# CuZn39In0.2 BlueBrass®

EN_2024_09

Comparable standards:

Aurubis designations: • PNA 377

**Description**

BlueBrass® is a brass alloy with approximately 39% zinc which offers good mechanical properties combined with good machinability and improved cold forming properties. PNA 377 has a medium zinc content, which makes it suited for applications where machinability and cold formability are required. PNA 377 has been optimized with the addition of indium for mechanical processing in machining processes. Fields of application are automotive as well as components for electrical and mechanical engineering.

**Composition**

| Cu [%] | Pb [%] | In [%] | Fe [%] | Ni [%] | Sn [%] | Si [%] |
|---|---|---|---|---|---|---|
| 59.5-61.5 | < 0.1 | 0.1-0.3 | 0.1-0.3 | 0.1-0.3 | 0.1-0.3 | 0.1 max |

| Mn [%] | Zn [%] |
|---|---|
| 0.1 max | Rest |

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] | α @20-300°C [$10^{-6}$/K] |
|---|---|---|---|---|---|---|
| 920 | 8.4 | 0.377 | 110 | 116 | ≥ 16 | 20.5 |

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 [%] | Hardness HV [-] |
|---|---|---|---|---|
| | 350-700 | 150-650 | 5-35 | 120-200 |

**Fabrication properties**

| | |
|---|---|
| Cold formability | excellent |
| Hot formability | not recommended |
| Soldering | excellent |
| Brazing | excellent |
| Oxyacetylene welding | fair |
| Gas shielded arc welding | fair |
| Resistance welding | good |
| Machinability | good |

| | |
|---|---|
| **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.<br>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).<br>Under certain circumstances (high Cu-content and low carbon-hardness) dezincification can be an issue with CuZn39. 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.<br>The stress cracking corrosion resistance (inspected in accordance with EN 14977:2006) and the dezincification resistance (inspected in accordance with DIN EN ISO 6509:1995) are comparable to those of conventional CuZn39Pb3. |
| **Typical uses** | Machined parts of any kind, components for electrical and mechanical engineering, connector pins, screws, clamps |