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First edition
2005-04-15

Mechanical vibration and shock — Characterization of the dynamic mechanical properties of visco-elastic materials —

Part 2: Resonance method

*Vibrations et chocs mécaniques — Caractérisation des propriétés
mécaniques dynamiques des matériaux visco-élastiques —*

Partie 2: Méthode de résonance



Reference number
ISO 18437-2:2005(E)

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Published in Switzerland

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Contents

	Page
1 Scope	1
2 Normative references	2
3 Terms and definitions	2
4 Test equipment (see Figure 1)	3
4.1 Electro-dynamic vibration generator	3
4.2 Accelerometers	3
4.3 Charge amplifiers	4
4.4 Test stand	4
4.5 Environmental chamber	5
4.6 Dual-channel spectrum analyser	5
4.7 Computer	5
5 Operating procedures	5
5.1 Sample preparation and mounting	5
5.2 Conditioning	6
5.3 Number of test pieces	7
5.4 Data acquisition	7
5.5 Temperature cycle	8
6 Analysis of results	8
6.1 Modulus and loss factor	8
6.2 Time-temperature superposition	10
6.3 Data presentation	10
6.4 Test report	11
Annex A (informative) Linearity of vibration resilient materials	12
Annex B (informative) Time-temperature superposition	13
Bibliography	15

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.

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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 18437-2 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration and shock*.

ISO 18437 consists of the following parts, under the general title *Mechanical vibration and shock — Characterization of the dynamic mechanical properties of visco-elastic materials*:

- *Part 2: Resonance method*
- *Part 3: Cantilever shear beam method*

Part 4 (*Impedance method*) is under preparation.

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Introduction

Visco-elastic materials are used extensively to reduce vibration magnitudes in structural systems through the dissipation of energy (damping) or isolation of components, and in acoustical applications that require a modification of the reflection, transmission or absorption of energy. Such systems often require specific dynamic mechanical properties in order to function in an optimum manner. Energy dissipation is due to interactions on the molecular scale and is measured in terms of the lag between stress and strain in the material. The visco-elastic properties (modulus and loss factor) of most materials depend on frequency, temperature, and strain magnitude. The choice of a specific material for a given application determines the system performance. The goal of this part of ISO 18437 is to provide details in constructing the resonance apparatus, in setting up the measurement equipment, in performing the measurements and analysing the resultant data. A further intent is to assist users of this method and to provide uniformity in the use of this method. This part of ISO 18437 applies to the linear behaviour observed at small strain magnitudes.