

# Wieland-F12

CuMn12Ni2 | Resistance alloy

## Material designation

EN	not standardized
UNS	not standardized

## Chemical composition\*

Cu	balance
Mn	12 %
Ni	2 %

\*Reference values in % by weight

## Physical properties\*

Electrical conductivity	MS/m	2.4
	%IACS	4.1
Resistivity	$\Omega\text{mm}^2/\text{m}$	0.43 ±5 %
Thermal conductivity	W/(m·K)	22.0
Thermal expansion coefficient (0–300 °C)	$10^{-6}/\text{K}$	19.5
Density	$\text{g}/\text{cm}^3$	8.4
Modulus of elasticity	GPa	130

\*Reference values at room temperature

## Corrosion resistance

The corrosion resistance of Cu-Mn alloys is largely identical to that of pure copper. However, manganese-containing copper alloys tend to heal damaged protective layers more easily.

Compared to brass, F12 is insensitive to stress corrosion cracking.

## Product standards

not standardized

## Material properties and typical applications

**Wieland-F12** is a resistance alloy characterised by its low temperature coefficient of the electric resistance and its low thermal electromotive force versus copper. The alloy also exhibits long-term stability of its electric resistance. The alloy is suitable for the production of precision, normal and shunt resistors.

**Wieland-F12** is merchandised under the family brand RESISTAN which includes all Wieland products for resistors.

## 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 temps.

## Fabrication properties

### Forming

Machinability (CuZn39Pb3 = 100 %)	20 %
Capacity for being cold worked	good
Capacity for being hot worked	good

### Surface treatment

Polishing mechanical	good
electrolytic	good
Electroplating	good

## Joining

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

## Heat treatment

Melting range	930–970 °C
Hot working	750–850 °C
Soft annealing	600–700 °C 1–3 h

## Trademarks

**RESISTAN®**

Further information is provided in the brochure on RESISTAN.