

**Acoustics and vibration - Laboratory measurement of vibro-acoustic transfer properties of resilient elements - Part 2: Dynamic stiffness of elastic supports for translatory motion - Direct method**

Acoustics and vibration - Laboratory measurement of vibro-acoustic transfer properties of resilient elements - Part 2: Dynamic stiffness of elastic supports for translatory motion - Direct method

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 10846-2:2001 sisaldab Euroopa standardi EN ISO 10846-2:1998 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.06.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 10846-2:2001 consists of the English text of the European standard EN ISO 10846-2:1998.</p> <p>This document is endorsed on 18.06.2001 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>
--	---

<p><b>Käsitlusala:</b></p> <p>This standard specifies a method for determining the dynamic transfer stiffness for translations of elastic supports, under preload. The method concerns the laboratory measurement input vibration and output force and is called the Direct Method.</p>	<p><b>Scope:</b></p> <p>This standard specifies a method for determining the dynamic transfer stiffness for translations of elastic supports, under preload. The method concerns the laboratory measurement input vibration and output force and is called the Direct Method.</p>
---	---

ICS 17.140.01

**Võtmesõnad:** acoustic measurements, acoustics, determination, dynamic stiffness, generalities, mechanical properties, resilient devices, tests, vibration, vibration isolators

ICS 17.140.01

**English version**

Acoustics and vibration  
**Laboratory measurement of vibro-acoustic transfer properties  
of resilient elements**

Part 2: Dynamic stiffness of elastic supports for translatory motion –  
Direct method  
(ISO 10846-2 : 1997)

Acoustique et vibrations – Mesurage  
en laboratoire des propriétés de  
transfert vibro-acoustique des élé-  
ments élastiques – Partie 2: Raideur  
dynamique en translation des sup-  
ports élastiques – Méthode directe  
(ISO 10846-2 : 1997)

Akustik und Schwingungstechnik –  
Laborverfahren zur Messung der  
vibro-akustischen Transfereigen-  
schaften elastischer Elemente – Teil 2:  
Bestimmung der dynamischen Trans-  
fersteifigkeit elastischer Stützelemente  
für translatorische Schwingungen –  
Direktes Verfahren (ISO 10846-2 : 1997)

This European Standard was approved by CEN on 1998-11-08.

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**

## Foreword

International Standard

ISO 10846-2 : 1997 Acoustics and vibration – Laboratory measurement of vibro-acoustic transfer properties of resilient elements – Part 2: Dynamic stiffness of elastic supports for translatory motion – Direct method,

which was prepared by ISO/TC 43 'Acoustics' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 211 'Acoustics', the Secretariat of which is held by DS, as a European Standard.

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 May 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 10846-2 : 1997 was approved by CEN as a European Standard without any modification.

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

## Introduction

Passive vibration isolators of various kinds are used to reduce the transmission of vibrations. Examples are automobile engine mounts, elastic supports for buildings, elastic mounts and flexible shaft couplings for shipboard machinery and small isolators in household appliances.

This part of ISO 10846 specifies a direct method for measuring the dynamic transfer stiffness function of linear elastic supports. This includes elastic supports with non-linear static load-deflection characteristics as long as the elements show an approximate linearity for vibrational behaviour for a given static preload. This part of ISO 10846 belongs to a series of International Standards on methods for the laboratory measurement of vibro-acoustic properties of resilient elements, which also includes documents on measurement principles, on an indirect method and on a driving point method. ISO 10846-1 provides guidance for the selection of the appropriate part of the series.

The laboratory conditions described in this part of ISO 10846 include the application of static preload. The results of the direct method are useful for isolators which are used to prevent low-frequency vibration problems and to attenuate structure-borne sound. The method is not sufficiently appropriate to characterize completely isolators which are used to attenuate shock excursions.

## 1 Scope

This part of ISO 10846 specifies a method for determining the dynamic transfer stiffness for translations of elastic supports, under specified preload. The method concerns the laboratory measurement of vibrations on the input side and blocking output forces and is called the direct method.

The method is applicable to elastic supports with parallel flanges (see figure 1).

NOTE 1 Vibration isolators which are the subject of this part of ISO 10846 are those which are used to reduce:

- a) the transmission of audiofrequency vibrations (structure-borne sound, 20 Hz to 20 kHz) to a structure which may, for example, radiate unwanted fluidborne sound (airborne, waterborne or other);
- b) the transmission of low-frequency vibrations (typically 1 Hz to 80 Hz) which may, for example, act upon human subjects or cause damage to structures of any size when vibration is too severe.

NOTE 2 In practice the size of the available test rig(s) may restrict the use of very small or very large elastic supports.

NOTE 3 When an elastic support has no parallel flanges, an auxiliary fixture should be included as part of the test element to arrange for parallel flanges.

NOTE 4 Portions of continuous supports of strips and mats are used as test samples in this method. Whether or not the portion describes the behaviour of the complex system sufficiently is the responsibility of the user of this part of ISO 10846.

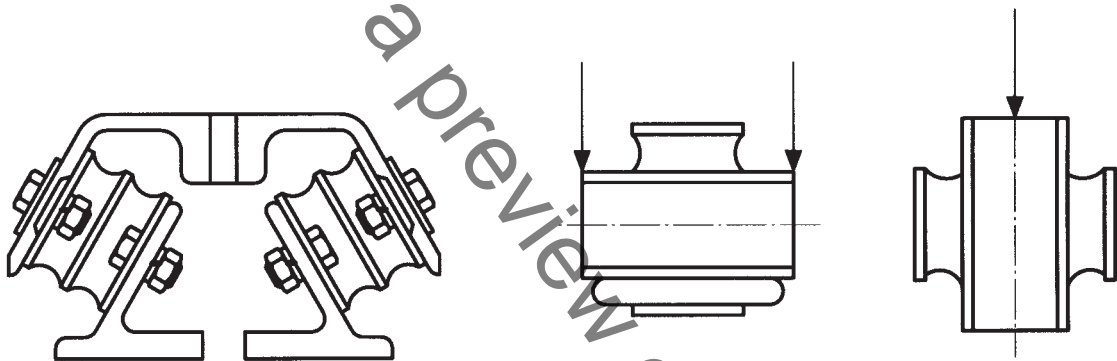


Figure 1 — Example of elastic supports with parallel flanges

Measurements for translations normal and transverse to the flanges are covered in this part of ISO 10846.

The method covers the frequency range from 1 Hz up to a frequency  $f_1$ , which is usually determined by the test rig.

The data obtained according to the method specified in this part of ISO 10846 can be used for:

- product information provided by manufacturers and to suppliers;
- information during product development;
- quality control;
- calculation of the transfer of vibrational energy through isolators.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10846. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10846 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of ISO maintain registers of currently valid International Standards.

ISO 266:—<sup>1)</sup>, *Acoustics — Preferred frequencies*.

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

ISO 10846-1:1997, *Acoustics and vibration — Laboratory measurement of vibro-acoustic transfer properties of resilient elements — Part 1: Principles and guidelines*.

ISO 5347-3:1993, *Methods for the calibration of vibration and shock pick-ups — Part 3: Secondary vibration calibration*.

ISO 5348:1987, *Mechanical vibration and shock — Mechanical mounting of accelerometers*.

ISO 7626-1:1986, *Vibration and shock — Experimental determination of mechanical mobility — Part 1: Basic definitions and transducers*.

ISO 7626-2:1990, *Vibration and shock — Experimental determination of mechanical mobility — Part 2: Measurements using single-point translational excitation with an attached vibration exciter*.

## 3 Definitions

For the purposes of this part of ISO 10846, the definitions given in ISO 2041 and the following apply.

### 3.1 resilient element

(see vibration isolator)

### 3.2 vibration isolator

isolator designed to attenuate the transmission of vibration in frequency range [ISO 2041:1990, 2.110]

### 3.3 elastic support

vibration isolator suitable for supporting part of the mass of a machine, a building or another type of structure

---

1) To be published. (Revision of ISO 266:1975)