Wieland-K55

CuNi3Si1Mg | C70250

C70250 is a high-performance alloy that is produced to very high strength tempers. The precipitation of silicides, which are distributed uniformly through the entire length of the strip delivers high strength levels and excellent resistance to thermal stress relaxation. These properties combined with good electrical conductivity and excellent formability offer a unique product to many markets and their applications. Specifically, C70250 is a superior solution for connector applications that require high spring forces and elevated service temperatures. Thicknesses are produced down to very thin gauges of 0.1 mm and below for miniaturized connectors and CPU sockets.

Chemical composition (Reference)	
Ni	3 %
Si	0.65 %
Mg	0.15 %
Cu	remainder

Physical properties (Reference values at room temperature)				
Electrical conductivity	25	MS/m	43	%IACS
Thermal conductivity	190	W/(m·K)	110	Btu·ft/(ft²·h·℉)
Coefficient of electrical resistance*	1.8	10^{-3}/K	1.0	10^{-3}/℉
Coefficient of thermal expansion*	17.6	10^{-6}/K	9.8	10^{-6}/℉
Density	8.82	g/cm³	0.318	lb/in³
Modulus of elasticity	131	GPa	19,000	ksi
Specific heat	0.399	J/(g·K)	0.095	Btu/(lb·℉)
Poisson´s ratio	0.34		0.34	

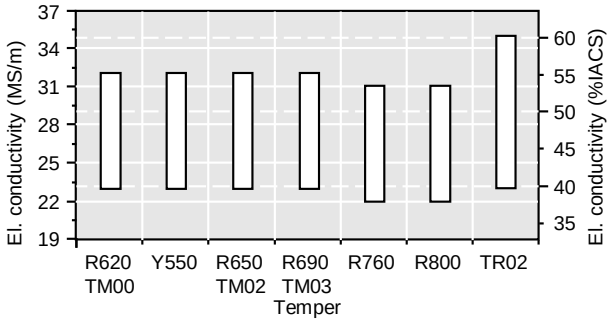
* Between 0 and 300 ℃

Mechanical properties (values in brackets are for information only)

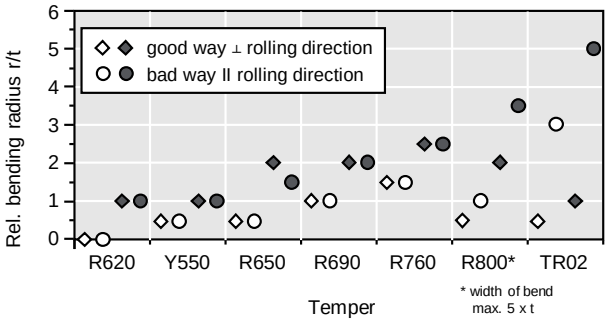
Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R620	620-700	90-102	≥ 500	≥ 73	≥ 14	(180-220)
Y550	620-740	90-107	≥ 550	≥ 80	≥ 14	(180-220)
R650	650-780	94-113	≥ 585	≥ 85	≥ 7	(200-240)
R690	690-800	100-116	≥ 655	≥ 95	≥ 5	(200-240)
R760	760-840	110-122	≥ 720	≥ 104	≥ 5	(210-250)
R800	800-900	116-131	≥ 750	≥ 109	≥ 1	(230-270)
TR02	608-725	88-105	550-650	80-94	≥ 6	(180-220)
TM00*	620-760	90-110	≥ 450	≥ 65	≥ 10	
TM02*	655-825	95-120	≥ 585	≥ 83	≥ 7	
TM03*	690-860	100-125	≥ 655	≥ 95	≥ 5	

* According to ASTM B888

Electrical conductivity



Bendability (Strip thickness t ≤ 0.5 mm) ◇○ 90° ◆● 180°



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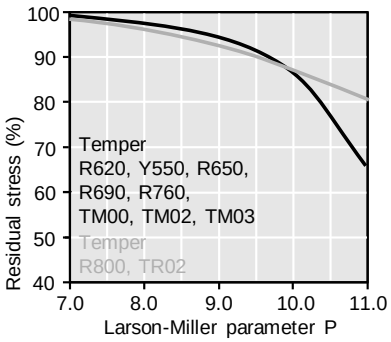
Thermal stress relaxation

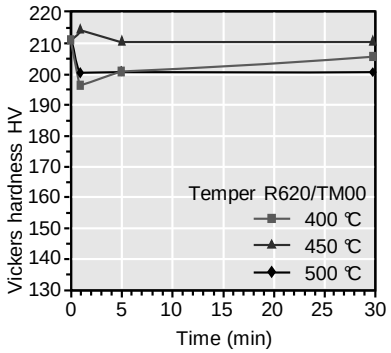


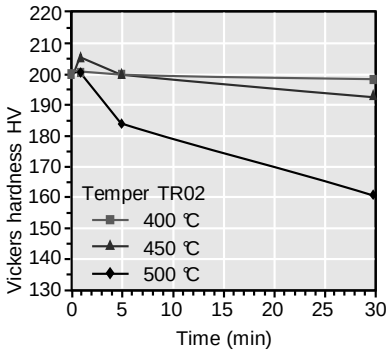
Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress relief annealed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

Wieland-Werke AG | Graf-Arco-Straße 36 | 89079 Ulm | Germany
info@wieland.com | wieland.com
Wieland Rolled Products North America | 4803 Olympia Park Plaza, Suite 3000 | Louisville, Kentucky | USA
infona@wieland.com | wieland-rolledproductsna.com

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