ZOLLERN

Solid metals. Fine solutions.

# Cast copper material **WKG** alloy 1000

## Cu with conductivity L 32, L 45

**WKG** is a construction material with high strength and medium electrical conductivity. With increasing conductivity the castability and freedom from pores and cracks decreases. Therefore, the ordered conductivity should only be as high as necessary.

ZOLLERN casts the following variants in accordance with DIN EN 1982:
Cu-C Class B = WKG L 45, minimum conductivity 45 MS/m
Cu-C Class C = WKG L 32, minimum conductivity 32 MS/m

| | |
|---|---|
| ZOLLERN brand | WKG |
| EN designation | Cu-C |
| EN material no: | CC040A |
| | EN 1982, ASTM, |

### // National designations / ISO

| | |
|---|---|
| DIN | G-Cu L35 2.0109 |
| DIN | G-Cu L45 2.0082 |
| USA | C 80100 |
| GB | HCC 1 |

### // Composition (mass fraction in %)

Composition to DIN EN 1982 is not specified.
The electrical conductivity and requirements for solderability or weldability are to be agreed.
In accordance with DIN 17665: Cu => 99.6%

### // Strength properties at room temperature

| | (minimum values) | | | |
|---|---|---|---|---|
| [1] EN 1982 | $R_m$ N/mm² | $R_{p0.2}$ N/mm² | $A_5$ % | HB |
| [1] Sand casting | 150 | 40 | 25 | 40 |

### // Physical properties

| | | |
|---|---|---|
| Density at 20 °C | | 8.9 kg/dm³ |
| Melting point | | 1083 °C |
| Thermal conductivity at 20°C | for L 32<br>for L 45 | 1.69 W/cm x°C<br>3.05 W/cm x°C |
| Electrical conductivity at 20°C | for L 32<br>for L 45 | 32 MS/m = 55 % IACS<br>45 MS/m = 78 % IACS |
| Electrical resistance at 20°C | for L 32<br>for L 45 | 0.0313 Ω mm²/m<br>0.0222 Ω mm²/m |
| Coefficient of linear expansion From 20 – 200°C | | 17 x $10^{-6}$ $°C^{-1}$ |
| Shrinkage | | approx. 1.5 – 2 % |
| Young's modulus | | 96 KN/mm² |
| Permeability | | < 1.01 |

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**Areas of application**
Due to its high electrical and thermal conductivity,
- castings are used in electrical machine construction, welding machines and in general mechanical engineering
- Other uses include in the chemical industry and in metallurgy for conducting electricity or transporting heat. For example, contact parts, power supply lines, cooling or heating elements, also with steel tubes inside

**Machinability**
The soft copper is difficult to machine.
Long, flowing chips and tangled chips are formed.
The machinability index is 10 where
CuZn39Pb3 = 100.

| | |
|---|---|
| **Relaxation annealing** | 200 – 400 °C |
| **Soft soldering** | easily possible |
| **Brazing** | easily possible |
| **Welding** | In principle, welding (TIG or MIG) is possible. However, due to the high thermal conductivity, preheating up to 600°C is usually necessary. Suitable filler wires are Cu-DHP = CF024A or SG-CuAg = 2.1211 or also SG-CuSi3 = 2.1461 |
| **Galvanisability** | good |





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