Wieland-L49

CuNi9Sn2
C72500

Rolled Products

Wieland

Material Designation	
EN	CuNi9Sn2
UNS*	C72500

** Unified Numbering System (USA)*

Chemical Composition (Reference)	
Ni	9 %
Sn	2 %
Cu	balance

Typical Applications

- Relay springs
- Connectors

Physical Properties*		
Electrical Conductivity	MS/m %IACS	6.4 11
Thermal Conductivity	W/(m·K)	48
Coefficient of Electrical Resistance**	10^{-3}/K	0.6
Coefficient of Thermal Expansion**	10^{-6}/K	17.6
Density	g/cm³	8.89
Modulus of Elasticity	GPa	140
Specific Heat	J/(g·K)	0.370
Poisson's Ratio		0.34

** Reference values at room temperature*
*** Between 0 and 300 °C*

Fabrication Properties	
Capacity for Being Cold Worked	excellent
Machinability	less suitable
Capacity for Being Electroplated	excellent
Capacity for Being Hot-Dip Tinned	excellent
Soft Soldering	excellent
Resistance Welding	good
Gas Shielded Arc Welding	excellent
Laser Welding	good

Corrosion Resistance

Wieland-L49 has good corrosion resistance in industrial atmosphere and resists very well to tarnishing even at prolonged storage. It also exhibits good resistance to different waters, humidity, non oxidizing acids, alkaline and saline solutions, organic acids, and dry gases. It is insensitive to stress corrosion cracking.

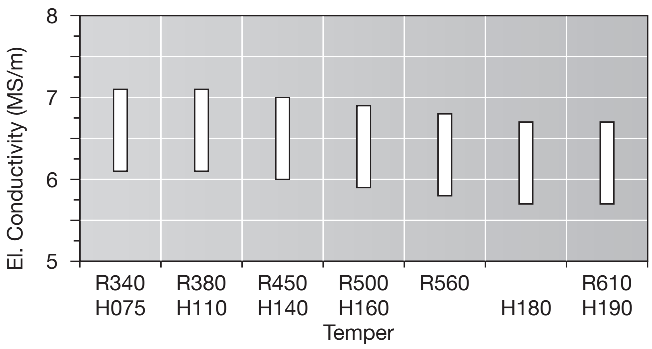
Mechanical Properties

Temper		R340	R380	R450	R500	R560	R610
Tensile Strength R_m	MPa	340–410	380–470	450–530	500–580	560–650	≥ 610
Yield Strength $R_{p0.2}$	MPa	≤ 250	≥ 200	≥ 370	≥ 450	≥ 520	≥ 580
Elongation A_{50mm}	%	≥ 30	≥ 10	≥ 6	≥ 3	≥ 2	–

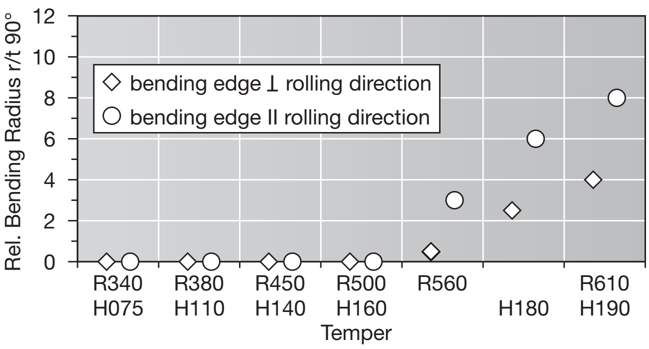
Intermediate tempers are feasible. Higher elongation values can be obtained by additional heat treatments.

Temper	H075	H110	H140	H160	H180	H190
Hardness HV	75–110	110–150	140–170	160–190	180–210	≥ 190

Electrical Conductivity



Bendability (Strip Thickness t ≤ 0.5 mm)



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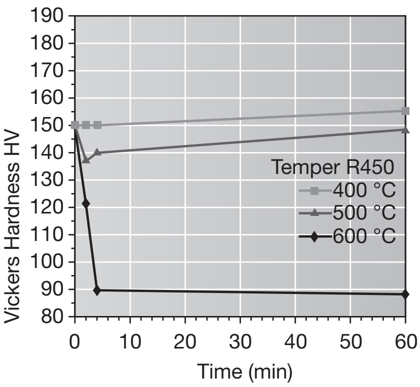
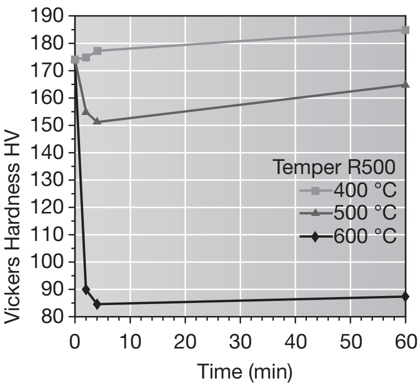
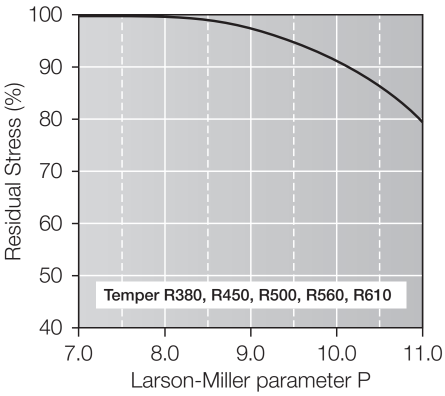
Resistance to Softening





Vickers hardness after heat treatment (typical values)

Thermal Stress Relaxation



Stress remaining after thermal relaxation as a function of Larson-Miller parameter (F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in °C.
Example: P = 9 is equivalent to 1.000 h/118 °C.
Measured on stress relief annealed specimens parallel to rolling direction. Total stress relaxation depends on the applied stress level. Furthermore, it is increased to some extent by cold deformation.

Fatigue Strength

The fatigue strength is defined as the maximum bending stress amplitude which a material withstands for 10^7 load cycles under symmetrical alternate load without breaking. It is dependent on the temper tested and is about $^1/_3$ of the tensile strength R_m.

Types and Formats Available

- Standard coils with outside diameters up to 1400 mm
- Traverse-wound coils with drum weights up to 1.5 t
- Multicoil up to 5 t
- Hot-dip tinned strip
- Contour-milled strip
- Sheet

Dimensions Available

- Strip thickness from 0.10 mm, thinner gauges on request
- Strip width from 3 mm, however min. 10 x strip thickness

Wieland-Werke AG **www.wieland.com**

Graf-Arco-Str. 36, 89079 Ulm, Germany, Phone +49 731 944 2030, Fax +49 731 944 4257, info@wieland.de

10/12 Bm (GSW/Ri)