

Wieland-Z32/Z33

CuZn39Pb3 | Machining brass

Material designation

EN	CuZn39Pb3 CW614N
UNS	C38500

Chemical composition*

Cu	57.5 %
Pb	3.3 %
Zn	balance

*Reference values in % by weight

Physical properties*

Electrical conductivity	MS/m	14.6
	%IACS	25
Thermal conductivity	W/(m·K)	113
Thermal expansion coefficient (0–300 °C)	10 ⁻⁶ /K	21.4
Density	g/cm ³	8.46
Modulus of elasticity	GPa	96

*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
Tube	EN 12449

Material properties and typical applications

Wieland-Z32/Z33 are the standard materials for machining (machining index 100 %). They are therefore available from stock in a wide range of dimensions. These alloys are also particularly suitable for hot stamping when the forged parts are subsequently machined extensively. Wieland-Z32 is recommended for applications where cold working with little reduction such as knurling is used. The ductility of this material makes it particularly suitable for the manufacture of wires as well as rods and sections.

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 %)	100 %
Capacity for being cold worked	poor
Capacity for being hot worked	excellent

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	poor
Electroplating	excellent

Heat treatment

Melting range	880–895 °C
Hot working	650–800 °C
Soft annealing	450–600 °C 1–3 h
Thermal stress relieving	200–300 °C 1–3 h

Trademarks



Further information is provided in the brochures on W5000 and W5006 and 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								
R360	6	80	5	60	360	–	350	–	15	20	–	–	
H090	6	80	5	60	–	–	–	–	–	–	90	125	
R430	2	60	2	40	430	–	220	–	6	8	10	–	
H110	2	60	2	40	–	–	–	–	–	–	110	160	
R500	2	14	2	10	500	–	350	–	–	3	5	–	
H135	2	14	2	10	–	–	–	–	–	–	135	–	

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	to	min.	min.	max.	min.	min.	min.	min.	max.		
M	all			as manufactured – without specified mechanical properties									
R360	6	40		360	–	320	–	15	20	–	–		
H090	6	40		–	–	–	–	–	–	90	125		
R430	3	20		430	–	220	–	6	8	10	–		
H110	3	20		–	–	–	–	–	–	110	160		
R500	3	10		500	–	350	–	2	5	8	–		
H135	3	10		–	–	–	–	–	–	135	–		

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										
R360	–	10	360	–	250	25	–	–	–	–			
H085	–	10	–	–	–	–	85	120	80	115			
R430	–	10	430	250	–	12	–	–	–	–			
H115	–	10	–	–	–	–	115	150	110	145			
R500	–	5	500	370	–	8	–	–	–	–			
H140	–	5	–	–	–	–	140	–	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	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	–			

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