

Cu-OF

C10200

Material Designation	
EN	CW008A
UNS*	C10200

\*Unified Numbering System (USA)

Chemical Composition (Reference)	
Cu	≥ 99,95 %

Typical Applications
• Submarine fibre optic cables
• Coaxial cables and waveguides
• Leadframes for semiconductors
• Vacuum technology
• Heat sinks

Physical Properties*		
Electrical Conductivity***	MS/m % IACS	58 100
Thermal Conductivity	W/(m·K)	394
Coefficient of Electrical Resistance**	10 <sup>-3</sup> /K	3.9
Coefficient of Thermal Expansion**	10 <sup>-6</sup> /K	17.7
Density	g/cm <sup>3</sup>	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

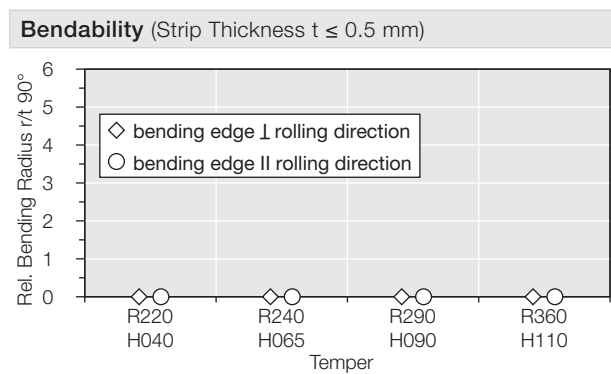
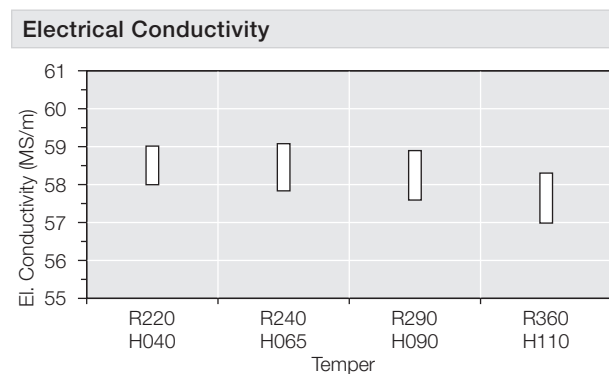
\*\*\* Minimum value in soft temper

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, 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 <sub>m</sub>	MPa	220–260	240–300	290–360	≥ 360
Yield Strength R <sub>p0,2</sub>	MPa	≤ 140	≥ 180	≥ 250	≥ 320
Elongation A <sub>50mm</sub>	%	≥ 33	≥ 8	≥ 4	≥ 2

Temper	H045	H065	H090	H110
Hardness HV	45–65	65–95	90–110	≥ 110

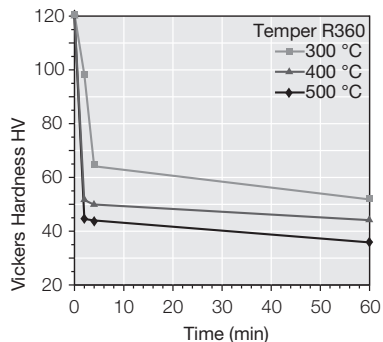


# WIELAND-K11

Cu-OF

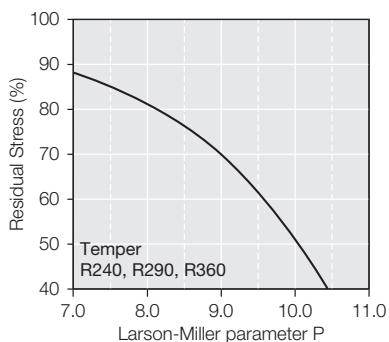
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## Resistance to Softening



Vickers hardness after heat treatment (typical values)

## Thermal Stress Relaxation



Stress remaining after thermal relaxation as a function of Larson-Miller parameter P (F. R. Larson, J. Miller, TransASME74 (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.

## 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 1.400 mm
- Traverse-wound coils with drum weights up to 1.5 t
- Multicoil up to 5 t
- Hot-dip tinned strip
- Countour-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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