

BOOK REVIEWS

1983 IP Standards for Petroleum and Its Products Part 1. Methods for Analyses and Testing, Vol. 2 Methods IP231-364

Reviewed by George V. Dyroff, Exxon Research & Engineering Co., Linden, NJ. Member of ASTM.

REFERENCE: Institute of Petroleum, London, 1983 *IP Standards for Petroleum and Its Products, Part 1. Methods for Analyses and Testing, Vol. 2 Methods IP231-364*, Wiley, New York, 1983, ISBN: 0-471-26266-8, hardcover, \$145.00, 364 pp.

This publication of the Institute of Petroleum (U.K.) is a collection of analytical test methods useful for evaluating quality parameters of petroleum products. It is analogous to a similar U.S. publication, *ASTM Book of Standards*. Although the information contained is particularly applicable to the United Kingdom, petroleum laboratories throughout the world can benefit by having copies in their possession. This issue updates the contents to 1983.

The ready accessibility of peripheral information is a particularly useful feature. The numerical list of methods, for example, clearly identifies those methods that are joint with ASTM and also indicates which institute panel is responsible for the method. An appendix provides the names and affiliation of panel members.

The over 100 methods follow a standard format, as they should, and are clearly written. Where appropriate, original literature references are provided. All drawings, figures, and pictures are clearly printed and readily understood. Pagination is novel and useful since it combines the test procedure number with a serial number.

Technical content of the procedures is beyond reproach and covers techniques ranging from classical wet chemistry to modern instrumentation (for example, nuclear mass resonance spectrometry and nondispersive X-ray fluorescence spectrometry). Some of the instrumental methods have included, as an Appendix, a guide to trouble shooting: a particularly useful addition. Process analyzers are also addressed in these standards with guidelines for calibrating and validating such instruments. An interesting discussion is presented on the differences between on-line analyzers and standard laboratory instrumentation.

In most instances, precision statements are included in the method. There are a few methods that lack precision statements even though they are amenable to usual statistical treatment; the reviewer feels it is premature to accord these methods status as standards.

While most test procedures described are intended for quality assessment of petroleum products and crude oils, some techniques have been provided for the characterization of pollutants of petroleum origin on seas and beaches. This is a noteworthy aid for tracing the origin of certain spills in the environment.

Generally speaking, this is a well conceived working manual for petroleum testers. The test procedures are well written, easy to follow, and technically sound. Considering the rapidity with which these test methods are revised or replaced, it is remarkable that only

one oversight has been spotted; there is a reference to a long discontinued ASTM method, D 526. That this is so is a tribute to the editorial staff of the IP.

The Govmark Book on Flammability Standards and Flammability Test Methods of Textiles, Plastics and Other Materials Used in Home and Contract Furnishings

Reviewed by Clayton Huggett, senior scientist, Center for Fire Research, National Bureau of Standards, Washington, DC. Member of ASTM.

REFERENCE: Messina, S., *The Govmark Book on Flammability Standards and Flammability Test Methods of Textiles, Plastics and Other Materials Used in Home and Contract Furnishings*, The Govmark Organization, Inc., P.O. Box 807, Bellmore, NY 11710.

With what flammability standards must my product comply? What agencies will have jurisdiction over the fire performance of my product? What flammability tests should I have performed to characterize its fire performance? How does its fire performance compare with that of competitive products? These are questions that are frequently asked by material suppliers, manufacturers, interior designers, and retailers but the answers are not always readily available, even to those with some familiarity with the fields of flammability standards and flammability testing. It is to questions such as these that this handbook seeks to provide simple answers.

With increased recognition of the role of building contents in destructive fires has come increased pressures to regulate their flammability properties. This is countered by traditional American insistence on freedom of choice in the selection of possessions, the difficulty in regulating highly mobile furnishings, and the highly fragmented nature of the regulatory system in this country. The result has been a fertile field for the development of diverse regulations by a variety of government agencies, federal, state and local, and by voluntary standards bodies and trade associations.

Chapters cover the requirements of the building codes and federal agencies, state and local jurisdictions, and voluntary industry associations. Standards applicable to various products and for use in various occupancies are called out. Cited test methods are described briefly but the reader is cautioned that reference to the actual text of the standard may be necessary to assure compliance. The sources of the relevant documents are given.

The loose-leaf format of the book suggests that updated material may be supplied from time to time, although none was furnished with the review copy which was about two years old. The slow pace of promulgation of flammability standards may make frequent updating unnecessary, but the situation is less satisfactory in a short chapter on Future Flammability Standards and Test Methods. Brief discussions of topics of current active investigation, such as heat re-

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lease, toxicity, and room fire tests are out of date in these rapidly moving fields and do little more than alert the reader to the attention being given to these topics.

A major impression gained from this handbook concerns the sorry state of flammability standards for building contents in this country. Fragmented jurisdictional authority, gaps and overlaps, and a multiplicity of test methods differing only in nonessential details such as sample dimension, ignition source, or acceptance criteria, add to the confusion. This book achieves its limited purpose of providing a pathway through this regulatory maze. Readers hoping for a deeper discussion of regulatory philosophy or testing technology will be disappointed—but such was not the author's purpose.

Gas Tables: International Version. Thermodynamic Properties of Air, Products of Combustion and Component Gases, Compressible Flow Functions, 2nd Edition (SI Units)

Reviewed by Neil A. Olien and V. D. Arp, Chemical Engineering Science Division, Center for Chemical Engineering, National Bureau of Standards, Boulder, CO. Mr. Olien is a member of ASTM.

REFERENCE: Kennan, J. H., Chao, J., and Kaye, J., *Gas Tables: International Version. Thermodynamic Properties of Air, Products of Combustion and Component Gases, Compressible Flow Functions, 2nd ed. (SI Units)*, Wiley Interscience, New York, ISBN: 0-471-08874-9, 1983, 211 pp.

This is the SI version of the second edition which was published in 1980 which in turn replaced the 1948 edition of *Gas Tables*. The first edition served the field of fluid and combustion mechanics for nearly two generations and the current edition and SI version continue the tradition. The conversion from engineering to SI units is complete

with the exception of minor parts on pp. 184–185. The 21 illustrative calculation examples, a key to making the tables of practical use, have all been converted to SI units. The changes from the 1948 edition are the addition of tables for 100% air combustion with hydrocarbon fuels (Tables 7 and 8) and the elimination of tables of logarithms. The principal difference between this edition and that of 1948 is the improvement of the accuracy of thermodynamic properties by using more recent correlations. In this case, however, the authors have failed to use the most modern correlations and data for real and ideal properties, especially those published in the 1970s by the NBS and the IUPAC Thermodynamic Tables Project. Differences would be slight, but together the NBS and IUPAC work cover all of the single components with the exception of carbon monoxide. These latter tables do not, of course, contain equations for combustion and compressible flow which are central to this book and thus in no way replace this book. By the same token, the NBS and IUPAC tables contain real gas properties that cannot be neglected in all instances.

This book of tables is directed primarily toward the specialized field of gas turbines and will be used by specialists working in that and allied fields. The strength of the tables is that they provide a modern version of tables to these specialists in a form completely compatible with the 1948 edition, thus requiring no change for the engineers accustomed to the earlier tables.

It would have been of great service to the users with ready access to microcomputers and programmable calculators if the functions used to produce the tables had also been provided with the appropriate tables. This would have allowed inclusion of the data in other computer programs as well as the obvious advantages in interpolation. The tables could then be used to verify the performance of the calculational programs.

These tables are to be recommended to engineers working in the field of gas turbines and related fields. The work is carefully done and the authors are to be commended for the excellent sections on calculational methods. Those sections are well written indeed.