

HANSER

Preface

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How to Improve Rubber Compounds

1800 Experimental Ideas for Problem Solving

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Preface

Rubber compounding is an art as well as a science. This book is intended to be a companion for the earlier book titled *Rubber Technology: Compounding and Testing for Performance*. As indicated in the preface of the earlier edition of this book, the art in rubber compounding is to achieve the best trade-offs in properties and to be able to meet product performance requirements at acceptable production costs.

The objective of this book is to provide the experienced and well-trained rubber compounder with new experimental ideas, which he or she may be able to use to improve certain specific rubber compound properties. Of course, when compounders are considering implementing some of these general experimental ideas for their specific compounds, not only should they thoroughly check out the effects on the target compound property, but also how this change will be affecting other compound properties as well. Generally, any specific change in a rubber compound will certainly affect a wide range of other properties for better or for worse. There always appear to be a wide range of “unintended consequences,” which have to be thoroughly checked out through laboratory testing, factory trials, controlled field evaluations, and so forth. All companies should have a formal approval process and sign-off procedures before any compounding change is allowed in production. Many times, the effective improvement of a rubber compound requires not just one change but an intelligent selection of multiple changes in order to achieve the best overall compromise (best trade-off) in compound properties to more effectively meet the product’s performance requirements.

The new edition now contains over 1800 experimental ideas to improve specific rubber compound properties, which are organized in five chapters covering improving cured physical properties, degradation resistance, measurable processability properties, qualitative processing attributes, and tire performance properties. In addition, this book includes an appendix on rubber blends commonly used for specific product applications and an appendix on commonly used cure systems. The majority of these experimental ideas were

found from a thorough review of the general rubber literature. Another set of experimental ideas was obtained from the companion book mentioned above. Also, a very important source of additional experimental ideas from the first edition was the contributions of the eighteen-member Review Panel for this book (listed in Section 1.6). The additional ideas published in the 2nd edition are the result of an extensive review of over one thousand recent journal articles and conference presentations from rubber societies in the United States, Europe, China, and India.

The experimental ideas given in this book may not work in all specific situations. Changes to improve one target compound property will certainly affect other properties as well, for better or for worse, and this book does not purport to show how these other properties are affected. Also, this book does not purport to address safety and health issues. The information contained in this book is experimental in nature and is meant for individuals with advanced scientific training and rubber compounding experience.

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www.rubberchemist.com