

## Copper Alloys

## DEFSTAN 02-838 (NES838) Bar

Datasheet Updated  
05 August 2021

### SPECIFICATIONS

Commercial	NES838
EN	DEF STAN 02-838

UK Defence Standard phosphor bronze alloy.

### CHEMICAL COMPOSITION

#### DEFSTAN 02-838 Phosphor Bronze

Element	% Present
Nickel (Ni)	0.00 - 0.30
Iron (Fe)	0.00 - 0.10
Tin (Sn)	4.00 - 5.50
Silicon (Si)	0.00 - 0.30
Lead (Pb)	0.00 - 0.02
Phosphorous (P)	0.02 - 0.40
Zinc (Zn)	0.00 - 0.30
Copper (Cu)	Balance

### ALLOY DESIGNATIONS

- DEF STAN 02-838
- NES838
- NES 838
- DEF STAN 838

### SUPPLIED FORMS

Annealed bar-Grade 1

- Bar
- Rod

### APPLICATIONS

- High performance fasteners
- Valve and pump components
- Propeller shafts
- Weapons handling systems
- Pipe fittings
- Heat exchangers
- Wear plates
- Thrust washers
- Bearings & bushes
- Safety tools
- Worm wheels and gears

### CHARACTERISTICS

- High strength and toughness
- Outstanding resistance to erosion and corrosion
- High wear and galling resistance
- Excellent mechanical properties at sub-zero temperatures
- Ultrasonically tested

## MECHANICAL PROPERTIES

### DEFSTAN 02-838

#### Bar 6mm to 18mm

Property	Value
Proof Stress	410 Min MPa
Tensile Strength	500 Min MPa
Elongation A	12 Min %

### DEFSTAN 02-838

#### Bar 18mm to 40mm

Property	Value
Proof Stress	380 Min MPa
Tensile Strength	460 Min MPa
Elongation A	12 Min %

### DEFSTAN 02-838

#### Bar 40mm to 60mm

Property	Value
Proof Stress	320 Min MPa
Tensile Strength	380 Min MPa
Elongation A	16 Min %

### DEFSTAN 02-838

#### Bar Over 60mm

Property	Value
Proof Stress	250 Min MPa
Tensile Strength	350 Min MPa
Elongation A	18 Min %

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