room temperature

Melting Range	1060°C - 1075°C (1940°F- 1967°F)
Room Temp Density	7.6 g/cm ³
Young's Modulus	115 GPa
Coefficient of expansion 20-300◦C	17 µm/m °C
Thermal Conductivity	42 W/m.K
Specific Heat	380 Joules/kg-K
Relative Magnetic Permeability	1.4

All material we supply has full traceability with inspection certification in accordance with BS EN 10402 3.1. We can supply material with intent of BS EN 10402 3.2 inspection certification on request.

We have onsite PCN and SNT Level II inspectors who can test material to your requirements.

All information included in this sheet is intended as a guide only and is correct to the best of our knowledge.