

Wieland-B06/BV9

CuSn6 | Phosphor bronze

Material designation

EN	CuSn6 CW452K
UNS	C51900

Chemical composition*

Sn	6.3 %
P	B06 0.04 % BV9 0.2 %
Cu	balance
Pb	≤0.02 %
Wieland BV9	
Pb	≤ 90 ppm
Cd	< 50 ppm

*Reference values in % by weight

Physical properties*

Electrical conductivity	MS/m	9
	%ACS	15
Thermal conductivity	W/(m·K)	75
Thermal expansion coefficient (0–300 °C)	10 ⁻⁶ /K	18.5
Density	g/cm ³	8.8
Modulus of elasticity	GPa	118

*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-B06/BV9 is a phosphor bronze containing 6 % tin making it possible to achieve high mechanical strength and good spring properties. It also exhibits good resistance to wear and corrosion. Phosphor bronze has good cold working properties and can be machined satisfactorily with suitable tool parameters.

Our Wieland-BV9 variant meets the requirements of the CPSIA with its restricted lead and cadmium content.

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 tempsers.

Fabrication properties

Forming

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

Joining

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

Surface treatment

Polishing	
mechanical	good
electrolytic	good
Electroplating	good

Heat treatment

Melting range	910–1,040 °C
Hot working	750–850 °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 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 – without specified mechanical properties						
R340	2	60	2	60	340	–	270	35	40	45	– –
H080	2	60	2	60	–	–	–	–	–	–	80 110
R420	2	40	2	40	420	220	–	–	25	30	– –
H120	2	40	2	40	–	–	–	–	–	–	120 155
R520	2	8	–	–	520	400	–	4	5	–	– –
H150	2	8	–	–	–	–	–	–	–	–	150 180
R700	2	4	–	–	700	600	–	–	–	–	– –
H180	2	4	–	–	–	–	–	–	–	–	180 215

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	
	von		bis	min.	min.	max.	min.	min.	min.	min.	max.
M	all			as manufactured – without specified mechanical properties							
R420	3		40	420	220	–	20	25	30	–	–
H120	3		40	–	–	–	–	–	–	120	155
R520	3		6	520	400	–	3	5	–	–	–
H150	3		6	–	–	–	–	–	–	150	180

Tubes acc. to EN 12449											
Temper	Wall thickness		Tensile strength R _m	Yield strength R _{p0.2}		Elongation %		Hardness			
	mm		MPa	MPa		A100		HV		HB	
	max.		min.	min.	max.	min.		min.	max.	min.	max.
M	20		as manufactured – without specified mechanical properties								
R340	10		340	–	260	50		–	–	–	–
H070	10		–	–	–	–		70	–	105	65 100
R400	5		400	220	–	30		–	–	–	–
H105	5		–	–	–	–		105	–	150	100 145
R490	3		490	390	–	10		–	–	–	–
H140	3		–	–	–	–		140	–	175	135 170
R580	2		580	500	–	5		–	–	–	–
H170	2		–	–	–	–		170	–	–	165 –

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.	min.	max.
M	all		as manufactured – without specified mechanical properties								
R340	1.5	20	340	–	270	35	40	45	–	–	–
H085	1.5	20	–	–	–	–	–	–	85	–	115
R420	0.1	12	420	220	–	20	25	30	–	–	–
H125	1.5	12	–	–	–	–	–	–	125	–	165
R520	0.1	8	520	400	–	3	5	–	–	–	–
H155	1.5	8	–	–	–	–	–	–	155	–	190
R700	0.1	4	700	600	–	–	–	–	–	–	–
H190	1.5	4	–	–	–	–	–	–	190	–	225
R900	0.1	1.5	900	800	–	–	–	–	–	–	–
H245	–	–	–	–	–	–	–	–	245	–	–

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