



# TECHNICAL DATA SHEET

CATEGORY: **NO CLEAN PIN PROBE TESTABLE SOLDER PASTE**  
 NAME: **NC254**  
 ALLOY: **SAC (Tin-Silver-Copper)**

## FEATURES

- BROAD PRINTING PROCESS WINDOW
- CLEAR, PIN-PROBE TESTABLE RESIDUES
- 24 HOUR STENCIL LIFE
- EXCELLENT WETTING
- REDUCES VOIDING UNDER MICRO-BGA'S
- 12-14 HOUR TACK TIME

## DESCRIPTION

**NC254** has been developed to offer extremely broad process windows for printing, wetting and pin probe testing. The superior wetting ability of NC254 results in bright, smooth, shiny, solder joints. NC254 offers very low post process residues, which remain crystal clear and probable even at the elevated temperatures required for today's lead free alloys. NC254 has shown to reduce or eliminate voiding under micro-BGAs. NC254 also offers high humidity tolerance and a chemistry developed for use in air reflow. Slump and humidity tolerances found in NC254 extend the solder pastes useable life in facilities where environmental control is not at its optimum.

## HANDLING

- NC254 has a refrigerated shelf life of 6 months at 4°C (40°F).
- Allow the solder paste to warm completely and naturally to ambient temperature; (8 hours is recommended), prior to breaking seal for use.
- Mix the product lightly and thoroughly, (1 to 2 minutes max.), to ensure even distribution of any separated material resulting from storage.
- Do not store new and used paste in the same container. Re-seal any opened containers while not in use.
- Replace the internal plug in conjunction with the cap of the 500 gram jar to ensure the best possible seal.

## PRINTER SETUP

Below are the suggested starting parameters for your screen printer. Assumptions were made as to the printer types used in today's applications, and adjustments will vary between equipment, application and facility environment.

SNAP-OFF DISTANCE	<b>ON CONTACT (0.00")</b>	SQUEEGEE PRESSURE	<b>.6 - .7 LBS/IN. OF BLADE</b>
PCB SEPARATION DISTANCE	<b>.030-.050"</b>	SQUEEGEE STROKE SPEED	<b>.5 - 6 IN/SEC *</b>
PCB SEPARATION SPEED	<b>MEDIUM</b>	<b>* DEPENDENT ON PCB AND PAD DESIGNS</b>	

## PASTE APPLICATION

- Apply sufficient paste to the stencil to allow a smooth, even roll during the print cycle. A bead diameter of 1/2 to 5/8 inch is normally sufficient to begin.
- Apply small amounts of fresh solder paste to the stencil at frequent, controlled intervals to maintain paste chemistry and workable properties.

- Cleaning of your stencil will vary according to the application; however, it can be accomplished using AIM 200AX-10 stencil cleaner. Use 200AX-10 in moderation and remove any excess cleaner from the stencil surface.
- NC254 provides the necessary tack time/force for today's high-speed placement equipment. Ensuring proper support of PCBs during assembly and handling will enhance product performance and reliability.
- For technical advice, consult the AIM web page at [www.aimsolder.com](http://www.aimsolder.com) or contact AIM.

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## **REFLOW DATA**

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Please see the attached Reflow Profile Supplement.

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## **PASTE TECH-TIPS**

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<b><u>PROBLEM</u></b>	<b><u>POTENTIAL CAUSE</u></b>
• <b>BRIDGING:</b>	EXCESS SOLDER DEPOSITION, COMPONENT ALIGNMENT, PAD/COMPONENT SOLDERABILITY
• <b>LEACHING:</b>	EXCESSIVE REFLOW TIME OR TEMPERATURE
• <b>SOLDER BALLS:</b>	LOW PREHEAT TEMPERATURE, EXCESSIVE HEAT RAMP-UP, OXIDIZED PASTE, EXCESS PASTE
• <b>TOMBSTONING:</b>	EXCESSIVE HEAT RATE, COMPONENT TO PAD SIZE MISMATCH, PASTE REGISTRATION
• <b>WHITE RESIDUE:</b>	SOLDER PASTE OXIDATION, EXCESSIVE TIME AT TEMPERATURE
• <b>DISCOLORED JOINT:</b>	PASTE OXIDATION, BOARD/COMPONENT CONTAMINATION, EXCESSIVE SOAK TIME

Visit [www.aimsolder.com](http://www.aimsolder.com) for additional information

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## **CLEANING**

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NC254 can be cleaned, if necessary, with saponified water or an appropriate solvent cleaner. Please refer to the AIM No-Clean-Cleaner Matrix for a list of suitable cleaning materials.

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## **SAFETY**

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- Use with adequate ventilation and proper personal protective equipment.
- Refer to the accompanying **Material Safety Data Sheet** for any specific emergency information.
- Do not dispose of any lead-containing materials in non-approved containers.

07.18.05

The information contained herein is based on data considered accurate and is offered at no charge. Product information is based upon the assumption of proper handling and operating conditions. All information pertains to solder paste produced with 45-micron powder. No warranty is expressed or implied regarding the accuracy of this data. Liability is expressly disclaimed for any loss or injury arising out of the use of this information or the use of any materials designated. Please review AIM's Terms and Conditions at [www.aimsolder.com/t&c.cfm](http://www.aimsolder.com/t&c.cfm).



# PRODUCT TESTING RESULTS

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## Surface Insulation Resistance Testing

**General References:** Surface Insulation Resistance (SIR) test for solder paste was carried out according to J-STD-004 and IPC-TM-650 method 2.6.3.3.

### Procedure

IPC-B-24 bare copper coupons were cleaned according to IPC-TM-650 method 2.6.3.3. §5.2.3. Solder paste was stencil printed on to the coupons, and then printed sample boards were reflowed in convection oven by using standard AIM thermo-profile NC-J. Prepare the sample for chamber according to IPC-TM-650 method 2.6.3.3. §5.3.3 to §5.3.5, and measurements were made according to IPC-TM-650 method 2.6.3.3. §5.4.1

### Pass Fail Criteria and Data Evaluation

Reference	Property	Pass-Fail Criteria	Result
IPC-TM-650 method 2.6.3.3. §5.5.1	Control coupons	>1E9 Ω at 96 and 168 h	<b>PASS</b>
J-STD-004 §3.2.4.5.1	Sample coupons	>1E8 Ω at 96 and 168 h	<b>PASS</b>
IPC-TM-650 method 2.6.3.3. §5.5.2	Post-test visual inspection	No dendrite growth or corrosion	<b>PASS</b>

### Conclusions

The result of the qualification test indicates that the AIM NC254 solder paste complies with the requirements of IPC TM-650, Method 2.6.3.3 for Surface Insulation Resistance.

## Telcordia GR-78-CORE (Bellcore) Testing

### Abstract

This report summarizes the test results of copper mirror, halide ion, surface insulation resistance (SIR), and electromigration for AIM NC254 solder paste and paste flux. The tests were conducted according to the requirements of Telcordia GR-78-CORE (Bellcore) Generic Requirements.

Test	Conditions	Results	Spec.
<b>Copper Mirror</b>	24 Hrs., 25C, 50%RH	<b>Passed</b>	low; no holes in mirror
<b>Halide Test (Silver Chromate)</b>	ambient condition	<b>Passed</b>	no white ppt.
<b>SIR</b>	35°C/85%RH, 4 days, bare copper IPC-B-25A coupon		
	Initial	8.34E+12 Ohms	
	Final	9.65E+12 Ohms	1.00E+10 min.
		<b>Passed</b>	
<b>Electromigration</b>	65°C/85% RH, 500Hrs., bare copper IPC-B-25A coupon		
	Initial	3.05E+10 Ohms	
	Final	1.57E+10 Ohms	R <sub>f</sub> / R <sub>i</sub> > 0.1
		<b>Passed</b>	

### Conclusions

The results of the qualification tests indicate that AIM NC NC254 solder paste meets the requirements of Telcordia GR-78-CORE (Bellcore) Generic Requirements. This material is approved for use.

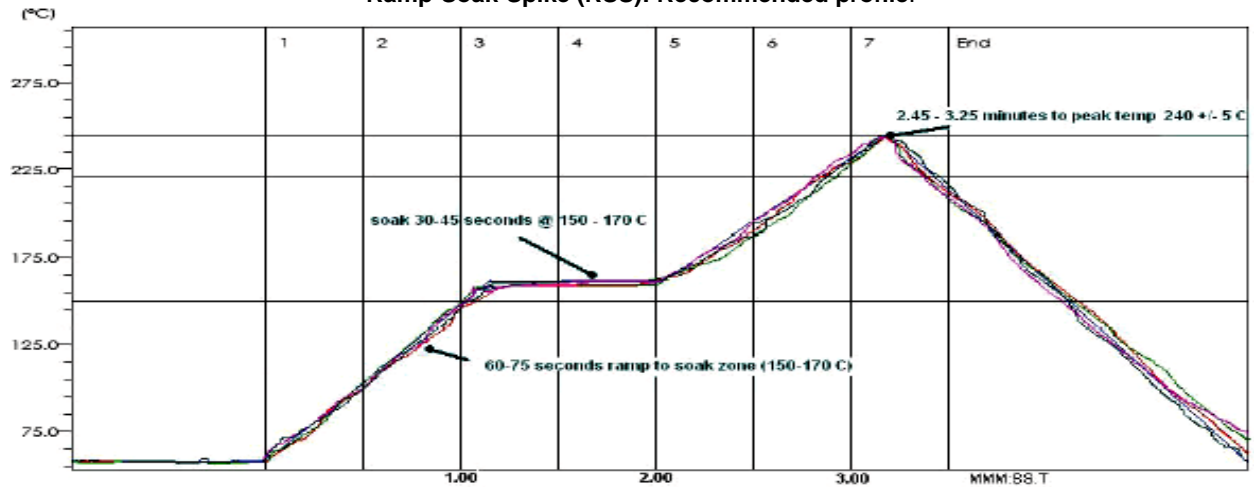


## REFLOW PROFILE SUPPLEMENT

ALLOY:

Sn/Ag/Cu

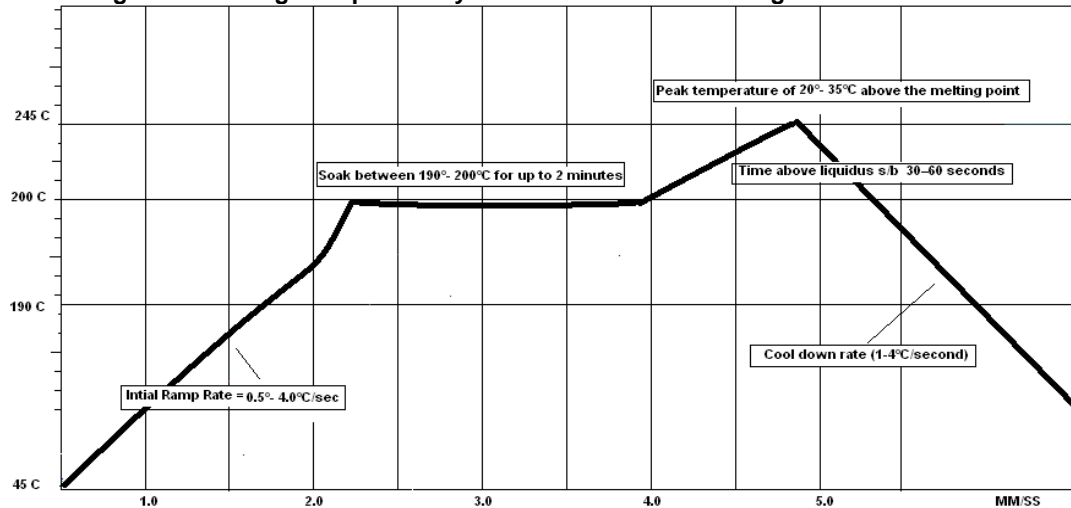
### Ramp-Soak-Spike (RSS): Recommended profile.



#### RSS Profile Guidelines

- The typical initial rate of rise for the RSS profile is 1.4 to 1.8°C/second.
- Ramp up to 150°C and then soak the assembly for 30 to 60 seconds.
- The soak zone should be controlled between 150 -170°C. Above this point the paste will lose its activator.
- Proceed to spike immediately once the PCB has reached thermal stability.
- Peak temperature is 240°C ± 5°C.
- Time above liquidus is 45 ± 15 seconds.
- The total profile length should be between 2 ¾ - 3 ½ minutes from ambient to peak temperature.
- Cool down should be controlled within 4°C/second.

### Low-Voiding Profile: Designed specifically to eliminate/reduce voiding with BGA and CSP devices



#### Profile Guidelines

- The initial rate of rise is 0.5 to 4°C/second.
- Ramp up to 190°C and then soak the assembly between 190 to 200°C for up to 120 seconds.
- Proceed to spike immediately after exiting the soak zone.
- Peak temperature is 238 to 253°C.
- Time above liquidus is 30 to 60 seconds.
- The total profile length should be between 4 ½ - 5 minutes from ambient to peak temperature.
- Cool down should be controlled within 4°C/second.