wieland

# Wieland-K82

CuZr | C15100

CuZr is precipitation hardened and thus exhibits excellent resistance to stress relaxation at elevated temperatures as well as a combination of high strength and excellent bend formability. CuZr is a versatile material solution that is used in a wide variety of applications including high current connectors, power distribution systems and automotive electric vehicle components.

| **Chemical composition** (Reference) | |
|---|---|
| Zr | 0.1 % |
| Cu | remainder |

| **Physical properties** (Reference values at room temperature) | | | | |
|---|---|---|---|---|
| Electrical conductivity | 55 | MS/m | 95 | %IACS |
| Thermal conductivity | 360 | W/(m·K) | 208 | Btu·ft/(ft²·h·℉) |
| Coefficient of electrical resistance* | 3.7 | $10^{-3}$/K | 2.1 | $10^{-3}$/℉ |
| Coefficient of thermal expansion* | 17.7 | $10^{-6}$/K | 9.8 | $10^{-6}$/℉ |
| Density | 8.94 | g/cm³ | 0.323 | lb/in³ |
| Modulus of elasticity | 121 | GPa | 17,500 | ksi |
| Specific heat | 0.385 | J/(g·K) | 0.092 | Btu/(lb·℉) |
| Poisson´s ratio | 0.34 | | 0.34 | |

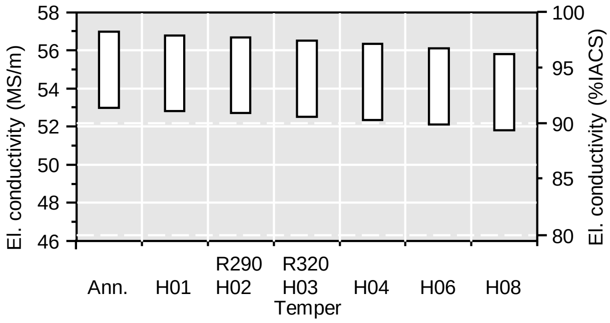
* Between 0 and 300 ℃

**Mechanical properties (values in brackets are for information only)**

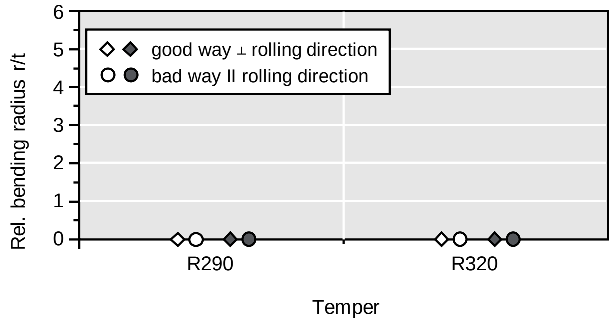
| Temper | Tensile strength $R_m$ | | Yield strength $R_{p0.2}$ | | Elongation $A_{50}$ | Hardness HV |
|---|---|---|---|---|---|---|
| | MPa | ksi | MPa | ksi | % | |
| R290 | 290-360 | 42-52 | ≥ 260 | ≥ 38 | ≥ 10 | (90-110) |
| R320 | 320-390 | 46-57 | ≥ 310 | ≥ 45 | ≥ 5 | (100-120) |
| Annealed* | 255-290 | 37-42 | ≥ 60 | ≥ 9 | ≥ 35 | |
| H01* | 275-310 | 40-45 | ≥ 180 | ≥ 26 | ≥ 11 | |
| H02* | 295-350 | 43-51 | ≥ 240 | ≥ 35 | ≥ 4 | |
| H03* | 325-385 | 47-56 | ≥ 310 | ≥ 45 | ≥ 2 | |
| H04* | 365-425 | 53-62 | ≥ 350 | ≥ 51 | ≥ 2 | |
| H06* | 405-450 | 59-65 | ≥ 395 | ≥ 57 | ≥ 1 | |
| H08* | 440-490 | 64-71 | ≥ 425 | ≥ 62 | ≥ 1 | |

* According to ASTM B888

**Electrical conductivity**




**Bendability (Strip thickness t ≤ 0.5 mm)** ◇○90° ◆●180°



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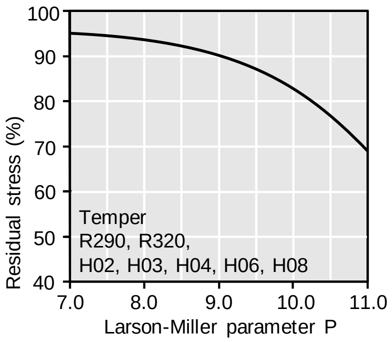
## Thermal stress relaxation

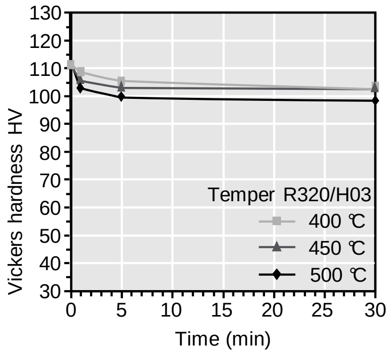



Stress remaining after thermal relaxation as a function of Larson-Miller parameter P
(F. R. Larson, J. Miller, Trans ASME74 (1952) 765–775) given by:
P = (20 + log(t))*(T + 273)*0.001.
Time t in hours, temperature T in ℃.
Example: P = 9 is equivalent to 1,000 h/118 ℃.
Measured on stress relief annealed 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 $R_m$.

## Softening resistance




Vickers hardness after heat treatment (typical values)

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

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