

# Wieland-Z31/41/48

CuZn40Pb2  
Machining/  
hot-stamping brass

## Extruded and drawn products



Material designation	
EN	CuZn40Pb2/CW617N
UNS	C38000

Chemical composition*	
Cu	58 %
Pb**	2 %
Zn	balance

\* Reference values in % by weight  
\*\* for Z41/Z48 max. 2.2 %

Physical properties*		
Electrical conductivity	MS/m %IACS	14.9 25
Thermal conductivity	W/(m·K)	113
Thermal expansion coefficient (0–300 °C)	10 <sup>-6</sup> /K	21.1
Density	g/cm <sup>3</sup>	8.43
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-Z31/Z41/Z48** are the reference materials for hot working. The mean lead content provides good machinability of the drop-forged part. Because of its composition the alloy is also suited for the production of drawn, complex profile shapes.

**Wieland-Z48** has been specially optimised for hot working.

**Wieland-Z41** has been specially optimised for the manufacture of rods for machining purposes which are supplied in the proven W5000 quality.

Both types Wieland-Z41 and Wieland-Z48 are hygienically suitable for contact with drinking water according to the UBA (Federal Environment Agency) list.

Wieland-Z31 can be used if the material is not required to comply with drinking water requirements.

### Types of delivery

The Extruded and Drawn Products Division supplies rods, wires, 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 %)	95 %	Polishing	
Capacity for being cold worked	poor	mechanical	good
Capacity for being hot worked	excellent	electrolytic	poor
		Electroplating	excellent
Joining		Heat treatment	
Resistance welding (butt weld)	fair	Melting range	880–895 °C
Inert gas shielded arc welding	poor	Hot working	650–800 °C
Gas welding	poor	Soft annealing	450–600 °C 1–3 h
Hard soldering	fair	Thermal stress relieving	200–300 °C 1–3 h
Soft soldering	excellent		

### Trademarks



## Wieland-PSR

Further information is provided in the brochures on W5000 and Wieland-PSR.

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## 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 <sub>m</sub> MPa min.	R <sub>p0.2</sub> MPa min. MPa max.		A100 % min.	A11.3 % min.	A % min.	HB			
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 <sub>m</sub> MPa min.	R <sub>p0.2</sub> MPa min. MPa max.		A100 % min.	A11.3 % min.	A % min.	HB				
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 <sub>m</sub> MPa min.	R <sub>p0.2</sub> MPa min. MPa max.		A %	HV		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 <sub>m</sub> MPa min.	R <sub>p0.2</sub> MPa min. MPa max.		A100 % min.	A11.3 % min.	A % min.	HB				
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

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