

NC670 No Clean Solder Paste

INTRODUCTION

NC670 No Clean Solder Paste is a halide free, rosin based solder paste, which allows a previously unseen level of repeatability and consistency. This paste offers an excellent open time, extended abandon time and good soldering activity with all surface finishes. NC670 meets or exceeds the requirements for ANSI/J-STD- 004-005 as well as all Bellcore test criteria for solder pastes. Residues left are clear and probable.

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 Halide free by all tests (i.e., no hidden halides)
- Excellent cosmetics and a clear residue
- Pin probable residue
- Low voiding/high reliability
- Compatible in either Nitrogen or Air reflow

PRODUCT INFORMATION

Alloys:	SN63, 62/36/2
Powder Size:	Available in type 3 and type 4. Type 5 available by request
Packaging:	500gram jars or cartridges. Also available in enclosed print head systems.
Flux:	NC670 flux available in 10CC and 30CC syringes.

PRINTING

Stencil aperture design and stencil quality are major factors in achieving excellent print consistency with any solder paste. UltraSlic™ (SAR ≥ 0.45) and Slic™ (SAR ≥ 0.55) stencils from Fine Line Stencil are recommended for optimal print performance and can be custom designed to minimize rework and improve the yields of any process. Some general stencil aperture design guidelines are as follows:

- Fine pitch components (≤ 0.020") – a 0.001" reduction (L & W) to minimize bridging and create a gasket between the stencil and SMT pad
- Discrete components – a 0.002" reduction (L & W) for water washable and a 0.002" reduction (L & W), with "U-shaped" homeplates, for no clean to minimize mid-chip solder beads

Contact Fine Line Stencil at 719-579-8055 for process-specific stencil design recommendations. www.fineline stencil.com

STORAGE AND HANDLING

NC670 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 **NC670** is between 19-32°C.

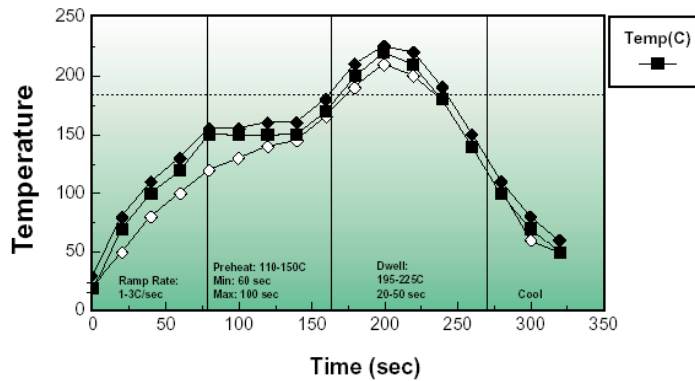
PRINTER OPERATION

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

Solder Paste Bead:	2cm. Add when bead < 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



Temperature Reflow Profile



COOLING

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

RECOMMENDED REFLOW PROFILE

A straight ramp profile @ 0.8°C to 1.5°C per second ramp profile rate is recommended with a 30 to 90 second TAL and 210°C to 220°C peak. High density assemblies may require preheating as follows:

- Ramp @ 1-2°C/sec to 140-160°C
- Dwell @ 195-225°C for 20-50 seconds
- Ramp @ 1-2°C/sec to 210-225°C peak
- Time above liquidus – 30-90 seconds
- Ramp down to R.T. @ 60-150°C/min

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 200-210°C 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.

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheets (MSDS) are available online at www.fctassembly.com

TEST RESULTS

J-STD-004A (IPC TM-650) Test	Result
Flux Type (per J-STD-004A)	ROLO
Copper Mirror	Pass
Halide Test	Pass
Silver Chromate (halides)	Pass
Fluoride test	Zero
Ion Chromatography (halides)	Zero
J-STD-005 (IPC-TM-650) Test	Result
Brookfield viscosity Type 3	750,000
Brookfield viscosity Type 4	800,000
Slump	Pass
Solder Ball	Pass
Wetting	Pass
Bellcore Test	Result
SIR	Pass
Electromigration	Pass

