

CuZn10

18 05

Comparable standards: UNS C22000 • EN CW501L • JIS C2200

Aurubis designations: C220 • PNA 222 • SM 1090

Description

CuZn10 is a solid solution strengthened copper alloy containing 10% zinc (brass). CuZn10 has very good cold formability and is suited for bending, stamping and other cold forming processes. The alloy may be soldered, brazed or welded. As the zinc content increases, the strength improves, yet the conductivity and ductility are reduced. CuZn10 has a good resistance to stress corrosion cracking, yet the alloy should be stress relieved if exposed to an ammonia atmosphere.

Due to the raised zinc content brass has economical advantages.

Fields of application are architecture, stamped and deep drawn products, dry goods, jewelry, cosmetic packaging and components of mechanical and electrical engineering.

Composition

| Cu | Fe | Pb | Zn | Al | Ni | Sn |
|-------|----------|----------|-----|----------|---------|---------|
| [%] | [%] | [%] | [%] | [%] | [%] | [%] |
| 89-91 | 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 |
|---------------|----------------------|--------------------------|-----------------|---------------|------------------|---------|-----------------------|
| | | | | | [MS/m] | [%IACS] | |
| [°C] | [g/cm ³] | [kJ/kgK] | [GPa] | [W/mK] | | | [10 ⁻⁶ /K] |
| 1043 | 8.8 | 0.38 | 117 | 189 | ≥ 25 | ≥ 43 | 18.4 |

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] | [%] | [-] |
| R240 | 240-290 | ≤ 140 | ≥ 36 | 50-80 | 0 | 0 | 0 | 0 |
| R280 | 280-360 | ≥ 200 | ≥ 13 | 80-110 | 0 | 0 | 0 | 0.5 |
| R350 | ≥ 350 | ≥ 290 | ≥ 4 | ≥ 110 | 0 | 0.5 | 1 | 1.5 |

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 | 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 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).

CuZn10 is hardly sensitive to stress corrosion cracking and is resistant to dezincification, 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

Architectural, stamped and deep drawn products, jewelry, dry goods, cosmetic packaging, components of electrical engineering, mechanical and building engineering.

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