

# Cu-DLP

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Comparable standards: UNS C12000 • EN CW023A

Aurubis designations: PNA 220 • DLP

**Description** Cu-DLP is a deoxidized, oxygen-free copper with a low residual phosphorus content. It combines very good formability and joining properties. The conductivity is reduced, yet higher than for Cu-DHP and Cu-HCP due to the low phosphorus content.

## Composition

Cu	P	Bi	Pb
[%]	[%]	[%]	[%]
min 99.90	0.005-0.013	0.0005 max	0.005 max

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.		$\alpha$ @20-300°C
[°C]	[g/cm <sup>3</sup> ]	[kJ/kgK]	[GPa]	[W/mK]	[MS/m]	[%IACS]	[10 <sup>-6</sup> /K]
1083	8.94	0.377	132	350	≥ 52	≥90	17.7

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

$c_p$  specific heat capacity  
 $\alpha$  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	0.5

$r = x * t$  (thickness  $t \leq 0.5\text{mm}$ )  
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**

Architecture, roofing, apparatus engineering, components of electrical engineering, cladding band, wire, heat exchangers, transistors, air conditioners, heat exchangers, air-, hydraulic- and oil-pipes

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