# Wieland-K09
OFE-Cu
C10100

# Rolled Products

Wieland

| Material Designation | |
|---|---|
| EN | no EN standard |
| UNS* | C10100 |

** Unified Numbering System (USA)*

| Chemical Composition (Reference) | |
|---|---|
| Cu | ≥ 99.99 % |

**Typical Applications**

- Submarine fibre optic cables
- Coaxial cables and waveguides
- Leadframes for semiconductors
- Vacuum technology
- Heat sinks

| Physical Properties* | | |
|---|---|---|
| Electrical Conductivity*** | MS/m<br>%IACS | 58.6<br>101 |
| Thermal Conductivity | W/(m·K) | 394 |
| Coefficient of Electrical Resistance** | $10^{-3}$/K | 3.9 |
| Coefficient of Thermal Expansion** | $10^{-6}$/K | 17.7 |
| Density | g/cm³ | 8.94 |
| Modulus of Elasticity | GPa | 127 |
| Specific Heat | J/(g·K) | 0.385 |
| Poisson's Ratio | | 0.34 |

* *Reference values at room temperature*
** *Between 0 and 300 °C*
*** *Minimum value in soft temper*

| 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 | less suitable |
| Gas Shielded Arc Welding | excellent |
| Laser Welding | fair |

**Corrosion Resistance**

Resistant to: industrial atmosphere (formation of dark resp. green protective layers), industrial and drinking water (max. flow rate approx. 1.5 to 2 m/s), pure water vapour, non oxidizing acids, alkalis (except for ammonia and cyanide-containing compounds), neutral saline solutions.

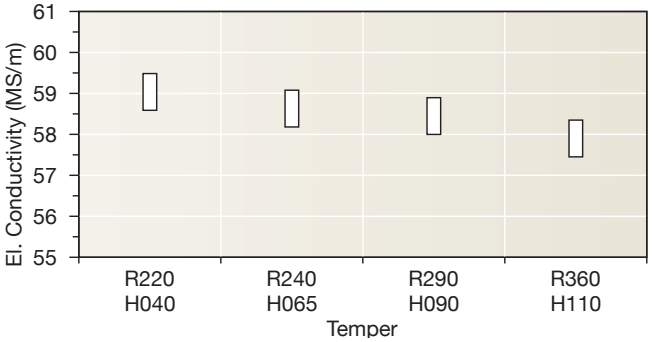
Not resistant to: oxidizing acids, hydrous ammonia and halogenated gases, hydrogen sulfide, seawater, especially with high flow rates.

**Mechanical Properties**

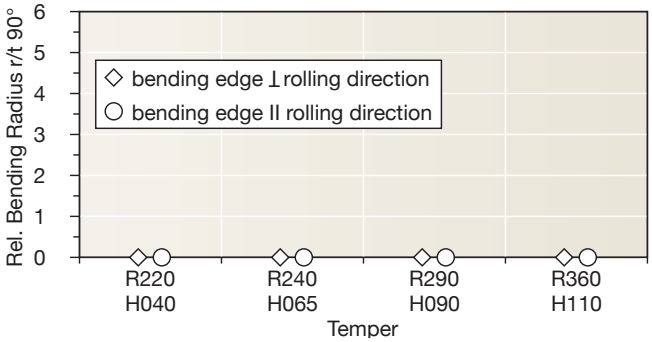
| Temper | | R220 | R240 | R290 | R360 |
|---|---|---|---|---|---|
| Tensile Strength $R_m$ | MPa | 220–260 | 240–300 | 290–360 | ≥ 360 |
| Yield Strength $R_{p0.2}$ | MPa | ≤ 140 | ≥ 180 | ≥ 250 | ≥ 320 |
| Elongation $A_{50mm}$ | % | ≥ 33 | ≥ 8 | ≥ 4 | ≥ 2 |

| Temper | H040 | H065 | H090 | H110 |
|---|---|---|---|---|
| Hardness HV | 45–65 | 65–95 | 90–110 | ≥ 110 |

**Electrical Conductivity**




**Bendability** (Strip Thickness t ≤ 0.5 mm)



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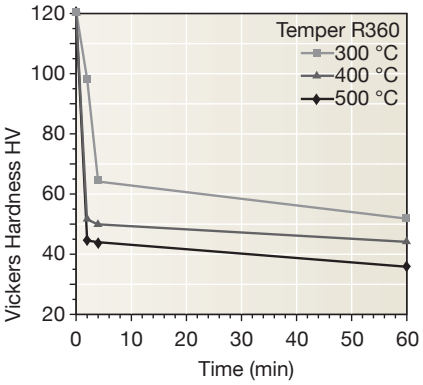
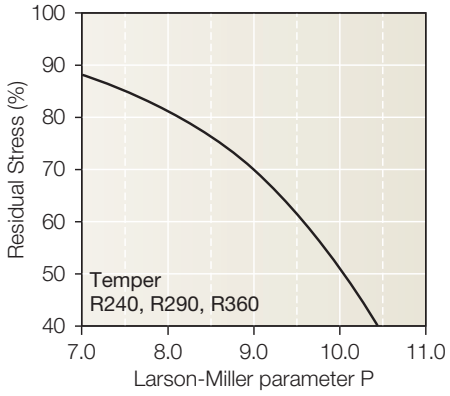
## Resistance to Softening




Vickers hardness
after heat treatment
(typical values)

## Thermal Stress Relaxation




Stress remaining after thermal relaxation as a function of Larson-Miller parameter (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 rolled to temper 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 1400 mm
- Traverse-wound coils with drum weights up to 1.5 t
- Hot-dip tinned strip
- Contour-milled strip

## Dimensions Available

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

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10/14 Bm (R+G)