

# Wieland-N18

CuNi18Zn20  
C76400

## Rolled Products



Material Designation	
EN	CuNi18Zn20
UNS*	C76400

\* Unified Numbering System (USA)

Chemical Composition (Reference)	
Cu	62 %
Ni	18 %
Zn	balance

Typical Applications
• Connectors
• Relay springs
• Shieldings

Physical Properties*		
Electrical Conductivity	MS/m	3.3
	%IACS	6
Thermal Conductivity	W/(m·K)	32
Coefficient of Electrical Resistance**	10 <sup>-3</sup> /K	0.3
Coefficient of Thermal Expansion**	10 <sup>-6</sup> /K	17.7
Density	g/cm <sup>3</sup>	8.70
Modulus of Elasticity	GPa	135
Specific Heat	J/(g·K)	0.380
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	excellent
Gas Shielded Arc Welding	excellent
Laser Welding	fair

**Corrosion Resistance**

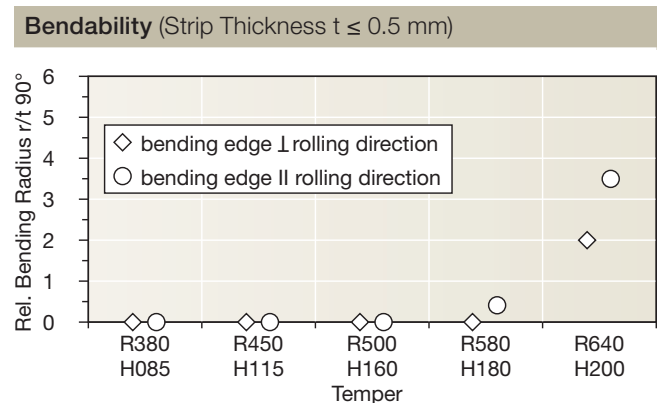
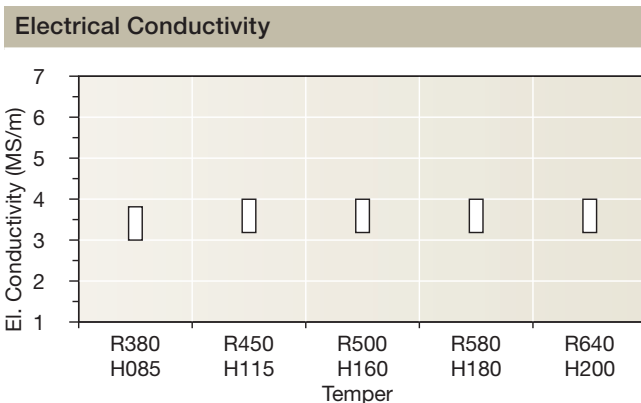
Good resistance to atmospheric influences, organic compounds, neutral and alkaline saline solutions. Not resistant to oxidizing acids, hydrous ammonia (sensitivity to stress corrosion cracking is much lower than that of brass).

Mechanical Properties						
Temper		R380	R450	R500	R580	R640
Tensile Strength R <sub>m</sub>	MPa	380–450	450–520	500–590	580–670	640–730
Yield Strength R <sub>p0.2</sub>	MPa	≤ 250	≥ 250	≥ 410	≥ 510	≥ 600
Elongation A <sub>50mm</sub>	%	≥ 27	≥ 9	≥ 3	–	–

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

Temper	H085	H115	H160	H180	H200
Hardness HV	85–115	115–160	160–190	180–210	200–230

Temper	G020	G035
Grain Size	mm	0.015–0.030
Hardness HV	≤ 120	≤ 110

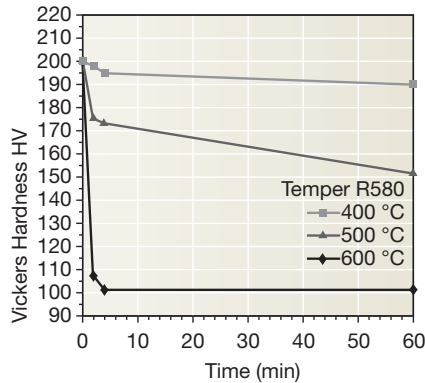
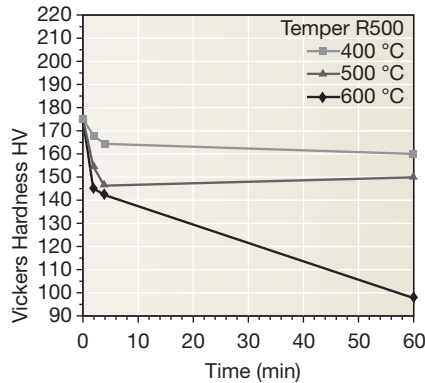


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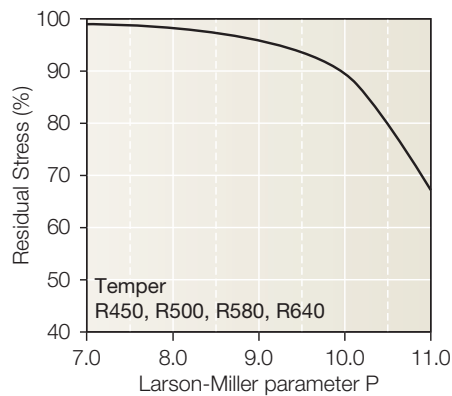
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## Resistance to Softening



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:  
 $P = (20 + \log(t)) \cdot (T + 273) \cdot 0.001$   
 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  $\frac{1}{3}$  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
- Strip and sheet with protective coating

## 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

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