HVS series ~Sn-3.0Ag-0.5Cu lead-free solder paste~

Sn-3.0Ag-0.5Cu generally better characteristic solder paste, contributing to higher productivity and low cost for commercial production.

### Characteristics
- Realize stable printing and soldering, minimal performance change of paste in operation
- Reduction of waste paste amount by replenishment at continuous usage

### Waste paste reduction
- Small change of viscosity
- Waste reduction to 1/5

#### Viscosity change during continuous printing

**Test condition**
- No aperture mask
- 50% of paste replacement, every 12 hours

#### Printability and wettability
- Stable printing and wetting

#### Recommended condition
- **Printing**
  - **Squeeze type**: Metal, Urethane, Plastic
  - **Printing speed (mm/sec)**: 30–80
  - **Printing pressure (×10^-6 N)**: 20–50
  - **Separation speed (mm/sec)**: 1.0–5.0
  - **Separation mode**: Constant speed

#### Reflow
- **Peak temperature**: 230–250°C
- **Heating rate**
  - Under 4°C/sec
  - Recommend 2°C/sec
- **Preheat time**
  - 80–110sec
  - Recommend 90sec
- **Over 219°C**
  - 30–60sec
  - Recommend 40sec

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**Printability and Wettability**

<table>
<thead>
<tr>
<th>Viscosity (Pas)</th>
<th>Thixotropic index</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.52</td>
<td>0</td>
</tr>
<tr>
<td>0.52</td>
<td>0.1</td>
</tr>
<tr>
<td>0.51</td>
<td>0.2</td>
</tr>
<tr>
<td>0.51</td>
<td>0.3</td>
</tr>
<tr>
<td>0.52</td>
<td>0.4</td>
</tr>
<tr>
<td>0.51</td>
<td>0.5</td>
</tr>
<tr>
<td>0.52</td>
<td>0.6</td>
</tr>
</tbody>
</table>

**Reduction of waste paste**

<table>
<thead>
<tr>
<th>Conventional paste</th>
<th>HVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of disposal (times/month)</td>
<td>20</td>
</tr>
<tr>
<td>Reduction of waste paste</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Representative values**

- **Mean bump height**
  - 35 μm
- **Pad width**
  - 60 μm
- **Pitch, P**
  - 80 μm
- **Length, L**
  - 80 μm
- **Emission Count**
  - < 0.002 cph/cm²

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**Test condition**

- Mask thickness: 120μm
- O₂ concentration: Air reflow