Seminar

ACCELERATED LIFE TESTING: ITS ROLE, CHALLENGES, ATTRIBUTES, PITFALLS AND INTERACTION WITH QUALIFICATION TESTING

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Abstract

Accelerated life testing (ALT) and highly-accelerated life testing (HALT) are major experimental methods in reliability engineering. I will discuss their roles, attributes, challenges, and pitfalls, as well as their interaction with the two other major types of accelerated testing: product development and qualification testing. I will also address the interaction of these methods with predictive modeling, both analytical (“mathematical”) and computer-aided (“simulation”).

The field of thermal stress failures in micro-electronic and photonic systems, including modeling, prediction, prevention and physical thermo-mechanical design for reliability, is used to illustrate the discussed concepts. As examples, I will examine thermal stresses and potential failure modes in bonded assemblies; in solder joints of flip-chip Si-on-Si structures; in thin films fabricated on thick substrates; in polymer-coated optical silica fibers (including some new developments associated with the application of nano-materials) and in fibers adhesively bonded into capillaries or soldered into ferrules.

I will indicate also the role that a probabilistic approach should play in understanding the effect of the variability in materials properties, structural geometry and loading conditions on the thermal stress in, and the reliability of, a structure experiencing thermal loading.

Time and Location:
Friday September 7, 2007
11am to 3:30pm
University of Greenwich
Royal George Lecture Theatre
Queen Anne Court Building
Martime Greenwich Campus
London SE10 9LS
Admission: This is a Free Event
Lunch Included

Sponsored by:

Please confirm attendance by 5th September
e-mail to: M.A.Greenaway@gre.ac.uk
About the Speaker:

Dr. Suhir is Distinguished Member of Technical Staff (ret), Basic Research, Physical Sciences and Engineering Research Division, Bell Labs, Murray Hill, NJ. Currently he is on the faculty of the Electrical Engineering Dept., University of California at Santa Cruz, and is Visiting Professor, Dept. of Mechanical Engineering, University of Maryland at College Park. In addition, he is CEO and President of a Small Business Innovative Research (SBIR) Company, ERS Co. funded through the US Government grants.

Dr. Suhir is Fellow of the Institute of Electrical and Electronics Engineers (IEEE), the American Physical Society (APS), the American Society of Mechanical Engineers (ASME), and the Society of Plastics Engineers (SPE). He is co-founder of the ASME Journal of Electronic Packaging and served as its Technical Editor (Editor-in-Chief) for eight years (1993-2001). Dr. Suhir has authored about 250 technical publications (papers, book chapters, books, patents), including monographs “Structural Analysis of Microelectronic and Fiber Optic Systems”, Van-Nostrand, 1991 and “Applied Probability for Engineers and Scientists”, McGraw-Hill, 1997. Dr. Suhir has edited and co-edited several books on materials, physics, mechanics, reliability and packaging of micro- and opto-electronic systems, including 2007 Springer book “Micro- and Opto-Electronic Materials and Structures” (with Dr. C.P. Wong and Dr. Y.C. Lee as co-editors). Dr. Suhir is currently editor of a Springer book series on physics, mechanics, design-for-reliability and packaging of microelectronic and photonic systems.

Dr. Suhir is Distinguished Lecturer of the IEEE CPMT (Components, Packaging and Manufacturing Technology) Society and teaches continuing education courses worldwide. Dr. Suhir is on several Technical Committees of the CPMT Society and is Associate Editor of the IEEE CPMT Transactions on Advanced Packaging. Dr. Suhir organized many successful conferences and symposia in the USA, Europe and Far East countries, and presented numerous keynote and invited talks. Dr. Suhir received many distinguished service and professional awards. Some of his recent and significant awards are:

• **2004 ASME Worcester Read Warner Medal** for outstanding contributions to the permanent literature of engineering through a series of papers in Mechanical, Microelectronic, and Optoelectronic Engineering, which established a new discipline known as the Structural Analysis of Microelectronic and Photonic Systems;

• **2001 IMAPS John A. Wagnon Technical Achievement Award** for outstanding contributions to the technical knowledge of the microelectronics, optoelectronics, and packaging industry;

• **2000 IEEE-CPMT Outstanding Sustained Technical Contribution Award** for outstanding, sustained and continuing contributions to the technologies in fields encompassed by the CPMT Society;

• **2000 SPE International Engineering/Technology (Fred O. Conley) Award** for outstanding pioneering and continuing contributions to plastics engineering; and

• **1999 ASME and Pi-Tau-Sigma Charles Russ Richards Memorial Award** for outstanding contributions to mechanical engineering.
Traveling to Greenwich:

The seminar will take place within the historic buildings of the Old Royal Navel College, Maritime Greenwich Campus, University of Greenwich, within the World Heritage Site at Greenwich.

It is advisable to travel by Train. The nearest station is Cutty Sark Station on the Docklands Light Rail which is 5 minute walk from the University and linked to the Underground for connections to all London Mainline Stations. Further details on how to travel to the University can be found at the following website:

http://www.gre.ac.uk/about/greenwich/greenwich_directions