**Datasheet:**

# EN CuZn39Pb2 / CW612N
# Brass with lead
# Rolled Products

**Alumeco ApS**
**16-01-2025**

| | |
|---|---|
| **Internal alloy name:** | **CW612N** |
| **Metal:** | **Brass** |
| **Chemical Symbol:** | **CuZn39Pb2** |
| **EN:** | **EN CuZn39Pb2** |
| **UNS:** | **C37700** |
| **SIS:** | **SS 5168** |
| **GB:** | **HPb60-2** |
| **JIS:** | **C3771** |
| **Also known as:** | **-** |
| **Alloy type:** | **Brass with lead** |

**Main usage:**

- Electrical components
- Industrial applications
- Watch components
- Fasteners, clamps and fittings
- Metals goods, e.g. signs, letters etc.

**Main properties:**

- Great hot formability properties
- Good soldering properties
- Great machinability

**Important norms and literature:**

**General Standards**
EN 1652:1998: Copper and copper alloys – Plate, sheet, strip and circles for general purposes

**Geometric Tolerance**
EN 1652:1998: Copper and copper alloys - Plate, sheet, strip and circles for general purposes

## Chemical composition in %: EN 1652:1998

| Cu | Al | Fe | Ni | Pb | Sn | Zn | Others |
|---|---|---|---|---|---|---|---|
| 59,0 – 60,0 | Max. 0,05 | Max. 0,3 | Max. 0,3 | 1,6 – 2,5 | Max. 0,3 | Remaining | Max. 0,2 |

## Mechanical properties: EN 1652:1998

| Material Condition | Thickness range mm | Rm MPa (Min. – Max.) | $Rp_{0,2}$ MPa | $A_{50mm}$ for thickness up to 2,5 mm % | A for thickness up to 2,5 mm % | Hardness HBW | Hardness HV |
|---|---|---|---|---|---|---|---|
| R360 | 0,3 – 5 | 360 – 440 | Max. 270 | 30 | 40 | - | - |
| R420 | 0,3 – 5 | 420 – 500 | Min. 270 | 12 | 20 | - | - |
| R490 | 0,3 – 5 | 490 – 570 | Min. 420 | - | 9 | - | - |
| R560 | 0,3 – 2 | Min. 560 | Min. 510 | - | - | - | - |

*** Information values only;**

## Physical properties:

| Density (20 °C) g/cm³ | Solidification range °C | Electrical conductivity %IACS | Thermal conductivity (20 °C) W/m K | Thermal expansion (20 - 300 °C) µm $m^{-1}$ $K^{-1}$ | Annealing temperature ºC | E – modulus (20 °C) N / mm² |
|---|---|---|---|---|---|---|
| 8,45 | 880 | 25 | 120 | 21,1 | 450 - 650 | 102000 |

## Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable)

**Machinability(Zerspanbarkeitsindex): 85***
*(CuZn39Pb3 = 100)

**Forming Methods:**

| | |
|---|---|
| Hot Formability: | 3 |
| Cold Formability: | 1 |

**Corrosion resistance:**

| | |
|---|---|
| Atmosphere: | 2 |
| Waters and alkaline: | 2 |
| Acids, Ammonia, Seawater etc.: | 1 |

**Joining Methods:**

| | |
|---|---|
| Soldering: | 3 |
| Brazing: | 2 |
| Oxy-acetylene welding: | 1 |
| Gas-shielded arc welding: | 1 |
| TIG welding: | 1 |
| MIG welding: | 1 |
| Gluing/adhesion: | 1-2 |

**Surface Treatment:**

| | |
|---|---|
| Polishing: | |
| Mechanical: | 3 |
| Electrolytic/chemical: | 1 |
| Galvanizing: | 3 |
| Hot Dipping: | 3 |

# Tolerances for Rolled Products of CW612N

**Dimensions: EN 1652:1997***

**Tolerances on thickness of hot rolled products (plate, sheet, strip and circles)**

| Nominal thickness *t* (mm) | Tolerance on thickness for nominal widths *w* (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | *w* ≤ 700 | | 700 < *w* ≤ 1000 | | 1000 < *w* ≤ 1500 | | 1500 < *w* |
| | *1)* | *2)* | *1)* | *2)* | *1)* | *2)* | |
| *t* ≤ 2,5 | By agreement | | | | | | By agreement |
| 2,5 < *t* ≤ 5,0 | ± 0,25 | ± 0,30 | ± 0,30 | ± 0,35 | ± 0,35 | ± 0,45 | |
| 5,0 < *t* ≤ 7,5 | ± 0,35 | ± 0,45 | ± 0,40 | ± 0,50 | ± 0,45 | ± 0,55 | |
| 7,5 < *t* ≤ 10 | ± 0,45 | ± 0,60 | ± 0,50 | ± 0,65 | ± 0,55 | ± 0,75 | |
| 10 < *t* ≤ 15 | ± 0,75 | ± 0,95 | ± 0,80 | ± 1,00 | ± 0,90 | ± 1,10 | |
| 15 < *t* ≤ 25 | ± 0,95 | ± 1,20 | ± 1,05 | ± 1,30 | ± 1,30 | ± 1,60 | |
| 25 < *t* ≤ 50 | ± 1,30 | ± 1,60 | ± 1,40 | ± 1,75 | ± 1,50 | ± 1,90 | |
| 50 < *t* | ± 1,50 | ± 1,90 | ± 1,65 | ± 2,05 | ± 1,80 | ± 2,20 | |

*1) For all materials except for CuAl8Fe3 (CW303G), CuNi10FeMN (CW352H), CuNi30MnIFe (CW354H) and CuZn20Al2As (CW702R).*

*2) For alloys CuAl8Fe3 (CW303G), CuNi10FeMN (CW352H), CuNi30MnIFe (CW354H) and CuZn20Al2As (CW702R).*

* Values are referred from Table 4 of EN 1652:1997

**Dimensions: EN 1652:1997***

**Tolerances on thickness of cold rolled products (sheet, strip and circles)**

| Nominal thickness *t* (mm) | Tolerance on thickness for nominal widths w (mm) | | | |
|---|---|---|---|---|
| | *w* ≤ 350 | 350 < *w* ≤ 700 | 700 < *w* ≤ 1000 | 1000 < *w* ≤ 1250 |
| 0,1 < *t* ≤ 0,2 | ± 0,018 | - | - | - |
| 0,2 < *t* ≤ 0,3 | ± 0,022 | ± 0,03 | ± 0,04 | - |
| 0,3 < *t* ≤ 0,4 | ± 0,025 | ± 0,04 | ± 0,05 | ± 0,07 |
| 0,4 < *t* ≤ 0,5 | ± 0,030 | ± 0,05 | ± 0,06 | ± 0,08 |
| 0,5 < *t* ≤ 0,8 | ± 0,040 | ± 0,06 | ± 0,07 | ± 0,09 |
| 0,8 < *t* ≤ 1,2 | ± 0,050 | ± 0,07 | ± 0,09 | ± 0,10 |
| 1,2 < *t* ≤ 1,8 | ± 0,060 | ± 0,08 | ± 0,10 | ± 0,11 |
| 1,8 < *t* ≤ 2,5 | ± 0,070 | ± 0,09 | ± 0,11 | ± 0,13 |
| 2,5 < *t* ≤ 3,2 | ± 0,080 | ± 0,10 | ± 0,13 | ± 0,17 |
| 3,2 < *t* ≤ 4,0 | ± 0,10 | ± 0,12 | ± 0,15 | ± 0,20 |
| 4,0 < *t* ≤ 5,0 | ± 0,12 | ± 0,14 | ± 0,17 | ± 0,23 |
| 5,0 < *t* ≤ 6,0 | ± 0,14 | ± 0,16 | ± 0,20 | ± 0,26 |
| 6,0 < *t* ≤ 7,0 | ± 0,16 | ± 0,19 | ± 0,23 | ± 0,29 |
| 7,0 < *t* ≤ 8,0 | ± 0,18 | ± 0,22 | ± 0,26 | ± 0,32 |
| 8,0 < *t* ≤ 9,0 | ± 0,20 | ± 0,25 | ± 0,29 | ± 0,35 |
| 9,0 < *t* ≤ 10,0 | ± 0,22 | ± 0,28 | ± 0,32 | ± 0,38 |

* Values are referred from Table 5 of EN 1652:1997

**Dimensions: EN 1652:1997***

**Tolerances on width of cold rolled strip**

| Nominal thickness *t* (mm) | Tolerance on thickness for nominal widths w (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | *w* ≤ 50 | 50 < *w* ≤ 100 | 100 < *w* ≤ 200 | 200 < *w* ≤ 350 | 350 < *w* ≤ 500 | 500 < *w* ≤ 700 | 700 < *w* ≤ 1250 |
| 0,1 < *t* ≤ 1,0 | +0,2<br>0 | +0,3<br>0 | +0,4<br>0 | +0,6<br>0 | +1,0<br>0 | +1,5<br>0 | +2,0<br>0 |
| 1,0 < *t* ≤ 2,0 | +0,3<br>0 | +0,4<br>0 | +0,5<br>0 | +1,0<br>0 | +1,2<br>0 | +1,5<br>0 | +2,0<br>0 |
| 2,0 < *t* ≤ 2,5 | +0,5<br>0 | + 0,6<br>0 | +0,7<br>0 | +1,2<br>0 | +1,5<br>0 | +2,0<br>0 | +2,5<br>0 |
| 2,5 < *t* ≤ 3,0 | +1,0<br>0 | +1,1<br>0 | +1,2<br>0 | +1,5<br>0 | +2,0<br>0 | +2,5<br>0 | +3,0<br>0 |
| 3,0 < *t* ≤ 4,0 | +2,0<br>0 | +2,3<br>0 | +2,5<br>0 | +3,0<br>0 | +4,0<br>0 | +5,0<br>0 | +6,0<br>0 |

* Values are referred from Table 6 of EN 1652:1997

**Dimensions: EN 1652:1997***

## Tolerances on width of plate and sheet

| Nominal thickness *t* (mm) | Tolerance on thickness for nominal widths *w* (mm) | | |
|---|---|---|---|
| | *w* ≤ 350 | 350 < *w* ≤ 1250 | 1250 < *w* |
| *t* ≤ 2,0 | +2,0<br>0 | +6,0<br>0 | By agreement |
| 2,0 < *t* ≤ 5,0 | +4,0<br>0 | +8,0<br>0 | |
| 5,0 < *t* | +8,0<br>0 | +10,0<br>0 | |

* Values are referred from Table 7 of EN 1652:1997

**Dimensions: EN 1652:1997***

## Tolerances on length of plate, sheet and strip cut for lengths up to 5000 mm

| Length | Nominal thickness (mm) | Tolerance on length (mm) |
|---|---|---|
| As Manufactured (ML) | t ≤ 15 | ± 50 |
| Fixed length (FL) | t ≤ 5,0 | +10<br>0 |
| | 5,0 < t | +15<br>0 |

* Values are referred from Table 8 of EN 1652:1997

**Dimensions: EN 1652:1997***

## Squareness of cut plate and sheet

| Nominal width *w* (mm) | Maximum allowable differences between diagonals, for lengths *l* (mm) | | |
|---|---|---|---|
| | 1000 < *l* ≤ 2000 | 2000 < *l* ≤ 3000 | 3000 < *l* |
| 350 < *w* ≤ 700 | 6 | 7 | 8 |
| 700 < *w* ≤ 1250 | 8 | 9 | 10 |
| 1250 < *w* | By agreement | | |

* Values are referred from Table 9 of EN 1652:1997

**Dimensions: EN 1652:1997***

## Tolerances on diameter for circles

| Nominal diamter *d* (mm) | Maximum allowable differences between diagonals, for lengths *l* (mm) | | |
|---|---|---|---|
| | 1000 < *l* ≤ 2000 | 2000 < *l* ≤ 3000 | 3000 < *l* |
| *d* ≤ 500 | ± 1 | ± 1,5 | ± 2 |
| 500 < *d* ≤ 1000 | ± 2 | ± 2,5 | ± 3 |
| 1000 < *d* ≤ 2000 | ± 3 | ± 3,5 | ± 4 |
| 700 < *d* | - | - | By agreement |

* Values are referred from Table 10 of EN 1652:1997

**Dimensions: EN 1652:1997***

## Edgewise curvature c

| Nominal width *w* (mm) | Maximum edgewise curvature *c* for thicknesses *t* (mm) | |
|---|---|---|
| | *t* ≤ 1,0 | 1,0 < *t* ≤ 4,0 |
| 3 < *w* ≤ 8 | 12 | - |
| 8 < *w* ≤ 15 | 8 | 10 |
| 15 < *w* | 4 | 6 |

* Values are referred from Table 11 of EN 1652:1997