Technical Data Sheet

STANNOL® Solder Paste SP2300

Lead- and Halide-Free No-Clean Solder Paste, REL0

Key benefits

- ✓ **Halide free formulation especially formulated for lead-free alloys**
- ✓ **Suitable for fine pitch down to 0,4mm**
- ✓ **Available in powder particle size type 4, 20-38µm and type 5, 15-25µm**
- ✓ **Compatible with a wide range of solderable surfaces**
- ✓ **Effective over a wide range of reflow profiles in air or nitrogen**
- ✓ **Leaves only very small amounts of transparent residues after soldering**
- ✓ **High tackiness for high speed pick and place equipment**
- ✓ **Exceptional wetting at components, which require high volumes of solder**

Description

The 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, which contains no halides. With a special formulation for perfect wetting, the SP2300 fulfils all the requirements for a modern solder paste, which can be used in a 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 after soldering on the PCB, and these small amounts of residues show exceptional electrical safety, there is no need for cleaning.

Application

Solder Paste Printing: The solder paste **SP2300** was developed for stencil printing. With the alloy TSC305 in solder particle size type 4 (20-38µm) and type 5 (15-25µm) it can be applied on nearly every standard printing system as well as most closed print heads.

Typical application parameters, type 4:	0.4-0.65mm Pitch at 150µm stencil thickness <0.4mm Pitch at 120µm stencil thickness
Typical application parameters, type 5:	<0.3mm Pitch at 100µm stencil thickness 01005 passive components with <100µm stencil thickness

Recommendation for solder paste printing:

- Use always the thinnest possible stencil thickness.
- Use always stencils with rounded corners, to reduce clogging of apertures to the lowest possible minimum.
- Set the squeegee pressure to 1kg for each 5cm of squeegee length. Then reduce the pressure step by step, till the solder paste starts smearing on the stencil. Then add 1kg 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.
- Optimum print results can be achieved at print speeds between 10-75 mm sec^{-1}.
- 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.
- Printer down times up to 60min can be achieved. The following first print after 1h should give good filling of apertures and a good print result.

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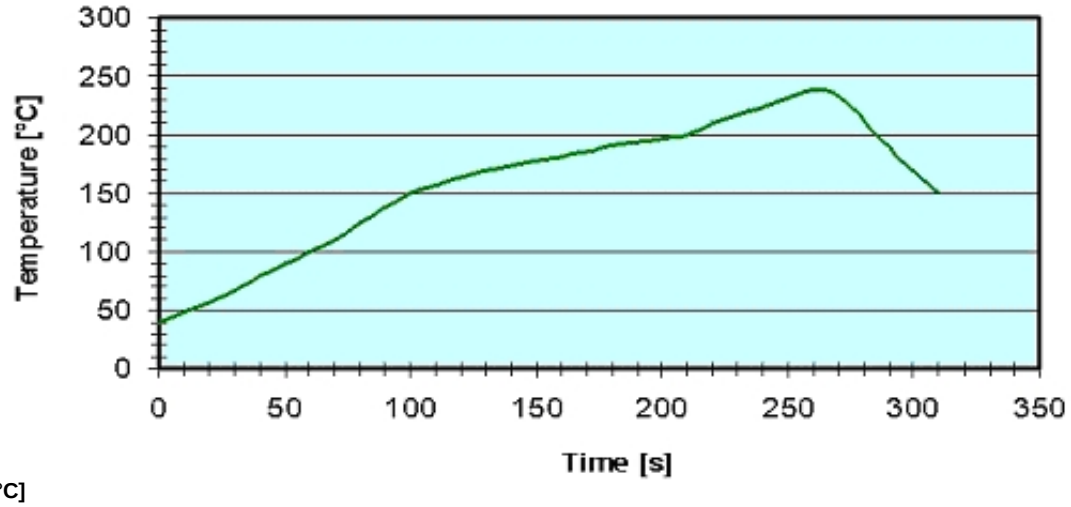
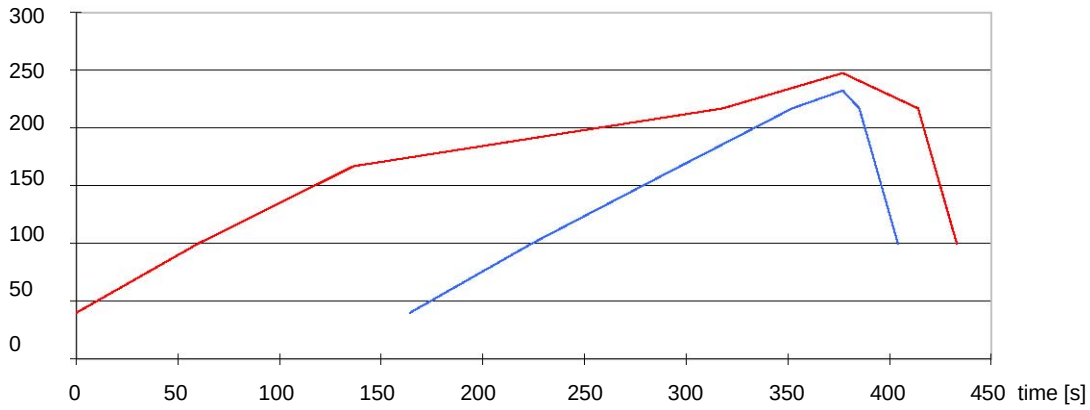
Reflow profile: The reflow can be done either in air or nitrogen. Following are examples for temperature profiles for the solder paste **SP2300**, which has shown good reflow results in practice with best wetting. Depending on the soldering equipment and PCBs, different temperature profile may be used. This example can only be a recommendation. We recommend for this solder paste to use a linear profile, 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 120sec. at max. 180°C.



Temperature [°C]



Recommendation process window:

	MAX (red)	**MIN (blue)**
Peak	250°C	230°C
T>217°C	100sec.	30sec.
100°C to 217°C	260sec.	130sec

Cleaning: Residues, left on the PCB after using the solder paste **STANNOL® SP2300** do not need to be removed. This solder paste has been designed as No-Clean solder paste. For extreme high reliable PCBs it may be possible to investigate if cleaning is necessary or not by carrying out SIR and ionic contamination measurements. Should a cleaning be required, standard cleaning processes may be used. More information about cleaning is available on request.

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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.

Solder paste type / Properties	STANNOL® SP2300 TSC305-89-4 / SP2300 TSC305-89-5
Alloy	Sn96.5 Ag3.0Cu0.5 (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
Solder balling	After 1h @ RT After 24 @ RT	pass, class 1 pass, class 1
Tackiness	JIS-Z-3284	At least 100g after 24h
Flux Activity Classification (without cleaning)	DIN 29454-1 J-STD-004	1.2.3.C RE L0

Packaging

STANNOL® SP2300 solder pastes are supplied in:

- 500g plastic jars with an air seal insert, 250g jars (type 5)
- 600g and 1200g Semco cartridges.

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

Storage and Shelf life

Providing **SP2300** solder pastes are stored at 0-10°C tightly sealed in the original container, this solder paste has a minimum shelf life of 6 months. Please let the solder paste after storage allow recovering to room temperature before opening the jar for at least 8-12h to avoid condensation of humidity on the solder paste surface.

Health and Safety

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

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