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## BOOK REVIEWS

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included are discussions of the failure modes and mechanisms of bolted joints. Case histories from industry are presented throughout the text to illustrate key points. Many up-to-date references are presented at the end of each chapter to allow the reader to pursue individual topics further, if desired. The text contains several appendices with useful tables and formulas for quick reference. The author has broad experience in the subject area from many years as a consultant to the power generation and nuclear industry, active participation on society working groups such as ASME and PVRC, as well as the presentation of numerous seminars on the topic. This book would serve as a valuable desk reference for engineers concerned with the design and performance of bolted joints.

### **International Advances in Nondestructive Testing, Volume 15**

*Reviewed by C. W. McKee, Wayne, PA 19087.*

**REFERENCE:** *International Advances in Nondestructive Testing, Volume 15*, Warren J. McGonagle, Ed., Gordon and Breach, New York, 1990.

This volume contains an interesting variety of papers on recent advances in nondestructive testing as well as comments of general interest on present problems. One of the latter points out the difficulties resulting from the differences in terminology between that used by the physicists who design nondestructive tests and that by the technicians who perform them. The conclusion was that the scientists should work directly with the technicians and discuss the testing procedures with them. Another paper of general interest made a comparison of the NDE professional and the M.D., stating that the former got less respect, although individuals in each profession must "understand and diagnose physical systems that vary in structure, material and function from one test to another."

The nondestructive testing of wire rope is the subject of four of the articles. That this is a world-wide concern is shown by the authors' origins: United States, Japan and Australia. Electromagnetic or eddy current testing is the most widely used method, but acousto-ultrasonics is proposed by one writer. Current research is aimed principally at determining a procedure that will predict with reasonable accuracy the remaining safe life of a rope.

Theoretical and laboratory investigation reports include the use of ultrasonic procedures to test composites by cepstral methods and to test nuclear power plant steam generators *in situ* for defects. Acousto-ultrasonics can be used to evaluate bonding in the adhesive joints found in aerospace applications, neutron radiography can check problem areas in nuclear reactor fuel pins, and X-rays are used to determine the density of wood. The ability of microwaves to penetrate dielectric materials has led to a proposal that they might be used as a viable nondestructive test in instances as diverse as concrete testing and avalanche prediction. The use of color in digital image enhancement is a major advance over the present black-and-white pictures.

This volume on the recent research and advances in nondestructive testing contains interesting information for everyone,

from manager to technician. The book is well organized and the articles are informative.

There are flaws, however. A major problem for the reader is the generally sloppy job of editing. For instance, the definitions necessary to understand the cepstral method can be found only in a not-included referenced article and the author uses the word "quefrequency", which apparently is the same as "quefrequency" in the references. Neither is defined. The omission of the figures in one article was noticed, and these are now found in a separate errata pamphlet. Grammatical errors include "Students would to acquire understanding" (page 7), the phrase "the sound field is sufficiently sound field" (page 183) and the two incomplete sentences in the last paragraph of page 271. The color photographs for the digital image enhancement article seem to have been an afterthought, since they are found after the index. Misspellings, such as "prliminary" (page 190) and "Losgdon" instead of "Logsdon" (page 222), and the inclusion of two Figures 6 on pages 96 and 97 are further examples of insufficient or inadequate editing.

### **Powder Testing Guide: Methods of Measuring the Physical Properties of Bulk Powders**

*Reviewed by J. W. Merks, President, Matrix Consultants, Vancouver, British Columbia, Canada.*

**REFERENCE:** Svarovsky, L., *Powder Testing Guide: Methods of Measuring the Physical Properties of Bulk Powders*, Elsevier, New York, 1987, \$54.00.

The scope of this guide is confined to dry solids with a top size of 3 mm and with limited amounts of moisture. Electrical and thermal properties that affect fire and explosion hazards are not addressed. The author reviews many tools and techniques to measure physical properties that affect flow characteristics of bulk solids and that may cause problems during storage, transport and transfer. The author discusses in detail the wide range of test methods used to measure the flow and handling properties of bulk solids.

The text deals with test methods for macro-properties of large sets of particles rather than micro-properties of single particles. Test methods that quantify interactions between aerated or non-aerated dry solids under static and dynamic conditions receive a great deal of attention. The author stresses that test methods cannot improve test samples and that sampling is an important element of testing properties of bulk solids. The list of references is a valuable feature.

The author displays a keen interest in powder technology. He limits his use of jargon and employs simple prose to describe the necessary technical terms. There are many useful illustrations. The *Powder Testing Guide* reflects the author's common sense approach to a subject that touches many industries. This book is valuable for scientists and engineers who need to know how to measure properties of bulk solids that affect storage and handling, and for laboratories that need to check, compare and validate test methods for bulk solids.