

Non-Hermetic Packaging for Hi-Rel Military and Aerospace

Packages made from polymeric materials as opposed to traditional hermetic materials (i.e. metals, ceramics and glasses) require a different approach from a production, testing and qualification standpoint. The problem is now one of moisture diffusion through the barrier and package interfaces. Fick's law of diffusion and the interaction of moisture and other gases with the plastic package, with or without a cavity, is of primary importance. The Class Y qualification program is an attempt to standardize the screen testing and qualification of PEMS. This seminar reviews some of the basic science and reliability issues related to plastic packaging.

A review of the techniques and methods to evaluate a "non-hermetic" approach is discussed with a special emphasis on cleaning of the device prior to encapsulation and alternate test methods to evaluate reliability.

Attendees will gain a better understanding of the reliability issues and material selection, testing and qualification of "non-hermetics" intended for mil and aerospace applications.

Course Outline:

"Non- Hermetic Packaging" and Testing Issues

- Qualification of near hermetic packages for medical applications
- Ficks law of moisture diffusion

Potting compounds

- PDMS, PEEK, LCP

Thin film/vapor deposited coatings

- ALD (Atomic Layer Deposition), Parylene-C

Thick film, spray, dip, or brush applied coatings

- Silicones –epoxies- bio-compatible organic coatings

Surface Cleanliness

- How to evaluate surface contamination

Coating material evaluation and effectiveness

- Conformance to surface topography

- Chemical inertness/resistance

- Permeability/diffusion properties

- Pinholes/cracks

- Adhesion

Summary plus Q&A