

## PRODUCT DATA SHEET

# RMA-SMQ®51AC

## Solder Paste

### Introduction

**RMA-SMQ®51AC** is an air reflow, RMA solder paste designed for use in a wide range of environmental conditions. It has exceptional stencil life and tack strength, and offers consistent print definition even in ultrafine-pitch applications. **RMA-SMQ®51AC**'s wide processing window allows it to be used with standard eutectic SnPb, SnPbAg, and high-temperature alloys, including AuSn, SnSb, and SnAg.

### Features

- Wide reflow process window
- Consistent fine-pitch print deposition
- Superior tack strength
- Exceptional wetting in air reflow

### Alloys

Indium Corporation manufactures low-oxide spherical solder powder composed of SnPb and SnPbAg in standard Type 3 and 4 mesh sizes (J-STD-006). Other non-standard mesh sizes are available upon request. The weight ratio of the solder powder to solder paste is referred to as the metal load and is typically in the range of 82–91% for standard alloy compositions.

### Standard Product Specifications

| Alloy | Metal Load<br>(% by weight) |            | Powder Type |
|-------|-----------------------------|------------|-------------|
|       | Printing                    | Dispensing |             |
| Sn63  | 90–90.5                     | 83–85      | Type 3      |
| Sn62  |                             |            |             |
| Sn63  | 89.5                        | 83–85      | Type 4      |
| Sn62  |                             |            |             |

### Compatible Products

- **Rework Flux:** TACFlux® 007
- **Cored Wire:** CW-807
- **Wave Flux:** WF-9945, WF-9955

*Note: Other products may be applicable.*

*Please consult one of Indium Corporation's Technical Support Engineers.*

### Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of solder paste. Solder paste packaged in cartridges should be stored tip down.

| Storage Conditions<br>(unopened containers) | Shelf Life |
|---------------------------------------------|------------|
| <10°C                                       | 6 months   |

Solder paste should be allowed to reach ambient working temperature prior to use. Generally, paste should be removed from refrigeration at least 2 hours before use. Actual time to reach thermal equilibrium will vary with container size. Paste temperature should be verified before use. Jars and cartridges should be labeled with date and time of opening.

### Cleaning

**RMA-SMQ®51AC** is designed for no-clean applications. However, the flux can be removed, if necessary, by using a commercially available flux residue remover.

Stencil cleaning is best performed using isopropyl alcohol (IPA) as a solvent. Most commercially available non-water-based stencil cleaners work well.

### Safety Data Sheets

The SDS for this product can be found online at <http://www.indium.com/sds>

| Industry Standard Test Results and Classification                       |      |                                                                            |       |
|-------------------------------------------------------------------------|------|----------------------------------------------------------------------------|-------|
| Flux Classification                                                     | ROL1 | Typical Solder Paste Viscosity for Sn63 T3 (Poise)                         | 1,700 |
| Based on the testing required by the current revision of IPC J-STD-004. |      | Conforms with all requirements from the current revision of IPC J-STD-005. |       |

*All information is for reference only.*

*Not to be used as incoming product specifications.*

**From One Engineer To Another®**



Form No. 97535 R18

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## Printing

### Stencil Design:

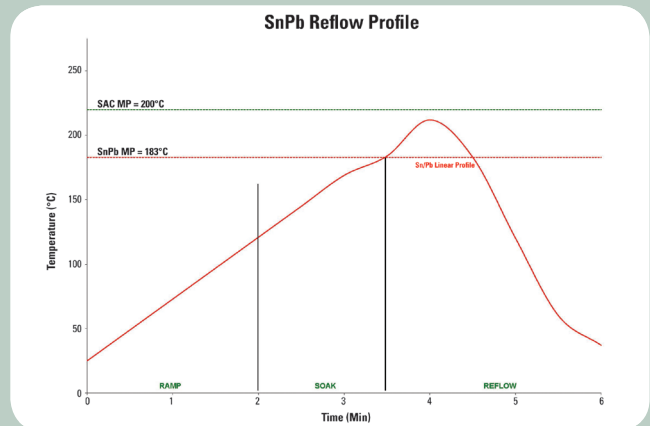
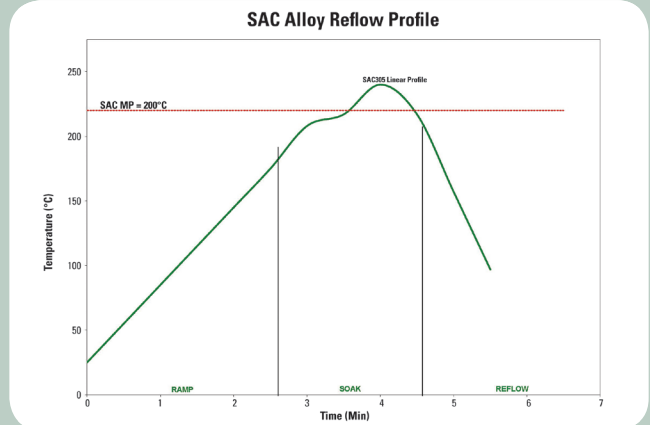
Electroformed and laser cut/electropolished stencils produce the best printing characteristics among stencil types. Stencil aperture design is a crucial step in optimizing the print process. The following are a few general recommendations:

- Discrete components—A 10–20% reduction of stencil aperture has significantly reduced or eliminated the occurrence of mid-chip solder beads. The “home plate” design is a common method for achieving this reduction.
- Fine-pitch components—A surface area reduction is recommended for apertures of 20mil pitch and finer. This reduction will help minimize solder balling and bridging that can lead to electrical shorts. The amount of reduction necessary is process dependent (5–15% is common).
- For optimum transfer efficiency and release of the solder paste from the stencil apertures, industry standard aperture and aspect ratios should be adhered to.

| Printer Operation         |                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------|
| Solder Paste Bead Size    | ~20–25mm in diameter                                                                       |
| Print Speed               | 25–50mm/second                                                                             |
| Squeegee Pressure         | 0.018–0.027kg/mm of blade length                                                           |
| Underside Stencil Wipe    | Start at once per every 10–25 prints and decrease frequency until optimum value is reached |
| Squeegee Type/Angle       | Metal with appropriate length/60 degrees                                                   |
| Separation Speed          | 5–20mm/second or per equipment manufacturer's specifications                               |
| Solder Paste Stencil Life | >8 hours (at 30–60% RH and 22–28°C)                                                        |

## Reflow

### Recommended Profile:



| Profile Details                                                             | Parameters                                                |                                                        |                                               | Comments                                                                       |
|-----------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------|
|                                                                             | SAC305                                                    | SAC305/Sn63/Sn62                                       | Sn63/Sn62                                     |                                                                                |
| Ramp Profile (Average Ambient to Peak)—Not the Same as Maximum Rising Slope | 0.5–1°C/second Recommended<br>0.5–2.5°C/second Acceptable |                                                        |                                               | To minimize solder balling, beading, hot slump                                 |
| Soak Zone Profile                                                           | 160–180°C/Recommended<br>150–200°C/Acceptable             | 30–90 seconds Recommended<br>30–120 seconds Acceptable | 140–150°C/Recommended<br>130–170°C/Acceptable | May minimize BGA/CSP voiding                                                   |
| Time Above Liquidus (TAL)                                                   | 235–250°C/Recommended<br>232–270°C/Acceptable             | 45–60 seconds Recommended<br>30–100 seconds Acceptable | 198–213°C/Recommended<br>195–233°C/Acceptable | Needed for good wetting/reliable solder joint<br>As measured with thermocouple |
| Peak Temperature                                                            | 260°C                                                     | —                                                      | 230°C                                         |                                                                                |
| Cooling Ramp Rate                                                           | 2–6°C/second Recommended<br>0.5–6°C/second Acceptable     |                                                        |                                               | Rapid cooling promotes fine-grain structure                                    |
| Reflow Atmosphere                                                           | Air or N <sub>2</sub>                                     |                                                        |                                               | N <sub>2</sub> can aid with material performance                               |

Note: All parameters are for reference only. Modifications may be required to fit process and design.

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