

# C19005

## STOL® 76M - CuNiSi

|                   |           |
|-------------------|-----------|
| Alloy Designation | STOL® 76M |
| EN                | CuNiSi    |
| DIN CEN/TS 13388  |           |
| UNS               | C19005    |

| Chemical Composition (Balance) |      |   |
|--------------------------------|------|---|
| Weight percentage              |      |   |
| Cu                             | Rest | % |
| Ni                             | 1.5  | % |
| Si                             | 0.3  | % |
| Sn                             | 0.1  | % |
| Zn                             | 0.4  | % |

### Characteristics

**STOL® 76M** is an optimized CuNiSi alloy that can be hardened by cold forming and by precipitation of NiSi-phases during a heat treatment. It has excellent bendability, excellent hot and cold forming properties, a high strength and a good corrosion resistance.

Due to the NiSi-precipitations the relaxation properties, even at temperatures up to 150 °C are excellent. In combination with a tin coating even at temperatures around 150 °C (3.000h) the tin coating does not peel off. The electrical and thermal conductivity is good. Welding, soldering and brazing properties are good too.

### Main Applications

**Automotive:** Switches and Relays, Contacts, Connectors, Terminals, Press fits.

**Electrical:** Switches and Relays, Contacts, Connectors, Terminals, Press fits, Components for the electrical industry, Stamped parts, Semiconductor Components.

### Mechanical Properties (EN 1652)

\* values for stress relieved qualities

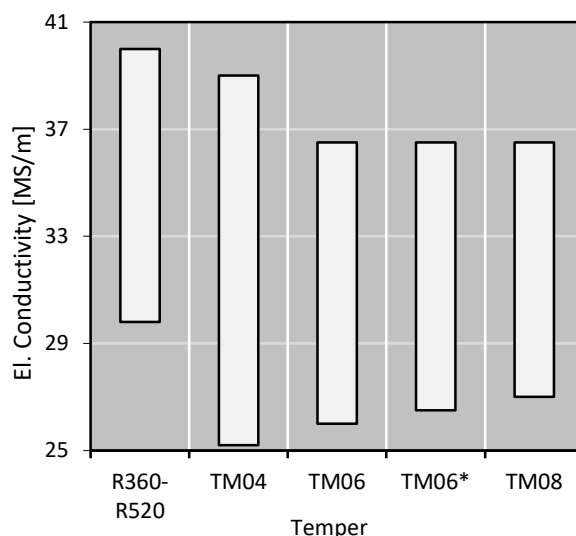
| Temper | Temper<br><small>H.. = Cold worked<br/>TM = Mill hardened</small> | Tensile Strength | Yield Strength min.      | Elongation min.        |   | Hardness  | Bendability 90° |     |
|--------|---|------------------|--------------------------|------------------------|---|---|-----------------|-----|
|        |   | Rm<br>MPa        | Rp <sub>0.2</sub><br>Mpa | A <sub>50mm</sub><br>% | HV<br><small>only for information</small> | gw<br><small>rel. Bending Radius R/T<br/>Strip Thickness ≤ 0.50mm</small> | bw              |     |
| R360   | H01 (¼ hard)  | 360 .. 430       | 300                      | 12                     | 14 *                                      | 100 .. 130  | 0               | 0   |
| R410   | H02 (½ hard)  | 410 .. 470       | 360                      | 9                      | 11 *                                      | 125 .. 155  | 0               | 0   |
| R460   | H03 (¾ hard)  | 460 .. 520       | 410                      | 7                      | 9 *                                       | 135 .. 165  | 0.5             | 1   |
| R520   | H06 (extra hard)  | 520 .. 580       | 460                      | 5                      | 7 *                                       | 145 .. 175  | 1               | 2   |
| R530   | TM04 (HM)   | 530 .. 630       | 430                      | 14                     |   | 150 .. 190  | 0               | 0   |
| R580   | TM06 (XHM)  | 580 .. 650       | 540                      | 8                      |   | 170 .. 200  | 1               | 1   |
| R580S  | TM06 (XHM)<br>bending optimized                                   | 580 .. 650       | 520                      | 9                      |   | 170 .. 200  | 0.5             | 0.5 |
| R620   | TM08 (SHM)  | 620 .. 700       | 560                      | 7                      |   | 180 .. 210  | 1               | 1.5 |

### Physical Properties

Typical values in annealed temper at 20 °C

|  |               |       |                     |
|--|---------------|-------|---------------------|
| Density                                      |               | 8.92  | g/cm <sup>3</sup>   |
| Thermal expansion coefficient                | 20 .. 300 °C  | 16.8  | 10 <sup>-6</sup> /K |
| Specific heat capacity                       |               | 0.377 | J/(g·K)             |
| Thermal conductivity                         |               | 250   | W/(m·K)             |
| Electrical conductivity                      | MS/m          | 33    | MS/m                |
| Electrical conductivity                      | IACS          | 57    | %                   |
| Thermal coefficient of electrical resistance | (0 .. 100 °C) | 2     | 10 <sup>-3</sup> /K |
| Modulus of elasticity                        | GPa           | 135   | GPa                 |

### Electrical Conductivity



#### Fabrication Properties \*

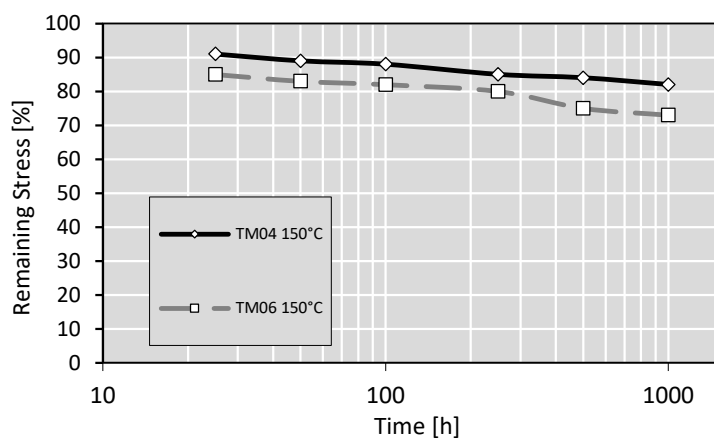
|                           |               |
|---------------------------|---------------|
| Cold Forming Properties   | Excellent     |
| Machinability (Rating 20) | Less suitable |
| Electroplating Properties | Excellent     |
| Hot Tinning Properties    | Excellent     |
| Soft Soldering, Brazing   | Excellent     |
| Resistance Welding        | Less suitable |
| Gas Shielded Arc Welding  | Excellent     |
| Laser Welding             | Fair          |

\* For more details call our technical service

#### Corrosion Resistance \*

**STOL® 76M** has good corrosion resistance.  
The alloy is insensitive to stress corrosion cracking.

#### Relaxation Properties



Relaxation values give an indication about stress relieve of strip under tension for a certain time and temperature.  
Typical test sample thickness is 0.3 – 0.6 mm.

Initial Stress  
80% von  $R_{p0.2}$   
Parallel Rolling Direction

#### Bend Fatigue (at room temperature)

The fatigue strength gives an indication about the resistance to variations in applied tension. It is measured under symmetrical alternating load. The maximum bending load for  $10^7$  load cycles without crack is measured. Dependent on the temper class it is approximately 1/3 of the tensile strength  $R_m$ .

#### Available delivery forms \*

- Strips in coils
- Traverse-wound coils with drum weights up to 1.5 t
- TECSTRIP®\_multicoil up to 2.5 t
- Hot-Dip-Tinned strips in thickness range 0.10 up to 1.20 mm

\* For more details call our sales service

Due to continued improvements within our production process, the details stated in our brochure can not be guaranteed. We reserve the right to update or amend our products, without prior notification. We suggest that you obtain confirmation of our product details / specifications prior to committing to specific alloys.