

# Wieland-K12

Cu-HCP | Copper

## Material designation

EN	Cu-HCP CW021A
UNS	C10300

## Chemical composition\*

Cu	≥ 99.95 %
P	0.002–0.007 %

deoxidized

\*Reference values in % by weight

## Physical properties\*

Electrical conductivity	MS/m	≥ 57
	%IACS	98
Thermal conductivity	W/(m·K)	> 385
Thermal expansion coefficient (0–300 °C)	10 <sup>-6</sup> /K	17.7
Density	g/cm <sup>3</sup>	8.94
Modulus of elasticity	GPa	127

\*Reference values at room temperature

## Corrosion resistance

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

## Product standards

Rod	EN 13601
Wire	EN 13601
Section	EN 13605
Tube	EN 13600

## Material properties and typical applications

Wieland-K12 is a copper which is resistant during heat treatment in reducing atmosphere (resistant to hydrogen embrittlement according to EN ISO 2626). As the amount of phosphorus added for deoxidation is only limited, the material retains its high electrical and thermal conductivity. Joining operations such as soldering and welding are possible without restriction.

## Types of delivery

The Extruded and Drawn Products Division supplies bars, wire, sections and tubes. Please get in touch with your contact person regarding the available delivery forms, dimensions and tempers.

## Fabrication properties

### Forming

Machinability (CuZn39Pb3 = 100 %)	20 %
Capacity for being cold worked	excellent
Capacity for being hot worked	fair

### Surface treatment

Polishing	
mechanical electrolytic	good excellent
Electroplating	excellent

### Joining

Resistance welding (butt weld)	fair
Inert gas shielded arc welding	excellent
Gas welding	good
Hard soldering	excellent
Soft soldering	excellent

### Heat treatment

Melting range	1.083 °C
Hot working	750–900 °C
Soft annealing	250–500 °C 1–3 h
Thermal stress-relieving	150–200 °C 1–3 h

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## Dimensions and mechanical properties according to standards

Rod and wire														acc. to EN 13601		
Temper	Diameter/ across flats		Thickness		Width		Tensile strength $R_m$		Yield strength $R_{p0.2}$		Elongation %		Hardness			
	round, square hexagonal		rectangular				MPa		MPa		A100	A	HB		HV	
	mm		mm		mm		min.		min. max.		min.	min.	min. max.		min. max.	
	from	up to	from	up to	from	up to										
D	2	160	0,5	40	1	200	cold drawn - without specified mechanical properties									
H035	2	160	0,5	40	1	200	-	-	-	-	-	-	35	65	35	65
R200	2	160	1	40	5	200	200	-	120	25	35	-	-	-	-	-
H065	2	80	0,5	40	1	200	-	-	-	-	-	-	65	90	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	-	-	-	-	-

Profiles											acc. to EN 13605			
Temper	Thickness		Width/Height		Tensile strength $R_m$		Yield strength $R_{p0.2}$		Elongation %		Hardness			
	mm		mm		MPa		MPa		A100		HB		HV	
	max.		max.		min.		min. max.		min.		min. max.		min. max.	
D	50	180	cold drawn - without specified mechanical properties											
H035	50	180	-	-	-	-	-	-	-	-	35	65	35	70
R200	50	180	200	-	120	25	35	-	-	-	-	-	-	-
H065	10	150	-	-	-	-	-	-	-	-	65	95	70	100
R240	10	150	240	-	160	-	-	15	-	-	-	-	-	-
H080	5	100	-	-	-	-	-	-	-	-	80	115	85	120
R280	5	100	280	-	240	-	-	8	-	-	-	-	-	-

Tubes											acc. to EN 13600			
Temper	Thickness		Tensile strength $R_m$		Yield strength $R_{p0.2}$		Elongation %		Hardness					
	mm		MPa		MPa		A100		HB		HV			
	from	up to	min.	max.	min.	max.	min.		min. max.		min. max.			
D	-	-	cold drawn - without specified mechanical properties											
H035	-	40	-	-	-	-	-	-	-	-	35	60	35	65
R200	-	40	200	250	-	120	35	-	-	-	-	-	-	-
H065	-	20	-	-	-	-	-	-	-	-	60	90	65	95
R250	-	20	250	300	150	-	15	-	-	-	-	-	-	-
H090	-	10	-	-	-	-	-	-	-	-	85	105	90	110
R290	-	10	290	360	250	-	5	-	-	-	-	-	-	-
H100	-	5	-	-	-	-	-	-	-	-	95	-	100	-
R360	-	5	360	-	320	-	(3)	-	-	-	-	-	-	-