CuSn2Fe0.1

EN_2024_06

Comparable standards: UNS C50715

Aurubis designations: KLF5* • PNA 328

Description

CuSn2Fe0.1 is a solid solution and precipitation strengthened copper alloy (bronze). This alloy has good corrosion resistance, very good cold workability and good electrical conductivity of min. 30% IACS.
Due to the Fe-P precipitates the alloy has high strength and good relaxation behaviour, thus it can be used at elevated temperatures and where high strength in combination with conductivity is required.

Composition

Cu [%]	Sn [%]	Fe [%]	P [%]	Pb [%]
rem	1.7-2.3	0.05-0.15	0.025-0.04	0.02 max

Composition of this alloy is in accordance with RoHS for electric & electronic components and ELV for the automotive industry.

Physical properties

Melting point [°C]	Density [g/cm³]	c_p @ 20°C [kJ/kgK]	Young's modulus [GPa]	Thermal cond. [W/mK]	Electrical cond. [MS/m]	Electrical cond. [%IACS]	α @20-300°C [10^{-6}/K]
1060	8.9	0.38	121	140	≥ 18	≥31	17.7

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

c_p specific heat capacity

α coefficient of thermal expansion

Mechanical properties

	Tensile Strength [MPa]	Yield Strength [MPa]	Elongation A_{50} [%]	Hardness HV [-]	Bend ratio 90° [r] GW	Bend ratio 90° [r] BW	Bend ratio 180° [r] GW	Bend ratio 180° [r] BW
R390	395-500	290-415	≥ 16	120-140	0	0	0	0
R510	515-600	440-545	≥ 6	150-180	0	0	0	1
R550	555-625	490-570	≥ 5	165-185	0	0	0	1.5
R600	605-665	550-625	≥ 3	180-200	0	0	0	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	fair
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	fair
Gas shielded arc welding	good
Resistance welding	good
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.

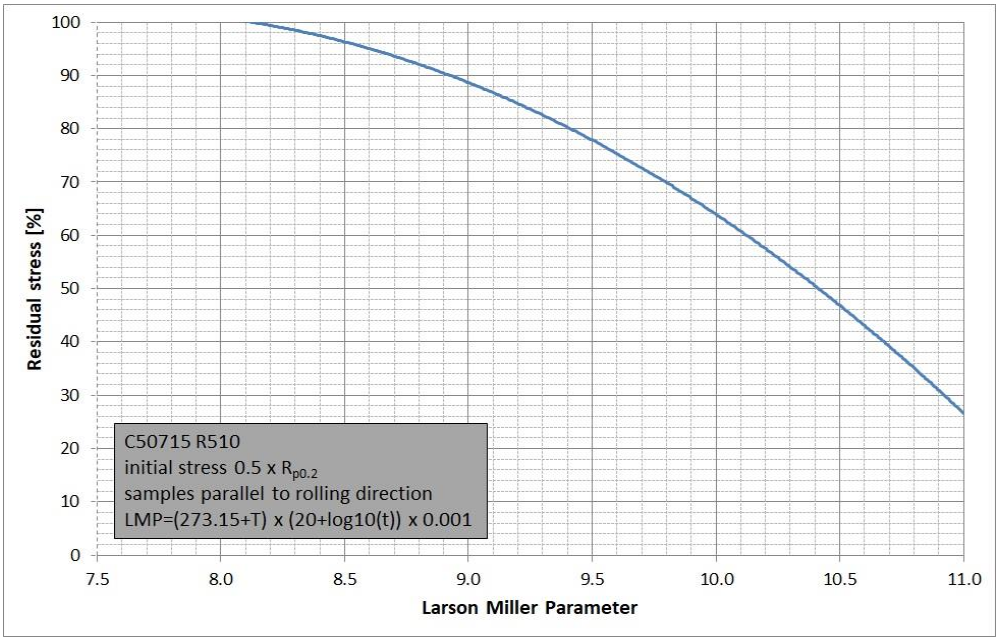
Corrosion Resistance

CuSn2Fe0.1 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.
CuSn2Fe0.1 is not resistant to: Ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres, oxidizing acids and sea water (especially at high flow rates).
CuSn2Fe0.1 is resistant to pitting corrosion, even in sea water.

Typical uses

Stamped parts, components of electrical engineering, connectors, contact springs, switch elements

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.