

Wieland-K81 High-copper alloy

Extruded/drawn products

Wieland-K81 is a high-copper alloy exhibiting high electrical and thermal conductivity as well as good mechanical strength. Due to these properties the material is used for electrically conductive stranded wire if the strength has to be higher than that of copper.

In the cable industry, Wieland-K81 is considered to be softening resistant, as it passes the softening test at 370 °C/10 min.

Chemical Composition*

Sn	0.10 %
Cu	balance

* Reference values in % by weight

Material Designation

DIN*	not standardized
EN	CuSn0.15 (CW117C)
UNS	C 14415

* Former national standard

Physical properties*

Electrical conductivity	MS/m	45
	% IACS	78
Thermal conductivity	W/(m*K)	300
Thermal expansion coefficient (0-300 °C)	10 ⁻⁶ /K	18,0
Density	g/cm ³	8,93
Modulus of elasticity	kN/mm ²	130

* Reference values at room temperature
1 GPa = 1 kN/mm²
1 MS/m = 1 m/Ω • mm²

Fabrication properties

Forming

Machinability	poor
Capacity for being cold worked	excellent
hot worked	excellent

Joining

Resistance welding	fair
Inert gas shield arc welding	excellent
Hard soldering	excellent
Soft soldering	excellent

Corrosion resistance

Wieland-K81 has good corrosion resistance in natural atmosphere (including seawater atmosphere) and industrial atmosphere. In different waters and neutral saline solutions, it exhibits better resistance to corrosion through abrasion and pitting than Cu-DHP. Wieland-K81 is insensitive to stress corrosion cracking.

Surface treatment

Polishing	mechanical	good
	electrolytic	good
Electroplating		good

Product standards

none

Heat treatment

Melting range	1065 - 1075 °C
Hot working	800 - 950 °C
Soft annealing	300 - 500 °C
Thermal stress-relieving	150 - 200 °C

Mechanical properties (values can be achieved and are a function of size and form)

Reference values	from (soft)	to (hard)
R _m [MPa]	250	500
R _{p0,2} [MPa]	200	475
A ₅ [%]	9	2
HV	60	130

Forms and sizes available

Material										
Wieland	EN designation		Outside diameter		Wall thickness		Circumscribing diameter		Diameter / width across flats	
	Brief designation	Number	from	to	from	to	from	to	from	to
K81	CuSn0.15	CW117C								
Round tubes										
Drawn sections										
Extruded sections										
Sectional tubes										
Round and polygonal rods									2	4.5
Round wires									0.3	4.5
Polygonal wires									2	

Wieland - K81

All values in mm

Wieland

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