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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 10846-5:2009 sisaldab Euroopa standardi EN ISO 10846-5:2009 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 10846-5:2009 consists of the English text of the European standard EN ISO 10846-5:2009.
Standard on kinnitatud Eesti Standardikeskuse 31.07.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 31.07.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
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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 10846-5:2008)

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 dynamique de transfert basse fréquence en translation des supports élastiques (ISO 10846-5:2008)

Akustik und Schwingungstechnik - Laborverfahren zur Messung der vibro-akustischen Transfereigenschaften elastischer Elemente - Teil 5: Ermittlung der Transfersteifigkeit elastischer Stützelemente aus der Eingangssteifigkeit bei Anregung in translatorischer Richtung und tiefen Frequenzen (ISO 10846-5:2008)

This European Standard was approved by CEN on 17 February 2009.

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Foreword

The text of ISO 10846-5:2008 has been prepared by Technical Committee ISO/TC 43 “Acoustics” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 10846-5:2009 by Technical Committee CEN/TC 211 “Acoustics” the secretariat of which is held by DS.

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of an identical text or by endorsement, at the latest by August 2009, and conflicting national standards shall be withdrawn at the latest by August 2009.

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Endorsement notice

The text of ISO 10846-5:2008 has been approved by CEN as a EN ISO 10846-5:2009 without any modification.

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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 and to attenuate structure-borne sound in the lower part of the audible frequency range. However, for complete characterization of resilient elements that are used to attenuate low-frequency vibration or shock excursions, additional information is needed, which is not provided by this method.

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 a specified preload. The method concerns the laboratory measurement of vibrations and forces on the input side with the output side blocked, and is called the “driving point method”.

The stiffness resulting from measuring the input displacement (velocity, acceleration) and input force is the dynamic driving point stiffness. Only at low frequencies, where the driving point stiffness and the transfer stiffness are equal, can this method be used for determination of the dynamic transfer stiffness.

NOTE 1 In ISO 10846-2, the direct method for measuring the dynamic transfer stiffness is covered. The direct method covers the determination of the low-frequency dynamic transfer stiffness and it covers, in principle, a wider frequency range than the driving point method. Nevertheless, the driving point method is covered in the ISO 10846 series of international standards as well. It is considered as a valuable option for owners of (often expensive) test rigs for driving point stiffness measurements, to extend the use of these rigs with the determination of low-frequency dynamic transfer stiffness.

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

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

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 available test rig(s) determines restrictions for very small and for very large resilient supports.

NOTE 3 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 Hz $\leqslant f_{UL} \leqslant$ 200 Hz.

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

— product information provided by manufacturers and suppliers;