Wieland-Z32/Z33
Machining brass

Extruded/drawn products

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. We recommend **Wieland-Z32** 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 bars and sections.

Chemical composition*

Cu	57.5%
Pb	3.3%
Zn	balance

* Reference values in % by weight

Material designation

EN	CuZn39Pb3
	CW614N
UNS	C38500
DIN*	CuZn39Pb3-2.0401
BS*	CZ121Pb3
NF*	CuZn40Pb3

* Former national standards

Physical properties*

Electrical conductivity	MS/m	14.6
	% IACS	25
Thermal conductivity	W/(m*K)	113
Thermal expansion coefficient	(0-300℃) 10^{-6}/K	21.4
Density	g/cm³	8.46
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 (CuZn39Pb3 = 100 %)	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 ℃
Hot working	650-800 ℃
Soft annealing	450-600 ℃, 1-3 h
Thermal stress-relieving	200-300 ℃, 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 (extruded/soft)	to (hard)
R_m	[MPa]	340	600
$R_{p0,2}$	[MPa]	180	480
A_5	[%]	40	10
HB		90	175

Forms and sizes available

Material										
Wieland	EN designation Brief designation	Number	Outside diameter		Wall thickness		Circumscribing diameter		Diameter / width across flats	
Z32/Z33	CuZn39Pb3	CW614N	from	to	from	to	from*	to	from	to
Round tubes			8	170/250	0.5	20				
Drawn sections							2.5	130		
Extruded sections								150		
Sectional tubes										
Round and polygonal rods									2	250
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

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