
**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**

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

*Partie 2: Raideur dynamique en translation des supports élastiques —
Méthode directe*



Foreword

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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.

International Standard ISO 10846-2 was prepared jointly by Technical Committees ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*, and ISO/TC 108, *Mechanical vibration and shock*.

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

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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.

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

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.

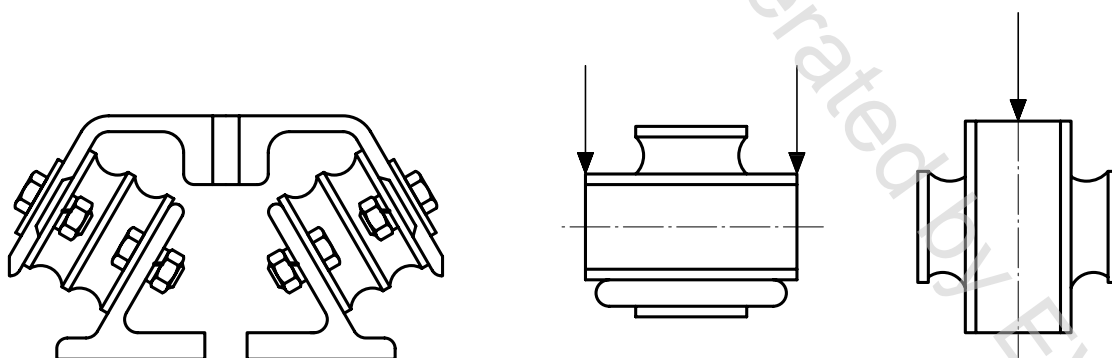


Figure 1 — Example of elastic supports with parallel flanges

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:—¹⁾, *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)