WIELAND-N12

CuNi12Zn24

C75700

ROLLED PRODUCTS

wieland

Material Designation	
EN	CW403J
UNS*	C75700

** Unified Numbering System (USA)*

Chemical Composition (Reference)	
Cu	64 %
Ni	12 %
Zn	balance

Typical Applications

- Deep drawn parts
- Cutlery
- Contact springs
- Connectors

Physical Properties*		
Electrical Conductivity	MS/m %IACS	4,4 8
Thermal Conductivity	W/(m·K)	42
Coefficient of Electrical Resistance**	10^{-3}/K	0.4
Coefficient of Thermal Expansion**	10^{-6}/K	18.0
Density	g/cm³	8.67
Modulus of Elasticity	GPa	125
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	good

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

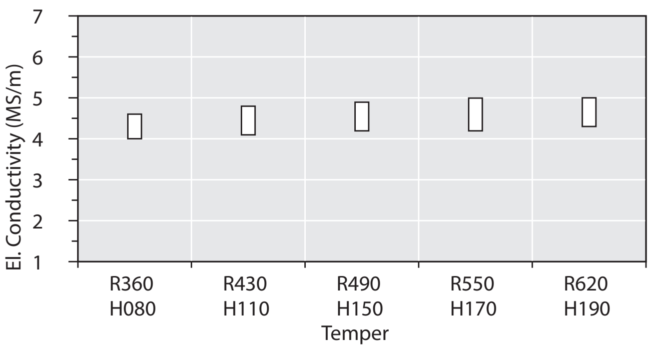
Temper		R360	R430	R490	R550	R620
Tensile Strength R_m	MPa	360–430	430–510	490–580	550–640	620–710
Yield Strength $R_{p0.2}$	MPa	≤ 230	≥ 230	≥ 400	≥ 480	≥ 580
Elongation A_{50mm}	%	≥ 35	≥ 8	≥ 5	–	–

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

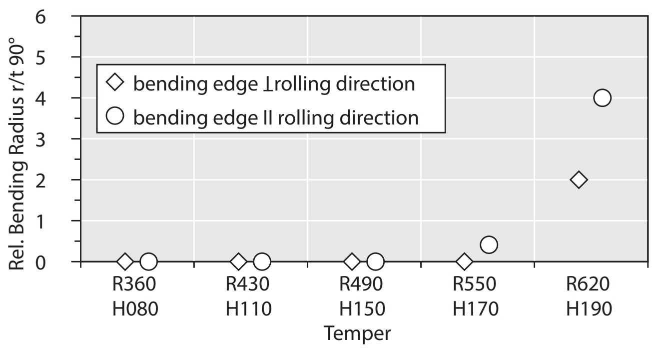
Temper		H080	H110	H150	H170	H190
Hardness HV		80–110	110–150	150–180	170–200	190–220

Temper		G020	G035
Grain Size	mm	0.015–0.030	0.025–0.050
Hardness HV		≤ 110	≤ 100

Electrical Conductivity



Bendability (Strip Thickness t ≤ 0.5 mm)



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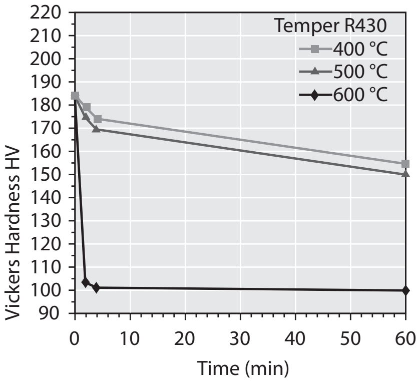
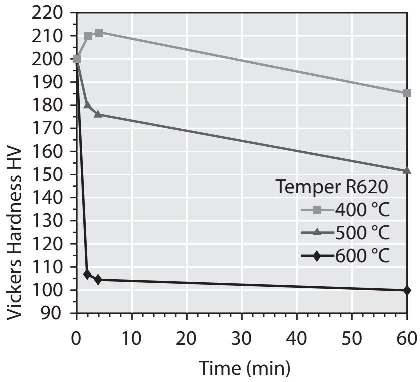
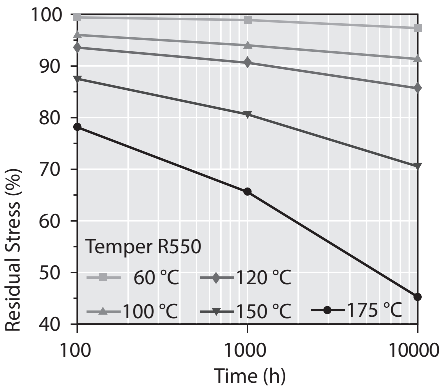
Resistance to Softening





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 ⅓ 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

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11/17 Bm (GSK/Tr)