Wieland-B16

CuSn6 | C51900 | CW452K

CuSn6 is characterized by a favorable combination of cold formability, strength, electrical conductivity and spring properties. It even provides reasonable thermal stability. This makes CuSn6 strip a prime candidate for signal connectors produced by stamping and bending operations, which require a certain spring force. CuSn6 is also a very frequently used material for press-fit pins/compliant pins with a flexible press-fit zone. The temperature stability of this alloy allows application even at elevated service temperatures. Thermal relaxation is negligible at 100 °C and a cceptable up to 120 °C.

Chemical composition (Reference)	
Sn	6 %
Cu	remainder

Physical properties (Reference values at room temperature)				
Electrical conductivity	10	MS/m	17	%IACS
Thermal conductivity	75	W/(m·K)	43	Btu·ft/(ft²·h·°F)
Coefficient of electrical resistance*	0.7	10^{-3}/K	0.4	10^{-3}/°F
Coefficient of thermal expansion*	18.0	10^{-6}/K	10.0	10^{-6}/°F
Density	8.80	g/cm³	0.318	lb/in³
Modulus of elasticity	118	GPa	17,000	ksi
Specific heat	0.377	J/(g·K)	0.090	Btu/(lb·°F)
Poisson´s ratio	0.34		0.34	

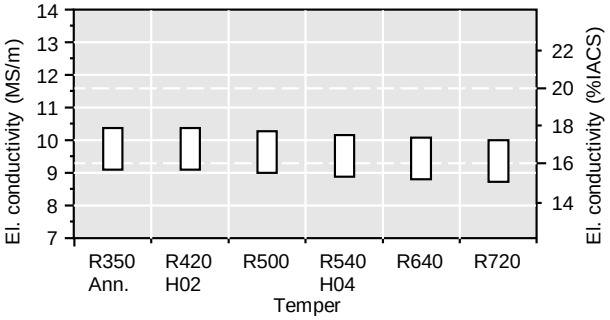
* Between 0 and 300 °C

Mechanical properties (values in brackets are for information only)

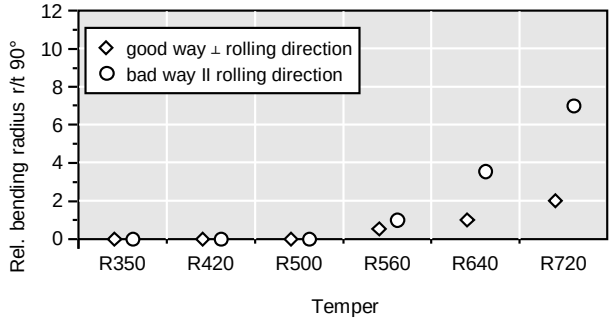
Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R350	350-420	55-61	≤ 300	≤ 44	≥ 45	(80-110)
R420	420-520	61-75	≥ 360	≥ 52	≥ 17	(125-165)
R500	500-590	73-86	≥ 460	≥ 67	≥ 8	(160-190)
R560	560-650	81-94	≥ 530	≥ 77	≥ 5	(180-210)
R640	640-730	93-106	≥ 610	≥ 88	≥ 3	(200-230)
R720	≥ 720	≥ 104	≥ 690	≥ 100	-	(≥ 220)
Annealed*	330-435	48-63				
H02*	440-545	64-79				
H04*	550-660	80-96				

* According to ASTM B103

Electrical conductivity



Bendability (Strip thickness t ≤ 0.5 mm)



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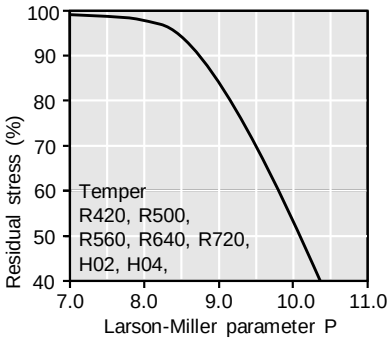
Thermal stress relaxation

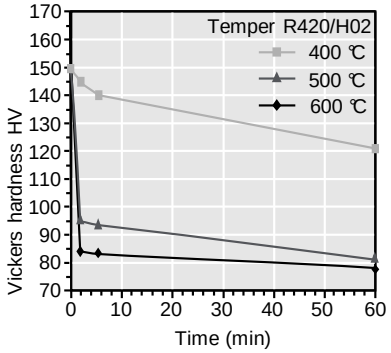


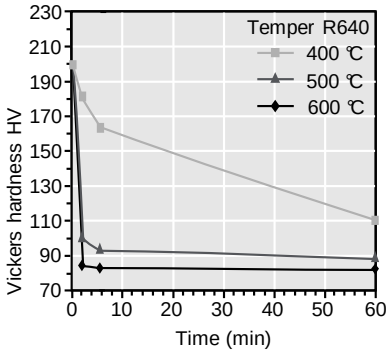
Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress relief annealed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

Resistance to softening





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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