

Via Hole Filling Has Come A Long Way Baby

As DFSM was replaced by LPI solder masks, at first, the question of how to deal with vias was largely overlooked with many fabricators simply coating the LPI on the panels and exposing whatever amount of solder mask flowed into the holes and hoped for the best. This was a scary prospect, considering most of these vias were just Cu barrel plated. To help address this, many of us began pulling the LPI solder mask away from the vias and plugging them as a separate process step after Final Finish with a thermal solder mask. This added extra processing steps but at least the barrel of the holes were protected. Mis-registration, partially plugged vias, plugging voids and a host of different material being used to plug the vias were still industry concerns.

Move forward to today, PWB designs are much more complex with very small vias, high aspect ratios, sequential builds with mixed substrates and blind vias with via in pad technology. Oh, and we shouldn't leave out back drilled vias as well. Void free vias, filled with materials with characteristics as closely matched to the substrates used is a must. The best way to achieve todays via filling demands is with a solvent free via fill material such as Taiyo's THP-100 DX1 Series which have industry leading properties such as low CTE values down to 19 ppm and Tg values as high as 173°C. Combine this with a via filling system such as ITC's THP35 state of the art hole filling machines which incorporates very high amounts of vacuum directly to the vias about to be filled and optimal paste flow control to maximize your ability to fill the toughest vias, void and shrinkage free and you'll have a high performance process for via filling. Your cured via plugs will have final properties very similar to the actual substrates used in the board itself. With this combination, filling 4 mil vias and panels with 40:1 aspect ratio is not a problem.