



EMH-Copper Tubes in Cu-HCP

Cu-HCP is an oxygen-free copper which is constant when exposed to heat treatment in reduction atmosphere. As the amount of phosphorous added for deoxidation is limited, the material retains its high electrical and thermal conductivity. Joining operations such as soldering and welding are possible without restriction.

Chemical Composition *

Cu	≥ 99.95 %
P	0.002 – 0.007 %

deoxidized and oxygen-free

* Standard values in % by weight

Material Description

EN	Cu-HCP, CW021A
UNS	C10300
DIN*	SE-Cu, 2.0070
BS*	not standardized
NF*	not standardized

* former national standards

Physical Properties *

Electrical conductivity

MS/m	≥ 57
% IACS	98

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	8.94
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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 %
Cold forming	excellent
Hot forming	fair

Joining

Resistance welding	good
Inert gas shielded arc welding	excellent
Hard soldering	excellent
Soft soldering	excellent

Surface Treatment

Polishing

mechanical	good
electrolytical	excellent

Electroplating

excellent

Heat Treatment

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

Corrosion Resistance

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

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

Standard values	from (soft)	to (hard)
R _m [MPa]	>200	>360
R _{p 0.2} [MPa]	<120	>320
A ₅ [%]	>35	(>3)
HB	>60	>95

