wieland

# eco SZ5®

## CuZn40 | lead-free brass according to RoHS

### Material designation

| | |
|---|---|
| EN | CW509L<br>CuZn40 |
| UNS | C27450 |

### Chemical composition*

| | |
|---|---|
| Cu | 60 % |
| Pb | max. 0.100 % |
| Zn | balance |

**Reference values in % by weight*

### Material properties and typical applications

eco SZ5® is a lead-free material which can nevertheless be machined due to its microstructure. It can therefore be used as a replacement for conventional leaded machining brass when a maximum lead content of 0.100 % is required and when a certain degree of cold formability is required.

The material is lead free according to RoHS und ELV.

### Physical properties*

| | | |
|---|---|---|
| Electrical conductivity | MS/m<br>%IACS | 15<br>26 |
| Thermal conductivity | W/(m·K) | 117 |
| Thermal expansion coefficient (0–300 °C) | $10^{-6}$/K | 12 |
| Density | g/cm³ | 8.4 |
| Moduls of elasticity | GPa | 95 |

**Reference values at room temperature*

### Types of delivery

The Business Unit Extruded Products supplies rods, wires, profiles and tubes. Please ask your contact for the available shapes, dimensions and conditions.

### Fabrication properties

#### Forming

| | |
|---|---|
| Machinability (CuZn39Pb3 = 100 %) | 85 % |
| Capacity for being cold worked | good |
| Capacity for being hot worked | good |

#### Surface treatment

| | |
|---|---|
| Mechanical polishing | excellent |
| Electrolytic polishing | fair |
| Electroplating | excellent |

#### Joining

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

#### Heat treatment

| | |
|---|---|
| Melting range | 870 - 920 °C |
| Hot working | 650 - 750 °C |
| Soft annealing | 450 - 500 °C, 1-3 h |
| Thermal stress relieving | 250 - 350 °C, 1-3 h |

### Corrosion resistance

Machining brass is generally quite resistant against organic substances as well as neutral or alkaline compounds.
Stress corrosion cracking should be taken into account, especially in an ammoniacal atmosphere and whilst under mechanical stress.
Dezincification in warm, acidic waters should also be taken into consideration.

### Product standards

| | |
|---|---|
| Rod | EN 12163 |
| | EN 12164 |
| | EN 12165 |
| Wire | EN 12166 |
| Section | EN 12167 |
| Hollow rod | EN 12168 |
| Tube | EN 12449 |

### Trademarks

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### Dimensions and mechanical properties according to standards

| Round rods/polygonal rods | | | | | | | | | | | | acc. to EN 12164 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temper | Diameter | | Width across flats | | Tensile strength | Yield strength | | Elongation | | | Hardness | |
| | | | | | $R_m$ | $R_{p0.2}$ | | A100 | A11.3 | A | HB | |
| | mm | mm | mm | mm | MPa | MPa | | % | % | % | | |
| | from | to | from | to | min. | min. | max. | min. | min. | min. | min. | max. |
| M | all | | all | | as manufactured | | | | | | | |
| R360 | 6 | 80 | 5 | 60 | 360 | – | 300 | – | 15 | 20 | – | – |
| H070 | 6 | 80 | 5 | 60 | – | – | – | – | – | – | 70 | 100 |
| R410 | 2 | 40 | 2 | 35 | 410 | 230 | – | 8 | 10 | 12 | – | – |
| H100 | 2 | 40 | 2 | 35 | – | – | – | – | – | – | 100 | 145 |
| R500 | 2 | 14 | 2 | 10 | 500 | 350 | – | 3 | 5 | 8 | – | – |
| H120 | 2 | 14 | 2 | 10 | – | – | – | – | – | – | 120 | – |

| Round wires | | | | | | | | | | | acc. to EN 12166 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Temper | Diameter | | Tensile strength | Yield strength | | Elongation | | | Hardness | | |
| | | | $R_m$ | $R_{p0.2}$ | | A100 | A11,3 | A | HB | | |
| | mm | mm | MPa | MPa | | % | % | % | | | |
| | from | to | min. | min. | max. | min. | min. | min. | min. | max. | |
| M | all | | as manufactured | | | | | | | | |
| R360 | 0,5 | 20 | 360 | – | 300 | 10 | 15 | 20 | – | – | |
| H080 | 1,5 | 20 | – | – | – | – | – | – | 80 | 100 | |
| R410 | 0,5 | 14 | 410 | 220 | – | 8 | 10 | 12 | – | – | |
| H100 | 1,5 | 14 | – | – | – | – | – | – | 100 | 160 | |
| R500 | 0,5 | 8 | 500 | 350 | – | 2 | 5 | – | – | – | |
| H130 | 1,5 | 8 | – | – | – | – | – | – | 130 | – | |

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