

## Technical Bulletin

### Conformal Coating Tracking and Comparative Tracking Index

Conformal Coating tracking is a potential failure mechanism that occurs on the surface of electrical insulation on a printed circuit board. It can occur be defined as the formation of a permanent conducting path across the PCB or components and is almost certainly caused by contamination on the surface.

There are two types of tracking to be considered. The first is related to moisture formation and the second occurs in dry conditions.

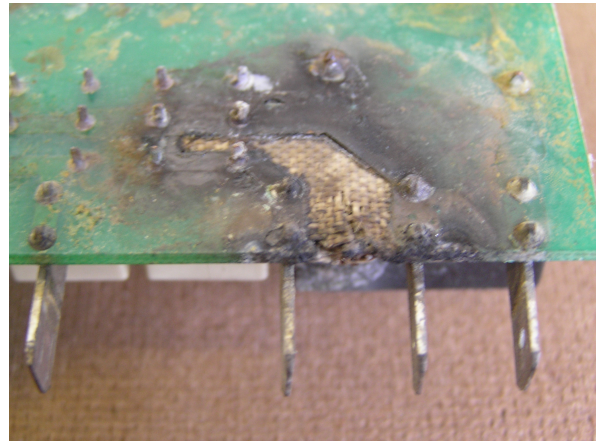
Moisture tracking occurs when there is found to be ionic contamination on the insulation of the printed circuit board. This can be in many forms including sodium chloride from environmental surroundings such as the presence of a salt atmosphere near the coast or is it can be found due to manufacturing process deposits.

The insulation separating the live components must be moist or wet for tracking to occur and this can occur in humid conditions. The mechanism for tracking occurs in five stages:

1. The area of concern is contaminated by ionic material and the surface contamination is significant enough to be a problem
2. Moisture is absorbed into the ionic contamination on the printed circuit board.
3. Conduction of current through the ionic contamination occurs
4. Formation of a dry non-conducting band in the contamination
5. Arcing across the dry band carbonising the insulation to form a conducting path.

Repetition of this failure mechanism allows conducting carbon paths to grow across the insulation surface leading eventually to complete failure.

Dry tracking can also occur through surface contamination but in this case the contaminant is a moisture free material such as metal dust from switch contacts.



The conformal coating materials are assessed using two standards. The first is IEC 112 that is used to determine the comparative tracking index (CTI) of solid insulating materials such as conformal coatings under moisture conditions. The second is IEC 587 to measure the resistance to tracking and corrosion under more aggressive circumstances.

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