

Wieland-B09/B10

CuSn8
Phosphor bronze

Extruded and drawn products



Material designation	
EN	CuSn8 CW453K
UNS	C52100

Chemical composition*	
Cu	balance
Sn	8%
P	0,01 - 0,4%

* Reference values in % by weight

Physical properties*		
Electrical conductivity	MS/m %IACS	6,5 11
Thermal conductivity	W/(m·K)	58
Thermal expansion coefficient (0–300 °C)	10 ⁻⁶ /K	18,5
Density	g/cm ³	8,8
Modulus of elasticity	GPa	115

* Reference values at room temperature

Corrosion resistance

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

Product standards	
Rod	EN 12163
Wire	EN 12166
Section	EN 12167
Tube	EN 12449

Material properties and typical applications

Wieland-B09/B10 is a phosphor bronze with a tin content of 8 % making it possible to achieve very high mechanical strength and good spring properties. It has excellent wear and corrosion resistance and is therefore also used for bearings. Phosphor bronzes exhibit good cold working properties and can be satisfactorily machined with adequate tooling parameters.

A very pure type of CuSn8 is **Wieland-B10** meeting the highest demands, for example, of Bourdon tubes.

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 %)	25 %
Capacity for being cold worked	excellent
Capacity for being hot worked	poor

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

Surface treatment		
Polishing	mechanical	good
	electrolytic	fair
Electroplating		good

Heat treatment	
Melting range	960–1020 °C
Hot working	700–800 °C
Soft annealing	500–700 °C 1–3 h
Thermal stress relieving	200–300 °C 1–3 h

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Mechanical properties according to EN

Round rods/polygonal rods acc. to EN 12163

Temper	Diameter		Width across flats		Tensile strength		Yield strength		Elongation at rupture			Hardness	
	mm from	mm to	mm from	mm to	R _m	R _{p0.2}		A100	A11.3	A	HB		
					MPa min.	MPa min.	MPa max.	% min.	% min.	% min.	min.	max.	
M	all		all		as manufactured – without specified mechanical properties								
R390	2	60	2	60	390	–	280	35	40	45	–	–	
H085	2	60	2	60	–	–	–	–	–	–	85	125	
R450	2	50	2	50	450	280	–	18	22	26	–	–	
H135	2	50	2	50	–	–	–	–	–	–	135	165	
R550	2	12	2	12	550	400	–	10	12	15	–	–	
H160	2	12	2	12	–	–	–	–	–	–	160	190	
R620	2	8	–	–	620	500	–	5	8	–	–	–	
H180	2	8	–	–	–	–	–	–	–	–	180	–	
R750	2	4	–	–	750	680	–	–	–	–	–	–	
H210	2	4	–	–	–	–	–	–	–	–	210	–	

Rectangular rods acc. to EN 12167

Temper	Thickness		Tensile strength		Yield strength		Elongation at rupture			Hardness	
	mm from	mm to	R _m	R _{p0.2}		A100	A11.3	A	HB		
			MPa min.	MPa min.	MPa max.	% min.	% min.	% min.	min.	max.	
M	alle		wie gefertigt – ohne Vorgabe mechanischer Werte								
R390	3	50	390	–	280	35	40	45	–	–	
H085	3	50	–	–	–	–	–	–	85	125	
R450	3	6	450	280	–	18	22	–	–	–	
H135	3	6	–	–	–	–	–	–	135	165	
R550	3	6	550	400	–	10	12	–	–	–	
H160	3	6	–	–	–	–	–	–	160	190	

Tubes acc. to EN 12449

Temper	Wallthickness mm max.	Tensile strength		Yield strength		Elongation at rupture		Hardness			
		R _m	R _{p0.2}	A100		HV		HB			
		MPa min.	MPa min. max.	% min.	min.	max.	min.	max.	min.	max.	
M	20	as manufactured – without specified mechanical properties									
R380	10	380	–	290	55	–	–	–	–	–	
H080	10	–	–	–	–	80	110	75	105	–	
R450	5	450	250	–	25	–	–	–	–	–	
H115	5	–	–	–	–	115	160	110	155	–	
R520	3	520	440	–	10	–	–	–	–	–	
H155	3	–	–	–	–	155	190	150	185	–	
R590	2	590	520	–	5	–	–	–	–	–	
H180	2	–	–	–	–	180	–	175	–	–	

Round wires acc. to EN 12166

Temper	Diameter		Tensile strength		Yield strength		Elongation at rupture			Hardness	
	mm from	mm to	R _m	R _{p0.2}		A100	A11.3	A	HV		
			MPa min.	MPa min.	MPa max.	% min.	% min.	% min.	min.	max.	
M	all		as manufactured – without specified mechanical properties								
R390	0.1	12	390	–	280	35	40	45	–	–	
H090	1.5	12	–	–	–	–	–	–	90	130	
R450	0.1	12	450	280	–	18	22	26	–	–	
H140	1.5	12	–	–	–	–	–	–	140	170	
R550	0.1	12	550	400	–	10	12	15	–	–	
H170	1.5	12	–	–	–	–	–	–	170	200	
R620	0.1	8	620	500	–	4	6	–	–	–	
H185	1.5	8	–	–	–	–	–	–	185	–	
R750	0.1	4	750	680	–	–	–	–	–	–	
H220	1.5	4	–	–	–	–	–	–	220	–	
R920	0.1	1.5	920	800	–	–	–	–	–	–	
H265	–	1.5	–	–	–	–	–	–	265	–	

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