

Plastics - Determination of water absorption

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 62:2008 sisaldab Euroopa standardi EN ISO 62:2008 ingliskeelset teksti.</p> <p>Standard on kinnitatud Eesti Standardikeskuse 24.04.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 15.02.2008.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 62:2008 consists of the English text of the European standard EN ISO 62:2008.</p> <p>This standard is ratified with the order of Estonian Centre for Standardisation dated 24.04.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.</p> <p>Date of Availability of the European standard text 15.02.2008.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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English Version

Plastics - Determination of water absorption (ISO 62:2008)

Plastiques - Détermination de l'absorption d'eau (ISO
62:2008)

Kunststoffe - Bestimmung der Wasseraufnahme (ISO
62:2008)

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

Foreword

This document (EN ISO 62:2008) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by August 2008, and conflicting national standards shall be withdrawn at the latest by August 2008.

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Endorsement notice

The text of ISO 62:2008 has been approved by CEN as a EN ISO 62:2008 without any modification.

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Introduction

Plastics exposed to water are subject to several different effects:

- a) dimensional changes (e.g. swelling) caused by absorption of water;
- b) extraction of water-soluble components;
- c) changes in other properties.

However, exposure to humidity, immersion and exposure to boiling water can result in distinctly different material responses. The equilibrium moisture content can be used to compare the amount of water absorbed by different types of plastics when they are exposed to moisture. Moisture content determined under non-equilibrium conditions can be used to compare different batches of the same material and to determine the diffusion constant of the material when determined under carefully controlled non-equilibrium conditions of exposure to moisture and when using plastic specimens of defined dimensions.

Plastics — Determination of water absorption

1 Scope

1.1 This International Standard describes a procedure for determining the moisture absorption properties in the “through-the-thickness” direction of flat or curved-form solid plastics. This International Standard also describes procedures for determining the amount of water absorbed by plastic specimens of defined dimensions, when immersed in water or when subjected to humid air under controlled conditions. The “through-the-thickness” moisture diffusion coefficient can be determined for single-phase material by assuming Fickian diffusion behaviour with constant moisture absorption properties through the thickness of the test specimen. This model is valid for homogeneous materials and for reinforced polymer-matrix composites tested below their glass transition temperature. However, some two-phase matrices such as hardened epoxies may require a multi-phase absorption model which is not covered by this International Standard.

1.2 Ideally, the best comparison of the water absorption properties and/or diffusion coefficients of materials should be carried out only using the equilibrium moisture content of plastics exposed to identical conditions. The comparison of materials using properties at moisture equilibrium does not assume, and is therefore not limited to, single-phase Fickian diffusion behaviour.

1.3 Alternatively, water absorption of plastic specimens of defined dimensions exposed to immersion or humidity under controlled conditions but for an arbitrary time period can be used to compare different batches of the same material or for quality control tests of a given material. For this type of comparison, it is essential that all test specimens be of identical dimensions and, as nearly as possible, have the same physical attributes, e.g. surface smoothness, internal stresses, etc. However, moisture equilibrium is not reached under these conditions. Therefore, results from this type of test cannot be used to compare the water absorption properties of different types of plastics. For more reliable results, simultaneous tests are recommended.

1.4 The results obtained using the methods described in this International Standard are applicable to most plastics but are not applicable to cellular plastics, granulates or powders, which can show additional absorption and capillary effects. Plastics exposed to moisture under controlled conditions for defined periods of time provide relative comparisons between them. The tests described for the determination of the diffusion coefficient may not be applicable to all plastics. Plastics that do not retain their shape when immersed in boiling water should not be compared using method 2 (see 6.4).

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 175:1999, *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals*

ISO 294-3, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 3: Small plates*

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