

| 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                          |
| • Connectors                             |
| • Relay springs                          |

| Physical Properties*                    |                     |          |
|---|---------------------|----------|
| Electrical Conductivity**               | MS/m<br>%IACS       | 29<br>50 |
| Thermal Conductivity                    | W/(m·K)             | 200      |
| Coefficient of Electrical Resistance*** | 10 <sup>-3</sup> /K | 1.83     |
| Coefficient of Thermal Expansion***     | 10 <sup>-6</sup> /K | 17.6     |
| Density                                 | g/cm <sup>3</sup>   | 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

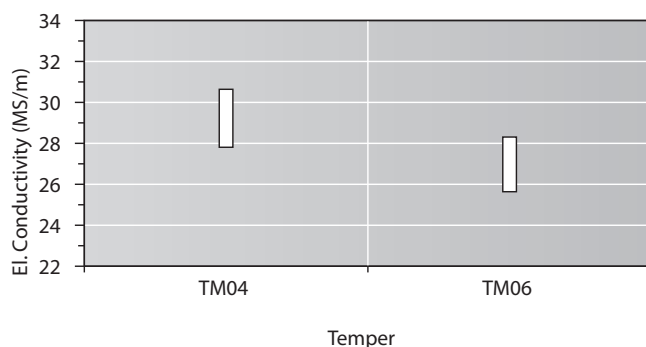
\*\*\* Between 0 and 300 °C

| 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 |

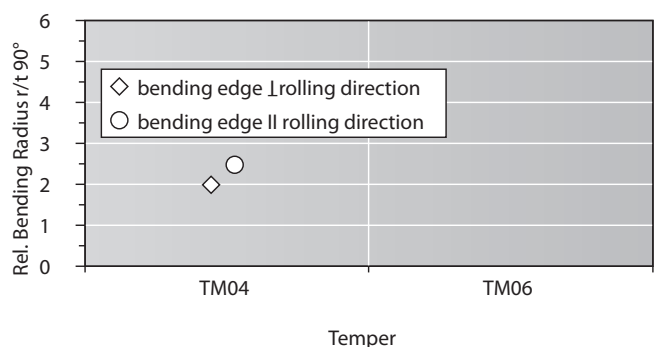
**Corrosion Resistance**  
Wieland-K57<sup>®</sup> has good corrosion resistance in natural atmosphere. It is insensitive to stress corrosion cracking.

| Mechanical Properties            |     |           |           |
|----------------------------------|-----|-----------|-----------|
| Temper                           |     | TM04      | TM06      |
| Tensile Strength R <sub>m</sub>  | MPa | 770–900   | 840–970   |
| Yield Strength R <sub>p0.2</sub> | MPa | 750–850   | 810–920   |
| Elongation A <sub>50mm</sub>     | %   | ≥ 4       | ≥ 1       |
| Hardness (for information only)  | HV  | (220–280) | (240–300) |

**Electrical Conductivity**



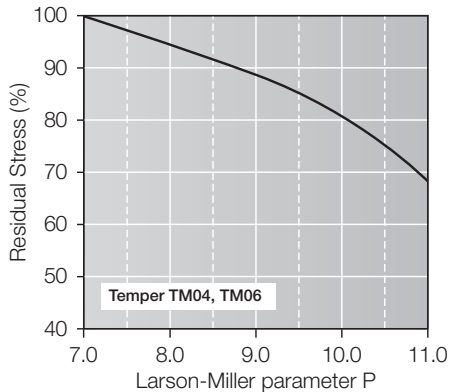
**Bendability (strip thickness s ≤ 0.2 mm)**



# 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