Mehaaniline võnkumine ja löök. Kämbla-käsivarre vibratsioon. Meetod kämbla-käsivarresüsteemi poolt koormatud elastsete materjalide vibratsiooni ülekanduvuse mõõtmiseks

Mechanical vibration and shock - Hand-arm vibration - Method for measuring the vibration transmissibility of resilient materials when loaded by the hand-arm system

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 13753:1999 sisaldab Euroopa standardi EN ISO 13753:1998 ingliskeelset teksti. Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 13753:1999 consists of the English text of the European standard EN ISO 13753:1998. This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: See standard määrab kindlaks elastse materjali vibratsiooni ülekanduvuse mõõtmiseks oludes, kus materjal on kämbla-käsivarresüsteemi poolt koormatud.	**Scope:**

ICS 13.160

Võtmesõnad: inimkeha, käelaba, käsivarred, mõju, teimid, vibratsioon, vibratsiooni mõõtmine, vibratsiooniteimid

EUROPEAN STANDARD
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EN ISO 13753

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ICS 13.160

Descriptors: Mechanical vibration, shock, hand-arm system, testing.

English version

Mechanical vibration and shock – Hand-arm vibration

Method for measuring the vibration transmissibility of resilient materials when loaded by the hand-arm system

(ISO 13753 : 1998)

Vibrations et chocs mécaniques – Vibrations main-bras – Méthode pour mesurer le facteur de transmission des vibrations par les matériaux résilients chargés par le système main-bras (ISO 13753 : 1998)

Mechanische Schwingungen und Stöße – Hand-Arm-Schwingungen – Verfahren zur Messung der Schwingungsübertragung elastischer Materialien unter Belastung durch das Hand-Arm-System (ISO 13753 : 1998)

This European Standard was approved by CEN on 1998-06-19.

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 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.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

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

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Ref. No. EN ISO 13753 : 1998 E

Foreword

International Standard

ISO 13753 : 1998 Mechanical vibration and shock – Hand-arm vibration – Method for measuring the vibration transmissibility of resilient materials when loaded by the hand-arm system,

which was prepared by ISO/TC 108 'Mechanical vibration and shock' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 231 'Mechanical vibration and shock', the Secretariat of which is held by DIN, as a European Standard.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of the relevant EU Directives.

For relationship with these directives, see Annex ZB.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by January 1999 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 13753 : 1998 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

Introduction

This International Standard was developed in response to the growing demand to protect people from the risks of vibration damage caused by exposure to hand-transmitted vibration.

Various standards refer to measurement and assessment of risk to vibration exposure and to methods of type testing specific tools and processes.

Resilient materials are used to cover handles and make gloves. It is hoped that both of these will reduce the magnitude of the vibration exposure. This International Standard describes a method of measuring the vibration attenuation of a sample of the material in the form of a flat sheet or layer. In some cases the material may be of two or more layers forming a sheet. It is a laboratory measurement and offers a reproducible and reliable procedure.

This International Standard assumes that the material behaves in a linear way and that it has negligible mass compared with the mass loading. (A correction could be made for the material mass if required.) The method determines the impedance of the material when loaded by a mass providing a compression force equivalent to that found when the material is gripped by the hand. This is done by measuring the transfer function of the mass-loaded material at all the required frequencies. The vibration transmission when loaded by the hand is computed using standard values of hand-arm impedance and the measured values of the material impedance. The impedances used in this International Standard are for the palm of the hand when gripping a circular handle. The resulting transmissibility may not be applicable to the fingers. The impedance for the z_h direction of the hand-arm system where the material is under compression is used. The mathematical basis of the method is contained in annex B.

If the results of this measurement procedure show transmissibilities greater than 0,6 at all frequencies up to 500 Hz, then the material would probably not provide greater attenuation in the practical situation in the same frequency range. In the practical situation, the transmissibility as a function of frequency should be appropriate to the frequency spectrum of the source.

1 Scope

This International Standard specifies a procedure to determine the vibration transmissibility of a resilient material when loaded by the hand-arm system.

The method is applicable to all materials which behave in a linear way. It is expected that this is realized in most elastic foam and rubber materials and, provisionally, in woven cloths. The method can be applied to mixed systems, e.g. a cloth material attached to a foam or rubber base.

It is expected that the results of this laboratory test will be used in screening materials used for vibration attenuation on the handles of tools and for gloves. This will enable rank ordering of materials for gloves, but will not necessarily predict the transmissibility of the gloves fabricated from these materials (for this purpose, see ISO 10819).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2041:1990, *Vibration and shock — Vocabulary.*

ISO 5349:1986, *Mechanical vibration — Guidelines for the measurement and the assessment of human exposure to hand-transmitted vibration.*

ISO 5805:1997, *Mechanical vibration and shock — Human exposure — Vocabulary.*

ISO 10068:—[1)], *Mechanical vibration and shock — Free mechanical impedance of the human hand-arm system at the driving point.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 2041, ISO 5349 and ISO 5805 apply.

NOTE For hand-transmitted vibration, see ISO 5805. For transmissibility, see ISO 2041.

1) To be published.