

Wieland-Z32/Z33

CuZn39Pb3
Machining brass

Extruded and drawn products



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 %IACS	14.6 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 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 %)	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.

Wieland-Z32/Z33

CuZn39Pb3

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			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 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	Yield strength		Elongation			Hardness		
	mm from	mm to	R _m MPa min.	R _{p0.2} MPa min. MPa max.		A100 % min.	A11.3 % min.	A % min.	HB 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	Yield strength		Elongation	Hardness		HB		
	mm from	mm to	R _m MPa min.	R _{p0.2} MPa min. MPa max.		A %	HV 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	Yield strength		Elongation			Hardness		
	mm from	mm to	R _m MPa min.	R _{p0.2} MPa min. MPa max.		A100 % min.	A11.3 % min.	A % min.	HB 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	–	

Wieland-Werke AG

www.wieland.com

Graf-Arco-Str. 36, 89079 Ulm, Germany, Phone +49 (0)731 944-0, Fax +49 (0)731 944-2772, info@wieland.de

This leaflet is for your general information only and is not subject to revision. No claims can be derived from it unless there is evidence of intent or gross negligence. The data presented is not guaranteed and does not replace expert advice.