

# CuZn5

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Comparable standards: UNS C21000 • EN CW500L • JIS C2100

Aurubis designations: C210 • PNA 221 • SM 1095

## Description

CuZn5 is a solid solution strengthened copper alloy containing 5% zinc (brass). Its color is similar to copper as well as the corrosion resistance, yet the strength is superior to copper or Cu-ETP. CuZn5 has very good cold formability and is suited for bending, stamping and other cold forming processes. The alloy may be soldered, brazed or welded.

CuZn5 is not as sensitive to stress corrosion cracking as alloys with a higher zinc content. Fields of application are industrial and electrical engineering, jewelry, watch industry and metal ware.

## Composition

Cu	Fe	Pb	Zn	Al	Ni	Sn
[%]	[%]	[%]	[%]	[%]	[%]	[%]
94-96	0.05 max	0.05 max	rem	0.02 max	0.3 max	0.1 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]
1066	8.86	0.38	117	234	≥ 33	≥57	18

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 <sub>50</sub>	Hardness HV	Bend ratio 90° [r]		Bend ratio 180° [r]	
	[MPa]	[MPa]	[%]	[-]	GW	BW	GW	BW
R230	230-280	≤ 130	≥ 36	45-75	0	0	0	0
R270	270-350	≥ 200	≥ 12	75-110	0	0	0	1
R340	≥ 340	≥ 280	≥ 4	≥ 110	0.5	1	1	2

$r = x * t$  (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	good
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	good
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**

Brass is resistant to: Natural, industrial and salt bearing atmospheres, drinking and service water (if the flow rate is not excessive), non oxidizing acids, alkaline and neutral saline solutions. Brass is not resistant to: Ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres, oxidizing acids and sea water (especially at high flow rates). CuZn5 is not prone to dezincification or stress corrosion cracking, different to brass alloys with higher zinc contents. Yet the alloy should be stress relieved if stress corrosion cracking might be an issue.

**Typical uses**

Components of electric engineering, jewelry and watch industry, stamping and embossing, base for gold plate and vitreous enameling, cosmetic packaging.

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