ASA/ANSI S2.72-2002/Part 1 / ISO 2631-1:1997
(formerly ANSI S3.18-2002 / ISO 2631-1: 2001)

Reaffirmed by ANSI September 11, 2018

AMERICAN NATIONAL STANDARD

Mechanical vibration and shock – Evaluation of human exposure to whole-body vibration – Part 1: General requirements

(a nationally adopted international standard)

Secretariat:

Acoustical Society of America

Approved on 13 May 2002:

American National Standards Institute, Inc.

Abstract

This part of ANSI S2.72 / ISO 2631 defines methods for the measurement of periodic, random and transient whole-body vibration. It indicates the principal factors that combine to determine the degree to which a vibration exposure will be acceptable. Informative annexes indicate current opinion and provide guidance on the possible effects of vibration on health, comfort and perception and motion sickness. The frequency range considered is 0.5 Hz to 80 Hz for health, comfort and perception and 0.1 Hz to 0.5 Hz for motion sickness.

Although the potential effects on human performance are not covered, most of the guidance on whole-body vibration measurement also applies to this area. This part of ANSI S2.72 / ISO 2631 also defines the principles of preferred methods of mounting transducers for determining human exposure. It does not apply to the evaluation of extreme-magnitude single shocks such as occur in vehicle accidents.

This part of ANSI S2.72 / ISO 2631 is applicable to motions transmitted to the human body as a whole through the supporting surfaces: the feet of a standing person, the buttocks, back and feet of a seated person or the supporting area of a recumbent person. This type of vibration is found in vehicles, in machinery, in buildings and in the vicinity of working machinery.

Reaffirmed by ANSI
on June 1, 2007

Reaffirmed by ANSI
on August 6, 2012

Reaffirmed by ANSI
September 11, 2018

ANSI S2.72-2002/Part 1 / ISO 2631-1:1997
(formerly ANSI S3.18-2002 / ISO 2631-1: 2001)

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Mechanical vibration and shock – Evaluation of human exposure to whole-body vibration – Part 1: General requirements

A Nationally Adopted International Standard

NAIS
ANSI S2.72-2002/Part 1 /
ISO 2631-1: 1997

Accredited Standards Committee S2, Mechanical Vibration and Shock

Standards Secretariat
Acoustical Society of America
35 Pinelawn Road, Suite 114 E
Melville, NY 11747-3177

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The Acoustical Society of America (ASA) is an organization of scientists and engineers formed in 1929 to increase and diffuse the knowledge of acoustics and to promote its practical applications.

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AMERICAN NATIONAL STANDARDS ON ACOUSTICS

The Acoustical Society of America (ASA) provides the Secretariat for Accredited Standards Committees S1 on Acoustics, S2 on Mechanical Vibration and Shock, S3 on Bioacoustics, and S12 on Noise. These committees have wide representation from the technical community (manufacturers, consumers, trade associations, general interest, and government representatives). The standards are published by the Acoustical Society of America through the American Institute of Physics as American National Standards after approval by their respective Standards Committees and the American National Standards Institute.

These standards are developed and published as a public service to provide standards useful to the public, industry, and consumers, and to Federal, State and local governments.

Each of the accredited Standards Committees [operating in accordance with procedures approved by American National Standards Institute (ANSI)] is responsible for developing, voting upon, and maintaining or revising its own Standards. The ASA Standards Secretariat administers Committee organization and activity, and provides liaison between the Accredited Standards Committees and ANSI. After the Standards have been produced and adopted by the Accredited Standards Committees, and approved as American National Standards by ANSI, the ASA Standards Secretariat arranges for their publication and distribution.

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made towards their resolution.

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Foreword

[This foreword is not part of the Nationally Adopted International Standard (NAIS), Mechanical vibration and shock – Evaluation of human exposure to whole body vibration – Part 1: General requirements, ANSI S2.72-2002/Part 1 / ISO 2631-1:1997 (formerly ANSI S3.18-2002 / ISO 2631-1:1997).]

This Nationally Adopted International Standard (NAIS) comprises a part of a group of definitions, standards, and specifications for use in work related to human exposure to mechanical vibration and shock. It has been adopted by the American National Standards Institute utilizing the Accredited Standards Committee Procedures, under the Secretariat of the Acoustical Society of America.

Accredited Standards Committee S3, Bioacoustics, under whose jurisdiction this NAIS was adopted, had the following scope at that time:

> *Standards, specifications, methods of measurement and test, and terminology in the fields of psychological and physiological acoustics, including aspects of general acoustics, shock, and vibration which pertain to biological safety, tolerance and comfort.*

This Standard is identical to International Standard ISO 2631-1:1997, Mechanical vibration and shock – Evaluation of human exposure to whole body vibration, which was prepared by Technical Committee ISO/TC 108, Mechanical vibration and shock, Subcommittee SC 4, Human exposure to Mechanical vibration and shock. However, in conformance with ANSI and ISO rules, decimal points were substituted in place of the commas used in ISO documents, the words "American National Standard" replace the words "International Standard" where they appear in the ISO document, and an informational footnote has been added on page 1.

In 2004, work related to human exposure to mechanical vibration and shock was transferred to Accredited Standards Committee S2, Mechanical Vibration and Shock. Five approved S3 standards were transferred to S2 at that time and were redesignated and republished as they each came up for reaffirmation in the normal standards cycle. This redesignation of ANSI S3.18-2002 / ISO 2631-1:1997 is taking place under this process. No substantive changes have been made to the approved 2002 text, except as noted in the preceding paragraph.

The ANSI equivalent for an ISO standard referenced herein is given below:

- ANSI S2.1-2000/ISO 2041:1990 is an identical national adoption of ISO 2041:1990.

At the time this NAIS was submitted to Accredited Standards Committee S3, Bioacoustics, for final approval, the membership was as follows:

R. F. Burkard, *Chairman*
J. Franks, *Vice Chairman*
S. B. Blaeser, *Secretary*

Acoustical Society of America ..... R. F. Burkard
.....J. Franks *(Alt.)*

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U.S. Army Human Research & Engineering Directorate ..... T. R. Letowski
..... J. Kalb *(Alt.)*

U.S. Department of the Air Force ..... R. McKinley

Individual Experts of Accredited Standards Committee S3, Bioacoustics, were:

J. Bareham
R. Benson
A. Brammer
J. L. Fletcher
T. A. Frank
R. S. Gales
D. Johnson
K. D. Kryter
R. McKinley
C. W. Nixon
D. D. Reynolds
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L. H. Royster
P. D. Schomer
H. E. von Gierke
D. E. Wasserman
L. A. Wilber
W. A. Yost
R. W. Young

Working Group S3-39, Human Exposure to Mechanical Vibration and Shock, which assisted Accredited Standards Committee S3, Bioacoustics, in the preparation of this Standard, had the following membership:

D.D. Reynolds – Chair

N. Alem	D. Roley
M. Cherniack	S.D. Smith
R. Dong	E.D. Sussman
T. Jetzer	D.E. Wasserman
W. Pielemeier	J. Wasserman
J. Rescigno	D. Wilder

Suggestions for improvement of this Standard will be welcomed. They should be made in writing to the Standards Secretariat, Acoustical Society of America, 35 Pinelawn Road, Suite 114E, Melville, New York 11747-3177.

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American National Standard

Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 1: General requirements

1 Scope

This part of ISO 2631 defines methods for the measurement of periodic, random and transient whole-body vibration. It indicates the principal factors that combine to determine the degree to which a vibration exposure will be acceptable. Informative annexes indicate current opinion and provide guidance on the possible effects of vibration on health, comfort and perception and motion sickness. The frequency range considered is

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2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 2631. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 2631 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2041:1990, *Vibration and shock — Vocabulary.*[1]

ISO 5805:1997, *Mechanical vibration and shock — Human exposure — Vocabulary.*

[1] (U.S. footnote. This note has been added to this American National Standard only for information and is not part of ISO 2631-1.) ISO 2041:1990 has been nationally adopted and is identical to ANSI S2.1-2000 / ISO 2041:1990.