

Wieland-Z23

CuZn36Pb3
Machining brass

Extruded and drawn products



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 %IACS	13 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 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		Surface treatment	
Machinability (CuZn39Pb3 = 100 %)	90 %	Polishing	
Capacity for being cold worked	fair	mechanical	good
Capacity for being hot worked	good	electrolytic	fair
		Electroplating	excellent
Joining		Heat treatment	
Resistance welding (butt weld)	fair	Melting range	885–900 °C
Inert gas shielded arc welding	poor	Hot working	700–800 °C
Gas welding	fair	Soft annealing	450–600 °C 1–3 h
Hard soldering	fair	Thermal stress relieving	200–300 °C 1–3 h
Soft soldering	excellent		

Trademarks



Further information is provided in the brochure on WICONNEC.

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Machining brass

Mechanical properties according to EN

Round rods/polygonal rods											acc. to EN 12164	
Temper	Diameter		Width across flats		Tensile strength	Yield strength		Elongation at rupture			Hardness	
	mm from	mm to	mm from	mm to	R _m MPa min.	R _{p0.2} MPa min. MPa max.		A100 % min.	A11.3 % min.	A % min.	HB	
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		Yield strength		Elongation at rupture			Hardness		
	mm from	mm to	R _m MPa min.	R _{p0.2} MPa min. MPa max.		A100 % min.	A11.3 % min.	A % min.	HB			
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		Yield strength		Elongation at rupture		Hardness			
	mm from	mm to	R _m MPa min.	R _{p0.2} MPa min. MPa max.		A %		HV		HB		
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		Yield strength		Elongation at rupture			Hardness		
	mm from	mm to	R _m MPa min.	R _{p0.2} MPa min. MPa max.		A100 % min.	A11.3 % min.	A % min.	HB			
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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