C65400

CuSi3Sn1.5Cr

C65400 is a silicon bronze that has a good combination of strength, formability, and stress relaxation resistance that exceeds most common copper alloys. This makes it suitable for a wide variety of specialized applications. Applications include automotive terminals, spring diaphragms, fasteners, lock washers, and clamps.

Chemical composition (Reference)	
Si	3 %
Sn	1.5 %
Cr	0.06 %
Cu	remainder

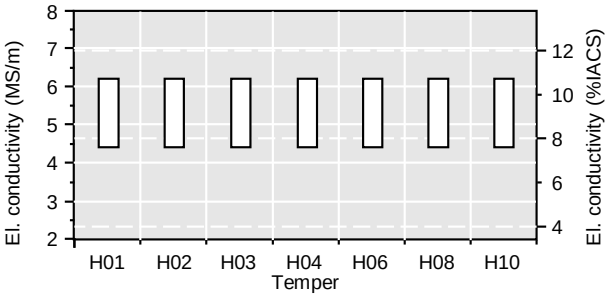
Physical properties (Reference values at room temperature)				
Electrical conductivity	4	MS/m	7	%IACS
Thermal conductivity	36	W/(m·K)	21	Btu·ft/(ft²·h·℉)
Coefficient of electrical resistance*	0.3	10^{-3}/K	0.2	10^{-3}/℉
Coefficient of thermal expansion*	17.5	10^{-6}/K	9.7	10^{-6}/℉
Density	8.85	g/cm³	0.309	lb/in³
Modulus of elasticity	117	GPa	17,000	ksi
Specific heat	0.377	J/(g·K)	0.090	Btu/(lb·℉)
Poisson´s ratio	0.34		0.34	

* Between 0 and 300 ℃

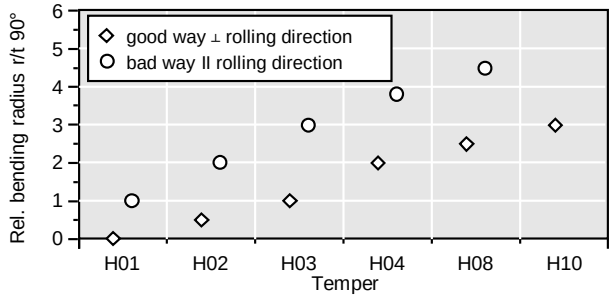
Mechanical properties (values in brackets are for information only)

Temper	Tensile strength R_m		Yield strength $R_{p0.2}$		Elongation A_{50} / $A_{2"}$
	MPa	ksi	MPa	ksi	%
H01	515-620	75-90	≥ 310	≥ 45	≥ 21
H02	595-695	86-101	≥ 455	≥ 66	≥ 11
H03	670-770	97-112	≥ 565	≥ 82	≥ 6
H04	745-825	108-120	≥ 650	≥ 94	≥ 3
H06	800-870	116-126	≥ 705	≥ 102	≥ 2
H08	855-915	124-133	≥ 770	≥ 112	≥ 2
H10	905-965	131-140	≥ 815	≥ 118	≥ 1

Electrical conductivity



Bendability* (Strip thickness t ≤ 0.4 mm)



* Typical 90° bend formability. Data for reference only.

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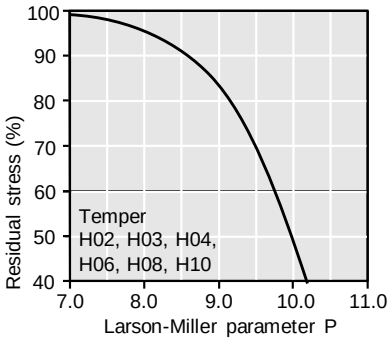
Thermal stress relaxation



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))*(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.

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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