

Preface

Today, designing of machines and dies is done to a large extent with the help of computer programs. However, the predictions of these programs do not always agree with the practical results, so that there is a need to improve the underlying mathematical models. Therefore, knowledge of the formulas, on which the models are based and the limits of their applicability is necessary if one wants to develop a new program or improve one already in use.

Often the plastics engineer has to deal with different fields of engineering. The search for the appropriate equations in the various fields concerned can be time-consuming. A collection of formulas from the relevant fields and their applications, as given in this book, make it easier to write one's own program or to make changes in an existing program to obtain a better fit with the experiments.

It is often the case that different equations are given in the literature on plastics technology for one and the same target quantity. The practicing engineer is sometimes at a loss judging the validity of the equations he encounters in the literature.

During his long years of activity as an R&D engineer in the polymer field at the BASF AG and other companies, Natti Rao tested many formulas published while solving practical problems. This book presents a summary of the important formulas and their applications, which Natti Rao, in cooperation with the well-known resin and machine manufacturers, successfully applied to solve design and processing problems.

The formulas are classified according to the fields, rheology, thermodynamics, heat transfer, and part design. Each chapter covers the relevant relations with worked-out examples. A separate chapter is devoted to the practical equations for designing extrusion and injection molding equipment with detailed examples in metric units.

In addition, this work contains new, straightforward, practical relationships that have been developed and tested in recent years in solving design problems in the area of extrusion and injection molding.

The topic of polymer machine design has been dealt with in several books. However, in these books the know-how was presented in a way that the vast majority of plastics engineers cannot easily apply it to the problems in their day-to-day work. By means of thoroughly worked-out, practical examples this book elucidates the computational background of designing polymer machinery in a manner which every engineer can understand and easily apply in daily practice.

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