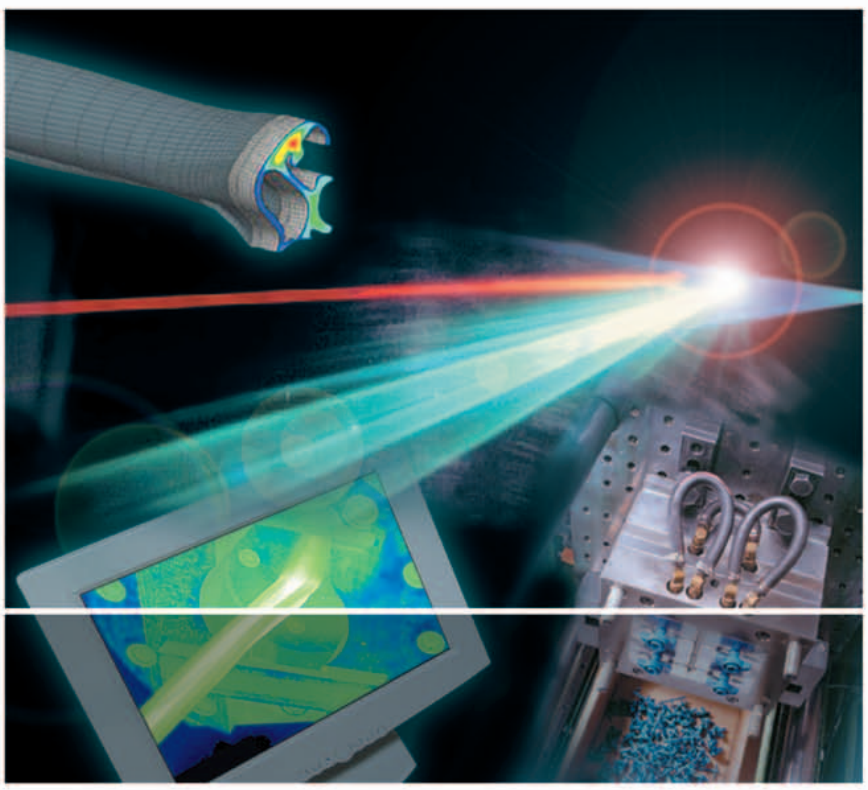
Donald C. Hylton

Understanding Plastics Testing



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Preface

The main objective of this primer on plastics testing is to present the subject in a manner that is understandable by the unlearned yet unchallenged by the learned. The plastics industry with its continued growth, demands of increased quality awareness, and versatility of applications, has forced testing of plastics to become essential to the continued success of the industry. It is important to know how to conduct a test but it is even more important to know what information the test yields and does not yield. This book presents a brief overview of materials, their properties, and attributes that contribute to results obtained from testing.

The primer can be separated into three basic segments. It begins by presenting an overview of material technology. The emphasis is on understanding plastics properties and behavior and how they influence testing. The second segment presents some overviews of popular tests, their background, and uses. It is not possible in the scope of this work to present a summary of all tests. The tests covered here represent the tests that are most frequently included on specifications and data sheets. Some tests such as creep and thermal analysis are included because of the very important information they can provide.

The final segment presents some concepts on quality and quality assurance. No testing laboratory is complete unless it places quality as its number one priority. Quality principles and practices demand thorough knowledge of testing procedures and understandings of the information generated.

Donald C. Hylton
June 2004

Acknowledgements

I owe any insight I may have to my teacher and mentor, Dr. Costel D. Denson. He took the time to personally teach me about rheology. With that he instilled in me a unique and simplistic way of thinking and approaching such a very difficult and complex subject as rheology. He taught me and explained to me what appear to be extraordinary complex mathematical principles. It was this teaching that established a base for my understanding of polymers and their behavior.

Throughout my career, it has been necessary to develop new test methods for new understandings of polymer properties or to select materials for specific applications. From this I developed a love for material testing and became a constant presence in laboratories.

Bill McConnell, the well known and respected plastic consultant challenged me to undertake this effort a few years ago and I have been struggling to meet that challenge since. The effort has led to a series of seminars and to this endeavor.

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