Mechanical vibration - Measurement and evaluation of human exposure to hand-transmitted vibration - Part 2: Practical guidance for measurement at the workplace

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 5349-2:2001 sisaldab Euroopa standardi EN ISO 5349-2:2001 ingliskeelset teksti. Käesolev dokument on jõustatud 19.12.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 5349-2:2001 consists of the English text of the European standard EN ISO 5349-2:2001. This document is endorsed on 19.12.2001 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This part of ISO 5349 provides guidelines for the measurement and evaluation of hand-transmitted vibration at the workplace in accordance with ISO 5349-1.	**Scope:** This part of ISO 5349 provides guidelines for the measurement and evaluation of hand-transmitted vibration at the workplace in accordance with ISO 5349-1.

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Võtmesõnad: hand-arm system, human body, human factors engineering, measurement, measuring instruments, people, physiological e, physiological effects (human body), safety requirements, vibration, vibration effects (human body), vibration measurement, vibration meters

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Mechanical vibration

Measurement and evaluation of human exposure to hand-transmitted vibration

Part 2: Practical guidance for measurement at the workplace
(ISO 5349-2 : 2001)

Vibrations mécaniques – Mesurage et évaluation de l'exposition des individus aux vibrations transmises par la main – Partie 2: Guide pratique pour le mesurage sur le lieu de travail (ISO 5349-2 : 2001)

Mechanische Schwingungen – Messung und Bewertung der Einwirkung von Schwingungen auf das Hand-Arm-System des Menschen – Teil 2: Praxisgerechte Anleitung zur Messung am Arbeitsplatz (ISO 5349-2 : 2001)

This European Standard was approved by CEN on 2001-06-22.

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 Management Centre or to any CEN member.

The European Standards exist 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 Management Centre has the same status as the official versions.

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CEN

European Committee for Standardization
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Contents

Foreword

The text of EN ISO 5349-2:2001 has been prepared by Technical Committee CEN/TC 231 "Mechanical vibration and shock", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 108 "Mechanical vibration and shock".

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 February 2002, and conflicting national standards shall be withdrawn at the latest by February 2002.

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.

Annexes A to E of this European Standard are informative.

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

Introduction

Operating machinery may expose workers to hand-transmitted mechanical vibration which can interfere with comfort, working efficiency and, in some circumstances, health and safety. The general requirements for measuring and evaluating hand-transmitted vibration exposure are specified in ISO 5349-1. The aim of the present part of ISO 5349 is to provide practical guidelines in accordance with ISO 5349-1 to perform measurements correctly and to develop an effective strategy for measurement of hand-transmitted vibration at the workplace.

The use of the strategy described in this part of ISO 5349 will lead to a realistic picture of the daily exposure of the operator at the workplace and of the relevant uncertainties.

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

– identifying a series of discrete operations which make up the subject's normal working pattern;

– selection of operations to be measured;

– measuring the r.m.s. acceleration value for each selected operation;

– evaluation of the typical daily exposure time for each operation identified;

– calculating the 8-h energy-equivalent vibration total value (daily vibration exposure).

The evaluation of vibration exposure as described in ISO 5349-1 is solely based on the measurement of vibration magnitude at the grip zones or handles and exposure times. Additional factors, such as gripping and feed forces applied by the operator, the posture of the hand and arm, the direction of the vibration and the environmental conditions, etc. are not taken into consideration. This part of ISO 5349, being an application of ISO 5349-1, does not define guidance to evaluate these additional factors. However, it is recognized that reporting of all relevant information is important for the development of improved methods for the assessment of vibration risk.

1 Scope

This part of ISO 5349 provides guidelines for the measurement and evaluation of hand-transmitted vibration at the workplace in accordance with ISO 5349-1.

This part of ISO 5349 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 8-h energy-equivalent vibration total value (daily vibration exposure). This part of ISO 5349 provides a means to determine the relevant operations which should be taken into account when determining the vibration exposure.

This part of ISO 5349 applies to all situations where people are exposed to vibration transmitted to the hand-arm system by hand-held or hand-guided machinery, vibrating workpieces, or controls of mobile or fixed machinery.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO 2041, *Vibration and shock – Vocabulary.*

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

ISO 5805, *Mechanical vibration and shock – Human exposure – Vocabulary.*

ISO 8041, *Human response to vibration – Measuring instrumentation.*

ISO 8662 (all parts), *Hand-held portable power tools – Measurement of vibrations at the handle.*

3 Terms and definitions and symbols

3.1 Terms and definitions

For the purposes of this part of ISO 5349, the terms and definitions given in ISO 2041 and ISO 5805 and the following apply.

3.1.1
hand-fed machine
machine where the operator feeds workpieces to the working part of the machine, such that the vibration exposure is obtained through the hand-held workpiece

EXAMPLE band-saw, pedestal grinder

3.1.2
hand-guided machine
machine which is guided by the operator with his hands, such that the vibration exposure is obtained through the handles, steering wheel or tiller

EXAMPLE ride-on lawn mower, powered pallet truck, swing grinder

3.1.3
hand-held workpiece
workpiece which is held in the hand, such that vibration exposure is obtained through the hand-held workpiece rather than, or as well as, through the power tool handle

EXAMPLE casting held against a pedestal grinder, wood fed into a band-saw