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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**

*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*



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## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 5349 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 5349-2 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 108, *Mechanical vibration and shock*, Subcommittee SC 4, *Human exposure to mechanical vibration and shock*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European Standard..." to mean "...this International Standard...".

ISO 5349 consists of the following parts, under the general title *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration*:

- *Part 1: General requirements*
- *Part 2: Practical guidance for measurement at the workplace*

Annexes A to E of this part of ISO 5349 are for information only.

Contents

	Page
Foreword.....	v
Introduction .....	vi
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions and symbols .....</b>	<b>1</b>
<b>3.1 Terms and definitions .....</b>	<b>1</b>
<b>3.2 Symbols .....</b>	<b>2</b>
<b>4 Quantities to be evaluated .....</b>	<b>2</b>
<b>5 Preparation of the measurement procedure .....</b>	<b>3</b>
<b>5.1 General.....</b>	<b>3</b>
<b>5.2 Selection of operations to be measured .....</b>	<b>3</b>
<b>5.3 Organization of the measurements.....</b>	<b>3</b>
<b>5.4 Duration of vibration measurements .....</b>	<b>4</b>
<b>5.5 Estimation of daily vibration duration .....</b>	<b>5</b>
<b>6 Measurement of vibration magnitude.....</b>	<b>6</b>
<b>6.1 Measurement equipment .....</b>	<b>6</b>
<b>6.2 Sources of uncertainty in vibration measurement.....</b>	<b>11</b>
<b>6.3 Check and verification of the measurement chain.....</b>	<b>12</b>
<b>7 Uncertainty of evaluation of daily vibration exposure.....</b>	<b>12</b>
<b>7.1 Acceleration measurement uncertainty .....</b>	<b>12</b>
<b>7.2 Exposure time measurement uncertainty .....</b>	<b>13</b>
<b>7.3 Evaluation of uncertainties.....</b>	<b>13</b>
<b>8 Calculation of the daily vibration exposure .....</b>	<b>13</b>
<b>9 Information to be reported.....</b>	<b>14</b>
<b>Annex A (informative) Examples of measurement locations .....</b>	<b>16</b>
<b>Annex B (informative) Evaluation of vibration exposure over periods greater than one day.....</b>	<b>25</b>
<b>Annex C (informative) Mechanical filters .....</b>	<b>27</b>
<b>Annex D (informative) Guidance on mounting accelerometers .....</b>	<b>28</b>
<b>Annex E (informative) Examples of the calculation of daily vibration exposure.....</b>	<b>31</b>
<b>Bibliography .....</b>	<b>39</b>

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## 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.