

When Does “Low” Become Too Low?

The continued miniaturization of components has allowed for amazing feats of engineering within the mobile electronics world. We now have smart phones and tablet computers mere millimeters thick, yet with more functioning power than the laptop I am writing on. New component classes of LGAs (CSPs, QFNs and microQFPs) with their standoff heights measured in microns allow this to happen.

Fortunately, or unfortunately — depending on your perspective, these new classes of components have also made their way into non-consumer, non-mobile products as well. Do these components pose reliability concerns?

No-clean paste fluxes are composed of various rosins, solvents and activators formulated to leave behind solid residues that remain non-conductive and non-corrosive based on the assumption that any residual activators will be tied up in the solid residue remaining. However as component standoffs continue to shrink, and more paste is being applied underneath the center of components (think QFN vs. QFP), can we safely assume that the paste residue solidifies? In order to solidify, all the solvents must be able to safely volatilize and outgas from underneath the component. Current testing is finding that under very low standoff devices (including some QFPs) this may not always be the case.

Kester has begun investigating this problem by reflowing SIR comb pattern coupons with low standoff devices placed on top. Initial results point to 2 conclusions:

1. Paste flux residue does not always fully outgas as expected and can remain semi liquid and wet underneath components.
2. Shadowing effects, thermal vias and ground planes of the component and board cause temperatures underneath arrayed devices to remain cooler and inconsistent with other areas of the board. In some cases, the temperature may remain cool enough to not allow for coalescence and soldering of the alloy.

Both of these characteristics will reduce the reliability of the end product. As use of low standoff, area-array components continues to expand, these types of concerns will need to be addressed.



Please contact Kester Technical Support at 1-800-2KESTER (1-800-253-7837) for more information.