

## PRODUCT DATA SHEET

# Ball-Attach Flux

## WS-788

### Introduction

**Ball-Attach Flux WS-788** is a thixotropic flux designed for use in pin transfer applications for ball-attachment to substrates (BGA manufacturing). Its rheology is specifically designed for use with even the smallest gravity-fed spheres. **WS-788** 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.

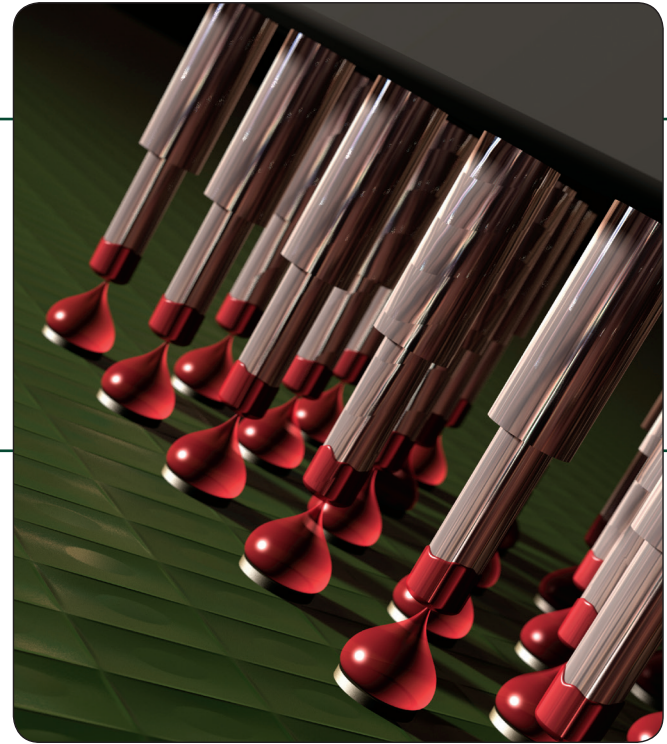
### Features

- Halogen-free
- Air reflow
- Designed for Pb-free applications
- Excellent solderability on a variety of surfaces
- Water wash
- Bubble-free packaging
- Flux rheology applicable for spheres 50–762 microns
- Uniform pin-transfer over extended periods
- Red color for ease of detection

### Properties

	Value	Test Method
Flux Classification	M0	J-STD-004 (IPC-TM-650: 2.3.32 and 2.3.33)
Typical Viscosity	12.5kcps	Brookfield HB DVII+-CP (5rpm)
SIR (Ohms, after cleaning)	>10 <sup>8</sup>	J-STD-004 (IPC-TM-650: 2.6.3.3 IPC-B-24)
Typical Acid Value	60mg KOH/g	Titration
Typical Tack Strength	200g	J-STD-005 (IPC-TM-650: 2.4.44)
Shelf Life	6 months (+5°C to +30°C)	Viscosity Change/ Microscope Examination

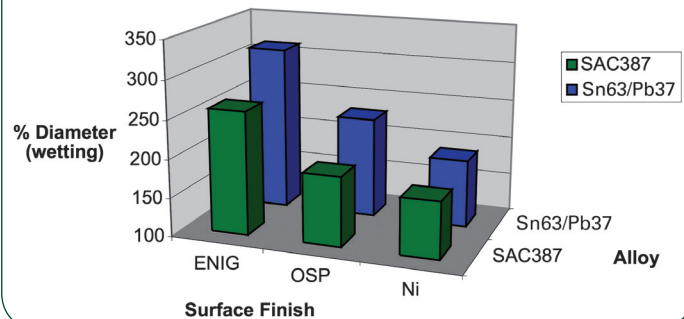
All information is for reference only. Not to be used as incoming product specifications.



### Application

The amount of flux deposited on the substrate can be optimized by changing equipment parameters. Key variables include pin shape, pin diameter, shear speed, dwell, and depth of immersion. The flux rheology can be optimized for the desired application by shearing to achieve the desired viscosity.

Solder Wetting Test



### Cleaning

**WS-788** 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.

From One Engineer To Another®



Form No. 98490 R1

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### Packaging

**WS-788** is available in 150g cartridges. Other packaging can be provided to meet the customer's specific requirements.



### Storage

If cold storage is used, after removing, **WS-788** should be allowed to stand for at least 4 hours at room temperature before using.

### Technical Support

Indium Corporation sets the industry standard in providing rapid response, on-site technical support for our customers worldwide. Indium Corporation's team of Technical Support Engineers can provide expertise in all aspects of Materials Science and Semiconductor Packaging process applications.

### Safety Data Sheets

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

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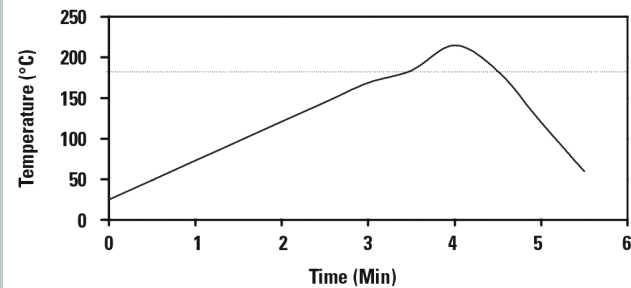
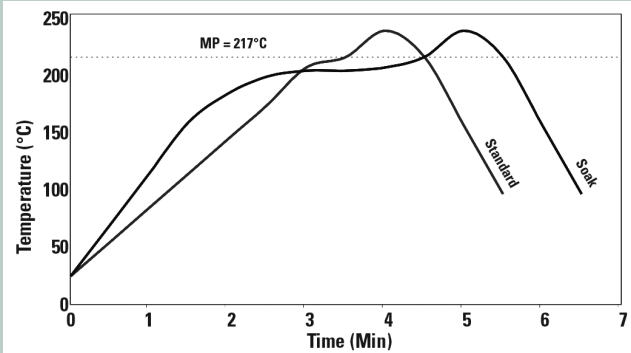
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### Reflow

#### Recommended Profile:



Peak reflow temperature should be <math><350^{\circ}\text{C}</math> in an air or nitrogen atmosphere (<math><500\text{ppm O}\_2</math>), with a linear ramp up to <math>30^{\circ}\text{C}</math> above liquidus temperature. These profiles are recommended to the user as starting points, and should be optimized by the user to meet their individual process needs.