Wieland-N12

CuNi12Zn24 | C75700 | CW403J

The nickel silver alloy C75700 combines mechanical strength, good formability and corrosion resistance which allow its use in springs and connectors in more harsh environments. Due to its excellent formability the alloy is also used for deep drawn parts. The natural color of the alloy comes nearest to silver; therefore, it is often used for cutlery and tableware that is silver-plated.

Chemical composition (Reference)	
Cu	64 %
Ni	12 %
Zn	remainder

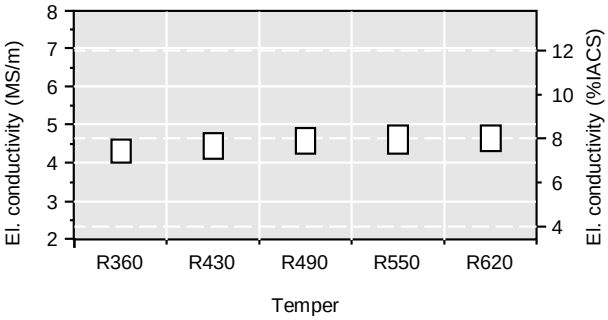
Physical properties (Reference values at room temperature)				
Electrical conductivity	4.4	MS/m	8	%IACS
Thermal conductivity	40	W/(m·K)	23	Btu·ft/(ft²·h·℉)
Coefficient of electrical resistance*	0.4	10^{-3}/K	0.2	10^{-3}/℉
Coefficient of thermal expansion*	16.2	10^{-6}/K	9.0	10^{-6}/℉
Density	8.67	g/cm³	0.313	lb/in³
Modulus of elasticity	125	GPa	18,000	ksi
Specific heat	0.380	J/(g·K)	0.091	Btu/(lb·℉)
Poisson´s ratio	0.34		0.34	

* Between 0 and 300 ℃

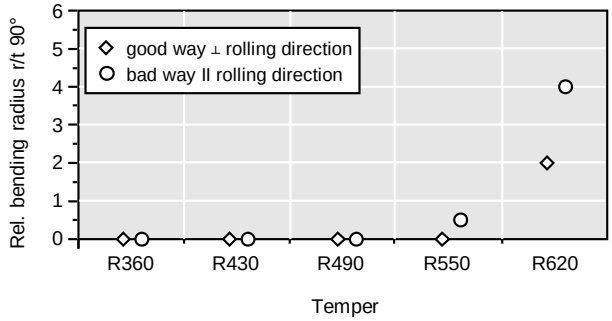
Mechanical properties (values in brackets are for information only)

Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R360	360-430	52-62	≤ 230	≤ 33	≥ 35	(80-110)
R430	430-510	62-74	≥ 230	≥ 33	≥ 8	(110-150)
R490	490-580	71-84	≥ 400	≥ 58	≥ 5	(150-180)
R550	550-640	80-93	≥ 480	≥ 70	-	(170-200)
R620	620-710	90-103	≥ 580	≥ 84	-	(190-220)

Electrical conductivity



Bendability (Strip thickness t ≤ 0.5 mm)



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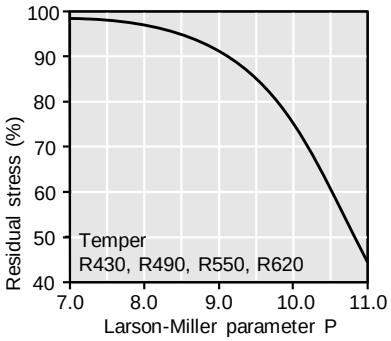
Thermal stress relaxation

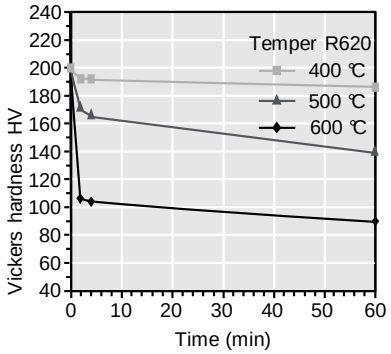


Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress relief annealed 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 temper tested and is about 1/3 of the tensile strength R_m.

Resistance to softening



Vickers hardness after heat treatment (typical values)

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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