# Wieland-M20
**CuZn20**
**C24000**

# Rolled Products

Wieland

| Material Designation | |
|---|---|
| EN | CuZn20 |
| UNS* | C24000 |

** Unified Numbering System (USA)*

| Chemical Composition (Reference) | |
|---|---|
| Cu | 80 % |
| Zn | balance |

**Typical Applications**

- Jewellery and metal goods
- Deep drawn parts

| Physical Properties* | | |
|---|---|---|
| Electrical Conductivity | MS/m<br>%IACS | 19<br>33 |
| Thermal Conductivity | W/(m·K) | 142 |
| Coefficient of Electrical Resistance** | $10^{-3}$/K | 1.5 |
| Coefficient of Thermal Expansion** | $10^{-6}$/K | 18.8 |
| Density | g/cm³ | 8.67 |
| Modulus of Elasticity | GPa | 119 |
| Specific Heat | J/(g·K) | 0.380 |
| 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 | fair |
| Laser Welding | fair |

**Corrosion Resistance**

Good resistance to: fresh water, neutral or alkaline saline solutions, organic compounds as well as land, sea, and industrial atmosphere.

Not resistant to: acids, hydrous sulphur compounds, hydrous ammonia in the non-stress-relieved condition. Low sensitivity to stress corrosion cracking.

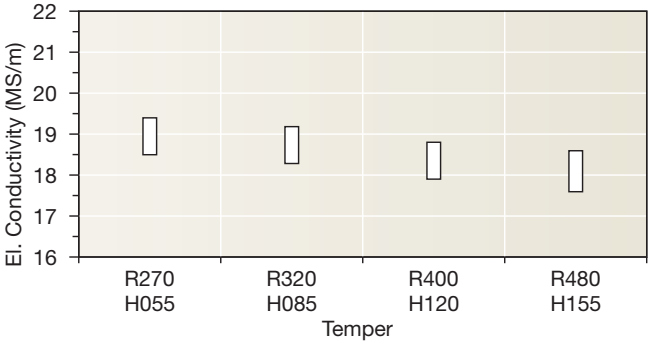
**Mechanical Properties**

| Temper | | R270 | R320 | R400 | R480 |
|---|---|---|---|---|---|
| Tensile Strength $R_m$ | MPa | 270–320 | 320–400 | 400–480 | ≥ 480 |
| Yield Strength $R_{p0.2}$ | MPa | ≤ 150 | ≥ 200 | ≥ 320 | ≥ 440 |
| Elongation $A_{50mm}$ | % | ≥ 38 | ≥ 20 | ≥ 5 | – |

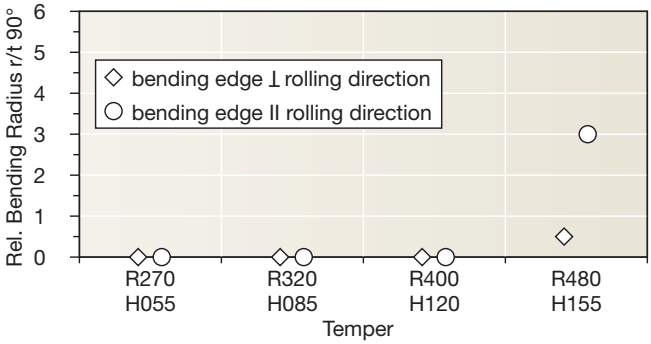
| Temper | H055 | H085 | H120 | H155 |
|---|---|---|---|---|
| Hardness HV | 55–85 | 85–120 | 120–155 | ≥ 155 |

| Temper | | G010 | G020 | G035 |
|---|---|---|---|---|
| Grain Size | mm | ≤ 0.015 | 0.015–0.030 | 0.025–0.050 |
| Hardness HV | | ≤ 105 | ≤ 85 | ≤ 75 |

**Electrical Conductivity**




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



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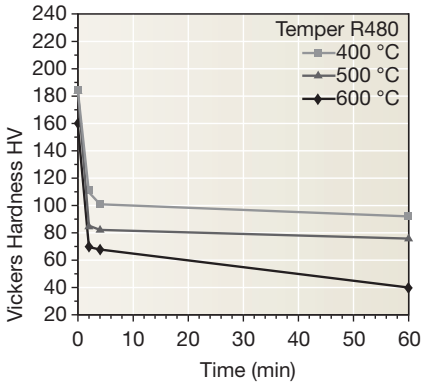
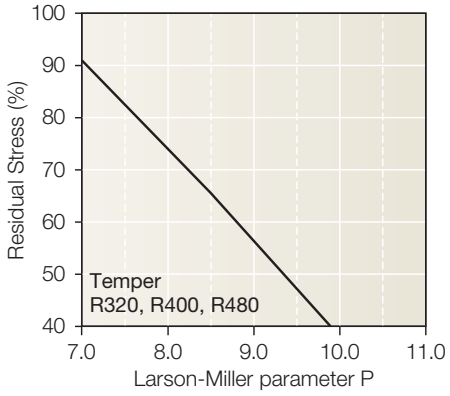
## Resistance to Softening




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
- 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

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10/14 Bm (R+G)