

Material Data Sheet

Technical Sales

Copper

Material designation:	EN-Material No.	DIN-Material-No.
	CW004A [Cu-ETP]	2.0065

Scope

This data sheet applies to flat and long products made of copper CW004A.

Application

The material CW004A has low strength values and can only be welded to a limited extent. Pure copper has good corrosion resistance in natural atmosphere. The material has very high electrical conductivity but is difficult to weld due to its oxygen content (hydrogen embrittlement). In addition, pure copper has very good formability. This material is used when high electrical is required (electrical engineering).

Chemical composition in %

Cu	Bi	O	Pb
≥99,90 ^{a)}	≤0,0005	≤0,040	≤0,005

Other elements^{b)}: total: max. 0,03 %

^{a)} including silver, up to a maximum of 0,015 %

^{b)} The total of other elements (than copper) is defined as the sum of Ag, As, Bi, Cd, Co, Cr, Fe, Mn, Ni, O, P, Pb, S, Sb, Se, Si, Sn, Te und Zn, subject to the exclusion of any individual elements indicated.

Mechanical properties at room temperature (rod, bar and wire) acc. to EN 13601

Temper	Dimensions			Hardness		Tensile strength	Proof strength	Elongation	
	round, square, hexagonal [mm]	Dicke [mm]	Breite [mm]	Brinell HBW	Vickers HV	R _m [N/mm ²]	R _{p0,2} [N/mm ²]	A _{100 mm} [%]	A [%]
D	2-160	0,5-40	1-200	as manufactured, without defined mechanical properties					
H035 ^{a)}	2-160	0,5-40	1-200	35-65	35-65	-	-	-	-
R200 ^{a)}	2-160	1-40	5-200	-	-	≥200	120	≥25	≥35
H065	2-80	0,5-40	1-200	65-60	70-95	-	-	-	-
R250	2-10	1-10	5-200	-	-	≥250	≥200	≥8	≥12
R250	>10-140	>10-40	>10-200	-	-	≥250	≥180	-	≥15
R230	>30-80	>10-40	>10-200	-	-	≥230	≥160	-	≥18
H085	2-40	0,5-20	1-120	85-110	90-115	-	-	-	-
H075	>40-80	>20-40	>20-160	75-100	80-105	-	-	-	-
R300	2-20	1-10	5-120	-	-	≥300	≥260	≥5	≥8
R280	>20-60	>10-20	>10-160	-	-	≥280	≥240	-	≥10
R260	>40-60	>20-40	>20-160	-	-	≥260	≥220	-	≥12
H100	2-10	0,5-5	1-120	≥100	≥110	-	-	-	-
R350	2-10	1-5	5-120	-	-	≥350	≥320	≥3	≥5

^{a)} Annealed

Mechanical properties at room temperature (tubes) acc. to EN 13600

Temper	Wall thickness t [mm]	Proof strength R _{p0,2} [N/mm ²]	Tensile strength R _m [N/mm ²]	Elongation A _{100 mm} [%]	Hardness	
					HBW	HV
D	all	cold drawn, without defined mechanical properties				
H035	≤40	-	-	-	35-60	35-65
R200	≤40	≤120	200-250	≥35	-	-
H065	≤20	-	-	-	60-90	65-95
R250	≤20	≥150	250-300	≥15	-	-
H090	≤10	-	-	-	85-105	90-110
R290	≤10	≥250	290-360	≥5	-	-
H100	≤5	-	-	-	≥95	≥100
R360	≤5	≥320	≥360	(≥3) ^{a)}	-	-

^{a)} The number in brackets is not a requirement of the standard, but is provided for information purpose only

Mechanical properties at room temperature (plate, sheet and strip) acc. to EN 13599

Temper	Thickness t [mm]	Proof strength R _{p0,2} [N/mm ²]	Tensile strength R _m [N/mm ²]	Elongation A _{50 mm} For thicknesses from 0,1 mm up to and including 2,5 mm [%]	A _{50 mm} For thicknesses > 2,5 mm [%]	Hardness HV
M	10-25	as manufactured				
H035	0,10-5	-	-	-	-	40-65
R220		(≤140)	220-260	≥33	≥42	-
H040	0,20-10	-	-	-	-	40-65
R200		(≤100)	200-250	-	≥42	-
H065	0,10-10	-	-	-	-	65-95
R240		≥180	240-300	≥8	≥15	-
H090	0,10-10	-	-	-	-	90-110
R290		≥250	290-360	≥4	≥6	-
H110	0,10-2	-	-	-	-	≥110
R360		≥320	≥360	≥2	-	

Reference data for some physical properties (for guidance only)

Density at 20 °C [kg/dm ³]	Electrical conductivity [MS/m]	Thermal Conductivity [W/m•K]	Specific heat capacity [J/Kg•K]	Young's modulus [MPa]	Shear modulus [MPa]
8,93	57,0	394	386	110000	-

Guidelines on the temperatures for hot forming and heat treatment

Soft annealing temperature	Stress-relieving annealing Temperature	Hot forming temperature
250-500 °C	150-200 °C	750-950 °C

Processing/Welding

The material has a very good cold formability. Furthermore, CW004A is not suitable for welding and brazing in a reducing atmosphere. The machinability of this materials is rated as moderate to difficult. Machinability improves with increasing mechanical strength.

Remark

The material is compliant to RoHS and REACH.

Editor

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Reference

DIN EN 13599 : 2014-12	DIN Media GmbH, D-10772 Berlin
DIN EN 13600 : 2022-08	
DIN EN 13601 : 2021-07	
Kupfer-Datenblätter	Deutsches Kupferinstitut Berufsverband e.V. D-40239 Düsseldorf

Important note

Information given in this data sheet about the condition or usability of materials respectively products are no warranty for their properties, but act as a description.

The information, we give on for advice, comply to the experiences of the manufacturer as well as our own. We cannot give warranty for the results of processing and application of the products.