

Wieland-B14 SUPRALLOY®

CuSn4 | C51100

Material Designation

EN	CW450K
UNS*	C51100

*Unified Numbering System (USA)

Chemical Composition (Reference)

Sn	4 %
Cu	balance

Typical Applications

- Miniaturized connectors
- Contact springs
- Relais springs

Physical Properties*

Electrical Conductivity	MS/m	13
	%IACS	22
Thermal Conductivity	W/(m·K)	100
Coefficient of Electrical Resistance**	10 ⁻³ /K	1,3
Coefficient of Thermal Expansion**	10 ⁻⁶ /K	18,0
Density	g/cm ³	8,85
Modulus of Elasticity	GPa	120
Specific Heat	J/(g·K)	0,377
Poisson's Ratio		0,34

*Reference values at room temperature

**Between 0 and 300 °C

Fabrication Properties

Capacity for Being Cold Worked	excellent
Machinability	less suitable
Capacity for Being Electroplated	excellent
Capacity for Being Hot-Dip Tinned	excellent
Soft Soldering	excellent
Resistance Welding	good
Gas Shielded Arc Welding	good
Laser Welding	good

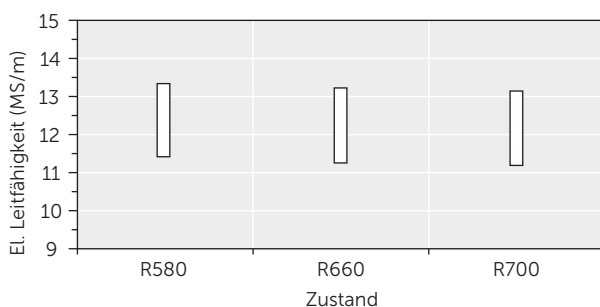
Corrosion Resistance

Resistant to seawater and industrial atmosphere. Largely insensitive to stress corrosion cracking.

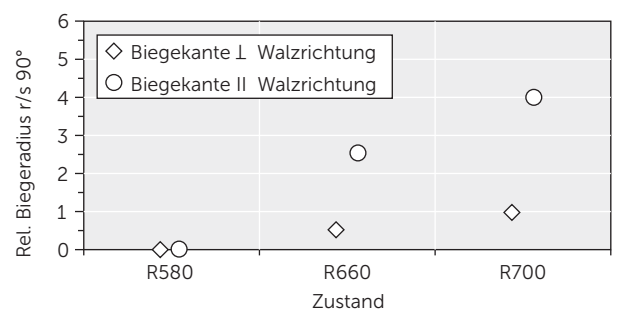
Mechanical Properties

Temper		R580	R660	R700
Tensile Strength R _m	MPa	580–680	660–760	700–800
Yield Strength R _{p0,2}	MPa	≥ 530	≥ 630	≥ 690
Elongation A _{50mm}	%	≥ 13	≥ 7	≥ 3
Hardness HV (for information)		170–230	180–240	190–250

Electrical Conductivity



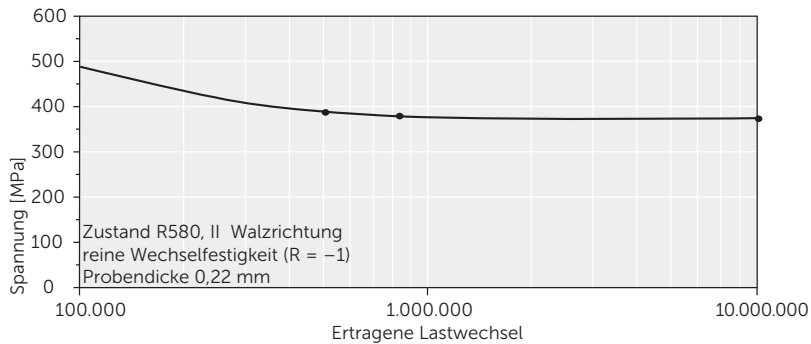
Bendability (Strip Thickness t ≤ 0.5 mm)



Wieland-B14 SUPRALLOY®

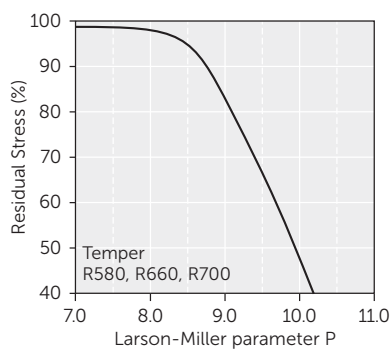
CuSn4 | C51100

Resistance to Softening (for Information)



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 $\frac{1}{3}$ of the tensile strength R_m .

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.

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: 0.10–0.40 mm, R580: 0.10–0.64 mm thinner gauges on request
- Strip width from 7 mm

Wieland-Werke AG

wieland.com

Graf-Arco-Str. 36, 89079 Ulm, Germany, P +49 731 944 2030, info@wieland.com

This printed matter is not subject to revision. No claims can be derived from it unless there is evidence of intent or gross negligence. The product characteristics are not guaranteed and do not replace our experts' advice.