



**STANNOL**®

Wenn's ums Löten geht  
When it's about soldering  
Quand il s'agit du soudage

## TECHNICAL DATASHEET

# STANNOL® SP318 LEAD-FREE NO-CLEAN SOLDER PASTE ROLO

**STANNOL® SP318** has been formulated for use with lead-free solders as a No-Clean product for printing and dispensing application. Reflow is possible in air and nitrogen. **SP318** lead-free solder paste offers excellent open time and good soldering activity over a wide range of reflow profiles and surface finishes. The SP318 contains a highly active type L flux, which gives an excellent wetting on components, which are difficult to solder.

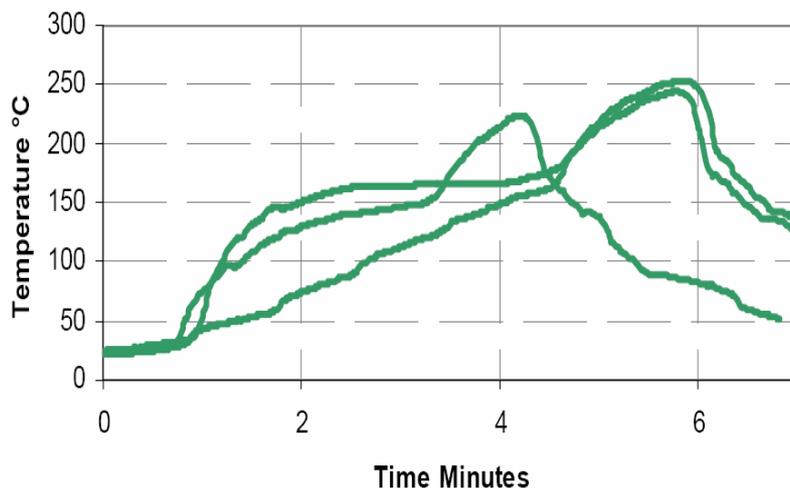
- ✓ Especially formulated for lead-free alloys
- ✓ Effective over a wide range of printer cycle times and print speed
- ✓ Long component tack time up to 72h at 27°C/80%RH
- ✓ Excellent slump resistance,
- ✓ Soft, non-stick, pin-testable clear residues for easy ICT testing
- ✓ Compatible with a wide range of solderable surfaces
- ✓ Effective over a wide range of reflow profiles in air or nitrogen
- ✓ Produces safe residues - eliminates the need for cleaning
- ✓ Available in dispensing grade
- ✓ Low colour for easy visual inspection

### APPLICATION

**Application by Dispensing:** The dispensing grade of SP318 is suitable for use with 23 gauge (inner diameter 0,33mm) needles or larger. It is essential that the dispensing mechanism and needles are clean and in good condition. Regular cleaning of the dispensing equipment is recommended before and immediately after use to prevent contamination with dry solder paste. Even relatively small amounts of contamination in the dispensing equipment and needles will cause inconsistent deposit volumes and even complete system blockage.

**Reflow:** Any of the available methods of heating to cause reflow may be used including IR, convection, hot belt, vapour phase and laser soldering. It is not practicable to recommend an ideal reflow temperature profile for all situations. However, the following shows example profiles that have given good results with lead free alloy TSC in practice. Recommendations for generating an appropriate reflow profile for use with lead free TSC alloy:

Recommended average	Upper limit
1. Heat up with 1-2K sec <sup>-1</sup> up to 120-180°C	Heat up with not more than 2-3K sec <sup>-1</sup>
2. Keep temperature stable at 120-180°C for 60-90sec (if necessary)	Avoid ramp at temperatures above >170-180°C
3. Heat up with 1-2K sec <sup>-1</sup> up to 230-260°C	Heat up with not more than 2-3K sec <sup>-1</sup>
4. Keep temperature at 230-260°C for app. 30-60sec	Keep temperature not longer than 90sec above liquidus



**Cleaning: STANNOL SP318** solder pastes are No-Clean and are designed to be left on the PCB in many applications since they do not pose a hazard to long term reliability. However, should there be a specific requirement for residue removal; this may be achieved using conventional cleaning processes based on solvents such as STANNOL FluxEx 500, or suitable saponifying agents, like the STANNOL FluxEx 200B. For stencil cleaning and cleaning board misprints, STANNOL FluxEx 401 Solvent Cleaner is recommended.

**Solder Powder:** The solder powder for STANNOL SP318 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 that the solder powder is at least 97% spherical (aspect ratio <1.5) and contains less than the minimum level of contaminants that would adversely affect solder paste performance. A typical maximum oxide contamination level of 80 ppm (expressed as oxygen in the solder) is regularly achieved or bettered.

## **TECHNICAL SPECIFICATIONS**

**Solder Paste Medium:** STANNOL SP318 medium contains a stable resin system and slow evaporating solvents with minimal odour. The formulation meets the requirements of the Telcordia (formerly known as Bellcore) GR-78-CORE and ANSI/J-STD-004 for a type ROL0 classification.

<b>Solder paste</b>	<b>STANNOL® SP318 TSC-88,5-3-765</b>	<b>STANNOL® SP318 TSC-88,5-ADP-830</b>	<b>STANNOL® SP318 TSC-84-3-400</b>
Alloy	Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu0,7	Sn95,5Ag3,8Cu0,7
Metal content , %	88,5	88,5	84,0
Solder powder size , µm	25-45	15-38	25-45
Viscosity, 25°C Brookfield cP <sup>(1)</sup>	765.000	830.000	~400.000
Malcom Viscosity, P <sup>(2)</sup>	1961	-	-
Thixotropic index <sup>(3)</sup>	0,54	-	-
Slump, J-STD-005, mm <sup>(4)</sup> RT (15 minutes)	IPC A21 Pattern	IPC A21 Pattern	IPC A21 Pattern
0.33 x 2.03 mm pads	0.06	0.06	-
0.63 x 2.03 mm pads	0.33	0.33	-
150°C (15 minutes)			
0.33 x 2.03 mm pads	0,20	0,20	-
0.63 x 2.03 mm pads	0,33	0,33	-
Initial tack force / gmm <sup>-3(5)</sup>	2,0	2,0	2,0
Open time (printed PCB) h	>48	>48	>48

<sup>(1)</sup> Measured at 25°C, TF spindle at 5rpm after 2 minutes

<sup>(2)</sup> Measured at 25°C, and a shear rate of 6s<sup>-1</sup>

<sup>(3)</sup> TI = log [viscosity at 1.8s<sup>-1</sup>/viscosity at 18s<sup>-1</sup>]

<sup>(4)</sup> The slump data is expressed as the min spacing between pads of the size

shown that does not allow bridging

<sup>(5)</sup> Tack data is derived from comparative laboratory tests and do not necessarily relate directly to a particular user's conditions

<b>Test</b>	<b>Specifications</b>	<b>Result</b>
Copper plate Corrosion	ANSI/J-STD004	pass
Copper mirror Corrosion	ANSI/J-STD004	pass
Chlorides & Bromides	ANSI/J-STD-004	pass
Surface insulation resistance (without cleaning)	ANSI/J-STD004J Telcordia GR-78-Core JIS-Z-3284	pass pass pass
Electro migration (without cleaning)	Bellcore TR-NWT-000078	pass
Flux Activity Classification (without cleaning)	ANSI/J-STD-004 IPC-SF-818	ROL0 LR3CN

## **PACKAGING**

**STANNOL® SP318** solder pastes are supplied in:

- 500g plastic jars with an air seal insert
- 600g /1000g Semco cartridges.
- 25g / 75g Semco hybrid cartridges (10cm<sup>3</sup>) with Luerlock for dispensing

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

**Shelf Life:** Providing **SP318** solder pastes are stored at 0-10°C tightly sealed in the original container, a minimum shelf life of 6 months for the stencil print versions and 3 months for the dispensing version in Semco cartridges can be expected. Air shipment is recommended to minimise the time the containers are exposed to higher temperatures. **SP318** solder pastes have been formulated to reduce separation on storage to a minimum.

## **HEALTH AND SAFETY**

Users should refer to the Health and Safety information relevant to specific **STANNOL® SP318** solder pastes products before use. The MSDS is available upon request.