wieland

Wieland-Z21

CuZn38Pb2 | Machining brass

Material designation

EN	CuZn38Pb2 CW608N
UNS	not standardized

Material properties and typical applications

Wieland-Z21 is a machining brass which combines the contrasting material properties of machining and cold working exceptionally well. This material is therefore well established in various industries as the standard alloy for machining and cold working. It is available from stock in many dimensions.

Chemical composition*

Cu	60.5 %
Pb	2 %
Zn	balance

**Reference values in % by weight*

Physical properties*

Electrical conductivity	MS/m %IACS	14 24
Thermal conductivity	W/(m·K)	109
Thermal expansion coefficient (0–300 °C)	10^{-6}/K	20.4
Density	g/cm³	8.44
Moduls of elasticity	GPa	102

**Reference values at room temperature*

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 %)	90 %
Capacity for being cold worked	fair
Capacity for being hot worked	excellent

Surface treatment

Polishing	
mechanical electrolytic	good fair
Electroplating	excellent

Joining

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

Heat treatment

Melting range	895–900 °C
Hot working	650–750 °C
Soft annealing	450–650 °C 1–3 h
Thermal stress relieving	200–300 °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
Wire	EN 12166
Section	EN 12167
Hollow rod	EN 12168
Tube	EN 12449

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Mechanical properties according to EN

Round rods/polygonal rods — acc. to EN 12164

Temper	Diameter mm		Width across flats mm		Tensile strength R_m MPa	Yield strength $R_{p0.2}$ MPa		Elongation % A100	Elongation % A11.3	Elongation % A	Hardness 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	–	300	–	15	20	–	–
H070	6	80	5	60	–	–	–	–	–	–	70	100
R410	2	40	2	35	410	230	–	8	10	12	–	–
H100	2	40	2	35	–	–	–	–	–	–	100	145
R500	2	14	2	10	500	350	–	3	5	8	–	–
H120	2	14	2	10	–	–	–	–	–	–	120	–

Rectangular rods — acc. to EN 12167

Temper	Thickness mm		Tensile strength R_m MPa	Yield strength $R_{p0.2}$ MPa		Elongation % A100	Elongation % A11.3	Elongation % A	Hardness HB	
	from	to	min.	min.	max.	min.	min.	min.	min.	max.
M	all		as manufactured – without specified mechanical properties							
R360	3	20	360	–	300	10	15	20	–	–
H070	3	20	–	–	–	–	–	–	70	100
R410	3	10	410	220	–	8	10	12	–	–
H100	3	10	–	–	–	–	–	–	100	145
R500	3	10	500	350	–	2	5	8	–	–
H120	3	10	–	–	–	–	–	–	120	–

Tubes — acc. to EN 12449

Temper	Wall thickness mm		Tensile strength R_m MPa	Yield strength $R_{p0.2}$ MPa		Elongation % A100	Hardness HV		Hardness HB	
	from	to	min.	min.	max.	min.	min.	max.	min.	max.
M	–	20	as manufactured – without specified mechanical properties							
R340	–	10	340	–	250	35	–	–	–	–
H080	–	10	–	–	–	–	80	110	75	105
R410	–	10	410	250	–	15	–	–	–	–
H105	–	10	–	–	–	–	105	140	100	135
R470	–	5	470	350	–	10	–	–	–	–
H135	–	5	–	–	–	–	135	–	130	–

Round wires — acc. to EN 12166

Temper	Diameter mm		Tensile strength R_m MPa	Yield strength $R_{p0.2}$ MPa		Elongation % A100	Elongation % A11.3	Elongation % A	Hardness HB	
	from	to	min.	min.	max.	min.	min.	min.	min.	max.
M	all		as manufactured – without specified mechanical properties							
R360	0.5	20	360	–	300	10	15	20	–	–
H080	1.5	20	–	–	–	–	–	–	80	110
R410	0.5	14	410	220	–	8	10	12	–	–
H100	1.5	14	–	–	–	–	–	–	100	160
R500	0.5	8	500	350	–	2	5	–	–	–
H130	1.5	8	–	–	–	–	–	–	130	–

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