



SLOVENSKI STANDARD
SIST EN ISO 2039-2:2000
01-maj-2000

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Plastics - Determination of hardness - Part 2: Rockwell hardness (ISO 2039-2:1987)

Kunststoffe - Bestimmung der Härte - Teil 2: Rockwellhärte (ISO 2039-2:1987)

Plastiques - Détermination de la dureté - Partie 2: Dureté Rockwell (ISO 2039-2:1987)

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Ta slovenski standard je istoveten z: EN ISO 2039-2:1999

<https://standards.iteh.ai/catalog/standards/sist/f47dacc1-159c-4f11-960e-726212ccc5fd/sist-en-iso-2039-2-2000>

ICS:

83.080.01	Polimerni materiali na splošno	Plastics in general
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SIST EN ISO 2039-2:2000 en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 2039-2

June 1999

ICS 83.080.10

English version

Plastics - Determination of hardness - Part 2: Rockwell hardness
(ISO 2039-2:1987)

Plastiques - Détermination de la dureté - Partie 2: Dureté
Rockwell (ISO 2039-2:1987)

Kunststoffe - Bestimmung der Härte - Teil 2: Rockwellhärte
(ISO 2039-2:1987)

This European Standard was approved by CEN on 6 May 1999.

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of the International Standard from Technical Committee ISO/TC 61 "Plastics" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by IBN.

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 December 1999, and conflicting national standards shall be withdrawn at the latest by December 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, 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 2039-2:1987 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

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Annex ZA (normative)**Normative references to international publications
with their relevant European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 291	1997	Plastics - Standard atmospheres for conditioning and testing	EN ISO 291	1997
ISO 868	1985	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)	EN ISO 868	1997
ISO 2039-1	1993	Plastics - Determination of hardness - Part 1: Ball indentation method	EN ISO 2039-1	1996

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INTERNATIONAL STANDARD

ISO
2039-2

Second edition
1987-07-15



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
ORGANISATION INTERNATIONALE DE NORMALISATION
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Plastics — Determination of hardness —

Part 2: Rockwell hardness

iTeh STANDARD PREVIEW
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Plastiques — Détermination de la dureté —

Partie 2: Dureté Rockwell

SIST EN ISO 2039-2:2000

<https://standards.iteh.ai/catalog/standards/sist/f47dacc1-159c-4f11-960e-726212ccc5fd/sist-en-iso-2039-2-2000>

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 2039-2 was prepared by Technical Committee ISO/TC 61, *Plastics*.

This second edition cancels and replaces the first edition (ISO 2039-2:1981), of which it constitutes a minor revision. <https://standards.iteh.ai/catalog/standards/sist/f47dacc1-159c-4f11-960e-726212ccc5fd/sist-en-iso-2039-2-2000>

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Plastics — Determination of hardness —

Part 2: Rockwell hardness

1 Scope and field of application

1.1 This part of ISO 2039 specifies a method for determining the indentation hardness of plastics by means of the Rockwell hardness tester using the Rockwell M, L and R hardness scales.

1.2 A Rockwell hardness number is directly related to the indentation hardness of a plastic material; the higher the Rockwell hardness number, the harder the material. Due to a short overlap of Rockwell hardness scales by this procedure two different Rockwell hardness numbers of different scales may be obtained on the same material, both of which may be technically correct.

1.3 For materials having high creep and recovery, the time-factors involved in application of the major and minor loads have a considerable effect on the results of the measurements.

1.4 An alternative method of using the apparatus to give hardness on the Rockwell- α hardness scale is specified in the annex which shows how this scale may be related to the hardness measurement of ISO 2039-1.

2 References

ISO 48, *Rubber, vulcanized — Determination of hardness (Hardness between 10 and 100 IRHD)*.¹⁾

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

ISO 868, *Plastics — Determination of indentation hardness by means of a durometer (Shore hardness)*.

ISO 2039-1, *Plastics — Determination of hardness — Part 1: Ball indentation method*.

3 Principle

3.1 This is a method for determining hardness in which a constant minor load is applied to a steel ball resting on the material to be tested, followed by application of a major load,

and then followed by a return to the same minor load, all at specified limits for times of loading. The actual measurement is based on the total depth of penetration, minus the elastic recovery after a fixed time following removal of the major load, minus the penetration resulting from the minor load. The Rockwell hardness number is derived from the net increase in depth of impression as the load on an indenter is increased from a fixed minor load to a major load and then returned to the same minor load.

3.2 Each Rockwell hardness scale division represents 0,002 mm vertical movement of the indenter. In practice, the Rockwell hardness number is derived from the following relationship :

$$HR = 130 - e$$

where

HR is the Rockwell hardness number;

e is the depth of impression after removal of the major load, in units of 0,002 mm.

NOTE — This relationship only holds for the E, M, L and R scales.

4 Apparatus

4.1 The apparatus is a standard Rockwell hardness tester which comprises essentially

- a **rigid frame** supporting an adjustable platform fitted with a plate at least 50 mm in diameter to support the test specimen;
- an **indenter** with its associated fittings;
- a **device** for applying the appropriate loads to the indenter without impact.

4.2 The indenter comprises a polished hardened steel ball which rolls freely in its housing. The ball shall not deform during the test or show damage after a test. The diameter of the indenter depends upon the Rockwell scale in use (see 4.5).

1) At present at the stage of draft. (Revision of ISO 48: 1979, ISO 1400: 1975 and ISO 1818: 1975.)