

# Cu-HCP

20 03

Comparable standards: UNS C10300 • EN CW021A  
 Aurubis designations: C103 • PNA 210 • HCP • SM 0013

## Description

Cu-HCP is a deoxidized, oxygen-free copper with a low residual phosphorus content. It combines very good formability, weldability and brazability with high electrical conductivity (min. 98% IACS).  
 Fields of application are electrical engineering, base plates for power modules, process equipment manufacture and in the cable industry.

## Composition

Cu	P
[%]	[%]
min 99.95	0.002-0.007

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 <sub>p</sub> @ 20°C	Young's modulus	Thermal cond.	Electrical cond.		α @20-300°C
					[MS/m]	[%IACS]	
[°C]	[g/cm <sup>3</sup> ]	[kJ/kgK]	[GPa]	[W/mK]			[10 <sup>-6</sup> /K]
1083	8.94	0.377	127	385	≥ 57	≥98	17.7

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

c<sub>p</sub> specific heat capacity  
 α coefficient of thermal expansion

## Mechanical properties

	Tensile Strength	Yield Strength	Elongation A <sub>50</sub>	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	0.5

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	fair
Gas shielded arc welding	excellent
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**

Telecommunication cables, terminals, clad products, busbars, base plates for power modules, electrical conductors, pressure vessels

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