# Wieland-N22

## CuNi12Zn24 | Lead free nickel silver

### Material designation

| | |
|---|---|
| EN | CuNi12Zn24<br>CW403J |
| UNS | C75700 |

### Chemical composition*

| | |
|---|---|
| Cu | 65.5 % |
| Ni | 12 % |
| Pb | ≤ 0.0100 % |
| Zn | balance |

**Reference values in % by weight*

### Physical properties*

| | | |
|---|---|---|
| Electrical conductivity | MS/m<br>%IACS | 4.4<br>7 |
| Thermal conductivity | W/(m·K) | 42 |
| Thermal expansion coefficient (0–300 °C) | $10^{-6}$/K | 18 |
| Density | g/cm³ | 8.67 |
| Moduls of elasticity | GPa | 125 |

**Reference values at room temperature*

### Corrosion resistance

Nickel silver generally exhibits good corrosion resistance to atmospheric influences, organic substances (perspiration, environmental influences) as well as alkaline and neutral saline solutions.

### Product standards

| | |
|---|---|
| Rod | EN 12163 |
| Wire | EN 12166 |
| Section | EN 12167 |
| Tube | EN 12449 |

### Material properties and typical applications

Wieland-N22 is silver-coloured and provides good resistance to tarnishing. It is a single-phase alloy and therefore exhibits excellent cold working properties. High strength can be achieved. Characteristic of nickel silver is good temperature resistance which is necessary for welding and soldering. Wieland-N22 is used, i.a., in the optical industry (spectacle components).

The material composition meets the requirements of the CPSIA.

### Types of delivery

The BU Extruded Products supplies bars, wire, sections and tubes. Please get in touch with your contact person regarding the available delivery forms, dimensions and tempers.

### Fabrication properties

#### Forming

| | |
|---|---|
| Machinability (CuZn39Pb3 = 100 %) | 25 % |
| Capacity for being cold worked | excellent |
| Capacity for being hot worked | fair |

#### Surface treatment

| | |
|---|---|
| Polishing | |
| mechanical | excellent |
| electrolytic | excellent |
| Electroplating | excellent |

#### Joining

| | |
|---|---|
| Resistance welding (butt weld) | excellent |
| Inert gas shielded arc welding | fair |
| Gas welding | fair |
| Hard soldering | excellent |
| Soft soldering | excellent |

#### Heat treatment

| | |
|---|---|
| Melting range | 1,020–1,065 °C |
| Hot working | 820–950 °C |
| Soft annealing | 600–750 °C<br>1–3 h |
| Thermal stress relieving | 300–400 °C<br>1–3 h |

### Trademarks

scriptoline®

Further information is provided in our brochure Scriptoline.

# Wieland-N22

## CuNi21Zn24 | Lead free nickel silver

### Machanical properties according to EN

**Round rods / polygonal rods** — acc. to EN 12163

| Temper | Diameter mm from | Diameter mm to | Width across flat mm from | Width across flat mm to | Tensile strength $R_m$ MPa min. | Yield strength $R_{p0,2}$ MPa min. | Yield strength $R_{p0,2}$ MPa max. | Elongation % A100 min. | Elongation % A11,3 min. | Elongation % A min. | Hardness HB min. | Hardness HB max. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | alle | | alle | | wie gefertigt – ohne Vorgabe mechanischer Werte | | | | | | | |
| R308 | 2 | 50 | 2 | 50 | 380 | – | 290 | 28 | 33 | 38 | – | – |
| H085 | 2 | 50 | 2 | 50 | – | – | – | – | – | – | 85 | 125 |
| R450 | 2 | 40 | 2 | 40 | 450 | 200 | – | 8 | 10 | 12 | – | – |
| H125 | 2 | 40 | 2 | 40 | – | – | – | – | – | – | 125 | 150 |
| R540 | 2 | 10 | 2 | 10 | 540 | 400 | – | 2 | 3 | 5 | – | – |
| H170 | 2 | 10 | 2 | 10 | – | – | – | – | – | – | 160 | 190 |
| R640 | 2 | 4 | 2 | 4 | 640 | 500 | – | – | – | – | – | – |
| H190 | 2 | 4 | 2 | 4 | – | – | – | – | – | – | 190 | – |

**Rectangular rods** — acc. to EN 12167

| Temper | Thicknes mm from | Thicknes mm to | Tensile strength $R_m$ MPa min. | Yield strength $R_{p0,2}$ MPa min. | Elongation % A100 min. | Elongation % A11,3 min. | Elongation % A min. | Hardness HB min. | Hardness HB max. |
|---|---|---|---|---|---|---|---|---|---|
| M | alle | | wie gefertigt – ohne Vorgabe mechanischer Werte | | | | | | |
| R450 | 6 | 40 | 450 | 200 | – | 10 | 12 | – | – |
| H125 | 6 | 40 | – | – | – | – | – | 125 | 150 |
| R540 | 3 | 6 | 540 | 400 | – | 2 | – | – | – |
| H160 | 3 | 6 | – | – | – | – | – | 160 | 190 |

**Tubes** — acc. to EN 12449

| Temper | Wallthickness mm max. | Tensile strength $R_m$ MPa min. | Yield strength $R_{p0,2}$ MPa min. | Yield strength $R_{p0,2}$ MPa max. | Elongation % A100 min. | Hardness HB min. | Hardness HB max. | Hardness HB min. | Hardness HB max. |
|---|---|---|---|---|---|---|---|---|---|
| M | 20 | – | wie gefertigt – ohne Vorgabe mechanischer Werte | | | | | | |
| R380 | 10 | 340 | – | 290 | 45 | – | – | – | – |
| H075 | 10 | – | – | – | – | 75 | 110 | 70 | 105 |
| R420 | 5 | 420 | 240 | – | 25 | – | – | – | – |
| H110 | 5 | – | – | – | – | 110 | 140 | 105 | 135 |
| R490 | 3 | 490 | 390 | – | 10 | – | – | – | – |
| H135 | 3 | – | – | – | – | 135 | – | 130 | – |

**Round wires** — acc. to EN 12166

| Temper | Diameter mm from | Diameter mm to | Tensile stregth $R_m$ MPa min. | Yield strength $R_{p0,2}$ MPa min. | Yield strength $R_{p0,2}$ MPa max. | Elongation % A100 min. | Elongation % A11,3 min. | Elongation % A min. | Hardness HB min. | Hardness HB max. |
|---|---|---|---|---|---|---|---|---|---|---|
| M | alle | | wie gefertigt – ohne Vorgabe mechanischer Werte | | | | | | | |
| R380 | 1,5 | 20 | 380 | – | 290 | 28 | 33 | 38 | – | – |
| H090 | 1,5 | 20 | – | – | – | – | – | – | 90 | 130 |
| R450 | 1,5 | 12 | 450 | 200 | – | 8 | 10 | 12 | – | – |
| H130 | 1,5 | 12 | – | – | – | – | – | – | 130 | 160 |
| R540 | 0,1 | 10 | 540 | 400 | – | 2 | 3 | 5 | – | – |
| H170 | 1,5 | 10 | – | – | – | – | – | – | 170 | 200 |
| R640 | 0,1 | 4 | 640 | 500 | – | – | – | – | – | – |
| H200 | 1,5 | 4 | – | – | – | – | – | – | 200 | – |
| R800 | 0,1 | 1,5 | 800 | 700 | – | – | – | – | – | – |
| H220 | – | 1,5 | – | – | – | – | – | – | 220 | – |

Wieland-Werke AG | Graf-Arco-Straße 36 | 89079 Ulm | Deutschland
info@wieland.com | wieland.com



03.20 | EX.ZMZ.UL/Er (MC.ED.UL)