

CuZr0.1

20 04

Comparable standards: UNS C15100 • JIS C1510
Aurubis designations: C151 • PNA 296

Description

CuZr0.1 is a precipitation hardened copper, alloyed with zirconium. It combines high electrical conductivity (min. 90% IACS for as rolled tempers) with medium strength as well as good thermal resistance and relaxation properties. Fields of application are connectors, leadframes and high temperature applications in electrical engineering.

Composition

Cu	Zr
[%]	[%]
min 99.8	0.05-0.15

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]
1098	8.94	0.386	121	360	≥ 55	≥95	17.6

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
R250	250-290	≤ 180	≥ 30	60-90	0	0
R280	280-320	≥ 180	≥ 22	80-110	0	0
R300	300-360	≥ 240	≥ 15	90-120	0.5	0.5
R330	330-390	≥ 310	≥ 8	100-130	1	1
R370	370-430	≥ 350	≥ 4	110-140	1.5	1.5
R410	410-460	≥ 390	≥ 2	120-150	2	2
R440	440-500	≥ 420	≥ 1	≥ 140	2.5	2.5

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	good
Oxyacetylene welding	not recommended
Gas shielded arc welding	not recommended
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.

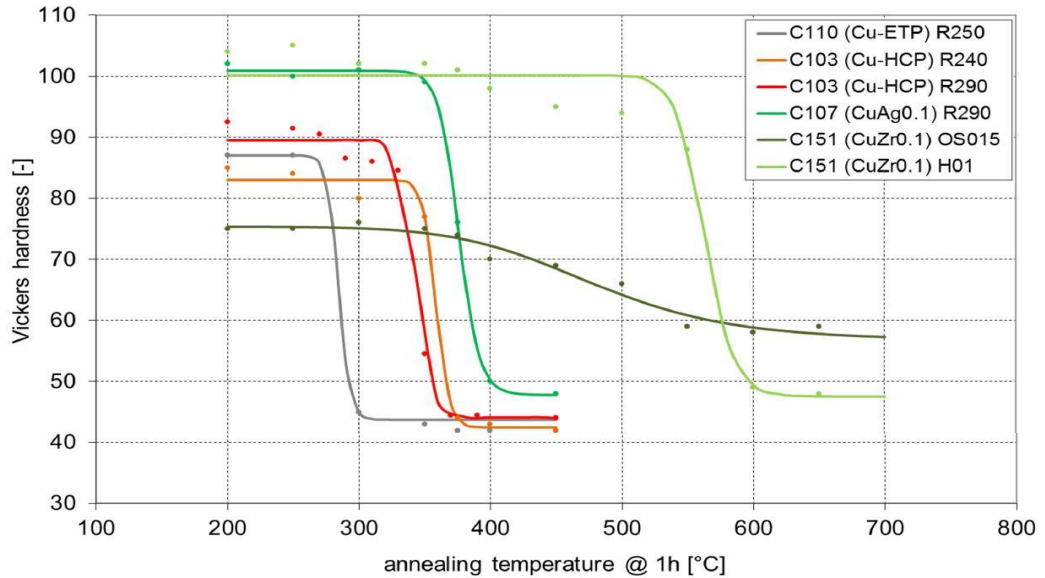
Corrosion Resistance

CuZr0.1 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.
 CuZr0.1 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

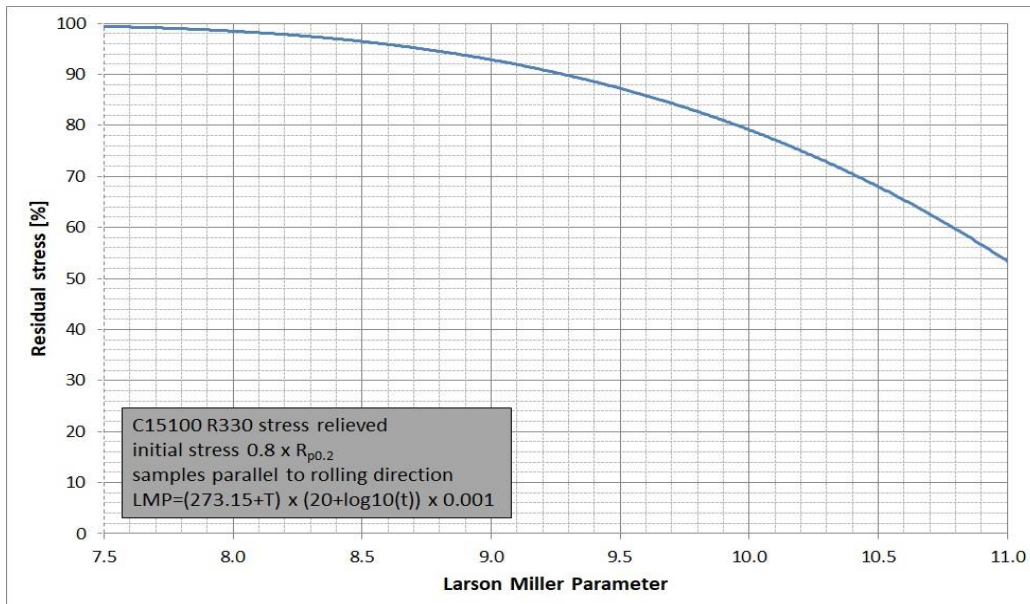
Connectors, leadframes, switches, circuit breakers, base plates for power modules, high temperature applications, components of electrical engineering

Softening Stability



The softening behaviour of various copper alloys with high conductivity is displayed. CuZr0.1 has a very good stability against softening. OS015 is annealed with an average grain size of 15µm, H01 corresponds to R280.

Relaxation Behaviour



Stress relaxation data shown as residual stress against Larson Miller Parameter. The Larson Miller Parameter represents temperature and time. Test method: Mandrel test according to ASTM E328.

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