

CuZn33

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Comparable standards: UNS C26000 • EN CW506L • JIS C2680
 Aurubis designations: C268 • PNA 227 • SM 1067

Description

CuZn33 is a solid solution strengthened copper alloy containing 33% zinc (brass). The alloy has very good cold forming properties and can be brazed and soldered, welding processes need to be executed with care, due to the high zinc content.

As the zinc content increases, the strength improves, yet the conductivity and ductility are reduced and the alloy gets more susceptible to stress corrosion cracking if exposed to an ammonia atmosphere, compared to pure copper. If exposed to an ammonia atmosphere, CuZn33 should be stress relieved.

Due to the raised zinc content the alloy has economical advantages.

Fields of application are metal ware and deep drawing parts, automotive, heat exchangers, connectors, coolers and components of electrical and mechanical engineering.

Composition

Cu	Fe	Pb	Zn	Al	Ni	Sn
[%]	[%]	[%]	[%]	[%]	[%]	[%]
66-68	0.05 max	0.05 max	rem	0.02 max	0.3 max	0.1 max

This alloy is in accordance with RoHS 2002/96/CE for electric & electronic components and 2002/53/CE for the automotive industry.

Physical properties

Melting point	Density	c _p @ 20°C	Young's modulus	Thermal cond.	Electrical cond.		α @ 20°C
[°C]	[g/cm ³]	[kJ/kgK]	[GPa]	[W/mK]	[MS/m]	[%IACS]	[10 ⁻⁶ /K]
932	8.5	0.38	112	116	≥ 16	≥ 28	20

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
R280	280-380	≤ 170	≥ 40	55-90	0	0	0	0
R350	350-430	≥ 170	≥ 23	95-125	0	0	0	0
R420	420-500	≥ 300	≥ 6	125-155	0	0	0	0
R500	≥ 500	≥ 450	-	≥ 155	0.5	0.5	1	1

Other tempers are available upon request.

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	not recommended
Soldering	excellent
Brazing	excellent
Oxyacetylene welding	good
Gas shielded arc 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**

Brass is resistant to: Natural, industrial and salt bearing atmospheres, drinking water, alkaline and neutral saline solutions.

Brass is not resistant to: Acids, ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres as well as sea water (especially at high flow rates).

Under certain circumstances (high Cl content and low carbon-hardness) dezincification can be an issue with CuZn33. The alloy also has a certain sensitivity to stress corrosion cracking when exposed to certain environments (e.g. ammonia, amine or sal ammoniac). The alloy should be stress relieved if stress corrosion cracking might be an issue.

Typical uses

Deep drawn parts, screws, mechanical engineering, Automotive, components of electrical engineering, hard ware, connectors, cases, chains, heat exchangers, coolers, springs, fittings, locks, watch industry

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