



EMH-Copper Tubes in Cu-ETP

Cu-ETP is a copper with a low oxygen content. It has good electrical and thermal conductivity. Due to the oxygen content its use at higher temperatures in a reducing atmosphere is critical, especially if a hydrogenous atmosphere (hydrogen embrittlement) is concerned. This means that there are certain limitations with regard to annealing and also welding and soldering.

Chemical Composition *

Cu	≥ 99.9 %
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with oxygen and non-deoxidized
(O max. 0.04 % or O max. 0.06 % if agreed)

* Standard values in % by weight

Material Description

EN	Cu-ETP, CW004A
UNS	C11000
DIN*	E-Cu57, 2.0060
BS*	C101
NF*	Cu-a1

* former national standards

Physical Properties *

Electrical conductivity

MS/m	≥ 58
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% IACS	≥ 98
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Thermal conductivity

W/(m*K)	> 385
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Thermal expansion coefficient

(0 – 300 °C) 10 ⁻⁶ /K	17.7
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Density

g/cm ³	8.93
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Modulus of elasticity

GPa	127
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* Standard values at room temperature
1 GPa = 1 kN/mm²
1 MS/m = 1 m/Ω · mm

Processing Properties

Forming

Machinability (CuZn39Pb3 = 100%)	20 %
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Cold forming	excellent
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Hot forming	fair
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Joining

Resistance welding	good
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Inert gas shielded arc welding	fair
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Hard soldering	good
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Soft soldering	excellent
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Surface Treatment

Polishing

mechanical	good
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electrolytical	excellent
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Electroplating	excellent
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Heat Treatment

Melting point	1,083 °C Liquidus
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Hot forming	750 – 900 °C
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Soft annealing	250 – 500 °C, 1-3 h
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Thermal stress-relieving	150 – 200 °C, 1-3 h
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Corrosion Resistance

Pure copper and high copper alloys generally show good corrosion resistance due to their precious character and are practically impervious to stress corrosion cracking.

Mechanical Properties (attainable values, depending on the dimension and form)

Standard values	from (soft)	to (hard)
R _m [MPa]	230	390
R _{p 0.2} [MPa]	70	350
A ₅ [%]	50	3
HB	50	110

