TECHNICAL DATA SHEET

STANNOL

SOLDER PASTE SP2300

Lead-and halogen-free, No-Clean solder paste, REL0

PRODUCT DESCRIPTION

Solder paste Stannol SP2300 was developed especially for lead-free alloys with the TSC305 (Sn96.5Ag3Cu0.5) as a standard alloy. It contains a highly active type L No-Clean flux. With a special formulation for perfect wetting, the SP2300 fulfils all the requirements for a modern solder paste, which can be used in high volume electronics manufacturing. Wetting properties have been optimized for all known surfaces in the electronics industry. As this solder paste leaves only very small amounts of residues on the PCB after soldering, and these small amounts of residues show exceptional electrical safety, there is no need for cleaning.

CHARACTERISTICS

This product offers the following advantages:

- **halogen-free version especially formulated for lead-free alloys**
- **suitable for fine pitch down to 0.4 mm**
- **suitable for particle sizes 4 and 5**
- **compatible with a wide range of solderable surfaces**
- **effective over a wide range of reflow profiles in air or nitrogen**
- **perfect wetting on all surfaces**
- **high tackiness for high speed pick and place equipment**
- **exceptional print to print consistency**

APPLICATION

Solder Paste Printing: The solder paste SP2300 was developed for stencil printing. With the alloy TSC305 in solder particle size type 4 (20-38 µm) or 5 (15-25 µm) it can be applied on common open standard printing system.

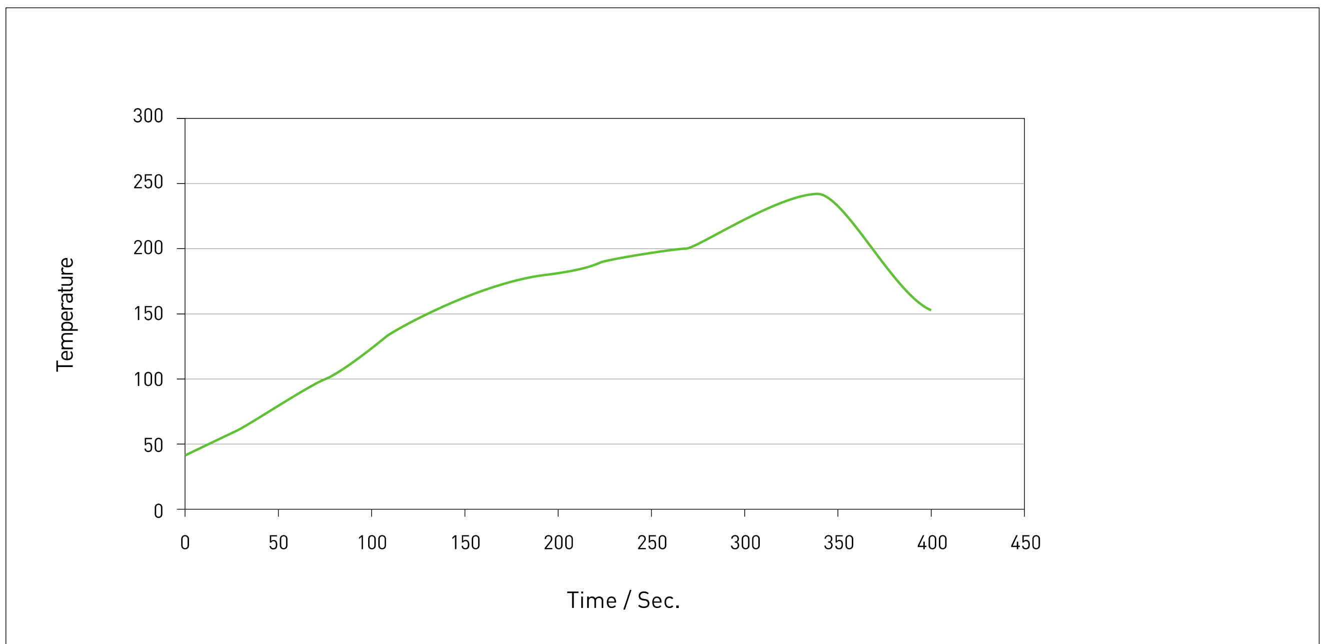
TYPICAL APPLICATION PARAMETERS	
For Type 4	0.4-0.65 mm Pitch at 150 µm stencil thickness < 0,4 mm Pitch at 120 µm stencil thickness
For Type 5	< 0.3 mm Pitch at 100 µm stencil thickness 01005 passive components with stencil thickness < 100 µm

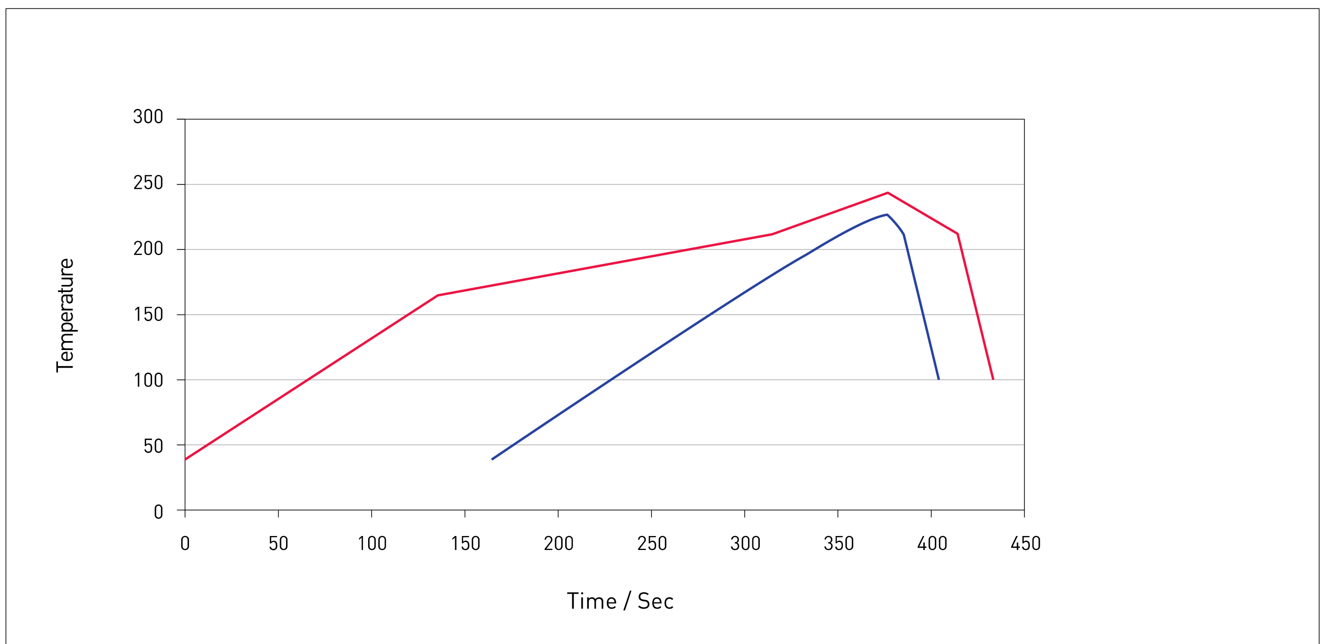
Recommendation for solder paste printing:

1. Use always the thinnest possible stencil thickness and always stencils with rounded corners, to reduce clogging of apertures to the lowest possible minimum.
2. Set the squeegee pressure to 1 kg for each 5 cm of squeegee length. Then reduce the pressure step by step, till 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.
3. Optimum print results can be achieved at print speeds between 10-75 mm sec^{-1}.
4. Please 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.
5. 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.

The SP2300 solder paste has an open time (time on printer and printed on circuit board) of at least 8 hours. During this time it remains in a low-viscosity, printable state with sufficient adhesive strength for components. The exact period always depends heavily on the environmental conditions in the respective production environment. If the life of the circuit board between printing and reflow exceeds 6 hours, storage in a closed container is recommended to prevent the paste from drying out due to drafts. This is especially the case with a rel. humidity of> 83 %. Pay attention to moisture.

Reflow profile: The reflow can be done either in air or nitrogen. Following is an example for a temperature profile for the solder paste SP2300, which has shown good reflow results in practice with best wetting. Depending on the soldering equipment and PCBs, different temperature profile may be used. This example can only be a recommendation. We recommend to use a linear profile for this solder paste, as this will ensure the optimum activity of the solder paste and ensures perfect wetting. If a non-linear profile has to be used for some reasons, the temperature in the preheat area should not exceed 120 sec. at max. 180 °C.





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

CLEANING

Stannol SP2300 was developed as a No-Clean solder paste. This means that there is no need to remove the residues. If extremely high electrical safety is required, SIR Tests and ionic contamination measurements can help to decide whether cleaning is necessary. If cleaning is required, the residues can be removed in conventional cleaning processes. For cleaning, Stannol cleaner Flux-Ex Post is recommended.

TECHNICAL SPECIFICATION

Solder powder: The solder powder for Stannol SP2300 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	SP2300 TSC305-89-4 / SP2300 TSC305-89-5
Alloy:	Sn96,5 Ag3,0 Cu0,5 (Ecoloy TSC305)
Melting range, °C:	217-223
Metal content, %	89
Solder powder, µm:	20-38 (type 4) / 15-25 (type 5)
Application:	stencil printing
Density g/cm³	3,9 +/- 0,2

Tests	Specification	Result
Copper plate corrosion:	ANSI/J-STD-004	pass
Copper mirror corrosion:	ANSI/J-STD-004	pass
Surface insulation resistance (without cleaning):	ANSI/J-STD-004 - IPC-TM650 JIS-Z-3284 85 °C/85 %rF JIS-Z-3284 40 °C/90 %rF DIN IEC 61189	pass pass pass pass
Silver chromate paper test:	ANSI/J-STD 004 / QQS-571	pass
Chlorides:	IPC-TM-650	> 20 ppm
Bromides:	IPC-TM-650	> 20 ppm
Solder balling:	after 1 h at RT after 24 h at RT	pass, class 1 pass, class 1
Tackiness:	JIS-Z-3284	at least 10 g after 2 h
Open time:	laboratory internal specification	at least h at 2 °C/6 % rF
Flux Activity Classification (without cleaning):	DIN 29454-1 J-STD-004B	1.2.3.C REL0

PACKAGING

Stannol SP2300 solder pastes are supplied in:

- **500 g plastic jars for Type 4; 250 g for Type 5**
- **600 g and 1200 g Semco cartridges for Type 4**

Other forms of packaging are available on request, probably subject to minimum order quantities.

Haberstr. 24 • 42551 Velbert • Tel: +49 (0)2051-3120-0 • Fax: +49 (0)2051-3120-111 • E-Mail: info@stannol.de • www.stannol.de

STORAGE AND SHELF LIFE

Please store the SP2300 solder paste at 2-8 °C in a refrigerator, tightly sealed in the original container. Shelf life in jars is 6 months from the date of manufacturing. Please refer to the expiry date on the label of the packaged product for more dedicated information. Allow the solder paste prior to use to recover to room temperature before opening the jar for at least 8-12 h to avoid condensation of humidity on the paste.

Solder paste in cartridges (e.g. Semco 6 & 12 oz) should be stored in upright position with the dispensing tip facing downwards. If cartridges cannot be stored vertically and need to be stored horizontally, it is recommended to turn cartridges 180° once a week to prevent separation.

HEALTH AND SAFETY

Before use please read the material safety data sheet carefully and observe the safety precautions described.

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.

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