



TECHNICAL DATA SHEET

CATEGORY: **NO-CLEAN SOLDER PASTE**
 NAME: **293+**
 ALLOY: **Sn63/Pb37 & Sn62/Pb36/Ag2**

FEATURES

- ENHANCED PRINTING CHARACTERISTICS
- LOW RESIDUE
- 14-16 HOUR STENCIL LIFE
- 8-12 HOURS TACK TIME
- IMPROVED IDLE TIMES / RESPONSE TO PAUSE
- EXCELLENT WETTING
- PRINTS UP TO 8 INCHES PER SECOND
- AIR REFLOW / NITROGEN NOT NECESSARY

* Passes BELLCORE and IPC (product testing results available upon request); passes Northern Telecom's copper mirror test

DESCRIPTION

293+ is a mildly activated, resin-based formulation developed to offer enhanced printing characteristics and improved idle times. 293+ also offers excellent activity and wetting characteristics (even for hard-to-wet alloys such as palladium, nickel/gold, organic coatings, etc.) and superior slump resistance, even during high-speed printing. In addition, 293+ offers high humidity tolerance, cleanable, low post-process residues, and a chemistry developed for use in air reflow. Slump and humidity tolerances found in 293+ extend the solder paste's useable life in facilities where environmental control is not at its optimum. 293+ has been utilized on various assemblies with RF designs without cleaning; however, the compatibility of flux residues on RF assemblies is strongly dependent upon circuitry design.

HANDLING

- 293+ has a refrigerated shelf life of 1 year, at 4°C; (40°F), and a non-refrigerated shelf life of 6 months at 22°C; (72°F). Do not freeze this product.
- Allow the solder paste to warm completely and naturally to ambient temperature; (8 hours is recommended), prior to breaking seal for use. Do not force warm the paste as separation of the product may occur.
- Mix the product lightly and thoroughly for 1 to 3 minutes 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.

PRINTER SETUP

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	ON CONTACT (0.00")	SQUEEGEE PRESSURE	.75-1.25 LBS/IN. OF BLADE
PCB SEPARATION DISTANCE	.030-.050"	SQUEEGEE STROKE SPEED	.5 - 8 IN/SEC *
PCB SEPARATION SPEED	MEDIUM/SLOW (.010 ~ .015)	* DEPENDENT ON PCB AND PAD DESIGNS	

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's 200AX-10 or DJAW-10 stencil cleaners. Use these in moderation and remove any excess cleaner from the stencil surface. 293+ 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.

REFLOW DATA

Please see the attached Reflow Profile Supplement.

CLEANING

293+ 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.

SAFETY

- 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.



PRODUCT TESTING RESULTS

CATEGORY: **NO-CLEAN SOLDER PASTE**
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This Product has been tested in accordance with following specifications.

INDEPENDENT LABORATORIES

Surface and Insulation Resistance - PASS

Bellcore GR-78	35/85, 4 Days (1.75×10^{10} minimum)	<u>Pattern Up (Uncleaned)</u> 3.89×10^{11}
		<u>Pattern Up (Cleaned)</u> 1.00×10^{12}

Electromigration - PASS

Bellcore GR-78	65°C/85%RH, 20 Days (Rf/Ri > 0.1)	<u>Taiyo PSR4000</u> $3.16 \times 10^{11}/4.15 \times 10^{11}$
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Ciba Geigy Probimer 52
 $8.07 \times 10^{10}/2.08 \times 10^{11}$

Silver Chromate - PASS

Bellcore GR-78	RT	PASS- No white ppt.
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Copper Mirror- PASS

Bellcore GR-78	24 hrs, 25°C, 50% RH	PASS- No Copper Removal
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AIM LABORATORY

Tack - PASS

IPC	TM-650 2.4.44	Initial Tack = 43gm
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Viscosity - PASS

IPC	J-STD-005	Relative to production batch
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Silver Chromate

IPC	TM-650 2.3.33	PASS
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Solder Ball Test

IPC	J-STD-005	PASS
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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.

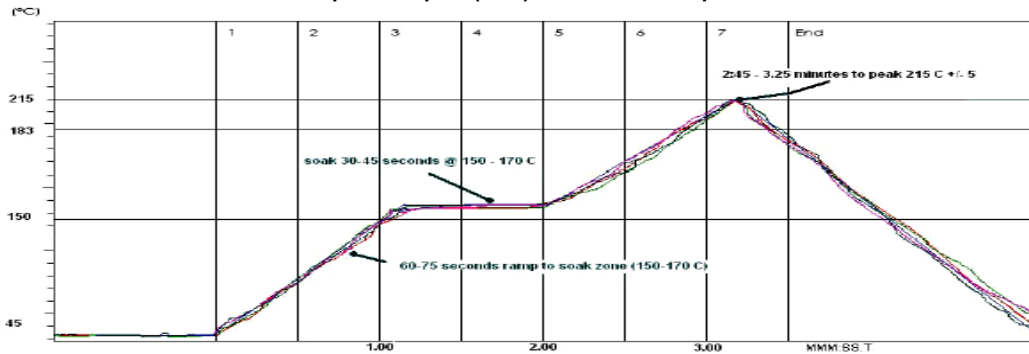


REFLOW PROFILE SUPPLEMENT

ALLOYS:

Sn63/Pb37 and Sn62/Pb36/Ag2

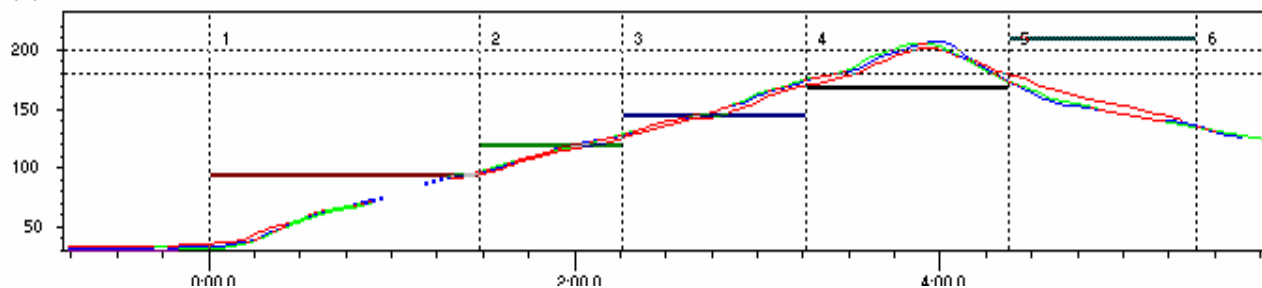
Ramp-Soak-Spike (RSS): Recommended profile



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 215°C ± 5°C.
- Time above liquidus is 45 ± 15 seconds.
- The total profile length should be between 2 ¼ - 3 ½ minutes from ambient to peak temperature.
- Cool down should be controlled within 4°C/second.

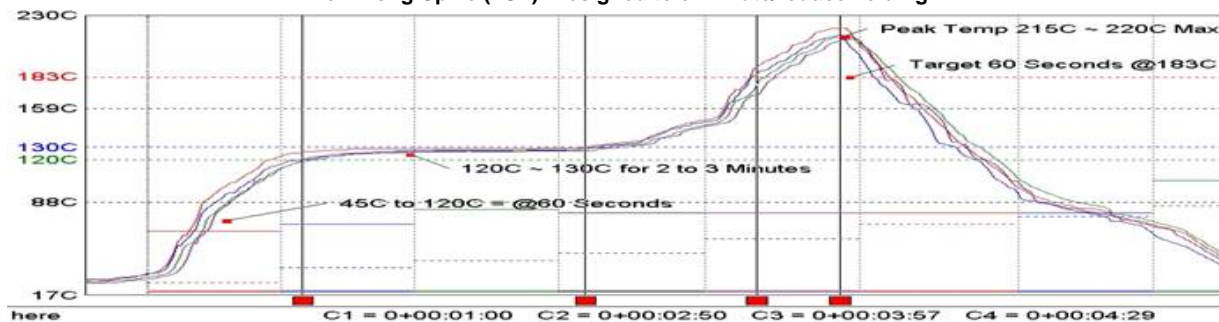
Ramp-to-Spike (RTS)



RTS Profile Guidelines

- The typical rate of rise for the RTS profile is 0.7 to 1.5°C/second.
- The profile should be a straight line or concave; it should not be convex.
- 2/3 of the profile should be below 150°C.
- Peak temperature is 215°C ± 5°C.
- Time above liquidus is 60 ± 15 seconds.
- The total profile length should be between 3 ½ - 4 minutes from ambient to peak temperature.
- Cool down should be controlled within 4°C/second.

Low-Long-Spike (LSP): Designed to eliminate/reduce voiding



LSP Guidelines

- The typical initial rate of rise for the LSP profile is 1.25°C/second.
- Ramp up to 120°C and then soak the assembly for 120 to 180 seconds.
- Proceed to spike immediately after exiting the soak zone.
- Peak temperature is 215°C ± 5°C.
- Time above liquidus is 60 ± 15 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.