wieland

Wieland-B18

CuSn8 | C52100 | CW453K

CuSn8 combines all positive properties of the standard phosphor bronzes with 5 and 6 % Sn. Due to its high tin content of 8 %, the material is able to provide even higher strength and thus is a candidate material for spring connectors that have very high spring forces and which are designed to transmit electric signals. It even provides a reasonable thermal stability. The temperature stability of this alloy allows application even at elevated service temperatures. Thermal relaxation is negligible at 100 ℃ and acceptable up t o 120 ℃.

Chemical composition (Reference)	
Sn	8 %
Cu	remainder

Physical properties (Reference values at room temperature)				
Electrical conductivity	7.5	MS/m	13	%IACS
Thermal conductivity	62	W/(m·K)	36	Btu·ft/(ft²·h·℉)
Coefficient of electrical resistance*	0.7	10^{-3}/K	0.4	10^{-3}/℉
Coefficient of thermal expansion*	18.2	10^{-6}/K	10.1	10^{-6}/℉
Density	8.80	g/cm³	0.318	lb/in³
Modulus of elasticity	110	GPa	16,000	ksi
Specific heat	0.377	J/(g·K)	0.090	Btu/(lb·℉)
Poisson´s ratio	0.34		0.34	

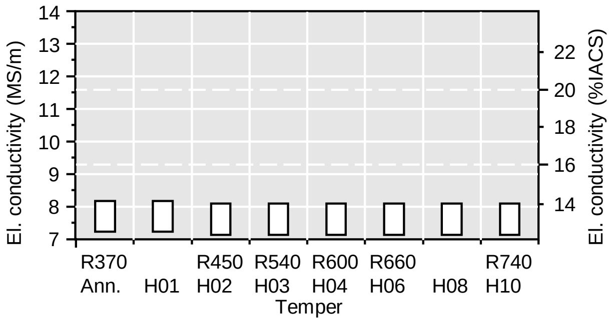
* Between 0 and 300 ℃

Mechanical properties (values in brackets are for information only)

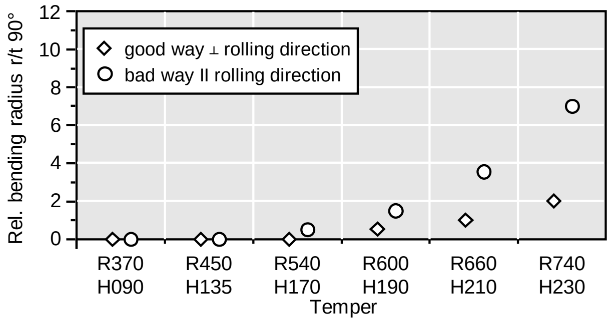
Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50}	Hardness HV
	MPa	ksi	MPa	ksi	%	
R370	370-450	54-65	≤ 300	≤ 44	≥ 50	(90-120)
R450	450-550	65-80	≥ 370	≥ 54	≥ 20	(135-175)
R540	540-630	78-91	≥ 470	≥ 68	≥ 13	(170-200)
R600	600-690	87-100	≥ 540	≥ 78	≥ 5	(190-220)
R660	660-750	96-109	≥ 620	≥ 90	≥ 3	(210-240)
R740	≥ 740	≥ 107	≥ 700	≥ 102	-	(≥ 230)
Annealed*	385-450	56-65	≥ 160	≥ 23	≥ 60	
H01*	435-515	63-75	≥ 240	≥ 35	≥ 40	
H02*	475-580	69-84	≥ 350	≥ 51	≥ 25	
H03*	550-635	80-92	≥ 485	≥ 70	≥ 18	
H04*	585-690	85-100	≥ 540	≥ 78	≥ 12	
H06*	670-770	97-112	≥ 635	≥ 92	≥ 10	
H08*	725-820	105-119	≥ 690	≥ 100	≥ 3	
H10*	760-840	110-122	≥ 725	≥ 105	≥ 2	

* According to ASTM B888

Electrical conductivity



Bendability (Strip thickness t ≤ 0.5 mm)



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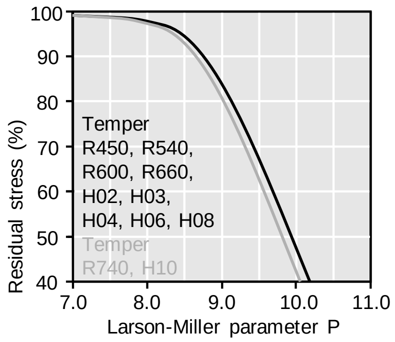
Thermal stress relaxation

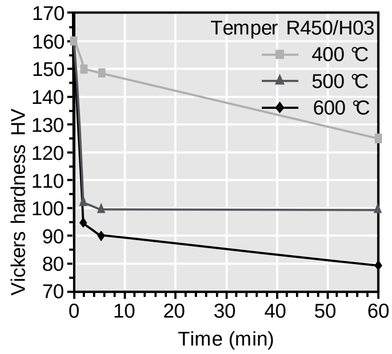


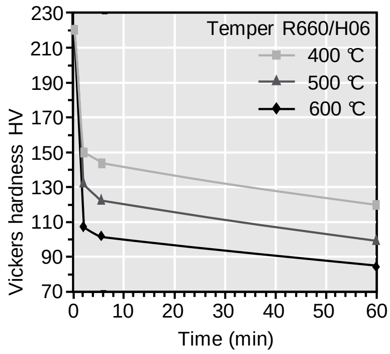
Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress relief annealed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

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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