

## Wieland-Z23

### Free-machining brass

Wieland-Z23 is a free-machining brass which combines the contrasting material properties of free machining and cold working exceptionally well. This material is particularly well established in various industries in the USA as the standard free-machining alloy C36000.

### Extruded/drawn products

#### Chemical composition\*

Cu	61%
Pb	3%
Zn	balance

\* Reference values in % by weight

#### Material designation

EN	CuZn36Pb3
	CW603N
UNS	C36000
DIN*	CuZn36Pb3-2.0375
BS*	CZ124
NF*	CuZn36Pb3

\* Former national standards

#### Physical properties\*

Electrical conductivity	MS/m	13
	% IACS	22
Thermal conductivity	W/(m*K)	100
Thermal expansion coefficient (0-300°C)	10 <sup>-6</sup> /K	20.6
Density	g/cm <sup>3</sup>	8.5
Modulus of elasticity	GPa	102

\* Reference values at room temperature

1 GPa = 1 kN/mm<sup>2</sup>

1 MS/m = 1 m/Ω • mm<sup>2</sup>

#### Fabrication properties

##### Forming

Machinability	90%
(CuZn39Pb3 = 100 %)	
Capacity for being cold worked	fair
Capacity for being hot worked	good

##### 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	885-900 °C
Hot working	700-800 °C
Soft annealing	450-650 °C, 1-3 h
Thermal stress-relieving	200-300 °C, 1-3 h

#### Product standards

Rod	EN 12164
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 <sub>m</sub> [MPa]	360	520
R <sub>p0.2</sub> [MPa]	150	500
A <sub>5</sub> [%]	45	12
HB	80	155

## Forms and sizes available

Material										
Wieland	EN designation		Outside diameter		Wall thickness		Circumscribing diameter		Diameter / width across flats	
	Brief designation	Number	from	to	from	to	from*	to	from	to
Z23	CuZn36Pb3	CW603N	8	130	0.5	20				
Round tubes										
Drawn sections							2.5	100		
Extruded sections								130		
Sectional tubes								100		
Round and polygonal rods									2	80
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 - Z23**

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