wieland

Wieland-K85

CuFe1MgP | C19700

C19700 offers strength and formability similar to the common CuFeP alloy C19400 but with higher electrical and thermal conductivity. The higher conductivity allows C19700 to replace traditional brasses and bronzes in applications where high current carrying capacity is required. Applications include fuse clips, automotive terminal blades, and cable shielding.

Chemical composition (Reference)	
Fe	0.6 %
Mg	0.1 %
P	0.2 %
Cu	balance

Physical properties (Reference values at room temperature)				
Electrical conductivity	46	MS/m	80	%IACS
Thermal conductivity	320	W/(m·K)	185	Btu·ft/(ft^2·h·℉)
Coefficient of electrical resistance*	3.0	10^{-3}/K	1.7	10^{-3}/℉
Coefficient of thermal expansion*	17.3	10^{-6}/K	9.6	10^{-6}/℉
Density	8.84	g/cm^3	0.319	lb/in^3
Modulus of elasticity	121	GPa	17,500	ksi
Specific heat	0.394	J/(g·K)	0.094	Btu/(lb·℉)
Poisson´s ratio	0.34		0.34	

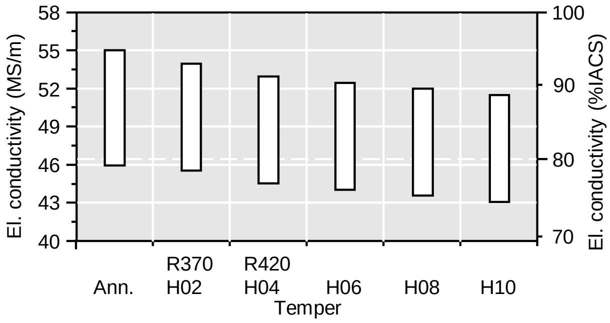
* Between 0 and 300 ℃

Mechanical properties (values in brackets are for information only)

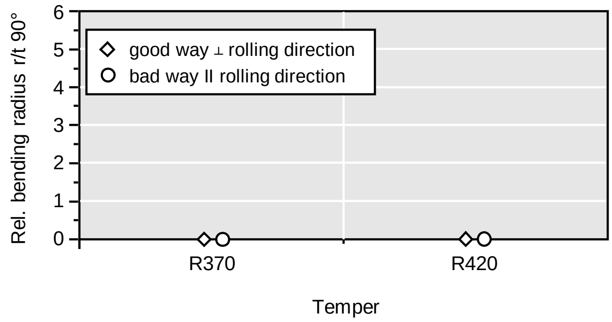
Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R370	370-430	54-62	≥ 300	≥ 44	≥ 6	(120-140)
R420	420-480	61-70	≥ 380	≥ 55	≥ 4	(130-150)
Annealed*	295-365	43-53	≥ 110	≥ 16	≥ 20	
H02*	365-435	53-63	≥ 250	≥ 36	≥ 6	
H04*	415-485	60-70	≥ 365	≥ 53	≥ 2	
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)



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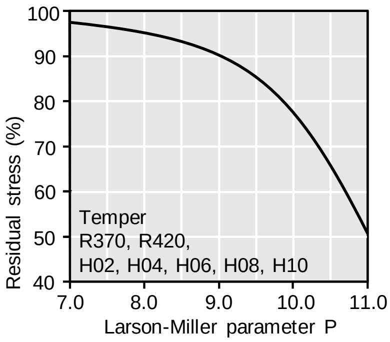
Thermal stress relaxation

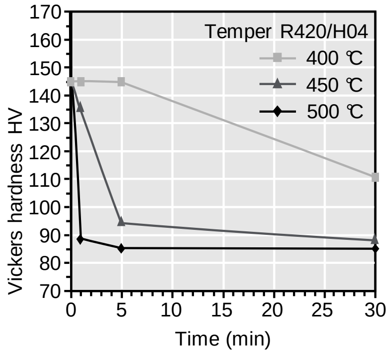


Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress-relief annealed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

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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