wieland

Wieland-K65

CuFe2P | C19400 | CW107C

Developed in the mid-1960s, C19400 continues to be used globally for a variety of applications including automotive and electrical connectors. C19400 offers a unique combination of good electrical and thermal conductivity with high strength, which makes it an excellent choice to replace standard copper or brass alloys for enhanced performance.

Chemical composition (Reference)	
Fe	2.4 %
Zn	0.12 %
P	0.03 %
Cu	balance

Physical properties (Reference values at room temperature)				
Electrical conductivity	37	MS/m	64	%IACS
Thermal conductivity	260	W/(m·K)	150	Btu·ft/(ft²·h·°F)
Coefficient of electrical resistance*	3.3	10^{-3}/K	1.8	10^{-3}/°F
Coefficient of thermal expansion*	17.6	10^{-6}/K	9.8	10^{-6}/°F
Density	8.91	g/cm³	0.322	lb/in³
Modulus of elasticity	121	GPa	17,500	ksi
Specific heat	0.385	J/(g·K)	0.092	Btu/(lb·°F)
Poisson´s ratio	0.34		0.34	

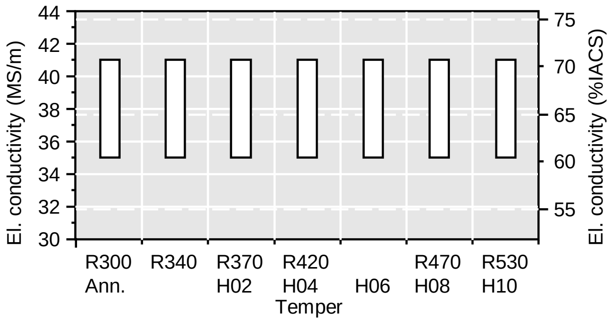
* Between 0 and 300 °C

Mechanical properties (values in brackets are for information only)

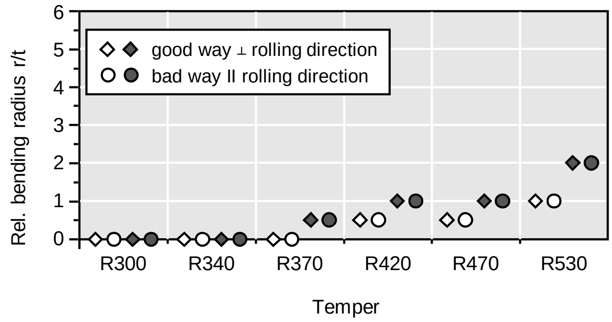
Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R300	300-340	44-49	≤ 240	≤ 35	≥ 20	(80-100)
R340	340-390	49-57	≥ 240	≥ 35	≥ 10	(100-120)
R370	370-430	54-62	≥ 330	≥ 48	≥ 6	(120-140)
R420	420-480	61-70	≥ 380	≥ 55	≥ 3	(130-150)
R470	470-530	68-77	≥ 440	≥ 64	≥ 4	(140-160)
R530	530-570	77-83	≥ 470	≥ 68	≥ 5	(150-170)
Annealed*	275-435	40-63	≥ 110	≥ 16	≥ 10	
Light Anneal	310-380	45-55	(160)	(23)	(26)	
H02*	365-435	53-63	≥ 250	≥ 36	≥ 6	
H04*	415-485	60-70	≥ 365	≥ 53	≥ 3	
H06*	460-505	67-73	≥ 440	≥ 64	≥ 2	
H08*	485-525	70-76	≥ 460	≥ 67	≥ 2	
H10*	505-550	73-80	≥ 485	≥ 70	≥ 1	

* According to ASTM B888

Electrical conductivity



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



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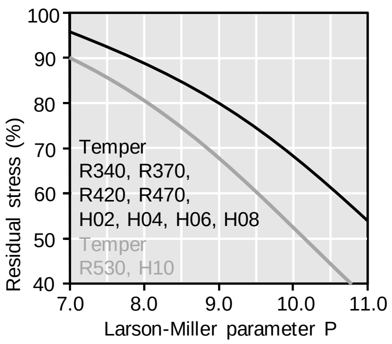
Thermal stress relaxation

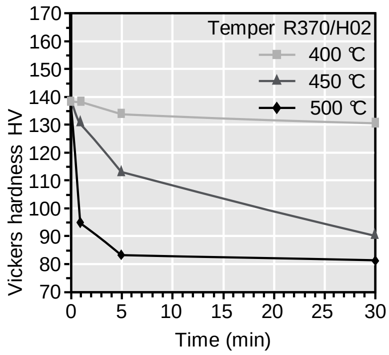


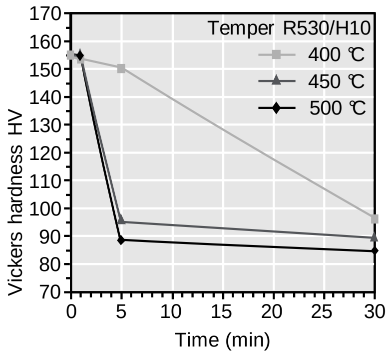
Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
$P = (20 + \log(t)) \cdot (T + 273) \cdot 0.001$.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress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