wieland

Wieland-N31

CuNi7Zn39Pb3Mn2 | Nickel silver (leaded)

Material designation

EN	CuNi7Zn39Pb3Mn2 CW400J
UNS	not standardized

Chemical composition*

Cu	49 %
Ni	7 %
Pb	3 %
Mn	2 %
Zn	balance

**Reference values in % by weight*

Material properties and typical applications

Wieland-N31 is a nickel silver with excellent machining properties making it possible to achieve high mechanical strength. Thanks to good hot working properties, complex shapes of semifinished products can be realized during extruding already.

Wieland-N31 has a silvery colour with a yellowish hue. It is highly suitable for manufacturing a wide variety of sections, precision turned and hot stamped parts requiring higher mechanical strength and higher corrosion resistance than for brass.

Physical properties*

Electrical conductivity	MS/m %IACS	3 5
Thermal conductivity	W/(m·K)	30
Thermal expansion coefficient (0–300 °C)	10^{-6}/K	19.5
Density	g/cm³	8.44
Moduls of elasticity	GPa	120

**Reference values at room temperature*

Types of delivery

The BU Extruded Products 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 %)	95 %
Capacity for being cold worked	poor
Capacity for being hot worked	good

Surface treatment

Polishing	
mechanical electrolytic	good poor
Electroplating	good

Joining

Resistance welding (butt weld)	good
Inert gas shielded arc welding	fair
Gas welding	poor
Hard soldering	fair
Soft soldering	good

Heat treatment

Melting range	850–900 °C
Hot working	700–800 °C
Soft annealing	600–700 °C 1–3 h
Thermal stress relieving	300–400 °C 1–3h

Corrosion resistance

Nickel silver generally exhibits relatively good corrosion resistance to atmospheric influences, organic substances (perspiration, environmental influences) as well as alkaline and neutral saline solutions.

Product standards

Rod	EN 12164 EN 12165
Wire	EN 12166
Section	EN 12167

Trademarks

scriptoline®

Further information is provided in our brochure Scriptoline.

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Mechanical properties according to EN

Round rods/polygonal rods — acc. to EN 12164

Temper	Diameter		Width across flats		Tensile strength R_m	Yield strength $R_{p0.2}$	Elongation %			Hardness	
	mm		mm		MPa	MPa	A100	A11.3	A	HB	
	from	to	from	to	min.	min.	min.	min.	min.	min.	max.
M	all		all		as manufactured – without specified mechanical properties						
R500	2	40	2	40	500	350	8	10	12	–	–
H125	2	40	2	40	–	–	–	–	–	125	165
R600	2	20	2	20	600	400	2	3	5	–	–
H155	2	20	2	20	–	–	–	–	–	155	190
R700	2	5	2	4	700	500	–	–	–	–	–
H180	2	5	2	4	–	–	–	–	–	180	–

Rectangular rods — acc. to EN 12167

Temper	Thickness		Tensile strength R_m	Yield strength $R_{p0.2}$	Elongation %			Hardness	
	mm		MPa	MPa	A100	A11.3	A	HB	
	from	to	min.	min.	min.	min.	min.	min.	max.
M	all		as manufactured – without specified mechanical properties						
R600	6	20	600	400	–	5	8	–	–
H155	6	20	–	–	–	–	–	155	190
R700	3	6	700	500	–	–	–	–	–
H180	3	6	–	–	–	–	–	180	–

Round wires — acc. to EN 12166

Temper	Diameter		Tensile strength R_m	Yield strength $R_{p0.2}$		Elongation %			Hardness	
	mm		MPa	MPa		A100	A11.3	A	HB	
	from	to	min.	min.	max.	min.	min.	min.	min.	max.
M	all		as manufactured – without specified mechanical properties							
H115	1.5	12	–	–	–	–	–	–	115	–
R500	1.5	12	500	350	–	8	10	12	–	–
H130	1.5	12	–	–	–	–	–	–	130	170
R600	1.5	12	600	400	–	2	3	5	–	–
H165	1.5	12	–	–	–	–	–	–	165	200
R700	1.5	5	700	500	–	–	–	–	–	–
H190	1.5	5	–	–	–	–	–	–	190	–

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