wieland

Wieland-N18

CuNi18Zn20 | C76400

Material designation	
EN	CW409J
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 %IACS	3.3 6
Thermal conductivity	W/(m·K)	33
Coefficient of electrical resistance**	10^{-3}/K	0.3
Coefficient of thermal expansion**	10^{-6}/K	17.7
Density	g/cm³	8.73
Modulus of elasticity	GPa	135
Specific heat	J/(g·K)	0.383
Poisson´s ratio		0.34

* Reference values at room temperature
** Between 0 and 300 ℃

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 solutions. Not resistant to oxidizing acids, hydrous ammonia (sensitivity to stress corrosion cracking is much lower than that of brass).

Mechanical properties

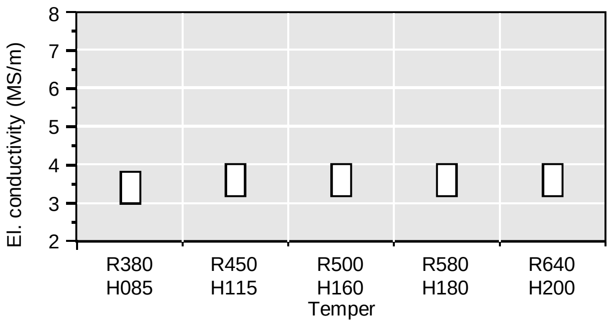
Temper		R380	R450	R500	R580	R640
Tensile strength R_m	MPa	380-450	450-520	500-590	580-670	640-730
Yield strength $R_{p0.2}$	MPa	≤ 250	≥ 250	≥ 410	≥ 510	≥ 600
Elongation A_{50mm}	%	≥ 27	≥ 9	≥ 3	-	-

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

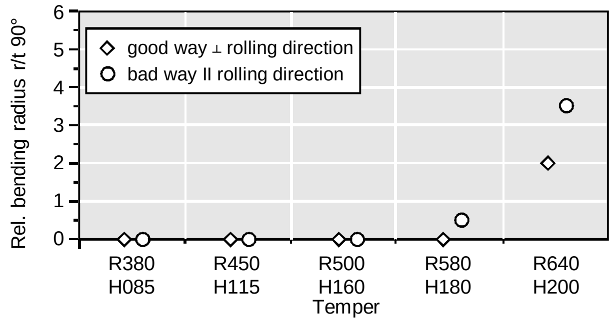
Temper	H085	H115	H160	H180	H200
Hardness HV	85-115	115-160	160-190	180-210	200-230

Temper		G020	G035
Grain size	mm	0.015-0.030	0.025-0.050
Hardness HV		≤ 120	≤ 110

Electrical conductivity



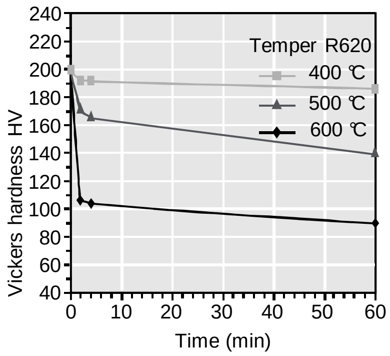
Bendability (Strip thickness t ≤ 0.5 mm)



Wieland-N12

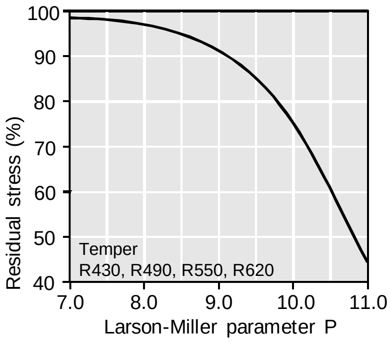
CuNi12Zn24 | C75700

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 P
(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 ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
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 tested temper and is about 1/3 of the tensile strength R_m.

Types and formats available

- Standard coils with outside diameters up to 1,400 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

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