

**Safety of machinery - Guidance for the  
drafting of the vibration clauses of  
safety standards**

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 12786:2000 sisaldab Euroopa standardi EN 12786:1999 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 11.01.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 12786:2000 consists of the English text of the European standard EN 12786:1999.</p> <p>This document is endorsed on 11.01.2000 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> This standard gives guidance on how to deal with vibration in type C-standards where vibration is identified as a significant hazard (see EN 292-1:1991, clause 4.6).*</p>	<p><b>Scope:</b> This standard gives guidance on how to deal with vibration in type C-standards where vibration is identified as a significant hazard (see EN 292-1:1991, clause 4.6).*</p>
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**ICS** 01.120, 13.110, 17.160

**Võtmesõnad:**

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ICS 01.120; 13.110; 17.160

**English version**

Safety of machinery  
**Guidance for the drafting of the vibration clauses of  
safety standards**

Sécurité des machines – Guide relatif à  
la rédaction des clauses vibrations des  
normes de sécurité

Sicherheit von Maschinen – Anleitung  
für die Abfassung der Abschnitte über  
Schwingungen in Sicherheitsnormen

This European Standard was approved by CEN on 1999-07-07.

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat 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 Central Secretariat has the same status as the official versions.

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**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

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## Contents

Foreword  
Introduction

- 1 Scope
- 2 Normative references
- 3 Requirements for drafting the vibration clauses in type C-standards
  - 3.1 General drafting rules
  - 3.2 Clause on "Vibration as a hazard"
  - 3.3 Clause on "Vibration reduction as a safety requirement"
    - 3.3.1 Vibration reduction at source by design
    - 3.3.2 Vibration reduction by protective devices
  - 3.4 Clause on "Verification of safety requirements and/or protective measures"
    - 3.4.1 Verification based on vibration emission values
    - 3.4.2 Verification of vibration reduction
  - 3.5 Clause on "Instruction handbook"

Annex A (informative) Further guidance on the evaluation of vibration emission data

Bibliography

## Foreword

This European Standard 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 February 2000, and conflicting national standards shall be withdrawn at the latest by February 2000.

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.

It is a guidance document to be used by CEN machinery TCs as the basis for the preparation of the clauses concerning vibration in their type C-standards. "Guidance" is used, because the document is a general one and therefore may not be applicable in all details for a specific type of machinery.

Several documents concerning vibration referred to in this European Standard are at present at the stage of draft. The latest reference document numbers are given which makes it possible to obtain these documents from a national member body.

Annex A is informative.

## Introduction

For many machines, vibration is a significant hazard, i. e. a hazard which an assessment carried out in accordance with EN 1050 has lead to identify as being connected with one or more essential requirements decreed in annex I of the Machinery Directive and which requires a specific action on the part of the manufacturer or supplier (see 6.4.2 of EN 414:1992). The information contained in this European Standard is based on the following principles:

- a) vibration reduction is an integral part of machinery safety;
- b) machinery shall be so designed and constructed that risks resulting from vibration produced by the machinery are reduced to the lowest level taking account of technical progress and available means of reducing vibration, in particular at source, and
- c) specific quantitative information on vibration emitted by machinery under specified operating and mounting conditions shall be given in accordance with the relevant vibration test code or, if no test code exists, under specified individual conditions;
- d) the vibration clauses of type C-standards shall deal with vibration aspects including residual risk; information on personal protective equipment may be helpful.

## 1 Scope

This European Standard gives guidance on how to deal with vibration in type C-standards where vibration is identified as a significant hazard (see 4.6 of EN 292-1:1991). As such, this European Standard supplements the rules given in EN 414.

The exact way that vibration is dealt with for particular machinery will depend on the structure of the type C-standards and is the responsibility of the type C-standards Technical Committees.

## 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.

EN 292-1:1991

Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology

EN 414:1992

Safety of machinery – Rules for the drafting and presentation of safety standards

EN 1032

Mechanical vibration – Testing of mobile machinery in order to determine the whole-body vibration emission value – General

EN 1033

Hand-arm vibration – Laboratory measurement of vibration at the grip surface of hand-guided machinery – General

EN 1299

Vibration isolation of machines – Information for the application of source isolation

- EN 12096  
Mechanical vibration – Declaration and verification of vibration emission values
- EN 28662-1  
Hand-held portable power tools – Measurement of vibrations at the handle – Part 1: General (ISO 8662-1:1988)
- EN 30326-1  
Mechanical vibration – Laboratory method for evaluating vehicle seat vibration – Part 1: Basic requirements (ISO 10326-1:1992)
- EN ISO 10819  
Mechanical vibration and shock – Hand-arm vibration – Method for the measurement and evaluation of the vibration transmissibility of gloves at the palm of the hand (ISO 10819:1996)
- EN ISO 11689  
Acoustics – Procedure for the comparison of noise-emission data for machinery and equipment (ISO 11689:1996)
- CR 1030-1  
Hand-arm vibration – Guidelines for vibration hazards reduction – Part 1: Engineering methods by design of machinery

### 3 Requirements for drafting the vibration clauses in type C-standards

#### 3.1 General drafting rules

The type C-standard shall reflect, in accordance with 6.8 of EN 414:1992, the application of the strategy defined in clause 5 "Strategy for selecting safety measures" of EN 292-1:1991 with a view to reducing the vibration emission to the lowest level taking account of technical progress and the available technical measures for vibration control at the source.

In addition, in every type C-standard dealing with vibration, there is a need to provide information on how the technical measures can be verified (see 6.9 of EN 414:1992). This verification shall be based on vibration emission values, see 3.4.1.

The information for use of the machinery (see 6.10 of EN 414:1992) shall include not only information on vibration emission values but also sufficient information on additional vibration reduction if necessary.

NOTE: If, for a particular type of machinery, vibration is considered by the relevant type C-standard Technical Committee not to be a significant hazard the following statement should be included in the safety standard:

"Vibration is not considered to be a significant hazard for these machines and no test method is given. This does not mean that the manufacturer of the machine is absolved from reducing vibration and making vibration declaration."

The following rules for the drafting of the vibration clauses of a type C-standard are given in accordance with the structure as laid down in EN 414:

- list of hazards, see 3.2,
- safety requirements and/or measures, see 3.3,
- verification of the effect of the safety measures, see 3.4,
- information for use, see 3.5.