

Technical Bulletin

Common failure mechanisms in conformal coating: Cracking

In conformal coating, there are several mechanisms that cause failure of printed circuit boards (PCBs). In a series of technical bulletins SCH will examine the common failure mechanisms in conformal coating including capillary flow, delamination, cracking, loss of adhesion, de-wetting, corrosion, orange peel, pinholes, bubbles and foam.

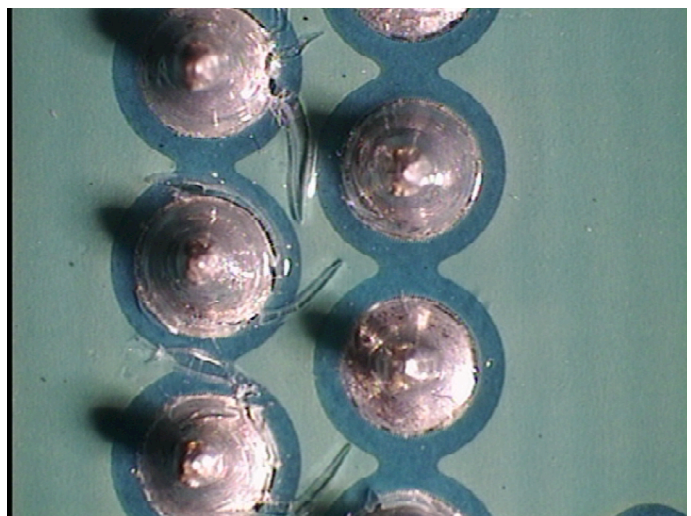
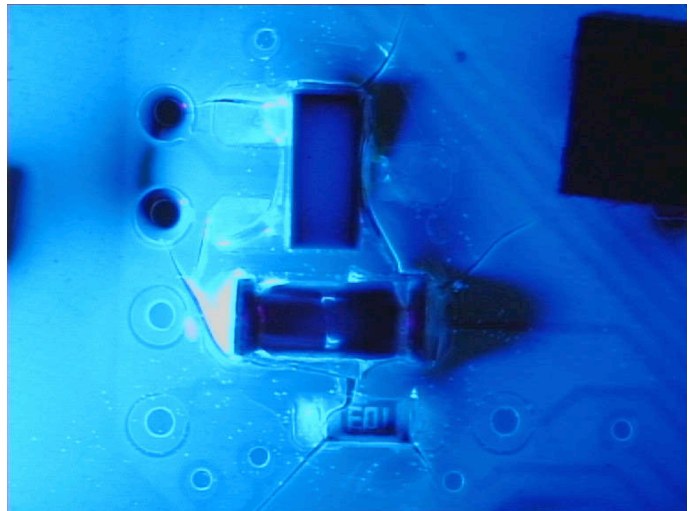
Definition

Cracking in conformal coating is where a smooth surface fractures into sections with the cracks in the coating leaving the area below exposed to potential contamination.

Causes of Cracking in Conformal Coating

Factors that influence cracking include:

1. Cure temperature too high
2. Conformal coating heat cured too quickly without allowing enough time for room temperature (RT) drying
3. Film thickness too great causing coefficient of thermal expansion (CTE) mismatch and cracks occurring in the coating
4. Operating temperature too high or too low causing the conformal coating to flex too much & crack.



Examples of Conformal Coating Cracking

Examples of Cracking Effects

Examples are shown in the images throughout the bulletin where the conformal coating has cracked, potentially allowing contaminants to the board surface.

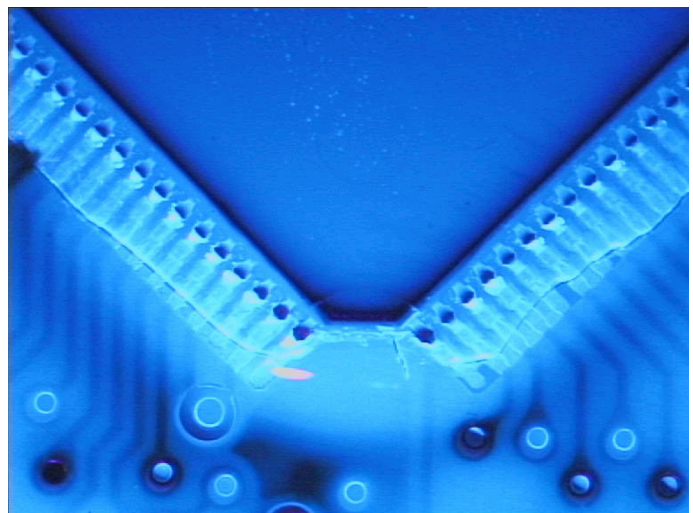
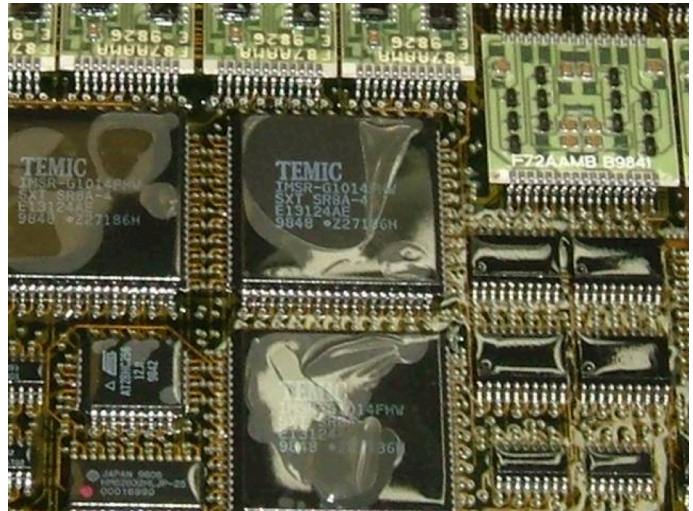
How to stop Cracking in Conformal Coating

It is possible to minimise conformal coating cracking effects by

- Lowering the initial cure temperature
- Allowing an initial drying time at room temperature before exposure to elevated temperature
- Reducing the coating thickness to avoid CTE mismatch issues
- Select a coating with a wider temperature range performance.
- Select a more flexible coating

Available Bulletins

Common Conformal Coating Failure Mechanisms covering delamination, loss of adhesion, dewetting, corrosion, orange peel, pin holes, bubbles and foam.



Examples of Conformal Coating Cracking

SCH Technologies offer

- Conformal coating Subcontract Services
- Conformal Coating Application Equipment
- Conformal Coatings
- Conformal Coating Training courses
- Conformal Coating Consultation & troubleshooting

PLEASE CHECK OUR WEBSITE FOR DETAILS