FELDER
NiGe - electronic solders

ISO-Tin Sn100Ni+
ISO-Tin Sn99Ag+
ISO-Tin Sn98Ag+
ISO-Tin Sn96Ag+
ISO-Tin Sn95Ag+

FELDER Löttechnik

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We produce the complete range of lead-free electronic solders from 0< up to 4,0 % pure silver content according to Fuji-Patent DE 198 16 671.

**FELDER ISO-Tin Sn100Ni+® • Sn99Ag+® • Sn98Ag+® • Sn96Ag+® • Sn95Ag+®** are patented and further optimized developments of the conventional Sn99,3Cu0,7Ni-alloys with the well-known and outstanding properties:

- **Ni** as barrier layer to
  - prevent tin-whiskers
  - increase the creep strength of the solder joint by reducing the growth of IM-phase
  - prevent corrosion appearances of solder pots and nozzle parts of older soldering units with stainless steel pots and of soldering irons tips
  - reduce Cu-leachings
- shiny soldering joints (there is no difference between the look of lead-free or lead-containing soldering joints)
- homogenous characteristic of the soldering joint’s metal structure and therefore an optimal solidification attitude without micro cracks

**FELDER ISO-Tin® NiGe - electronic solders can do more!**
The plus + in FELDER ISO-Tin® NiGe - electronic solders stands for germanium!

Germanium (Ge) has an oxygen reducing effect and improves the soldering properties as follows:

- Ge reduces the surface tension of the molten solder and thus improves the wetting properties of the SnCuNi-alloy.

- Ge reduces the dross formation compared to Sn99.3Cu0.7Ni about further 50 – 70 %!

- Ge-endowed solder already shows at first sight considerably less surface oxides than conventional solders.

- Ge improves the tensile strength of the soldering joint about approx. 10 %.

- Ge further reduces the copper removal and simplifies the refreshing of the solder filling.

- Ge shows a low rate of consumption. Thus a minimal Ge-part is sufficient and it remains stable in the molten solder.

- Ge supports the formation of the metal structure formation of the soldering joint and thereby reduces the development of micro cracks.
ISO-Tin®

Sn100Ni+® • Sn99Ag+® • Sn98Ag+® • Sn96Ag+® • Sn95Ag+®

Physical properties in comparison to the standard solder Sn99,3Cu0,7

<table>
<thead>
<tr>
<th>Product</th>
<th>Sn100Ni+®&lt;br&gt;Sn99,3Cu0,7AgNiGe</th>
<th>Sn99Ag+®&lt;br&gt;Sn99Ag0,3Cu0,7NiGe</th>
<th>Sn98Ag+®&lt;br&gt;Sn98,1Ag1,2Cu0,7NiGe</th>
<th>Sn96Ag+®&lt;br&gt;Sn96,5Ag3,0Cu0,5NiGe</th>
<th>Sn95Ag+®&lt;br&gt;Sn95,5Ag3,8Cu0,6NiGe</th>
<th>Sn99,3Cu0,7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting temperature</td>
<td>227 °C e</td>
<td>217-227 °C</td>
<td>217-222 °C</td>
<td>217-219 °C</td>
<td>217 °C e</td>
<td>227°C e</td>
</tr>
<tr>
<td>Solder wave temperature</td>
<td>≥ 265 °C</td>
<td>≥ 260 °C</td>
<td>≥ 255 °C</td>
<td>≥ 255 °C</td>
<td>≥ 255 °C</td>
<td>≥ 270 °C</td>
</tr>
<tr>
<td>Density in g/cm³</td>
<td>7,31</td>
<td>7,34</td>
<td>7,37</td>
<td>7,38</td>
<td>7,38</td>
<td>7,31</td>
</tr>
<tr>
<td>Tensile strength in N/mm²</td>
<td>40</td>
<td>44</td>
<td>48,0</td>
<td>56,0</td>
<td>59,4</td>
<td>37,4</td>
</tr>
<tr>
<td>Extension in %</td>
<td>70</td>
<td>66</td>
<td>64</td>
<td>68</td>
<td>68</td>
<td>66</td>
</tr>
<tr>
<td>Hardness Hv</td>
<td>11,5</td>
<td>14</td>
<td>15</td>
<td>18</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>Thermal expansion factor in 1/°C</td>
<td>23,6 x 10⁻⁶</td>
<td>23,0 x 10⁻⁶</td>
<td>23,7 x 10⁻⁶</td>
<td>23,3 x 10⁻⁶</td>
<td>23,3 x 10⁻⁶</td>
<td>21,5 x 10⁻⁶</td>
</tr>
</tbody>
</table>

The solders Sn100Ni+® and Sn99Ag+® are also available as special alloy for hot air tinning as HASL-Sn100Ni+® and HASL-Sn99Ag+® (recommended by PENTAGAL-CHEMIE).

.....and you will have a further advantage:

This product range offers you the possibility to change your solder bath of SnCuNi alloys respectively of Sn100Ni+® with a concentrate in order to convert your bath to silver containing alloys and therefore to lower process temperatures.

Delivery forms

Rods, ca. 400 g, 330 x 20 x 10 mm
3,5 kg blocks with hanging hole 47 x 20 x 545 mm

Also deliverable as massive wire and as wire segments for first filling.