

## Wieland-FX9 Nickel-free alloy

**Wieland-FX9** has been developed as nickel-free alternative to nickel-silver alloys. This silver-coloured alloy has excellent cold working properties making it possible to also manufacture complex sections. Wieland-FX9 does not contain nickel and is, therefore, anti-allergenic. It has met the human ecological requirements of the German certification authority FI (Research Institute) Hohenstein, and was therefore awarded the Öko-Tex certificate. Due to its low electrical conductivity it is also highly suitable as resistance alloy in electrical engineering.

## Extruded/drawn products

Chemical composition*		Material designation	
Mn	15%	EN	not standardized
Zn	15%	UNS	C66950
Al	1%	DIN*	not standardized
Cu	balance	BS*	not standardized
		NF*	not standardized

\* Reference values in % by weight

\* Former national standards

Physical properties*			Fabrication properties			Corrosion resistance*		
Electrical conductivity	MS/m	2.0	<b>Forming</b>	Machinability	20%	FX9 exhibits good resistance to fresh water, neutral or alkaline saline solutions, organic compounds, land, sea and industrial atmosphere.	The material is not resistant to acids, moist sulfur compounds, moist ammonia in the non-stress-relieved condition. It is moderately susceptible to stress corrosion cracking.	
	% IACS	3.0						Capacity for being cold worked
Thermal conductivity	W/(m*K)	15	Capacity for being hot worked	good				
			Thermal expansion coefficient (0-300°C) 10 <sup>-6</sup> /K	21.6	<b>Joining</b>			
Temperature coefficient of resistivity 10 <sup>-3</sup> /K	-0.01	Resistance welding			excellent			
		Density	g/cm <sup>3</sup>	8.03	Inert gas shielded arc welding			fair
Modulus of elasticity	GPa				125			Hard soldering
		Thermoelectric voltage against copper $\mu$ V/K	1.28	8.03				Soft soldering
					<b>Surface treatment</b>			
			Polishing	mechanical	excellent			none
				electrolytic	excellent			
			Electroplating		excellent			
			<b>Heat treatment</b>					
			Melting range		839 - 894°C			
			Hot working		700 - 800 °C			
			Soft annealing		500 - 700 °C			
			Thermal stress-relieving		200 - 300 °C			

\* Reference values at room temperature

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

1 MS/m = 1 m/Ω • mm<sup>2</sup>

### 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]	430	800
R <sub>p0.2</sub> [MPa]	250	710
A <sub>10</sub> [%]	40	8
HB	95	200

## 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
FX9	CuZn15Mn15Al	---								
Round tubes										
Drawn sections										
Extruded sections										
Sectional tubes										
Round and polygonal rods									2	4.5
Round wires									0.3	
Polygonal wires									2	

All values in mm

**Wieland - FX9**

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