



ASTM'S LONG-AWAITED FUELS AND LUBRICANTS HANDBOOK 2ND EDITION NOW AVAILABLE

The long-awaited ASTM International Fuels and Lubricants Handbook: Technology, Properties, Performance, and Testing 2nd Edition is now available. Although there are other books which delve into various aspects of fuels and lubricant chemistry and applications, what separates this voluminous text from the rest is that few shed light on fluid properties, the science and engineering behind it all, as well as testing methodologies, all in one convenient reference source. This encyclopedic handbook would serve as the pièce de résistance of any petroleum industry bookshelf, library or study. This indispensable manual can be employed as either a stand-alone reference or in tandem with the annual ASTM Book of Standards.

This handbook, which was just published, provides an overview of test methods, in addition to the applications-adjacent properties being tested. It contains dozens of contributions organized in sections on petroleum refining processes for fuels and lubricant basestocks; fuels, hydrocarbons and synthetic lubricants; and performance/property testing procedures.

It tackles many topics pertinent to the 21st century, which were omitted in the premiere publication released in 2004, since the technology of fuels manufacturing has continued to evolve as we have moved to "ultra low sulfur" and "low emission" fuels of today. Also, renewable fuels to supplement petroleum-based fuels are now extensively utilized worldwide with increasing frequency. These fuels were scarcely available, or in use, when the inaugural edition was published. Furthermore, the fuels chapters in this manual have been vigorously updated to encompass references to recently developed technologies of fuels manufacturing. In addition, cutting-edge test methods employing computerized instrumentation to evaluate all physical, chemical and performance properties of fuels have been expounded upon. The latest fuel product specifications from the U.S., Canada, Europe and Asia have been encompassed and expounded upon in exacting detail. Finally, the continued regulation of emissions from engines burning fuels has been updated.

This tome is an indispensable tool for the student, neophytes, seasoned professional and everyone in between. The premiere section of this book is titled: "Petroleum Refining Processes for Fuels and Lubricants Basestocks". Two of the new chapters included in this section are "Asphaltenes Review: Characterization and Modeling" and "Coal-to-Liquid Conversion Processes: A Review." The succeeding section is called "Fuels, Properties

and Performance". In this portion, the fuels chapters have been organized to present a foundational historical perspective at the intermediate level. A discourse on newer developments is included therein and extensively referenced to allow for more advanced self study. Physical, chemical and performance properties of fuels are discussed thoroughly, as are test methods used to discern these properties. Innovative computerized and spectroscopic instrumentation methods are discussed. Also found in this section are methods used to help define "contamination" and/or "cleanliness" of fuels. The most current fuel product specifications from the U.S., Canada, Europe and Asia have also been included and discussed thoroughly.

This more than 1500-page compendium has been edited by three industry experts George E. Totten, past president of the International Federation for Heat Treating and Surface Engineering (FHTSE) and a fellow of ASTM International. He has been the author or coauthor of approximately 800 publications including patents, technical papers, chapters and books. Dr. Raj Shah, director at Koehler Instrument Company, based in Long Island, NY, is the other esteemed editor. He is an elected fellow by his peers at STLE, AIC, NLGI, IChemE, CMI, InstMC, the Energy Institute and the Royal Society of Chemistry. This Chartered Petroleum engineer who has a Ph. D in Chemical Engineering from Penn State University and a Fellow from the Chartered Management Institute, London, played a key role, and was an editor for the first edition of this book as well. He has coauthored more than 250 publications and is well known to readers of Petro Industry News. The other illustrious contributing editor, David Forester, serves as a consultant to the oil industry and has more than 40 years' experience in the fuel and refining additive business. He holds more than 35 U.S.

patents on development of diesel and jet fuel additives, refinery antifoulants and other refinery and process-related additives. This is just to name a few of the most salient accomplishments of the venerable contributors to the sophomore edition of this extensive work. Comments from all three of the editors can be found at https://www.astm.org/DIGITAL_LIBRARY/MNL/SOURCE_PAGES/MNL37-2ND.htm

Petro Industry News had a chance to speak to one of the editors about this book release. Dr. Shah said of this impressive sophomore edition, which he and his colleagues are now eager to share with the world, "A book like this is a comprehensive book that needs to be on a reference shelf of every petroleum laboratory everywhere in the world." He continued when asked why this is such an indispensable resource for anyone in the industry to possess he replied, "What the editors and authors have done in this book, essentially, is they have harnessed the information from a variety of different sources, not just from the ASTM standards, but also going all over the world and looking at what standardization and test methods are used for evaluating fuels, lubricants, grease, all kinds of petroleum and petrochemicals. Dr. Shah added that the book they have gone on to produce, in contrast to the prior edition, is an "up-to-date snapshot ... of where the testing industry stands and where the test methods are. This compendium, however, doesn't stop there. "A lot of people do that," conceded Dr. Shah, "What we have been able to do is then go behind the scenes and understand [questions such as] Why is this test method necessary? Why does somebody need to do this test? What is meant by the results of this test?"

If you own a copy of the first edition then you are cognizant of the fact that some of these topics were addressed there as well.



However, about a decade and a half has passed since then and “the world as moved on, technology has moved on,” informed Dr. Shah. He noted that diesel fuel has progressed over these past 15 years; biodiesel has also evolved as has gasoline and the petroleum and petrochemical industry regarding testing techniques and other issues. “This book addresses all that, but more importantly, it addresses alternative ways in which these things are done all over the world.” Dr. Shah added that this book aids in extrapolating topics such as what the best answers mean, how to interpret these results and how you make sense out of these findings. It discusses the science and engineering, from an insider’s perspective, in the production and testing of all petroleum products.

This sweeping vade mecum has been in production for almost eight years, necessitating many iterations in order to keep up with the latest industry innovations. “You have to make a lot of changes since as we were getting closer to finishing the manual things have changed,” Dr. Shah added, “In fact, it took so long that we had to update some things in the last year to be the most current. The hard work and dedication of all the authors, my coeditors and ASTM staff is the only way this book finally got completed.”

The impact of this publication on the petroleum industry cannot be overestimated as Dr. Shah elucidated, “Sometimes an engineer, a petroleum engineer or a petroleum chemist, needs a one-source reference which will help him to get everything, and this is exactly that.” While, Dr. Shah volunteers that this voluminous text will not necessarily be exhaustive in answering all questions pertaining

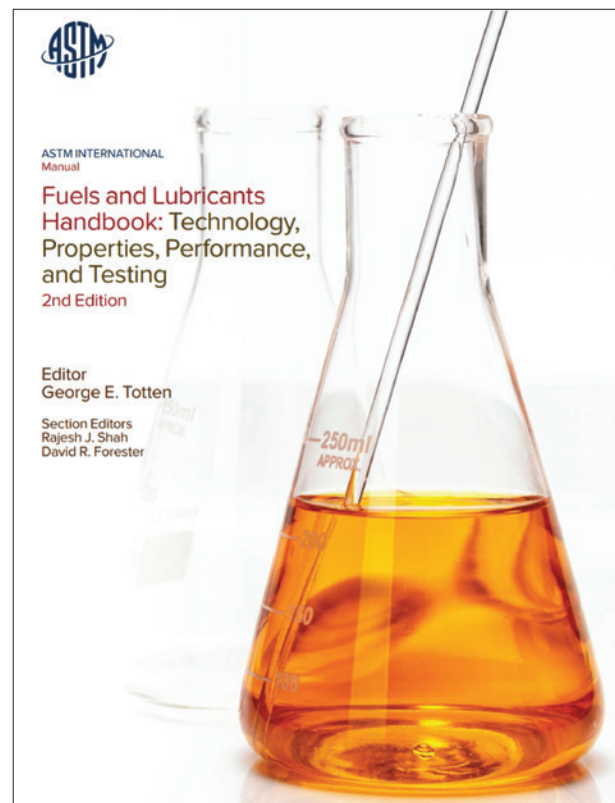
to a given subject, this book can be used as an entry point, and de facto survey course, on subjects such as used oil and refining, synthetic lubricants, new diesel specifications, etc., in addition to providing introductory insights into topics such as how NMR, or a GC, works in regard to petroleum products. “It will give you enough information to answer what the latest tests are, and it will give you information to explain what these new tests mean, what the results mean, how you should interpret the results and what the data changes are,” said Dr. Shah. One of the most useful aspects of this comprehensive reference tool is that it has, “an extensive list of references.” According to Dr. Shah, “So for somebody who wants to really dig into the subject, then you go inside the list of references, and you’ll be able to find a lot more material.”

This extensive tome is singular in the remarkably broad scope of topics available to you in one easy-to-access volume. “It is almost like the Encyclopedia Britannica for the petroleum industry,” says Dr. Shah. “It is the one-source stop for the petroleum and petrochemical industry.” “While this book will be able to provide a lot of answers directly, if someone needs to investigate thoroughly into a topic, this compendious signpost will point to places to go from there. Due to the all-encompassing nature of this latest edition, the objective is for it to be a “widely-used reference book at all refineries, at all lubricant plants, at all grease plants, asphalt plants, and used by professors, and by people doing research in a field,” said Dr. Shah. “They can look at the list of references, and get a ton more; so that’s what we’re hoping will happen from this publication.”

This book is for anyone who wants to enter or stay up-to-date in this industry. This link explains a bit more about that <https://youtu.be/gaAiW7sCQwk>

“Whether he or she wants to work at an additive company, or wants to work in refining, as a petroleum engineer, or to work as a chemist. Whether someone wants to work as a formulation person, or wants to work in sales and marketing,” said Dr. Shah, “They need to understand how certain products are made, and this book gives you all of that information.” The contributing editor underscored that this manual is for every kind of petroleum chemist, refiner or lubricant specialist as well as an indispensable addition to libraries, academia and for students who are either in the process of completing graduate or undergraduate level work in chemical engineering and chemistry. “It has a wide audience, and each one will get something different out of it,” said Dr. Shah. “For someone in the industry for 30 years, they might find a list of information in there which they did not know about as well. So, it’s written for the novice as well as somebody who really is looking to get right behind the scenes into details on how products are made, tested and what results mean.”

More details on the book can be found on the ASTM Website at https://www.astm.org/DIGITAL_LIBRARY/MNL/SOURCE_PAGES/MNL37-2ND_foreword.pdf



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Mr. David Phillips has been with International labmate for over two decades and is currently International Sales Manager for Petro Industry News for over a decade.



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