
**Rubber-covered rollers — Determination
of apparent hardness —**

Part 2:
Shore-type durometer method

*Cylindres revêtus de caoutchouc — Détermination de la dureté
apparente —*

Partie 2: Méthode au duromètre type Shore



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Foreword

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The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 7267-2 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This second edition cancels and replaces the first edition (ISO 7267-2:1986), which has been revised primarily to modify the test time (see 6.1) and to update the normative references.

ISO 7267 consists of the following parts, under the general title *Rubber-covered rollers — Determination of apparent hardness*:

- *Part 1: IRHD method*
- *Part 2: Shore-type durometer method*
- *Part 3: Pusey and Jones method*

Introduction

The hardness of a roller covering has traditionally been determined on the finished roller, since it is this hardness that is critical to the correct functioning of the roller in its end application. Values of hardness, determined by whichever method is chosen, are therefore dependent not only on the method employed and on the rubber, but also on the diameter of the roller, the thickness of the covering and, in the case of thin coverings, on the nature of the roller core. For this reason, the term “apparent hardness” is used to distinguish between the values obtained by methods described in the various parts of this International Standard and those that would be obtained for the rubber if it was possible to use the standard test methods for standard test pieces forming the subjects of other International Standards.

Since rollers vary considerably in size, construction and end use, and in view of the fact that hardness determinations are made for such different purposes as specification and factory process control, it has not been possible to standardize on one test method. Consequently, three methods are described (see Foreword), each capable of standing alone.

Rubber-covered rollers — Determination of apparent hardness —

Part 2: Shore-type durometer method

WARNING — Persons using this part of ISO 7267 should be familiar with normal laboratory practice. This part of ISO 7267 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.

CAUTION — Certain procedures specified in this part of ISO 7267 may involve the use or generation of substances, or the generation of waste, that could constitute a local environmental hazard. Reference should be made to appropriate documentation on safe handling and disposal after use.

1 Scope

This part of ISO 7267 specifies a method for the determination of the apparent hardness of vulcanized- or thermoplastic-rubber roller covers, expressed in Shore hardness, for measurement where only medium precision is required. The method and apparatus used are essentially those described in ISO 7619-1, the measurements in this case being made on the curved surface of the conditioned rubber-covered roller rather than on a flat test piece. Shore type A and type D instruments are specified, the latter being used for measurements on rollers of high hardness.

NOTE With some rollers, there may be significant variation in the thickness of the rubber over the surface of the roller, which could affect the measured apparent hardness.

2 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 7619-1, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

3 Time interval between forming and finished grinding, and testing

Tests shall not be carried out less than 16 h after forming and/or finished grinding and, for arbitration purposes, not less than 72 h after forming.

4 Conditioning and temperature of test

Whenever possible, the test shall be carried out at a standard laboratory temperature in accordance with ISO 23529. The product under test shall, if possible, be maintained under the test conditions for sufficient time to reach temperature equilibrium with the test environment. Where this is impracticable, the period of time and the conditions shall be as given in the product specification (see Note).

The same temperature shall be used throughout any one test or series of tests intended to be comparable.

NOTE For large rollers having heavy, metal cores, ambient conditions may not allow equilibrium temperatures to be obtained.

5 Apparatus

The apparatus used shall be either the Shore type A or the Shore type D instrument described in ISO 7619-1.

Measurements shall be made with a type D instrument when values above 90 are obtained with the type A durometer, and with the type A instrument when values less than 20 are obtained with the type D durometer.

6 Procedure

6.1 Firmly locate the roller to be tested with its major axis horizontal and with the area in which the hardness is to be measured uppermost. Hold the hardness meter in position with the indenter immediately above the area which is to be measured. Apply the presser foot to the roller surface as rapidly as possible, without shock, ensuring that the indenter is normal to the rubber surface. Apply just sufficient force to obtain firm contact between the presser foot and the roller. Normally, the reading is taken 3 s after the presser foot is in firm contact with the roller surface for vulcanized rubber or 15 s after the presser foot is in firm contact with the roller surface for thermoplastic rubber. Other test times may be used, however, provided they are stated in the test report.

Better reproducibility may be obtained by using either a stand or mass centred on the axis of the indenter, or both, to apply the presser foot to the test piece. Masses of 1 kg and 5 kg are recommended for type A and type D durometers, respectively.

6.2 Make three measurements at different points at least 6 mm apart within the test area in which the hardness is to be determined.

NOTE Several test areas along the length and around the circumference of the roller may be required to determine the average hardness of the covering and the hardness variation over a single roller (see ISO 6123-1, *Rubber or plastics covered rollers — Specifications — Part 1: Requirements for hardness*).

7 Expression of results

Express the apparent hardness as the median of the three measurements for each test area, reported to the nearest whole number in Shore A or Shore D units.

8 Test report

The test report shall include the following information:

- a) a full description of the roller and its origin;
- b) a full reference to the test method used, i.e. the number of this part of ISO 7267;
- c) test details:
 - 1) the time and temperature of conditioning prior to testing,
 - 2) the temperature of test, and the relative humidity, if necessary,
 - 3) the test time used (see 6.1),
 - 4) details of any procedures not specified in this part of ISO 7267;
- d) test results:
 - 1) the number of areas or rollers tested,
 - 2) the individual test results,
 - 3) the apparent hardness, expressed as Shore A or Shore D (see Clause 7);
- e) the date of the test.

