

Wieland-B03

CuSn4 | Phosphor bronze

Material designation

EN	CuSn4 CW450K
UNS	C51100

Chemical composition*

Cu	balance
Sn	4 %
P	0.2 %

*Reference values in % by weight

Material properties and typical applications

Wieland-B03 is characterized by a very good cold formability and a homogeneous microstructure making it suitable for chipless forming, such as drawing, rolling, bending, flanging and impact extrusion. This makes it possible to achieve high mechanical strength and sufficient electrical conductivity.

Due to its good spring characteristics, this alloy is used among others for spring elements, hose pipes, bourdon tubes, connectors and contacts. The alloy is suitable for average requirements.

Physical properties*

Electrical conductivity	MS/m	11.7
	%IACS	20
Thermal conductivity	W/(m·K)	83.4
Thermal expansion coefficient (0–300 °C)	10 ⁻⁶ /K	17.8
Density	g/cm ³	8.85
Modulus of elasticity	GPa	110

*Reference values at room temperature

Types of delivery

The BU Extruded Products 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	poor

Surface treatment

Polishing mechanical	excellent
electrolytic	excellent
Electroplating	excellent

Corrosion resistance

In general excellent resistance to corrosion in seawater, industrial atmosphere and to stress corrosion cracking.

Joining

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

Heat treatment

Melting range	950–1,070 °C
Hot working	750–850 °C
Soft annealing	500–650 °C 1–3 h
Thermal stress relieving	200–300 °C 1–3 h

Product standards

Wire	EN 12166
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Mechanical properties according to EN

Round wires										acc. to EN 12166	
Temper	Diameter		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 – without specified mechanical properties								
R330	1.5	20	330	–	220	35	40	45	–	–	
H085	1.5	20	–	–	–	–	–	–	85	115	
R420	0.1	12	420	220	–	20	25	30	–	–	
H125	1.5	12	–	–	–	–	–	–	125	185	
R520	0.1	8	520	380	–	5	6	–	–	–	
H150	1.5	8	–	–	–	–	–	–	150	185	
R650	0.1	4	650	500	–	–	–	–	–	–	
H210	1.5	4	–	–	–	–	–	–	210	225	
R850	0.1	1.5	850	750	–	–	–	–	–	–	
H230	–	1.5	–	–	–	–	–	–	230	–	