

**Plastid. Dünaamiliste mehhaaniliste
omaduste määramine. Osa 3:
Paindevibratsioon.
Resonantskõverameetod**

Plastics - Determination of dynamic mechanical
properties - Part 3: Flexural vibration - Resonance-
curve method

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 6721-3:2000 sisaldab Euroopa standardi EN ISO 6721-3:1996 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 11.01.2000 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 6721-3:2000 consists of the English text of the European standard EN ISO 6721-3:1996.</p> <p>This document is endorsed on 11.01.2000 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>
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<p>Käsitlusala:</p> <p>Standardi ISO 6721 käesolev osa määrab kindlaks resonantsköveratel põhineva paindevibratsiooni meetodi homogeensete plastide paindekoondmooduli E^*f määramiseks ning sama põhimõttega meetodi helisummutamiseks ettenähtud lamineeritud plastide summutusomaduste määramiseks. Sellisteks näideteks on süsteemid, milles on summutava kihiga kaetud metall-leht, või mitmekihilised süsteemid, kus kahe metall-lehe vahel on plastist vahekiht. Paljudel eesmärkidel on kasulik määratleda neid omadusi temperatuuri ja sageduse funktsioonidena.</p>	<p>Scope:</p>
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ICS 83.080.01

Võtmesõnad: dünaamiline, mehaaniline, määramine, omadused, painduv, plastid, resonantsköverameetod, vibratsioon

ICS 83.080.00

Descriptors: Plastics, testing, mechanical properties.

English version

Plastics

Determination of dynamic mechanical properties

Part 3: Flexural vibration – Resonance-curve method

(ISO 6721-3:1994 + Corr 1:1995)

Plastiques – Détermination des propriétés
mécaniques dynamiques – Partie 3: Vibra-
tion en flexion – Méthode en résonance
(ISO 6721-3:1994 + Corr 1:1995)

Kunststoffe – Bestimmung dynamisch-
mechanischer Eigenschaften – Teil 3:
Biegeschwingung – Resonanzkurven-
Verfahren (ISO 6721-3:1994, ein-
schließlich Technischer Korrektur 1:1995)

This European Standard was approved by CEN on 1996-01-15 and is identical to the ISO Standard as referred to.

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.

This European Standard exists 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, 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 6721-3:1994 Plastics – Determination of dynamic mechanical properties – Flexural vibration – Resonance-curve method,

which was prepared by ISO/TC 61 'Plastics' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 249 'Plastics' 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 August 1996 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 6721-3:1994 was approved by CEN as a European Standard without any modification.

1 Scope

This part of ISO 6721 specifies a bending-vibration method based upon resonance curves for determining the flexural complex modulus E_f^* of homogeneous plastics and the damping properties of laminated plastics intended for acoustic insulation, for example systems consisting of a metal sheet coated with a damping plastic layer, or sandwich systems consisting of two sheet-metal layers with an intermediate plastic layer. For many purposes, it is useful to determine these properties as a function of temperature and frequency.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 6721. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 6721 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 6721-1:1994, *Plastics — Determination of dynamic mechanical properties — Part 1: General principles*.

3 Definitions

See ISO 6721-1:1994, clause 3.

NOTE 1 As stated in ISO 6721-1, frequencies derived from resonance curves based on deformation-rate amplitude measurements can be exactly related to dynamic properties. For the recommended range of the loss factor of this part of the International Standard, i.e. $\tan \delta < 0,1$, resonance curves based upon deformation amplitudes can also be used. For highly damping materials, see ISO 6721-1:1994, annex A.

4 Principle

A specimen is submitted to forced bending vibrations in the frequency range between about 10 Hz and 1 000 Hz. The resonance curve (see ISO 6721-1:1994, subclause 3.11) is determined and, from the curve obtained, the flexural storage modulus E_f' (see ISO 6721-1:1994, subclause 3.2) is calculated in the range above 0,5 MPa and the loss factor given by $\tan \delta = E_f''/E_f'$ (see ISO 6721-1:1994, subclause 3.6) is calculated in the range between about 10^{-2} and 10^{-1} (see note 1). The test frequency can be varied by making measurements at more than one vibrational order. The measurement range for the flexural loss modulus E_f'' (see ISO 6721-1:1994, subclause 3.3) is determined by that of the loss factor and by the value of the storage modulus.

The mode of oscillation used is designated oscillation mode III (see ISO 6721-1:1994, table 2) and the type of modulus measured is designated E_f (see ISO 6721-1:1994, table 3).

The test is performed on rectangular bars, either mounted vertically with the upper end clamped and the other end free (method A) or suspended horizontally by fine fibres at vibrational nodes (method B) (see figure 1). Method A is suitable for testing specimens