



Hard-rolled copper strip, mat. no. 2.0070 (SE-Cu58)

1. Applications:

With a copper content of at least 99.95% and low oxygen and phosphorous content, the SE-Cu58 alloy is better quality than the generally used copper types, E-Cu (UNS C11000) and SF-Cu (UNS C12200).

This material is used in general electrical engineering for cable straps and connectors, transformer coils, semiconductors and sheet metal parts (e.g. for seals).

Further applications:

heat sinks, heat exchangers and vacuum technology

Copper is generally **not** suitable for springs.

At high demands on the purity of copper we suggest the alloy OFE-Copper (UNS C10100) with a copper content of minimum 99.99%.

2. Material codes:

German Norm:	2.0070 SE-Copper 58
ASTM:	C 10300
Engl. Norm:	CW020A
Engl. Norm:	CU-PHC
Franz. Norm:	-
Japan. Norm:	-

3. Chemical composition: *

Cu:	balance
Pb:	ca. 4 ppm
Bi:	< 1 ppm
As:	ca. 3 ppm
Sb:	ca. 3 ppm
Sn:	< 1 ppm
Zn:	<3 ppm
Fe:	ca. 8 ppm
Ni:	ca. 8 ppm
Ag:	ca. 10 ppm
Se:	ca. 1 ppm
Te:	<1 ppm
S:	ca. 8 ppm

* the exact composition of each batch can be documented by a material certificate 2.2 or 3.1 according to DIN EN 10 204.

4. Delivery condition:

Condition: temper rolled, not hardenable

Surface: no data available
 Flatness: according to EN-Norms
 Ultimate tensile str.: ca. 360 N/mm²

Further mechanical data: see chapter 7 and 8.

5. Sizes:

Thicknesses: 0.01 – 0.50mm
 Raw material width: up to 600 mm possible from new production
 Standard sizes: 150 + 305mm (not in all thicknesses)
 Edges: cut
 Lengths: individual lengths from 5 to 10 000mm or as coil

The following sizes are available from stock (without obligation),
 status: October 2015:

Thickness in mm	Width in mm	Annotation
0,01	150 + 305mm	
0,02	150 + 305mm	
0,03	150 + 305mm	
0,04	150 mm	
0,05	150 + 305mm	
0,06	150 + 305mm	
0,10	150 + 305mm	
0,20	150 + 305mm	
0,30	150 + 305mm	
0,50	150 + 305mm	

6. Tolerances:

Thickness tolerance: +/- 10 %
 Width tolerance: -0/+0.40 mm
 Straightness: normal
 Flatness: wave height max. 1.0 mm

7. Further mechanical data:

Yield str. Rp0,2 : usually > 320 N/mm²
 Elongation A 50: usually < 2%

If good tumbling is done, the following values can be achieved:

Reversed bending stress (Mean stress = 0):

The maximum value is approx. 30% of the tensile strength for temper rolled copper if bending direction is at a 90° angle to the rolling direction

Fluctuating bending stress (Minimum stress = 0):

no data available, but the maximum value is lower than for the reversed bending stress.

As the fatigue strength depends on different factors like the corrosive conditions and the edge treatment, no definitive endurance limit values can be guaranteed.

We suggest the use of brass for springs instead of copper.

At high forces or bending not in the right angle to the rolling direction the alloy CuBe2 is recommended (or hardened steels like 1.1274 or 1.4031Mo).

8. Physical properties

Density:	8.94 g/cm ³
Thermal conductivity:	390 W/(m °C) depending on the temperature
Spec. heat capacity:	385 J/(kg °C) mean value at 50 – 100 °C
Thermal expansion:	17.7 x 10 ⁻⁶ (between 30 - 300 °C)
Electric resistance:	58 mS/m (equivalent to 99% IACS) in the hard condition
Modus of elasticity:	127 000 MPa at 20 °C
Relative permeability μ_r :	copper is non magnetisable

9. Blanking

We recommend a punch-to-die clearance of 4-10 % of the strip thickness. The corner radius should be at least 0.25 mm and the punching die should be at least twice the strip thickness.

10. Laser cutting

This alloy can be laser cut by solid state lasers. Due to the high thermal conductivity of copper the laser cutting is difficult.

11. Photo etching

Copper can be etched easily.

12. Bending

Copper can be bended in the soft condition without any limitations. However, in the temper rolled condition supplied by h+s a minimum bending radius of 1 x strip thickness should be used.

13. Flat grinding

Copper is not magnetic and can not be hold by magnetic clamping devices of flat grinding machines.

14. Welding

Copper is suitable for gas shielded welding and medium suitable for laser welding. Electric resistance welding should be avoided. Hard and soft soldering of copper can be done easily.

15. Corrosion resistance

Copper has a good resistance against normal industrial atmosphere (creation of dull or green protective layer), water (maximum flow velocity 1.5-2 m/s), pure water steam, non oxidising acids, alkali (except ammoniac alkali and cyanide containing chemical compounds) and neutral saline solutions.

Not resistant against: oxidising acids, humid ammoniac and halogenated gases, hydrogen sulphide and seawater (especially at high flow velocity).

Important Annotation

The specifications which are given in this technical information sheet about the condition and application of the alloys are only for reference and are no confirmation about certain performances and characteristics.

The information correspond to our own experiences and experiences of our suppliers.

We can not guarantee for the results during processing and utilisation.