

Wieland-M59

CuZn42 – CW510L | Lead free brass

Material designation

EN	CuZn42 CW510L
UNS	not standardized

Chemical composition*

Cu	58 %
Zn	balance
Pb	max. 0.1 %

*Reference values in % by weight

Physical properties*

Electrical conductivity	MS/m	13,9
	%IACS	24
Thermal conductivity	W/(m·K)	139
Thermal expansion coefficient (0–300 °C)	10 ⁻⁶ /K	21.7
Density	g/cm ³	8.41
Modulus of elasticity	GPa	107

*Reference values at room temperature

Corrosion resistance

Machining brass is generally quite resistant against organic substances as well as neutral or alkaline compounds.

Stress corrosion cracking should be taken into account, especially in an ammoniacal atmosphere and whilst under mechanical stress.

Dezincification in warm, acidic waters should also be taken into consideration.

Product standards

Rod	EN 12164 EN 12165
Wire	EN 12166
Section	EN 12167
Hollow Rod	EN 12168

Material properties and typical applications

Wieland-M59 is a lead-free material which nevertheless has good machining properties due to its microstructure. M59 can therefore be used as a substitute for conventional lead-containing machining brass if a lead content of max. 0.1 % is necessary and the requirements regarding mechanical properties and corrosion resistance are not too high.

The material is lead free according to RoHS and ELV.

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 %)	60 %
Capacity for being cold worked	poor
Capacity for being hot worked	excellent

Surface treatment

Polishing	
mechanical	excellent
electrolytic	poor
Electroplating	excellent

Joining

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

Heat treatment

Melting range	870–900 °C
Hot working	650–750 °C
Soft annealing	450–550 °C 1–3 h
Thermal stress relieving	250–350 °C 1–3 h

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Mechanical properties according to EN

Round rods/polygonal rods												acc. to EN 12164	
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								
R360	6	80	5	60	360	–	320	–	15	20	–	–	
H090	6	80	5	60	–	–	–	–	–	–	90	125	
R430	2	40	2	35	430	220	–	6	8	10	–	–	
H110	2	40	2	35	–	–	–	–	–	–	110	160	
R500	2	14	2	10	500	350	–	–	3	5	–	–	
H135	2	14	2	10	–	–	–	–	–	–	135	–	

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	from	to	min.	min.	max.	min.	min.	min.	min.	max.	
M	all				as manufactured – without specified mechanical properties								
R360	6	20			360	–	320	–	15	20	–	–	
H095	6	20			–	–	–	–	–	–	95	130	
R430	0.5	14			430	220	–	6	8	10	–	–	
H115	1.5	14			–	–	–	–	–	–	115	170	
R500	0.5	8			500	350	–	2	5	–	–	–	
H145	1.5	8			–	–	–	–	–	–	145	–	