**PRODUCT DATA SHEET**

**PoP Paste Indium9.88-HF**

**Package-on-Package**

**Introduction**

PoP Paste Indium9.88-HF is a no-clean solder paste designed for use in package-on-package (0.4mm and larger) applications. PoP Paste Indium9.88-HF has a rheology designed to provide a long-lasting dipping process.

**Features**

- Halogen-free - no intentionally added halogens
- Eliminates defects due to package-warping
- Air reflow
- Rheology optimized for both dipping and package-retention
- Designed for use with both SAC305 and Sn63/Pb37 alloys
- Excellent solderability
- Long pot life
- Suitable for use down to 0.4mm pitch

**Physical Properties**

<table>
<thead>
<tr>
<th>Properties</th>
<th>Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flux Type Classification</td>
<td>ROLO</td>
<td>J-STD-004 (IPC-TM-650: 2.3.32 and 2.3.33)</td>
</tr>
<tr>
<td>Typical Viscosity</td>
<td>240kcps</td>
<td>ANSI/IPC-TM650</td>
</tr>
<tr>
<td>SIR (Ohms, after reflow)</td>
<td>Pass (&gt;10⁶ after 7 days @ 85 °C &amp; 85% RH)</td>
<td>ANSI/IPC-TM650</td>
</tr>
<tr>
<td>Typical Tack Strength</td>
<td>61g</td>
<td>ANSI/IPC-TM650</td>
</tr>
<tr>
<td>Shelf Life</td>
<td>6 months from DOM</td>
<td>Viscosity Change/ Microscope Examination</td>
</tr>
<tr>
<td>Working Life</td>
<td>8 hours at room temperature</td>
<td>Internal Test Method</td>
</tr>
</tbody>
</table>

**Alloys**

PoP Paste Indium9.88-HF is available in two alloy configurations: tin-lead, eutectic (63Sn/37Pb), and SAC305 (96.5Sn/3.0Ag/0.5Cu). Table 2 shows the alloy properties.

**Application**

Solder paste is applied to the spheres in a doctor-bladed dipping process (Figure 1).

- Typical package-on-package applications only need dipping to 25-45% of the sphere height.

Care must be taken to avoid contaminating the bottom of the package itself with PoP paste, as this may cause bridging defects.

**Table 2. Alloy properties.**

<table>
<thead>
<tr>
<th>Indalloy® Number</th>
<th>Alloy Composition</th>
<th>Liquidus °C</th>
<th>Solidus °C</th>
<th>Liquidus °F</th>
<th>Solidus °F</th>
<th>Density g/cm³</th>
<th>Tensile Strength psi</th>
<th>Young’s Modulus psi*10^6</th>
<th>Elongation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>63Sn/37Pb</td>
<td>183</td>
<td>183</td>
<td>361</td>
<td>361</td>
<td>8.40</td>
<td>7500</td>
<td>4.35</td>
<td>37</td>
</tr>
<tr>
<td>256</td>
<td>96.5Sn/3.0Ag/0.5Cu</td>
<td>220</td>
<td>217</td>
<td>428</td>
<td>423</td>
<td>7.40</td>
<td>7200</td>
<td>2.41</td>
<td>19.3</td>
</tr>
</tbody>
</table>

**Figure 1. Dipping process.**

Consistent solder paste volumes are reproducibly attained from dipping 0.4mm or higher pitch packages in PoP Paste Indium9.88-HF. Figure 2 is an example of a PoP process where a 0.5mm pitch BGA package has been dipped in 8mil thickness (~50% of ball height).

**Figure 2. Bottom view of 0.5mm pitch BGA package after dipping in PoP Paste Indium9.88-HF.**
PRODUCT DATA SHEET

PoP Paste Indium9.88-HF Package-on-Package

Packaging

PoP Paste Indium9.88-HF is available in airless (bubble-free) packaging. For automated dispense applications:

- 100g (30cc) syringes with an air-pressure plunger
- Other packaging may be available to meet specific requirements. Consult with Indium Corporation Sales or Technical Service staff for details.

Cleaning

Although designed as a no-clean material, the residue from PoP Paste Indium9.88-HF may be cleaned using appropriate cleaning solutions. Please consult with Indium Corporation Technical Service personnel for details.

Storage & Handling

PoP Paste Indium9.88-HF syringes and cartridges should be stored tip down at <10°C for a maximum of six months. Storage temperatures should not exceed 30°C for more than four days. PoP Paste Indium9.88-HF should be allowed to stand for at least four hours at room temperature before use.

Once removed from cold storage, the solder paste in a sealed syringe may remain at room temperature for up to seven days before and during use. However, once outside the syringe, its working life is estimated to be eight hours, and may be less under high temperature (>25°C) and humidity (>70%RH) conditions.

The paste should not be subjected to multiple cold/heat cycles or viscosity changes and/or flux separation may occur.

Table 3.

<table>
<thead>
<tr>
<th>Profile Details</th>
<th>Parameters</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramp Profile (Average Ambient to Peak) - Not the Same as Maximum Rising Slope</td>
<td>SAC305</td>
<td>0.5–1°C/Second Recommended</td>
</tr>
<tr>
<td></td>
<td>SAC305/Sn63/Sn62</td>
<td>0.5–2.5°C/Second Acceptable</td>
</tr>
<tr>
<td>Soak Zone Profile</td>
<td>160–180°C/Recommended 150–200°C/Acceptable</td>
<td>30–90 Seconds Recommended 30–120 Seconds Acceptable</td>
</tr>
<tr>
<td>Time Above Liquidus (TAL)</td>
<td>235–250°C/Recommended 232–270°C/Acceptable</td>
<td>45–60 Seconds Recommended 30–100 Seconds Acceptable</td>
</tr>
<tr>
<td></td>
<td>260°C</td>
<td>—</td>
</tr>
<tr>
<td>Peak Temperature</td>
<td>260°C</td>
<td>230°C</td>
</tr>
<tr>
<td>Cooling Ramp Rate</td>
<td>2–6°C/Second Recommended 0.5–6°C/Second Acceptable</td>
<td></td>
</tr>
<tr>
<td>Reflow Atmosphere</td>
<td>Air or N2</td>
<td></td>
</tr>
</tbody>
</table>

Reflow

Recommended Profile:

SAC Alloy Reflow Profile

SnPb Reflow Profile

Safety Data Sheet

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

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