wieland

Wieland-K82

CuZr | C15100

CuZr is a precipitation hardened alloy with very high electrical conductivity. K82 exhibits excellent resistance to thermal stress relaxation and softening at elevated temperatures as well as a interesting combination of strength and bend formability. This alloy is suitable for various high-current applications, e.g. high current connectors, power distribution systems and electric vehicle components.

Chemical composition (Reference)	
Zr	0.1 %
Cu	remainder

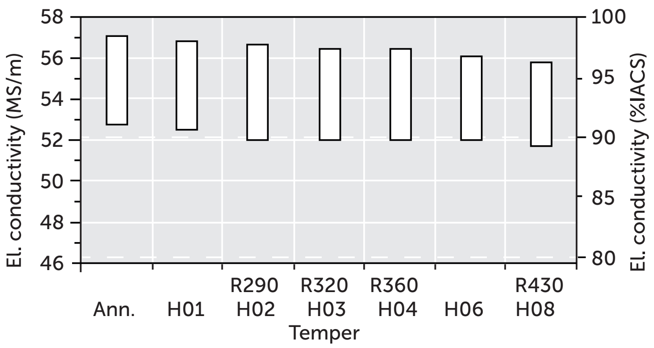
Physical properties (Reference values at room temperature)				
Electrical conductivity	55	MS/m	95	%IACS
Thermal conductivity	360	W/(m·K)	208	Btu·ft/(ft²·h·°F)
Coefficient of electrical resistance*	3.7	10^{-3}/K	2.1	10^{-3}/°F
Coefficient of thermal expansion*	17.7	10^{-6}/K	9.8	10^{-6}/°F
Density	8.94	g/cm³	0.323	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

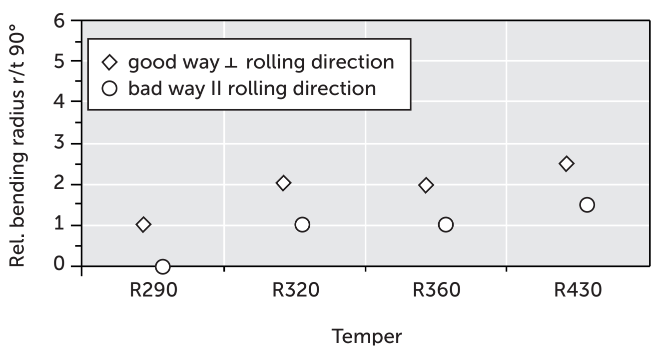
Mechanical properties (values in brackets are for information only)						
Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R290	290-360	42-52	≥ 260	≥ 38	≥ 10	(90-110)
R320	320-390	46-57	≥ 310	≥ 45	≥ 5	(100-120)
R360	360-430	52-62	≥ 350	≥ 51	≥ 2	(110-140)
R430	430-520	62-75	≥ 420	≥ 61	≥ 1	(115-145)
Annealed*	255-290	37-42	≥ 60	≥ 9	≥ 35	
H01*	275-310	40-45	≥ 180	≥ 26	≥ 11	
H02*	295-350	43-51	≥ 240	≥ 35	≥ 4	
H03*	325-385	47-56	≥ 310	≥ 45	≥ 2	
H04*	365-425	53-62	≥ 350	≥ 51	≥ 2	
H06*	405-450	59-65	≥ 395	≥ 57	≥ 1	
H08*	440-490	64-71	≥ 425	≥ 62	≥ 1	

*According to ASTM B888

Electrical conductivity



Bendability (Strip thickness t ≤ 0.5 mm)



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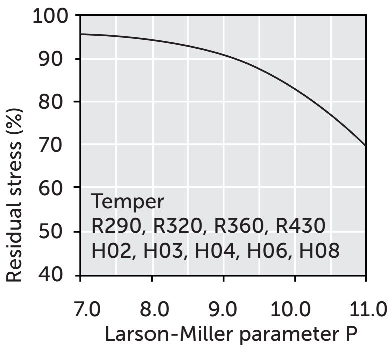
Thermal stress relaxation

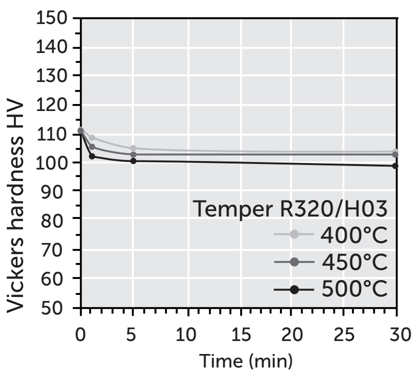


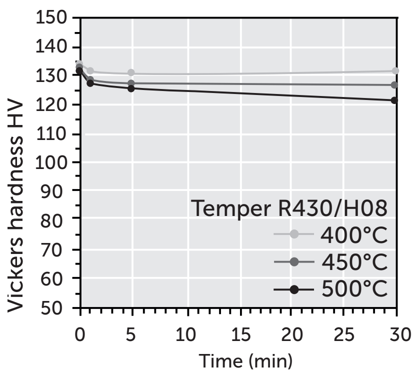
Stress remaining after thermal relaxation as a function of Larson-Miller parameter P (F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
$P = (20 + \log(t)) \cdot (T + 273) \cdot 0.001$.
Time t in hours, temperature T in °C.
Example: P = 9 is equivalent to 1,000 h/118 °C.
Measured on stress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

Softening resistance





Vickers hardness after heat treatment (typical values)

Types and formats available

- Standard coils with outer 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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