

Wieland-N59

CuNi9Zn41FeMn
Lead free nickel silver
for machining

Extruded and drawn products



Material designation

EN	not standardized
UNS	not standardized

Chemical composition*

Cu	49 %
Pb	≤ 0.1 %
Ni	9 %
Fe+Mn+Si	1 %
Zn	balance

* Reference values in % by weight

Physikalische Eigenschaften*

Electrical conductivity	MS/m %IACS	6 10
Thermal conductivity	W/(m·K)	40
Thermal expansion coefficient (0–300 °C)	10 ⁻⁶ /K	20
Density	g/cm ³	8.35
Modulus of elasticity	GPa	110

* Reference values at room temperature

Corrosion resistance

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

Product standards

No EN standard

Material properties and typical applications

Wieland-N59 has been developed to provide the market with a lead-free nickel silver exhibiting good machining properties. The addition of Fe, Mn and Si leads to the formation of hard silicides which act as chip breakers, on the one hand, and increase the strength of the material, on the other hand. N59 is suitable for connector housings with increased corrosion resistance requirements. Compared to the typical housing material CuNi7Zn39Pb3Mn2 (Wieland-N31), N59 has a much higher electrical conductivity.

The higher strength raises the wear resistance of ball pen tips. This enables longer writing flows of the pen. The corrosion resistance of N59 is comparable to the ball pen tips alloy CuNi12Zn38Mn5Pb2 (Wieland-N48).

Types of delivery

The Extruded and Drawn Products Division 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		Surface treatment	
Machinability (CuZn39Pb3 = 100 %)	50 %	Polishing	
Capacity for being cold worked	fair	mechanical	good
Capacity for being hot worked	good	electrolytic	poor
		Electroplating	good
Heat treatment			
		Melting range	870–900 °C
		Hot working	680–750 °C
		Soft annealing	600–650 °C 1–3 h
		Thermal stress relieving	300 °C 1–3 h
Joining			
Resistance welding (butt weld)	good		
Inert gas shielded arc welding	fair		
Hard soldering	fair		
Soft soldering	good		

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Dimensions and mechanical properties, typical values

Round wire for ball pen tips

Temper	Diameter		Tensile strength R_m MPa	Yield strength $R_{p0.2}$ MPa	Elongation A100 %	Hardness HV1
	mm from	mm to				
drawn	1	3	approx. 730	approx. 640	>2	approx. 210

Round rods

Temper	Diameter		Tensile strength R_m MPa	Yield strength $R_{p0.2}$ MPa	Elongation A11.3 %	Hardness HV1
	mm from	mm to				
drawn	6	8	approx. 730	approx. 560	approx. 11	approx. 200