



STANNOL



SOLDER WIRES

SOLDER PASTES

FLUXES

SOLDER BARS

SOLDERING EQUIPMENT

MEASUREMENT AND TESTING SYSTEMS

CONFORMAL COATINGS

ACCESSORIES

SOLDERING MATERIALS

MAIN CATALOGUE

TRADITION & INNOVATION

The company was founded on 10 May 1879 by the master plumber Wilhelm Paff who developed, manufactured and sold soldering fluid next to his craftsman activities. His successor Hans Eckstaedt, the son-in-law of the company founder, successfully managed the expansion and established the internationally protected trademark Stannol in the market at the end of the 1920s. In the 1950s Stannol started to develop products for electrical engineering and later also for the upcoming electronics industry.

Today Stannol is held in high regard by customers worldwide. This applies both in the industrial sector as well as for the DIY range as Stannol applies the high quality requirements of our customers to all our products. The product range includes solder, solder wire, solder paste, solder flux, soldering irons, electronically controlled soldering stations and a comprehensive range of accessories.



Founded by the master plumber Wilhelm Paff



Registration of STANNOL as a protected trademark



Takeover by Karl-Heinz Dörr and change of name to Stannol GmbH



Purchase of Circuit Chemical Products with expansion of product range



Purchase of the company Jürgen Armack with the expansion of the product range

1879

1920

1989

2001

2017

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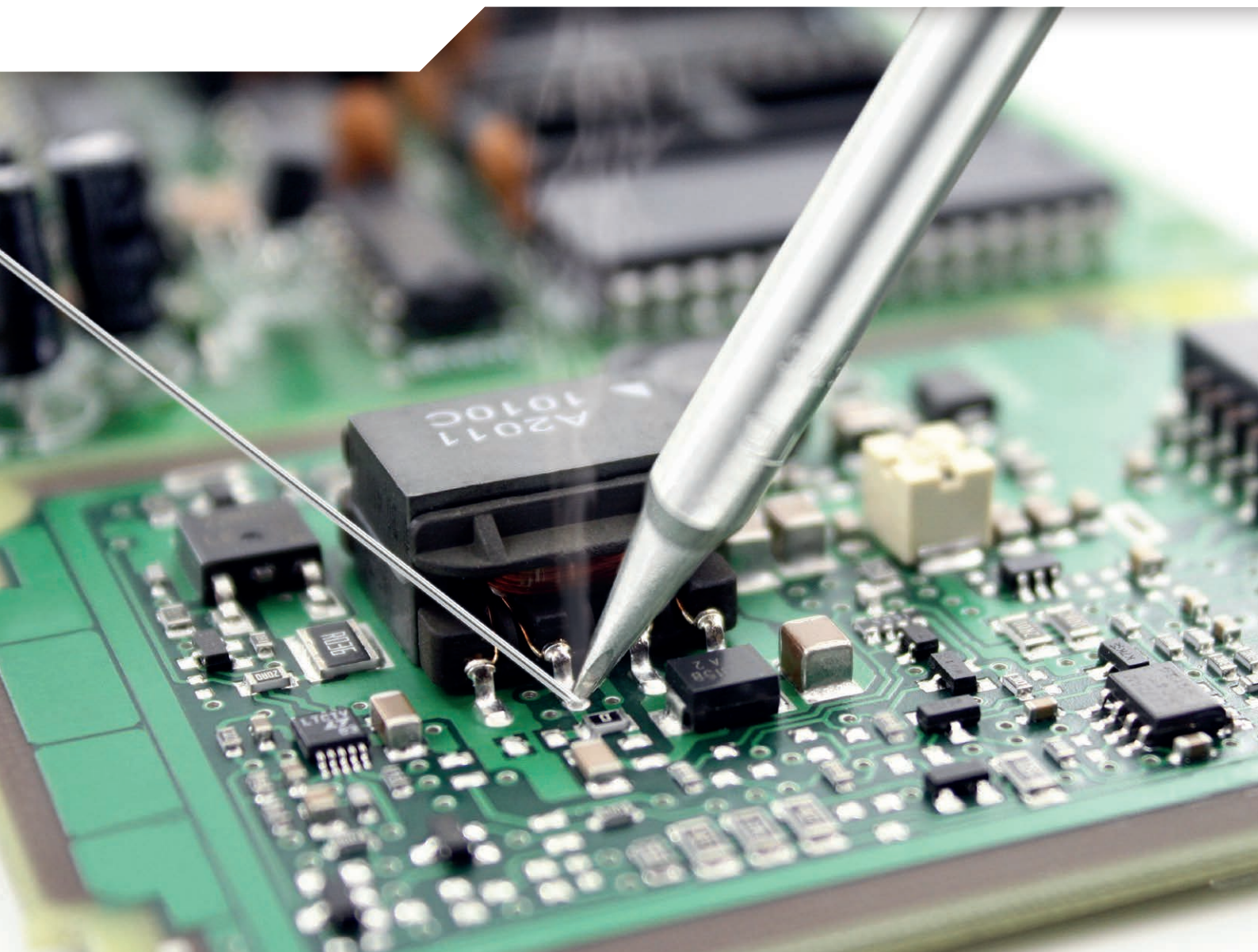
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SOLDER WIRES

IN ELECTRONICS, A SOLDER WIRE IS USED TO CONNECT COMPONENTS TO EACH OTHER WITH ELECTRICAL CONDUCTIVITY. HOWEVER, A SOLDER WIRE CAN ALSO BE USED TO FORM A MECHANICAL SOLDER JOINT ON MANY DIFFERENT SOFT SOLDERABLE SURFACES. DUE TO THE MANY DIFFERENT APPLICATIONS AND APPLICATION AREAS, WE PROVIDE A WIDE RANGE OF MANY DIFFERENT SOLDER WIRES.

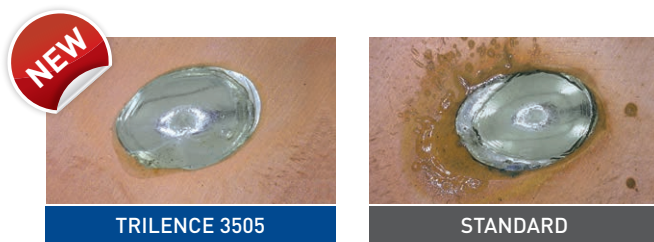
Solder wires can be flux-cored or solid. A flux is necessary for the soldering process to remove oxides and other impurities and to guarantee a reliable connection. Flux-cored solder wires already contain the correct amount of flux. Different fluxes are used, depending on the soldering task. The selection of a suitable alloy also plays an important role for the solder joint.

For selection of the alloy, please refer to page 7 and 13 of this catalogue. Following we would like to introduce the different types of fluxes, which can be used inside solder wires for different applications. We are pleased to present our complete product overview, available delivery forms such as fluxes, diameters and reel sizes in a personal meeting.

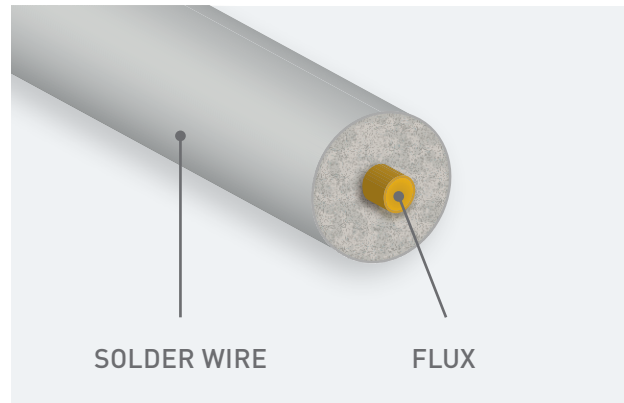
HALIDE CONTAINING FLUXES FOR SOLDER WIRES

There are two groups of different activation levels to choose from: Halide containing and halide free fluxes for solder wires. The fluxes with higher activity usually contain halides. Stannol provides different halide containing solder wire fluxes which can be used in the electronics industry as No-Clean products.

The new solder wire series Trilence has been developed to fulfil the highest requirements. The extremely low tendency to create flux spitting is one of the major advantages, beside the good wetting activity and the transparent, clear residues.



The different behaviour of the residues of lead-free solder wires can be clearly seen on a blank copper surface. The Trilence 3505 features a low spitting behaviour, bright residues and optimum wetting.



An important part of the solder wires is the flux, which is responsible for the removal of oxides from the metal surfaces. The Stannol range of solder wires is manufactured as a standard with one flux core.

If clear residues are required, the proven **KRISTALL SERIES** of solder wires from Stannol should be selected. These fluxes have been developed to leave transparent residues on the circuit board. The Kristall 511 flux has a slightly higher activation than the HS10 flux and can be used as an option if transparent residues are required.

New in this series will be the **KRISTALL 611**. This new flux is characterized by high activity and at the same time very low flux spitting behaviour, similar to the Trilence series.

The flux **HS10** is a solder wire flux based on rosin which has proven to be successful for decades. Short wetting times on common surfaces are achieved with this flux. This flux is suitable for both manual soldering and robot soldering with fast cycle times.

Flux type **2630** provides the highest activity of our No-Clean solder wire fluxes. It is used for surfaces with poor solderability and for larger solder areas which may require a higher thermal input to the solder joint.

Stannol made a completely new approach during the development of the solder wire **ALU1** for soldering on aluminium: Non-toxic activators were combined with each other in order to enable a good solder joint and wetting of soft solder on aluminium. The residues are non-corrosive and do not have to be removed.



HALIDE-FREE SOLDER WIRE FLUXES

Halide-free solder wire fluxes are used if halides are not permitted in the manufacturing process and if higher electrical safety of the residues is required. In comparison with the halide containing fluxes, these fluxes provide lower activity and require good solderable surfaces.

The **KRISTALL 400** solder wire flux is the halide-free version of the Kristall series from Stannol. Characteristical for these fluxes are transparent residues and good activity with which outstanding soldering results can be achieved.

KRISTALL 600 is the second halide-free version of the Kristall series from Stannol. Additional to the transparent residues and the good activity this flux has a lower tendency of flux spitting when soldering at high temperatures.

The halide-free wire flux **HF32** combines high activity with good wetting characteristics and low residues on the circuit board in an outstanding way. The HF32 can be used for manual and robot soldering.

The **TRILENCE 3500** solder wire was developed for challenging soldering applications. The very low flux spitting can considerably reduce the maintenance intervals and thus the downtime of soldering machines. The Trilence 3500 contains a halide- and rosin-free flux which is based on a matrix of synthetic resins. The Trilence 3500 solder wire can be used just like conventional solder wires.

ZV16 solder wire is certainly one of the most interesting innovations. It is halide-free and based on chemically modified resins. Its good activity is depending on the used combination of different organic acids. Only a relatively low amount of flux content in the wire is required to achieve a good solder joint. The most important property of the rosin-free flux is, that it leaves minor amounts of soft residues after soldering. These residues can be brushed off easily to achieve a clean, residue free solder joint.

ORGANIC FLUXES FOR SOLDER WIRES

In addition to solder wires for electronics, Stannol also provides flux-cored solder wires with special organic fluxes which have been developed for difficult wettable surfaces. These include either wires with water-washable residues or fluxes, such as **ALU1**, which ensures safe wetting on aluminium.

The **S321** solder wire flux is particularly suitable for soldering metal and sheet metal. Tinned surfaces as well as brass or iron can also be processed well with this solder wire.

The **WS2213** is a new solder wire with water-soluble residues. It was developed for surfaces in electronics that are difficult to solder. Simple and fast wetting, short cycle time and also fast removal of residues are the main features of this wire.

Stannol made a completely new approach during the development of the solder wire **ALU1** for soldering on aluminium: Non-toxic activators were combined with each other in order to enable a good solder joint and wetting of soft solder on aluminium. The residues are non-corrosive and do not have to be removed.



SOLDER WIRE FLUX PROPERTIES

SOLDER WIRE FLUX		FLUX PROPERTIES						LEAD-CONTAINING ALLOYS					FLOWTIN SERIES ⁽¹⁾ lead-free alloys with micro alloy additions				ECOLOY SERIES ⁽²⁾ lead-free alloys without micro alloy additions						SN100C ®	FAIRTIN
		FLUX CONTENT	HALIDE CONTENT	NO-CLEAN	DIN EN ISO 9454-1	J-STD-004	DIN 8511 F-SW	S-Sn60Pb40	S-Sn60Pb39Cu1	S-Sn63Pb37	S-Sn62Pb36Ag2	S-Pb93Sn5Ag2	FLOWTIN TSC Sn95.5Ag3.8Cu0.7 + FLOWTIN	FLOWTIN TSC305 Sn96.5Ag3.0Cu0.5 + FLOWTIN	FLOWTIN TSC0307 Sn99Ag0.3Cu0.7 + FLOWTIN	FLOWTIN TC Sn99.3Cu0.7 + FLOWTIN	ECOLOY TS S-Sn96Ag4	ECOLOY TSC S-Sn95Ag4Cu1	ECOLOY TSC305 S-Sn96Ag3Cu1	ECOLOY TSC0307 S-Sn98Cu1Ag	ECOLOY TC S-Sn99Cu1	ECOLOY TC300 S-Sn97Cu3	SN100C ® Sn99.3Cu0.7+NiGe	
MELTING RANGE							183 – 190°C	183 – 190°C	183°C	179°C	296 – 301°C	217°C	217 – 222°C	217 – 227°C	227°C	221°C	217°C	217 – 220°C	217 – 227°C	227°C	227 – 310°C	227°C		
HALIDE-CONTAINING	Trilence 2708	2.7%	0.8%	●		REM1							●		●									
	Trilence 3505	3.5%	0.5%	●		REL1							●		●									
	Kristall 505	3.0%	0.5%	●	1.2.2	REM1	26	●																
	Kristall 511	2.7 / 3.0 %	1.1%	●	1.2.2	REM1	26						●	●	●	●		●	●		●		●	
	Kristall 611	2.52%	1.1%	●		REM1								●		●							●	
	HS10	2.5%	1.0%	●	1.1.2	ROM1	26	●	●	●	●	●					●	●	●		●	●		
	2630	2.0 / 2.2%	1.7%	●	1.1.2	ROM1	26		●									●			●			
	ALU1	3.5%	0.06%		2.1.2	REM1															●			
HALIDE-FREE	HF32 SMD	1.0%	0.0%	●	1.1.3	ROLO	32	●			●													
	Kristall 400	2.2%	0.0%	●	1.2.3	RELO	33	●			●		●		●	●		●	●		●		●	
	Kristall 600	2.2%	0.0%	●		RELO							●		●								●	
	HF32	3.5%	0.0%	●	1.1.3	ROLO	32	●	●		●							●			●			
	Trilence 3500	3.5%	0.0%	●		RELO							●		●									
	ZV16	1.6%	0.0%	●		RELO													●					
ORGANIC	S321	2.0%	>5.0%		2.1.2	ORH1	24	●													●			
	WS2213	2.2%	1.3%		2.1.2	ORH1															●			
	Solid							●		●				●	●	●	●	●	●	●	●	●	●	

(X) Must be checked in each individual case.



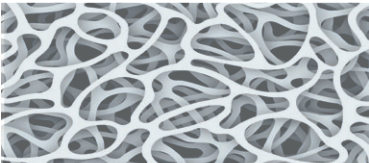

(1) (1) The micro-alloyed FLOWTIN solders have been developed by Stannol to achieve the lowest possible dissolution rate of copper and iron. Depending on the general conditions, an increase in the life time of soldering tips of up to 50% is possible.

(2) All ultra pure, lead-free standard alloys are designated as ECOLY.

For further information about the characteristics of the alloys, please visit our homepage www.STANNOL.de

Additional flux / alloy combinations are also possible, partially on a production-related minimum order quantity - please feel free to contact us!

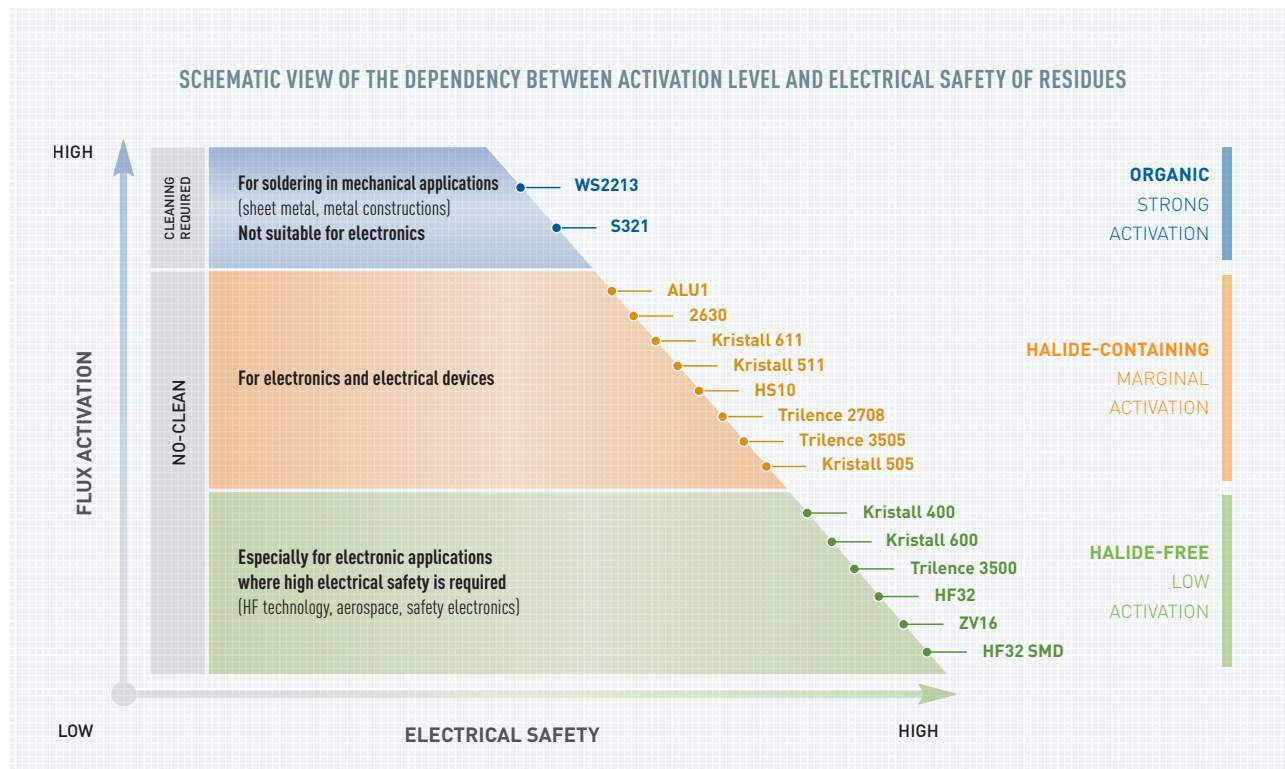
FLUX CLASSIFICATION ACCORDING TO J-STD 004

INGREDIENTS IN FLUXES	ACTIVITY	MAX. HALIDE CONTENT	CLASSIFICATION	FULL DESIGNATION
 RO ROSIN	Low	0%	L0	ROL0
	Low	<0.5%	L1	ROL1
	Moderate	0%	M0	ROM0
	Moderate	0.5-2.0%	M1	ROM1
	High	0%	H0	ROH0
	High	>2%	H1	ROH1
 RE RESIN	Low	0%	L0	REL0
	Low	<0.5%	L1	REL1
	Moderate	0%	M0	REM0
	Moderate	0.5-2.0%	M1	REM1
	High	0%	H0	REH0
	High	>2%	H1	REH1
 OR ORGANIC	Low	0%	L0	ORL0
	Low	<0.5%	L1	ORL1
	Moderate	0%	M0	ORM0
	Moderate	0.5-2.0%	M1	ORM1
	High	0%	H0	ORH0
	High	>2%	H1	ORH1
 IN INORGANIC	Low	0%	L0	INL0
	Low	<0.5%	L1	INL1
	Moderate	0%	M0	INM0
	Moderate	0.5-2.0%	M1	INM1
	High	0%	H0	INH0
	High	>2%	H1	INH1

FLUX CLASSIFICATION ACCORDING TO DIN EN 61190-1-1

FLUX CLASSIFICATION	COPPER MIRROR TEST	SILVERCHROMATE PAPER TEST	FLUORIDES BY SPOT TEST	QUANTITATIVE HALIDE CONTENT (CL & BR)	FLUX CORROSION	CONDITIONS FOR PASSING THE 100 MOHM TEST CRITERIA
L0	No signs of breakthrough	Pass	Pass	<0.01	No signs of corrosion	Cleaned or not cleaned
L1		Pass	Pass	<0.5		
M0	Breakthrough in maximum 50% of the area	Pass	Pass	<0.01	No signs of corrosion	Cleaned or not cleaned
M1		Fail	Fail	0.5 - 2.0		
H0	Breakthrough in more than 50% of the area	Pass	Pass	<0.01	Major corrosion can be expected	Cleaned
H1		Fail	Fail	>2.0		

ACTIVATION MATRIX



In this chart the dependency of the flux activation level to the electrical safety of the flux residues is shown. The lower the flux activation level can be chosen, the higher the electrical safety of the flux residues after soldering can be expected. When using the activated flux Kristall 511 for example, high electrical safety can be achieved after soldering – as a No-Clean flux without a subsequent cleaning process.

THE STANNOL COLOR CODE

Stannol uses a unique colour code for easy differentiation between the different groups of solder wires. The colour code is based on two parts: The first part is the colour of the reel, the second part is the colour on the label. This ensures an easy error prevention in mixed manufacturing areas.





SOLDER BARS

SOLDER BARS AND SOLID SOLDER WIRES ARE USED IN DIFFERENT ALLOYS AS BASE AND REFILL SOLDERS FOR WAVE AND SELECTIVE SOLDERING IN ELECTRONICS MANUFACTURING. STANNOL SOLDERS FOR PRINTED CIRCUIT BOARDS ARE PRODUCED FROM VIRGIN METALS ONLY. TO ACHIEVE THE EXPECTED HIGH QUALITY WE ONLY USE TIN WITH A PURITY CONTENT OF AT LEAST 99.9%.

For lead-containing and lead-free applications, Stannol manufactures many different high purity solders for electronics manufacturing. These solders are produced to international standards or with special properties such as minimised dross formation and minimised copper dissolution. The ongoing development of solders for the electronic industry has highest priority at Stannol. We would like to introduce some of these optimised solders in this catalogue, as well as the most important solders for use in electronics manufacturing.

We would be pleased to present our complete portfolio, including optional special alloys and special dimensions, during a personal meeting.

ECOLOY – LEAD-FREE SOLDERS BY STANNOL

Lead-free solders, based on pure tin with an addition of silver and/or copper, are suitable for all lead-free applications in electronics manufacturing.

For the production of electronics, **ECOLOY TSC** alloys (Tin, Silver, Copper) are a reliable lead-free option. TSC alloys are available in different compositions and vary by the ratio of tin, silver and copper. The eutectic alloy TSC with Sn95.5Ag3.8Cu0.7 should be highlighted due to its low melting point of 217°C and excellent wetting properties.

The alloy **TSC305** (Sn96.5Ag3.0Cu0.5) with a lower silver content has become an industrial standard alloy over the last years. Lower silver reduces the price and a lower content ensures less maintenance.

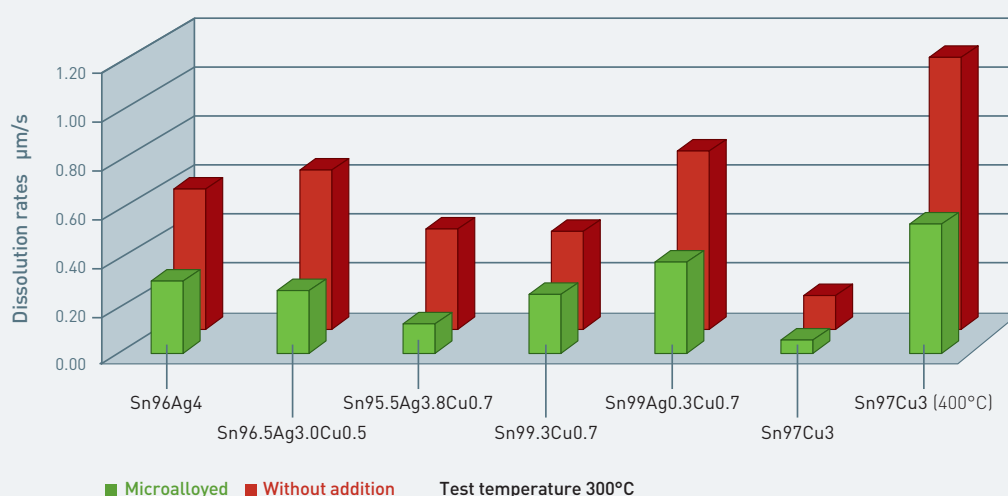
Even more favourable is the alloy **TSC0307**, which has a composition of 99% tin and only 0.3% silver and 0.7% copper. Up to 90% of the expensive silver can be reduced, although the properties are virtually the same during the soldering process.

The **TC** alloy (S-Sn99.3Cu0.7) is a lead-free solder, which replaces eutectic or almost eutectic tin-lead alloys at the lowest possible cost. The main advantage of the product is that it contains no silver, which leads to extensive cost savings, as well as a defined melting point of 227°C and good wetting properties.

FLOWTIN – DEVELOPED BY STANNOL

For manufacturing sites where a low dissolution rate of copper and iron is an important issue for a reliable soldering process, microalloyed solders have been developed in our laboratory. Due to the addition of small amounts of metal dopants like Co and Ni, the solders have a considerably lower copper and iron dissolution. This results in less control and maintenance of the

soldering equipment. **FLOWTIN** solders by Stannol are patent pending. FLOWTIN solders show a finer grain structure which leads to an optimised shiny surface of the solder joint. This is an additional advantage compared to conventional lead-free solders.



Different dissolution rates in comparison

SN100C® – SILVER-FREE INDUSTRIAL STANDARD

SN100C® is another silver-free microalloyed solder with unique properties. Due to its acceptance and usage in many thousand different wave- and selective soldering equipment, it has become a worldwide accepted industrial standard. It is also well established solder for HASL-equipment in the PCB manufacturing. Based on S99.3Cu0.7 with additions of Ni and Ge this solder has economic advantages due to the missing expensive silver. The addition of nickel and germanium ensures a highly reduced dissolution rate of copper. Additionally the dross formation is much lower than with standard solders.

This alloy is worldwide patented by the company NIHON SUPERIOR (e.g. patent no. EP0985486) and licensed by Stannol. Therefore we can offer our customers SN100C® and its variations in the expected Stannol quality! Different solder wires are available in SN100C® to ensure our customers the usage of one alloy all over the whole manufacturing process.

SOLDER ANALYSIS

We offer our customers the option of a periodic monitoring of the solder quality and composition of their soldering machines. This analysis and evaluation of impurities is performed in our laboratory. Further details can be found on our website: www.stannol.de/en/service/test-analysis-service/

RECYCLING

Used solder and dross contain valuable metals. Stannol offers an appropriate recycling with financial compensation calculated according to the current metal prices of the LME (London Metal Exchange). All solders must be sorted by type (lead containing and lead-free solders) for remuneration purposes. We provide appropriate material containers free of charge.

Further details about this process can be found on our website: www.stannol.de/en/service/environment-disposal/

SOLID SOLDER WIRE

Solid solder wires are used, e.g. for the refill of solder baths in selective solder machines. Stannol offers all common alloys, diameters and reel sizes.



COMPOSITION OF SOLDERS

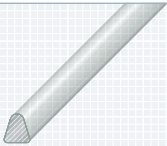

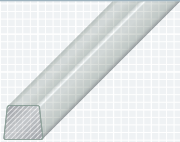

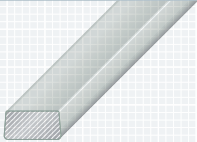

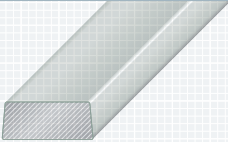

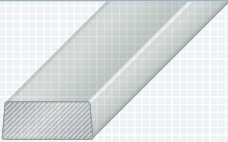

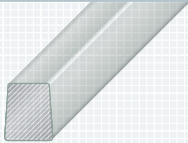

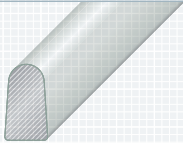

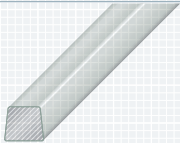

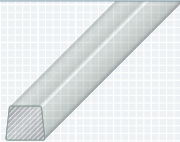
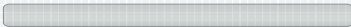
ALLOY NAME	ALLOY NUMBER ²	ALLOY COMPOSITION	INTERNAL NAME Tin Silver Copper Bismuth	ROHS	MELTING POINT MELTING RANGE (approximate values)
Sn99.9 ¹	---	Sn99.9	ECOLLOY T	lead-free	232°C
S-Sn99.3Cu0.7 ²	401	Sn99.3Cu0.7	ECOLLOY TC	lead-free	227°C
S-Sn97Cu3 ²	402	Sn97Cu3	ECOLLOY TC300	lead-free	227–310°C
S-Sn96.3Ag3.7 ²	701	Sn96.3Ag3.7	ECOLLOY TS	lead-free	221°C
S-Sn95.5Ag3.8Cu0.7 ²	713	Sn95.5Ag3.8Cu0.7	ECOLLOY TSC	lead-free	217°C
S-Sn96.5Ag3.0Cu0.5 ²	711	Sn96.5Ag3Cu0.5	ECOLLOY TSC305	lead-free	217–220°C
Sn97.1Ag2.6Cu0.3 ³	---	Sn97.1Ag2.6Cu0.3	ECOLLOY TSC263	lead-free	217–224°C
S-Sn99Cu0.7Ag0.3 ²	501	Sn99Cu0.7Ag0.3	ECOLLOY TSC0307	lead-free	217–227°C
S-Bi58Sn42 ²	301	Bi58Sn42	ECOLLOY TB	lead-free	139°C
Bi57Sn42Ag1 ³	---	Bi57Sn42Ag1	ECOLLOY TBS	lead-free	139–142°C
FLOWTIN Sn99.3Cu0.7 ⁴	---	Sn99.3Cu0.7 + FLOWTIN	FLOWTIN TC	lead-free	227°C
FLOWTIN Sn99.6Cu0.4 ⁴	---	SN99.6Cu0.4 + FLOWTIN	FLOWTIN TC04	lead-free	227°C
FLOWTIN Sn97Cu3 ⁴	---	Sn97Cu3 + FLOWTIN	FLOWTIN TC300	lead-free	227–310°C
FLOWTIN Sn96Ag4 ⁴	---	Sn96Ag4 + FLOWTIN	FLOWTIN TS	lead-free	221°C
FLOWTIN Sn95.5Ag3.8Cu0.7 ⁴	---	Sn95.5Ag3.8Cu0.7 + FLOWTIN	FLOWTIN TSC	lead-free	217°C
FLOWTIN Sn96.5Ag3.0Cu0.5 ⁴	---	Sn96.5Ag3.0Cu0.5 + FLOWTIN	FLOWTIN TSC305	lead-free	217–220°C
FLOWTIN Sn97.1Ag2.6Cu0.3 ⁴	---	Sn97.1Ag2.6Cu0.3 + FLOWTIN	FLOWTIN TSC263	lead-free	217–224°C
FLOWTIN Sn98.5Ag0.8Cu0.7 ⁴	---	SN98.5Ag0.8Cu0.7 + FLOWTIN	FLOWTIN TSC0807	lead-free	217–226°C
FLOWTIN Sn99Ag0.3Cu0.7 ⁴	---	Sn99Ag0.3Cu0.7 + FLOWTIN	FLOWTIN TSC0307	lead-free	217–227°C
FLOWTIN+ Sn99.3Cu0.7 ⁵	---	Sn99.3Cu0.7 + FLOWTIN+	FLOWTIN+ TC	lead-free	227°C
TSCX0307 ³	---	Sn99Ag0.3Cu0.7+X	TSCX0307	lead-free	217–227°C
SN100C ⁶	403	Sn99.3Cu0.7NiGe	SN100C	lead-free	227°C
SN100Ce ⁶	---	Sn99.9NiGe	SN100Ce	lead-free	227–232°C
SN100CS ⁶	---	Sn99.3Cu0.7NiGe	SN100CS	lead-free	227°C
SN100CeS ⁶	---	Sn99.9NiGe	SN100CeS	lead-free	227–232°C
SN100CS+ ⁶	---	Sn99.3Cu0.7NiGe	SN100CS+	lead-free	227°C
SN100CeS+ ⁶	---	Sn99.9NiGe	SN100CeS+	lead-free	227–232°C
S-Sn63Pb37E ³	102 ³	Sn63Pb37	STANNOLOY SN63	lead-containing	183°C
S-Sn63Pb37E ³	102 ³	Sn63Pb37	STRATOLOY SN63	lead-containing	183°C
Sn63Pb37 ³	---	Sn63Pb37P	WSL3 SN63	lead-containing	183°C
S-Sn62Pb36Ag2 ²	171	Sn62Pb36Ag2	SN62	lead-containing	179°C
S-Sn60Pb40 ²	103	Sn60Pb40	SN60	lead-containing	183–190°C
S-Pb93Sn5Ag2 ²	191	Pb93Sn5Ag2	HMP (high melting point)	lead-containing	296–301°C

¹ According to DIN EN 61190-1-3 | ² According to ISO EN 9453:2014 | ³ According to ISO EN 9453:2014 and internal specification based on ISO EN 9453:2014 | ⁴ Analogous to ISO EN 9453:2014 or internal specification + FLOWTIN addition | ⁵ Analogous to ISO EN 9453:2014 or internal specification + FLOWTIN and desoxidation addition

⁶ Variations in the SN100C® solders are mainly based on different Ni and Ge contents. Further details can be found in the technical datasheet or you may ask our team of application engineers about the best option for your application.

All the above mentioned lead-free alloys are available as copper-free versions, too. The copper-free versions can be required to maintain the copper content or reduce higher copper contents during the usage of the solder in the soldering equipment. The above listed alloys represent only a small selection; other alloys are available on request. Some alloys are subject to production-related MOQs.

AVAILABLE DELIVERY FORMS OF STANNOL SOLDER

TRIANGULAR BAR¹ Dimensions (LxWxH) 443 x 11.5 x 14.5 mm approx. 0.36 kg ² bei Sn99Cu1		
FORMBLOCK 330¹ (kg-Stange) Dimensions (LxWxH) 328 x 20 x 20 mm approx. 1 kg ² bei Sn63Pb37		
FORMBLOCK 325 E Dimensions (LxWxH) 325 x 30 x 15 mm approx. 0.88 kg ² bei SN100C®		
FORMBLOCK NR. 7¹ Dimensions (LxWxH) 540 x 48 x 20 mm approx. 3.7 kg ² bei Sn63Pb37		
FORMBLOCK NR. 8 Dimensions (LxWxH) 540 x 48 x 20 mm approx. 3.7 kg ² bei Sn63Pb37		
FORMBLOCK 300 (Poka Yoke) Dimensions (LxWxH) 300 x 25 x 28.5 mm approx. 1.6 kg ² bei Sn63Pb37		
FORMBLOCK 300 LF (Poka Yoke) Dimensions (LxWxH) 300 x 22 x 40 mm approx. 1.6 kg ² bei Sn99Cu1		
FORMBLOCK 160 E Dimensions (LxWxH) 164 x 24 x 20 mm approx. 0.54 kg ² bei Sn63Pb37		
FORMBLOCK 330 E Dimensions (LxWxH) 330 x 21 x 20 mm approx. 1 kg ² bei Sn96.5Ag3,5		

Other sizes and delivery forms are available upon request. The dimensions specified in the catalogue may vary due to production techniques.

1 Preferred bar form / 2 Average weight of the specified alloy.

FAIRTIN FROM STANNOL FOR SUSTAINABLE TIN MINING

With FAIRTIN, Stannol was the first solder manufacturer to develop a series of fair solder bars and solder wires for industrial production. Manufacturers can use these to make their products socially and environmentally more sustainable

Until now there were only two important purchasing criteria for solder: QUALITY and PRICE. In many mining areas, there are disastrous working and living conditions due to the growing demand for raw materials. The environment also suffers greatly from the uncontrolled extraction of minerals.

FAIRTIN goes much further than the current efforts of the industry to avoid the financing of armed conflicts in the Congo (see Dodd-Frank-Act, section 1502). Tin for FAIRTIN comes only from suppliers who take care for the environment, respect national and international legislation and fulfill their social responsibilities.



FAIR ZUR UMWELT
FAIR TO THE ENVIRONMENT



FAIR ZU DEN MITARBEITERN
FAIR TO THE EMPLOYEES



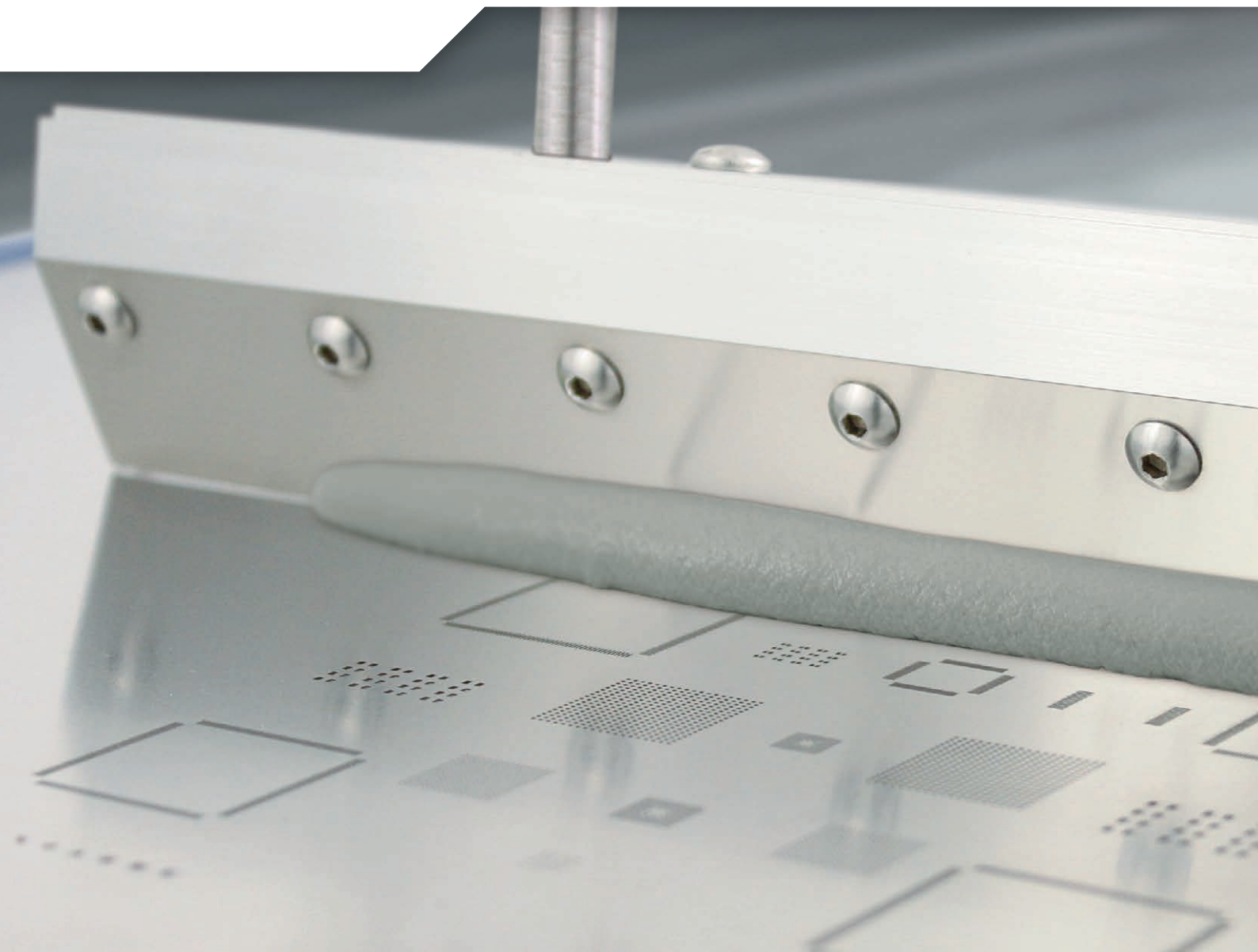
FAIR DURCH TRANSPARENZ
FAIR THROUGH TRANSPARENCY

For FAIRTIN we only use tin from suppliers who meet the following criteria:

- take care about the environment
- take social responsibility for employees and local population
- act transparently beyond the legal minimum and adhere to fair trade

Currently, there is no tin mining that is certified as fair. With FAIRTIN you buy the fairest industrially available tin and help to drive the future development forward.





SOLDER PASTES

BOTH LEADED AND LEAD-FREE SOLDER PASTES ARE USED IN ELECTRONICS – FOR REFLOW SOLDERING AND REWORK SOLDERING PROCESSES.

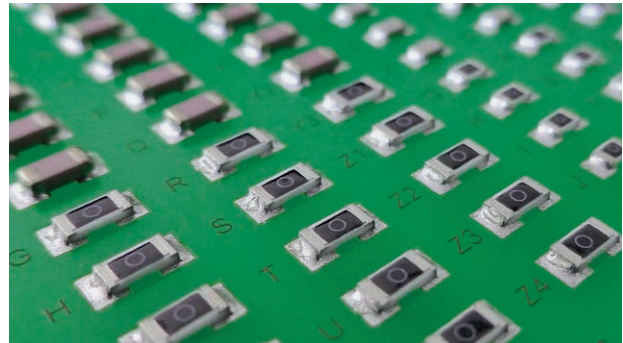
Stannol supplies both lead containing and lead-free solder pastes in various particle sizes and packaging (e.g. jars and cartridges) for a wide range of application. We offer eutectic silver containing, low-silver and silver-free solder pastes specifically developed for lead-free applications.

This part of our catalogue features some popular solder pastes, as well as several new developments for use in SMT manufacturing. Please do not hesitate to contact us for further details about additional solder pastes from our portfolio.

LEAD-FREE SOLDER PASTES

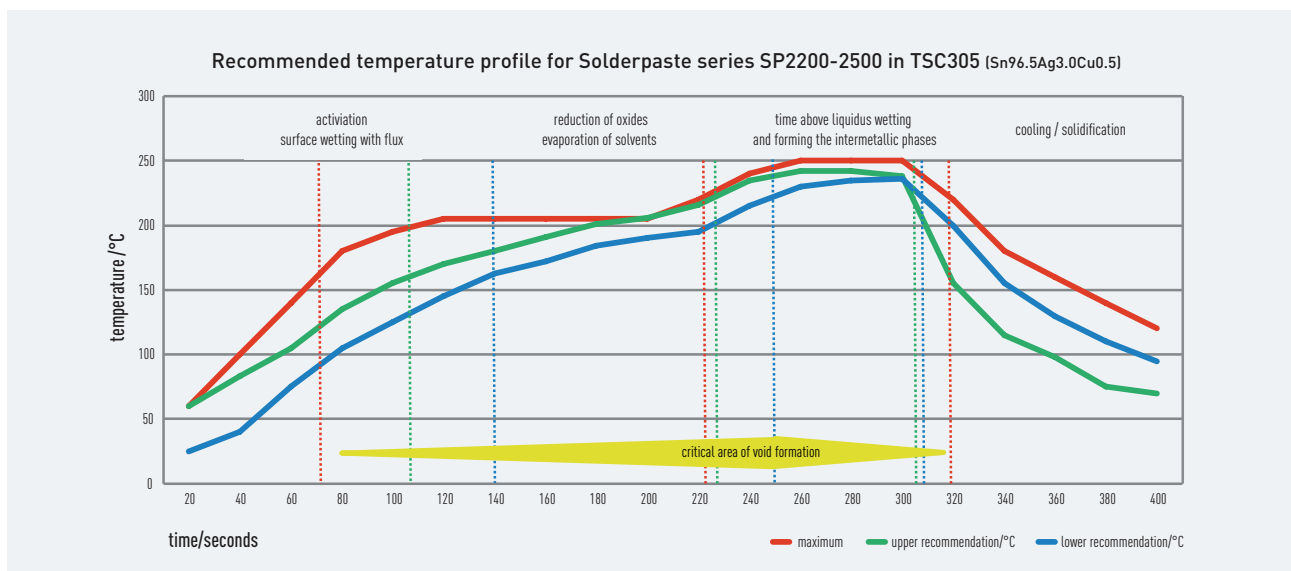
The No-Clean solder pastes **SP2100** and **SP2200** are developed for use with lead-free alloys in stencil printing. In addition to the long open time, even after long printer down times, both pastes immediately show a perfect print definition. Due to activation as a type L1 flux, SP2100 solder paste is more suitable for use on surfaces that are difficult to solder. This paste achieves good wetting and soldering results.

The No-Clean SP2200 solder paste, by contrast, is activated as type L0. This activation ensures good wetting combined with a high level of electrical safety on all surfaces used in electronics today. Both solder pastes leave only small amounts of residues after the reflow process, which are bright and transparent and do not have to be removed.



Minimal amount of residues at highest electrical safety are the highlights of our latest and future oriented paste generations.

IDEAL TEMPERATURE PROFILES FOR REFLOW SOLDERING



The integration of new solder pastes in established manufacturing processes is usually quite easy and simple. Some cases may require minor modifications to the reflow profile due to board and component configuration. This will ensure the highest possible performance of the flux formulation at minimal adjustments. Easy basic setting can start with 25K above liquidus for 40-60 seconds as the average process window. This is still respecting the sensitivity of the majority of components.

Following the special conditions in vapour phase equipment, critical components or circuit boards could require a faster or linear profile instead. Please do not hesitate to contact our technical specialists for personal support and optimization purposes.

NEW SOLDER PASTE SP2300

The main drivers to develop the **SP 2300** have been the requirement to significantly reduce if not eliminating voiding and contemporary avoid solder balling. Even with large area paste deposits or thermal pad bonding the SP2300 proves significant characteristics to exceed the IPC defaults as well as a comfortable process window.

The halogen free formulation of the REL0 flux is convincing at oxygen or nitrogen atmosphere with an uncompromising wetting and printability. To address the enhanced challenges in fine pitch soldering the SP2300 is available in T3 and T4 powder size. Operators with enhanced optical expectations will be more than satisfied with the improved transparency of the residues. To be used in soak and linear profiles our new solder paste is equally effective. It is available in TSC305 and silver reduced alloys. SP2300 is qualified for the usage in ramp and linear profiles, but for void reduction we recom-



The solder paste SP2300 ensures even with the low activation with a proper wetting activity. It shows low voiding and low solder beading.

mend to use a ramp profile with highest possible ramp and peak temperature not exceeding 245°C.

LEAD CONTAINING SOLDER PASTES

SP1100 and **SP1200** solder pastes are only available with lead containing alloys. These pastes are distinguished by their classification and hence by their different wetting behaviour. While the SP1100 as a highly activated ROM1 solder paste can also achieve good soldering results on surfaces that are difficult to solder, the SP1200 as a ROL1 solder paste is designed for showing best results on good solderable surfaces. The residues of these two No-Clean solder pastes do not have to be removed.

The additional lead containing solder paste, **SP15 63S4** allows us to offer solutions to eliminate tombstones. By using combinations of alloys and powder particle sizes in this solder paste, different approaches are selected in order to reduce the number of raised components. The choice of solder paste is only one aspect of removing defects. Layout of the stencil, the pad geometry, solder paste quantity and other manufacturing parameters are just as important to reduce tombstones. Nevertheless, the use of a suitable solder paste can support the safe overall reduction of defects, especially at increasingly smaller components.

SOLDER PASTE FOR DISPENSING

For dispensing applications we offer the **SP651M** solder paste in the lead-free alloy TSC305 (Sn96.5Ag3.0Cu0.5) as a standard product. This solder paste has been designed for reliable automatic dispensing processes with inner dispensing needle diameters down to 0.4mm in particle size 3. The flux medium

is classified as ROL0 according to J-STD-004. It is a Halide-Zero formulation and shows a good process window due to its well-balanced activity. This solder paste leaves only minor amounts of clear and transparent residues.

SOLDER PASTES WITH LOW MELTING POINT ALLOYS

The No-Clean solder paste Stannol **SP3000** in the alloy Bi57Sn42Ag1 is a lead-free low temperature solder paste. It is used in applications that require lower peak reflow temperatures. Today, lead-free alloys with a high tin content such as TSC305 (Sn96.5Ag3.0Cu0.5, 221-223°C) are mostly used. This lead-free alloy requires processing temperatures 30-40K higher than those of Pb-containing solders. Not all components in the soldering process can withstand these soldering temperatures without damage. There are also newer applications, e.g. in the LED sector (optoelectronics), which require reduced maximum soldering temperatures.

The alloy Bi57Sn42Ag1 used in this solder paste has a melting range of around 140°C and can therefore be processed safely and reliably with a maximum reflow temperature of 170-180°C. Due to the silver content of 1%, this alloy has a considerably increased long-term reliability compared to the eutectic BiSn alloy. Further advantages are lower temperatures in the reflow oven, reduced wear of the equipment, reduced energy costs.

The SP3000 is not part of our standard scope of delivery. If you are interested in this solder paste, please contact us.

SOLDER PASTES OVERVIEW

NAME	ALLOY	CLASS ¹	MELTING RANGE	PARTICLE SIZE	METAL CONTENT	APPLICATION	PACKAGING SIZES ³	ART.-NO.
SP15	Sn62.8Pb36.8Ag0.4 ²	ROL1	179-183°C	3/5 (10-45 µm)	89.5%	Stencil printing	500g jar	690015
SP15	Sn62.8Pb36.8Ag0.4 ²	ROL1	179-183°C	3/5 (10-45 µm)	89.5%	Stencil printing	12 oz Semco	690017
SP1100	Sn62Pb36Ag2	ROM1	179°C	3 (25-45 µm)	90%	Stencil printing	500g jar	691100
SP1200	Sn62Pb36Ag2	REL1	179°C	3 (25-45 µm)	90%	Stencil printing	500g jar	691200
SP2100	Sn95.5Ag4Cu0.5	REL1	217-223°C	3 (25-45 µm)	88%	Stencil printing	500g jar	692100
SP2100	Sn95.5Ag4Cu0.5	REL1	217-223°C	4 (20-38 µm)	88%	Stencil printing	500g jar	692150
SP2200	Sn95.5Ag4Cu0.5	REL0	217-223°C	3 (25-45 µm)	89%	Stencil printing	500g jar	692200
SP2200	Sn96.5Ag3Cu0.5	REL0	217-220°C	3 (25-45 µm)	89%	Stencil printing	500g jar	692210
SP2200	Sn96.5Ag3Cu0.5	REL0	217-220°C	4 (20-38 µm)	89%	Stencil printing	1200 g Semco	692212
SP2200	Sn96.5Ag3Cu0.5	REL0	217-220°C	4 (20-38 µm)	89%	Stencil printing	500g jar	692250
SP2200	Sn99Ag0.3Cu0.7	REL0	217-227°C	3 (25-45 µm)	89%	Stencil printing	500g jar	692220
SP2200	Sn99Ag0.3Cu0.7	REL0	217-227°C	4 (20-38 µm)	89%	Stencil printing	500g jar	692225
SP2200	Sn96.5Ag3Cu0.5	REL0	217-220°C	3 (25-45 µm)	89%	Stencil printing	600g Semco	692215
SP2300	Sn96.5Ag3Cu0.5 ⁴	REL0	217-224°C	3 (25-45 µm)	89%	Stencil printing	500g jar	692300
SP2300	Sn96.5Ag3Cu0.5 ⁴	REL0	217-224°C	4 (20-38 µm)	89%	Stencil printing	500g jar	692350
SP2500	Sn96.5Ag3Cu0.5 ⁴	REL0	217-224°C	3 (25-45 µm)	89%	Stencil printing	500g jar	692500
SP2500	Sn96.5Ag3Cu0.5 ⁴	REL0	217-224°C	4 (20-38 µm)	89%	Stencil printing	500g jar	692550
SP2500	Sn99Ag0.3Cu0.7	REL0	217-227°C	3 (25-45 µm)	89%	Stencil printing	500g jar	692520

SOLDER PASTE FOR DISPENSING								
SP651M	Sn96.5Ag3.0Cu0.5	ROLO	217-220°C	3 (25-45 µm)	84%	autom. dispensing	75g/30 cm ³ cartridge	690102

¹ According to J-STD-004 | ² Optimized against Tombstone-Effect | ³ Other packaging sizes are available on request | ⁴ Anti-Voiding formulation.



FLUXES

FOR SOFT-SOLDERING IN THE ELECTRONICS MANUFACTURING, A FLUX IS USED IN ORDER TO SAFELY REMOVE OXIDES AND OTHER CONTAMINANTS FROM THE COMPONENTS AND THE PCBS. THIS ENABLES A RELIABLE SOLDER CONNECTION.

The right choice of flux for wave and selective solder processes in electronics manufacturing is determined by different factors. What is essential in one manufacturing environment may be of much less importance in another. Our fluxes are just as multifaceted as our customers' requirements. Be it a water-based or a conventional solvent-based flux, with or without resin, with or without certain substances due to special material combinations. Since 1879 the range of available fluxes for reliable soldering has constantly grown in line with the growing requirements. We would like to present you in the following few pages some of our most successful flux products. Many other special fluxes from our portfolio can be demonstrated on a one-on-one basis.

EF-SERIES OF LIQUID FLUXES

The **EF-SERIES** covers many of the manufacturing industry's requirements for liquid soldering fluxes by providing versatility and a large application area. The EF series has been developed for application with modern spray fluxing systems. Since the series encompasses fluxes with different activation strengths, it gives you the chance to select the optimum activation according to soldering and reliability requirements. While e.g. low activation may be selected for a full nitrogen tunnel wave soldering system, soldering with older equipment and on difficult surfaces requires a higher activation level.

Apart from the activity and the resulting soldering performance, the reliability of No-Clean fluxes and their residues after soldering are important factors for the selection of the right flux for the production process.

While the EF series is completely Halide Zero designed, it offers types with or without resin, with only traces of activator, up to broadband fluxes that fulfil all the requirements of current electronics manufacturing systems.

All of these fluxes ensure a high to very high degree of electrical safety with varying but low amounts of residues on soldered printed circuit boards.

In comparison with **EF330** the flux **EF350** with its small addition of resin raises the insulation resistance of the flux residues and concurrently reduces the formation of solder beads. The good activation of the flux EF350 provides a wide process window and can therefore obtain good results also in a selective soldering process.

The **EF200** and **EF210** show less activation and are well suited for soldering in nitrogen atmosphere as well as on some air soldering equipment, where they leave less residues on the PCBs due to their lower amount of solids.

The version **EF270F** was optimised for application with foam fluxing units. It contains well-balanced additives, which ensure a proper foam formation over a long time. This results in a perfect thin layer of flux and a safe application prior to a good wetting and safe formation of the solder joints.

During the development of the newest member of the EF series, the **EF250**, the reduction of flux residues in the soldering equipment and on the PCBs was one of the main goals while maintaining the very good wetting properties, known from the EF series of fluxes. Reduction of equipment cleaning and maintenance was achieved with the EF250 flux. The PCBs leave the soldering process in a very clean condition; the very low amount of flux residues passes all international test standards.



All common Stannol No-Clean fluxes with small amounts of solids can be applied reproducibly in minor amounts with every common spray method on the market.

SPECIAL FLUXES

The **500-6B** is an active flux with high priority on the electrical safety of its residues. The solids contain activators and a high amount of rosin. This results in a higher residue level after soldering, but this is often accepted due to its very high electrical safety and insulation resistance. The flux 500-6B can be applied with all commonly installed fluxing systems.

The flux **500-17/1** can be perfectly used for pre-tinning of enameled copper wires at higher temperatures as well as different other delicate soldering applications. It has been developed especially for dip soldering and its high amount of solids ensures that there is always enough active flux left at the component to be soldered, even at elevated preheat temperatures or high temperatures of a dip-solder bath. There is enough activity to achieve an even pre-tinning and good soldering results.

SEMI-AQUEOUS FLUXES

Some slightly older soldering equipment is not well equipped in preheating for the use of VOC-free fluxes. The heat transfer rate or the length of some equipment is not high or long enough. What to do if you need to reduce your VOC emissions? The usage of semi-aqueous fluxes might be an option. With this family of fluxes the VOC emissions can be reduced up to 50% and your existing equipment can be further used. Lower flash points for easier transport and storage may also apply on some of these fluxes. They are all based on resin- and halide-free formulations.

Already some years in our product range of the semi-aqueous fluxes the **HW139** with 2.5% solids had proven his wide process window, easy application and good soldering results in many different applications.

As the newest development in this segment of fluxes we introduce the **HW240**, which differs from the other ones due to its unique activation system. This ensures good soldering results combined with very low amounts of residues.

WATER-BASED FLUXES

The flux **WF300** is available in spraying and foaming variations. With a comparatively high solid content for a spray flux, the applicable flux volume can be reduced considerably and still results in reliable soldering. Therefore you can reduce the required amount of energy for drying the board prior to soldering as well as the volume of required flux.

WF130 is our newest water based ORLO flux development. It comes with perfect soldering results and leaves very small amounts of safe residues, which provide an extremely low corrosive potential. This water based flux is a true halogen "Zero" flux and contains no VOCs. Due to the very low corrosive potential it is one of the few available L0 classified water based fluxes. Introducing water-based fluxes requires a comprehensive assessment of the application. Our application specialists will gladly provide expert advice on site.



OVERVIEW

FLUX	DIN EN ISO 9454-2	DIN EN 61190-1-1	APPLICATION METHOD*	VOC CONTENT	SOLID CONTENT %
EF200	2.2.3.A	ORLO	S	High	2.0
EF210	2.2.3.A	ORLO	S	High	2.1
EF250	2.2.3.A	ORLO	S	High	2.5
EF270	2.2.3.A	ORLO	S	High	2.7
EF270F	2.2.3.A	ORLO	SF	High	2.7
EF330	2.2.3.A	ORLO	S	High	3.3
EF350	2.2.3.A	ORLO	S	High	3.5
WF130	2.1.3.A	ORLO	S	Free	3.0
WF203	2.1.3.A	ORM0	S, SF, T, P	Free	3.5
WF300F	2.1.3.A	ORM0	SF	Free	4.6
WF300S	2.1.3.A	ORM0	S	Free	4.6
500-6B	1.1.3.A	ROLO	S, SF, T, P	High	6.0
500-17/1	1.1.3.A	ROLO	S, SF, T, P	High	15.0
500-3431BF	2.2.3.A	ORLO	S, SF	High	4.4
900-7/1H	2.1.2.A	ORM1	S, SF	High	1.7
HW139	2.2.3.A	ORM0	S	Low	2.5
HW240	2.2.3.A	ORLO	S, SF	Low	2.4
X33-08i	2.2.3.A	ORLO	S, SF	High	2.0
L-2	2.2.3.A	OR L0	S, SF, T, Pinsel	High	2.0
P-770	2.2.3.A	OR L0	S, SF	High	2.3
P-981	1.2.3.A	RE L0	S, SF	High	2.7

*Application methods: **S** spraying / **SF** foaming / **T** dipping / **P** brushing

PACKAGE SIZE

FLUX	2.5 LITRES	25 LITRES
EF200	Art.-Nr. 164025	Art.-Nr. 164024
EF210	Art.-Nr. 164149	Art.-Nr. 164150
EF250	Art.-Nr. 164103	Art.-Nr. 164106
EF270	Art.-Nr. 164159	Art.-Nr. 164157
EF270F	Art.-Nr. 164102	Art.-Nr. 164101
EF330	Art.-Nr. 164156	Art.-Nr. 164155
EF350	Art.-Nr. 164151	Art.-Nr. 164152
WF130	Art.-Nr. 164163	Art.-Nr. 164164
WF203	Art.-Nr. 164166	Art.-Nr. 164167
WF300F	Art.-Nr. 830389	Art.-Nr. 830390
WF300S	Art.-Nr. 830391	Art.-Nr. 830392

FLUX	2.5 LITRES	25 LITRES
500-6B	Art.-Nr. 164014	Art.-Nr. 164016
500-17/1	Art.-Nr. 164037	Art.-Nr. 164038
500-3431BF	Art.-Nr. 164153	Art.-Nr. 164147
900-7/1H	Art.-Nr. 158010	Art.-Nr. 158007
HW139	Art.-Nr. 164145	Art.-Nr. 164146
HW240	Art.-Nr. 164108	Art.-Nr. 164109
X33-08i	Art.-Nr. 830378	Art.-Nr. 830381
L-2	Art.-Nr. 000000	Art.-Nr. 142216
P-770	Art.-Nr. 980008	Art.-Nr. 142306
P-981	Art.-Nr. 142342	Art.-Nr. 142346

MORE FLUXES ARE AVAILABLE

This brochure shows only a limited range of products and we only focused on our top selling products. Our flux portfolio in total encompasses more than 100 different products. You will find more products as well as an innovative product selector tool at www.stannol.de. Using this selector guide you have the opportunity to refine the product choice according to different criteria.



STANNOL

TRADITION AND INNOVATION.

SOLDERING TECHNOLOGY SINCE 1879 – MADE IN GERMANY



SOLDER WIRES



FLUXES



SOLDERING STATIONS



SOLDER PASTES



ACCESSORIES



SOLDER BARS



STANNOL

STANNOL GmbH & Co. KG

Haberstr. 24, 42551 Velbert / Germany

Tel: +49 (0) 2051 3120 -0, Fax: +49 (0) 2051 3120 -111

info@stannol.de, www.stannol.de