

# Wieland-B18 SUPRALLOY®

CuSn8 | C52100

## Material Designation

EN	CW453K
UNS*	C51100

\*Unified Numbering System (USA)

## Chemical Composition (Reference)

Sn	8 %
Cu	balance

## Typical Applications

- Miniaturized connectors
- Contact springs
- Relais springs

## Physical Properties\*

Electrical Conductivity	MS/m	8
	%IACS	14
Thermal Conductivity	W/(m·K)	67
Coefficient of Electrical Resistance**	10 <sup>-3</sup> /K	0.7
Coefficient of Thermal Expansion**	10 <sup>-6</sup> /K	18.5
Density	g/cm <sup>3</sup>	8.80
Modulus of Elasticity	GPa	115
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

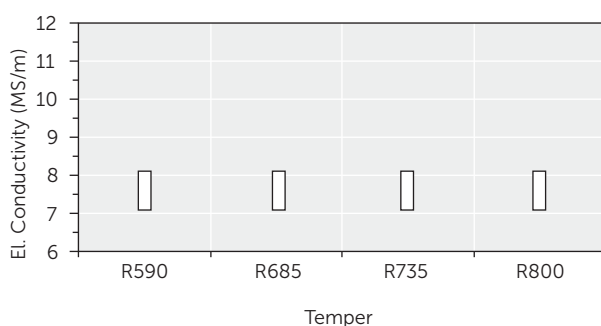
## Corrosion Resistance

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

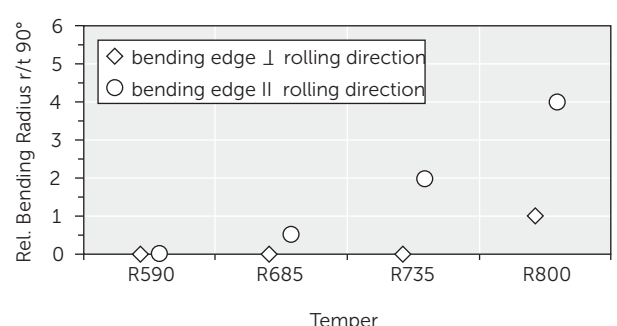
## Mechanical Properties

Temper		R590	R685	R735	R800
Tensile Strength R <sub>m</sub>	MPa	590–705	685–785	735–835	800–900
Yield Strength R <sub>p0.2</sub>	MPa	≥ 540	≥ 650	≥ 700	≥ 775
Elongation A <sub>50mm</sub>	%	≥ 20	≥ 15	≥ 9	≥ 5
Hardness HV (for information)		185–235	210–260	230–270	250–290

## Electrical Conductivity



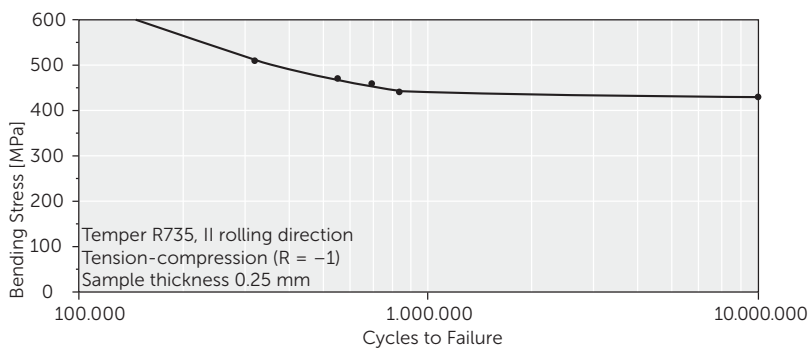
## Bendability (Strip Thickness t ≤ 0.5 mm)



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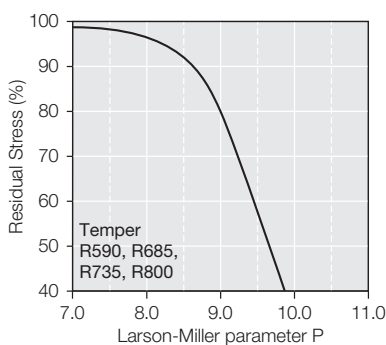
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## Fatigue Strength / Woehler Curve (for information)



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: 0.10–0.64 mm, R800: 0.10–0.40 mm, thinner gauges on request
- Strip width from 7 mm

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