

PRODUCT DATA SHEET

NC-SMQ®92J

Solder Paste

Introduction

NC-SMQ®92J is a halogen-free, air reflow, no-clean solder paste formulated to leave a benign, probe-testable residue. The residue is easily penetrated and will not clog multi-point probes. This product has other qualities such as consistent fine-pitch paste deposition, unsurpassed stencil life and tack time, and excellent wetting. **NC-SMQ®92J** will perform well on high-speed surface mount lines utilizing fast print speeds and rapid chip placement. **NC-SMQ®92J** meets or surpasses all ANSI/J-STD-004, -005 specifications, and Bellcore test criteria.

Features

- Excellent wetting reflow in air
- Probe-testable residue
- Extended open time
- Consistent fine-pitch printing
- Strong initial tack strength and long-term stability
- High humidity resistance
- Halogen-free

Alloys

Indium Corporation manufactures low-oxide spherical powder composed of SnPb and SnPbAg in the industry 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 85–92% for standard alloy compositions.

Bellcore and J-STD Tests and Results

| Test | Result | Test | Result |
|--|------------|---|-------------|
| J-STD-004 (IPC-TM-650) | | J-STD-005 (IPC-TM-650) | |
| Flux Type Classification | ROLO | Typical Solder Paste Viscosity (Sn63, 90.25%, Type 3) Malcolm (10rpm) | 2,000 poise |
| Flux Induced Corrosion (Copper Mirror) | Pass | | |
| Presence of Halide Fluoride Spot Test Elemental Analysis (Br, Cl, F) | Pass 0% | Typical Thixotropic Index; SSF (ICA Test) | -0.75 |
| | | Slump Test | Pass |
| Post Reflow Flux Residue (ICA Test) | 45% | Solder Ball Test | Pass |
| Corrosion | Pass | Typical Tackiness | 38g |
| SIR | Pass | Wetting Test | Pass |
| Acid Value | 113 | BELLCORE GR-78 | |
| | | SIR | Pass |
| | | Electromigration | Pass |

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

Standard Product Specifications

| Alloy | | Metal Load (% by weight) | | | |
|---------------|-------------------|--------------------------|-------------|-------------|-------------|
| Name | Composition | T3 Printing | T3 Dispense | T4 Printing | T4 Dispense |
| Sn63 | Sn63/Pb37 | 90% & 90.25% | 85% | 89.5% | 84% |
| Sn62 | Sn62/Pb36/Ag2 | | | | |
| Indalloy® 100 | Sn62.6/Pb37/Ag0.4 | | | | |

Compatible Products

- **Rework Flux:** PoP Flux 8.9HF-LV, TACFlux®020
- **Cored Wire:** CW-807
- **Wave Flux:** WF-9945, WF-9955, FP-500, NC-771

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 (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.

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 are available on request.

Safety Data Sheets

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

From One Engineer To Another®



PRODUCT DATA SHEET

NC-SMQ® 92J Solder Paste

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 adequate release of solder paste from stencil apertures, a minimum aspect ratio of 1:5 is suggested. The aspect ratio is defined as the width of the aperture divided by the thickness of the stencil.

| Printer Operation | |
|---------------------------|--|
| Solder Paste Bead Size | ~20–25mm in diameter |
| Print Speed | 25–100mm/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/~45–60 degrees |
| Separation Speed | 5–20mm/second or per equipment manufacturer’s specifications |
| Solder Paste Stencil Life | >12 hours (at 30–60% RH and 22–28°C) |

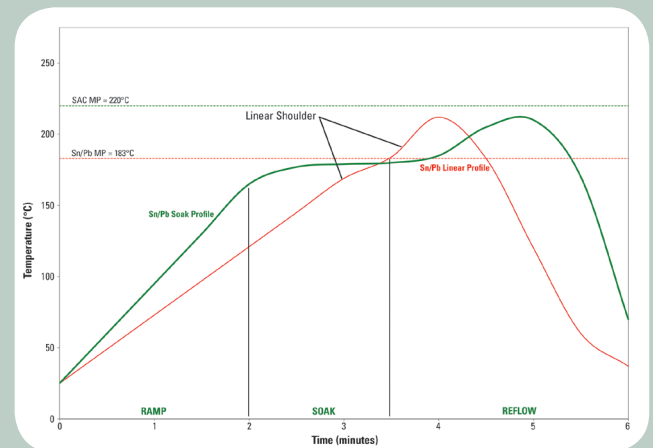
Cleaning

NC-SMQ® 92J 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.

Reflow

Recommended Profile:



The stated profile applies to Sn63 and Sn62 alloys. This can be used as a general guideline in establishing a reflow profile when using NC-SMQ® 92J Solder Paste. Deviations from these recommendations are acceptable, and may be necessary, based on specific process requirements, including board size, thickness, and density. Start with the linear profile, then move to the optional soak profile, if needed. The flat soak portion of the linear profile (linear shoulder) may also be eliminated.

| Reflow Profile Details | Parameters | | Comments |
|---|----------------------------|-----------------------------|--|
| | SnPb | | |
| Ramp Profile (Average Ambient to Peak)— Not the Same as Maximum Rising Slope | 0.5–1°C/second Recommended | 0.5–2.5°C/second Acceptable | To minimize solder balling, beading, hot slump |
| Soak Zone Profile (Optional) | 30–90 seconds Recommended | 30–120 seconds Acceptable | May minimize BGA/CSP voiding |
| | 140–150°C/Recommended | 130–170°C/Acceptable | |
| Time Above Liquidus (TAL) | 45–60 seconds Recommended | 30–100 seconds Acceptable | Needed for good wetting/ reliable solder joint |
| Peak Temperature | 210–230°C/Recommended | 195–233°C/Acceptable | As measured with thermocouple |
| Cooling Ramp Rate | 2–6°C/second Recommended | 0.5–6°C/second Acceptable | Rapid cooling promotes fine-grain structure |
| Reflow Atmosphere | Air or N ₂ | | N ₂ typically preferred for small components |

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

This product data sheet is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices. All Indium Corporation’s products and solutions are designed to be commercially available unless specifically stated otherwise.

Contact our engineers today: askus@indium.com

Learn more: www.indium.com

ASIA +65 6268 8678 • CHINA +86 (0) 512 628 34900 • EUROPE +44 (0) 1908 580400 • USA +1 315 853 4900



©2018 Indium Corporation