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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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EUROPEAN COMMITTEE FOR STANDARDIZATION
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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).