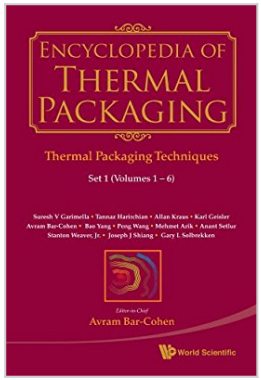

Encyclopedia of Thermal Packaging:Set 1: Thermal Packaging Techniques(A 6–Volume Set): Volumes 1 - 6

By Avram Bar-Cohen

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Please click here for information on Set 2: Thermal Packaging Tools

Thermal and mechanical packaging — the enabling technologies for the physical implementation of electronic systems — are responsible for much of the progress in miniaturization, reliability, and functional density achieved by electronic, microelectronic, and nanoelectronic products during the past 50 years. The inherent inefficiency of electronic devices and their sensitivity to heat have placed thermal packaging on the critical path of nearly every product development effort in traditional, as well as emerging, electronic product categories.

Successful thermal packaging is the key differentiator in electronic products, as diverse as supercomputers and cell phones, and continues to be of pivotal importance in the refinement of traditional products and in the development of products for new applications. The *Encyclopedia of Thermal Packaging*, compiled in multi-volume sets (*Set 1: Thermal Packaging Techniques, Set 2: Thermal Packaging Tools, Set 3: Thermal Packaging Applications, and Set 4: Thermal Packaging Configurations*) will provide a comprehensive, one-stop treatment of the techniques, tools, applications, and configurations of electronic thermal packaging. Each of the author-written sets presents the accumulated wisdom and shared perspectives of a few luminaries in the thermal management of electronics.

Set 1: Thermal Packaging Techniques

The first set of the Encyclopedia, Thermal Packaging Techniques, focuses on the technology “building blocks” used to assemble a complete thermal management

system and provide detailed descriptions of the underlying phenomena, modeling equations, and correlations, as well as guidance for achieving the optimal designs of individual “building blocks” and their insertion in the overall thermal solution. Specific volumes deal with microchannel coolers, cold plates, immersion cooling modules, thermoelectric microcoolers, and cooling devices for solid state lighting systems, as well as techniques and procedures for the experimental characterization of thermal management components. These “building blocks” are the essential elements in the creation of a complete, cost-effective thermal management system.

The four sets in the *Encyclopedia of Thermal Packaging* will provide the novice and student with a complete reference for a quick ascent on the thermal packaging “learning curve,” the practitioner with a validated set of techniques and tools to face every challenge, and researchers with a clear definition of the state-of-the-art and emerging needs to guide their future efforts. This encyclopedia will, thus, be of great interest to packaging engineers, electronic product development engineers, and product managers, as well as to researchers in thermal management of electronic and photonic components and systems, and most beneficial to undergraduate and graduate students studying mechanical, electrical, and electronic engineering.

Readership: Packaging engineers, electronic product development engineers, and product managers, as well as researchers in thermal management of electronic and photonic components and systems, and most beneficial to undergraduate and graduate students studying mechanical, electrical, and electronic engineering.

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Editorial Review

Review
"The Encyclopedia meets head-on the challenges engineers and researchers face in this era of information abundance. By its breadth of coverage, the Encyclopedia provides a bird's eye view of the techniques and approaches used over the entire field of electronics thermal management. By its depth of coverage, each volume provides the reader with a comprehensive guide to a specific subject area. This is undoubtedly a milestone publication that will serve the industry and the research community for many years to come." --Dr Wataru Nakayama, Research Consultant, ThermTech International

From the Inside Flap
Packaging, the physical design and implementation of electronic systems is responsible for much of the progress in miniaturization, reliability and functional density achieved by the full range of electronic, microelectronic and nanoelectronic products during the past several decades. The inherent inefficiency of electronic devices and their sensitivity to heat have placed thermal management on the critical path of nearly every organization dealing with traditional electronic product development, as well as emerging, product categories. Successful thermal packaging is the key differentiator in electronic products, as diverse as supercomputers and cell phones, and continues to be of critical importance in the refinement of traditional products and in the development of products for new applications.

The Encyclopedia of Thermal Packaging, compiled into four 5-volume sets (Thermal Packaging Techniques, Thermal Packaging Configurations, Thermal Packaging Tools and Thermal Packaging Applications), will provide comprehensive, one-stop treatment of the techniques, configurations, tools and applications of electronic thermal packaging. Each volume in a set comprises 250350 pages and is written by world experts in thermal management of electronics.

About the Author
Dr Avram Bar-Cohen is an internationally recognized leader in thermal science and technology, an Honorary member of ASME, and Fellow of IEEE, as well as Distinguished University Professor in the Department of Mechanical Engineering at the University of Maryland. His publications, lectures, short courses, and research outcomes, as well as professional service in ASME and IEEE, have helped to create the scientific foundation for the thermal management of electronic components and systems and pioneered techniques for energy-efficient sustainable design of manufactured products. His current research focuses on on-chip thermoelectric and two-phase microchannel coolers for high heat flux electronic components, thermal control of solid-state lighting systems, and polymer-fiber composite heat exchangers for seawater applications. Bar-Cohen was the general chair for the 2010 International Heat Transfer Conference in Washington DC and is the President of the Assembly of International Heat Transfer Conferences. He is the Editor-in-Chief of World Scientific Press' forthcoming Encyclopedia of Thermal Packaging. From 2001 to 2010 he served as the Chair of Mechanical Engineering at Maryland and is currently on assignment as a Program Manager in the Microsystem Technology Office at the Defense Advanced Projects Agency in Virginia.

In addition to Honorary membership in ASME, Bar-Cohen's honors include the Luikov Medal from the International Center for Heat and Mass Transfer in Turkey (2008), ASME's Heat Transfer Memorial Award (1999), Curriculum Innovation Award (1999), Edwin F Church Medal (1994) and Worcester Reed Warner Medal (2000), and the Electronic and Electrical Packaging Division's Outstanding Contribution Award (1994) as well as the InterPack Achievement Award (2007). Bar-Cohen was the founding chair of the IEEE

Intersociety Conference on Thermal Management in Electronic Equipment (ITHERM) in 1988 and was recognized with the IEEE CPMT Society's Outstanding Sustained Technical Contributions Award (2002), the ASME/IEEE ITHERM Achievement Award (1998) and the THERMI Award from the IEEE/Semi-Therm Conference (1997).

Bar-Cohen has co-authored Design and Analysis of Heat Sinks (Wiley, 1995) and Thermal Analysis and Control of Electronic Equipment (McGraw-Hill, 1983), and has co-edited 14 books in this field. He has authored/co-authored some 350 journal papers, refereed proceedings papers, and chapters in books; has delivered 70 keynote, plenary and invited lectures at major technical conferences and institutions, and he holds 8 US and 3 Japanese patents. He has advised to completion 65 master's and PhD students at the University of Maryland, the University of Minnesota and the Ben Gurion University (Beer Sheva, Israel), where he began his academic career in 1972. From 1998 2001 he directed the University of Minnesota Center for the Development of Technological Leadership and held the Sweatt Chair in Technological Leadership.

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