wieland

Wieland-LV3

CuNi9Sn6 | Age hardening Copper-Nickel alloy

Material designation

EN	not standardized
UNS	C72700

Chemical composition*

Cu	Rest
Ni	9 %
Sn	6 %
Pb	≤ 0.02 %

** Reference values in % by weight*

Material properties and typical applications

Wieland LV3 is an age-hardenable alloy which is excellently suited for highly technical parts. The property profile of the finished parts can be specifically adjusted by heat treatment. High strengths of more than 1,000 MPa can be achieved which allow miniaturisation of the component and at the same time offer good spring properties even at higher operating temperatures. LV3 can be used as an alternative to copper-beryllium alloys.
Applications: Springs, spectacles, miniature components, turned parts such as connectors.

The material is lead free according to RoHS and ELV.

Physical properties*

Electrical conductivity	MS/m %IACS	5.2/7–8.7 9/12
Thermal conductivity	W/(m·K)	54
Thermal expansion coefficient (0–300 °C)	10^{-6}/K	17.3
Density	g/cm³	8.89
Moduls of elasticity	GPa	120

**Reference values at room temperature*

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

Machinability (CuZn39Pb3 = 100 %)	30 %
Capacity for being cold worked	excellent
Capacity for being hot worked	good

Surface treatment

Polishing	
mechanical	good
electrolytic	good
Electroplating	excellent

Joining

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

Heat treatment

Melting range	968–1,078 °C
Hot working	780–950 °C
Soft annealing	750–800 °C
Age hardening	350°C / 3 h

*high temperatures change the ageing condition

Corrosion resistance

High-copper alloys generally exhibit good resistance to organic substances and neutral or alkaline compounds. Insensitive to stress corrosion cracking.

Product standards

Rod	not standardized
Wire	not standardized
Section	not standardized

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Dimensions and mechanical properties

Standard values for achievable tensile strength R_m according to dimensional ranges		
Rods and wire	up to 8 mm	R_m 400–1,200 MPa
	8.1–10 mm	R_m 400–1,200 MPa

Possible tempers, guide values for mechanical properties

TB	Solution annealed	
	from	up to
R_m [MPa]		500
$R_{p0,2}$ [MPa]		250
A50 [%]	30	

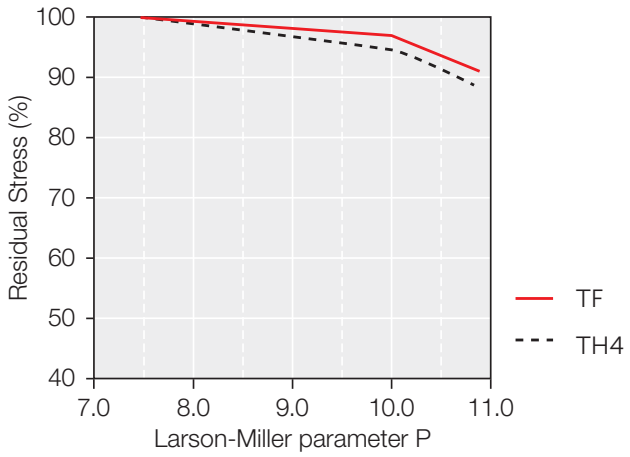
TF	Solution annealed, age hardened	
	from	up to
R_m [MPa]	750	880
$R_{p0,2}$ [MPa]	500	
A50 [%]	20	

TD	Solution annealed and cold drawn	
	from	up to
R_m [MPa]	520	> 850
$R_{p0,2}$ [MPa]	500	> 780
A50 [%]	1	

TH	Solution annealed, cold drawn, age hardened	
	from	up to
R_m [MPa]	950	> 1,200
$R_{p0,2}$ [MPa]	830	> 1,150
A50 [%]	0.1	> 13

Thermische Relaxation

Thermal Stress Relaxation LV3 –
Age hardened 350°/3h
Tension s1 = 0,8 * $R_{p0,2}$



Stress remaining after thermal relaxation as a function of Larson-Miller parameter P:

P= (20+log(t)) x (T + 273) x 0,001

Time t in hours
Temperature T in °C

Example: P = 9 is equivalent to 1,000h/118 °C

Wieland-Werke AG | Graf-Arco-Straße 36 | 89079 Ulm | Germany
info@wieland.com | wieland.com

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