

Preface

What is the purpose of the publication of this book?

This book was actually written and published from the year 2000 [1] in the form of articles in various Russian and foreign journals or conference papers.

You can find all these “thermal engineering” publications on the two Web sites: <http://twi.mpei.ac.ru/ochkov/work1.htm> and <http://twi.mpei.ac.ru/ochkov/work2.htm>.

So why do you need an additional publication in book form? In particular nowadays, the traditional (“paper”) book publishing is going through hard times. Usually are only those books published, where the costs of publication are paid in advance, either by the author, state, university, research institute or a business organization. In this case, you have to save on everything: on the reviewers, scientific and literary editors, proofreaders, etc. Therefore, the quality of many books can be reduced.¹ Therefore, still numerous inaccuracies and/or errors remain in the text, and because of this, books often unfortunately are overlooked. Publishers often have no alternatives to this method. The competition between traditional publishing and electronic (by Internet) publishing is very intense. Often, someone just scans the book, posts it on the Internet, and consequently, blocks its sale fully or partially. Further details on this topic are provided in [2].

However, it was possible to publish this book, and the reader is able to hold it in his hands and read it. What is the price—this is the second question. The authors do not think about the commercial success of the book. The most important thing for the authors is that this book is useful for the readers. It does not matter how the book published: hard copy, electronic form including live Internet calculations, etc.

So, why this book was published?!

“There is nothing more pleasant than to smell a printed book”, especially, if you are one of the authors and you can see your own name on the book. The Internet has nowadays a great speed and accessibility, but traditional technical books usually are published as hard copies. If you have printed version of the book, you can present it

¹It is often said: “reduced to the level of the Internet”. However, the Internet has also many decent titles with proper content and design.

to somebody, to a research institute, or even to a university. This cannot be done with an Internet site. Although an Internet site has also its own advantages, you can hotfix bugs and add new material or diagrams, illustrations, etc. We will not argue about what is better—the book or the Web site, and will actively take the advantages of both “media products.” Another advantage of paper books is that you can read on the couch or even when you are on a trip. But nowadays, there are also e-books or tablet computers, with which can also read on the couch and additionally make electronic bookmarks and fast search in the text. The authors both fear and hope that after their book is published, someone will scan it and post it on the Internet (see above). They fear because the publishers and authors lose money, and they hope because it is an indirect indication that the book is interesting and the readers demand it. Bad books, which nobody reads, are not pirated and posted on the Internet.

Now, about the authors of this book.

There are Valery Ochkov, Konstantin Orlov (Moscow Power Engineering Institute—www.mpei.ru and Thermocenter, named V.P. Glushko, Joint Institute for High Temperatures, Russian Academy of Sciences—www.jiht.ru) and Volodymyr Voloshchuk (National University of Water Management and Natural Resources Use (Rivne, Ukraine—<http://nuwm.edu.ua>). Nikolay Rogalev (Moscow Power Engineering Institute) is an editor of this book. Usually, you note which of the authors of the book have written which chapter of the book. However, in this book, it is hard to do. Here, it is better to talk about the contribution by each of the authors. One of them created a function on the properties of substances (working fluids); the other one created a Web site and the third one wrote and debugged Mathcad programs. Most texts were written by Valery Ochkov and edited by Nikolay Rogalev and all of the other authors. If the reader encounters in the book the word “author,” then all of the above persons will be meant. The words “I,” “we,” “me,” “my,” etc., in the texts of this book are all its authors and readers are meant, like “as we noted above,” “we see on the chart,” etc.

In this book, the reader will not find the traditional description of thermal engineering processes. The authors do not add anything new to these descriptions and only rewrite existing texts² available in “more respectable books” [3–7]. The purpose of the book is how to use modern software tools, in particular Mathcad and the Internet for the calculations of thermal engineering processes.

The book contains *Studies*. What is this? In the language of musicians and chess players, “Studies” (“chess problems” and “musical sketches”) are a little exercise to practice some elements of the play/game. The studies of this book do not seek to teach those who wish to work professionally with Mathcad. The studies show the basics of working with Mathcad, “work out some elements of the play/game” in the environment of the program. The examples showed for simple and clear problems involving current issues of computational mathematics (solution of equations and systems—algebraic and differential, optimization, statistics, mathematical

²Therefore, by the way, many authors of study books do this.

modeling, the technique of symbolic transformations, graphs and animations, etc.). The word “study” in art means a sketch, which is a part of a future picture. Studies of this book are not only exercises, but also a kind of sketches, where the attentive reader will find many useful tips and interesting ideas that will be useful to him in the future when writing large Mathcad paintings, related not only to thermal engineering.

The Web site of the book is <https://www.ptcusercommunity.com/groups/thermal>, where readers will also find how to contact the author. A lot of effort and money are invested in the Web site. The development of the Web site was supported by grants of the Russian Foundation for Basic Research (www.rffi.ru) and the budgetary funds allocated for the development of the Moscow power Engineering Institute (www.mpei.ru) as a national research university.

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