

PRODUCT DATA SHEET

WS-641

Cu-Pillar Flip-Chip Flux

Introduction

Cu-Pillar Flip-Chip Flux WS-641 is a water-washable dipping flux designed for use in thermocompression bonding flip-chip copper pillar applications. Its rheology and chemical design enables its use with dipping depths down to 10 microns or less. **WS-641** has an activator system powerful enough to promote solder wetting even on mildly oxidized copper and ENEPIG. Its cleanability in deionized (DI) water and halogen-free nature makes it environmentally-friendly, as well.

Features

- Halogen-free – no intentionally added (NIA) halogens
- Uniform dipping volumes over long periods
- Proven high yields in copper-pillar (Cu-pillar) flip-chip TCB (thermocompression bonding) reflow on interposer
- Designed for SnAg microbumps
- Flux rheology applicable for copper-pillar dipping
- Excellent solderability on a wide range of surfaces
- Bubble-free packaging

Properties

Property	Value	Test Method
Flux Classification	M0	J-STD-004 (IPC-TM-650: 2.3.32 and 2.3.33)
Typical Viscosity	8kcps	Brookfield Spindle TB (20rpm)
SIR (Ohms, after cleaning)	Pass (>10 ⁸ after 7 days @ 85°C & 85% RH)	J-STD-004 (IPC-TM-650: 2.6.3.3 IPC-B-24)
Typical Acid Value	31mg	KOH/g Titration
Specific Gravity	1.11	Measured at 25°C
Shelf Life	≤25°C for 6 months	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 temperature, copper-pillar dimensions, shear speed, time of shearing before dipping, dwell time in flux, and depth of immersion. The flux rheology can be optimized for the desired application by shearing to achieve the desired viscosity. Humidity must be kept at <60%RH.

Cleaning

WS-641 post-reflow 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 >two minutes at >60psi.

Packaging

WS-641 is available in 10cc and 30cc syringes.

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Storage

For maximum shelf life, syringes and cartridges should be stored tip down. Storage temperatures should not exceed 25°C. If placed in cold storage, **WS-641** should be allowed to stand for at least four hours at room temperature before use.

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>

Reflow

WS-641 flux is designed for the rapid reflow conditions seen in copper-pillar first-level interconnect (FLI) thermocompression bonding. An oxygen level of 75ppm O₂ or less will ensure good wetting. A peak reflow temperature of 330°C or less will ensure good cleanability of the residues.



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