wieland

Wieland-B18

CuSn8 | C52100

Material Designation

EN	CW452K
UNS*	C52100

*Unified Numbering System (USA)

Chemical Composition (Reference)

Sn	6 %
Cu	balance

Typical Applications

- Stamped parts
- Connectors
- Contact springs
- Relay springs
- Slide bearings

Corrosion Resistance

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

Physical Properties*

Electrical Conductivity	MS/m %IACS	7,5 13
Thermal Conductivity	W/(m·K)	67
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	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

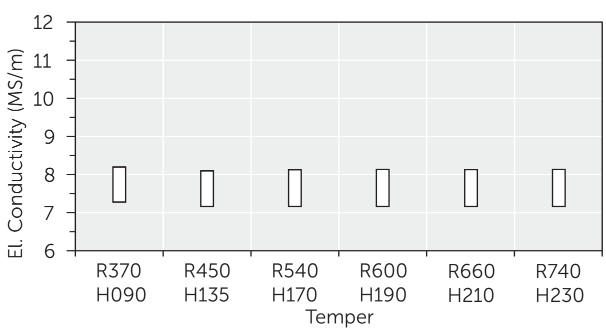
Mechanical Properties

Temper		R370	R450	R540	R600	R660	R740
Tensile Strength R_m	MPa	370–450	450–550	540–630	600–690	660–750	≥ 740
Yield Strength $R_{p0,2}$	MPa	≤ 300	≥ 370	≥ 470	≥ 540	≥ 620	≥ 700
Elongation A_{50mm}	%	≥ 50	≥ 20	≥ 13	≥ 5	≥ 3	–

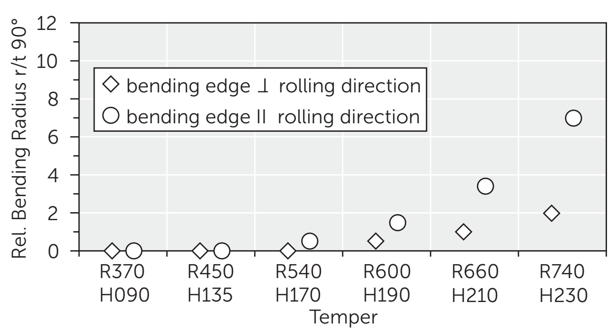
Intermediate tempers are feasible. Higher elongation values can be obtained by additional heat treatments.

Temper	H090	H135	H170	H190	H210	H230
Hardness HV	90–120	135–175	170–200	190–220	210–240	≥ 230

Electrical Conductivity



Bendability (Strip Thickness t ≤ 0.5 mm)



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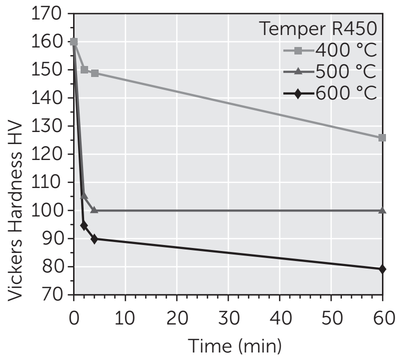
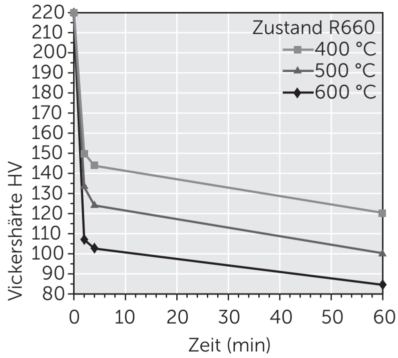
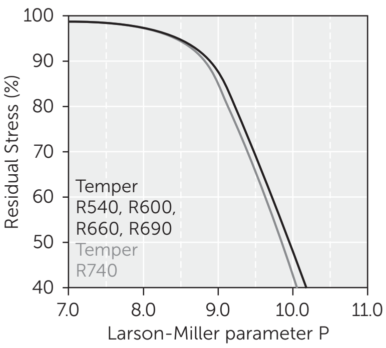
Resistance to Softening (for Information)





Vickers hardness after heat treatment (typical values)

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.

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
- Sheet
- Strip and sheet with protective coating

Dimensions Available

- Strip thickness from 0.10 mm, thinner gauges on request
- Strip width from 3mm, however min. 10 x strip thickness

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10/18 BM (MC.ED.UL)