

Mechanical Engineering Handbook, CD-ROM Version, Frank Kreith, Editor-in-Chief, CRC Press, Boca Raton, FL. \$129.00.

REVIEWED BY EDWARD B. MAGRAB¹

This CD-ROM is the electronic version of the 2600 page book of the same title, and is one in a series of CD-ROM handbooks being issued by CRC Press. CRC Press also plans to provide annual updates for this series for an additional fee. The CD-ROM handbook comes with Adobe Acrobat reader version 3.0, which can be installed from the CD-ROM if one doesn't have it. The Acrobat reader provides an excellent search engine, which makes navigating the 2600 pages easy.

The handbook is divided into 20 sections, with about one-third of the total number of pages devoted to the thermal and fluid areas: engineering thermodynamics, fluid mechanics, heat and mass transfer, energy resources, energy conversion and air conditioning and refrigeration. Another two sections comprising about 10% of the book cover electrical engineering and mechanical systems control. There are also sections on mechanics of solids, engineering economics and project management, patent law and miscellaneous topics, mathematics, transportation, and materials; and appendices that list properties of gases, liquids and solids.

It is the remaining sections of the handbook, however, that contain material that differentiates it from other mechanical engineering handbooks. Here Dr. Kreith has chosen to summarize many new and increasingly important topics for mechanical engineers, modern approaches to: engineering design, modern manufacturing, robotics, environmental engineering, computer-

aided engineering, and communication and information systems. And in the section for Miscellaneous Topics one finds an introduction to bioengineering. These topics reflect the changes that mechanical engineering is undergoing. The decision to include these emerging topics, however, was done at the expense of several more traditional topics, such as the selection and sizing of machine elements, fasteners, seals and pumps.

Along the line of new topics concerning mechanical engineers, the reviewer would have liked to have seen a section devoted to modern transducers, sensors and measurement techniques, including microelectromechanical (MEM) devices and specific applications and examples of "smart" sensors. However, there is good discussion of general instrumentation techniques, and separately, one subsection directed at sensors used in robot applications and another for temperature and heat transfer measurements. In the section on modern manufacturing methods perhaps a future update could give us a peek at manufacturing at the micrometer and nanometer scale, and in the section on Materials provide coverage of "smart" materials such as shape memory alloys and polymers. Also, a discussion of the application of reliability and risk analysis to mechanical systems would be timely.

There are some minor inconveniences that occasionally occur when using the CD-ROM version: some tables require multiple application of the zoom feature in order to be able to read just a small portion of it; for some tables and figures the zoom cannot be used at all because their maximum resolution have already been reached at the normal screen size. Furthermore, one cannot thumb through the CD-ROM version to get a sense of the entire handbook as one can do with the book version; something the reviewer likes to do. But being able to carry this lightweight version of the handbook around with your laptop computer and the excellent search engine that quickly finds all instances of the words of interest more than offset these minor drawbacks.

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