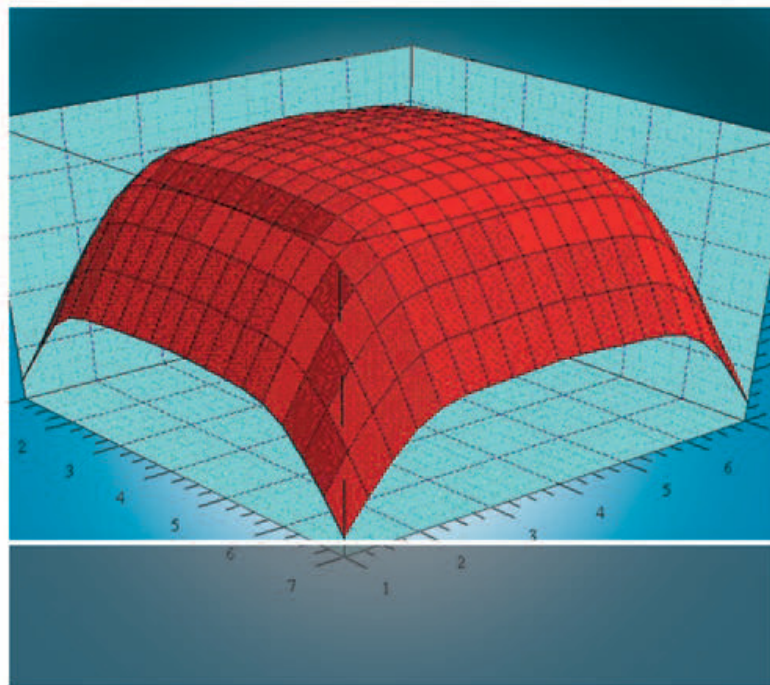


James L. Throne

Understanding Thermoforming



2nd Edition

HANSER

James L. Throne
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Foreword to the Second Edition

The first edition of this modest work was designed as an introduction and supplement to my larger effort, “Technology of Thermoforming”, also published by Hanser. It presented a general overview of this rapidly growing field, without extensive details or equations.

Although the basic elements of thermoforming have not changed in the near-decade since the publication of the first edition, the industry is maturing and more details of the inner workings of the process are needed. Thermoforming is not just about machinery, molds, plastics, and making parts. It is also about process monitoring and control, quality assurance, safety and competitiveness with other processes. I’ve made an effort to broaden the work to include many of these aspects.

Two disparate areas for product development have become important recently. Thermoforming has been used in transportation for many years, primarily to produce low-volume parts. Truck and aircraft interiors and bus and train toilet interiors are examples. The development of paint film technology has spurred an interest in thermoformed paint-free exterior panels for domestic vehicles. Another developing area is bio-devices. Biotechnology is arguably the most rapidly growing science worldwide. Of course, there are many thermoforming applications already. A recent development, where 25-micron thick film is thermoformed into 350-micron hemispheres as containers for cell cultures, emphasizes microthermoforming.

The intent of the work has not changed. It remains a primer. I’ve rearranged the chapters to focus on the mechanics of the process first, then to consider the nature of the polymers. I’ve also added a short chapter on comparing thermoforming – technically and economically – with other technologies such as blow molding, rotational molding, and injection molding.

One caveat, though. In the first edition, there were no equations. In this edition, there are equations, but only simple ones, for illustration only.

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