
Akustika in vibracije - Laboratorijsko merjenje vibro-akustičnih prenosnih lastnosti elastičnih elementov – 5. del: Točkovna metoda za določanje nizkofrekvenčne prenosne togosti elastičnih podpor za translatorno gibanje (istoveten prEN ISO 10846-5:2005)

Acoustics and vibration - Laboratory measurement of vibro-acoustic transfer properties of resilient elements - Part 5: Driving point method for determination of the low frequency transfer stiffness of resilient supports for translatory motion (ISO/DIS 10846-5:2005)

<https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[kSIST prEN ISO 10846-5:2009](https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dbc23033/ksist-pren-iso-10846-5-2009)

<https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dbc23033/ksist-pren-iso-10846-5-2009>

November 2005

ICS

English Version

Acoustics and vibration - Laboratory measurement of vibro-acoustic transfer properties of resilient elements - Part 5: Driving point method for determination of the low frequency transfer stiffness of resilient supports for translatory motion (ISO/DIS 10846-5:2005)

Acoustique et vibrations - Mesurage en laboratoire des propriétés de transfert vibro-acoustique des éléments élastiques - Partie 5: Méthode du point d'application pour la détermination de la raideur de transfert à basse fréquence en translation des supports élastiques (ISO/DIS 10846-5:2005)

ITeH STANDARD PREVIEW
(standards.iteh.ai)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 211.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

This document (prEN ISO 10846-5:2005) has been prepared by Technical Committee ISO/TC 43 "Acoustics" in collaboration with Technical Committee CEN/TC 211 "Acoustics", the secretariat of which is held by DS.

This document is currently submitted to the parallel Enquiry.

Endorsement notice

The text of ISO 10846-5:2005 has been approved by CEN as prEN ISO 10846-5:2005 without any modifications.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[kSIST prEN ISO 10846-5:2009](https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009)

<https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009>



DRAFT INTERNATIONAL STANDARD ISO/DIS 10846-5

ISO/TC 43/SC 1

Secretariat: DS

Voting begins on:
2005-11-17

Voting terminates on:
2006-04-17

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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

Part 5:

Driving point method for determination of the low frequency transfer stiffness of resilient supports for translatory motion

Acoustique et vibrations — Mesurage en laboratoire des propriétés de transfert vibro-acoustique des éléments élastiques —

Partie 5: Méthode du point d'application pour la détermination de la raideur de transfert à basse fréquence en translation des supports élastiques

(standards.iteh.ai)

ICS 17.140.01

[kSIST prEN ISO 10846-5:2009](https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009)

<https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009>

ISO/CEN PARALLEL ENQUIRY

The CEN Secretary-General has advised the ISO Secretary-General that this ISO/DIS covers a subject of interest to European standardization. **In accordance with the ISO-lead mode of collaboration as defined in the Vienna Agreement, consultation on this ISO/DIS has the same effect for CEN members as would a CEN enquiry on a draft European Standard.** Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[kSIST prEN ISO 10846-5:2009](https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009)

<https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009>

Copyright notice

This ISO document is a Draft International Standard and is copyright-protected by ISO. Except as permitted under the applicable laws of the user's country, neither this ISO draft nor any extract from it may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission being secured.

Requests for permission to reproduce should be addressed to either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Reproduction may be subject to royalty payments or a licensing agreement.

Violators may be prosecuted.

Contents

Page

Foreword	iii
Introduction.....	iii
1 Scope	3
2 Normative references	3
3 Terms and definitions	3
4 Principle	3
5 Test arrangements	3
5.1 Normal translations	3
5.1.1 Overview	3
5.1.2 The resilient support under test	3
5.1.3 Static preloading system	3
5.1.4 Force measurement system	3
5.1.5 Acceleration measurement system	3
5.1.6 Dynamic excitation system	3
5.2 Transverse translations	3
5.2.1 Overview	3
5.2.2 Resilient support under test	3
5.2.3 Static preloading system	3
5.2.4 Force measurement system	3
5.2.5 Acceleration measurement system	3
5.2.6 Dynamic excitation system	3
5.3 Suppression of unwanted vibrations	3
5.3.1 General	3
5.3.2 Normal direction	3
5.3.3 Transverse direction	3
6 Criteria for the adequacy of the test arrangement	3
6.1 General requirements	3
6.1.1 Frequency range	3
6.1.2 Limitation due to the acceleration of the output flange	3
6.1.3 Limitation due to unwanted input vibrations	3
6.2 Determination of upper limiting frequency	3
6.3 Force transducers	3
6.4 Accelerometers	3
6.5 Summation of signals	3
6.6 Analysers	3
7 Test procedures	3
7.1 Selection of force measurement system and force distribution plates	3
7.2 Installation of the test element	3
7.3 Mounting and connection of accelerometers	3
7.4 Mounting and connections of the vibration exciter	3
7.5 Source signal	3
7.6 Measurements	3
7.6.1 General	3
7.6.2 Validity of the measurements	3
7.6.3 Measurement uncertainty	3
7.7 Test for linearity	3
8 Evaluation of test results	3
8.1 Calculation of dynamic driving-point stiffness	3

8.2 One-third-octave-band values of the frequency-averaged dynamic driving-point stiffness3
8.3 One-third-octave-band values of the frequency-averaged transfer stiffness3
8.4 Presentation of one-third-octave-band results.....3
8.5 Presentation of narrow-band data3
9 Information to be recorded3
10 Test report3
Annex A (informative) Static load-deflection curve3
Annex B (informative) Measurement uncertainty3
B.1 General.....3
B.2 Level of frequency-averaged dynamic transfer stiffness.....3
B.3 Standard uncertainties.....3
B.3.1 Signal processing and background noise3
B.3.2 Instrumentation.....3
B.3.3 Installation of the test element.....3
B.3.4 Laboratory test rig3
B.3.5 Difference between driving point stiffness and transfer stiffness3
B.4 Contributions to combined measurement uncertainty.....3
B.5 Calculation of expanded uncertainty for a coverage probability of 95 %.....3
Bibliography3

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[kSIST prEN ISO 10846-5:2009](https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009)
<https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009>

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 10846-5 was prepared jointly by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*, and ISO/TC 108, *Mechanical vibration and shock*.

ISO 10846 consists of the following parts, under the general title *Acoustics and vibration — Laboratory measurement of vibro-acoustic transfer properties of resilient elements*:

- *Part 1: Principles and guidelines*
- *Part 2: Direct method for determination of the dynamic stiffness of resilient supports for translatory motion*
- *Part 3: Indirect method for determination of the dynamic stiffness of resilient supports for translatory motion*
- *Part 4: Dynamic stiffness of elements other than resilient supports for translatory motion*
- *Part 5: Driving point method for determination of the low frequency transfer stiffness of resilient supports for translatory motion*

Annexes A to B of this part of ISO 10846 are for information only.

Introduction

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

This part of ISO 10846 specifies a driving point method for measuring the low-frequency dynamic transfer stiffness function of linear resilient supports. This includes resilient supports with non-linear static load-deflection characteristics provided that the elements show an approximate linearity for vibration 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 a direct method and on an indirect method. ISO 10846-1 provides global guidance for the selection of the appropriate International Standard.

The laboratory conditions described in this part of ISO 10846 include the application of static preload, where appropriate.

The results of the method described in this part of ISO 10846 are useful for resilient supports that are used to prevent low-frequency vibration problems or to attenuate structure-borne sound in the lower part of the audible frequency range. The method does not characterize completely resilient supports that are used to attenuate shock excursions.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[kSIST prEN ISO 10846-5:2009](https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009)

<https://standards.iteh.ai/catalog/standards/sist/4d4373be-34d6-4344-948d-384dcbc23033/ksist-pren-iso-10846-5-2009>

Acoustics and vibration — Laboratory measurement of vibro-acoustic transfer properties of resilient elements — Part 5: Driving point method for determination of the low-frequency transfer stiffness of resilient supports for translatory motion

1 Scope

This part of ISO 10846 specifies a driving point method for determining the low-frequency transfer stiffness for translations of resilient supports, under specified preload. The method concerns the laboratory measurement of vibrations and forces on the input side with the output side blocked, and is called “driving point method”. The method is applicable to test elements with parallel flanges (see Figure 1).

Resilient elements, which are the subject of this part of ISO 10846, are those, which are used to reduce

- the transmission of vibration in the lower part of the audible frequency range (typically 20 Hz – 200 Hz) to a structure which may, for example, radiate unwanted fluid-borne sound (airborne, waterborne or others);
- the transmission of low-frequency vibration (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.

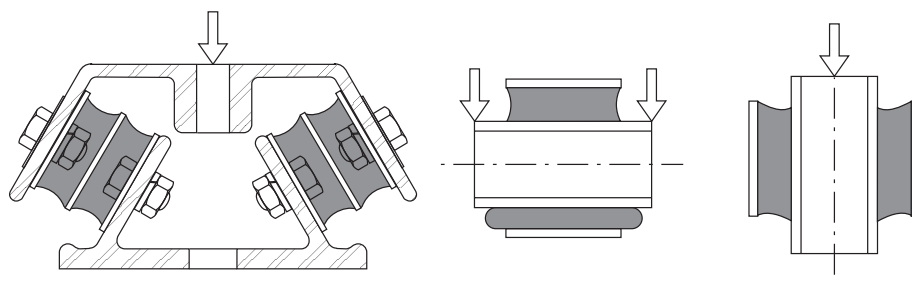
NOTE 1 In practice the size of available test rig(s) determines restrictions for very small and for very large resilient supports.

NOTE 2 Samples of continuous supports of strips and mats are included in the method. Whether or not the sample describes the behaviour of the complex system sufficiently is the responsibility of the user of this part of ISO 10846.

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

The method covers the frequency range from $f_1 = 1$ Hz to the upper limiting frequency f_{UL} .

Typically $50 \text{ Hz} \leq f_{UL} \leq 200 \text{ Hz}$.



NOTE 1 When a resilient support has no parallel flanges, an auxiliary fixture should be included as part of the test element to arrange for parallel flanges.

NOTE 2 Arrows indicate load direction.

Figure 1 — Example of resilient supports with parallel flanges

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, and
- calculation of the transfer of vibration through isolators.

2 Normative references

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

ISO 266, *Acoustics – Preferred frequencies*

ISO 2041, *Vibration and shock – Vocabulary*

ISO 5348, *Mechanical vibration and shock – Mechanical mounting of accelerometers*

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

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

ISO 16063-21, *Methods for the calibration of vibration and shock transducers – Part 21: Vibration calibration by comparison to a reference transducer*

GUM, Guide to the expression of uncertainty in measurement. BIPM/IEC/IFCC/ISO/OIML/IUPAC/IUPAP, 1993¹⁾

3 Terms and definitions

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

3.1

vibration isolator resilient element

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

3.2

resilient support

vibration isolator(s) suitable for supporting a machine, a building or another type of structure

3.3

test element

resilient support under test including flanges and auxiliary fixtures, if any

1) Corrected and reprinted in 2005.