

Defence Standard 02-834 / NES834 is an aluminium silicon bronze that offers similar properties to other aluminium bronzes including good strength levels and a high corrosion resistance. However, it is primarily recognised and specified by the MoD (Navy) for its controlled low magnetic permeability level of <1.005.

With an aluminium content of ~6% and a ~2% silicon addition the material gives designers a very good impact strength that is maintained down to cryogenic temperatures. The Defence Standard 02-834 also offers a superior machinability rating to other aluminium bronzes providing designers with a superb combination of properties and more options during the material selection process.

Related Specifications

| | |
|-------------------------|--------------|
| Def Stan 02-834 | NES 834 Pt 2 |
| Def Stan 02-879 Annex D | CA107 |
| C64200 | DGS 1044 |
| DGS8543 | CW301G |

Chemical Composition

| | | |
|------------------|-------------|--|
| Copper | Rem | |
| Aluminium | 8.5 - 10.0% | |
| Nickel | 4.5 - 5.5% | |
| Iron | 4.0 - 5.0% | |
| Manganese | 0.50% max | |
| Total Impurities | 0.50% max | |

Key Features

- High Mechanical Strength and Toughness
- Very low magnetic permeability
- Good Impact Strength
- Very Good Corrosion Resistance
- Non- Sparking
- Retention of properties at sub-zero temperatures

Mechanical Properties

| | 6-15mm | 15-25mm | 25-100mm | >100mm |
|----------------------------|--------|---------|----------|--------|
| UTS (N/mm ²) | 680 | 680 | 635 | 620 |
| Proof (N/mm ²) | 325 | 325 | 295 | 245 |
| Elongation (%) | 17 | 17 | 17 | 17 |
| Impact Strength (J) | - | 24 | 27 | 23 |

Physical Properties

| | |
|-------------------------------------|-----------------------|
| Density | 7.8 g/m ³ |
| Specific Heat | 380 J/Kg K |
| Melting Range | 1060-1075°C |
| Coeff. Thermal Expansion (20-300°C) | 18 x 10 ⁻⁶ |

| | |
|-------------------------|----------------------------|
| Thermal Conductivity | 45 W/m °K |
| Electrical Conductivity | 8 % IACS |
| Magnetic Permeability | <1.05 |
| Modulus of Elasticity | 110-125 KN/mm ² |

Fabrication Properties

| | |
|-----------------------|----------------------------------|
| Annealing Temp | 600-700°C |
| Stress Relieving Temp | 300-400°C |
| Hot Working Temp | 850-900°C |
| Hot Formability | Good |
| Cold Formability | Fair |
| Machinability Rating | 60% (Free machining brass = 100) |

Joining Methods

| | |
|--------------------|-----------------|
| Soldering | Not Recommended |
| Brazing | Fair |
| MIG Welding | Good |
| TIG Welding | Good |
| Resistance Welding | Good |

Typical Applications

The Def Stan 02-834 is mainly utilised by the MoD Navy for non-magnetic parts and including high strength fasteners and chains, but due to its fantastic blend of properties it is also used for safety tooling, valve components, non-magnetic parts, marine hardware, gears, bearings and bushes and instrumentation components.

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