

Material Designation

EN	no EN standard
UNS*	C70350

* Unified Numbering System (USA)

This is a high-performance copper alloy developed by Wieland and Olin Brass, USA.

Chemical Composition (Reference)

Ni	1.5 %
Co	1.1 %
Si	0.6 %
Cu	balance

Typical Applications

- Components for the electrical industry
- Stamped parts
- Relay springs
- Connectors suitable for use at elevated temperatures

Physical Properties*

Electrical Conductivity**	MS/m	29
	%IACS	50
Thermal Conductivity	W/(m·K)	200
Coefficient of Electrical Resistance***	10 ⁻³ /K	1.83
Coefficient of Thermal Expansion***	10 ⁻⁶ /K	17.6
Density	g/cm ³	8.82
Modulus of Elasticity	GPa	131
Specific Heat	J/(g·K)	0.39
Poisson's Ratio		0.34

* Reference values at room temperature

** For TM06 45 %IACS

*** Between 0 and 300 °C

Fabrication Properties

Capacity for Being Cold Worked	good
Machinability	less suitable
Capacity for Being Electroplated	good
Capacity for Being Hot-Dip Tinned	good
Soft Soldering	good
Resistance Welding	fair
Gas Shielded Arc Welding	good
Laser Welding	less suitable

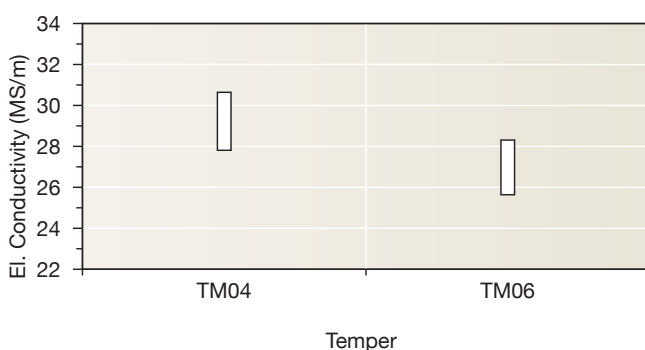
Corrosion Resistance

Wieland-K57[®] has good corrosion resistance in natural atmosphere. It is insensitive to stress corrosion cracking.

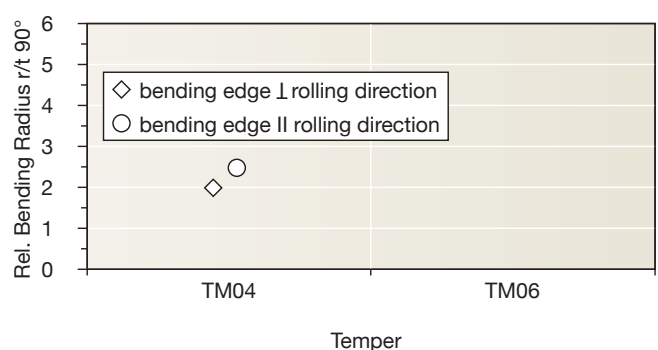
Mechanical Properties

Temper		TM04	TM06
Tensile Strength R _m	MPa	770–900	840–970
Yield Strength R _{p0.2}	MPa	750–850	810–920
Elongation A _{50mm}	%	≥ 4	≥ 1
Hardness (for information only)	HV	(220–280)	(240–300)

Electrical Conductivity



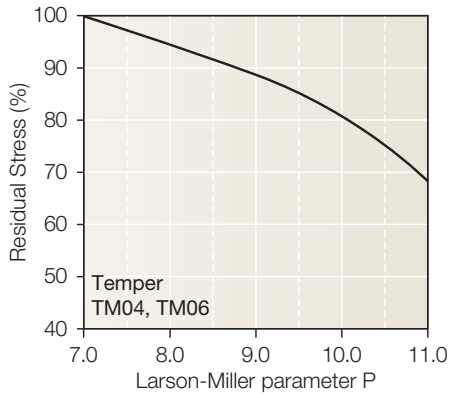
Bendability (strip thickness s ≤ 0.2 mm)



Wieland-K57®

CuNi1Co1Si
C70350

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:
 $P = (20 + \log(t)) \cdot (T + 273) \cdot 0.001$
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 1400 mm
- Traverse-wound coils with drum weights up to 1.5 t
- Multicoil up to 5 t
- Contour-milled strip

Dimensions Available

- Strip thickness 0.08–0.20 mm, other gauges on request
- Strip width from 3 mm, however min. 10 x strip thickness