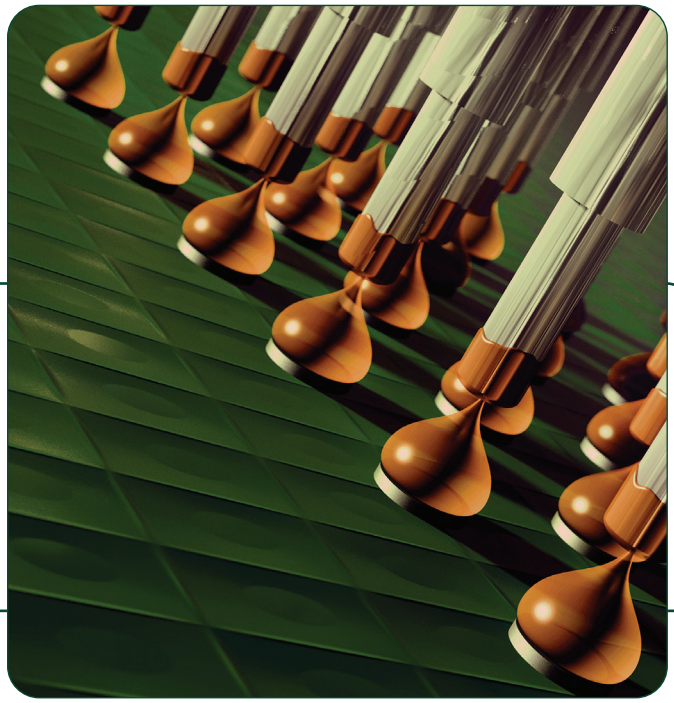
PRODUCT DATA SHEET

WS-446-NRD

Ball-Attach Flux



Introduction

Ball-Attach Flux WS-446-NRD is a water-soluble ball-attach 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-446-NRD** has an activator system powerful enough to promote wetting on the most demanding substrate metallizations. It contains no dye, so it does not stain surfaces.

Features

- Designed for ball-attach pin transfer applications
- Flux rheology applicable for all sphere sizes
- Excellent solderability on a wide range of surfaces
- Water-soluble
- Does not stain substrates or wash equipment

Properties

	Value	
Flux Type Classification	H1	J-STD-004 (IPC-TM-650: 2.3.32 and 2.3.33)
Typical Viscosity	12kcps (5min)	Brookfield Viscosity HBDVII+CP51 (5mins) @ 5rpm, 25°C
SIR (Ohms, after cleaning)	Pass (>10^8 after 7 days @ 85°C and 85% RH)	J-STD-004 (IPC-TM-650: 2.6.3.3 IPC-B-24)
Typical Acid Value	72mg KOH/g	Titration
Typical Tack Strength	380g	J-STD-005 (IPC-TM-650: 2.4.44)
Shelf Life	6 months (-20 to +10°C)	Viscosity change/ microscope examination

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

Application

The amount of **WS-446-NRD** 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 desired application by shearing to achieve the desired viscosity.

Cleaning

WS-446-NRD 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

Ball-Attach Flux WS-446-NRD is available in 150g (6 fl. oz.) and 300g (12 fl. oz.) cartridges. Other packaging can be provided to meet the customer's specific requirements.

Storage

For maximum shelf life, **WS-446-NRD** syringes and cartridges should be stored tip down at -20–10°C for maximum shelf life. Storage temperatures should not exceed 25°C for more than 4 days, and should never exceed 30°C. After removing from cold storage, **WS-446-NRD** 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, onsite 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

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

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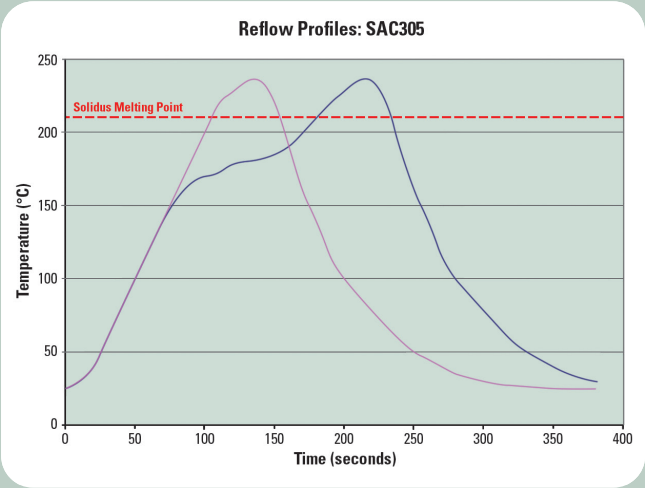
WS-446-NRD Ball-Attach Flux

Reflow

Recommended Profile:



A short preheat (150–160°C) for less than 45 seconds may be used to reduce voiding. The profile should ideally be a linear ramp at 1–2°C/second up to 20–30°C above solidus temperature, with a rapid cool down afterwards, and a minimum time above liquidus of 20 seconds.

This product data sheet is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

All of Indium Corporation's solder paste and preform manufacturing facilities are IATF 16949:2016 certified. Indium Corporation is an ISO 9001:2015 registered company.

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