

Wieland-B14

CuSn4
C51100

Rolled Products



| Material Designation | |
|----------------------|--------|
| EN | CuSn4 |
| UNS* | C51100 |

* Unified Numbering System (USA)

| Chemical Composition (Reference) | |
|----------------------------------|---------|
| Sn | 4 % |
| Cu | balance |

| Typical Applications |
|----------------------|
| • Stamped parts |
| • Connectors |
| • Contact springs |

| Physical Properties* | | |
|--|---------------------|----------|
| Electrical Conductivity | MS/m %IACS | 12 21 |
| 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 |

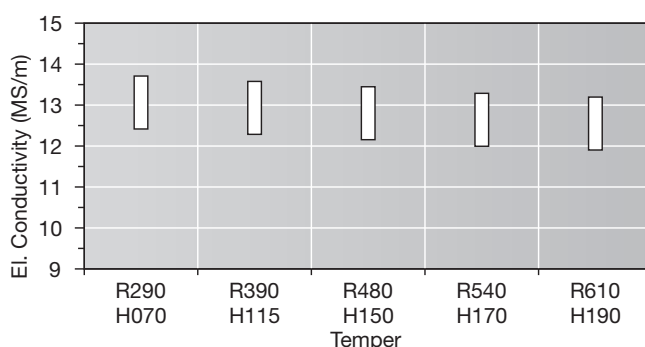
Corrosion Resistance
Resistant to seawater and industrial atmosphere. Largely insensitive to stress corrosion cracking.

| Mechanical Properties | | | | | | |
|----------------------------------|-----|---------|---------|---------|---------|-------|
| Temper | | R290 | R390 | R480 | R540 | R610 |
| Tensile Strength R _m | MPa | 290–390 | 390–490 | 480–570 | 540–630 | ≥ 610 |
| Yield Strength R _{p0.2} | MPa | ≤ 190 | ≥ 320 | ≥ 440 | ≥ 510 | ≥ 580 |
| Elongation A _{50mm} | % | ≥ 40 | ≥ 11 | ≥ 4 | ≥ 3 | – |

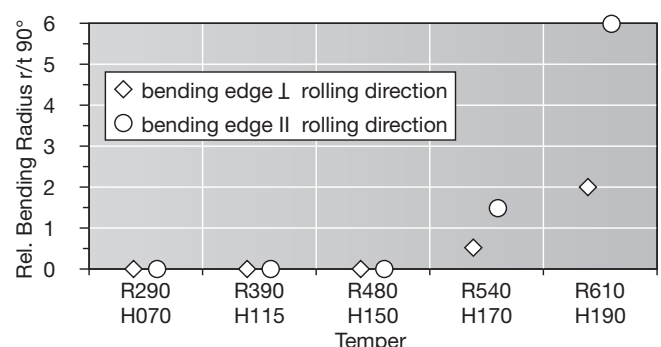
Intermediate tempers are feasible. Higher elongation values can be obtained by additional heat treatments.

| Temper | H070 | H115 | H150 | H170 | H190 |
|-------------|--------|---------|---------|---------|-------|
| Hardness HV | 70–100 | 115–155 | 150–180 | 170–200 | ≥ 190 |

Electrical Conductivity



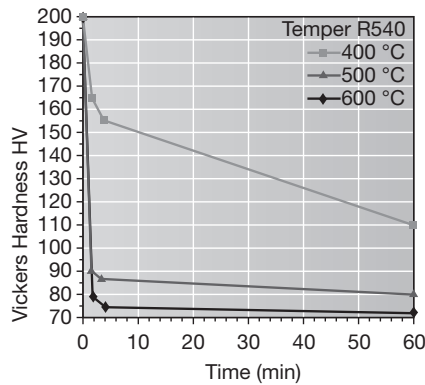
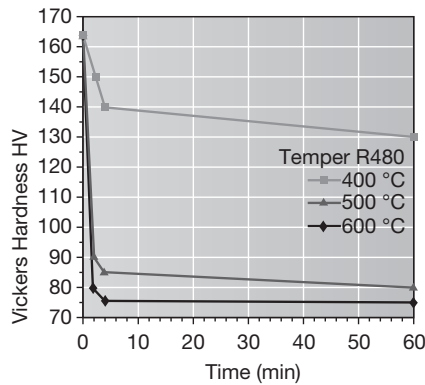
Bendability (Strip Thickness t ≤ 0.5 mm)



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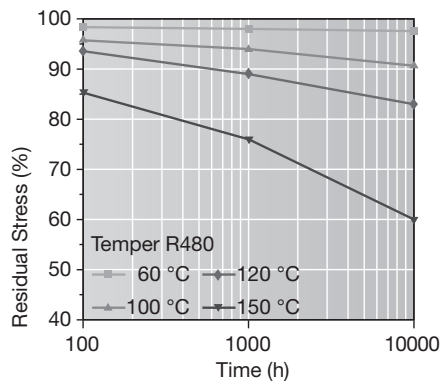
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Resistance to Softening



Vickers hardness
after heat treatment
(typical values)

Stress Relaxation



Stress remaining as a function
of service temperature and time.
Measured on stress relief annealed
specimens parallel to rolling direction.
Values extrapolated according to
F. R. Larson, J. Miller, Trans ASME74
(1952) 765-775.
Total stress relaxation depends on
the applied stress level.

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

Types and Formats Available

- Standard coils with outside diameters up to 1400 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 3 mm, however min. 10 x strip thickness

Wieland-Werke AG

www.wieland.com

Rolled Products Division

Graf-Arco-Str. 36, 89079 Ulm, Germany, Phone +49 (0)731 944-0, Fax +49 (0)731 944-2772, info@wieland.de
Ziegeleiweg 20, 42555 Velbert-Langenberg, Germany, Phone +49 (0)731 944-0, Fax +49 (0)731 944-9270, info@wieland.de
Lantwattenstr. 11, 78007 Villingen-Schwenningen, Germany, Phone +49 (0)731 944-0, Fax +49 (0)731 944-7108, info@wieland.de

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