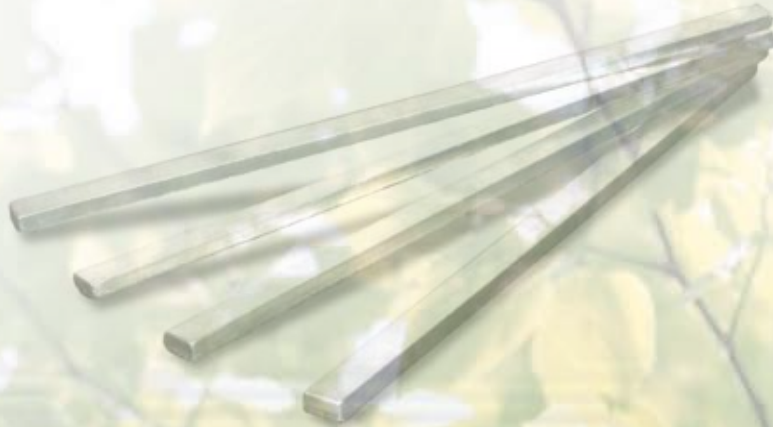


# FELDER

## NiGe - electronic solders



ISO-Tin Sn100Ni+®

ISO-Tin Sn99Ag+®

ISO-Tin Sn98Ag+®

ISO-Tin Sn96Ag+®

ISO-Tin Sn95Ag+®

# FELDER

## Löttechnik

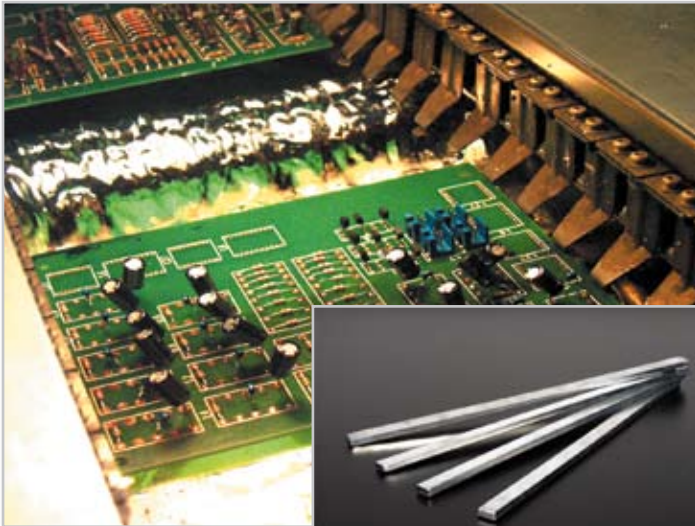


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# FELDER Löttechnik



## FELDER NiGe - electronic solders

### The innovative lead-free electronic solders!

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
- **ISO-Tin Sn100Ni+®** - obvious price advantage (ca. 30 %) compared to alloy SAC 305
- **ISO-Tin Sn99Ag+®** - obvious price advantage (ca. 30 %) compared to alloy SAC 305
- **ISO-Tin Sn98Ag+®** - obvious price advantage (ca. 15 %) compared to alloy SAC 305



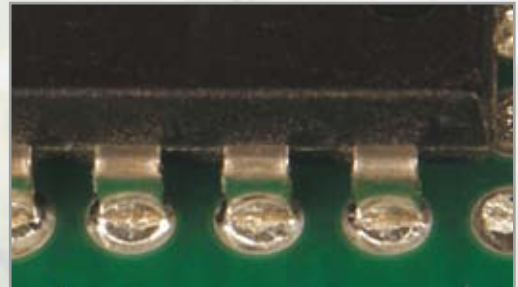
**FELDER ISO-Tin® NiGe - electronic solders can do more!**



## 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.



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

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

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

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.