



BSI Standards Publication

**Mechanical vibration —
Guideline for the assessment of
exposure to hand-transmitted
vibration using available
information including that
provided by manufacturers of
machinery**

National foreword

This Published Document is the UK implementation of CEN/TR 15350:2013. It supersedes PD CEN/TR 15350:2006 which is withdrawn.

This Published Document was prepared by CEN Technical Committee CEN/TC 231, Mechanical vibration and shock, to provide guidance on the assessment of exposure to hand-transmitted vibration, as required by the European Directive on Physical Agents (Vibration), 2002/44/EC. It is not a European or British Standard. The European Union has commissioned separate guidance on implementing the Directive.

This Published Document does not constitute guidance on the British implementation of Directive 2002/44/EC. Guidance on the Control of Vibration at Work Regulations 2005 has been published by the Health and Safety Executive. The Health and Safety Executive has found that advice in the Annexes to this Published Document can be unreliable, particularly that relating to the content of column 6 of Tables E.1, F.1 and H.1.

The EU Guide 'Non-binding guide to good practice with a view to implementation of Directive 2002/44/EC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents vibrations' can be found at the EU Bookshop URL below.

<http://bookshop.europa.eu/en/non-binding-guide-to-good-practicewith-a-view-to-implementation-of-directive-2002-44-ec-on-the-minimum-health-and-safety-requirements-regarding-the-exposure-of-workers-to-the-risks-arising-from-physical-agents-vibrations--pbKE7007108/>

Further information concerning preparation of the EU Guide can be found at:

www.humanvibration.com/EU/VIBGUIDE.htm

The UK participation in its preparation was entrusted by Technical Committee GME/21, Mechanical vibration, shock and condition monitoring, to Subcommittee GME/21/6, Mechanical vibration, shock and condition monitoring - Human exposure to mechanical vibration and shock.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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ISBN 978 0 580 81144 9

ICS 13.160

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 March 2014.

Amendments/corrigenda issued since publication

Date	Text affected
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ICS 13.160

English Version

**Mechanical vibration - Guideline for the assessment of exposure
to hand-transmitted vibration using available information
including that provided by manufacturers of machinery**

Vibrations mécaniques - Guide pour l'évaluation de
l'exposition aux vibrations transmises à la main à partir de
l'information disponible, y compris l'information fournie par
les fabricants de machines

Mechanische Schwingungen - Anleitung zur Beurteilung der
Belastung durch Hand-Arm-Schwingungen aus Angaben zu
den benutzten Maschinen einschließlich Angaben von den
Maschinenherstellern

This Technical Report was approved by CEN on 8 June 2013. It has been drawn up by the Technical Committee CEN/TC 231.

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Contents

Page

Foreword.....	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Estimation of the vibration magnitude.....	7
5 Estimation of the daily exposure duration	11
6 Consideration of uncertainties	11
7 Estimation and assessment of the vibration exposure	12
8 Documentation.....	17
Annex A (informative) Guidance on the information which users could expect from machinery manufacturers and suppliers.....	18
Annex B (informative) Principle of the procedure for the estimation of the daily vibration exposure using manufacturers' declared emission values.....	20
Annex C (informative) Simplified method for a quick estimate of machine equivalent acceleration	21
Annex D (informative) Use of manufacturer's declared values or other values measured according to current vibration test codes.....	23
Annex E (informative) Estimation of the daily vibration exposure for electric machines	25
Annex F (informative) Estimation of the daily vibration exposure for pneumatic machines.....	34
Annex G (informative) Estimation of the daily vibration exposure for machines with internal combustion engine	39
Annex H (informative) Estimation of the daily vibration exposure for hydraulic machines	45
Bibliography.....	50

Foreword

This document (CEN/TR 15350:2013) has been prepared by Technical Committee CEN/TC 231 "Mechanical vibration and shock", the secretariat of which is held by DIN.

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.

This document supersedes CEN/TR 15350:2006.

The main technical changes compared to CEN/TR 15350:2006 are the following ones:

- an annex on a simplified method for a quick estimate of machine equivalent acceleration has been added;
- an annex on estimation of the daily vibration exposure for hydraulic machines has been added;
- lists of machines in the annexes have been expanded and further vibration emission test codes have been considered.

Introduction

This Technical Report provides information on how to assess the vibration exposure from hand-held power tools and hand-guided machines. The methods described use existing vibration emission values declared for the machine of interest or information coming from other sources. It should be noted that vibration usually varies a lot over time, with different workstations and different operators. It is therefore not possible to get precise exposure figures from limited investigations. But also the declared values need to be used with great care since they are measured for a limited number of defined work situations. The actual work situation for a specific operator, however, may be very different thus creating different vibration. On the other hand values from real work that can be found in literature are only correct for the specific work situation and time when they were measured. The user of this Technical Report should be aware that the exposure to vibration does not only depend on the machine used but also to a large extent on things like quality of inserted tools, the work situation and operator behaviour. These factors need to be taken into account to make an ideal assessment of vibration exposure.

The daily vibration exposure to be assessed depends on both the average magnitude of vibration at the surface in contact with the hand and the total daily duration for which an employee is in contact with that vibration.

As there is a big difference between a rough estimation of the daily vibration exposure to identify workers at risk and the definition of the state of the art regarding machine vibration emission, vibration total values calculated by applying correction factors are not suitable to determine the state of the art for machine categories. To define the state of the art a high level of accuracy is needed, which means that this can only be obtained by measurements in all three axes.

1 Scope

This Technical Report gives guidelines for estimating, assessing and documenting the daily vibration exposure due to the use of hand-held power tools and hand-guided machines, according to the requirements of the European Physical Agents Directive (vibration) 2002/44/EC. This Technical Report is addressed to competent services for the assessment of vibration exposure at the workplace and to national authorities and industrial organisations. It helps to establish documentation for specific machinery or work situations and can also be useful for employers.

It follows the method of EN ISO 5349-1 and EN ISO 5349-2 but instead of measuring the vibration magnitudes at the specific workplaces, the methods in this Technical Report use existing vibration values from other sources of information including those provided by the manufacturers of the machinery according to the requirements of the Machinery Directive 2006/42/EC. It is important that the vibration values used in the exposure assessment are representative of those in the specific use of the machinery. Workplace measurements, however, are required if suitable data are not available to represent the vibration under the specific working conditions or if the calculation results do not help to decide whether or not the vibration exposure limit value or exposure action value is likely to be exceeded.

This Technical Report gives guidance on how to estimate the exposure duration and the daily vibration exposure $A(8)$ as defined in EN ISO 5349-1. It also offers a simple method for estimating the daily vibration exposure by means of a table which indicates the vibration exposure as a function of the equivalent vibration total value and the associated exposure duration. Both methods can be used even in cases of multiple exposures on the same day.

Annex A gives guidance for manufacturers and suppliers of machinery concerning information that warns of risks from vibration, which should be reported to the customer.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

EN ISO 5349-2:2001, *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)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 5349-2:2001 and the following apply.

3.1 user time

daily duration of the work involving the use of the machinery, i.e. including the interruptions required by the work and the break periods directly related to the use

Note 1 to entry: This is more likely to be reported by the operator than the exposure duration (see 3.2).

3.2 exposure duration

T

total duration the hand is in direct contact with the vibrating surface (handle, work piece, etc.)

Note 1 to entry: The exposure duration is often confused with the user time when estimating the daily exposure duration T (see Example in 7.2.2).