



**ASA/ANSI S2.1-2009 / ISO 2041:2009
(Revision of ANSI S2.1-2000 /
ISO 2041:1990)**

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AMERICAN NATIONAL STANDARD

**Mechanical vibration, shock and condition
monitoring –Vocabulary**

(a nationally adopted international standard)

Secretariat:

Acoustical Society of America

Approved on October 8, 3005:

American National Standards Institute, Inc.

Abstract

This Nationally Adopted International Standard defines terms and expressions unique to the areas of mechanical vibration, shock and condition monitoring.

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ANSI/ASA S2.1-2009/ISO 2041 :2009

Accredited Standards Committee S2, Mechanical Vibration and Shock

Standards Secretariat
Acoustical Society of America
35 Pinelawn Road, Suite 114 E
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Foreword

[This Foreword is for information only and is not a part of ANSI/ASA S2.1-2009 / ISO 2041:2009 American National Standard Mechanical vibration, shock and condition monitoring – Vocabulary.]

This nationally adopted international standard comprises a part of a group of definitions, standards, and specifications for use in mechanical vibration and shock. It was developed and approved by Accredited Standards Committee S2 Mechanical Vibration and Shock, under its approved operating procedures. Those procedures have been accredited by the American National Standards Institute (ANSI). The Scope of Accredited Standards Committee S2 is as follows:

Standards, specification, methods of measurement and test, and terminology in the field of mechanical vibration and shock, and condition monitoring and diagnostics of machines, including the effects of exposure to mechanical vibration and shock on humans, including those aspects which pertain to biological safety, tolerance and comfort.

This standard is an identical national adoption of ISO 2041:2009 which was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*. This standard is a revision of ANSI S2.1-2000/ISO 2041:1990. This revision reflects advances in technology and refinements in terms used in the previous version. As such, it incorporates more precise definitions of some terms reflecting changes in accepted meaning. New terms which were driven by changes in technology (primarily in the areas of signal processing, condition monitoring and vibration and shock diagnostics and prognostics) are incorporated.

At the time this Standard was submitted to Accredited Standards Committee S2, Mechanical Vibration and Shock for approval, the membership was as follows:

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..... R. Shultz (Alt.)

Individual Experts of Accredited Standards Committee S2, Mechanical Vibration and Shock, were:

A.J. Brammer
D.D. Reynolds
D.E. Wasserman

Working Group S2/WG 2, Terminology and Nomenclature in the Field of Mechanical Vibration and Shock and Condition Monitoring and Diagnostics of Machines, which assisted Accredited Standards Committee S2, Mechanical Vibration and Shock, in the development of this standard, had the following membership.

D.J. Evans, Chair

M. Craun	C.F. Gaumont
B.E. Douglas	R.J. Peppin

Suggestions for improvements of this standard will be welcomed. They should be sent to Accredited Standards Committee S2, Mechanical Vibration and Shock, in care of the Standards Secretariat of the Acoustical Society of America, 35 Pinelawn Road, Suite 114E, Melville, New York 11747-3177. Telephone: 631-390-0215; FAX: 631-390-0217; E-mail: asastds@aip.org.

Introduction

Vocabulary is the most basic of subjects for standardization. Without an accepted standard for the definition of terminology, the development of other technical standards in a technical area becomes a laborious and time-consuming task that would ultimately result in the inefficient use of time and a high probability of misinterpretation.

American National Standard Mechanical vibration, shock and condition monitoring – Vocabulary

Scope

This Nationally Adopted International Standard defines terms and expressions unique to the areas of mechanical vibration, shock and condition monitoring.

1 General

1.1

displacement

relative displacement

(vibration and shock) time varying quantity that specifies the change in position of a point on a body with respect to a reference frame

NOTE 1 The reference frame is usually a set of axes at a mean position or a position of rest. In general, a rotation displacement vector, a translation displacement vector, or both can represent the displacement.

NOTE 2 A displacement is designated as relative displacement if it is measured with respect to a reference frame other than the primary reference frame designated in a given case.

NOTE 3 Displacement can be:

- oscillatory, in which case simple harmonic components can be defined by the displacement amplitude (and frequency), or
- random, in which case the root-mean-square (rms) displacement (and band-width and probability density distribution) can be used to define the probability that the displacement will have values within any given range.

Displacements of short time duration are defined as transient displacements. Non-oscillatory displacements are defined as sustained displacements, if of long duration, or as displacement pulses, if of short duration.

1.2

velocity

relative velocity

(vibration and shock) rate of change of displacement

NOTE 1 In general, velocity is time-dependent.

NOTE 2 The reference frame is usually a set of axes at a mean position or a position of rest. In general, a rotation velocity vector, a translation velocity vector, or both can represent the velocity.

NOTE 3 A velocity is designated as relative velocity if it is measured with respect to a reference frame other than the primary reference frame designated in a given case. The relative velocity between two points is the vector difference between the velocities of the two points.

NOTE 4 Velocity can be:

- oscillatory, in which case simple harmonic components can be defined by the velocity amplitude (and frequency), or
- random, in which case the root-mean-square (rms) velocity (and band-width and probability density distribution) can be used to define the probability that the velocity will have values within any given range.