

Wieland-Z31/Z41/Z48 Machining/ hot-stamping brass

Wieland-Z31 is the reference material 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. For drinking water applications we supply this material as Z41. Under the designation Wieland-Z48 it has been specially optimized for hot working and, like Z41, it meets the requirements of DIN 50930-6.

Extruded/drawn products

Chemical composition*

Cu	58%
Pb**	2%
Zn	balance

* Reference values in weight %

** To Z41 / Z48 a max. of 2.2 % Pb applies

Material designation

EN	CuZn40Pb2
	CW617N
UNS	C38000
DIN*	CuZn40Pb2-2.0402
BS*	CZ122
NF*	not standardized

* Former national standards

Physical properties*

Electrical conductivity	MS/m	14.9
	% IACS	25
Thermal conductivity	W/(m*K)	113
Thermal expansion coefficient (0-300°C)	10 ⁻⁶ /K	21.1
Density	g/cm ³	8.43
Modulus of elasticity	GPa	96

* Reference values at room temperature

1 GPa = 1 kN/mm²

1 MS/m = 1 m/Ω • mm²

Fabrication properties

Forming

Machinability	95%
(CuZn39Pb3 = 100 %)	
Capacity for being cold worked	poor
Capacity for being hot worked	excellent

Joining

Resistance welding	fair
Inert gas shielded arc welding	poor
Hard soldering	fair
Soft soldering	excellent

Corrosion resistance

Machining brass is generally quite resistant against organic substances as well as neutral or alkaline compounds.

*Stress corrosion cracking and dezincification in warm, acidic waters should be taken into account, especially in an ammoniacal atmosphere and whilst under mechanical stress.

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

Product standards

Rod	EN 12164
	EN 12165
Wire	EN 12166
Section	EN 12167
Hollow rod	EN 12168
Tube	EN 12449

Mechanical properties (values can be achieved and are a function of size and form)

Reference values	from (soft/extruded)	to (hard)
R _m [MPa]	400	570
R _{p0.2} [MPa]	180	490
A ₅ [%]	35	10
HB	95	175

Forms and sizes available

Wieland - Z31/Z41/Z48

Material										
Wieland Z31/Z41/Z48	EN designation		Outside diameter		Wall thickness		Circumscribing diameter		Diameter / width across flats	
	Brief designation	Number	from	to	from	to	from*	to	from	to
	CuZn40Pb2	CW617N	8	170	0.5	20				
Round tubes										
Drawn sections							2.5	130		
Extruded sections								150		
Sectional tubes										
Round and polygonal rods									2	125
Round wires									0.3	
Polygonal wires									2	

All values in mm

* Depending on the form, cross-sections in the lower size range are also available as wire.

Wieland

Wieland-Werke AG

89070 Ulm

Germany

Telephone:

+49 (0) 731 944 - 0

Telefax:

+49 (0) 731 944 - 28 79

info@wieland.de

www.wieland.de

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