

|                                                                                                                                                                                                                                                                  |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|
| <div>Datasheet:</div> <div>EN CuFe2P / CW107C</div> <div>Low alloyed Copper Tubes</div> <div>Alumeco ApS</div> <div>21-03-2025</div>                                                                                                                             |                            |                                                                                                                                                                                                                                                                                                   |                                                | <div>Internal alloy name: CW107C</div> <div>Metal: Copper</div> <div>Chemical Symbol: CuFe2P</div> <div>EN: EN CuFe2P</div> <div>UNS: C19400</div> <div>SS: -</div> <div>GB: TFe2.5</div> <div>JIS: -</div> <div>Also known as: -</div> <div>Alloy type: Electrical conducting</div>                    |                                                                                                                                                                      |                        |  |
| <div>Main usage:</div> <div><ul style="list-style-type: none"><li>Automotive</li><li>Cables and wires</li><li>Clamps, connectors and fasteners</li><li>Electrical installations</li><li>Electronic products</li><li>Lightning rods and grounding</li></ul></div> |                            |                                                                                                                                                                                                                                                                                                   |                                                | <div>Important norms and literature:</div> <div>General Standards</div> <div>EN 12449:2023: Copper and copper alloys – Seamless, round tubes for general purposes</div> <div>Geometric Tolerance:</div> <div>EN 12449:2023: Copper and copper alloys – Seamless, round tubes for general purposes</div> |                                                                                                                                                                      |                        |  |
| <div>Main properties:</div> <div><ul style="list-style-type: none"><li>High thermal and electrical conductivity</li><li>Excellent forming properties</li></ul></div>                                                                                             |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |
| <div>Chemical composition in %: EN 12449:2023</div>                                                                                                                                                                                                              |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |
| Cu                                                                                                                                                                                                                                                               | Fe                         | Pb                                                                                                                                                                                                                                                                                                | Zn                                             | P                                                                                                                                                                                                                                                                                                       | Other elements                                                                                                                                                       |                        |  |
|                                                                                                                                                                                                                                                                  |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         | Each                                                                                                                                                                 | Together               |  |
| Rest                                                                                                                                                                                                                                                             | 2,1 – 2,6                  | Max. 0,03                                                                                                                                                                                                                                                                                         | 0,05 – 0,2                                     | 0,015 – 0,15                                                                                                                                                                                                                                                                                            | -                                                                                                                                                                    | Max. 0,2               |  |
| <div>Mechanical properties: EN 12449:2023</div>                                                                                                                                                                                                                  |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |
| Material Condition                                                                                                                                                                                                                                               | Wall Thickness<br><i>t</i> | Tensile Strength<br><i>R<sub>m</sub></i>                                                                                                                                                                                                                                                          | 0,2% proof strength<br><i>R<sub>p0,2</sub></i> | Elongation<br><i>A</i>                                                                                                                                                                                                                                                                                  | Hardness                                                                                                                                                             |                        |  |
|                                                                                                                                                                                                                                                                  | Max. mm                    | Min. MPA                                                                                                                                                                                                                                                                                          | MPa                                            | Min. %                                                                                                                                                                                                                                                                                                  | HV                                                                                                                                                                   | HBW                    |  |
| M                                                                                                                                                                                                                                                                | 20                         | -                                                                                                                                                                                                                                                                                                 | -                                              | -                                                                                                                                                                                                                                                                                                       | 165 – 215                                                                                                                                                            | 160 – 210              |  |
| R300                                                                                                                                                                                                                                                             | 10                         | 300                                                                                                                                                                                                                                                                                               | Max. 250                                       | 25                                                                                                                                                                                                                                                                                                      | -                                                                                                                                                                    | -                      |  |
| H085                                                                                                                                                                                                                                                             | 10                         | -                                                                                                                                                                                                                                                                                                 | -                                              | -                                                                                                                                                                                                                                                                                                       | 85 – 115                                                                                                                                                             | 80 – 110               |  |
| R370                                                                                                                                                                                                                                                             | 5                          | 370                                                                                                                                                                                                                                                                                               | Min. 250                                       | 15                                                                                                                                                                                                                                                                                                      | -                                                                                                                                                                    | -                      |  |
| H110                                                                                                                                                                                                                                                             | 5                          | -                                                                                                                                                                                                                                                                                                 | -                                              | -                                                                                                                                                                                                                                                                                                       | 110 – 140                                                                                                                                                            | 105 – 135              |  |
| R420                                                                                                                                                                                                                                                             | 5                          | 420                                                                                                                                                                                                                                                                                               | Min. 320                                       | 5                                                                                                                                                                                                                                                                                                       | -                                                                                                                                                                    | -                      |  |
| H135                                                                                                                                                                                                                                                             | 5                          | -                                                                                                                                                                                                                                                                                                 | -                                              | -                                                                                                                                                                                                                                                                                                       | Min. 135                                                                                                                                                             | Min. 130               |  |
| * Information values only;                                                                                                                                                                                                                                       |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |
| <div>Physical properties:</div>                                                                                                                                                                                                                                  |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |
| Density                                                                                                                                                                                                                                                          | Solidification range       | Electrical conductivity                                                                                                                                                                                                                                                                           | Thermal conductivity<br>(20 °C)                | Thermal expansion<br>(20 - 300 °C)                                                                                                                                                                                                                                                                      | Annealing temperature                                                                                                                                                | E – modulus<br>(20 °C) |  |
| g/cm³                                                                                                                                                                                                                                                            | °C                         | %IACS                                                                                                                                                                                                                                                                                             | W/m K                                          | µm m <sup>-1</sup> K <sup>-1</sup>                                                                                                                                                                                                                                                                      | °C                                                                                                                                                                   | N / mm²                |  |
| 8,78                                                                                                                                                                                                                                                             | 1084                       | 64,7                                                                                                                                                                                                                                                                                              | 262                                            | 17                                                                                                                                                                                                                                                                                                      | -                                                                                                                                                                    | 123.000                |  |
| <div>Properties and information's (3 Excellent; 2 Good; 1 Poor/not recommendable)<sup>1</sup></div>                                                                                                                                                              |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |
| <div>Machinability (Zerspanbarkeitsindex): 20*</div> <div>*(CuZn39Pb3 = 100)</div>                                                                                                                                                                               |                            | <div>Joining Methods:</div> <div>Soldering: 3</div> <div>Brazing: 2</div> <div>Oxy-acetylene welding: 1</div> <div>Gas-shielded arc welding: 1</div> <div>TIG welding: 1</div> <div>MIG welding: 1</div> <div>Spot/seam welding: 1</div> <div>Butt welding: 2</div> <div>Gluing/adhesion: 2</div> |                                                |                                                                                                                                                                                                                                                                                                         | <div>Surface Treatment:</div> <div>Polishing:</div> <div>Mechanical: 2</div> <div>Electrolytic/chemical: 3</div> <div>Galvanizing: 3</div> <div>Hot Dipping: 3</div> |                        |  |
| <div>Forming Methods:</div> <div>Hot Formability: 2</div> <div>Cold Formability: 3</div>                                                                                                                                                                         |                            | <div>Corrosion resistance:</div> <div>Atmosphere: 2</div> <div>Waters and alkaline: 2</div> <div>Acids, Ammonia, Seawater: 1</div>                                                                                                                                                                |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |
| <div><sup>1</sup>Information extracted from Kunftanverband:</div>                                                                                                                                                                                                |                            |                                                                                                                                                                                                                                                                                                   |                                                |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                        |  |

<sup>1</sup>Information extracted from Kupferverband;

## Tolerances for Tubes of CW107C

Dimensions: EN 12449:1999\*

### Tolerances on diameter

| Nominal diameter $d$ (mm) | Tolerances on nominal diameter (mm) |                                                                                        |
|---------------------------|-------------------------------------|----------------------------------------------------------------------------------------|
|                           | Applicable to mean diameter         | Applicable to any diameter including deviation from circular form for straight lengths |
| $3 \leq d \leq 10$        | $\pm 0,06$                          | $\pm 0,12$                                                                             |
| $10 < d \leq 20$          | $\pm 0,08$                          | $\pm 0,16$                                                                             |
| $20 \leq d \leq 30$       | $\pm 0,12$                          | $\pm 0,24$                                                                             |
| $30 \leq d \leq 50$       | $\pm 0,15$                          | $\pm 0,30$                                                                             |
| $50 \leq d \leq 100$      | $\pm 0,20$                          | $\pm 0,50$                                                                             |
| $100 \leq d \leq 200$     | $\pm 0,50$                          | $\pm 1,00$                                                                             |
| $200 \leq d \leq 300$     | $\pm 0,75$                          | $\pm 1,50$                                                                             |
| $300 \leq d \leq 450$     | $\pm 1,00$                          | $\pm 2,00$                                                                             |

\* Values are referred from Table 16 of EN 12449:1999

Dimensions: EN 12449:1999\*

### Tolerances on wall thickness

| Nominal outside diameter $D$ (mm) | Tolerances on nominal wall thickness $t$ (mm) |                |                |                 |          |
|-----------------------------------|-----------------------------------------------|----------------|----------------|-----------------|----------|
|                                   | %                                             |                |                |                 |          |
|                                   | $0,3 \leq t \leq 1$                           | $1 < t \leq 3$ | $3 < t \leq 6$ | $6 < t \leq 10$ | $10 < t$ |
| $3 \leq D \leq 40$                | $\pm 15$                                      | $\pm 13$       | $\pm 11$       | $\pm 10$        | -        |
| $40 < D \leq 120$                 | $\pm 15$                                      | $\pm 13$       | $\pm 12$       | $\pm 11$        | $\pm 10$ |
| $120 \leq D \leq 250$             | -                                             | $\pm 13$       | $\pm 13$       | $\pm 12$        | $\pm 11$ |
| $250 \leq D \leq 450$             | -                                             | -              | $\pm 15$       | $\pm 15$        | $\pm 15$ |

\* Values are referred from Table 17 of EN 12449:1999

Dimensions: EN 12449:1999\*

### Tolerances on fixed lengths, tubes in straight lengths

| Nominal outside diameter $D$ (mm) | Tolerance on fixed length $l$ (mm) |                     |                      |              |
|-----------------------------------|------------------------------------|---------------------|----------------------|--------------|
|                                   | $l \leq 250$                       | $250 < l \leq 1000$ | $1000 < l \leq 4000$ | $4000 < l$   |
| $3 \leq D \leq 25$                | +1<br>0                            | +3<br>0             | +5<br>0              | By agreement |
| $25 < D \leq 100$                 | +2<br>0                            | +5<br>0             | +7<br>0              |              |
| $100 < D \leq 450$                | +3<br>0                            | +5<br>0             | +10<br>0             |              |

\* Values are referred from Table 18 of EN 12449:1999

Dimensions: EN 12449:1999\*

### Tolerances on fixed lengths, tube in coils (not level wound)

| Specified length $L$ (m) | Tolerance % |
|--------------------------|-------------|
| $L \leq 50$              | +2<br>0     |
| $50 < L \leq 100$        | +3<br>0     |
| $100 < L$                | +5<br>0     |

\* Values are referred from Table 19 of EN 12449:1999

Dimensions: EN 12449:1999\*

### Tolerances on diameter including deviation from circular form, tube in coils

| Nominal outside diameter $D$ (mm) | Tolerances on nominal diameter including deviation from circular form | Applicable for coil inside diameter min. |
|-----------------------------------|-----------------------------------------------------------------------|------------------------------------------|
| $3 \leq D \leq 6$                 | $\pm 0,30$                                                            | 400                                      |
| $6 < D \leq 10$                   | $\pm 0,50$                                                            | 600                                      |
| $10 \leq D \leq 20$               | $\pm 0,70$                                                            | 800                                      |
| $20 \leq D \leq 30$               | $\pm 0,90$                                                            | 1000                                     |

\* Values are referred from Table 20 of EN 12449:1999

**Dimensions: EN 12449:1999\***  
**Tolerances on straightness**

| Ratio of         | Depth of arc (see Figure 1)                     |                                                |
|------------------|-------------------------------------------------|------------------------------------------------|
|                  | $h_1$<br>in any length $l_1$ of 1000 mm<br>max. | $h_2$<br>in any length $l_2$ of 400 mm<br>max. |
| $r \leq 5$       | 2                                               | 0,8                                            |
| $5 < r \leq 10$  | 3                                               | 1,2                                            |
| $10 < r \leq 20$ | 4                                               | 1,6                                            |
| $20 < r \leq 40$ | 5                                               | 2,0                                            |
| $40 < r$         | 6                                               | 2,5                                            |

\* Values are referred from Table 21 of EN 12449:1999

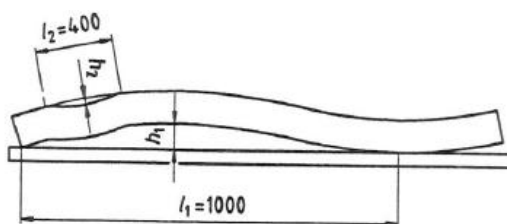


Figure 1 - Measurement of straightness from EN 12449:1999

**Dimensions: EN 12449:1999\***  
**Sampling rate**

| Mass per unit length<br>kg/m    | Size of inspection lot for one test sample<br>kg |
|---------------------------------|--------------------------------------------------|
| $\bar{\lambda}_m \leq 0,25$     | $\leq 500$                                       |
| $0,25 < \bar{\lambda}_m \leq 5$ | $\leq 1000$                                      |
| $5 < \bar{\lambda}_m$           | $\leq 2500$                                      |

\* Values are referred from Table 22 of EN 12449:1999