

Current Trends in Protective Packaging of Computers and Electronic Components

Peache/O'Sullivan, EDITORS



STP 994

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ASTM
1916 Race Street,
Philadelphia, PA 19103

Library of Congress Cataloging-in-Publication Data

Current Trends in Protective Packaging of Computers and Electronic Components /
Robert J. Peache and Denis O'Sullivan, editors.

(Special technical publication; 994)

Proceedings of a symposium held in Phoenix, Arizona, Oct. 23-24, 1986, sponsored by
ASTM Committee D 10 on Packaging.

"ASTM publication code number (PCN) 04-994000-11."

Includes bibliographies and index.

ISBN 0-8031-1171-1

1. Electronic apparatus and appliances—Protection—Congresses.

2. Electronic apparatus and appliances—Packaging—Congresses.

I. Peache, De Robert J. II. O'Sullivan, Denis. III. ASTM Committee
D 10 on Packaging. IV. Series: ASTM special technical publication; 994.
TK7870.C87 1988

621.38—dc19

88-3289

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Foreword

This symposium on Current Trends in Protective Packaging of Computers and Electronic Components was presented at Phoenix, Arizona, 23–24 October 1986. It was sponsored by ASTM Committee D 10 on Packaging. Robert J. Peache, Wang Laboratories, Inc., Lowell, Massachusetts, and Denis O'Sullivan, Digital Equipment Corp., Maynard, Massachusetts served as symposium chairmen and as the editors of this publication.

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Overview

During the spring of 1985 the Executive Committee of ASTM Committee D 10 on packaging felt that a symposium on the state-of-the-art of packaging materials and techniques being used by the rapidly expanding electronics industry would be timely and have a wide appeal. It was noted that many new requirements for packaging were being generated by this industry, particularly in the areas of protection from electrostatic discharge and highly fragile components. With this in mind, the Long Range Planning Subcommittee was chartered to develop a symposium titled "Current Trends in Protective Packaging of Computers and Electronic Components." The papers submitted represent a cross section of many issues currently important in the area of protective packaging of computers and electronic components in general. The authors of the papers come from both within the membership of ASTM Committee D 10 and from the packaging community in general. Each has experience in the field and many have a vast amount of experience in packaging in general, and specifically in packaging electronics.

The papers which follow are presented in the same sequence in which they were presented at the symposium.

The paper by R. McGill on page 1 discusses how the Government has focused the attention of various industry associations that represent both electrostatic discharge (ESD) sensitive item and ESD protective packaging material suppliers to the needs of the military logistical environment. According to McGill, in doing so, the crucial development of reliable test standards, establishment of ESD protective control techniques, and the standardization of ESD sensitive item identification, marking and common handling procedures offer the promise of benefiting industry as much as the government itself. Specific problems as well as steps being taken to correct recognized deficiencies are discussed.

A. F. Murello's paper on page 10 describes what has been done at RCA to protect electronic components from ESD. His paper presents the data compiled over two years of application of the static decay and triboelectric testing methods. According to Murello, the data demonstrates that a topically coated PVC tube in a foil-lined sleeve is a cost-effective, state-of-the-art method of packaging semiconductor devices.

The D. P. Crowley paper on page 24 considers the importance of packaging material flammability when designing fire protection for high tech storage operations as seen from a risk management perspective. Crowley describes current developments in low flammability packaging materials, including corrugated fiberboard containers and foam plastic cushioning materials. Packaging trends in this area are also forecasted.

R. M. Fiedler's paper on page 33 discusses predicting the required minimum thickness of protective package cushions, and how to easily calculate them based on available data and fundamental engineering principles. According to Fiedler, cushioning materials can be directly compared based on their efficiency ratings that are easily derived from data normally presented in cushion curves for cushion materials. His paper presents examples of the relationship of these variables along with the general equations. Cushion efficiency ratings are also discussed and examples from published cushion data are reviewed.

The paper by R. L. Sheehan on page 43 discusses how to predict the field performance of packaging by developing quantitative models that may be simulated on a computer. According to Sheehan, these models add to the understanding of the system, and are useful to investigate the projected effects of alternate assumptions and of inherent uncertainties. The models discussed in his paper relate to a package or the contained product being damaged by mechanical shock resulting from a drop.

The last paper by H. H. Schueneman on page 58 compares three different cushion test methods. These test procedures were used as the basis of package designs. The packages were then tested and the results compared to the design criteria. Differences in results were related to how the various test procedures describe cushion performance. In addition, a suggestion is made to use test procedures that give both material comparison data and creditable package design information.

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ISBN 0-8031-1171-1