

Reaction Injection Moulding: Polymer Chemistry and Engineering

Jiri E. Kresta (Ed.)

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This book is based on a symposium sponsored by the American Chemical Society in August 1983. It is a collection of papers which are divided into four main sections

- (a) Future Trends for Reaction Injection Moulding (RIM)
- (b) Polyurethane RIM
- (c) Non-Urethane RIM
- (d) RIM Technology

The first section of the book is short (2 chapters) but it will be a particularly useful section for those new to the technology and those considering its possible use. Chapter 1 deals with future prospects for RIM in the USA and presents a good review of the advantages and disadvantages of different systems. Chapter 2 presents a useful comparison of the costs

involved in injection moulding, compression moulding and RIM. The breakdown of costs is interesting and should permit potential users in other countries to do a similar analysis.

The second section of the book deals with the polymer chemistry and physics of polyurethane systems. The variables affecting morphology, structure, properties and catalysis are discussed but being a collection of papers the book tends to suffer from a lack of continuity in dealing with these important areas. The six chapters in this section contain some useful and practical information but it needs to be filtered out from the chemistry. This is not easy for the non-chemist and may well limit the usefulness of the book. What is apparent is the way in which the properties of urethane RIM systems derive from the extent of phase separation. Chapter 3 gives a description of the factors which influence the formation of the hard (reinforcing) regions and the soft rubbery phases. Chapter 4 describes the effects of additives in controlling the formation of these hard and soft phases. Chapter 5 indicates how the formation of crystallites affects the kinetics of the formation reaction. Chapters 6 and 7 deal with the rheology and the structure/properties of glass fibre reinforced RIM products.

The third section of the book deals with the non-urethane RIM systems such as

those based on ketone-animal (Chapter 9) and caprolactam (Chapters 10-12). The latter chapters give an interesting overview of the state of the art with nylon RIM systems and provides useful data on performance characteristics.

The fourth section of the book contains six chapters on miscellaneous aspects of RIM technology. These include two chapters mould release, one on RRIM, one on mould filling and one on new developments in RIM equipment. These chapters are particularly good and contain a lot of useful data in their respective areas. The final chapter is on injection moulding of rubber which seems a little out of place in a book on RIM although it does of course involve reaction moulding in the strict use of the term.

One criticism of the book is that it should more accurately have been entitled 'Some aspects of Reaction Injection Moulding' since it only deals with selected topics. Overall it should prove useful to the reader who already has some ideal of what RIM is all about. It contains some new and valuable information but unfortunately as a compilation of papers there is not a coherent approach and much of the information will not be readily apparent to the newcomer.

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