



# FELDER

— seit 1979 —

## LÖTTECHNIK

# DELIVERY PROGRAM ELECTRONIC

The technology for soldering in electronic production.





## High-quality joints from Oberhausen

FELDER GMBH has been producing first-class products since 1979. Our product range and services are perfectly orientated to the needs of our customers, making us the perfect partner in our specialist field: the development and production of solders, solder pastes and fluxes for soldering and brazing as well as anodes and solder wires for flame spraying. The delivery program is just as diverse as the areas of application. Whether for the hot air levelling of PCBs, the cable assembling, the assembly production or also for the surface technology - with our soldering technology products we work to the best of our ability and grow every day in line with our assignments.

In 1986 our company moved to the current location in Oberhausen. Our production halls and warehouses were modernized in 1991 and 2005 and doubled in 2013/2014 to a total of 7000 m<sup>2</sup>. In recent decades we have emerged as the innovative market leader. The economic success and the consistently growing clientele acknowledges the work that we do.

As one of the leading manufacturers of solders and fluxes in Europe, our products are naturally subject to continual quality control in our modern laboratory and comply with a high standard of quality according to the guidelines of ISO 9001. Aspects concerning the environment are also strictly monitored and certified according to ISO 14001.

Careful advice and customised problem solutions are part of our philosophy. Our extensive range of products makes us a very capable partner for industry and trade. By maintaining this high quality standard, FELDER GMBH secures its market position for the future.

We look forward to working together with you.

## FELDER GMBH

Löttechnik

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## ISO-Tin® basic electronic solders

### From pure metals of first melting.

For use in wave, selective and dip solder baths.

Format	Dimension
ca. 0,250 kg triangular rods	10 x 10 x 10 x 400 mm
ca. 1,000 kg rods	330 x 20 x 20 mm
ca. 3,500 kg blocks with suspension eyelet	545 x 47 x 20 mm

Also as solid wire on spools for automatic feeding and available as cone / pellets for first filling.



Product	Alloy	EN ISO 9453:2014	Melting range	Rec. solder wave temperature
Sn96,5Ag3,0Cu0,5	Sn96,5Ag3,0Cu0,5	Sn96,5Ag3Cu0,5	217 - 219 °C	≥ 255 °C
Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu0,7	217 °C eutektic	≥ 255 °C
Sn96,5Ag3,5	Sn96,5Ag3,5	Sn96,5Ag3,5	221 °C eutektic	≥ 260 °C
Sn99,3Cu0,7	Sn99,3Cu0,7	Sn99,3Cu0,7	227 °C eutektic	≥ 270 °C
Sn63Pb37	Sn63Pb37E	Sn63Pb37E	183 °C eutektic	≥ 250 °C

For our **FELDER ISO-Tin® basic electronic solders**, we only use materials of the highest purity in our melt. Our special manufacturing process ensures minimal dross formation even during soldering processes in a normal atmosphere.

For use in selective soldering systems with wettable nozzles, we also offer a guaranteed phosphorus-free version. (Phosphorus is suspected of accelerating the passivation of the solder nozzles).

Each delivery is provided with a batch number. A certificate of analysis is available on request. The analytical values are determined with an emission spectrometer. Our lead-free solders comply with the RoHS directive and thus also the ElektroG. We will be pleased to provide you with a declaration of conformity.

All lead-free **FELDER ISO-Tin® basic electronic solders** basic electronic solders are of course also available as copper-free refillable solders.

Please note the application advantages of our NiGe-doped electronic solders. Please ask for our detailed product information.

## Desoxidation tablets

Phosphorus doped solder additive to reduce dross formation  
Especially for wave and dip soldering systems without protective gas equipment  
Phosphorus content 0.8 % P

Content	Format	Alloy (according to EN 9453:2014)
0,250 kg cans	pressed pellets	Sn60Pb40P (Sn60Pb40)
0,250 kg cans	pressed pellets	Sn99,9P (Sn99,9)



## Nickel and germanium concentrates

For the adjustment and correction of the nickel and germanium contents in correspondingly doped solders as well as for the conversion from lead-free basic electronic solders to our NiGe solders.

Content	Format	Alloy
5,000 kg cartons	rods 10x150 mm	Sn99Ge1
5,000 kg cartons	rods 10x150 mm	Sn97Ni3

## ISO-Tin®.

### High temperature solders and high melting point solders

#### from pure metals of first melting

for immersion tin plating in transformer construction and in cable assembly

Format	Dimension
ca. 0,250 kg triangular rods	10 x 10 x 10 x 400 mm
ca. 1,000 kg rods	20 x 20 x 300 mm

Also available as solid wire on spools for automatic feeding.



Product	DIN EN ISO 9453:2014	Melting range	Soldering temperatures
Sn96Cu4Ni	-	227 - 335 °C	≤ 500 °C
Sn95Cu5	-	227 - 350 °C	≤ 500 °C
Sn97Cu3	Sn97Cu3	227 - 310 °C	≤ 450 °C

#### RoHS-compliant high lead content solders with > 85 % lead content

Pb93Sn5Ag2	Pb93Sn5Ag2	296 - 301 °C	> 500 °C
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Of course, we also manufacture alloys according to your specifications and factory standards.

#### For solder baths with continuous operating temperatures up to 570 °C!

Enamelled copper wires with high-temperature resistant enamel finishes are used in transformer construction. These enamels require melting temperatures of up to 570 °C. Our high-melting solders are specially adjusted to this demanding process and are high temperature stable. According to RoHS and ElektroG, high lead content solders with a lead content of more than 85 % may still be used without restriction in electronics production, because there is no applicable lead-free alternative to these solders. We will be happy to provide you with a declaration of conformity.

## Pure tin cone for electroplating

### Sn99,9

For the production of chemical Sn-surfaces in the production of printed circuit boards and for the galvanic tinning in the electronics industry and metalworking industry.

Format	Dimension
Cones	20 x 25 mm
Cones	23 x 35 mm
Cones	30 x 35 mm



In use, our cones are characterised by their excellent sliding properties. This prevents tilting in the titanium basket and achieves a high bulk density. Through a new production process in the manufacturing of our pellets, we have succeeded in achieving a longer operating life for the same application quantity.



# Sn100Ni+®

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



## Electronic solder

### ISO-Tin® NiGe-Electronic solder

From pure metals of first smelting

For use in wave, selective, and dip soldering baths

Format	Dimension
Approx. 0.400 kg rods	330 x 20 x 10 mm
Approx. 1.000 kg rods	330 x 20 x 20 mm
Approx. 3.500 kg blocks with hanging loop	545 x 47 x 20 mm
Also available as solid wire on spools for automatic feeding and as cones/pellets for initial filling.	

## HAL-Lote

### ISO-Tin® NiGe-HAL-solder

From pure metals of first smelting

for hot-air tinning in printed circuit board manufacturing

Format	Dimension
Approx. 0.400 kg rods	330 x 20 x 10 mm
Approx. 1.000 kg rods	330 x 20 x 20 mm
Approx. 3.500 kg blocks with hanging loop	545 x 47 x 20 mm
Also available as solid wire on spools for automatic feeding and as cones/pellets for initial filling.	

The alloys from the Sn100Ni+ family are known for their good soldering properties, shiny solder joints, and reduction of copper alloying. NiGe solder alloys have proven their reliability in numerous tests.

	Product	Alloy	EN ISO 9453	Melting range	Rec. soldering wave temperature	Application
Wave soldering	Sn100Ni+®**	Sn99.3Cu0.7AgNiGe	Sn99.25Cu0.7Ni0.05	227 °C eutectic	≥ 265 °C	Wave soldering Selective soldering Immersion soldering
	Sn100Ni+®-Refill**	Sn99.9NiGe	-	Refill for Sn100Ni+®		
	Sn99Ag+®**	Sn99Ag0.3Cu0.7NiGe	-	217 - 227 °C	≥ 260 °C	
	Sn98Ag+®**	Sn98Ag1.2Cu0.7NiGe	-	217 - 222 °C	≥ 255 °C	
	Sn96Ag+®**	Sn96.5Ag3.0Cu0.5NiGe	-	217 - 219 °C	≥ 255 °C	
	Sn95Ag+®**	Sn95.5Ag3.8Cu0.7NiGe	-	217 °C eutectic	≥ 255 °C	
HAL-tinning	HAL-Sn100Ni+®**	Sn99.3Cu0.7AgNiGe	Sn99,25Cu0,7Ni0,05	227 °C eutectic	≥ 277 °C	hot-air tinning
	HAL-Sn100Ni+®-Refill	Sn99.9NiGe	-	Refill for HAL-Sn100Ni+® (acc. to Cu-content)		
	HAL-Sn99Ag+®**	Sn99Ag0.3Cu0.7NiGe	Sn99Cu0.7Ag0.3(NiGe)	227 °C eutectic	258 - 268 °C	
	HAL-Sn99Ag+®-Refill	Sn99.7Ag0.3NiGe	-	Refill for HAL-Sn99Ag+® (acc. to Cu-content)		

\*\* Fuji-Patent: DE-Patent-No. 19816671C2; US-Patent-No. 6.179.935B1; Japan-Patent-No. 3296289

All electronic solders are of course also available as REFILL solder without copper. Our lead-free solders comply with the RoHS directive and therefore also with the ElektroG. We will be happy to provide you with a corresponding declaration of conformity. Please note the application-related advantages of our NiGe-doped electronic solders. Request our detailed product information.

# SN100-403C



## Electronic solder

### ISO-Tin® SN100-403C

**From pure metals of first smelting**

For use in wave, selective, and dip soldering baths

Format	Dimension
approx. 0.250 kg triangular rods	10 x 10 x 10 x 400 mm
approx. 1.000 kg rods	330 x 20 x 20 mm
approx. 3.500 kg Blocks with hanging loop	545 x 47 x 20 mm

Also available as solid wire on spools for automatic feeding and as cones/pellets for initial filling.

The alloys from the SN100-403C family are known for their good soldering properties, shiny solder joints, and reduction of copper alloying. The SN100-403C solder has proven its reliability in numerous tests.

## HAL-Solder

### ISO-Tin® SN100-403CL

**From pure metals of first smelting**

For hot-air tinning in printed circuit board manufacturing

Format	Dimension
approx. 0.250 kg triangular rods	10 x 10 x 10 x 400 mm
approx. 1.000 kg rods	330 x 20 x 20 mm
approx. 3.500 kg Blocks with hanging loop	545 x 47 x 20 mm

Also available as solid wire on spools for automatic feeding and as cones/pellets for initial filling.

	Product	Alloy	EN ISO 9453	Alloy No.	Melting range	Rec. soldering wave temperature	Application
wave soldering	SN100-403C *	SnCu07NiGe0.0055	Sn99.25Cu0.7Ni0.05	403	227 °C eutectic	≥ 265 °C	Wave soldering Selective soldering Immersion soldering
	SN100-403Ce *	SnNiGe0.0055	-		Refill for SN100-403C	≥ 265 °C	
	SN100-403CS *	SnCu07NiGe0.01	Sn99.25Cu0.7Ni0.05	403	227 °C eutectic	≥ 265 °C	
	SN100-403CeS *	SnNiGe0.01	-		Refill for SN100-403CS	≥ 265 °C	
	SN100-403CS+ *	SnCu07NiGe0.025	Sn99.25Cu0.7Ni0.05	403	227 °C eutectic	≥ 265 °C	
	SN100-403CeS+ *	SnNiGe0.025	-		Refill for SN100-403CS+	≥ 265 °C	
	SN100-403C3 *	SnCu3NiGe0.0055	-		227 - 310 °C	340 - 420 °C	Immersion soldering
	SN100-403C4 *	SnCu4NiGe0.0055	-		227 - 340 °C	380 - 540 °C	
HAL-tinning	SN100-403CL *	SnCu07NiGe0.0055	Sn99.25Cu0.7Ni0.05	403	227 °C eutectic	≥ 277 °C	hot-air tinning
	SN100-403CLe *	SnNiGe0.0055	-		Refill for SN100-403CL	≥ 277 °C	
	SN100-403CLe(+) *	SnNi0.15Ge0.0055	-		Refill for SN100-403CL	≥ 277 °C	
	SN100-403CLS *	SnCu07NiGe0.01	Sn99.25Cu0.7Ni0.05	403	227 °C eutectic	≥ 277 °C	
	SN100-403CLeS *	SnNiGe0.01	-		Refill for SN100-403CLS	≥ 277 °C	
	SN100-403CLeS(+) *	SnNi0.15Ge0.01	-		Refill for SN100-403CLS	≥ 277 °C	

\* Manufactured according to NIHON SUPERIOR patent: DE patent no. 69918758; European patent no. 0985486

Our lead-free solders comply with the RoHS directive and therefore also with the ElektroG. We will be happy to provide you with a corresponding declaration of conformity. Please note the application-related advantages of our NiGe-doped electronic solders. Request our detailed product information.

 **Made in Germany**



## Solder wire ISO-Core®

“Ultra-Clear” • “Clear” • “RA-Clear”



### Flux-filled lead-free soft solder wires

Flux residues according to DIN EN 61190-1-1 / IPC J-STD-004

Highly qualified solder wires for manual and automatic soldering in electrical engineering, Electromechanics and electronics. Standard flux ratio 2.2 % / 3.5 %

**Thermally stable • splash-free • optimum wetting • crystal-clear residues**

ISO-Core	IPC J-STD-004	EN ISO 9454-1	halogen content	resistance test (demanded <8,0 log Ohm)	Type
Ultra-Clear	RELO	1231	0 %	passed - > 11,0 log Ohm	No-clean
Clear	REL1	1222	< 0.15 %	passed - > 11,0 log Ohm	No-clean
RA-Clear	REM1	1223	< 1.2 %	passed - > 10,0 log Ohm	No-clean

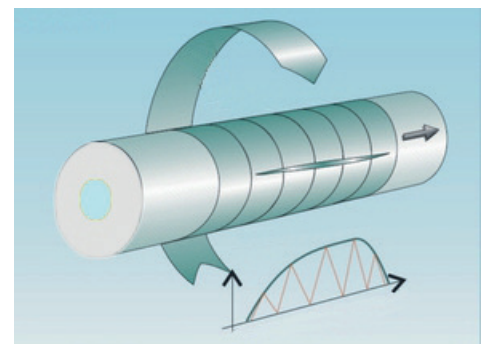
Alloy	DIN EN ISO 9453:2014	DIN EN 61190-1-3	Melting range
Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu,7	217°C eutektic
Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu,5	217 - 219°C
Sn99,3Cu0,7	Sn99,3Cu0,7	Sn99Cu,7	227°C eutektic
Sn100Ni+ / SN100-403C	Sn99,25Cu0,7Ni0,05	Sn99,25Cu,7Ni,05	227°C eutektic

Ø in mm 0,25 • 0,50 • 0,75 • 1,00 • 1,50 • 2,00 • 3,00

Spools in kg 0,10 • 0,25 • 0,50 • 1,00 • 5,00 • 10,00

Other alloys, diameters and coil sizes on request.

100% inline monitoring



## Solder wire ISO-Core®

### “Ultra-Clear“ • “Clear“ • “RA-Clear“

High-quality lead-free solder wires for manual and automatic soldering in electrical engineering, electromechanics and electronics. The flux is characterized by **high temperature resistance** and does **not splash** during melting. An **optimal wetting** as well as **values of propagation above the norm** are making these lead-free solder wires to top products among tubular solders.

The new flux formulations „Ultra-Clear“, „Clear“, „RA-Clear“ are based on synthetic resins (free of rosin) and have been perfectly adapted to the new requirements of lead-free soldering technology:

- **High wetting speed and spreading on all surfaces** commonly used in electronics
- **No (painful) flux splashes** on the assembly, plant components or hands
- **Crystal-clear flux residues** to optimize the optical impression
- **Minimum outgassing and neutral odour** reduce workplace pollution
- **Easy removable small residues on soldering tips** - these can be removed with conventional means (FELDER Tinner, remove soldering sponge, metal wool)
- **100M $\Omega$ -test passed** - can also be used in assembly production
- **Service life of the soldering iron tips is noticeably extended**

## 100% inline monitoring • 100% consistent quality

The installation of the new monitoring unit results in outstanding advantages for the product quality:

- Identification of flux interruptions and flux fluctuations
- Optimization of production through continuous inline measurements
- Identification of air inclusions and other wire anomalies
- Continuous monitoring of the wire diameter in 2 axes
- Measuring accuracy is higher by a factor of 10 than the tolerance of the DIN / IPC specifications
- Identification of alloy deviations
- In case of deviations from the standard measured variable, the faulty wire is sorted out

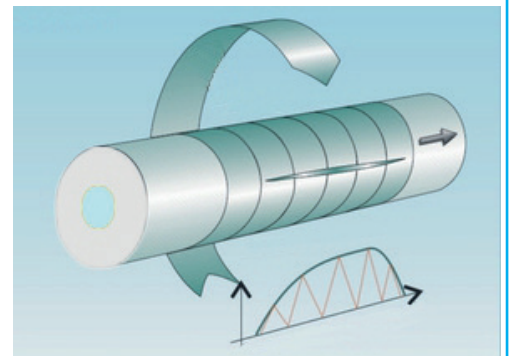
Thus the FELDER-ISO-Core® solder wire is always ready for use:

- Hand and repair soldering
- Automated soldering (robot soldering)

### **CONCLUSION:**

**We guarantee product quality without flux interruptions**

- **100% flux filled**



**Made in Germany**



## Solder wire ISO-Core® “RA“, „RA-05“

### Flux-filled, halogen-containing activated soft solder wire

Flux according to DIN EN ISO 9454-1, 1123; DIN EN 61190-1-1 / IPC J-STD-004, ROM1

Standard solder wire for manual soldering in electrical engineering,

Standard flux content 2.5 %

Halogenide content 1.0%; also available as RA-05 with a halogenide content < 0.5% and

thus as ROL1 according to IPC J-STD-004!

**Ø in mm** 0,25 • 0,50 • 0,75 • 1,00 • 1,50 • 2,00 • 3,00

**Spools in kg** 0,10 • 0,25 • 0,50 • 1,00 • 5,00 • 10,00



Alloy	DIN EN ISO 9453:2014	DIN EN 61190-1-3	Melting range	lead-free/-containing
Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu,7	217 °C eutektic	lead-free
Sn96,5Ag3,0Cu0,5	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu,5	217 - 219 °C	
Sn97Ag3	Sn97Ag3	Sn97Ag3	221 - 224 °C	
Sn99,3Cu0,7	Sn99,3Cu0,7	Sn99,3Cu,7	227 °C eutektic	
Sn97Cu3	Sn97Cu3	Sn97Cu3	227 - 310 °C	
Sn100Ni+ / SN100 <sup>-403</sup> C	Sn99,25Cu0,7Ni0,05	Sn99,25Cu,7Ni,05	227 °C eutektic	
Sn99Ag+	Sn99Cu0,7Ag0,3(NiGe)	Sn99Cu,7Ag,3(NiGe)	217 - 227 °C	
Sn60Pb40	Sn60Pb40E	Sn60Pb40	183 - 190 °C	lead-containing
Sn60Pb38Cu2	Sn60Pb39Cu1	Sn60Pb38Cu02	183 - 190 °C	
Pb50Sn50	Pb50Sn50	Sn50Pb50	183 - 215 °C	
Pb60Sn40	Pb60Sn40	Sn40Pb60	183 - 238 °C	
Pb93Sn5Ag2	Pb93Sn5Ag2	Sn05Pb93Ag02	296 - 301 °C	RoHS-conformal: Pb > 85 %

Other alloys, diameters and coil sizes on request.

## Solder wire ISO-Core® “EL“

### Flux-filled, halogen-free activated soft solder wire

Flux according to DIN EN ISO 9454-1, 1131; DIN EN 61190-1-1 / IPC J-STD-004, ROLO.

No-clean standard solder wire for manual soldering in electronics,

Standard flux content 3.5 %.

**Ø in mm** 0,25 • 0,50 • 0,75 • 1,00 • 1,50 • 2,00 • 3,00

**Spools in kg** 0,10 • 0,25 • 0,50 • 1,00 • 5,00 • 10,00



Alloy	DIN EN ISO 9453:2014	DIN EN 61190-1-3	Melting range	lead free/-containing
Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu,7	217 °C eutektic	lead-free
Sn96,5Ag3,0Cu0,5	Sn96,5Ag3Cu0,5	Sn96,5Ag3Cu,5	217 - 219 °C	
Sn97Ag3	Sn97Ag3	Sn97Ag3	221 - 224 °C	
Sn99,3Cu0,7	Sn99,3Cu0,7	Sn99,3Cu,7	227 °C eutektic	
Sn97Cu3	Sn97Cu3	Sn97Cu3	227 - 310 °C	
Sn100Ni+ / SN100 <sup>-403</sup> C	Sn99,25Cu0,7Ni0,05	Sn99,25Cu,7Ni,05	227 °C eutektic	
Sn99Ag+	Sn99Cu0,7Ag0,3(NiGe)	Sn99Cu,7Ag,3(NiGe)	217 - 227 °C	
Sn60Pb40	Sn60Pb40E	Sn60Pb40	183 - 190 °C	lead-containing
Sn60Pb38Cu2	Sn60Pb39Cu1	Sn60Pb38Cu02	183 - 190 °C	
Pb50Sn50	Pb50Sn50	Sn50Pb50	183 - 215 °C	
Pb60Sn40	Pb60Sn40	Sn40Pb60	183 - 238 °C	
Pb93Sn5Ag2	Pb93Sn5Ag2	Sn05Pb93Ag02	296 - 301 °C	RoHS-conformal: Pb > 85 %

The qualities „EL“ and „ELR“ have been tested by Siemens (Certification Body CT Berlin) on the surface resistivity value (SIR) and electrochemical migration. Both tests passed!



**Made in Germany**

## Halogenide-free activated FELDER electronic solder wires according to DIN EN ISO 9454-1, 1231 or 2231

(Alloys, diameters and coil sizes on request)

**ISO-Core® “ELR”** Low-residue no-clean SMD solder wire, specially adapted to the requirements of post-soldering work on SMD-assembled assemblies. Standard flux content 1.0 %.  
Flux according to DIN EN ISO 9454-1, 2231; DIN EN 61190-1-1 / IPC J-STD-004, ORLO

**ISO-Core® “ELS”** Like our ISO-Core® “ELR”, but based on synthetic resins. Standard flux content 1.0 %.  
Flux according to DIN EN ISO 9454-1, 1231; DIN EN 61190-1-1 / IPC J-STD-004, REL0

## FELDER-special solder wire

(Alloys, diameters and coil sizes on request)

**ISO-Core® “LASER-RA”** Special low-residue solder wire for use in laser soldering systems. The flux core is highly temperature resistant and thus perfectly adapted to the demanding requirements of the laser soldering process (fast soldering cycle, high soldering temperature). Standard flux content 2.5 %.

**ISO-Core® “EWL”** Electronic solder wire with water-soluble flux based on organic acids, halogenide-containing activated. Especially for assemblies that are potted or painted. In contrast to conventional no-clean flux residues, the complete removal of the residues prevents interaction with the paint or casting compound. Standard flux content 2.5 %.  
Flux according to DIN EN ISO 9454-1, 2123; DIN EN 61190-1-1 / IPC J-STD-004, ORM1

## Application matrix - FELDER- ISO-Core® comparison of electronic solder wires

Eigenschaft	ISO-Core Clear	ISO-Core Ultra-Clear	ISO-Core RA	ISO-Core LASER-RA	ISO-Core EL	ISO-Core ELR	ISO-Core ELS	ISO-Core EWL
EN ISO 9454-1 / J-STD-004	1222 / REL1	1231 / REL0	1123 / ROM1	1223 / REM1	1131 / ROLO	2231 / ORLO	1231 / REL0	2123 / ORM1
Flux content (standard) %	2.2 / 3.5	1.5 / 2.2	2.5	2.5	3.5	1.0	1.0	2.5
No-Clean	•	•			•	•	•	
Lead-free	•	•	•	•	•	•	•	•
Lead-containing			•		•	•	•	•
High lead containing ( > 85 %)	•		•		•			
Residues easily removable	•	•	•	•	•	•	•	•
Water washable								•
Halogenide-free		•			•	•	•	
Synthetic resins	•	•		•			•	
Hand soldering	•	•	•		•	•	•	•
Rework (Flux ≤ 1.5 %)	•	•				•	•	
Automatic soldering	•	•		•				•
Laser-soldering	•	•		•				
Water clear residues	•	•						
No flux splashes	•	•		•				

## Other flux-filled FELDER solder wires

In addition to the FELDER ISO-Core® electronic soldering wires, we offer further special soldering wires, e.g. for soldering steel and stainless steel (ISO-Core® “VA”) or aluminium (ISO-Core® “AL”) an (further information on these soldering wires can be found on the corresponding leaflet).



## ISO-Cream® No-clean SMD solder pastes

Homogeneous, ready-to-use, low-odor mixture of metal powder, binding agents, solvents, fluxing agents, and thixotropic agents. 250 g and 500 g cans, 5, 10, and 30 cc dispenser cartridges

### “Active-Clear“

Excellent wetting on all PCB surfaces, especially NiAu and NiPd under normal, inert gas atmosphere and in the vapor phase, based on synthetic resins (rosin-free), clear inconspicuous residues, minimal void formation, halide content < 0.15% (REL1)

### “Clear“

Halide-free version of our ISO-Cream® “Active-Clear“, based on synthetic resins (rosin-free), clear inconspicuous residues, minimal void formation, processing period at least 72 hours, halide-free (<0.01%), RELO

### “Clear“ GreenTin®

Halide-free version of our ISO-Cream® “Active-Clear“, Based on synthetic resins (colophony-free), clear inconspicuous residues, minimal void formation, processing period at least 72 hours, halide-free (<0.01%), RELO



## Significant reduction in CO2 footprint

With **GreenTin**, we have opted for sustainable and high-purity tin from the refinery, which is obtained entirely from recycled materials. Through precise upcycling processes, the refinery achieves purity levels of up to 99.99%. The result is an ecologically sourced material of the highest quality. Instead of raw materials from mines, we rely on a particularly environmentally friendly European alternative.

Alloy	CO <sub>2</sub> -Emission (per kg)			
Sn96.5Ag3Cu0.5	Primary metal*	Proportionately	Recycling metal	Proportionately
96.5 % Zinn	10.15 kg	9.795 kg	0.93 kg	0.897 kg
3.0 % Silber	449.39 kg	13.48 kg	52.0 kg	1.560 kg
0.5 % Kupfer	4.87 kg	0.024 kg	0.8 kg	0.004 kg
CO <sub>2</sub> - Footprint		<b>23.305 kg</b>		<b>2.461 kg</b>
<b>CO2 reduction of 20,844 kg = 89.44 %!</b> <b>comparison of the solder powder content of an SMD solder paste made from primary metals</b>				


Lead-free alloys	Melting range
Sn96.5Ag3Cu0.5	217 - 219 °C
Sn100Ni+® / SN100-403C®	227 °C eutectic
Sn99.25Cu0.7Ni0.05	
Sn95.5Ag3.8Cu0.7	217 °C eutectic
Sn96.5Ag3.5	221 °C eutectic
Sn77.2In20Ag2.8	175 - 187 °C

Lead-free alloys	Melting range
Sn62Pb36Ag2	179 °C eutectic
Pb93Sn5Ag2	296 - 301 °C

Other alloys available on request.

Grain sizes		
Typ 2	Standard	45 - 75 µm
Typ 3	Fine-Pitch	25 - 45 µm
Typ 4	Fine-Pitch	20 - 38 µm
Typ 5	Ultra-Fine-Pitch	15 - 25 µm
Typen 6-8	Upon request	

\* Efficiency Agency NRW

Property	ISO-Cream Clear	ISO-Cream Clear  GreenTin®	ISO-Cream Active-Clear	ISO-Cream EL 42/58	ISO-Cream EWL 2303	ISO-Cream RA 2601
EN ISO 9454-1 / 61190-1-1	1231 / RELO	1231 / RELO	1222 / REL1	1122 / ROL1	2131 / ORM0	1123 / ROM1
No Clean	•	•	•	•		
Residues easily removable	•	•	•	•	•	•
Stencil printing	•	•	•	•	•	•
Dispenser	•	•	•	•	•	
Jetprint	•	•	•		•	
Stamp printing / Pin in paste	•	•	•		•	
Vapor phase	•	•	•			
Stickiness > 48 Std.	•	•	•			
Unleaded	•	•	•	•	•	•
Containing lead					•	•
High lead content (Pb > 85 %)	•	•	•			•

## SMD special soft solder paste

Homogeneous, ready-to-use, low-odor mixture of metal powder, binders, solvents, fluxing agents, and thixotropic agents.

- ISO-Cream® “RA 2601”** Flux according to DIN EN ISO 9454-1, 1123, or DIN EN 61190-1-1, ROM1. Especially for soldering partners with poor wettability. The flux residues on the soldered circuits should be removed.
- ISO-Cream® “EL 42/58”** No-clean SMD solder paste for temperature-sensitive components such as LEDs, low peak temperature (approx. 170 °C) in the soldering process, solderable under normal and protective gas atmospheres, high contour stability, halide content < 0.15% (ROL1)
- ISO-Cream® “EL 42/57/1”** Alloy: Bi58Sn42 - 138 °C eutectic  
Alloy: Bi57Sn42Ag1 - 138 -139 °C
- ISO-Cream® “EWL 2303”** Water-soluble solder paste for excellent wetting on all known surfaces. Flux, ISO 9454-1:2016, 2131, DIN EN 61190-1-3/ IPC J-STD-004B, ORM0



Description	Contents
Cans	0.250 and 0.500 kg
Cartridges	6 and 12 oz
Dispenser cartridges	5, 10 and 30 ccm
Other containers are available on request.	



## ISO-Flux® Electronic flux

### Flux for wave soldering processes in component manufacturing

**FELDER ISO-Flux® electronic flux** For the manufacture of highly sophisticated electronics. For mixed-assembly circuits (THT/SMT). Can be used in both lead-free and lead-based soldering processes.

Packaging form	Pack size
Bottle	1.000 l
Canister	5.000 l, 10.000 l, 25.000 l
Other container sizes are available on request.	



Product	DIN EN ISO 9454-1	IPC-J-STD-004	Solid content	Use and application
<b>ClearWave</b>	2131	ORLO	2.0 %	Wave/selective soldering, spray fluxing, drop jetting
<b>ClearWave S</b>	2231	ORLO	2.2 %	Wave/selective soldering, spray fluxing, foam fluxing
<b>ClearWave R</b>	1131	ROLO	3.5 %	Wave/selective soldering, spray fluxing, foam fluxing
<b>ELS 3320</b>	2231	ORLO	2.7 %	Wave/selective soldering, lead-free, halogen-free and resin-free, no-clean
<b>ELS 3320-22</b>	2231	ORLO	2.2 %	same as ELS 3320, but with minimised solid content

Other types of flux for assembly production (water-washable / halide-containing / VOC-free) are also available.

### Description

„ClearWave“	No-clean electronic flux with a solids content of 2.0% without resin content. The minimal flux residues have very high surface resistances and are non-corrosive.
“ClearWave S“	Electronics flux with a solid content of 2.2%. ClearWave S also contains a small amount of synthetic resin (0.2%). This serves to encapsulate residues that have not completely reacted in the selective soldering process.
“ClearWave R“	ROLO flux with a solids content of 3.5%. Contains colophony, low residue, IPC-J-STD-001 compliant.
“ELS“	Resin-free no-clean electronic flux based on organic activators.

## ISO-Flux® Cable flux

### Special flux for cable assembly and coil production

For dip tinning and dip and selective soldering of copper strands and enamelled copper wires

**FELDER ISO-Flux® cable flux** differs from conventional fluxes in that it partially tins the stripped cable ends.

Packaging form	Pack size
Bottle	1.000 l
Canister	5.000 l, 25.000 l
Other container sizes are available on request.	



Product	DIN EN ISO 9454-1	IPC-J-STD-004	Solid content	Halide content	Scope of application
<b>KF 23</b>	2231	ORLO	5.0 %	< 0.01 %	Cable assembly, transformer construction, selective soldering
<b>KF 32</b>	1231	RELO	15.0 %	< 0.01 %	Cable assembly, selective soldering, resin-based
<b>KF 070</b>	2123	ORM1	1.3 %	< 1.5 %	Cable assembly, transformer construction, solid core
<b>KF-L</b>	2123	ORM1	3.4 %	< 0.5 %	Cable assembly, low VOC

## ISO-Flux® SMD- and BGA repair flux

For rework and repair soldering following the reflow process

FELDER ISO-Flux® "Clear" and ISO-Flux® "Active-Clear" sind paste-like rework flux for soldering, desoldering and also for diluting FELDER SMD solder pastes ISO-Cream® "Clear" and "Active-Clear"

Packaging form	Pack size
Dispenser cartridges	5, 10 and 30 ccm
Cans	100 g
Other containers are available on request.	



Product	Viscosity	Flux
ISO-Flux® Clear	250 - 350 Pa s	Paste flux Type 1231 (DIN EN ISO 9454-1), RELO (DIN EN 61190-1-1 / J-STD-004)
ISO-Flux® Active-Clear	250 - 350 Pa s	Paste flux Type 1222 (DIN EN ISO 9454-1), REL1 (DIN EN 61190-1-1 / J-STD-004)

### Description

ISO-Flux® "Clear" and ISO-Flux® "Active-Clear" have been adapted to the requirements of assembly and connection technology and thus optimised for Sn/Ag, Sn/Ag/Cu and Sn/Cu soldering systems. They are also ideally suited for hot air and iron soldering.

### Further FELDER Repair-flux (for lead-containing soldering processes)

ISO-Flux® "EL 3201-B" and "EL 3202-A" are suitable for reworking solder joints containing lead.

## ISO-Flux® Soldering oils and soldering pastes

For soft soldering in electronics and electrical appliance manufacturing

FELDER soft soldering flux ISO-Flux® "EL" and "E" are very well suited for hand and dip soldering as well as tinning work, especially at high soldering temperatures and long soldering times.

Type	Packaging form	Pack size
Solder paste	Can	20 g, 50 g, 100 g, 250 g
Solder oil	Bottle	100 ml, 1.000 l
Solder oil	Canister	5.000 l, 10.000 l, 25.000 l



Product	DIN EN ISO 9454-1	IPC-J-STD-004	Halide content	Scope of application
Solder oil / solder paste "EL" 1131		ROLO	< 0.01 %	General soldering work and in electronics
Solder oil / solder paste "E" 1123		ROM1	1 % / 0.5 %	Electrical engineering and electrical equipment manufacturing

## Flux thinner

To adjust the concentration of FELDER ISO-Flux®-fluxes

FELDER Flussmittelverdünner "VF-1" and "VF-2" When used in foam fluxing equipment, the flux gradually becomes concentrated, which affects the soldering result. In dip fluxing stations, the solvent also evaporates through large, open surfaces. To determine the amount of thinner to be added, we recommend titrating the acid number of the flux (FELDER titration set accessory).

Product	To be used with the following FELDER fluxes:
Thinner "VF-1"	All ISO-Flux® -Ethanol-based types
Thinner "VF-2"	All ISO-Flux® "ClearWave"-Types, Solder oil "E" and "EL" as well as all FELDER cable flux agents

Packaging form	Package size
Flasche	1.000 l
Kanister	5.000 l, 25.000 l

Other container sizes are available on request.

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## Soldering accessories

### Tinner

For cleaning and tinning soldering tips.  
Consisting of a mixture of solder activators,  
resins, soldering tin powder and binders.  
It also gently removes strong oxide layers in the case of  
minimal smoke emission.  
Alloy Sn97Cu3 (DIN EN ISO 9453),  
Flux 1231 (DIN EN ISO 9454-1), 15 g can with adhesive pad.

### Desoldering braid

Flux-impregnated copper strands for desoldering SMD and THT  
components and removing excess solder on printed circuits.  
Flux 1131 (DIN EN ISO 9454-1) or ROL0 (DIN EN 61190-1-1)  
widths: 1,00 - 1,50 - 2,00 - 2,50 - 3,00 mm  
On folding spools à 1,6 m and spools à 15 -100 m.

### Analysis mould

Mould for your service analyses with engraved analysis customer number.



## Soldering services

### Free analysis service

Of course, our service also includes the monitoring of your solder bath alloy.  
This free service starts as part of the solder bath changeover or initial filling  
and initially includes four service analyses within 8 weeks. After the change-  
over phase, we continue to offer our customers the free solder bath analysis  
service (according to the customer information solder bath analysis service).

### Scrap metal disposal

We are authorized by the district government to take back the solder drosses  
of our customers, as far as they have been produced during the use of our  
products. These solder drosses are processed by our subsidiary Artenjak-  
Zinn GmbH. With your scrap metal invoice, you will receive a corresponding  
acceptance certificate, which is sufficient proof of proper disposal in accor-  
dance with § 26 Para. 3 KrWG. We will be happy to provide you with collection  
containers in accordance with the regulations.

### Withdrawal of solder paste left-overs

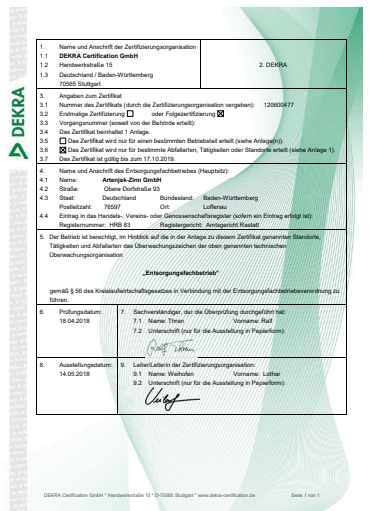
As a responsible supplier certified according to DIN EN ISO 14001,  
we offer our customers to recycle solder paste residues from their  
production. The conditions for the return of solder pastes are  
adapted to the current LME quotation and the delivery condition.

### Technical application consulting and training

Our application technology department will be happy to advise you on all  
questions relating to soldering. Our new training room also offers us the  
opportunity to train your employees in soldering technology in groups of up  
to 15 people. Certifications according to IPC and also practical hand soldering  
trainings are carried out by external trainers in our company.

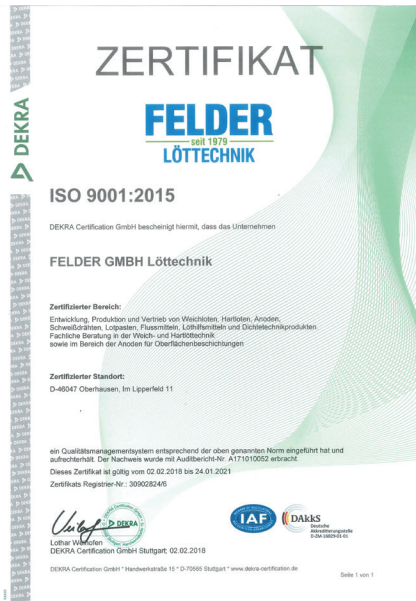
### Analytics and microscopic investigations

Our modernly equipped laboratory offers the possibility of an exact metal  
content determination by means of OES spectroscopy far into the trace range.  
With our 3D-microscope we can carry out microscopic examinations up to  
a resolution of 5000-times at solder joints for you. We can also prepare the  
corresponding sections of the solder joints/components for you. With our  
modern, fully automatic surface resistance measuring device (64 channels)  
we are able to perform SIR tests (Surface Insulation Resistance) in accordance  
with the current IPC and ISO regulations to conduct migration studies.



**Made in Germany**





### Own laboratory for product research and quality control



**FELDER GMBH Löttechnik** is an innovative company in the field of soldering technology. State-of-the-art manufacturing processes guarantee high and consistent quality for our solders and fluxes.

All **FELDER products** are subject to the constant quality control by our own laboratory and are tested according to the guidelines of the **ISO 9001** and **ISO 14001**.

The laboratory equipment includes **optical emission spectrometers, digital microscopes and IR spectrophotometers**. Of course, we also master the classical analytical methods.

These are the prerequisites for many trend-setting developments of our company.

Careful advice and customer-specific problem solutions are a matter of course for us.

Our application engineers have many years of experience, are very familiar with the challenges in electronic component production and are happy to provide you with „advice and assistance“.

We meet your requirements!

We look forward to a good business relationship.

 **Made in Germany**



## Soft solders from sustainable and fair resources

- Extracting raw materials and  paying fair prices
-  protecting the environment
  -  promoting occupational safety
  -  granting children a carefree childhood

For some years now, our approach has been to source our tin preferentially from producers who are committed both to their staff in the form of good working conditions and to the environmental conditions within the mining areas. The wages of all employees must be sufficient to guarantee their families a carefree future. Therefore, one of our preferred tin producers is MINSUR, a Peruvian company whose corporate philosophy is based on transparency and thus on environmental protection, occupational safety and fair working conditions. Especially customers who have the highest purity requirements (in particular low Pb-values < 50 ppm) or require an European origin are supplied by us with solders made from European electrolytically-won tin.

Since this year we have been able to officially confirm that we process fair-trade pure tin on a scale that allows us to produce and supply all FELDER soft solders used in the electronics industry in **ECOTIN** quality.

With your use of **ECOTIN** products you can also support the fostering of fair working conditions and of activities to protect the environment as well as the fight against child labour worldwide.

**Without ifs and buts ! Without surcharge ! Always in **ECOTIN**-quality.**

**FELDER **ECOTIN** - fair quality**

# ECOTIN

  
FAIR RESOURCING


## Extracting raw materials and

- paying fair prices
- protecting the environment
- promoting occupational safety
- granting children a carefree childhood



**Made in Germany**