

● Properties of Busbar Materials

| Property | Units | H C Copper | | Cuponal | Aluminium | | |
|--|----------------------|------------------------|------------------------|-----------------------|------------------------|------------------------|------------------------|
| | | Annealed | 1/2 Hard | | EIE (EC) | | E91E(6101) |
| | | | | M | H2 | TF | |
| 0.1% proof stress | MN/m ² | 62 | 108-186 | * | - | - | 163 |
| 0.2% proof stress | MN/m ² | 78 | | † | - | - | 170 |
| Min. ultimate tensile strength | MN/m ² | 217 | 235-300 | 130-170 | 60 | 85 | 200 |
| Modus of elasticity | MN/m ² | 95x10 ³ | 120x10 ³ | 85x10 ³ | 69x10 ³ | 69x10 ³ | 65x10 ³ |
| Density at 20°C | kg/m ³ | 8.89x10 ³ | 8.89x10 ³ | 3.63x10 ³ | 2.70x10 ³ | 2.70x10 ³ | 2.70x10 ³ |
| Max. electrical resistivity at 20°C | Ωm | 1.724x10 ⁻⁸ | 1.777x10 ⁻⁸ | 2.65x10 ⁻⁸ | 2.826x10 ⁻⁸ | 2.826x10 ⁻⁸ | 3.133x10 ⁻⁸ |
| Min. electrical conductivity at 20°C | 1/Ωm | 58x10 ⁶ | 56x10 ⁶ | 37.7x10 ⁶ | 35.4x10 ⁶ | 35.4x10 ⁶ | 31.9x10 ⁶ |
| | %IACS | 100 | 97 | 65 | 61 | 61 | 55 |
| Temp. coefficient of resistance at 20°C | 1/°C | 3.93x10 ⁻³ | 3.93x10 ⁻³ | 4.01x10 ⁻³ | 4.03x10 ⁻³ | 4.03x10 ⁻³ | 3.64x10 ⁻³ |
| Coeff. of linear thermal expansion 20-100°C | 1/°C | 17x10 ⁻⁶ | 17x10 ⁻⁶ | 21.9x10 ⁻⁶ | 23x10 ⁻⁶ | 23x10 ⁻⁶ | 23x10 ⁻⁶ |
| Melting point | °C | 1083 | 1083 | 658 | 658 | 658 | 600-650 |
| Specific heat | J/kg/°C | 393.5 | 393.5 | 711.7 | 921.1 | 921.1 | 879.2 |
| Thermal conductivity | W/m ² /°C | 3.85x10 ⁶ | 3.85x10 ⁶ | 2.38x10 ⁶ | 2.22x10 ⁶ | 2.22x10 ⁶ | 1.80x10 ⁶ |

* 0.1% proof stress = 70% of ultimate tensile strength
 † 0.2% proof stress = 80% of ultimate tensile strength

Cuponal - copper clad aluminium busbar

Cuponal consists of a solid core of electrical grade aluminium, with a pressure bonded outer layer of high conductivity copper. The copper cladding is nominally 15% by volume, with the exception of certain sizes of high aspect ratio, which are produced with nominally 20% by volume. The purpose of the copper cladding is to seal the aluminium and provide a copper joining surface. The diagram below shows the typical distribution of the copper cladding on a rectangular profile Cuponal bar.

