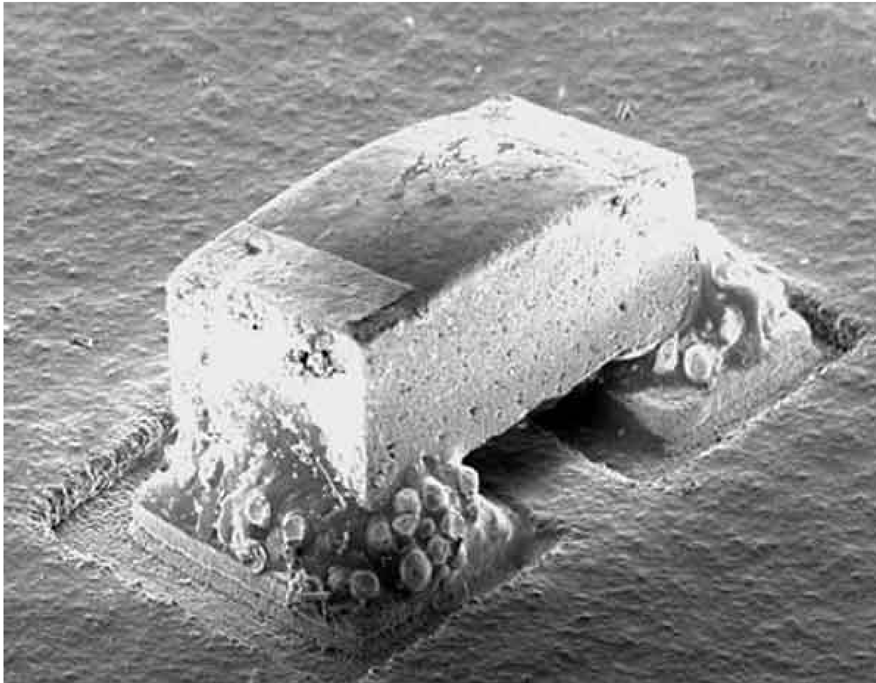
Defect of the Month

Lead-Free Solder Paste Non-Coalescence



0201 chip component with lead-free solder paste that has not fully reflowed in air. This is a common fault on small paste deposits when people return to a traditional soak profile. Some solder pastes are far more tolerant that others, the resulting solder joint is sound but the balls have not fully reflowed in to the bulk of the solder joint.

This type of issue has been seen during 2003, 2004 on 0201 chip terminations and on 01005 chips in convection reflow but never in vapour phase soldering due to the inert atmosphere during the soldering stages of the process. Basically the small solder paste deposit is exposed to a long period at elevated temperature during a lead-free profile which reduces the performance of the flux in the paste. It is seen more with profiles that have a long pre-heat like a traditional profile. A profile which does not have long dwell prior to reflow is less affected.

Many paste suppliers have recommended the straight ramp profile but in the real world many users have not been able to achieve this with lead-free on existing ovens. In most cases the actual joint is satisfactory and only the outer surface shows this effect; however, most people would not accept this type of process defect.

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Bob Willis

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