

# PRODUCT DATA SHEET

# WS-446

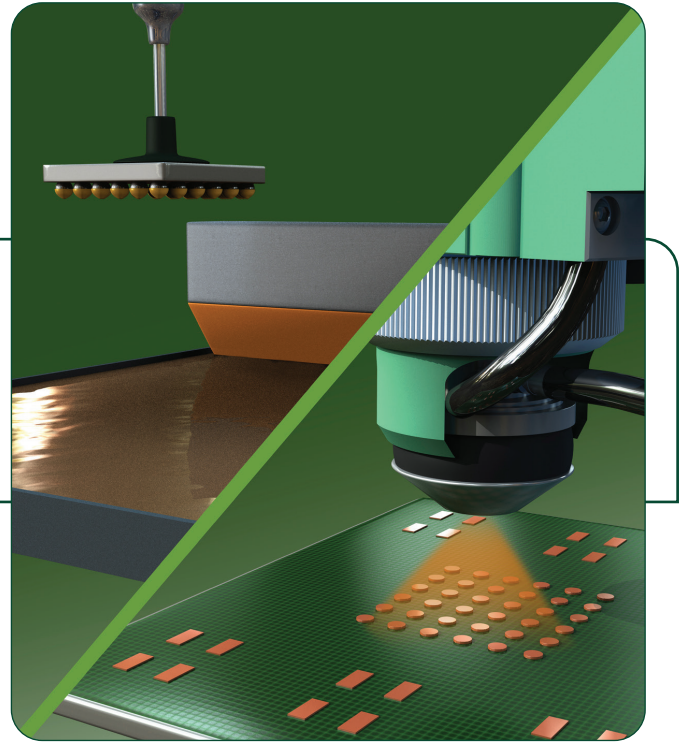
## Flip-Chip Flux

### 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

|                            | Value  | Test Method                               |
|----------------------------|--|---|
| Flux Type Classification   | H1   | J-STD-004 (IPC-TM-650: 2.3.32 and 2.3.33) |
| Typical Viscosity          | 9kcps  | Brookfield HB DVII+-CP (5rpm)             |
| SIR (Ohms, after cleaning) | Pass (>10 <sup>8</sup> after 7 days @ 85°C and 85% RH) | J-STD-004 (IPC-TM-650: 2.6.33 IPC-B-24)   |
| Typical Acid Value         | 71mg KOH/g   | Titration                                 |
| Typical Tack Strength      | 570g   | J-STD-005 (IPC-TM-650: 2.4.44)            |
| Shelf Life                 | 5–25°C for 3 months or -20–5°C for 6 months            | Viscosity change/ microscope examination  |

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

### 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.

### 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.



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### 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

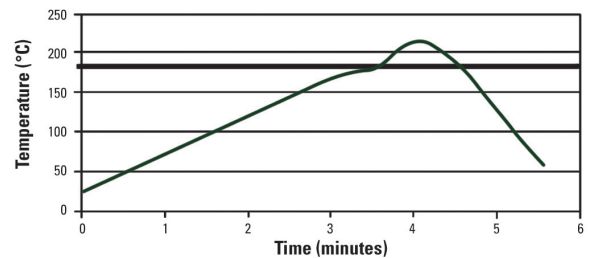
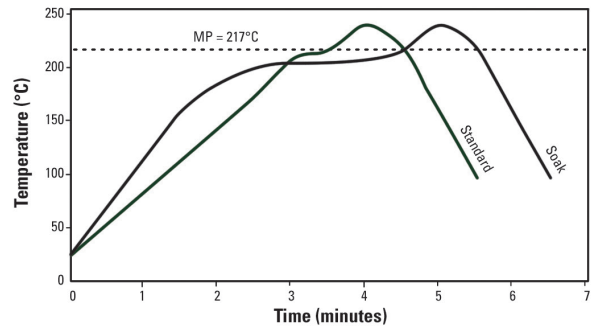
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### Safety Data Sheets

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

### Reflow

#### Recommended Profile:



Peak reflow temperature should be <350°C in a nitrogen atmosphere (<50ppm O<sub>2</sub>), 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.

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