

**Plastics - Determination of temperature
of deflection under load - Part 2:
Plastics, ebonite and long-fibre-
reinforced composites**

Plastics - Determination of temperature of deflection
under load - Part 2: Plastics, ebonite and long-fibre-
reinforced composites

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 75-2:2004 sisaldab Euroopa standardi EN ISO 75-2:2004 + AC:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 27.08.2004 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 75-2:2004 consists of the English text of the European standard EN ISO 75-2:2004 + AC:2006.</p> <p>This document is endorsed on 27.08.2004 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>
--	---

<p>Käsitlusala:</p> <p>This part of ISO 75 specifies three methods, using different values of constant flexural stress, that can be used for the determination of the temperature of deflection under load of plastics (including filled plastics and fibrereinforced plastics in which the fibre length, prior to processing, is up to 7,5 mm) and ebonite:</p> <ul style="list-style-type: none">- method A, using a flexural stress of 1,80 MPa;- method B, using a flexural stress of 0,45 MPa;- method C, using a flexural stress of 8,00 MPa.	<p>Scope:</p> <p>This part of ISO 75 specifies three methods, using different values of constant flexural stress, that can be used for the determination of the temperature of deflection under load of plastics (including filled plastics and fibrereinforced plastics in which the fibre length, prior to processing, is up to 7,5 mm) and ebonite:</p> <ul style="list-style-type: none">- method A, using a flexural stress of 1,80 MPa;- method B, using a flexural stress of 0,45 MPa;- method C, using a flexural stress of 8,00 MPa.
--	--

ICS 83.060, 83.080.01

Võtmesõnad: bend testing, bending stress, determination, dimensional stability, ebonite, materials testing, plastics, temperature, temperature measurement, testing, testing conditions, tests, thermal stability, vulcanized rubber

English version

Plastics

Determination of temperature of deflection under load

Part 2: Plastics and ebonite

(ISO 75-2 : 2004)

Plastiques – Détermination de la température de fléchissement sous charge – Partie 2: Plastiques et ébonite (ISO 75-2 : 2004)

Kunststoffe – Bestimmung der Wärmeformbeständigkeitstemperatur – Teil 2: Kunststoffe und Hartgummi (ISO 75-2 : 2004)

This European Standard was approved by CEN on 2003-06-20.

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 Management Centre or to any CEN member.

The European Standards exist 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, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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

Foreword

International Standard

ISO 75-2 : 2004 Plastics – Determination of temperature of deflection under load – Part 2: Plastics and ebonite, which was prepared by ISO/TC 61 ‘Plastics’ of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 249 ‘Plastics’, the Secretariat of which is held by IBN, 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 November 2004 at the latest.

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

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

Endorsement notice

The text of the International Standard ISO 75-2 : 2004 was approved by CEN as a European Standard without any modification.

Contents

Page

Foreword	2
Introduction	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Principle	5
5 Apparatus	5
6 Test specimens	5
7 Conditioning	6
8 Procedure (flatwise testing)	6
9 Expression of results	7
10 Precision	7
11 Test report	8
Annex A (normative) Testing in the edgewise position	9
Annex B (informative) Precision	11
Bibliography	12

Introduction

ISO 75-1:1993 and ISO 75-2:1993 described three methods (A, B and C) using different test loads and two specimen positions, edgewise and flatwise. For testing in the flatwise position, test specimens with dimensions 80 mm × 10 mm × 4 mm were required. These can be moulded directly or machined from the central section of the multipurpose test specimen (see ISO 3167). These “ISO bars” cannot be easily used in the edgewise position, because this would require both a reduction in span and an increase in test load by the same factor, and this may be impossible to achieve on existing instruments for edgewise testing. Specimens for testing in the edgewise position are less closely specified. Using the 80 mm × 10 mm × 4 mm ISO bar has the following advantages:

- Thermal expansion of the test specimen has less influence on the test result.
- Draft angles do not influence the test result. The specimen does not stand “on edge”.
- The moulding parameters and the specimen dimensions are specified more closely.

This increases the comparability of the test results. Therefore, it was decided that the possibility of testing in the edgewise position would be deleted from the standard. In order to provide a sufficient transition period, in this edition the flatwise position is described as the preferred and recommended one, while testing in the edgewise position is optional and has been moved to a normative annex (in this part of ISO 75). This annex and all other references to edgewise testing will be deleted on occasion of the next revision of this document.

Earlier editions of this International Standard allowed methods other than using a heating bath for heating the test specimen, namely forced-circulation ovens or fluidized beds. None of these alternative methods is widely used and no proven instruments are commercially available. Furthermore, there is no general comparability between tests using different heating methods due to the differences in the heat transfer characteristics and the temperature control methods described in this standard.

Therefore only heating in heating baths is allowed in this edition.

In order to maintain consistency with ISO 10350-1:1998, T_f has been used as the symbol for temperature of deflection under load.

1 Scope

This part of ISO 75 specifies three methods, using different values of constant flexural stress, that can be used for the determination of the temperature of deflection under load of plastics (including filled plastics and fibre-reinforced plastics in which the fibre length, prior to processing, is up to 7,5 mm) and ebonite:

- method A, using a flexural stress of 1,80 MPa;
- method B, using a flexural stress of 0,45 MPa;
- method C, using a flexural stress of 8,00 MPa.

The standard deflection Δ_s used to determine the temperature of deflection under load corresponds to a flexural-strain increase $\Delta\epsilon_f$ defined in this part of ISO 75. The initial flexural strain due to the loading of the specimen at room temperature is neither specified nor measured in this part of ISO 75. The ratio of this flexural-strain difference to the initial flexural strain depends on the modulus of elasticity, at room temperature, of the material under test. This method is therefore only suitable for comparing the temperatures of deflection of materials with similar room-temperature elastic properties.

NOTE The methods give better reproducibility with amorphous plastics than with semi-crystalline ones. With some materials, it may be necessary to anneal the test specimens to obtain reliable results. Annealing procedures, if used, generally result in an increase in the temperature of deflection under load (see 6.6).

For additional information, see ISO 75-1:2004, clause 1.

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 75-1:2004, *Plastics — Determination of temperature of deflection under load — Part 1: General test method*

ISO 293, *Plastics — Compression moulding test specimens of thermoplastic materials*

ISO 294-1, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 1: General principles, and moulding of multipurpose and bar test specimens*

ISO 2818, *Plastics — Preparation of test specimens by machining*