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hybrid format (on site & MS Teams)

Seminar: November 10th/11th, 2022

Reliability of Electronic Systems



Illustration of a smart power module's failure due to corrosion

Thursday, November 10th

- 10:00** Welcome & Introduction Round
- 10:45** **Session 1: Reliability Management Basics**
Terminology, introduction to reliability methods
- 11:50** **Session 2.1: Requirements & Test Development**
Derivation of application-specific load profiles
(mission profiles)
- 12:35** Lunch Break
- 13:35** **Session 2.2: Requirements & Test Development**
Basic considerations for reliability test development
- 15:35** **Lab Tour**
- 17:00** Adjourn
- 18:00** Social Event (Dinner)

Note: There will be short coffee breaks throughout the days.



Friday, November 11th

- 09:00** Recap
- 09:15** **Session 3: Analytics & FEM as a Tool for Reliability**
Use of analytics to determine failure mechanisms, introduction to FEM
- 12:35** Lunch Break
- 13:30** **Session 4: Condition Monitoring as Part for a Circular Economy**
Controlling and managing reliability with condition monitoring, introduction to circular economy
- 14:45** **Workshop / Wrap-up**
- 15:30** Final Discussion
- 16:00** End of Seminar

Seminar Description

The two-day event will be held by the specialists of the department »Environmental and Reliability Engineering« at Fraunhofer IZM in Berlin.

Participants are taught methods and background knowledge for ensuring reliability in the development and production process of electronic systems.

The first day of the seminar starts with the establishment of a common understanding of terms and definitions. Moreover, methods will be presented for the examination of systems and determination of boundary conditions allowing the evaluation of system reliability. In order to predict the expected lifetime, application-specific load profiles are derived and correlated with test profiles.

On the second day of the event, capabilities and limits of numerical simulation are presented as a useful tool in early-stage development. The importance of structural analysis and material characterization for quantitative reliability prediction will be discussed and different methods of gathering information about reliability in tests and in the field will be introduced.

The days will be wrapped up with a lab tour (for participants on site) and a workshop, where the participants can apply the acquired knowledge under supervision. The focus is on long-term knowledge transfer.



FEM simulation: thermal behavior (left) & warpage prediction (right) in a smart power module

Brief Seminar Overview & Topics

Due to shorter development times and higher demands on electronic components and systems, the role of reliability assessment is constantly gaining in importance. Fraunhofer IZM is organizing a two-day seminar to provide participants with the relevant methods and tools along the product development process. Topics are:

- Definitions and introduction to important terms
- Methods for system assessments
- Stress impacts and resulting failure mechanisms
- Empirical and analytical failure modelling
- Systematics of FE simulation
- Implementation of realistic stress tests
- Analyzing and interpreting of test results
- Handling of reliability characteristics
- Assuring reliability by condition monitoring
- Analytical measurement methods

Key Facts

Registration: Please register via the online tool on the event website (see link or code). The max. number of participants is 30.
www.izm.fraunhofer.de/en/news_events



Location: The seminar takes place at Fraunhofer Institute for Reliability and Microintegration IZM in Berlin. A remote participation via MS Teams is possible as well!

Attendance Fee: 850 € (exempt from sales tax, § 4 No. 22 UStG). Seminar documents are included; for participants on site additionally lunch, drinks & a dinner event.

Who should attend: The seminar is primarily aimed at engineers in the fields of development, technology, production, manufacturing and quality assurance.