Wieland-K88

CuCrAgFeTiSi | C18080

Wieland-K88 is a complex copper alloy system developed specifically for high temperature under hood automotive connectors and smart high power distribution components. Design engineers can expect high performance properties that include extreme resistance to stress relaxation – up to 200 °C – and very high electrical/thermal conductivity. In addition, K88 has excellent formability and good platability.

Chemical composition (Reference)	
Cr	0.5 %
Ag	0.2 %
Fe	0.08 %
Ti	0.06 %
Si	0.03 %
Cu	remainder

Physical properties (Reference values at room temperature)				
Electrical conductivity	46	MS/m	80	%IACS
Thermal conductivity	320	W/(m·K)	185	Btu·ft/(ft²·h·℉)
Coefficient of electrical resistance*	3.0	10^{-3}/K	1.7	10^{-3}/℉
Coefficient of thermal expansion*	17.6	10^{-6}/K	9.8	10^{-6}/℉
Density	8.92	g/cm³	0.322	lb/in³
Modulus of elasticity	140	GPa	20,300	ksi
Specific heat	0.381	J/(g·K)	0.091	Btu/(lb·℉)
Poisson´s ratio	0.34		0.34	

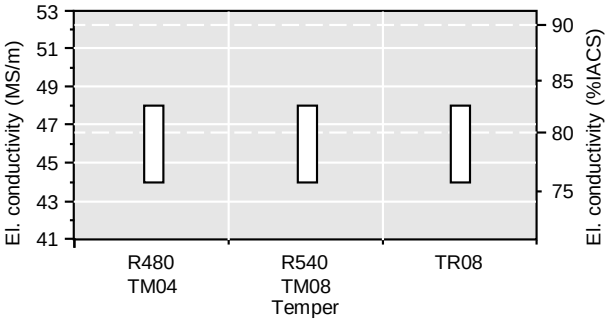
* Between 0 and 300 °C

Mechanical properties (values in brackets are for information only)

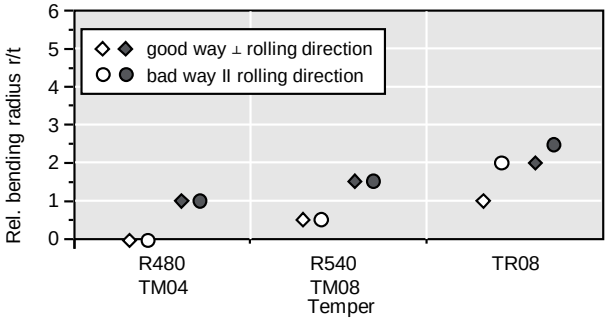
Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R480/TM04*	480-560	70-81	≥ 450	≥ 65	≥ 7	(140-170)
R540/TM08*	540-630	78-90	≥ 520	≥ 75	≥ 2	(150-180)
TR08*	520-620	75-91	≥ 500	≥ 72	≥ 7	(160-190)

* According to ASTM B936

Electrical conductivity



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



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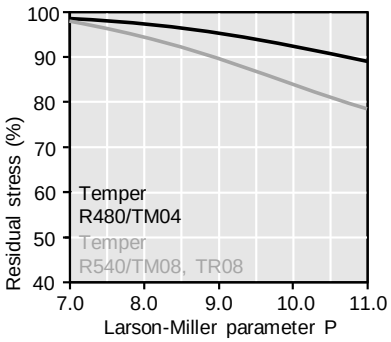
Thermal stress relaxation

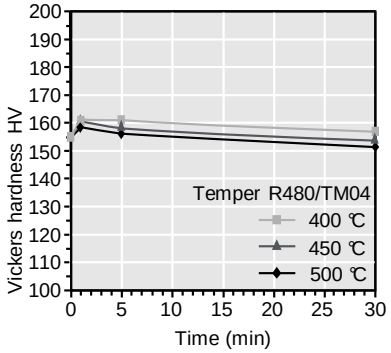


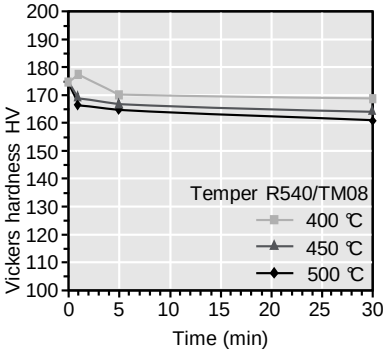
Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress relief annealed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

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