NC-SMQ®90 Solder Paste

Introduction

NC-SMQ®90 is a halide-free, no-clean solder paste formulated to yield accurate, repeatable dispensing performance on both pneumatic and positive displacement dispensing equipment. It is a moderately low-residue, air reflow product with exceptional wetting capabilities. **NC-SMQ90** 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/Ag/Cu in the industry standard type 3 mesh size (J-STD-006). Other non-standard mesh sizes and alloys 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 84-86% 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	—	85%	-325/+500	0.001-0.0018"
SAC305	—	84%	Type 3	25-45 µ
SAC387			-325/+500	0.001-0.0018"

Packaging

Standard packaging is 10cc and 30cc Semco syringes with a yellow (flatwall) or red (wiper) piston, or a thumb plunger. Other packaging options are available upon request.

Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of solder paste by slowing down the flux/powder reaction. The shelf life of **NC-SMQ90** is 6 months when stored at < 5°C, and 3 months when stored at 5° to 25°C. Solder paste packaged in syringes and cartridges should be stored with the tip down to prevent flux separation and piston backoff.

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. Removing paste from storage one day before use is recommended. 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

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BELLCORE AND J-STD TESTS & RESULTS

Test	Result
J-STD-004 (IPC-TM-650)	
• Flux Type Classification	ROL0
• Flux Induced Corrosion (Copper Mirror)	Pass
• Presence of Halide:	
Fluoride Spot Test	Pass
Elemental Analysis (Br, Cl, F)	0%
• Post Reflow Flux Residue (ICA Test)	38%
• Corrosion	Pass
• SIR	Pass
• Typical Acid Value	129

Test	Result
J-STD-005 (IPC-TM-650)	
• Typical Solder Paste Viscosity (Sn63, 85%, Type 3)	
Brookfield (5 rpm)	450 kcps
Malcom (10 rpm)	1000 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.

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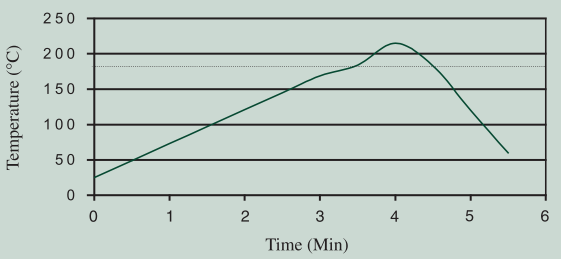
Reflow

Recommended Profile:



This profile is designed for use with Sn63/Pb37 & Sn62/Pb36/Ag2 and can serve as a general guideline in establishing a reflow profile for use with other alloys. Adjustments to this profile may be necessary based on specific process requirements. Please contact Indium Corporation's Technical Support if you require a reflow profile for a different alloy.

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 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.

Cleaning

NC-SMQ®90 is designed for no-clean applications, however the flux can be removed, if necessary, by using a commercially available flux residue remover.

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