Aurubis Stolberg

CuMg0.1

EN_2024_06

Comparable standards: UNS C15500 • JIS C1550

Aurubis designations: C155 • C155 • PNA 297

Description

CuMg0.1 is an alloy hardened by the addition of magnesium. It shows increased strength and very good electrical conductivity (min. 86% IACS). Magnesium increases the wear resistance of copper, as well as the thermal stability and relaxation properties.

Composition

Cu [%]	Mg [%]	P [%]	Ag [%]
min 99.75	0.08-0.13	0.04-0.08	0.027-0.1

Composition of this alloy is in accordance with RoHS for electric & electronic components and ELV for the automotive industry.

Physical properties

Melting point [°C]	Density [g/cm³]	c_p @ 20°C [kJ/kgK]	Young's modulus [GPa]	Thermal cond. [W/mK]	Electrical cond. [MS/m]	Electrical cond. [%IACS]	α @20-300°C [10^{-6}/K]
1082	8.91	0.394	117	≥340	≥ 50	≥86	17.6

Note: The specified conductivity applies to the soft condition only.

c_p specific heat capacity

α coefficient of thermal expansion

Mechanical properties

	Tensile Strength [MPa]	Yield Strength [MPa]	Elongation A_{50} [%]	Hardness HV [-]	Bend ratio 90° [r] GW	Bend ratio 90° [r] BW	Bend ratio 180° [r] GW	Bend ratio 180° [r] BW
R235	235-300	≥105	≥30	-	0	0	0	0
R300	300-360	≥250	≥ 28	90-125	0	0	0	0.5
R360	360-420	≥320	≥ 13	120-140	0	0.5	1	2
R420	420-460	≥380	≥ 5	130-150	0.5	1	2	2.5
R460	≥460	≥420	≥ 3	≥140	1	2	3	5

r = x * t (thickness t ≤ 0.5mm)

GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction.

Fabrication properties

Cold formability	excellent
Hot formability	excellent
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	not recommended
Gas shielded arc welding	not recommended
Resistance welding	fair
Machinability	not recommended

Electrical conductivity

The electrical conductivity depends on chemical composition, the level of cold deformation and the grain size. A high level of deformation as well as a small grain size decrease the conductivity.

Corrosion Resistance	CuMg0.1 is resistant to: Natural and industrial atmospheres as well as maritime air, drinking and service water, non oxidizing acids, alkaline solutions and neutral saline solutions. CuMg0.1 is not resistant to: Ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres, oxidizing acids and sea water (especially at high flow rates).
Typical uses	Components of electrical engineering, connectors, lead frames