Wieland-N17

CuNi18Zn27 | C77000 | CW410J

The nickel silver C77000 is an excellent spring material. It combines high strength with excellent stiffness, formability, corrosion resistance and solderability. These characteristics make it extremely adaptable to a range of spring applications including flat and slightly formed springs. C77000 is also commonly used for switches, jacks and relays in industrial equipment. Due to its high Ni content that provides a “white” appearance, C77000 is a natural choice for decorative trims and belt buckles.

Chemical composition (Reference)	
Cu	55 %
Ni	18 %
Zn	remainder

Physical properties (Reference values at room temperature)				
Electrical conductivity	3.5	MS/m	6	%IACS
Thermal conductivity	32	W/(m·K)	18	Btu·ft/(ft²·h·℉)
Coefficient of electrical resistance*	0.3	10^{-3}/K	0.2	10^{-3}/℉
Coefficient of thermal expansion*	16.7	10^{-6}/K	9.3	10^{-6}/℉
Density	8.70	g/cm³	0.314	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	

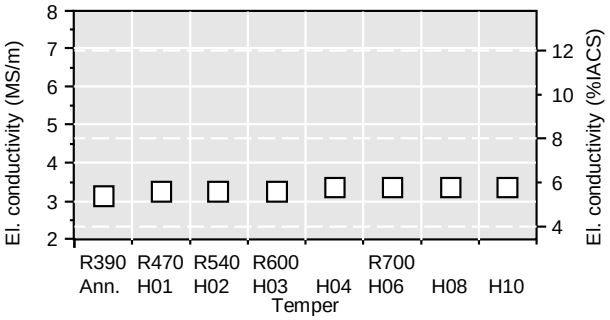
* Between 0 and 300 ℃

Mechanical properties (values in brackets are for information only)

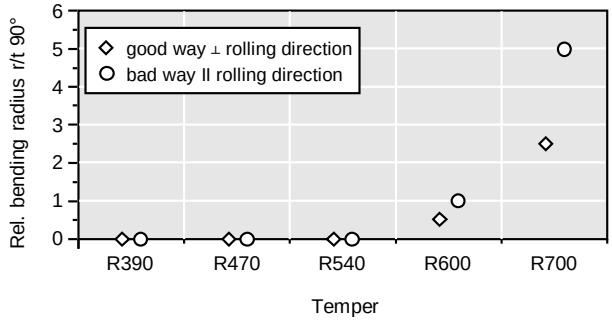
Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R390	390-470	57-68	≤ 280	≤ 41	≥ 30	(90-120)
R470	470-540	68-78	≥ 280	≥ 41	≥ 11	(120-170)
R540	540-630	78-91	≥ 450	≥ 65	≥ 4	(170-200)
R600	600-700	87-102	≥ 550	≥ 80	≥ 2	(190-220)
R700	700-800	102-116	≥ 660	≥ 96	≥ 1	(220-250)
Annealed	420-525	61-76	(220)	(32)	(43)	
H01*	475-600	69-87	(435)	(63)	(26)	
H02*	540-655	78-95	(540)	(78)	(14)	
H03	605-695	88-101	(635)	(92)	(8)	
H04*	635-750	92-109	(675)	(98)	(4)	
H06*	705-805	102-117	(740)	(107)	(≥ 1)	
H08*	745-850	108-123	(770)	(112)	(≤ 1)	
H10	≥ 800	≥ 116	(≥ 795)	(≥ 115)	(≤ 1)	

* According to ASTM B122

Electrical conductivity



Bendability (Strip thickness t ≤ 0.5 mm)



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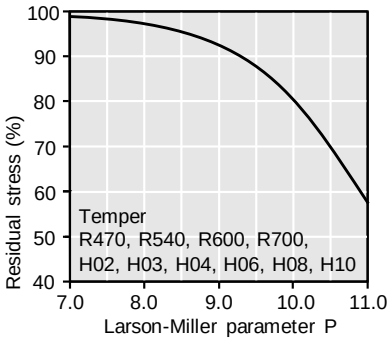
Thermal stress relaxation

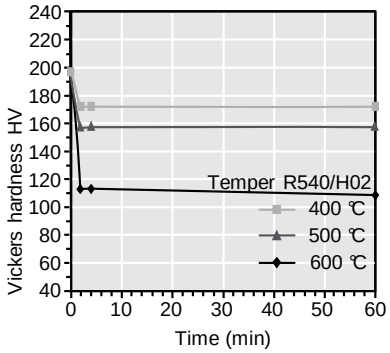


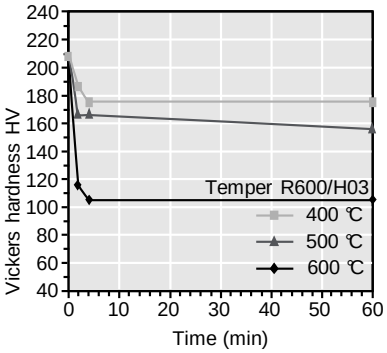
Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress relief annealed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

Softening resistance





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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