About the Editor

LEONARD MORDFIN earned a bachelor's degree from The Cooper Union, and master's and Ph.D. degrees from the University of Maryland, all in mechanical engineering. He has been an independent consultant in both mechanical testing and nondestructive testing since 1994. Prior to that, he spent most of his career at the National Institute of Standards and Technology (formerly the National Bureau of Standards) where his principal activities included research on stability, creep, fatigue, and fracture of aircraft structures, and the development of standards for nondestructive testing. He also held management positions as deputy and acting chief of the Office of Nondestructive Evaluation and leader of the Mechanical Properties & Performance Group in the Metallurgy Division. Dr. Mordfin also served a two-year assignment as program manager for materials research at the Air Force Office of Aerospace Research.

He has more than 60 publications to his name, including book and encyclopedia chapters as well as journal papers. He has edited 5 books, among them Mechanical Relaxation of Residual Stresses and, with Harold Berger, Nondestructive Testing Standards: Present and Future. He has lectured extensively in the United States as well as in Australia, Canada, Israel, Japan, Norway, Singapore, and South Korea.

Dr. Mordfin is the recipient of numerous awards for his work, including the ASTM Award of Merit for his service to Committee E28 on Mechanical Testing, the Charles W. Briggs Award from ASTM Committee E07 on Nondestructive Testing, the Edward Bennett Rosa Award from NIST, a Bronze Medal from the U.S. Department of Commerce, and a Superior Performance Award from the Department of the Air Force.

A past chairman of ASTM’s Committee on Publications, Dr. Mordfin presently serves the Society as chairman of its subcommittees on residual stress measurement and mechanical testing terminology, and its section on infrared methods of nondestructive testing. He is the principal U.S. delegate to the ISO technical committee on nondestructive testing, and chairman of the USA Technical Advisory Group for that ISO committee. He is also a member of the USA Technical Advisory Group for the ISO technical committee on mechanical testing.

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Handbook of Reference Data for Nondestructive Testing

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Editor

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Foreword

QUALIFIED NONDESTRUCTIVE TESTING (NDT) personnel regularly demonstrate their abilities to carry out their responsibilities with accuracy and efficiency. They understand the capabilities of their equipment and the approaches that will yield the most accurate and reliable results.

Much nondestructive testing is repetitive although never routine because the needs for careful attention to detail and for alertness to tiny discrepancies are always present. On the other hand, it is not at all uncommon for the NDT professional to be faced with a new challenge—a test object that involves different materials, shapes, or dimensions, and a requirement for an immediate test. This handbook is intended to serve as a useful tool in such situations. In the absence of his or her library or computer, this little book is intended to furnish all or most of the reference data needed to proceed.

The reference data are provided here in tables, charts, graphs, and equations that will help the NDT professional to develop a promising approach and to carry out a test that is likely to produce reliable results. However, several words of caution are in order.

A considerable portion of the data documented herein are material property data: densities, acoustic velocities, X-ray absorption coefficients, magnetic permeabilities, and so on. These data have been gleaned from the literature and are believed to be reliable, but they have not been independently verified in most cases. (Note, however, that a blank page (or two) has been provided at the end of each chapter for the user to record data particular to his or her needs, which could include instrument
serial numbers, characteristics, and calibrations, as well as relevant material properties.)

Testing conditions and parameters are presented here, having been compiled from recognized standards, but their appearance here is intended only to serve as reminders. They do not replace the standards that may apply. Clearly, the excerpts from standards that are given here may not comprise all of the relevant requirements, and, certainly, testing parameters outside of those cited may be authorized by the contracting organization.

Finally, it is acknowledged that, with a few exceptions, this book does not address the interpretation and evaluation of NDT indications, these activities most commonly being carried out in places where more thorough sources of reference data are easily accessible.

In closing, I wish to express my sincere appreciation to David Mackintosh, Sam Robinson, John Slotwinski, Patrick Abbott, and Charles Ehrlich, who compiled and organized entire chapters for this book. I am also indebted to many other experts who contributed to this volume, providing data, sources, and valuable reviews and comments. Two of these merit particular mention, namely, Connie Presley and, most especially, Dennis Poffenroth.

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