wieland

C42200

CuZn12Sn1

This tin brass provides designers a copper alloy solution with high strength and good resistance to dezincification corrosion and stress corrosion cracking. Commonly used in automotive terminals, C42200 provides mechanical properties and performance very similar to high zinc brass alloys with the added benefit of improved resistance to stress relaxation.

Chemical composition (Reference)	
Cu	87.5 %
Sn	1 %
Zn	remainder

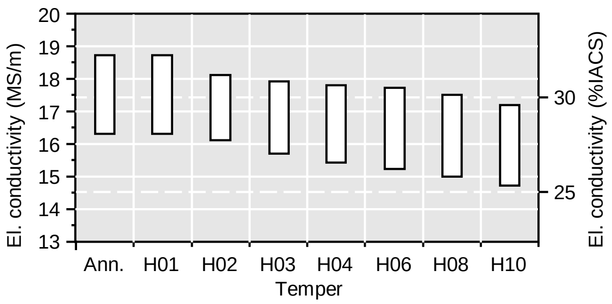
Physical properties (Reference values at room temperature)				
Electrical conductivity	18	MS/m	31	%IACS
Thermal conductivity	130	W/(m·K)	75	Btu·ft/(ft²·h·°F)
Coefficient of electrical resistance*	1.2	10^{-3}/K	0.7	10^{-3}/°F
Coefficient of thermal expansion*	17.7	10^{-6}/K	9.8	10^{-6}/°F
Density	8.80	g/cm³	0.318	lb/in³
Modulus of elasticity	112	GPa	16,000	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

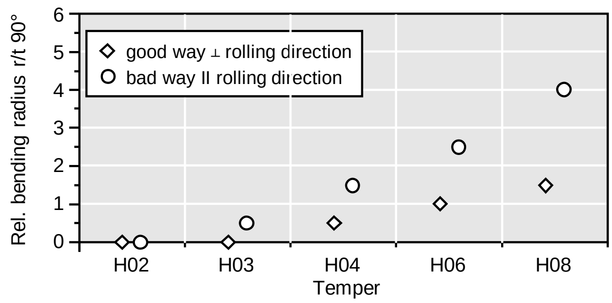
Mechanical properties (values in brackets are for information only)

Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50} / $A_{2"}$
	MPa	ksi	MPa	ksi	%
Annealed	285-340	41-49	≥ 85	≥ 12	≥ 43
H01	325-395	47-57	≥ 145	≥ 21	≥ 17
H02	370-450	54-65	≥ 330	≥ 48	≥ 6
H03	415-495	60-72	≥ 400	≥ 58	≥ 4
H04	460-545	67-79	≥ 460	≥ 67	≥ 3
H06	515-585	75-85	≥ 495	≥ 72	≥ 2
H08	565-635	82-92	≥ 530	≥ 77	≥ 2
H10	≥ 605	≥ 88	≥ 565	≥ 82	≥ 1

Electrical conductivity



Bendability* (Strip thickness t ≤ 0.4 mm)



* Typical 90° bend formability. Data for reference only

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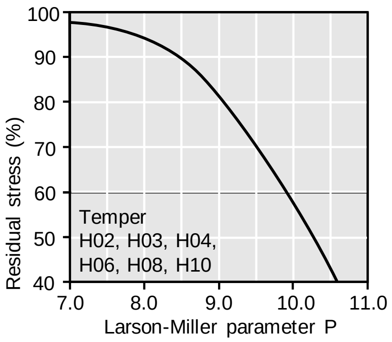
Thermal stress relaxation

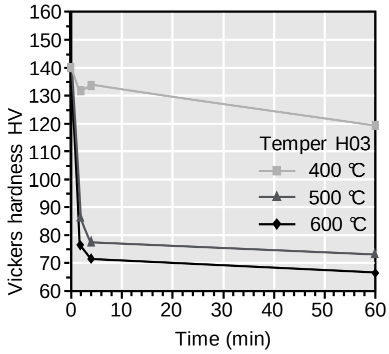


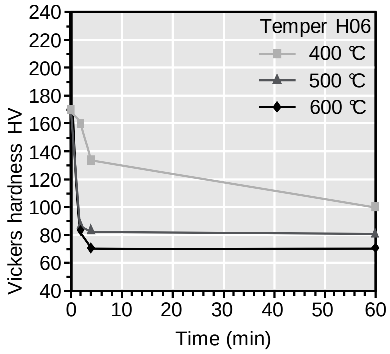
Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
$P = (20 + \log(t)) \cdot (T + 273) \cdot 0.001$.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress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

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

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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