

CuCrZr

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Comparable standards: UNS C18150

Aurubis designations: PNA 372

Description

CuCrZr is a precipitation hardened alloy with additions of chrome and zirconium. The alloy has very high electrical and thermal conductivity at good strength levels. Furthermore CuCrZr offers outstanding relaxation and softening resistance.

The properties make the alloy suited for complicated technical application where a high conductivity is demanded, and the component is exposed to stresses and temperatures.

Composition

Cu	Cr	Zr
[%]	[%]	[%]
rem	0.5-1.5	0.02-0.20

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
[°C]	[g/cm ³]	[kJ/kgK]	[GPa]	[W/mK]	[MS/m]	[%IACS]	[10 ⁻⁶ /K]
1081	8.94	0.383	117	323	≥ 46.4	≥80	17.1

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]		Bend ratio 180° [r]	
	[MPa]	[MPa]	[%]	[-]	GW	BW	GW	BW
R480	480-560	≥450	≥ 10	150-190	0	0	1	1.5
R540	540-660	≥500	≥ 4	160-200	1	1	2	2.5
R540S	540-660	≥500	≥ 7	160-190	0	0	1	1.5

$r = x \cdot t$ (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	good
Hot formability	excellent
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	good
Gas shielded arc welding	excellent
Resistance welding	fair
Machinability	fair

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**

CuCrZr 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.
CuCrZr 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

Automotive, demanding components of electrical engineering, connectors

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