Copper and Copper Alloys
CW307G

SPECIFICATIONS

Commercial	CA104

Bronzes are Copper-based alloys with the major alloying element being 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

CHEMICAL COMPOSITION

Element	% Present
Copper (Cu)	82 typical
Aluminium (Al)	8.5 - 11
Nickel (Ni)	4 - 5
Iron (Fe)	4 - 4.5
Manganese (Mn)	0.5 typical

SUPPLIED FORMS

This alloy is typically supplied as Round Rod/Bar
- Bar
- Rod

GENERIC PHYSICAL PROPERTIES

Property	Value
Density	7.58 g/cm³
Electrical Resistivity	0.172 x10^{-6} Ω .m
Melting Point	1035 °C
Modulus of Elasticity	115 GPa
Thermal Conductivity	37.7 W/m.K

MECHANICAL PROPERTIES

Property	Value
Proof Stress	400-530 MPa
Tensile Strength	600-760 MPa
Elongation A50 mm	15-5 %
Hardness Vickers	170-220 HV

Mechanical properties vary widely according to condition (soft/half hard/etc)

CORROSION RESISTANCE

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

TEMPERATURE RESISTANCE

This alloy largely retains its strength and hardness up to 400°C.
It is also resistant to high temperature scaling at up to 1000°C

WELDABILITY

This alloy is fully weldable by common welding methods.

MACHINABILITY

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

[1 OF 2] CONTINUED

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REVISION HISTORY

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