

## Setting Up a Package-On-Package Assembly Process

### Paste Leveling

It is important to start with a level reservoir of paste (or flux) to prepare for component dipping. For manual/prototype equipment - begin by setting the blade height to 1/3 the sphere diameter of the component you are dipping. Next, apply about 1/3 of the paste or flux you need to fill the area between the reservoir and the blade. After applying the initial material, let the blade level the material, now you are ready to apply the next 1/3 of the paste or flux you will use. After leveling, add the remaining 1/3 paste/flux to the reservoir. Cycle the leveling blade a few times and observe the material in the flux tray.

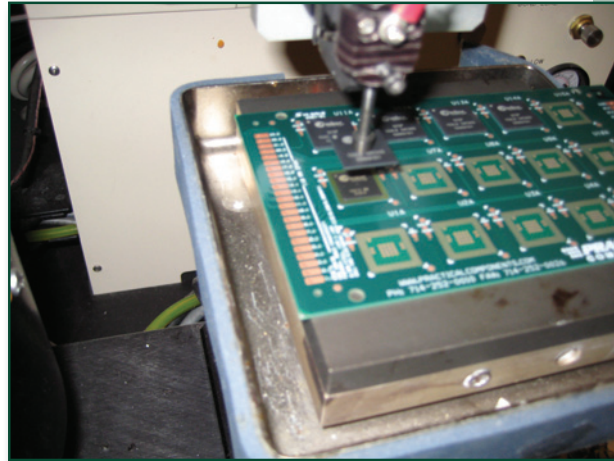
If a large amount of material accumulates along the perimeter you've applied too much paste or flux. If the surface is wavy or has craters, just add some more paste or flux. Craters in the solder paste are a problem if left untreated, as they will create inconsistencies in solder transfer efficiency. A good dipping paste will look smooth after leveling. This is in part due to lower metal loading of Package-on-Package solder pastes, but can also be affected by the leveling blade design.

### Component Dipping

Before dipping a component, verify that your paste or flux is 1) the proper thickness and 2) uniform across the surface of the flux reservoir. You can check this by using a film depth gauge.

After picking up a Package-on-Package component from its tray, center it over the paste or flux it will be dipped into. Verify again that the surface of the paste or flux is smooth and even. Dip the component into the reservoir and let it bottom out in the reservoir. You can now pick the component out of the reservoir and observe the imprint left by the components solder spheres. If the imprint looks distorted or incomplete, there may be a problem with your material depth or co-planarity.

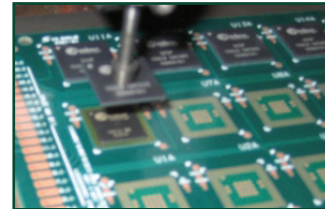
If the pattern looks defined and regular, continue by placing the component. Be sure to level out the flux reservoir each time by advancing the blade (linear tray) or rotating the reservoir (rotary tray).



### Placement

Stacking Package-on-Package components is one of the easiest parts of the assembly process. Although each Package-on-Package

solder paste and Package-on-Package flux is different, there should be no issues using up to 20psi of pressure during placement of a second component. Stacking placement is just like normal SMT placement. Ensure your placement machine will tolerate the slight change in height.



### Transport

The stack of components that have just been assembled are vulnerable to misalignment and oxidation. We have done some work up-front to provide Package-on-Package solder pastes and fluxes that have sufficient tack to hold components in place during typical conditions, and flux that will protect the solder from oxidation during transport and reflow. Automated conveyors are suggested, but use caution if you are handling the stacked packages.

### Reflow

Simply heat per the reflow profile suggested by your solder manufacturer. A cage should be placed over the components if they may come in contact with curtains on the reflow oven. Assembling Package-on-Package components with solder paste will almost always contribute a little more voiding than using a ball attachment flux, but that is the tradeoff for increased solder volume.

APPLICATION NOTE

Form No. 98484 R0

[www.indium.com](http://www.indium.com)

[askus@indium.com](mailto:askus@indium.com)

ASIA: Singapore, Cheongju: +65 6268 8678  
 CHINA: Suzhou, Shenzhen, Liuzhou: +86 (0)512 628 34900  
 EUROPE: Milton Keynes, Torino: +44 (0) 1908 580400  
 USA: Utica, Clinton, Chicago: +1 315 853 4900

