

● 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.

