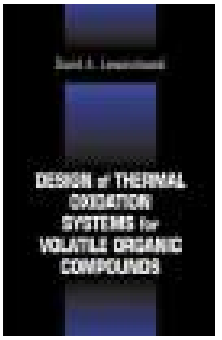
Books

Design of Thermal Oxidation Systems for Volatile Organic Compounds



David A. Lewandowski
Lewis Publishers, Boca Raton, FL, 348 pp., $79.95, 2000

How often have you purchased a book on a particular topic in hopes that it would provide a good overview with sufficient technical detail and background to be useful and practical, then have been disappointed? Here is a great book that provides an excellent balance of background, theory, and practical knowledge to cover thermal oxidation for controlling emissions of volatile organic compounds (VOCs). It is comprehensive with 15 chapters exploring a range of topics including regulatory background, combustion chemistry, material and energy balances, burner and combustion-chamber design, heat recovery (with one complete chapter devoted to the complex and popular regenerative design), catalytic oxidation, combustion and post-combustion NO_x control, wet and dry acid-gas scrubbing systems, and safety systems. The last chapter contains a design checklist of topics to be considered during specification and purchase. Each chapter is well done, making the book especially well-suited for someone who works with thermal oxidizers and has expertise in one area, but needs more information on the whole range of subjects that are involved with this topic.

What makes this book so excellent? It is how Mr. Lewandowski distills the broad subject to target just what is important. Examples abound: Chapter 2 on environmental regulations gives a brief summary of the Clean Air Act, but particular attention is devoted to the Title III MACT standard program for air toxics, many of which are VOCs. Chapter 4, "Combustion Chemistry," shows how SO_3 formation affects the acid dew point of exhaust gases; although, unlike the practical nature of the rest of the book, this topic is covered only theoretically.

Chapter 5 provides a good discussion of mass and energy balances with appropriate topics including lower and higher heating values, auxiliary fuel requirements, flame temperature, excess air, and water quenching. Because there can be so many compounds in a mixed VOC stream, an approximate method is provided for determining the VOC heating value. Chapter 7 furnishes practical information about design, including various types of burners, residence chambers, refractories, mixing, and typical arrangements. Chapter 10 is devoted to regenerative heat recovery using ceramic beds. The final chapters detail air pollution control-systems, safety systems, and a design checklist. Even the appendices are practical with comprehensive lists of key information, such as incinerability ranking. I hope that you can tell from this review that I highly recommend this book.

Charlie Brown

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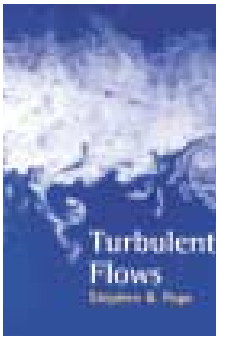
Turbulent Flows

Stephen B. Pope
Cambridge University Press, New York, 771 pp., indexed, hardback: $130.00, paperback: $49.95, 2000



This is an extensive treatise on the theory and modeling of a variety of detailed turbulent flows. The book is intended as a text for a graduate course, which has been taught by the author for a number of years. It is organized into two parts, plus appendices. Part I includes a general introduction to turbulent flows and how they can be described quantitatively, considering the fundamental physical principles involved. The topics included address the Navier-Stokes equations, statistics of turbulent flow fields, and the Kolmogorov hypothesis. Part II is concerned with modeling and simulation of turbulent flows, including direct numerical simulation, turbulent-viscosity models (such as the *k*-model), Reynolds-stress models, and large-eddy simulation. Details of the mathematical techniques used are given in ten appendices.

The approach is entirely mathematical, with quite a few exercises for the student scattered throughout each of the 13 chapters. Many of the exercises ask the student to "show that... " and, hence, serve to amplify the material in the text. The complexity of the topic is somewhat demonstrated by the fact that the list of nomenclature covers 14 pages! Despite that many of the mathematical tools are summarized briefly in the appendices, the reader is expected have a thorough grounding in fluid mechanics in general, and a significant mathematical acuity. The book could have benefited greatly from more-detailed physical descriptions of the processes considered to help the reader appreciate the physical nature of these topics. This book is a useful compendium of the fundamental theories and models relevant to a variety of turbulent flow situations for the relatively advanced theoretician. However, it is not one that the practicing engineer would be likely to find useful for direct application to engineering problems.

Ron Darby

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Multi-Media Fluid Mechanics

G. M. Homsy, et al.
Cambridge University Press, New York, CD-ROM, $19.95, 2000

This is a rather remarkable CD, if for no other reason than the shear number of different videos, animations, illustrations, etc. (in the hundreds) that are included. These are grouped under five headings: dynamics, boundary layers, kinematics, history and video library. However, within each of these categories (except for history) there are multiple menus and sub-menus listing items such as virtual labs, demonstrations (experimental and computational), simulators, flow visualization, etc. Navigation through the CD requires some getting used to and can be confusing because of the variety of methods for getting around (from the main and multiple sub-menus, a topics list, various pull-down menus, special features, a video gallery, etc.)

Use of the videos, simulations, visualizations and animations can give life to the corresponding still pictures or board drawings usually used in the classroom. Of particular interest are the video clips illustrating boundary layers, wakes, flow paths, etc. The history category contains interesting bibliographic sketches of a number of famous scientists. The CD is intended as a companion for any course in fluid mechanics, and there is an extremely wide variety of illustrations to choose from, to complement any such course.

It would take hours to completely peruse the entire disk, and navigating through it can sometimes be confusing. (One error was found in browsing the disk — the mathematical definition of the speed of sound is inverted).

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Intellectual Property: A Guide for Engineers

ASME Press, ASME International, New York, 60 pp., $13, 2000
To order: Visit www.asme.org or call (800) 843-2763

This soft-cover publication is small in size (about 5×8 in.) and only 60 pp., but is densely packed with information on intellectual property. Although no authors are listed, the book comes from an authoritative source, the Intellectual Property Law Section of the American Bar Association. Chapters are on patents, copyrights, trademarks and service marks, trade secrets, intellectual property and the Internet, and international protection of intellectual property. Much useful information is included, individual topics are easy to locate, and it is a refreshing note that the (unidentified) authors have adopted a reasonably sophisticated tone, rather than the condescending one that is often found in intellectual property books directed to non-lawyers.

As with any book that tackles a subject so broad in scope, the authors are faced with what to leave out and how much detail to provide on what they include. They do give a good sense of what the differences are between patents, copyrights, trademarks, and trade secrets, and how to choose between them. Another fortunate choice is including advice on how to preserve the right to patent and preserve trade secrets, particularly useful to the working engineer. The book also has information on the impact that the Internet has had on intellectual property and the types of protection and remedies for those who use the Internet to conduct business.

In trying to cover so much in so few pages, however, treatment of individual topics is out of proportion to the topics themselves, and some of the most obvious questions are misleadingly addressed or left unanswered. The chapter on patents, for example, is 11 pages long, the same as the trademarks chapter and only two pages longer than the copyrights chapter. Not all patents have "a term ending 20 years from the date of filing" — some are still 17 years from their issue date, and the book contains some other statements that are incorrect. The book lists activities that constitute patent infringement, but fails to include the most recent one, *i.e.*, an offer for sale of an infringing product, despite mentioning the statute that added this in.

Mention is also made of the "one-year grace period" for a U.S. patent after public disclosure, that no such period is available for "corresponding foreign patents," and that those interested in foreign patents must therefore file their U.S. application before any such disclosure. The book fails to explain that foreign patents will only be "corresponding" if they are filed within one year from the U.S. patent. The place for this explanation would be the chapter, "International Protection …," but this chapter does little more than mention the Paris Convention and the Patent Cooperation Treaty that are so critical to multinational patents, and leaves out the critical facts about both of these agreements. Among the topics left out entirely is patent interferences, *i.e.*, which among competing applicants is awarded a patent, a topic of concern in today's highly competitive technologies.

The chapters on copyrights, trademarks and trade secrets do a better job. Amusingly, however, the Uniform Trade Secrets Act is incorrectly referred to as "USTA" rather than UTSA. This is not trivial , since "USTA" to the intellectual property lawyer means the United States Trademark Association (now the International Trademark Association), an organization that has nothing to do with trade secrets.

Perhaps the key to this book is its title page, which presents it as "A Project for the Committee on Issues Identification" of ASME. Identifying issues is always a good starting point for engineers and attorneys, but whether this is the intent of the authors is unclear, since the book fails to acknowledge the wide differences in the degree of detail that it provides among the various topics. Readers should be forewarned that in the patent area at least, the book is little more than an overview of selected topics, and professional advice is still needed before any strategies are set.

M. Henry Heines

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