TECHNICAL DATA SHEET

SOLDER PASTE SP6500 lead free

No-Clean solder paste

PRODUCT DESCRIPTION

Halogen-zero solder paste SP6500 is part of Stannol's sustainable greenconnect product line. The special feature: With SP6500, about 85 percent of CO_2 emissions can be saved compared to conventional solder pastes, mainly through the use of recycled solder.

SP6500 was specifically developed for fine-feature printing and reflow processes using the most demanding soak reflow profiles, both in air and nitrogen atmospheres. Thanks to its specially engineered formulation, SP6500 provides excellent wetting behaviour and fully meets the requirements of a modern solder paste for high-volume electronics manufacturing. Its wetting performance has been optimized for all commonly used surfaces in the electronics industry.

SP6500 only leaves minimal residues on the PCB after the reflow process. These residues exhibit outstanding electrical reliability, eliminating the need for post-reflow cleaning.

CLASSIFICATION AND PROPERTIES

The product offers following advantages:

- **solder powder made from recycled solder**
- **about 85 percent CO_2 savings**
- **halogen-zero**
- **especially formulated for lead-free alloys**
- **suitable for fine pitch down to 0,4 mm**
- **compatible with a wide range of solderable surfaces**
- **long stencil life, consistent performance for at least 6 hours of continuous printing without addition of new paste, 24 hour SMT production ability achieved from 20 °C up to 32 °C**
- **leaves only very small amounts of transparent residues after soldering**
- **high tackiness for high speed pick-and-place equipment**
- **ensures high pick-and-place yields, good self-alignment and a low tomb-stoning defect rate**
- **exceptional print-to-print consistency**

APPLICATION

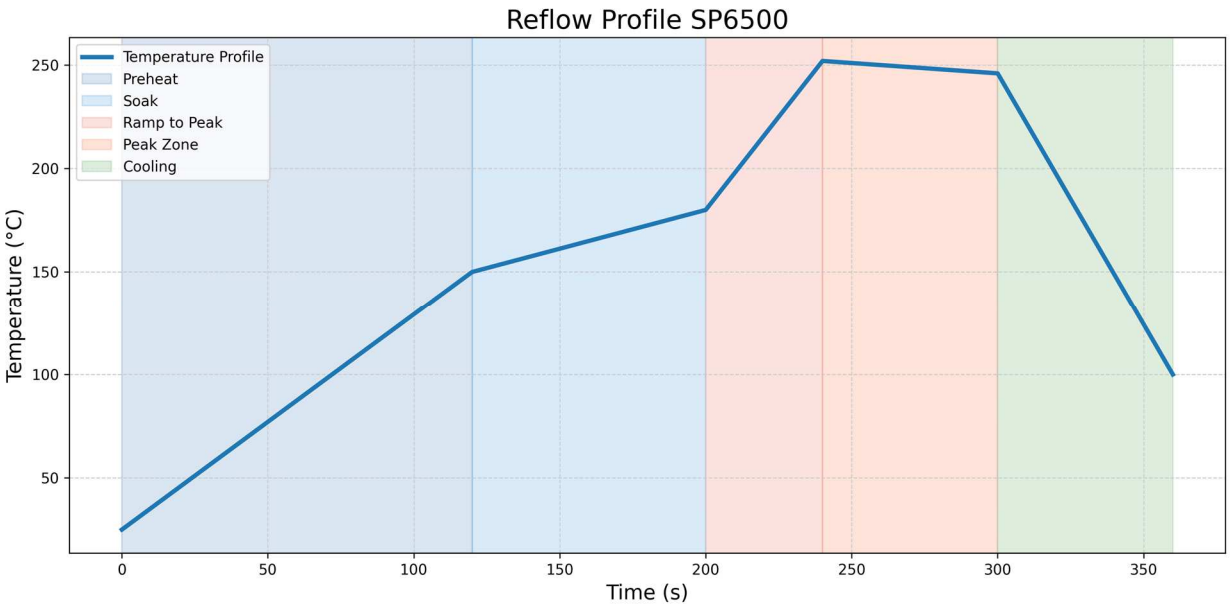
Solder Paste Printing: The solder paste SP6500 was developed for stencil printing. With the alloy SAC0307 in solder particle size type 4 (20-38 µm) it can be applied on nearly every standard printing system as well as most closed print heads.

TYPICAL APPLICATION PARAMETERS	SP6500
	0.4-0.65 mm pitch at 150 µm stencil thickness
	<0.4 mm pitch at 120 µm stencil thickness
minimum pad width	180-200 µm at 150 µm stencil thickness

Recommendation for solder paste printing:

1. Always use the thinnest possible stencil thickness.
2. Always use stencils with rounded corners to reduce clogging of apertures to the lowest possible minimum.
3. Set the squeegee pressure to 1 kg for each 5 cm of squeegee length. Then reduce the pressure step by step, until the solder paste starts smearing on the stencil. Then add 1 kg to the squeegee pressure and check that the solder paste leaves no residues after printing on the surface of the stencil. Evaluate this parameter at your desired print speed.
4. Optimum print results can be achieved at print speeds between 25-150 mm sec^{-1}.
5. Ensure a perfect sealing between PCB and stencil. The PCB has to have the best possible support to achieve the optimum sealing to the stencil, so that the solder paste cannot be printed between pads and stencil. This avoids solder balling.
6. Printer down times up to 60 min can be achieved. The following first print after 1 h should give good filling of apertures and a good print result.

Reflow profile: The reflow process can be performed under air or nitrogen. The temperature profile below is typical and has shown good reflow results with the best wetting behaviour for SP6500. Depending on the soldering equipment and PCBs, different temperature profiles may be used. For this solder paste, a linear reflow profile is recommended, as this will ensure the optimum activity of the solder paste and ensures perfect wetting. This example can only be a recommendation.



RECOMMENDED PROCESS WINDOW	MAXIMUM	MINIMUM
peak temperature	250 °C	232 °C
time above reflow T>221 °C	90 sec.	30 sec.
soak time 130 °C to 217 °C	135 sec.	80 sec.
rising slope	1.7	0

CLEANING

Stannol SP6500 was developed as a No-Clean solder paste. This means that it is not obligatory to remove the residues. For extreme high reliable PCBs it may be worth investigating if cleaning is necessary by carrying out SIR and ionic contamination measurements. 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 solder powder for Stannol SP6500 solder pastes is produced by atomising alloys conforming to the purity requirements of J-STD-006, EN 29453 or other national and international standards where relevant. Careful control of production processes ensures exact solder powder particle distribution in a spherical shape.

GENERAL PROPERTIES	SP6500
alloy	Sn99Ag0.3Cu0.7
melting range, °C	217-227
metal content, %	88.5
solder powder, µm	20-38 (type 4)
application:	stencil printing

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

TESTS	SPECIFICATION	RESULTS
copper corrosion	ANSI/J-STD-004	pass
copper mirror test	ANSI/J-STD-004	pass
surface insulation resistance (without cleaning)	ANSI/J-STD-004, IPC-TM-650 JIS-Z-3284 85 °C/85 %rF JIS-Z-3284 40 °C/90 %rF DIN IEC 61189	pass
silver chromate paper test	ANSI/J-STD 004 QQS-571	pass
solder balling:	after 1 h at room temperature after 24 h at room temperature	pass, class 1
tackiness	JIS-Z-3284	at least 100 g after 24 h
flux activity classification (without cleaning)	DIN 29454-1 J-STD-004	1.2.2.C ROL0

PACKAGING

Stannol SP6500 solder paste can be supplied in:

- **500 g plastic jars**
- **6 oz or12 oz cartridges**

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

STORAGE AND SHELF LIFE

Providing SP6500 solder paste is stored at 2-8 °C tightly sealed in the original container it has a minimum shelf life (from date of production) of 6 months (jar). After storage, let the solder paste allow recovering to room temperature before opening the jar for at least 4 h to avoid condensation of humidity on the solder paste surface.

HEALTH AND SAFETY

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

DISCLAIMER

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