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Title: How Does Printed Solder Paste Volume Affect Solder Joint Reliability?

Printing of solder paste and stencil technology has been well studied and many papers have been presented on the topic. Very few studies have looked at how solder paste volume affects solder joint reliability. It is the aim of this work to correlate solder paste volume to solder joint reliability.

The circuit board chosen for this work includes a variety of component sizes and types. The components tested are as follows: 0402 up to1206 Imperial chip components; PLCC; SOT, SO, and SSOP J-lead components. In an effort to determine the lower limit of acceptable solder paste volume, printed volumes were varied between 25 and 125% of nominal. Solder joint quality was assessed using IPC-A-610 standard methods, x-ray and cross sectional analysis. Solder joint strength was measured using shear and pull tests. Thermal cycling between -40 ℃ and 125 ℃ was done for 1000 cycles to induce failures in the solder joints, and solder joint quality and strength was measured again.

In summary, the solder joint reliability data was correlated to printed solder paste volume. This was done in an effort to establish basic guidelines for the solder paste volumes required to generate reliable solder joints.