

Flux Removal and Cleaning

The removal of flux and residues from the substrate is an important process to ensure good adhesion and reliability in the flip chip process. If flux residues remain on the surface of the IC and substrate then lack of adhesion and subsequent delamination of the underfill can occur and cause premature solder bump fatigue failure. Having a clean, residue free surface is critical to the packaged device reliability.

To completely remove the flux and leave the surface clean Veeco has developed a combination of batch immersion followed by single wafer spray processing. The steps are outlined below:



Heated Solvent Immersion



*Double-sided, Heated Solvent
High Pressure Spray*

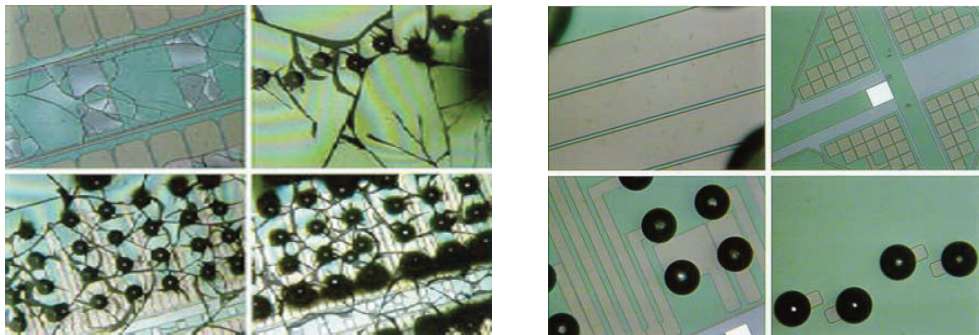


Double-sided Final Clean, Rinse and Dry

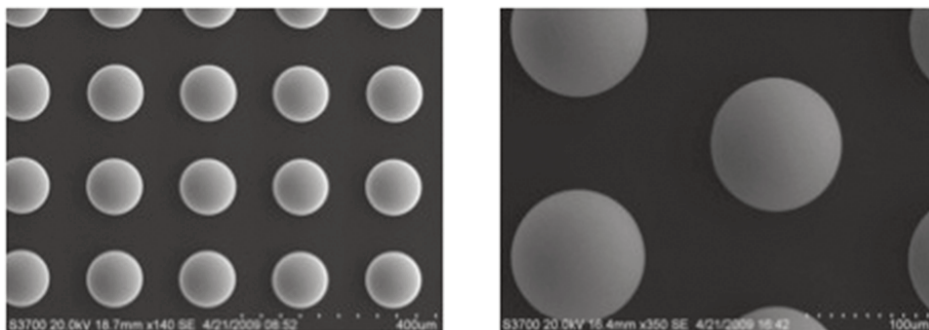
Below are some examples of flux cleaner chemistries that we have used.

Class	Flux Cleaner	Post Rinse	Operating Temperature
Non-aqueous	Bio Act SC-10 Bio Act EC-7R Mesitylene	IPA or DI Water DI Water IPA	45°C 45°C 45°C
Semi-aqueous	Micronox 2302 (Kyzen)	DI Water	70°C

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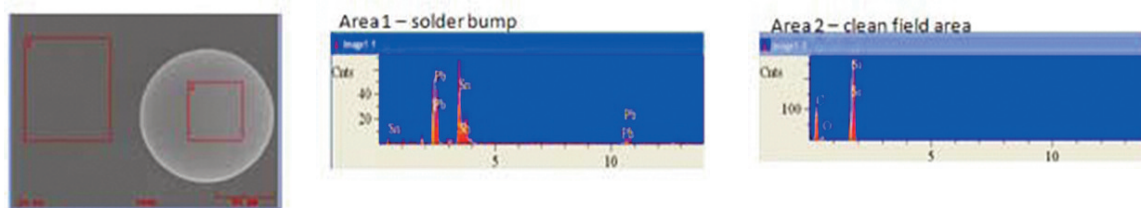


To ensure that we have completed removed the flux from surface and not left any residue we are doing SEM and EDX analysis. Below are SEM images of the resulting structure after flux removal and cleaning.



To look more closely at the surface to identify the surface compositions, we then do an EDX on the metal bump and background field. Energy dispersive X-ray spectroscopy (EDS, EDX or EDXRF) is an analytical technique used for the elemental analysis or chemical characterization of a sample. As a type of spectroscopy, it relies on the investigation of a sample through interactions between electromagnetic radiation and matter, analyzing x-rays emitted by the matter in response to being hit with charged particles. Its characterization capabilities are due in large part to the fundamental principle that each element has a unique atomic structure allowing x-rays that are characteristic of an element's atomic structure to be identified uniquely from each other.

The Locations in the boxes are analyzed.



Veeco Systems for Effective, Safe Flux Removal and Cleaning Performance

All Veeco systems meet SEMI® S2-0706E safety and SEMI S8-0705 ergonomic compliant, CE Marked, and ETL Listed.



*Veeco 3303/4
3-4 Process Modules*



*Veeco 3305/6
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8-12 Processing Modules*

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process capabilities at www.veeco.com/PSF**

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