

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

*Reference values in % by weight

Physical properties*

Electrical conductivity	MS/m	9
	%IACS	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.

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	good
electrolytic	good
Electroplating	good

Joining

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

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

Wieland-B09/B10

CuSn8 | Phosphor bronze

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.	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	–	