

BOOK REVIEWS

The Contractor's Dictionary of Equipment, Tools, and Techniques

Reviewed by Thomas F. O'Connor, FASTM, Smith, Hinchman & Grylls Associates, Inc., Detroit, MI 48226.

REFERENCE: Webster, L. F., *The Contractor's Dictionary of Equipment, Tools, and Techniques*, John Wiley & Sons, Inc., New York, 1995, ISBN: 0-471-11523-1, 666 pp., \$69.95.

The reviewer has over the years bought or consulted a number of dictionaries describing terms commonly used by the construction industry. Some of these reference books were rather amateurishly developed and others seemed to concentrate on just one aspect of the construction industry. With this book the author seems to have developed a very comprehensive listing of terms and explanations not only for building construction but also for architecture, engineering, surveying, interior design, heavy construction, mining, and public works among others. He has also included terms related to those industries not normally included in construction dictionaries. Although the title is directed toward contractors, others associated with the construction industry such as architects, engineers, and students, especially, will also find this dictionary worthwhile.

In general, I found this dictionary to be a very good one-volume source for explanations of most of the terms normally encountered by design professionals and others involved in the construction industries. The book will be especially helpful for students who are learning about an industry and need to know the proper definitions and use of terminology by that industry.

The terms, including abbreviations and acronyms, are listed alphabetically in bold type followed by an explanation of the term or a reference to another term or location in the dictionary. In general, as an aid to the reader, related terms have been grouped. For example, the term "soil types" has 24 different soils listed and explained under this general heading. The same format is also used for other terms such as "brick" and "horsepower." I found this format to be very helpful when researching a general term and its related more specific terms.

At the back of the book, the author has included a discussion of metric and nonmetric measurements and an 8-page table listing factors to permit conversion of nonmetric values to metric and metric to nonmetric. Although his discussion of the metric system and SI units is brief, it is to the point and logically presents base, supplementary, derived, and other SI units.

The book does not include illustrations accompanying the text and understanding a term is sometimes difficult when trying to use only words. The often-used phrase "a picture is worth a thousand words" is applicable in that some terms in the book need an illustration along with or in place of the words.

The author is inconsistent in the listing of terms and the sources for those terms. For example, the term "class (of fire)" is listed in the dictionary with three classes being explained. There is no reference for the source of this classification system. Does this term only apply to a certain industry? This also occurs with the term "brick type," wherein six brick types are listed (e.g. FBS, FBX) but are not explained nor is a source listed. However, for the term "exposure durability classification" the source (American Plywood Association) is indicated and the four listed terms are explained.

Unfortunately, this book seems to add to and not improve on the many other dictionary sources that have been published. Unfortunate is the fact that a term such as "sealant" has an explanation that differs to some degree between this source and other dictionary sources. For those of us who need commonly accepted definitions of terms as used by the industry, this can present a problem. Which explanation in which book is authoritative and what is the source?

The dictionary could have been more beneficial if terms developed by professional societies such as ASTM technical committees, as compiled in the ASTM book of *Standard Definitions*, were also included. ASTM and other professional society-developed definitions have been recognized as representing the accepted usage of a term. The inclusion of these terms (and a reference for the source) would have made this volume a unique and most valuable source of terminology. Perhaps in future editions this could be implemented by the author.

For those who need general explanations of terms related to the construction industry this book will prove most beneficial because it is so comprehensive.

BOOK REVIEWS

Superconducting Levitation: Applications to Bearings and Magnetic Transportation

Reviewed by Haig M. Vahradian, graduate assistant and doctoral candidate, Department of Industrial Technology, University of Northern Iowa, Cedar Falls, IA.

REFERENCE: Moon, Francis C. and Chang, Pei-Zen, *Superconducting Levitation: Applications to Bearings and Magnetic Transportation*, John Wiley & Sons, Inc., New York, 1994, ISBN 04-715-5925-3.

One of the major drawbacks to any transportation system or motorized device is overcoming the friction inherent when two surfaces move in relation to one another. Overcoming friction requires additional energy and fuel, which reduces the efficiency of the entire system. The recent breakthroughs in high-temperature superconductors are inspiring unique innovations in transportation and bearing technology. Magnetic levitation (Mag-Lev) transportation systems have ignited the imagination and wonder of the public as the "Star Trek/Science Fiction" phenomenon becomes reality. Generally, this book presents the basic principles governing the levitation of material bodies by magnetic fields. However, lift alone is not levitation. Levitation connotes a state of equilibrium, which creates the real challenge. The intent of the authors is to provide scientists, physicists, engineers, and students with an understanding of superconductors, magnetics, mechanics, and the dynamics of superconducting-bearing technology and the Mag-Lev transportation systems to promote their development and use in industry.

Specifically, the book investigates the phenomenon of high-temperature superconductors and the various materials used in this technology. The performance characteristics of wire and thin film superconductors based on materials of niobium (i.e. niobium-tin and niobium-titanium) and copper oxides (i.e. yttrium-barium-copper-oxide and bismuth-strontium-calcium-copper-oxide) are

compared and contrasted as to their possible applications. Also, the methods of production and processing of these superconductors are explored.

Next, the text addresses the principles and dynamics of superconducting bearings and magnetic levitation transportation systems technology. The following six magnetic bearing systems are thoroughly examined along with complete and valuable information on calculating bearing pressure, magnetic levitation, torque, and drag forces: superconducting coil systems, permanent magnet systems, superconducting permanent magnets, actively controlled electromagnets, passive superconducting bearing systems, and eddy current systems. Also included is a section on dynamics problems associated with creating equilibrium in magnetically-levitated bearing systems, addressing issues of linear stability, natural frequency and vibration of levitated bodies, and gyroscopic effects on spinning levitated superconductors.

Finally, the book lists the many applications of superconducting-bearing technology ranging from simple machine bearings to high-tech applications in gas-turbine aircraft engines and cryopumps for liquid hydrogen rocket motors. Furthermore, the authors provide the nexus between superconducting magnetic levitation technology and transportation systems by providing a comprehensive review of current and future magnetically-levitated trains from around the world.

With the development of high-temperature superconducting bearing and transportation systems comes the responsibility of practically applying this technology to the betterment of society. This will require scientists and engineers to be well versed in the dynamics of this still-evolving technology. The book *Superconducting Levitation: Applications to Bearings and Magnetic Transportation* is a one-of-a-kind reference guide for physicists, engineers, and students working with, or intrigued by, magnetic levitation systems. The first author, Francis Moon, is a professor at Cornell University in the Sibley School of Mechanical and Aerospace Engineering and holds three patents related to superconducting bearings. The book is well written, but not for the technologically challenged. It contains many informative tables, photos, and illustrations, and would be an asset to any technical library.