wieland

Wieland-B16 SUPRALLOY®

CuSn6 | C51900

Material Designation	
EN	CW452K
UNS*	C51900

*Unified Numbering System (USA)

Chemical Composition (Reference)	
Sn	6 %
Cu	balance

Typical Applications

- Miniaturized connectors
- Contact springs
- Relais springs

Physical Properties*		
Electrical Conductivity	MS/m %IACS	10 17
Thermal Conductivity	W/(m·K)	75
Coefficient of Electrical Resistance**	10^{-3}/K	0.7
Coefficient of Thermal Expansion**	10^{-6}/K	18.5
Density	g/cm³	8.80
Modulus of Elasticity	GPa	118
Specific Heat	J/(g·K)	0,377
Poisson's Ratio		0.34

*Reference values at room temperature
**Between 0 and 300 °C

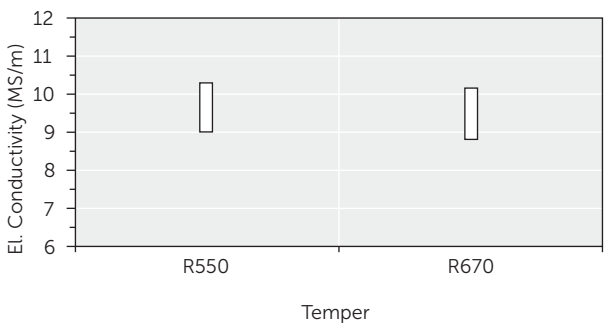
Fabrication Properties	
Capacity for Being Cold Worked	excellent
Machinability	less suitable
Capacity for Being Electroplated	excellent
Capacity for Being Hot-Dip Tinned	excellent
Soft Soldering	excellent
Resistance Welding	good
Gas Shielded Arc Welding	good
Laser Welding	good

Corrosion Resistance

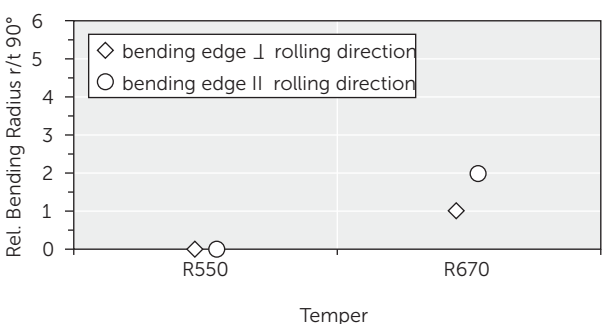
Resistant to seawater and industrial atmosphere. Largely insensitive to stress corrosion cracking.

Mechanical Properties			
Temper		R550	R670
Tensile Strength R_m	MPa	550–650	670–780
Yield Strength $R_{p0,2}$	MPa	≥ 500	≥ 660
Elongation A_{50mm}	%	≥ 16	≥ 7
Hardness HV (for information)		(170–230)	(200–260)

Electrical Conductivity



Bendability (Strip Thickness t ≤ 0.5 mm)



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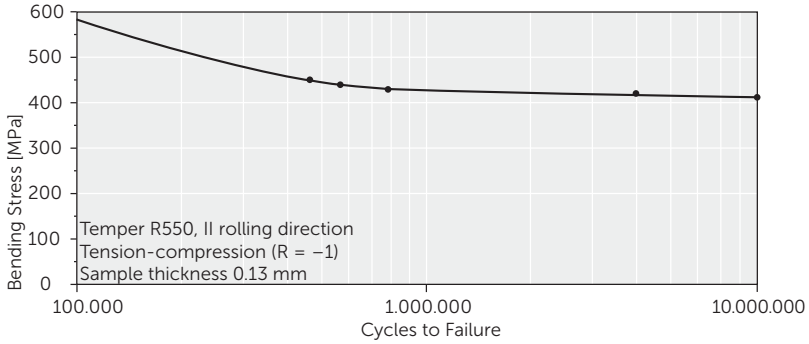
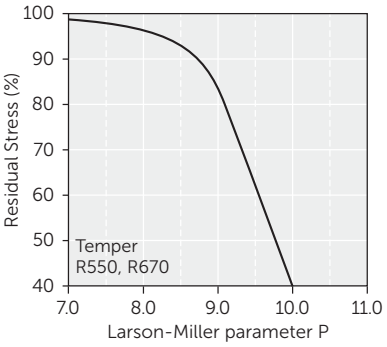
Resistance to Softening (for Information)



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 $^1/_3$ 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))*(T + 273)*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, thinner gauges on request
- Strip width from 7 mm

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10/18 BM (MC.ED.UL)