Product Data Sheet

RMA-SMQ® 51 AC Solder Paste

Benefits

- Wide reflow process window
- Consistent fine pitch print deposition
- Extended open time
- Superior tack strength
- No-clean residue
- Exceptional wetting in air reflow

Introduction

RMA-SMQ®51AC is a rosin-based, mildly activated, air reflow, solder paste designed for use in a wide range of environmental conditions. It has exceptional stencil life, and tack time, and consistent print definition even with fine pitch applications. In addition, **RMA-SMQ51AC** meets or surpasses all ANSI/J-STD-004, -005 specifications and Bellcore test criteria.

Alloys

Indium Corporation manufactures low-oxide spherical powder composed of Sn/Pb and Sn/Pb/Ag in a standard type 3 mesh size (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		Mesh Size	Particle Size
Sn63/Pb37	Printing	Dispensing	Type 3	25-45 µ
Sn62/Pb36/Ag2	90.5%	85%	-325/+500	0.001-0.0018"

Packaging

Standard packaging for stencil printing applications includes 4oz. jars and 6oz. or 12oz. cartridges. Packaging for enclosed print head systems is also readily available. For dispensing applications, 10cc 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-SMQ51AC** 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 two 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.

Material Safety Data Sheets

The MSDS for this product can be found online at http://www.indium.com/techlibrary/msds.php

OVER→

BELLCORE AND J-STD TESTS & RESULTS

Test	Result
J-STD-004 (IPC-TM-650)	
• Flux Type Classification	ROL1
• Flux Induced Corrosion (Copper Mirror)	Pass
• Presence of Halide:	
Silver Chromate	Pass
Fluoride Spot Test	Pass
Cl Equivalent	<0.019% of paste
• Post Reflow Flux Residue (ICA Test)	47%
• Corrosion	Pass
• SIR	Pass
• Bellcore Electromigration	Pass
• Typical Acid Value	85

Test	Result
J-STD-005 (IPC-TM-650)	
• Typical Solder Paste Viscosity (Sn63, 90.5%, Type 3)	
Brookfield (5 rpm)	1100 kcps
Malcom (10 rpm)	2200 poise
• Slump Test	Pass
• Solder Ball Test	Pass
• Typical Tackiness	38 grams
• Wetting Test	Pass

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

Form No. 97535 R15

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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 area aperture has significantly reduced or eliminated the occurrence of 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 20 mil 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/sec.
• Squeegee Pressure:	0.018-0.027kg/mm of blade length
• Underside Stencil Wipe:	Once every 10-25 prints
• Solder Paste Stencil Life:	>8 hrs. @ 30-60% R.H. & 22-28°C

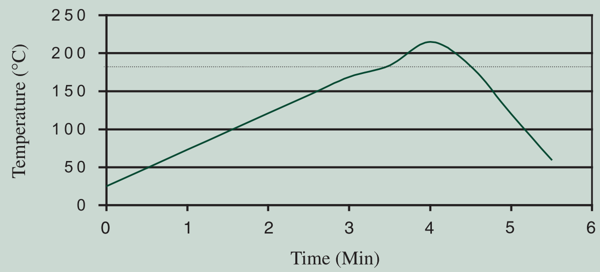
Cleaning

RMA-SMQ51AC 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.

Reflow

Recommended Profile:



This profile is designed for use with Sn63/Pb37 & 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 a 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 produce a fine grain structure in the solder joint. Slow cooling will form a large grain structure, which will typically exhibit poor fatigue resistance. If excessive cooling (>4°C/second) is used, both the components and the solder joint may be stressed due to a high CTE mismatch.

Compatible Products

- Rework Flux: TACFlux 007

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