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Preface

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Plastic Part Design for Injection Molding

An Introduction

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Preface

The injection molding process is the most widely used manufacturing process for the production of plastic parts. The process is so versatile, that it can be used for the production of small electronic and medical parts, or for the production of very large automotive or building construction components. The growth in the injection molding industry continues due in large part to advances in both plastic material and injection molding process technologies.

Unfortunately, designing injection molded plastic parts can be an extremely difficult task due to the complexities of both the part geometry and the molding process. It is also very difficult for even experienced designers to work with new plastic material grades that may process and perform in a different manner than those materials used previously. It is in fact very difficult to design a plastic part that is functional, manufacturable, and esthetically pleasing. The part design process involves a series of tradeoffs or compromises so that each of these important demands can be met. Ideally, injection molded plastic parts are developed using the *Concurrent Engineering* practices discussed in this book. This edition also includes a chapter on *Design for Enhanced Recyclability and Sustainability*.

The need for a book describing the various aspects of the plastic part design process was recognized by the author when searching for suitable design course texts. The author's integrated approach to plastic part design and plastic materials selection is described in the book, which includes hundreds of original figures that are used to illustrate specific points. The book goes into great detail on the subject of *Design for Manufacturability*, specifically how the various phases of the injection molding process can impact a part design. Common problems, such as weld lines, warpage, or ejection difficulties are discussed, as are potential solutions. In addition, the fundamentals of plastic material performance and structural design are covered, along with the subject of plastic part prototyping. The last section of the book reviews the various assembly methods that can be used for injection molded plastic parts.

The book should serve as a well illustrated reference and introductory design guide for the plastic part designer. It is hoped that the book provides an overview of the many different considerations that must be taken into account when designing a plastic part that will be manufactured by the injection molding process.

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