

Wieland-K52

CuNi2Si | High copper alloy

Material designation

EN	CuNi2Si CW111C
UNS	C70260

Zusammensetzung*

Cu	Rest
Ni	2 %
Si	0,6 %

*Reference values in % by weight

Physical properties*

Electrical conductivity	MS/m	>17**
	%IACS	>29**
Thermal conductivity	W/(m·K)	160
Thermal expansion (0–300 °C)	10 ⁻⁶ /K	16
Density	g/cm ³	8,8
Modulus of elasticity	GPa	140

* Reference values at room temperature

** Guide value, highly dependent on aging condition.

Corrosion resistance

Pure copper and low-alloyed copper generally have good corrosion resistance to organic and alkaline substances due to their noble character. Oxidizing acids and moist sulphur compounds can attack Cu-Ni-Si alloys.

In the hardened state, Cu-Ni-Si alloys are considered almost insensitive to stress corrosion cracking.

Material properties and typical applications

Wieland-K52 is a precipitation hardenable alloy and can be adapted to the application in its delivery condition. The alloy has a good deformation capacity and can be processed by hot forging and cold forming.

Depending on the adjusted microstructure condition, the components can be age-hardened.

Typical applications are wear-resistant contact elements in electrical engineering. Bearing and guide bushes, guide rails and sliding elements, also in areas subject to elevated temperatures. Highly stressed connecting elements with special requirements for corrosion and weather resistance.

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	30 %
(CuZn39Pb3 = 100 %)	
Capacity for being cold worked	good
Capacity for being hot worked	good

Surface treatment

Polishing	
mechanical	good
electrolytic	fair
Electroplating	good

Joining

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

* high temperatures can alter material properties

Heat treatment

Melting range	1.040–1.060 °C
Hot working	800–900 °C
Soft/solution annealing	>850 °C
Age hardening	400–525 °C

Product standards

Rod	EN 12163 EN 12165
Wire	EN12166
Section	EN 12167
Tube	EN 12449

Trademark

Carodur 2

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Dimensions and mechanical properties according to standards

Round rods/polygonal rods												acc. to EN 12163	
Temper	Diameter		Width across flat		Tensile strength R_m	Yield strength $R_{p0.2}$		Elongation			Hardness		
	mm		mm		MPa	MPa		A100	A11,3	A	HB		
	from	to	from	to	min.	min.	max.	min.	min.	min.	min.	max.	
M	all		all		as manufactured								
R550	20	80	20	80	550	430	-	-	-	15	-	-	
H150	20	80	20	80	-	-	-	-	-	-	150	190	
R600	20	50	20	50	600	520	-	-	-	10	-	-	
H165	20	50	20	50	-	-	-	-	-	-	165	210	
R640	2	30	2	30	640	590	-	6	8	10	-	-	
H180	2	30	2	30	-	-	-	-	-	-	180	230	

Rectangular rods												acc. to EN 12167	
Temper	Thickness				Tensile strength R_m	Yield strength $R_{p0.2}$		Elongation			Hardness		
	mm				MPa	MPa		A100	A11,3	A	HB		
	from	to			min.	min.	max.	min.	min.	min.	min.	max.	
M	all				as manufactured								
R550	10	40			550	430	-	-	-	15	-	-	
H150	10	40			-	-	-	-	-	-	150	190	
R600	3	30			600	520	-	4	6	10	-	-	
H165	3	30			-	-	-	-	-	-	165	210	
R640	3	10			640	590	-	3	5	8	-	-	
H180	3	10			-	-	-	-	-	-	180	230	