



Electronic Materials and Processes Handbook

By Charles Harper

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Micro-miniaturization in electronics--a necessity for personal communications devices like cell phones and PDAs--has radically altered the materials these electronics are made from.

This new edition, the first update of the handbook since 1993, is a complete rewrite, reflecting the great importance of engineering materials for thermal management and flexibility and microminiature sizes, and will be an invaluable tool to anyone working in electronic packaging, fabrication, or assembly design.

- * ALL NEW--A complete rewrite of the previous edition
- * Details and characterizes every major material type, allowing engineers to make accurate, cost-effective design choices
- * Full materials breakdown for high density packaging techniques
- * Materials for communications wiring and cabling

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Electronic Materials and Processes Handbook By Charles Harper Bibliography

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Editorial Review

Review

Charlie Harper's popular handbook is now appearing in its 3rd edition (copyright 2004). Since edition No. 2 issued in 1994 there have been remarkable changes in electronic designs and packages that triggered new material requirements and the introduction of novel materials and processes. So it is very timely to have an updated reference source like the ***Electronic Materials and Processes Handbook*** for engineers and scientist who work in this field and are looking for practical material data, guide lines, manufacturing methods, design and application criteria, as well as performance criteria and limits. It should be mentioned that this book is also a valuable resource for novices and non-technical people who want to gain some insight into electronic materials and processes. Such readers will enjoy Charles Cohn's Chapter 1 on the development and Fabrication of IC Chips. It starts with the atomic structure of elements, reminisces about the vacuum tube, leads to semiconductor theory, the first integrated circuits made by Jack Kilby and Robert Noyce, and a good overview of the IC fabrication process. . .

The following chapters cover basic materials and processes associated with these materials: Chapter 2 (Karl F. Schoch, Jr., Northrop Grumman) is an excellent overview of Plastics, Elastomers, and Composites, offering tables with material properties, terms and definitions, trade names, and material/structure correlation. The following two chapters cover Ceramics And Glasses, and Metals. The remaining six chapters are grouped around technologies, material systems, and fabrication processes such as Solder Technology, Electroplating, Printed Circuit Board Fabrication, Hybrid Microelectronics and Multichip Modules, Electronic Assembly Materials (adhesives, underfills, and coatings), and Thermal Management Materials and Systems. . .

Charles Harper succeeded (as usual!) to persuade world experts from industry and academia to contribute to the ten chapters, such as Barry Burns and Christy Marinelli (Henkel Loctite) for Electronic Assembly Materials and Mike Carano (Electrochemicals) for Printed Circuit Board Fabrication. . .

Each chapter concludes with an extensive list of references for those who want to dig deeper. A well-organized seventeen pages long index helps the reader to navigate through the handbook. It is difficult to find fault with this publication, so I won't try to. Oh yes, I was missing the sequential numerals to mark the pages, but I did get used to the decimal structure of chapters and sub-chapters!.. (*CircuiTree Magazine* 2003-11-01)

From the Back Cover

MICROMINIATURIZATION -- EXPLAINED IN A BIG WAY!

. The rise of cellular phones, PDAs, and palmtops has brought with it a host of new challenges for those charged with creating materials to meet those devices' specifications. And now, thanks to McGraw-Hill's ***Electronic Materials Handbook***, engineers have comprehensive coverage of the materials that cater to the microminiaturization trend in electronics..

. Written by a team of experts from around the globe, this indispensable volume reflects the importance of engineering materials for thermal management system optimization and flexibility in microminiature sizes. It offers detailed discussions of a complete range of pertinent topics, including:..

* Full material breakdowns for high-density packaging techniques.

- * Materials for communications wiring and cabling.
- * And much, much, more!.

. So, no matter if your work includes electronic packaging, fabrication, or assembly design, *Electronic Materials Handbook* will help you master the growing demands of microminiaturization..

. **Inside you'll find:**

Basic Materials and Processes.

- * Semiconductors.
- * Plastics, Elastomers, and Composites.
- * Ceramics, Glasses, and Diamonds.
- * Metals.
- * And more!.

Materials Systems.

- * Circuit Board Processing.
- * Hybrid Microelectronic Materials and Systems.
- * Optoelectronic Materials and Systems.
- * Encapsulants, Underfills, and Molding Compounds for
- * High-Density Packaging.
- * And more! .

About the Author

Charles A. Harper is President of Technology Seminars, Inc., of Lutherville, Maryland, an organization dedicated to presentation of educational seminars in the field of electronic packaging and materials. He has authored over a dozen well known books in the field and is among the founders and past presidents of the International Microelectronics and Packaging Society. He is also Series Editor for the McGraw-Hill Electronic Packaging and Interconnection Series. Mr. Harper is a graduate of The Johns Hopkins School of Engineering, where he also served as Adjunct Professor.

Users Review

From reader reviews:

Luke Shaffer:

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