

Project Summary:

Investigation of Dendritic Growth over Conformal Coating

A major controls manufacturer requested root-cause analysis of dendritic growth found in gas pressure sensors. Initial findings revealed that location of the sensor within the product housing increased the likelihood of condensation. White residue found on the conformal coating was found to contain mostly copper. Elevated levels of chloride found during ion chromatography may have been able to induce the dendritic growth when in a condensing environment. Recommendations included the use of Parylene coating instead of gel conformal coating or increasing the thickness of the current coating to ensure complete coverage of all metal. Also, minimization of condensation in the use environment may help to stop dendritic growth.

Keywords: white residue, conformal coating, electrochemical migration, ECM, connector pin array, port, housing, condensate, chloride, concentration, contamination, energy dispersive spectroscopy, EDS, corrosion reaction, ion chromatography, anions, phosphate, cross-section, cation, weak organic acid, electric field strength, wearout, gel, surface wetting force, use environment, condensation, exposed metal, potting