Introduction

Flip-Chip Flux WS-446 is a water soluble flip-chip dipping flux which has an activator system powerful enough to promote wetting on the most demanding substrate metallizations. The flux is a distinctive red color, which aids automated level-sensing equipment and also enhances visual inspection.

Features

- Designed for flip-chip dipping applications
- Tackiness suitable for holding large die during assembly
- Bubble-free packaging
- Red color for ease of detection

Properties

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flux Type Classification</td>
<td>H1</td>
<td>J-STD-004 (IPC-TM-650: 2.3.32 and 2.3.33)</td>
</tr>
<tr>
<td>Typical Viscosity</td>
<td>9kcps</td>
<td>Brookfield HB DVII+-CP (5rpm)</td>
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<tr>
<td>SIR (Ohms, after cleaning)</td>
<td>Pass (&gt;10⁸ after 7 days @ 85°C and 85% RH)</td>
<td>J-STD-004 (IPC-TM-650: 2.6.33 IPC-B-24)</td>
</tr>
<tr>
<td>Typical Acid Value</td>
<td>71mg KOH/g</td>
<td>Titration</td>
</tr>
<tr>
<td>Typical Tack Strength</td>
<td>570g</td>
<td>J-STD-005 (IPC-TM-650: 2.4.44)</td>
</tr>
<tr>
<td>Shelf Life</td>
<td>5–25°C for 3 months or -20–5°C for 6 months</td>
<td>Viscosity change/ microscope examination</td>
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</table>

Cleaning

WS-446 residue can be cleaned with DI water, or water with an added cleaner. Ideal conditions for spray cleaning: 25°C (room temperature) or higher for >1 minute at >60psi.

Packaging

WS-446 is available in 10 and 30cc syringes.

Application

WS-446 is intended to be used in a nitrogen reflow environment of 50ppm oxygen or less. WS-446 can be used on many surface finishes including immersion Ag, Cu, and Ni. These surfaces can be soldered with Sn/Pb or Pb-free alloys.

Flux depth should be set to approximately 30–50% of the flip-chip solder bump height.
PRODUCT DATA SHEET
WS-446 Flip-Chip Flux

Storage
For maximum shelf life, WS-446 syringes and cartridges should be stored tip down at 5–25°C for 3 months or -20–5°C for 6 months. Storage temperatures should not exceed 25°C. After removing from cold storage, WS-446 should be allowed to stand for at least 4 hours at room temperature before using.

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
Please refer to the SDS document within the product shipment, or contact our local team to receive a copy.

Reflow
Recommended Profile:

![Reflow Temperature Profile Graph]

Peak reflow temperature should be <350°C in a nitrogen atmosphere (<50ppm O₂), with a linear ramp up to 30°C above liquidus. These profiles are recommended to the user as starting points, and should be optimized by the user to meet their individual process needs.