

**Mechanical vibration - Measurement  
and evaluation of occupational  
exposure to whole-body vibration with  
reference to health - Practical guidance  
KONSOLIDEERITUD TEKST**

Mechanical vibration - Measurement and evaluation  
of occupational exposure to whole-body vibration  
with reference to health - Practical guidance  
CONSOLIDATED TEXT

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 14253:2004+A1:2007 sisaldab Euroopa standardi EN 14253:2003+A1:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.12.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 14253:2004+A1:2007 consists of the English text of the European standard EN 14253:2003+A1:2007.</p> <p>This document is endorsed on 18.12.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>This European Standard provides guidelines for the measurement and evaluation of whole-body vibration at the workplace. This European Standard describes the precautions to be taken to make representative vibration measurements and to determine the daily exposure time for each operation in order to calculate the daily exposure value standardized to an 8 h reference period. This European Standard provides a means to determine the relevant operations that should be taken into account when determining the vibration exposure. This European Standard applies to situations where people are exposed to whole-body vibration at the workplace, transmitted through the buttocks for a seated person or through the feet for a standing person. This European Standard is restricted to the evaluation of exposure to whole-body vibration using quantities derived from frequency-weighted root-mean-square acceleration. The frequency range considered is 0,5 Hz to 80 Hz. Where the vibration includes shocks or impacts, methods in this European Standard may underestimate the severity of the exposure. There is a need to assess the risks arising from exposure to whole-body shocks and high crest factor vibration. Methods for this are beyond the scope of this European Standard.</p>	<p><b>Scope:</b></p> <p>This European Standard provides guidelines for the measurement and evaluation of whole-body vibration at the workplace. This European Standard describes the precautions to be taken to make representative vibration measurements and to determine the daily exposure time for each operation in order to calculate the daily exposure value standardized to an 8 h reference period. This European Standard provides a means to determine the relevant operations that should be taken into account when determining the vibration exposure. This European Standard applies to situations where people are exposed to whole-body vibration at the workplace, transmitted through the buttocks for a seated person or through the feet for a standing person. This European Standard is restricted to the evaluation of exposure to whole-body vibration using quantities derived from frequency-weighted root-mean-square acceleration. The frequency range considered is 0,5 Hz to 80 Hz. Where the vibration includes shocks or impacts, methods in this European Standard may underestimate the severity of the exposure. There is a need to assess the risks arising from exposure to whole-body shocks and high crest factor vibration. Methods for this are beyond the scope of this European Standard.</p>
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ICS 13.160

**Võtmesõnad:** human factors engineering, hygiene, operating stations, physiological e, physiological effects, safety requirements, whole body vibrations, vibration, vibration effects (human body), vibration measurement, vibration meters, working places

English Version

**Mechanical vibration - Measurement and calculation of  
occupational exposure to whole-body vibration with reference to  
health - Practical guidance**

Vibrations mécaniques - Mesurage et calcul de l'effet sur la  
santé de l'exposition professionnelle aux vibrations  
transmises à l'ensemble du corps - Guide pratique

Mechanische Schwingungen - Messung und rechnerische  
Ermittlung der Einwirkung von Ganzkörper-Schwingungen  
auf den Menschen am Arbeitsplatz im Hinblick auf seine  
Gesundheit - Praxisgerechte Anleitung

This European Standard was approved by CEN on 1 September 2003 and includes Amendment 1 approved by CEN on 21 October 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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## Foreword

This document (EN 14253:2003+A1:2007) has been prepared by 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 May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

This document supersedes EN 14253:2003.

This document includes Amendment 1, approved by CEN on 2007-10-21.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** and **A1**.

Users of this EN, prepared in the field of application of Article 137 (formerly 118a) of the EC Treaty, should be aware that standards have no formal legal relationship with Directives which may have been made under Article 137 of the Treaty. In addition, national legislation in the Member states may contain more stringent requirements than the minimum requirements of a Directive based on Article 137. Information on the relationship between the national legislation implementing Directives based on Article 137 and this EN may be given in a national foreword of the national standard implementing this EN.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## Introduction

Occupational exposure to whole-body vibration can, in some circumstances, contribute to illness. The general requirements for measuring and evaluating whole-body vibration exposure are specified in ISO 2631-1. The aim of this European Standard is to provide practical guidelines to develop an effective strategy for evaluation of whole-body vibration exposure at the workplace.

The use of the strategy described in this European Standard will lead to a realistic picture of the daily exposure of a subject and of the relevant uncertainties.

The evaluation of vibration exposure can be broken up into a number of different stages:

- identifying a series of discrete operations which make up the subject's working pattern;
- selection of operations to be evaluated;
- establishing the r.m.s. acceleration value for each selected operation;
- evaluation of a typical daily exposure time for each operation identified;
- calculating the daily vibration exposure.

## 1 Scope

This European Standard provides guidelines for the measurement and evaluation of whole-body vibration at the workplace.


This European Standard describes the precautions to be taken to make representative vibration measurements and to determine the daily exposure time for each operation in order to calculate the daily exposure value standardized to an 8 h reference period. This European Standard provides a means to determine the relevant operations that should be taken into account when determining the vibration exposure.

This European Standard applies to situations where people are exposed to whole-body vibration at the workplace, transmitted through the buttocks for a seated person or through the feet for a standing person.

This European Standard is restricted to the evaluation of exposure to whole-body vibration using quantities derived from frequency-weighted root-mean-square acceleration. The frequency range considered is 0,5 Hz to 80 Hz. Where the vibration includes shocks or impacts, methods in this European Standard may underestimate the severity of the exposure. There is a need to assess the risks arising from exposure to whole-body shocks and high crest factor vibration. Methods for this are beyond the scope of this European Standard.

## 2 Normative references

The following referenced documents are indispensable for the application 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.

EN ISO 8041, *Human response to vibration - Measuring instrumentation (ISO 8041:2005)* 

EN 30326-1, *Mechanical vibration — Laboratory method for evaluating vehicle seat vibration — Part 1: Basic requirements (ISO 10326-1:1992)*

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

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

## 3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

### 3.1

#### operation

identifiable activity for which a representative vibration magnitude measurement is made, being a combination of a type of work and a working condition

EXAMPLE The type of work can be travelling for a lorry, lifting for a fork-lift truck, etc.; a working condition can be good or poor travelling surface, soft or hard material to excavate, etc.

### 3.2

#### work cycle

operation or series of different operations, which is repeated