

## **Plastics - Determination of hardness - Part 1: Ball indentation method**

Plastics - Determination of hardness - Part 1: Ball indentation method

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 2039-1:2003 sisaldab Euroopa standardi EN ISO 2039-1:2003 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 06.06.2003 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 2039-1:2003 consists of the English text of the European standard EN ISO 2039-1:2003.</p> <p>This document is endorsed on 06.06.2003 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><b>Käsitlusala:</b> This part of ISO 2039 specifies a method for determining the hardness of plastics and ebonite by means of a loaded ball indenter</p>	<p><b>Scope:</b> This part of ISO 2039 specifies a method for determining the hardness of plastics and ebonite by means of a loaded ball indenter</p>
---	---

**ICS** 83.080.01

**Võtmesõnad:** balls, definition, definitions, determination, ebonite, hardness, hardness measurement, hb, indentation hardness, indentation tests, penetration tests, plastics, quality control, resistances to indentation, test specimens, testing, tests, vulcanized rubber

**English version**

**Plastics – Determination of hardness**

**Part 1: Ball indentation method  
(ISO 2039-1 : 2001)**

Plastiques – Détermination de la  
dureté – Partie 1: Méthode de péné-  
tration à la bille (ISO 2039-1 : 2001)

Kunststoffe – Bestimmung der  
Härte – Teil 1: Kugeleindruckversuch  
(ISO 2039-1 : 2001)

This European Standard was approved by CEN on 2002-12-12.

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, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, 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 2039-1 : 2001 Plastics – Determination of hardness – Part 1: Ball indentation 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’, 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 August 2003 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, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 2039-1 : 2001 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

## Contents

Page

<b>Foreword</b>	2
<b>1 Scope</b>	3
<b>2 Normative reference</b>	3
<b>3 Term and definition</b>	3
<b>4 Principle</b>	3
<b>5 Apparatus</b>	4
<b>6 Test specimens</b>	4
<b>7 Conditioning</b>	4
<b>8 Procedure</b>	4
<b>9 Expression of results</b>	5
<b>10 Test report</b>	6
<b>Annex A (informative) Value of the ball indentation hardness as a function of the depth of penetration and the test load</b>	7

## 1 Scope

This part of ISO 2039 specifies a method for determining the hardness of plastics and ebonite by means of a loaded ball indenter.

The ball indentation hardness determined by this method may provide data for research and development, quality control and acceptance or rejection under specifications.

## 2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 2039. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 2039 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 291:1997, *Plastics — Standard atmospheres for conditioning and testing*

## 3 Term and definition

For the purposes of this part of ISO 2039, the following term and definition apply.

### 3.1

#### **ball indentation hardness**

#### **HB**

the quotient of the load on the ball indenter by the surface area of the impression caused by the ball indenter after a specified time of load application

NOTE It is expressed in newtons per square millimetre.

## 4 Principle

The method consists of forcing a ball under a specified load into the surface of the test specimen. The depth of impression is measured under load. The surface area of the impression is computed from its depth. The ball indentation hardness is then calculated from the following relationship:

Ball indentation hardness = Applied load/Surface area of impression