

# INTERNATIONAL STANDARD

**ISO**  
**7619**

Second edition  
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## **Rubber — Determination of indentation hardness by means of pocket hardness meters**

*Caoutchouc — Détermination de la dureté par pénétration au moyen d'un  
duromètre de poche*



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## 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 7619 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Sub-Committee SC 2, *Physical and degradation tests*.

This second edition cancels and replaces the first edition (ISO 7619:1986). The main modifications with respect to the first edition are the following:

- a new note (note 1) has been added to clause 1, this note replacing the second paragraph of clause 3;
- in 4.1.4 b), the equation has been modified;
- in 4.2.3 and 4.2.4, the minimum hardness for calibration of the durometer has been changed from 25 IRHD to 30 IRHD;
- a footnote relating to 8.1 has been added;
- a footnote relating to 8.2.2 has been added;
- a new clause (clause 9) on the precision of the test method has been added between the clauses on “Calibration” and “Test report” (now clause 10);
- a new annex (annex A) on guidance for using precision results has been added.

Annex A of this International Standard is for information only.

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# Rubber — Determination of indentation hardness by means of pocket hardness meters

**WARNING** — Persons using this International Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

## 1 Scope

**1.1** This International Standard specifies a method for the determination of the indentation hardness of rubber by means of pocket hardness meters of two types:

- a) the Shore-type durometer;
- b) a meter calibrated in IRHD.

Two types of Shore-type durometer are described; durometer type A is used for rubbers in the normal hardness range and type D for rubbers in the high hardness range.

**1.2** The use of pocket meters is primarily intended for control purposes and is not recommended for specification purposes. For such purposes, the methods given in ISO 48 should be used. It is possible to increase the precision by fixing the pocket hardness tester on a support.

**1.3** A similar method for measuring the hardness of plastics is given in ISO 868:1985, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)*.

**NOTE 1** The hardness of rubber, as measured by the Shore A durometer or the IRHD meter, is not a simple fundamental property but is a complex response to an applied indentation. The measurement will depend upon the following factors:

- a) the elastic modulus of the rubber;
- b) the viscoelastic properties of the rubber;
- c) the thickness of the test piece;
- d) the geometry of the indenter;
- e) the pressure exerted;
- f) the rate of increase of pressure;
- g) the interval at which the hardness is recorded.

Because of these factors, results using a Shore A durometer should not be related directly to IRHD values, although correlations have been established for some individual rubbers or compounds.

## 2 Normative references

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

ISO 48:1994, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*.

ISO 471:1995, *Rubber — Times, temperatures and humidities for conditioning and testing*.

## 3 Principle

The measured property is the penetration of a specified indenter forced into the material under specified conditions.

## 4 Apparatus

### 4.1 Shore-type durometers: Types A and D

The durometers consist of the components described in 4.1.1 to 4.1.4.

**4.1.1 Pressure foot**, with a central hole of diameter between 2,5 mm and 3,2 mm, centred at least 6 mm from any edge of the foot.

**4.1.2 Indentor**, formed from a hardened steel rod of  $1,25 \text{ mm} \pm 0,15 \text{ mm}$  diameter to the shape and dimension shown in figure 1, for type A durometers, and figure 2 for type D durometers.

**4.1.3 Indicating device**, allowing the extent of protrusion of the point of the indenter beyond the face of the pressure foot to be read off; the device shall be calibrated directly in terms of units ranging from 0, for the maximum protrusion of  $2,50 \text{ mm} \pm 0,04 \text{ mm}$ , to 100 for nil protrusion obtained by placing the pressure foot and indenter in firm contact with a flat piece of glass.

**4.1.4 Calibrated spring**, to apply force to the indenter in accordance with one of the following equations:

a)  $F = 550 + 75 H_A$

where

$F$  is the applied force, in millinewtons;

$H_A$  is the hardness reading on the type A durometer.

b)  $F = 445 H_D$

where

$F$  is the applied force, in millinewtons;

$H_D$  is the hardness reading on the type D durometer.