

CuNi12Zn24

CuNi12Zn24 | C75700

Nickel silver alloy combines corrosion resistance, which allows it to be used in springs and connectors in more demanding environments, with good formability and mechanical strength.

Due to its excellent formability, the alloy is also used in deep drawing applications.

The alloy's natural color is the closest to silver, which is why it is often used in cutlery and silver-plated tableware.

Comparable Standards

| EN | UNS |
|--------|--------|
| CW403J | C75700 |

Chemical Composition %

| Cu | Zn | Ni | Sn | Fe | Pb | Mn |
|-------|-----|-------|----------|---------|----------|---------|
| 63-66 | rem | 11-13 | 0.03 max | 0.3 max | 0.03 max | 0.5 max |

Physical Properties

| | | |
|-------------------------|-----------|----------------------|
| Melting Point | 1020-1065 | [°C] |
| Density | 8.67 | (g/cm ³) |
| Cp @ 20°C | 0.380 | [kJ/kgK] |
| Thermal Conductivity | 40 | (W/mK) |
| Electrical Conductivity | ≥8 | %IACS |
| Modulus of Elasticity | 125 | [GPa] |
| α @ 20°C | 16.2 | [10-6/K] |

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

Cp specific heat

α thermal expansion coefficient

Fabrication Properties

| | |
|------------------------------|---------------|
| Machinability | less suitable |
| Electrolytic Coating Feature | excellent |
| Soft Soldering | excellent |
| Gas shield arc welding | excellent |
| Laser Welding | good |
| Cold Formability | excellent |
| Resistance welding | excellent |
| Hot-dip tinned properties | excellent |

Electrical Conductivity

Electrical conductivity depends on chemical composition, level of cold deformation, and grain size. High levels of deformation and small grain size reduce conductivity.

Typcial Uses

Contact springs for the watch industry, connectors, gears, pressure diaphragms, cutlery, various parts for electronic and optical devices, and parts made by pressing, deep drawing, bending, and cutting.

Corrosion Resistance

Nickel silver materials are resistant to atmospheric effects, organic compounds, and neutral and alkaline salt solutions. Nickel silver materials are not resistant to oxidizing acids and aqueous ammonias.

Mechanical Properties

| | Tensile Strength [MPa] | Yield Strength [MPa] | Elongation A50 [%] | Hardness HV [-] | Bend ratio 90° [r] | |
|------|------------------------|----------------------|--------------------|-----------------|--------------------|-----|
| | | | | | GW | BW |
| R360 | 360-430 | ≤ 230 | ≥ 35 | 80-110 | 0 | 0 |
| R430 | 430-510 | ≥ 230 | ≥ 8 | 110-150 | 0 | 0 |
| R490 | 490-580 | ≥ 400 | ≥ 5 | 150-180 | 0 | 0 |
| R550 | 550-640 | ≥ 480 | - | 170-200 | 0 | 0.5 |
| R620 | 620-710 | ≥ 580 | - | 190-220 | 2 | 4 |

Other tempers are available upon request.

$r = x * t$ (thickness $t \leq 0.5\text{mm}$)

GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction.

Dimensional Specifications

| Thickness (mm) | Width (mm) |
|----------------|------------|
| 0.10-0.20 | 10-340 |
| 0.21-1.00 | 5-340 |
| 1.01-4.00 | 15-340 |
| 4.01-5.00 | 25-340 |