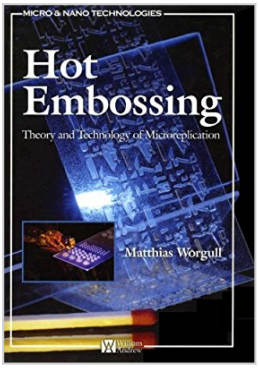

Hot Embossing: Theory and Technology of Microreplication (Micro and Nano Technologies)

By Matthias Worgull

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This book is an overview of replication technology for micro- and nanostructures, focusing on the techniques and technology of hot embossing, a scaleable and multi-purpose technology for the manufacture of devices such as BioMEMS and microfluidic devices which are expected to revolutionize a wide range of medical and industrial processes over the coming decade.

The hot embossing process for replicating microstructures was developed by the Forschungszentrum Karlsruhe (Karlsruhe Institute of Technology) where the author is head of the Nanoreplication Group. Worgull fills a gap in existing information by fully detailing the technology and techniques of hot embossing. He also covers nanoimprinting, a process related to hot embossing, with examples of actual research topics and new applications in nanoreplication.

*A practical and theoretical guide to selecting the materials, machinery and processes involved in microreplication using hot embossing techniques.

*Compares different replication processes such as: micro injection molding, micro thermoforming, micro hot embossing, and nanoimprinting

*Details commercially available hot embossing machinery and components like tools and mold inserts

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Editorial Review

From the Inside Flap
The aim of the book is to give the reader a fundamental knowledge about hot embossing. It book provides the history, theory, and current state of hot embossing, addressing processes, modeling, simulation, techniques, tools, and applications. Replication processes are fully analyzed, including material and cost concerns for Micro Reaction Injection Molding (RIM), injection compression molding, micro- hot embossing and thermoforming, and nanoimprinting replication processes. Molding topics cover classification, melts (shear/strain behavior, orientation and relaxation), solids (viscoelasticity; characteristics), thermal aggregate states (amorphous and semicrystalline structures; commercial availability) and characteristics (thermal material data; calorimetric data measurement).

• Discusses polymers in hot embossing, e.g.: principles / parameters, components & process steps / variations (coverage of position controlled -, double sided -, & multilayer molding)

• Details commercially available hot embossing machinery, features & components

• Includes scientific applications and related information: requirements for hot embossing in scientific environments, microoptical and microfluidic devices, and structures in the sub-mircon range

• Discusses the requirements for the use in industry, CD-production, film fabrication, Fresnel Lenses, spectrometer, etc.

About the Author
Dr. Matthias Worgull currently works at the Institute for Microstructure Technology at Forschungszentrum Karlsruhe, Germany. His degree from the University of Karlsruhe is in Mechanical Engineering. He has been the leader of the Nanoreplication Group at the Institute since 2005.

Users Review

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Ryan Connors:

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