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Presentation: CCA Conformal Coatings, Best Practice- *Application & Optical Microscopy Inspection Methods*

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Abstract:

High reliability electronic assemblies and sub-systems require protection from the effects of moisture and corrosive contaminants that are ever present in the environment by which they are expected to perform. Methods to protect critical electronics include sealed dry nitrogen filled shelters, enclosure environment control (humidity & temperature) and the use of various conformal coating chemistries.

While Conformal coatings do NOT provide a hermetic seal from the environment they are utilized to provide a hydrophobic moisture barrier that significantly reduces moisture absorption over time. Conformal coatings comprised of Polyurethane, Epoxy, Acrylic, Silicones & Poly-Para-Xylene (Parylene), have material advantages & disadvantages based on cost, process and the level of desired environmental protection. Material property selection factors include ease of application, rework, uniformity of coverage, dielectric isolation, moisture, chemical, fungal and resistance to UV exposure breakdown.

Topics Covered-

1. Background and overview of various conformal coatings
2. Characteristics, advantages and challenges of coatings and methods
3. Other techniques which utilize custom Chemical Vapor Deposition (CVD) processes.
4. Review an example of an sub-assembly Acrylic conformal coating Inspection process
5. Use of UV Tracers and best practice optical inspection techniques used confirm conformal coat uniformity and coverage

Author Bio:

Aaron DerMarderosian Jr. is a Principal Multi-Discipline engineer in Raytheon's Space and Airborne Systems Division working in the mechanical & design support engineering failure analysis laboratory Largo, FL. He has worked in engineering for over 25 years focused on: reliability analysis & assessment, failure investigation, product / program FRACA, design verification test, systems & circuit analysis. Investigation activities include counterfeit analysis, detection & avoidance methods, Hardware security assessments and root cause analysis of failed components and electronic assemblies. He received the IEEE Reliability Society Engineer of the Year award for 2015, is a senior member of the IEEE, member of SMTA & served as IEEE Boston Reliability chapter AdCom officer for 10 years. Aaron received multiple individual & team achievement awards, Engineering technical honors in 2004 & 2007 and a technical innovation & inventors award in 1991 (Raytheon), leading to a patent. Aaron has presented at several technical conferences & IEEE events, he has a B.S. in Electrical Engineering Technology from Northeastern University.

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