**Introduction**

**NC-SMQ90** 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 SnPb and SnAgCu 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**

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Metal Load</th>
<th>Mesh Size</th>
<th>Particle Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sn63/Pb37</td>
<td>Sn62/Pb36/Ag2</td>
<td>Type 3 -325/+500</td>
<td>24–45μm 0.001–0.0018”</td>
</tr>
<tr>
<td>SAC305</td>
<td>SAC387</td>
<td>84% Type 3 -325/+500</td>
<td>24–45μm 0.001–0.0018”</td>
</tr>
</tbody>
</table>

**Packaging**

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

**Cleaning**

**NC-SMQ90** is designed for no-clean applications; however, the flux can be removed, if necessary, by using a commercially available flux residue remover.

**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. 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 2 hours before use. Actual time to reach thermal equilibrium will vary with container size. Removing paste from storage 1 day before use is recommended. Jars and cartridges should be labeled with date and time of opening.

**Bellcore and J-STD Tests and Results**

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flux Type Classification</td>
<td>ROL0</td>
<td>Typical Solder Paste Viscosity (Sn63, 85%, Type 3) Brookfield (5rpm) Malcolm (10rpm)</td>
<td>450kcps 1,000 poise</td>
</tr>
<tr>
<td>Flux-Induced Corrosion (Copper Mirror)</td>
<td>Pass</td>
<td>Slump Test</td>
<td>Pass</td>
</tr>
<tr>
<td>Presence of Halide: Fluoride Spot Test (Br, CI, F)</td>
<td>Pass</td>
<td>Solder Ball Test</td>
<td>Pass</td>
</tr>
<tr>
<td>Elemental Analysis</td>
<td>38%</td>
<td>Wetting Test</td>
<td>Pass</td>
</tr>
<tr>
<td>Post-Reflow Flux Residue (ICA Test)</td>
<td></td>
<td>Corrosion</td>
<td>Pass</td>
</tr>
<tr>
<td>SIR</td>
<td>Pass</td>
<td>SIR</td>
<td>Pass</td>
</tr>
<tr>
<td>Typical Acid Value</td>
<td>129</td>
<td>Typical Acid Value</td>
<td>129</td>
</tr>
</tbody>
</table>

All information is for reference only. Not to be used as incoming product specifications.
NC-SMQ90 Solder Paste

Reflow

Recommended Profile:

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.

Technical Support
Indium Corporation’s internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Materials 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

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.

All of Indium Corporation’s solder paste and preform manufacturing facilities are IATF 16949:2016 certified. Indium Corporation is an ISO 9001:2015 registered company.

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