Wieland-K80®

CuFeP
C19210

Rolled Products

Material Designation	
EN	no EN standard
UNS*	C19210

** Unified Numbering System (USA)*

Chemical Composition (Reference)	
Fe	0.1 %
P	0.03 %
Cu	balance

Typical Applications

- Leadframes for power transistors
- Components for the electrical industry
- Connector pins

Physical Properties*		
Electrical Conductivity	MS/m %IACS	53 91
Thermal Conductivity	W/(m·K)	350
Coefficient of Electrical Resistance**	10^{-3}/K	3.2
Coefficient of Thermal Expansion**	10^{-6}/K	17.0
Density	g/cm³	8.89
Modulus of Elasticity	GPa	130
Specific Heat	J/(g·K)	0.385
Poisson's Ratio		0.34

* *Reference values at room temperature*
** *Between 0 and 300 °C*

Fabrication Properties	
Capacity for Being Cold Worked	excellent
Machinability	fair
Capacity for Being Electroplated	excellent
Capacity for Being Hot-Dip Tinned	excellent
Soft Soldering	excellent
Resistance Welding	fair
Gas Shielded Arc Welding	excellent
Laser Welding	fair

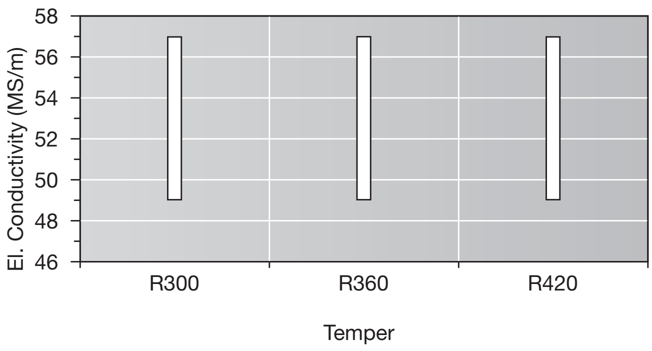
Corrosion Resistance

Wieland-K80® has good corrosion resistance in natural atmosphere (also sea air) and industrial atmosphere. In different waters and neutral saline solutions, it exhibits better resistance to abrasive corrosion and pitting than SF-Cu. Wieland-K80® is insensitive to stress corrosion cracking.

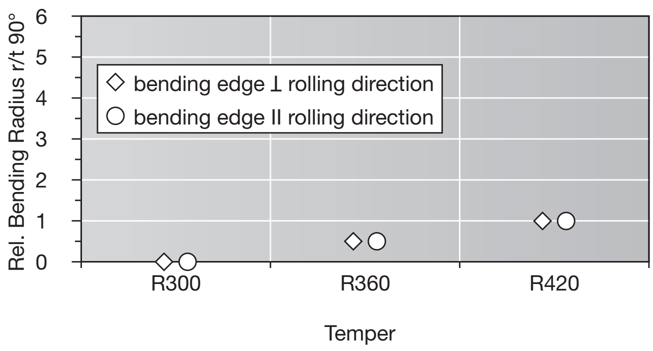
Mechanical Properties				
Temper		**R300**	**R360**	**R420**
Tensile Strength R_m	MPa	300–380	360–440	420–500
Yield Strength $R_{p0.2}$	MPa	≤ 300	≥ 260	≥ 350
Elongation A_{50mm}	%	≥ 10	≥ 3	≥ 2
Hardness HV (for information only)		(80–110)	(100–130)	(120–150)

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

Electrical Conductivity



Bendability (Strip Thickness t ≤ 0.5 mm)



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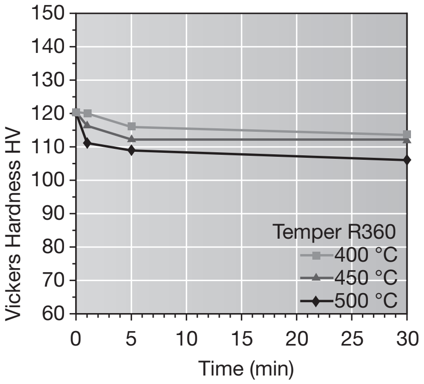
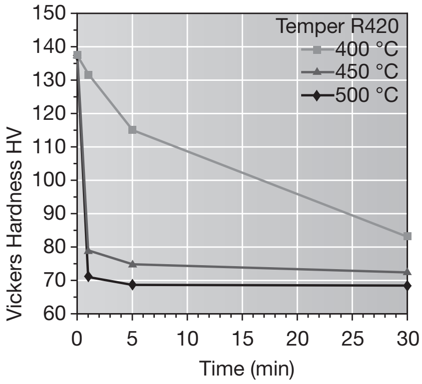
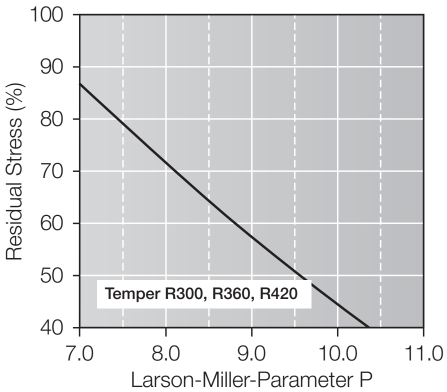
Resistance to Softening





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 rolled to temper 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
- Hot-dip tinned strip
- Contour-milled strip

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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10/12 Bm (GSW/Ri)