



SOLDER PASTE SP6000 lead free

No-Clean solder paste

PRODUCT DESCRIPTION

Solder paste SP6000 is part of Stannol's sustainable greenconnect product line. The special feature: With SP6000, more than 85 percent of CO₂ emissions can be saved compared to conventional solder pastes mainly through the use of recycled solder.

SP6000 solder paste has been developed for use with the alloys TSC305 (Sn96.5Ag3Cu0.5) and TSC105 (Sn98.5Ag1Cu0.5). Other alloys such as TSC0307 (Sn99Ag0.3Cu0.7) and TSC387 (Sn95.5Ag3.8Cu0.7) have been tested with the medium and are equally suitable. The wetting properties have been optimised for all known lead-free surfaces on PCBs and components. The very few residues are transparent and non-corrosive after the reflow process.

CLASSIFICATION AND PROPERTIES

The product offers following advantages:

- **solder powder made from recycled solder**
- **85 percent CO₂ savings**
- **very suitable for use with low silver content (TSC105, TSC0307)**
- **suitable for fine pitch up to 0,4 mm**
- **very good first print results after longer printer downtime**
- **reflow process under air or nitrogen possible**
- **very good wetting on most surfaces**
- **RoHS compliant**

APPLICATION

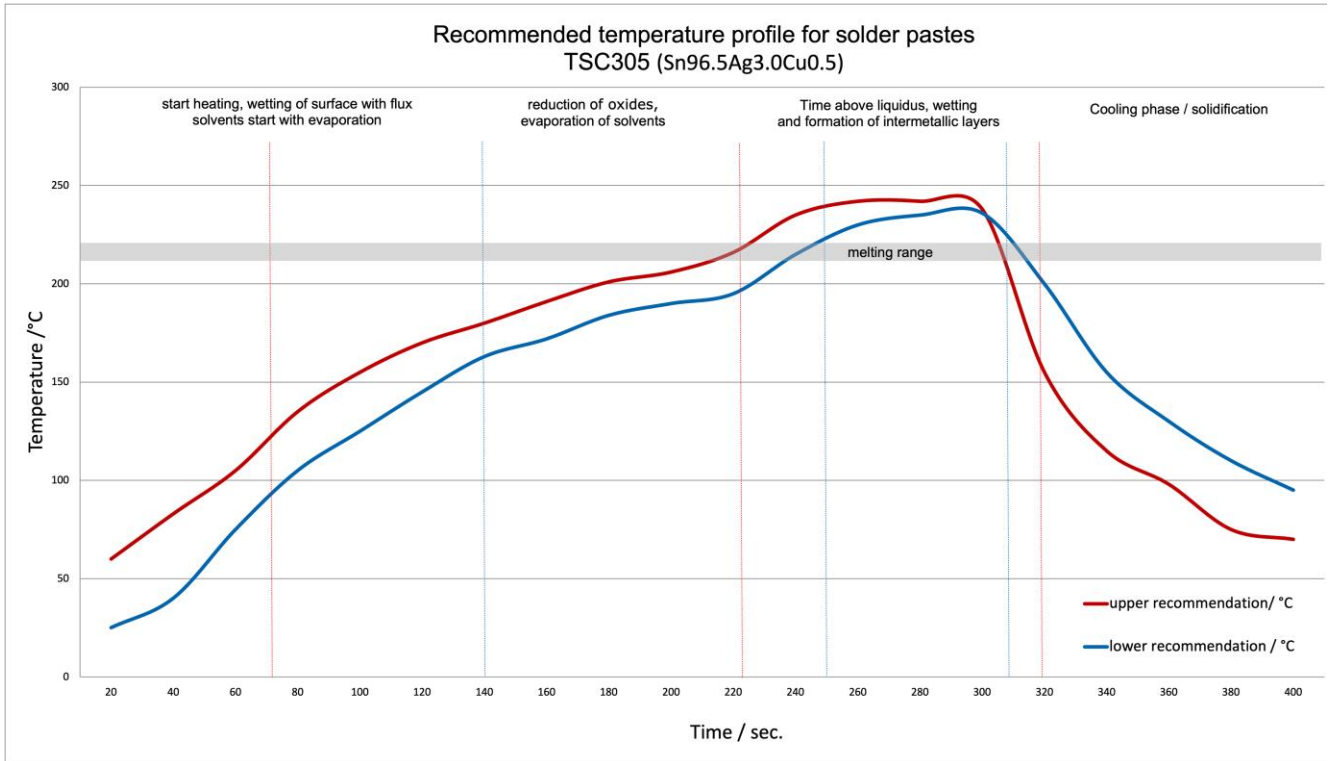
Solder paste printing: The SP6000 solder paste has been developed for stencil printing. With the aforementioned alloys as solder powder in particle size 3 (25-45 µm) and 4 (20-38 µm), the solder paste SP6000 can be used in all common open and closed printing systems.

Stencil thickness: 100-150 µm (depending on application)

Recommendations for solder paste printing:

1. Generally, use the thinnest stencil possible.
2. Use stencils with rounded corners to minimise clogging of the stencil openings.
3. Set the squeegee pressure to 0.25 kg/cm squeegee length. Then reduce the squeegee pressure in small steps until the solder paste starts to smear. Now the squeegee force is set to the optimum. Make these adjustments at your desired print speed.
4. The optimum printing speed with the SP6000 solder paste is in the range of 20-100 mm sec⁻¹.
5. Pay close attention to the sealing of the PCB and stencil. The PCB must be very well supported in order to seal against the stencil and the solder paste cannot be pushed sideways past the pads.

Reflow profiles: The reflow process can be performed under air and nitrogen. The temperature profile below is typical and has shown good wetting results when used with SP6000 solder paste. However, other profiles can be applied depending on the available equipment and solder as well as requirements of PCB. For this solder paste, a linear reflow profile is recommended. If a saddle profile is chosen, the temperature load in the preheater should not exceed a time of 120 seconds at temperatures around 180 °C.



RECOMMENDED PROCESS WINDOW	MAX (RED)	MIN (BLUE)
Peak temperature:	250 °C	230 °C
T > 217 °C:	100 sec.	30 sec.
100 °C to 217 °C:	260 sec.	130 sec.

CLEANING

Stannol SP6000 was developed as a No-Clean solder paste. This means that it is not obligatory to remove the residues. If cleaning is necessary, the residues can be removed using conventional cleaning processes. We recommend using Stannol cleaner Flux-Ex Pre before soldering and Flux-Ex Post Power to remove residues after the soldering process.

TECHNICAL SPECIFICATIONS

Solder powder: The permitted impurities in this solder powder are in accordance with ANSI/J-STD-006. The nominal solder powder particle size is 25-45 µm (type 3) and 20-38 µm (type 4) with a precisely controlled particle size distribution and spherical shape.

GENERAL PROPERTIES	
alloy:	Sn98,5Ag1Cu0,5 (Ecoloy TSC105) / Sn96,5 Ag3,0 Cu0,5 (Ecoloy TSC305) / Sn99Ag0,3Cu0,7 (Ecoloy TSC0307) / Sn95,5Ag3,8Cu0,7 (Ecoloy TSC387)
melting range, °C:	217-223
metal content, %:	88,8
solder powder, µm:	25-45 (type 3) / 20-38 (type 4)
application:	stencil printing

The data in the table are typical values and do not represent a specification.

Tests	Specification	Result
Copper corrosion:	ANSI/J-STD-004C IPC-TM-650, Method 2.6.15	pass
Copper mirror test:	ANSI/J-STD-004C IPC-TM-650, Method 2.3.32	pass
Surface insulation resistance:	ANSI/J-STD-004C IPC-TM-650, Method 2.6.3.3/2.6.3.7	pass
Silver chromate paper test:	ANSI/J-STD 004 IPC-TM-650, Method 2.3.33	pass
Chlorides:	ANSI/J-STD-004C IPC-TM-650, Method 2.3.35	no addition
Bromides:	ANSI/J-STD-004C IPC-TM-650, Method 2.3.35	no addition
Solder balling:	ANSI/J-STD-005A IPC-TM-650, Method 2.4.43 after 1 h at room temperature after 24 h at room temperature	pass, class 1 pass, class 1
Wetting test:	ANSI/J-STD-005A, IPC-TM-650 IPC-TM-650, Method 2.4.45	pass, class 1
Slump test: (T4, stencil 150 µm)	10 min at 150 °C	pass, 0,3 mm
Open time:	laboratory internal specification	at least 8 h at 23 °C/65 % rF
Flux activity classification:	J-STD-004	RELO

PACKAGING

Stannol SP6000 solder paste can be supplied in:

- 500 g plastic jars
- 600 g Semco 6 oz oder 1200 g Semco 12 oz cartridges

Other types of packaging are also available on request. These may be associated with certain minimum purchase quantities.

STORAGE AND SHELF LIFE

At a storage temperature of 2 to 8 °C, the minimum shelf life (from date of manufacture) is 6 months in the unopened original container. Solder paste in cartridges (Semco 6 oz and 12 oz) should be stored upright with the cap of the dispensing opening facing downwards. If this is not possible, we recommend turning the lying cartridges by 180° once a week to avoid separation. Allow the solder paste to warm up to room temperature in the closed original container for approx. 2 hours before processing to prevent condensation of humidity on the surface.

HEALTH AND SAFETY

Before first use, read the safety data sheet and observe the safety measures.

DISCLAIMER

The above values are typical and represent no form of specification. The Data Sheet serves for information purposes. Any verbal or written advise is not binding for the company, whether such information originates from the company offices or from a sales representative. This is also in respect of any protection rights of third parties, and does not release the customer from the responsibility of verifying the products of the company for suitability of use for the intended process or purpose. Should any liability on the part of the company arise, the company will only indemnify for loss or damage to the same extent as for defects in quality.