

# NL930-PT No Clean Solder Paste

## INTRODUCTION

**NL930-PT** is a halogen-free lead-free no clean solder paste, which allows a previously unseen level of repeatability and consistency. **NL930-PT** is designed for pin probability which, when combined with FCT Assembly's UltraSlic™ and Slic stencil, delivers Surface Area Ratio (SAR) paste transfer efficiencies below 0.6 and 0.55 respectively. **NL930-PT** is formulated to deliver exceptional cosmetics, especially when used in conjunction with Nihon Superior's SN100C patented lead free alloy.

## ATTRIBUTES

- Excellent print consistency with Surface Area Ratios (SAR) as low as 0.55 when used with the UltraSlic™ stencil technology
- Wide reflow profile window with good solderability on various PCB surface finishes
- Completely Halogen free by all tests (i.e., no hidden halides)
- Excellent cosmetics and a clear residue
- Pin-probable residue (no cracking, no gumming)
- Low voiding/high reliability
- Compatible in either Nitrogen or Air reflow
- Formulated to work with SAC and SN100C alloys

## PRODUCT INFORMATION

Alloys:	SAC 305, SN100C
Powder Size:	Available in type 3 and type 4. Type 5 available by request
Packaging:	500 gram jars or cartridges. Also available in enclosed print head systems.
Flux:	NL930-PT flux available in 10CC and 30CC syringes.

## STORAGE AND HANDLING

**NL930-PT** should be refrigerated at 0-10°C to prolong shelf life. At this range the shelf life will exceed 9 months. Cartridges should be stored tip down. Paste can be stored up to two weeks at room temperature. When refrigerated, warm up paste container to room temperature for up to four hours. Paste must be at ≥ 19°C before processing. Working range of **NL930-PT** is between 19-32°C.

## PRINTING

Fine Line Stencil's Slic and UltraSlic™ stencils are recommended for best printing characteristics among stencil types. Below are surface area ratios achieved:

**Slic ≤ 0.6**

**UltraSlic™ ≤ 0.55**

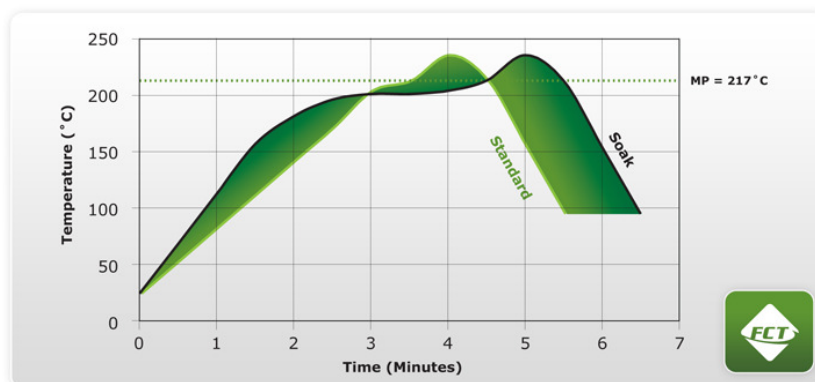
## PRINTER OPERATION

The following are general recommendations for stencil printer optimization. Adjustments may be necessary based on specific process requirements.

Solder Paste Bead:	2 cm. Add when bead goes below 1 cm
Squeegee:	Metal, Slic blade preferred. 60 degrees from horizontal
Speed:	25 to 150 mm/sec.
Pressure:	0.18-0.27 Kg/cm (squeegee length)
Underside Wipe:	Slic and Ultraslic should exceed > 10 prints/wipe
Stencil life:	> 8 hours at 30+60% RH and 20-25°C

## STANDARD PRODUCT AVAILABILITY

Alloy	Metal loading
SAC 305	88.40% for type 3
SAC 305	88.10% for type 4
SN100C	88.30% for type 3
SN100C	88.00% for type 4



### RECOMMENDED REFLOW PROFILE

The recommendations apply to most lead free alloys in the SAC alloy system. This can be used as a general guideline in establishing a reflow profile when using **NL930-PT**. Deviations from these recommendations are acceptable and may be necessary, based on specific process requirements including board size, thickness and other process characteristics. Please add 7-10C when using SN100C based solder paste.

### REFLOW

A peak temperature of 12-45 C above the melting point of the alloy is recommended for optimum results. A time above liquidus (TAL) of 30 to 90 seconds should also be used. Excessive temperature or excessive TAL may result in excessive Intermetallic Compound (SnCu—IMC) formation, which can adversely affect solder joint and long term reliability.

### HEATING

A linear ramp of 0.5 to 2 C/sec is suggested to gradually remove the solvents and other volatile components in the solder paste. This also helps in minimizing solder balls, beading and bridging from hot slump.

A linear ramp also helps minimize depletion of flux activity which can happen at extended times above the liquidus (TAL) and at very high reflow temperatures.

A profile with a soak between 200-210C for less than 20 seconds can be used to reduce void formation on BGA and CSP devices.

A short 20-30 second soak below the melting point of the solder can be used to help minimize tombstoning.

### COOLING

A cooling rate greater than 2C per second should be used to insure a fine grain solder structure and minimal IMC layer.

### CLEANING

**NL930-PT** is a no clean solder paste and does not need to be removed from the circuit board. If the need arose to remove the flux residue, then the following cleaners could be used.

Kyzen Aquanox: A4241, A4520, A4625, A4633, A4639, A4703, A4651US.

Kyzen Ionox: I3300, I3335, I3302, FCR

Kyzen Micronox: MX2305

### MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheets (MSDS) are available online at [www.fctassembly.com](http://www.fctassembly.com)

### TEST RESULTS

J-STD-004A (IPC TM-650) Test	Result
Flux Type (per J-STD-004A)	ROLO
Copper Mirror	Low activity
Halide Test	0.00%
Silver Chromate	No halides
Fluoride test	None detected
Ion Chromatography	Zero halides
J-STD-005 (IPC-TM-650) Test	Result
Brookfield viscosity Type 3	520 to 620 Kcps
Brookfield viscosity Type 4	520 to 620 Kcps

Slump	Pass
Solder Ball	Pass
Wetting	Pass
<b>Bellcore Test</b>	<b>Result</b>
SIR	Pass
Electromigration	Pass