Institute of Environmental Sciences and Technology

IEST-RP-NANO201.1

Contamination Control Division, Nanotechnology
Recommended Practice 201.1

Measuring and Reporting Vibrations in Advanced-Technology Facilities

1827 Walden Office Square, Suite 400
Schaumburg, IL 60173
Phone: (847) 981-0100 • Fax: (847) 981-4130
E-mail: information@iest.org • Web: www.iest.org

This Recommended Practice was prepared by and is under the jurisdiction of Working Group 201 of the IEST Contamination Control Division (WG-NANO201). The following WG voting members contributed to the development of this edition of this Recommended Practice.

Hal Amick, Colin Gordon & Associates
WG-NANO 201 Chair

Ahmad Soueid, HDR, Inc.
WG-NANO 201 Vice-Chair

Byron Davis, Vibrasure

Roger Diener, RBD Associates

Michael Gendreau, Colin Gordon & Associates

Wei Sun, Engsysco, LLC

John Weaver, Consultant

The Working Group would like to recognize two individuals who significantly contributed to the development of this document, but are honored posthumously:

David Swinehart, Consultant

Louis Vitale, Vitatech Electromagnetics

The Working Group also wishes to acknowledge the contributions of members who prefer to remain anonymous.

First printing, March 2024

ISBN: 978-1-937280-66-6

ISBN: 978-1-937280-65-9

PROPOSAL FOR IMPROVEMENT: The Working Groups of the Institute of Environmental Sciences and Technology are continually working on improvements to their Recommended Practices and Reference Documents. Suggestions from users of these documents are welcome. If you have a suggestion regarding this document, please use the online Proposal for Improvement form found on the IEST website at www.iest.org.

Institute of Environmental Sciences and Technology
1827 Walden Office Square, Suite 400
Schaumburg, IL 60173
Phone: (847) 981-0100 • Fax: (847) 981-4130
E-mail: information@iest.org • Web: www.iest.org

NOTICE AND DISCLAIMER: This Recommended Practice is published by the Institute of Environmental Sciences and Technology (IEST) to advance the technical and engineering sciences. Use of this document is entirely voluntary, and determination of its applicability and suitability for any particular use is solely the responsibility of the user. Use of this Recommended Practice does not imply any warranty or endorsement by IEST.

The information in this publication was considered technically sound by the consensus of persons engaged in the development and approval of the document at the time it was developed. Consensus does not necessarily mean that there is unanimous agreement among all persons participating in the development of this document.

IEST standards, recommended practices, and guideline publications, of which the document contained herein is one, are developed through a voluntary consensus standards development process. This process brings together volunteers and seeks out the views of persons who have an interest in the topic covered by this publication. While IEST administers the process to promote fairness in the development of consensus, the organization does not write the document and does not independently test, evaluate, or verify the accuracy or completeness of any information or the soundness of any judgments contained in IEST standards, recommended practices, and guideline publications.

IEST disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document. IEST disclaims and makes no guaranty or warranty, express or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this document will fulfill any of the particular purposes or needs of users of the document. IEST does not guarantee the performance of any individual manufacturer or seller's products or services by virtue of this standard or guide.

In publishing and making this document available, IEST is not undertaking to render professional or other services for or on behalf of any person or entity, nor is IEST undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. Information and other standards on the topic covered by this publication may be available from other sources, which the user may wish to consult for additional views or information not covered by this publication.

IEST has no power, nor does it undertake to police or enforce compliance with the contents of this document. IEST does not certify, test, or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of compliance with any health or safety-related information in this document shall not be attributable to IEST and is solely the responsibility of the certifier or maker of the statement.

IEST-RP-NANO201.1

CONTENTS

SECTION

FIGURES

TABLES

APPENDIXES

Measuring and Reporting Vibrations in Advanced-Technology Facilities

IEST-RP-NANO201.1

1 SCOPE AND LIMITATIONS

1.1 Scope

This Recommended Practice (RP) is intended to establish guidelines for conducting vibration measurements and reporting data where vibration-sensitive scientific instruments are located in existing or planned advanced technology facilities. This includes facilities for nanotechnology, quantum computing, microelectronics, pharmaceutical and biological research, metrology laboratories, and other research, development, and production facilities in which vibration control is important.

These guidelines are specifically for the following:

a) Selecting suitable instrumentation and hardware for use in vibration measurements

b) Establishing sensitive process tool vibration thresholds

c) Conducting vibration measurements on sites and in facilities

d) Reporting results of vibration measurements in a uniform and consistent format

Some of this vibration-sensitive equipment is used in the manufacture, measurement, and inspection of integrated circuits. Such equipment may be collectively referred to as "process tools" in this RP.

Because equipment used in a wide variety of technological applications is sensitive to vibration and sound, it is therefore necessary to establish levels of vibration sensitivity for them and to ensure that vibrations occurring in the facility or at the site at which they are located are below those levels.

1.2 Limitations

This RP focuses on vibration. Although measurement and reporting of acoustical environments are equally important, they are not the subject of this RP. However, other documents such as ANSI *S1.1, S1.4, S1.11,* and *S1.13* (see Section 2) are available for those seeking guidance in measuring acoustical noise.

This document does not espouse one format of criterion over another, although it provides several example criteria that meet the recommended parameters given here. It assumes that a criterion, such as that contained in a Site Requirements Guide, is available. Further, it assumes that the criterion is stated with enough precision to allow its unambiguous application. However, in the event that the criterion contains ambiguity, the parameters required for clarity are given. If this document is to be used as a guideline to develop a criterion, those same parameters may be used to minimize the risk of ambiguity.