Handbook of Acoustical Measurements and Noise Control, Third Edition

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Preface

At the time the first edition of the *Handbook of Noise Control* was published in 1957, various aspects of noise control were treated in specialized scientific journals and in reports of government agencies and industrial organizations. This information was not always easily accessible. Furthermore, there was a need for an authoritative work covering the entire field. The *Handbook* met this need and was also the first book on noise control published in the U.S.A. It included considerable technical information not previously available and defined the term *noise control* for the first time: *Noise control is the technology of obtaining an acceptable noise environment, at a receiver, consistent with economic and operational considerations; the receiver may be a person, a group of people, an entire community, or a piece of equipment whose operation is affected by noise.*

In the years that followed, many countries enacted noise control legislation, and noise became a matter of increasing social and economic importance, leading to new engineering methods of control. Accordingly, the *Handbook of Noise Control* was updated in 1979 to reflect these important changes.

More recently, technical innovations such as microminiaturization and the practical application of digital techniques have made possible innovative measurement techniques and the application of engineering methods that were not economically feasible a generation earlier. These changes have given rise to the need for a completely revised and enlarged handbook. Because there is now much greater emphasis on acoustical measurements throughout the text, the book has been retitled *Handbook of Acoustical Measurements and Noise Control*.

The *Handbook* employs uniform terminology, symbols, and abbreviations that probably represent as close to an international consensus as is possible to obtain at this time. Both the International System of units and the U.S. Customary System of units are used throughout.

Each of the chapters in the *Handbook* is written by an expert in his or her special area. Technical information has been made accessible by the use of simple charts and written explanations in place of highly technical formulas without lowering the substantive level of the *Handbook's* contents. This has required much effort on the part of the authors of the various chapters, and I am deeply grateful to them for their skill and patience.

The chapters of the *Handbook* are grouped as follows: properties and propagation of sound waves in the open air and in enclosures; measurement instrumentation, measurement techniques, the analysis of sound and vibration, and standards; hearing characteristics, hearing loss from noise exposure, hearing evaluation, hearing protection devices, hearing conservation programs, and liability for hearing loss; effects of noise on speech communication, annoyance, human performance, and physiology; criteria for noise and vibration exposure; methods of measuring, evaluating, and controlling noise and vibration in buildings; machinery and equipment noise (its characteristics, measurement, analysis, monitoring, and methods of control); the measurement and control of noise in heating, ventilating, and air-conditioning (HVAC) systems—including noise control criteria for use in designing HVAC systems and in assessing the noise produced by such systems; transportation noise; community noise; and noise legislation and regulations (including litigation and environmental impact statements).

The wealth of technical information contained in this book has been collected from many sources. Material has been reproduced, by permission, from books as well as copyrighted publications of a number of technical societies, primarily the Acoustical Society of America, the Institute of Noise Control Engineering, and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. Some of the contributors are employed by the government of the United States. Material included in their chapters has been released for publication, but because these are personal contributions, the contents do not necessarily reflect the official view of the relevant department or agency.

Other valuable sources include publications of the standards organizations of various countries and publications of international organizations—particularly the International Organization for Standardization and the International Electrotechnical Commission. Copies of these publications may be obtained by writing the appropriate organizations at the addresses listed in Chapter 15. The standards cited in the text have resulted from the selfless efforts of members of various national and international committees, to whom we owe a debt of gratitude.

Special thanks are due Harold B. Crawford, editor in chief of engineering and technical books at McGraw-Hill, Inc.; Margaret Lamb, editing manager in McGraw-Hill's Professional Publishing Group; and especially Laura Givner, editing supervisor in the Professional Publishing Group.

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