Int. J. Heat Mass Transfer. Vol. 23, p. 251
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BOOK REVIEW

Fluid Flow and Heat Transfer. AKSEL L. LYDERSEN, John Wiley, New York (1979).

THIS BOOK is intended for chemical engineers. It is not a textbook in the sense that the subjects of fluid flow and heat transfer are developed as they should be for beginners in the subjects: indeed, the first sentence of Chapter 1 runs: "It is assumed that the fundamentals of fluid statics and fluid mechanics are known by the reader". This sentence conveys much of the style of the book, which is terse, unpretentious and business-like.

The Chapter headings are:

1. Pressure drop in pipes, channels, fittings and equipment.
2. Dimensional analysis and dimensionless groups.
3. Flow measurements.
4. Pumping, compression and expansion.
5. Agitation.
6. Particle and drop mechanics.
7. Liquid filtration and flotation.
8. Atomization, dispersion, homogenization, crushing and grinding.
9. Steady state heat transfer.
10. Unsteady state heat transfer.
11. Energy economy.

There are two appendices:

1. Units, conversion factors and symbols.
2. Physical properties of gases and liquids.

There is a well-organised index.

The author has made it his aim to collect together as many useful formulae as he can and to present them in an easy-to-use fashion. There is sufficient text separating the formulae and tables to make the book one which is pleasant to read; but the density of useful information per page is not much less than that of a well-constructed handbook.

The reviewer's liking for the book is a consequence of two characteristics, of quite different natures. The first is its undoubted utility: the designer looking for a formula will often find what he wants in this book. The second is a touchingly naive quality which may be illustrated by the following passage:

"The heat-transfer coefficient h_f of a heated or cooled falling liquid film at a vertical wall (Figure 9.14) is measured to be[21]

$$\frac{h_f s}{k} = C\,\mathrm{Re}^m\,\mathrm{Pr}^{0.344}\left(\frac{\mu}{\mu_w}\right)^n \tag{9.30}$$

where

$$s = 0.3\left(\frac{3\mu^2}{g\rho^2}\right)^{1/3}\mathrm{Re}^{8/15}." \tag{9.31}$$

A table of C's, m's and n's, with their Reynolds- and Prandtl-number limits of validity, then follows.

The confidence in the well-ordered simplicity of Nature which underlies such passages (of which the book is delightfully full), is reminiscent of an age in which all true gentlemen believed in God, democracy and motherhood. As one who worries about how to extend turbulence models to falling films, and what boundary conditions to impose at the wavy free surface, the reviewer experiences the regrets of the agnostic, envying the believer his simple faith.

The book uses SI units consistently. It is well printed and illustrated. If this reviewer had not received his copy free, he would have bought one.

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