INTERNATIONAL STANDARD

ISO 6123-1

Second edition
2015-08-15

Rubber or plastics covered rollers — Specifications —

Part 1: Requirements for hardness

Cylindres revêtus de caoutchouc ou de plastique — Spécifications —

Partie 1: Spécifications de dureté

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

Reference number
ISO 6123-1:2015(E)

© ISO 2015

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

COPYRIGHT PROTECTED DOCUMENT

© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

 © ISO 2015 – All rights reserved

Contents

Page

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

© ISO 2015 – All rights reserved

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products (other than hoses)*.

This second edition cancels and replaces the first edition (ISO 6123-1:1982), of which it constitutes a minor revision, mainly to update the normative references.

ISO 6123 consists of the following parts, under the general title *Rubber or plastics covered rollers — Specifications:*

— *Part 1: Requirements for hardness*

— *Part 2: Surface characteristics*

— *Part 3: Dimensional tolerances*

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

 © ISO 2015 – All rights reserved

Introduction

Covered rollers are cylindrical cores, generally of metal, with a cover of rubber or plastics for a particular use. They are manufactured in a wide variety of sizes and hardness grades depending on the intended use.

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

© ISO 2015 – All rights reserved

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

Rubber or plastics covered rollers — Specifications —

Part 1:
Requirements for hardness

1 Scope

This part of ISO 6123 specifies requirements for the measured hardness of rubber or plastics covered rollers.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7267 (all parts), *Rubber-covered rollers — Determination of apparent hardness*

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

3 Specification of hardness

The hardness of rubber or plastics covered rollers shall be specified in one of the following units, as agreed between the interested parties:

a) international rubber hardness degrees (IRHD);

b) Shore hardness degrees (Shore A or Shore D);

c) Pusey and Jones indentation values.

As hardness can be affected by temperature, the application temperature should be specified, if necessary.

A basic correlation is recognized between IRHD, Shore hardness degrees and Pusey and Jones indentation values for a determined quality. An equivalence exists between IRHD and Shore A hardness degrees. If medium accuracy is required, the use of a Shore A durometer instead of an IRHD hardness tester is possible, but it should be noted that the values are not in any case identical, due to differences in the intervals between taking readings.

NOTE 1 All hand-operated hardness meters are subject to variations in reading from one operator to another. With meters of the IRHD or the Pusey and Jones type, the reading is influenced by the rate of application of the load and whether or not the force applied has a component other than perpendicular. With spring - loaded meters of the Shore type, the reading is additionally dependent on the pressure exerted.

NOTE 2 Since hardness is measured by indentation, the thickness of the rubber or plastics material can affect the hardness reading obtained. The hardness reading of a cover compound on a roller and the true hardness of that compound under standard laboratory conditions are only comparable when the cover thickness is:

a) for IRHD hardness:

up to 50 IRHD: not less than 9 mm,

over 50 IRHD: not less than 6 mm;

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

© ISO 2015 – All rights reserved

b) for Shore hardness:

up to 50 Shore A: not less than 9 mm,

over 50 Shore A and for Shore D hardness: not less than 6mm;

c) for Pusey and Jones indentation values:

over 200 P and J: not less than 18 mm,

over 100 up to 200 P and J: not less than 12 mm,

over 40 up to 100 P and J: not less than 9 mm,

up to 40 P and J: not less than 6 mm.

4 Determination of hardness

4.1 Methods

4.1.1 IRHD hardness

The determination shall be carried out, using a hardness meter calibrated in international rubber hardness degrees (IRHD), by the method specified in ISO 7267-1. The meter shall be equipped with a suitable base plate for use with curved surfaces and to accommodate a jig for holding small rollers of diameter less than 150 mm. A Pusey and Jones type support is suitable, as well as any other support permitting the measurement of hardness of a curved surface.

4.1.2 Shore hardness

The determination shall be carried out by the method specified in ISO 7267-2, using a type A Shore durometer for hardnesses up to 90 Shore A degrees, and a type D Shore durometer for higher hardnesses.

4.1.3 Pusey and Jones hardness

The determination shall be carried out by the method specified in ISO 7267-3, using a Pusey and Jones indentation instrument with a 3,175 mm ball.

4.2 Test conditions

4.2.1 Test temperature

The test shall be carried out, whenever possible, at a standard laboratory temperature (23 °C ± 2 °C or 27 °C ± 2 °C) in accordance with ISO 23529. The covered roller shall be brought to the test temperature prior to testing to ensure temperature equilibrium.

As hardness can be affected by temperature, the same test temperature shall be used throughout any one test or series of tests intended to be comparable. If this condition cannot be met, it is necessary to consider the influence of temperature on the hardness of the used compound in order to compare the results correctly.

The test temperature shall be recorded.

4.2.2 Cover surface

The test shall be made on smooth, ground, clean surfaces, unless otherwise agreed between interested parties.

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

 © ISO 2015 – All rights reserved

4.3 Procedure

For rollers having up to 2,5 m of cover length, the hardness shall be measured at five points:

— three points, each 120° apart, around the circumference in the middle of the roller;

— one-point at each end, at a distance of 10 % of the cover length from the end.

For rollers having over 2,5 m of cover length, the hardness shall be measured at nine points:

— three points, each 120° apart, around the circumference in the middle of the roller;

— at each end three points, each 120° apart, around the circumference, and each at a distance of 10 % of the cover length from the end.

4.4 Expression of results

The hardness of the covered roller shall be reported as the average of all readings taken in accordance with 4.3, rounded to the nearest integer.

5 Nominal hardness

Rubber or plastics covered rollers are available in a wide range of hardness values; the particular hardness to be supplied shall be specified by agreement between the interested parties in accordance with Clause 3, as an integer as follows:

a) for IRHD hardness: 99 – 98 – 97- 95 IRHD, and multiples of 5 for values below 95 IRHD (for example 90, 85, 80 IRHD);

b) for Shore hardness: multiples of 5 (for example 40, 45, 50, 55 Shore hardness degrees);

c) for Pusey and Jones indentation values:

   1) multiples of 3 for P and J indentation values from 0 to 15 P and J,

   2) multiples of 5 for P and J indentation values over 15 up to 100 P and J,

   3) multiples of 10 for P and J indentation values over 100 up to 200 P and J,

   4) multiples of 25 for P and J indentation values over 200 P and J.

6 Tolerances on nominal hardness

Unless otherwise agreed (see, however, Clause 8), the permitted deviation of the measured hardness (i.e. the average value reported in accordance with 4.4) from the nominal hardness shall be as follows:

a) for IR HD hardness: see Table 1;

b) for Shore hardness: ± 5 Shore A or Shore D hardness degrees;

c) for Pusey and Jones indentation values: see Table 2.

STANDARDSISO.COM : Click to view the full PDF of ISO 6123-1:2015

© ISO 2015 – All rights reserved