

# SOLDER PASTE SP2100

Lead-free, no-clean solder paste

## DESCRIPTION

The solder paste Stannol SP2100 was developed especially for lead-free alloys with the TSC405 (Sn95.5Ag4Cu0.5) as a standard alloy with a melting point of 217°C. It contains a highly active type L no-clean flux. With a special formulation for perfect wetting, the SP2100 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.

## CHARACTERISTICS

This products offers the following advantages:

- Especially formulated for lead-free alloys
- Suitable for fine pitch down to 0,4mm
- 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
- Temperature range for application 20-32°C, non-sensitive to high humidity conditions
- Exceptional print to print consistency

## APPLICATION

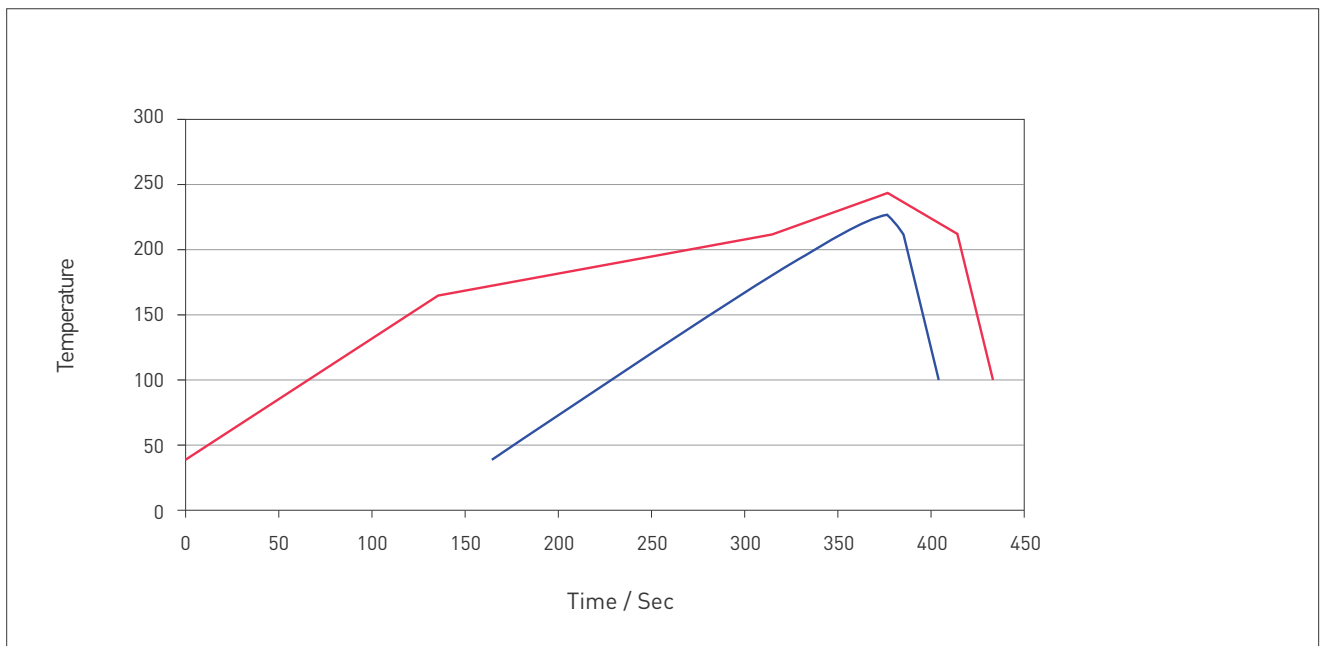
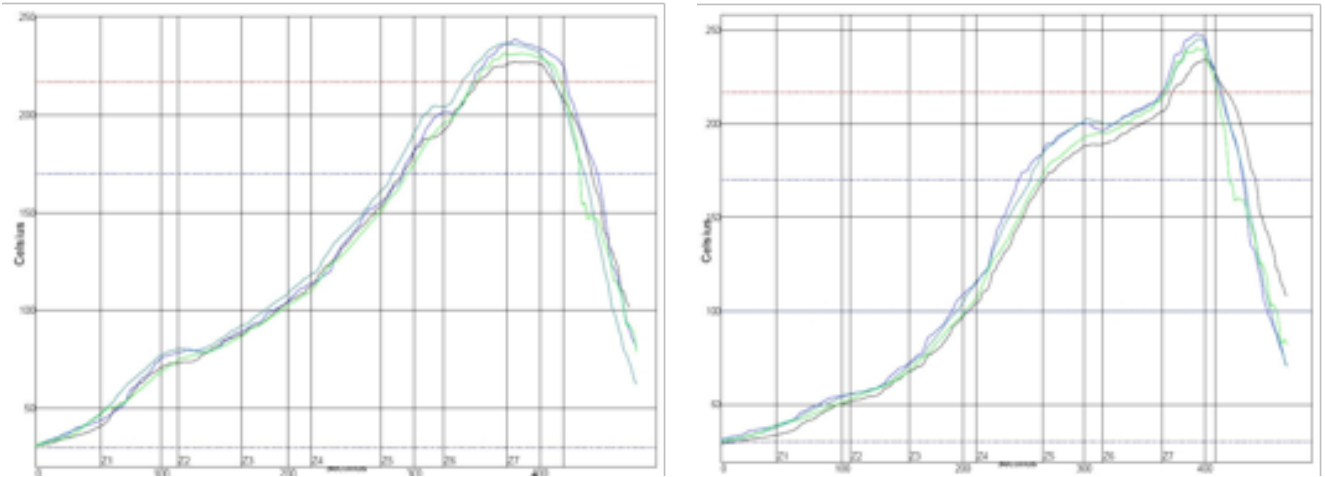
**Solder Paste Printing:** The solder paste SP2100 was developed for stencil printing. With the alloy TSC405 in solder particle size type 3 (25-45µm) it can be applied on nearly every standard printing system as well as most closed print heads.

TYPICAL APPLICATION PARAMETERS	SOLDER PASTE SP2100
---	0.4-0.65mm Pitch at 150µm stencil thickness
---	<0.4mm Pitch at 120µm stencil thickness
<b>Minimum pad width:</b>	180-200µm at 150µm stencil thickness

### Recommendation for solder paste printing:

1. Use always the thinnest possible stencil thickness.
2. Use always stencils with rounded corners, to reduce clogging of apertures to the lowest possible minimum.
3. 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.
4. Optimum print results can be achieved at print speeds between 10-75 mm sec-1.
5. 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.
6. 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.

**Reflow profile:** The reflow can be done either in air or nitrogen. Following are examples for temperature profiles for the solder paste SP2100, 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.



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

**Cleaning:** Residues, left on the PCB after using the solder paste Stannol SP2100 do not need to be removed. This solder paste has been designed as a 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.

## TECHNICAL SPECIFICATION

**Solder powder:** The solder powder for Stannol SP2100 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	SP2100 TSC405-88-3
Alloy:	Sn95.5 Ag4Cu0.5 (Ecoloy TSC405)
Melting range, °C:	217-223
Metal content, %:	88
Solder powder, µm:	25-45
Application:	stencil printing
Viscosity Brookfield cPs <sup>(1)</sup> , 25°C	750.000-1.200.000
Physica CSR @ 10rpm, Pas	180 +/- 40
Density g/cm <sup>3</sup>	4.0 +/- 0.3

(1) measured at 25°C, using the TF spindle at 5 Rpm after 2 minutes

Tests	Specification	Result
Kupferkorrosion:	ANSI/J-STD-004	pass
Copper mirror corrosion:	ANSI/J-STD-004	pass
Surface insulation resistance (without cleaning):	ANSI/J-STD-004 - IPC-TM650	pass
	JIS-Z-3284 85°C/85%rF	pass
	JIS-Z-3284 40°C/90%rF	pass
	DIN IEC 61189	pass
Silver chromate paper test:	ANSI/J-STD 004 / QQS-571	pass
Solder balling:	After 1h at RT	pass, class 1
	After 24 at RT	pass, class 1
Tackiness:	JIS-Z-3284	At least 100g after 24h
Flux Activity Classification (without cleaning):	DIN 29454-1	1.2.2.C
	J-STD-004	RE L1

## PACKAGING

Stannol SP2100 solder pastes are supplied in:

- 500g plastic jars
- 600g and 1200g Semco cartridges

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

## STORAGE AND SHELF LIFE

Providing SP2100 solder pastes are stored at 0-10°C tightly sealed in the original container, this solder paste has a minimum shelf life (from date of production) of 6 months (jar) or 3 months (cartridge). 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.

## NOTE

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.