

# Preface

There are many books on various aspects of fuels and lubricant chemistry, applications, and testing. However, few focus on testing and none provide extensive, in-depth coverage on fluid properties and testing methodologies together. And while there are numerous national and international standards that deal with specific testing procedures appropriate for fuels and lubricants, it is generally beyond the scope of these procedures to provide an extensive discussion of the principles behind the tests and their relationship to the properties themselves. Therefore, there is a strong need to address these informational shortcomings in the Fuels and Lubricants industry, which is one of the most significant tasks undertaken in this work.

The ASTM *Fuels and Lubricants Handbook: Technology, Properties, Performance, and Testing* is an extensive, in-depth, well-referenced handbook that provides a detailed overview of various testing methodologies and also provides a thorough overview of the applications-related properties being tested. Since this manual provides an overview of all of the ASTM and important non-ASTM test procedures relating to the application areas addressed, it is an excellent companion text to the *Annual Book of ASTM Book of Standards*, or it is an invaluable reference manual on its own.

The organization of the ASTM *Fuels and Lubricants Handbook: Technology, Properties, Performance, and Testing* is based approximately on the committee structure of the ASTM D.02 Petroleum Fuels and Lubricants Committee and the standards for which each committee is responsible. The information in this text is subdivided into four sections: I–Petroleum Refining Processes for Fuels and Lubricant Basestocks; II–Fuels; III–Hydrocarbons and Synthetic Lubricants; and IV–Performance/Property Testing Procedures.

This manual contains thirty-eight chapters covering the following topics:

- An overview of petroleum oil refining processes
- Liquefied petroleum gas (LPG)
- Aviation, automotive diesel, non-aviation gas turbine, and marine fuels
- Gasoline and oxygenated fuel blends
- Petroleum hydrocarbon base oil chemistry
- Synthetic hydrocarbons
- Environmentally friendly fluids including those formulated from vegetable oil and synthetic ester basestocks
- Lubricating oils for turbines, compressors (industrial and refrigeration), gears, and automotive applications
- Metalworking fluids
- Petroleum waxes
- Lubricating greases
- Oils used in non-lubricating applications: heat transfer fluids and metal quenchant
- Detailed discussion on: static petroleum measurement, volatility, elemental analysis, fuel combustion characteristics, oxidation, corrosion and viscosity
- Properties of coke, petroleum pitch, and carbon materials
- Hydrocarbon structural analysis procedures
- An extensive discussion of lubrication and wear
- Environmental and toxicity testing
- Statistical quality assurance testing procedures

Essentially, all of the numerous important applications and test methods involved in the Fuels and Lubricants industry are discussed and referenced here. We strongly believe that this book will be an invaluable resource for anyone working in this industry, especially since this information is not available in any other single source.

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