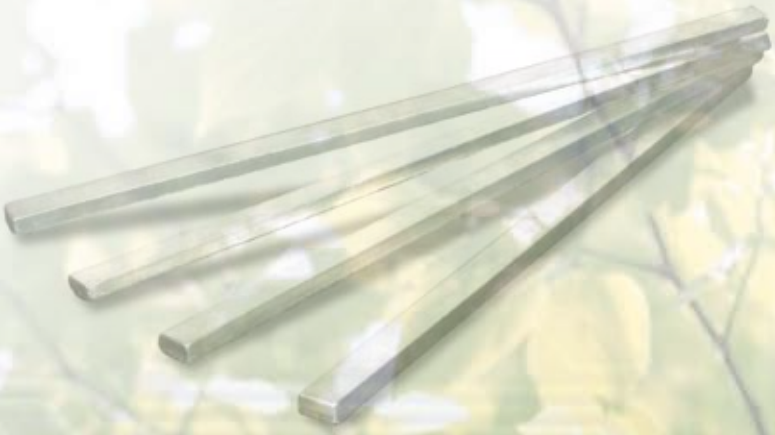
# FELDER

# NiGe - electronic solders



ISO-Tin Sn100Ni+®

ISO-Tin Sn99Ag+®

ISO-Tin Sn98Ag+®

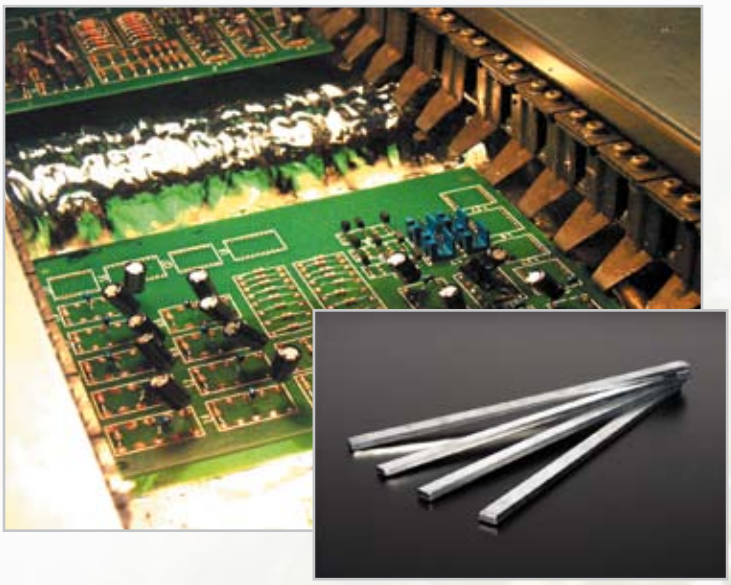
ISO-Tin Sn96Ag+®

ISO-Tin Sn95Ag+®

**FELDER**
**Löttechnik**

**FELDER GMBH**
**Löttechnik**
Im Lipperfeld 11
D-46047 Oberhausen

Telephone: +49 2 08 / 8 50 35 - 0
Fax: +49 2 08 / 2 60 80
Internet: www.felder.de
E-Mail: info@felder.de



# 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!

**FELDER GMBH**
**Löttechnik**
Im Lipperfeld 11
D-46047 Oberhausen

Telephone: +49 2 08 / 8 50 35 - 0
Fax: +49 2 08 / 2 60 80
Internet: www.felder.de
E-Mail:info@felder.de

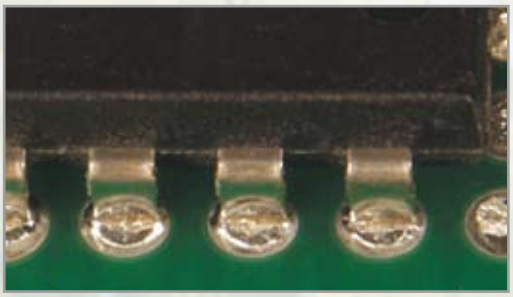
# FELDER
# ISO-Tin® NiGe - electronic solders

FELDER Löttechnik

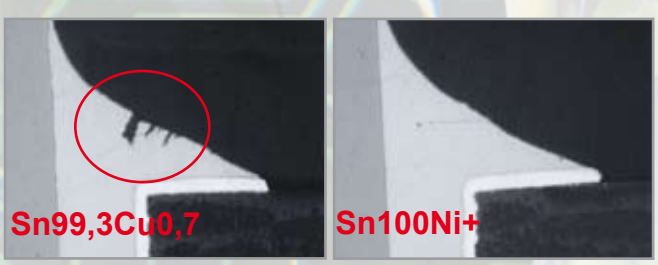
## The plus + in FELDER ISO-Tin® NiGe - electronic solders stands for germanium!

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.




**FELDER GMBH**
**Löttechnik**
Im Lipperfeld 11
D-46047 Oberhausen

Telephone: +49 2 08 / 8 50 35 - 0
Fax: +49 2 08 / 2 60 80
Internet: www.felder.de
E-Mail: info@felder.de

ISO-Tin®

FELDER Löttechnik

# 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 | $23{,}6 \times 10^{-6}$ | $23{,}0 \times 10^{-6}$ | $23{,}7 \times 10^{-6}$ | $23{,}3 \times 10^{-6}$ | $23{,}3 \times 10^{-6}$ | $21{,}5 \times 10^{-6}$ |

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.

**FELDER GMBH**
**Löttechnik**
Im Lipperfeld 11
D-46047 Oberhausen

Telephone: +49 2 08 / 8 50 35 - 0
Fax: +49 2 08 / 2 60 80
Internet: www.felder.de
E-Mail: info@felder.de