PRODUCT DATA SHEET

RMA-SMQ51A

Solder Paste

Introduction

RMA-SMQ51A is a rosin-based, mildly activated, air reflow, solder paste ideally suited for high speed assembly processes. Due to **RMA-SMQ51A**'s high tack value and exceptional tack endurance, placement machines can run at full speed. In addition, its wide processing window allows it to be used with standard eutectic Sn/Pb, Sn/Pb/Ag, and high-temperature alloys including Au/Sn, Pb/Sn, and Pb/Sn/Ag.

RMA-SMQ51A prints ultrafine-pitch with full and consistent deposition. Excellent wetting is observed with OSP, Au/Ni, and HASL metallizations.

Features

- Wide reflow process window
- Consistent fine-pitch print deposition
- Extended open time
- Superior tack strength
- Ideally suited for high speed assembly processes
- Exceptional wetting in air reflow

Alloys

Indium Corporation manufactures low-oxide spherical powder composed of Sn/Pb and Sn/Pb/Ag in a standard Type 3 mesh size. Other non-standard mesh sizes are available upon request. The weight ratio of the flux/vehicle to the solder powder is referred to as the metal load and is typically in the range of 83–92% for standard alloy compositions.

Bellcore and J-STD Tests and Results

Test	Result
J-STD-004 (IPC-TM-650)	
Flux Type Classification	ROL1
Flux-Induced Corrosion (Copper Mirror)	Pass
Presence of Halide Silver Chromate Fluoride Spot Test C1 Equivalent	 Pass Pass ≤0.019%
Corrosion	Pass
SIR	Pass
Bellcore Electromigration	Pass

Test	Result
J-STD-005 (IPC-TM-650)	
Typical Solder Paste Viscosity (Sn62, 90%, -325/+500) Brookfield (5rpm) Malcolm (10rpm)	 950kcps 2,800 poise
Slump Test	Pass
Solder Ball Test	Pass
Wetting Test	Pass

All information is for reference only.
Not to be used as incoming product specifications.

Standard Product Specifications

Alloy	Metal Load		Mesh Size	Particle Size
	Printing	Dispensing		
Sn63/Pb37 Sn62/Pb36/Ag2	90%	85%	Type 3 -325/+500	25–45µm 0.001–0.0018"

Packaging

Standard packaging for stencil printing applications includes 4oz jars and 6 or 12oz cartridges. Packaging for enclosed print head systems is also readily available. For dispensing applications, 10 and 30cc syringes are standard. Other packaging options may be available upon request.

Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of solder paste. The shelf life of **RMA-SMQ51A** is 6 months when stored at <10°C. Storage temperatures should not exceed 25°C. When storing solder paste contained in syringes and cartridges, they should be stored tip down.

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.

Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Material Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice in solder preforms, wire, ribbon, and paste. Indium Corporation's Technical Support Engineers provide rapid response to all technical inquiries.

Safety Data Sheets

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

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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 in stencil aperture area may significantly reduce or eliminate 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).
- A minimum aspect ratio of 1:5 is suggested for adequate release of solder paste from stencil apertures. The aspect ratio is defined as the width of the aperture divided by the thickness of the stencil.

Printer Operation:

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

Solder Paste Bead Size	20–25mm diameter
Print Speed	25–50mm/second
Squeegee Pressure	0.018–0.027kg/mm of blade length
Underside Stencil Wipe	Once every 10–25 prints
Solder Paste Stencil Life	>8 hours (at 30–60% RH and 22–28°C)

Cleaning

RMA-SMQ51A meets no-clean requirements. The flux can be removed, if necessary, by using a commercially available flux residue remover.

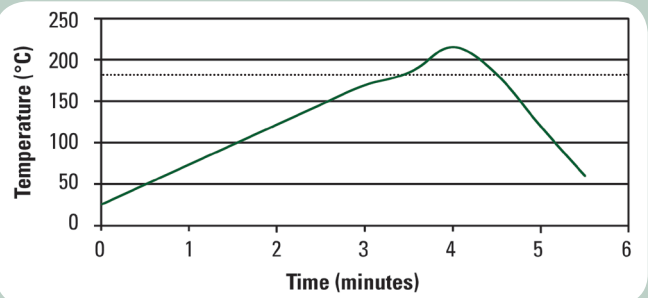
Stencil Cleaning: This is best performed using an automated stencil cleaning system for both stencil and misprint cleaning to prevent extraneous solder balls. Most commercially available stencil cleaning formulations including isopropyl alcohol (IPA) work well.

Compatible Products

- **Rework Flux**: TACFlux® 007

Reflow

Recommended Profile:



This reflow profile is designed for use with Sn63/Pb37 and Sn62/Pb36/Ag2 alloys. It will serve as a general guideline in establishing a reflow profile for this process. Adjustments to this profile may be necessary based on specific process requirements and the use of alloys with different melting temperatures.

Heating Stage:

A linear ramp rate of 0.5–1°C/second allows gradual evaporation of volatile flux constituents and prevents defects such as solder balling/beading and bridging as a result of hot slump. It also prevents unnecessary depletion of fluxing capacity when using higher temperature alloys.

Liquidus Stage:

A peak temperature of 25–45°C (215°C shown) above the melting point of the solder alloy is needed to form a quality solder joint and achieve acceptable wetting due to the formation of an intermetallic layer. If the peak temperature is excessive, or the time above liquidus greater than the recommended 45–90 seconds, flux charring, excessive intermetallic formation, and damage to the board and components can occur.

Cooling Stage:

A rapid cool down of <4°C/second is desired to form a fine-grain structure in the solder joint. Slow cooling will form a large-grain structure, which typically exhibit poor fatigue resistance. If excessive cooling (>4°C/second) is used, both the components and the solder joint can be stressed due to a high CTE mismatch.

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