ICS 13.160 SLOVENSKÁ TECHNICKÁ NORMA November 2017

STN	**Ozva človeka na kmitanie Meracie prístroje Časť 1: Všeobecné požiadavky na prístroje merania kmitania (ISO 8041-1: 2017)**	**STN EN ISO 8041-1 01 1422**

Human response to vibration - Measuring instrumentation - Part 1: General purpose vibration meters (ISO 8041-1:2017)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/17

Obsahuje: EN ISO 8041-1:2017, ISO 8041-1:2017

Oznámením tejto normy sa ruší
STN EN ISO 8041 (01 1422) zo septembra 2005

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 8041-1

May 2017

ICS 13.160

Supersedes EN ISO 8041:2005

English Version

Human response to vibration - Measuring instrumentation - Part 1: General purpose vibration meters (ISO 8041-1:2017)

Réponse des individus aux vibrations - Appareillage de mesure - Partie 1: Instrument de mesure à usage général (ISO 8041-1:2017)

Schwingungseinwirkung auf den Menschen - Messeinrichtung - Teil 1: Schwingungsmesser für allgemeine Anwendungen (ISO 8041-1:2017)

This European Standard was approved by CEN on 22 April 2017.

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Contents

Page

European foreword

This document (EN ISO 8041-1:2017) has been prepared by Technical Committee ISO/TC 108 "Mechanical vibration, shock and condition monitoring" in collaboration with Technical Committee CEN/TC 231 “Mechanical vibration and shock” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2017 and conflicting national standards shall be withdrawn at the latest by November 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 8041-1:2017 has been approved by CEN as EN ISO 8041-1:2017 without any modification.

STN EN ISO 8041-1: 2017

INTERNATIONAL STANDARD

ISO 8041-1

First edition
2017-05

Human response to vibration — Measuring instrumentation —

Part 1: General purpose vibration meters

Réponse des individus aux vibrations — Appareillage de mesure —

Partie 1: Instrument de mesure à usage général

Reference number
ISO 8041-1:2017(E)

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Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 3, *Use and calibration of vibration and shock measuring instruments*.

This first edition cancels and replaces ISO 8041:2005, which has been technically revised. It also incorporates the Technical Corrigendum ISO 8041:2005/Cor. 1:2007. The following main changes have been made:

— addition of an Introduction explaining the reasons for this revision;

— addition of a validation test for one-off instruments;

— revision and simplification of the verification test;

— addition of Annex I, which gives example estimates of the instrumental measurement uncertainty;

— correction of errors in formulae, numbers and figures.

A list of parts in the ISO 8041 series can be found on the ISO website.

Introduction

Until 2005, when the previous edition of this document was published, measuring instrumentation for human response to vibration (vibration meters) normally consisted of a signal processing unit and a detachable vibration transducer. According to recent developments, however, part of the signal processing steps can be integrated in the transducer unit, so that the signal coming out of the transducer's sensing element and going into the signal conditioning unit is not accessible any more. These transducer units include, for example, IEPE and MEMS transducers.

Some of the test procedures specified in this document, however, presume that this point in the signal path is accessible (electrical input). Since such an input is not mandatory these tests can only be performed on a vibration meter having an electrical input or after some technical modifications to the instrumentation, e.g. internal access to signal paths. Or those tests can only be performed mechanically, which in certain cases requires modifications to some test procedures. Such modifications to test procedures, however, are beyond the present scope of this document.

Some of the test procedures specified in this document can only be performed if an electrical output is available, see for example 5.13. Since such an output is not mandatory these tests can only be performed on a vibration meter having an electrical output or after some technical modifications to the instrumentation, e.g. internal access to signal paths.

The verification test now specified in this document is practicable and has the objective of identifying an instrument which is adequately calibrated for the intended applications and is suitable for its purpose, at a cost reasonable for the calibration laboratory and affordable for the end user. Therefore, the verification test is strongly reduced in its extent compared to the full pattern evaluation, or validation, and only tests the most relevant characteristics of a vibration meter.

INTERNATIONAL STANDARD **ISO 8041-1:2017(E)**

Human response to vibration — Measuring instrumentation —

Part 1: General purpose vibration meters

1 Scope

This document specifies the performance specifications and tolerance limits for instruments designed to measure vibration values, for the purpose of assessing human response to vibration. It includes requirements for pattern evaluation, or validation, periodic verification and *in situ* checks, and the specification of vibration calibrators for *in situ* checks.

Vibration instruments specified in this document can be single instruments, combinations of instrumentation or computer-based acquisition and analysis systems.

Vibration instruments specified in this document are intended to measure vibration for one or more applications, such as the following:

— hand-transmitted vibration (see ISO 5349-1);

— whole-body vibration (see ISO 2631-1, ISO 2631-2 and ISO 2631-4);

— low-frequency whole-body vibration in the frequency range from 0,1 Hz to 0,5 Hz (see ISO 2631-1).

Vibration instruments can be designed for measurement according to one or more of the frequency weightings defined within each of these applications.

Three levels of performance testing are defined in this document:

a) pattern evaluation or validation:

   1) pattern evaluation, i.e. a full test of the instrument against the specifications defined in this document;

   2) validation of one-off instruments, i.e. a limited set of tests of an individual vibration measuring system against the relevant specifications defined in this document;

b) periodic verification, i.e. an intermediate set of tests designed to ensure that an instrument remains within the required performance specification;

c) *in situ* checks, i.e. a minimum level of testing required to indicate that an instrument is likely to be functioning within the required performance specification.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2631-1, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 1: General requirements*

ISO 2631-2, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 2: Vibration in buildings (1 Hz to 80 Hz)*

ISO 2631-4:2001, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 4: Guidelines for the evaluation of the effects of vibration and rotational motion on passenger and crew comfort in fixed-guideway transport systems*

ISO 5347 (all parts), *Methods for the calibration of vibration and shock pick-ups*

ISO 5348, *Mechanical vibration and shock — Mechanical mounting of accelerometers*

ISO 5349-1:2001, *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 1: General requirements*

ISO 16063 (all parts), *Methods for the calibration of vibration and shock transducers*

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) — Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) — Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-6, *Electromagnetic compatibility (EMC) — Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-6-2:2005, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards – Immunity for industrial environments*

CISPR 22:2008, *Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement*