

Wieland-Z23

CuZn36Pb3 | Machining brass

Material designation

EN	CuZn36Pb3 CW603N
UNS	C36000

Chemical composition*

Cu	61 %
Pb	3 %
Zn	balance

*Reference values in % by weight

Physical properties*

Electrical conductivity	MS/m	13
	%IACS	22
Thermal conductivity	W/(m·K)	100
Thermal expansion coefficient (0–300 °C)	10 ⁻⁶ /K	20.6
Density	g/cm ³	8.5
Modulus of elasticity	GPa	102

*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
Wire	EN 12166
Section	EN 12167
Hollow rod	EN 12168
Tube	EN 12449

Material properties and typical applications

Wieland-Z23 is a free machining brass which combines the contrasting material properties of free machining and cold working exceptionally well. This material is particularly well established in various industries in the USA as the standard free machining alloy C36000.

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	good

Joining

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

Surface treatment

Polishing	
mechanical	good
electrolytic	fair
Electroplating	excellent

Heat treatment

Melting range	885–900 °C
Hot working	700–800 °C
Soft annealing	450–600 °C 1–3 h
Thermal stress relieving	200–300 °C 1–3 h

Trademarks



Further information is provided in our brochure on Wiconnec.

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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						
R340	10	80	10	60	340	–	280	–	–	20	– –
H070	10	80	10	60	–	–	–	–	–	–	70 120
R400	2	25	2	20	400	200	–	4	8	12	– –
H100	2	25	2	20	–	–	–	–	–	–	100 140
R480	2	14	2	10	480	350	–	3	5	8	– –
H125	2	14	2	10	–	–	–	–	–	–	125 –

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	
	from	to		min.	min.	max.	min.	min.	min.	min.	max.
M	all			as manufactured – without specified mechanical properties							
R340	3	20		340	–	280	10	15	20	–	–
H070	3	20		–	–	–	–	–	–	70	120
R400	3	10		400	200	–	4	8	12	–	–
H100	3	10		–	–	–	–	–	–	100	140
R480	3	10		480	350	–	2	5	8	–	–
H125	3	10		–	–	–	–	–	–	125	–

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	
	from	to	min.	min.	max.	min.		min.	max.	min.	max.
M	–	20	as manufactured – without specified mechanical properties								
R300	–	10	300	–	250	35		–	–	–	–
H080	–	10	–	–	–	–		80	110	75	105
R400	–	10	400	250	–	15		–	–	–	–
H105	–	10	–	–	–	–		105	140	100	135
R460	–	5	460	350	–	10		–	–	–	–
H135	–	5	–	–	–	–		135	–	130	–

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	0.5	20	340	–	280	10	15	20	–	–	
H080	1.5	20	–	–	–	–	–	–	80	130	
R400	0.5	14	400	200	–	4	8	12	–	–	
H100	1.5	14	–	–	–	–	–	–	100	150	
R480	0.5	8	480	350	–	2	5	–	–	–	
H135	1.5	8	–	–	–	–	–	–	135	–	

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