Wieland-M59

CuZn42 – CW510L
Lead free brass according to RoHS

Extruded and drawn products

Wieland

Material designation	
EN	CuZn42 – CW510L
UNS	not standardized

Chemical composition*	
Cu	58 %
Zn	balance
Pb	0.1 %

** Reference values in % by weight*

Material properties and typical applications

Wieland-M59 is a lead-free material which nevertheless has good machining properties due to its microstrucutre. It 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 composition meets the requirements of the RoHS (Pb max. 0.1 %)

Physical properties*		
Electrical conductivity	MS/m %IACS	18 31
Thermal conductivity	W/(m·K)	139
Thermal expansion coefficient (0–300 °C)	10^{-6}/K	21.7
Density	g/cm³	8.41
Modulus of elasticity	GPa	107

** Reference values at room temperature*

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

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

Surface treatment	
Polishing	
mechanical	excellent
electrolytic	poor
Electroplating	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

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

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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 A100	Elongation A11.3	Elongation A	Hardness HB	
	mm from	mm to	mm from	mm to	MPa min.	MPa min.	MPa max.	% min.	% min.	% min.	min.	max.
M	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 A100	Elongation A11.3	Elongation A	Hardness HB	
	mm from	mm to	MPa min.	MPa min.	MPa 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	–

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12/16 Er (GSW/Ri)