

Cu-OFE

20 03

Comparable standards: UNS C10100 • EN CW009A • JIS C1011
 Aurubis designations: C101 • PNA 203 • OFE-OK

Description

Cu-OFE is an oxygen-free, high conductivity copper with a minimum of 99.99% Cu. It offers the advantages of both electrolytic tough pitch copper (ETP) and phosphor deoxidized copper. The high purity with less than 5ppm oxygen and the absence of deoxidizers accounts for min. 101% IACS electrical conductivity as well as no susceptibility to hydrogen embrittlement. Cu-OFE has a very good formability and can be soldered and welded, which makes it superior to Cu-ETP in these aspects.

The main fields of application are critical electrical, electronic and communication components or the vacuum technology.

Composition

Cu
[%]
min 99.99

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

Physical properties

Melting point	Density	c _p @ 20°C	Young's modulus	Thermal cond.	Electrical cond.		α @20-300°C
					[MS/m]	[%IACS]	
[°C]	[g/cm ³]	[kJ/kgK]	[GPa]	[W/mK]			[10 ⁻⁶ /K]
1083	8.94	0.394	127	394	≥ 58	≥100	17.7

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

c_p specific heat capacity
 α coefficient of thermal expansion

Mechanical properties

	Tensile Strength	Yield Strength	Elongation A ₅₀	Hardness HV	Bend ratio 90° [r]	
	[MPa]	[MPa]	[%]	[-]	GW	BW
R220	220-260	≤ 140	≥ 33	40-65	0	0
R240	240-300	≥ 180	≥ 8	65-95	0	0
R290	290-360	≥ 250	≥ 4	90-110	0	0
R360	≥ 360	≥ 320	≥ 2	≥ 110	0	0

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	fair
Gas shielded arc welding	good
Resistance welding	not recommended
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**

Copper 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.
Copper 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

Radar components, conductors, contacts and terminals, base plates for power modules, printed circuits, carrier tapes, flat-type cables, flexible circuits, terminal lugs, copper ceramic substrates, vakuum technology, components of electrical engineering

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