Wieland-K65®
CuFe2P
C19400

Rolled Products

Wieland

Material Designation

EN	CuFe2P
UNS*	C19400

** Unified Numbering System (USA)*

Chemical Composition (Reference)

Fe	2.4 %
Zn	0.12 %
P	0.03 %
Cu	balance

Typical Applications

- Components for the electrical industry
- Stamped parts
- Connectors
- Leadframes for semiconductors

Physical Properties*

Electrical Conductivity	MS/m %IACS	37 64
Thermal Conductivity	W/(m·K)	280
Coefficient of Electrical Resistance**	10^{-3}/K	3.3
Coefficient of Thermal Expansion**	10^{-6}/K	17.6
Density	g/cm³	8.91
Modulus of Elasticity	GPa	123
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	good
Machinability	less suitable
Capacity for Being Electroplated	good
Capacity for Being Hot-Dip Tinned	excellent
Soft Soldering	excellent
Resistance Welding	fair
Gas Shielded Arc Welding	excellent
Laser Welding	good

Corrosion Resistance

Wieland-K65® exhibits good corrosion resistance in natural atmosphere (also sea air) and industrial atmosphere. In different waters and neutral saline solutions, it shows better resistance to corrosion through abrasion and pitting than SF-Cu. Wieland-K65® is insensitive to stress corrosion cracking.

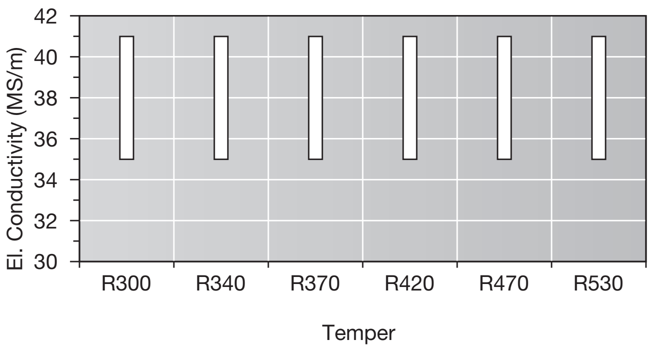
Mechanical Properties

Temper		R300	R340	R370	R420	R470	R530
Tensile Strength R_m	MPa	300–340	340–390	370–430	420–480	470–530	530–570
Yield Strength $R_{p0.2}$	MPa	≤ 240	≥ 240	≥ 330	≥ 380	≥ 440	≥ 470
Elongation A_{50mm}	%	≥ 20	≥ 10	≥ 6	≥ 3	≥ 4	≥ 5

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

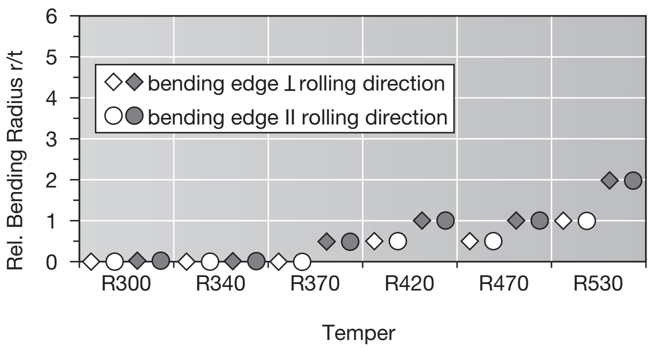
Temper	H080	H100	H120	H130	H140	H150
Hardness HV	80–100	100–120	120–140	130–150	140–160	150–170

Electrical Conductivity



Bendability (Strip Thickness t ≤ 0.5 mm)

◇○ 90° ◆● 180°



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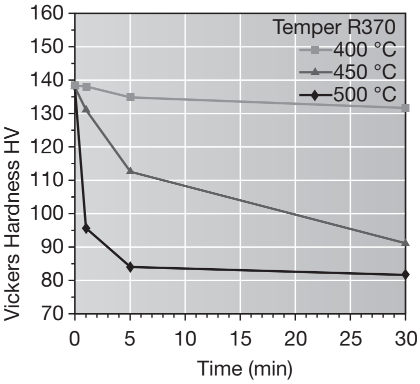
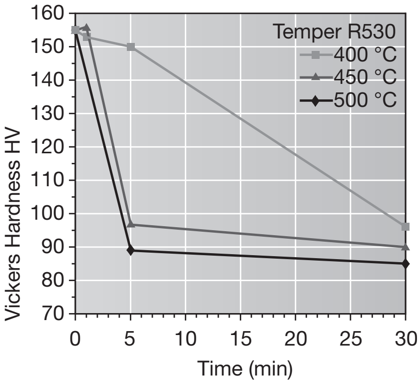
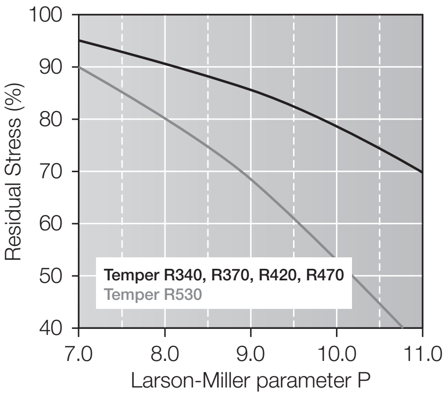
Resistance to Softening





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 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.

Types and Formats Available

- Standard coils with outside diameters up to 1400 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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10/12 Bm (GSW/Ri)