WIELAND-M20

CuZn20

C24000

ROLLED PRODUCTS

wieland

Material Designation	
EN	CW503L
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 %IACS	19 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.

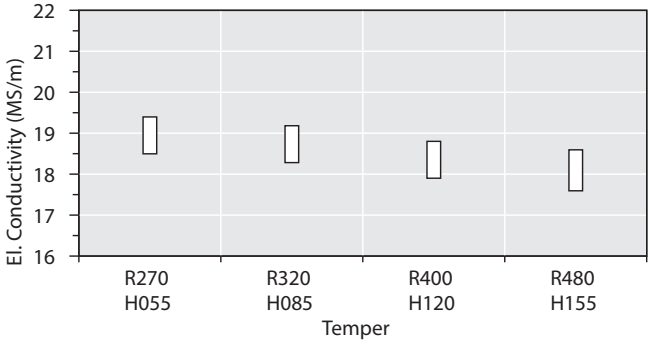
Mechanical Properties

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	–

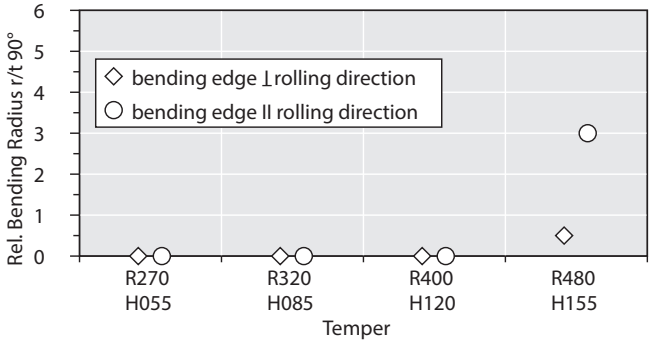
Temper		H055	H085	H120	H155
Hardness HV		55–85	85–120	120–155	≥ 155

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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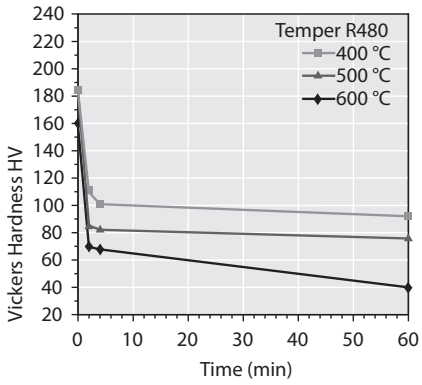
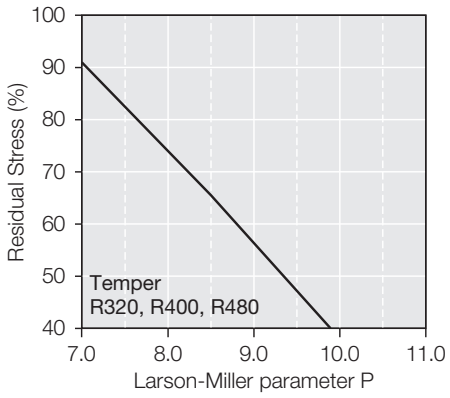
Resistance to Softening



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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11/17 Bm (GSK/Tr)