

SADIK KAKAÇ, RAMESH K. SHAH and WIN AUNG  
(Editors), **Handbook of Single-phase Convective Heat Transfer**. Wiley, New York, 1987.

THE EDITORS of this volume set themselves the objective of 'furnishing the latest design and research information in the area of single-phase convective heat transfer to practising engineers, researchers, academicians, and students'—and they have succeeded admirably in this ambitious aim.

The text is made up of 22 chapters, each a treatise on a particular aspect of the subject written by an expert in the field. The mainstream subjects are given due attention; topics covered include forced convection in external flows, in ducts, and in tubed equipment and heat exchangers, and natural and mixed convection in internal and external flows. In addition, a number of chapters are devoted to rather more esoteric topics, such as heat transfer in liquid metals, electric and magnetic effects, non-Newtonian flow and heat transfer, and the effects of temperature-dependent properties, of radiation and of fouling. In all what is provided represents an extremely comprehensive coverage of a vast subject area.

A uniform style of presentation is used throughout the text. In each subject the discussion proceeds systematically from a presentation of the basic concepts and equations (usually in differential form), via relevant theoretical analyses, to the presentation of results in the form of empirical formulae, graphs, and tables. Each chapter is supplied with its own list of references and nomenclature—in the latter respect it should be remarked that a (largely successful) attempt has been made to ensure consistency in the use of symbols throughout the volume.

Those producing a handbook of this kind in the late 1980s are faced with a dilemma. The book is intended, in large part, to assist those concerned with the solution of practical problems involving convective heat transfer; and it is readily apparent that computer-modelling techniques are playing an increasing role in the solution of such problems, supplementing or replacing the use of design data or practical tests.

How should a heat transfer handbook reflect this? Should it adopt the 'ostrich' approach, and pretend that computer modelling does not exist—or will not catch on? I am glad to

say that the present volume does not make this mistake. Instead it adopts a middle line, by introducing computer-modelling techniques into the discussion wherever appropriate, and providing references for those wishing to study the subject further. For example, there is, in Chapter 2, an elegant review of turbulence models and their role in external forced convection; and Chapter 13 includes a discussion of the application of finite-difference and finite-element methods to natural convection in enclosures.

It can be argued, however, that the recognition of the importance of computational fluid dynamics in this subject area should go further. The prospective problem solver could be given advice on the usefulness, and dangers, of such techniques for particular classes of problems; and results obtained via computer-modelling techniques could be included alongside the more usual empirical data and formulae. I look forward to the next edition of this handbook, in which I hope that the editors and contributors will find ways of extending their otherwise comprehensive treatment of the subject in these respects.

At the end of the day the real test of a handbook of this kind is how it performs in practical use. It is unlikely to be read as a textbook, except by the most determined reader. Instead it will be used selectively: as a source of data, correlations or property values required for a particular purpose, as an introduction to an aspect of the subject with which the reader is unfamiliar, or as an *aide-mémoire* for material with which the reader ought to be familiar. I have, during my relatively short acquaintance with the book, sampled all three roles, and found that it performs them well. The comprehensive index makes it possible easily and quickly to locate particular tit-bits of information; and the readability of the text and the extensive lists of references make the book ideal for educational and re-educational purposes.

The editors and contributors are to be congratulated on the creation of this handbook. It should, in its own way, become a bestseller.

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