

# Bronze Defence Standard (formerly NES) 833

Bronzes are Copper based alloys. Major alloying elements are often, but not always, Zinc and Tin. They offer a combination of properties such as high strength, hardness, corrosion resistance and wear resistance.

Copper-Aluminium alloys are commonly known as Aluminium Bronzes. These alloys are a range of Copper-based alloys in which the primary alloying element is up to 14% Aluminium. The four major groups of Aluminium Bronze are:

- ◆ Single phase alloys containing less than 8% of Aluminium.
- ◆ Two-phase (duplex) alloys containing 8 to 11% Aluminium. These alloys also frequently have additions of Iron and Nickel to increase strength. This group's contains casting alloys AB1 and AB2, the wrought alloys CA105, CA104 and Defence Standard alloys (formerly Naval Engineering Standard, NES,) (NES 747 when cast and the wrought form NES 833).
- ◆ The low magnetic permeability Aluminium Silicon alloys.
- ◆ The Copper Manganese Aluminium alloys with good castability.

Alloy Defence Standard (NES) 833 is an Aluminium Bronze with good ductility and impact strength. It also has superior corrosion resistance.

## Applications

Aluminium Bronze to Defence Standard (NES) 833 is typically used in:

- ◆ Marine Valves
- ◆ Pumps
- ◆ Weapons handling systems
- ◆ Couplings
- ◆ Fasteners
- ◆ Gears
- ◆ Marine propeller shafts

## Typical Chemical Composition

%	NES833
Cu	82
Pb	-
Sn	-
Fe	4.2
Al	9.3
Mn	0.3
Zn	-
Si	-
Ni	4.2

## Typical Mechanical Properties

Grade	NES833
Tensile Strength (MPa)	635
Proof Stress 0.2% (MPa)	295
Elongation A5 (%)	17
Hardness HB	150

## Typical Physical Properties

Property	Value
Density	7.5 g/cm <sup>3</sup>
Electrical Resistivity	0.172x10 <sup>-6</sup> Ω.m
Thermal Conductivity	42 W/m.K at 20°C


## Alloy Designations

Brass alloy Defence Standard (NES) 833 corresponds to the following designations:

European	British	Proprietary
CW307G	DGS1043	Hidurax

*Note that CW307G is equivalent in terms of chemical composition only and is not an acceptable substitute.*



	<p><i>Amari is a registered trademark of Amari Metals Ltd</i></p> <p>© Copyright: Amari Metals Ltd, 25 High Street, Cobham, Surrey, KT11 3DH</p>
<p>All Data is indicative only and must not be seen as a substitute for the full specification from which it is drawn. In particular, the mechanical property requirements vary widely with temper, product form and product dimensions. For more complete details please refer to the relevant specification.</p>	

## Corrosion Resistance

Defence Standard (NES) 833 has high corrosion resistance, particularly in marine environments. Alloy

It is immune to chloride stress corrosion cracking.

This alloy also has excellent resistance to cavitation erosion.

## Temperature Resistance

Bronze alloy Defence Standard (NES) 833 largely retains its strength and hardness up to 400°C.

It is also resistant to high temperature scaling at up to 1000°C

## Welding and Joining

Bronze alloy NES833 is fully weldable by common welding methods.

## Machinability

Machinability is poor rated at 30 compared to Brass CZ121 / CW614N which is rated as 100.

## Supplied Form

Defence Standard (NES) 833 is typically supplied in the following form:

- ◆ Round Rod



*This information is based on our present knowledge and is given in good faith. However, no liability will be accepted by the Company in respect of any action taken by any third party in reliance thereon. As the products detailed may be used for a wide variety of purposes and as the Company has no control over their use; the Company specifically excludes all conditions or warranties expressed or implied by statute or otherwise as to dimensions, properties and/or fitness for any particular purpose. Any advice given by the Company to any third party is given for that party's assistance only and without liability on the part of the Company. Any contract between the Company and a customer will be subject to the Company's Conditions of Sale. The extent of the Company's liabilities to any customer is clearly set out in those Conditions; a copy of which is available on request*



**Amari is a registered trademark of Amari Metals Ltd**

© Copyright: Amari Metals Ltd, 25 High Street, Cobham, Surrey, KT11 3DH

All Data is indicative only and must not be seen as a substitute for the full specification from which it is drawn. In particular, the mechanical property requirements vary widely with temper, product form and product dimensions. For more complete details please refer to the relevant specification.