DRAFT INTERNATIONAL STANDARD

ISO/DIS 20444

ISO/TC **45**/SC **1**

Secretariat: **DIN**

Voting begins on:
2020-06-11

Voting terminates on:
2020-09-03

Rubber and plastics hoses — Determination of abrasion resistance of the outer cover —

Part :
Abrasion tests where the hose is rotated against a reciprocating abrasion tool

Tuyaux en caoutchouc et en plastique — Détermination de la résistance à l'abrasion du revêtement extérieur

ICS: 23.040.70

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/bf0e7b74-30fb-4446-8271-8f0a9a50fb2e/iso-dis-20444

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.

Reference number
ISO/DIS 20444:2020(E)

© ISO 2020

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/bf0e7b74-30fb-4446-8271-8f0a9a50fb2e/iso-dis-20444



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2020 – All rights reserved

Contents

Page

Foreword ..... **iv**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Principle **1**
5 Apparatus **1**
6 Test pieces **3**
7 Conditioning of test pieces **3**
8 Procedure **3**
9 Test report **4**
10 Identification statement (Reference to this document) **4**
Annex A (Informative) **Recommendations for abrasion cycles required** **5**
Bibliography **7**

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/bf0e7b74-30fb-4446-8271-8f0a9a50fb2e/iso-dis-20444

© ISO 2020 – 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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/bf0e7b74-30fb-4446-8271-8f0a9a50fb2e/iso-dis-20444

This is the first edition of this document.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Rubber and plastics hoses — Determination of abrasion resistance of the outer cover

WARNING — Persons using this document should be familiar with normal laboratory practice. This document 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.

© ISO 2020 – All rights reserved

Rubber and plastics hoses — Determination of abrasion resistance of the outer cover —

Part :
Abrasion tests where the hose is rotated against a reciprocating abrasion tool

1 Scope

This document specifies a method for the determination of the abrasion resistance of the outer cover of rubber and plastics hoses.

This test method is suitable for hoses with outside diameters from 10 mm to 100 mm.

This method is intended primarily for testing hydraulic hoses having textile- or wire-reinforcement and a nominally smooth and parallel cover, and other hoses of a similar type.

This method is not intended for predicting product abrasion life, but is suitable for the comparison of abrasion levels.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

2 Normative references

ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/0e7b74-30fb-4446-825f-8f09e504b2e/iso-dis-20444

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 8330, *Rubber and plastics hoses and hose assemblies — Vocabulary*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8330 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Principle

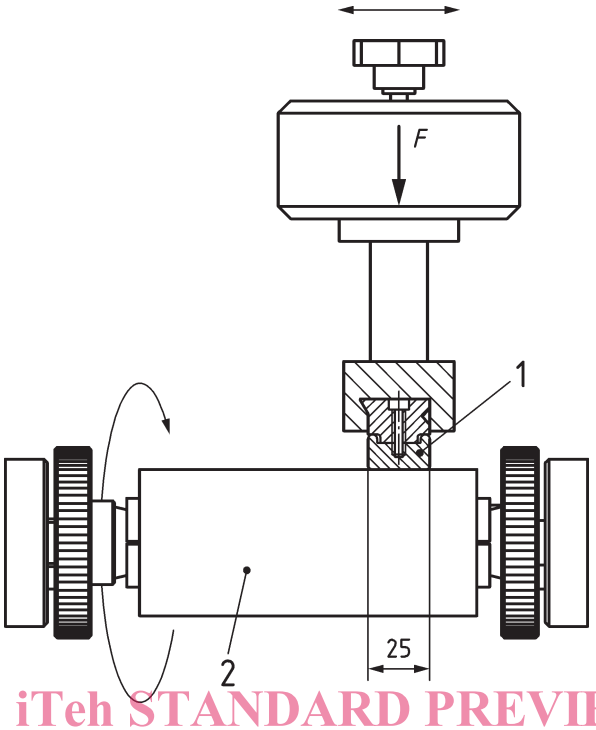
Test pieces are abraded by the abrading tool and evaluated in accordance with the number of cycles completed or the number of cycles to the reinforcement exposure.

5 Apparatus

5.1 The abrasion test machine shall be capable of moving the abrading tool (75 ± 5) mm back and forth along the test piece with rotation at (1,3 ± 0,033) Hz [(78 ± 2) rpm)] with the machine synchronized for the lateral movement (back and forth) to be completed at the same cycle rate [one cycle equals one

© ISO 2020 – All rights reserved

back and forth movement for a total of (150 ± 10) mm of travel, and 360 degrees of rotation]. A typical arrangement is shown in Figure 1.



iTeh STANDARD PREVIEW
(standards.iteh.ai)

Key

1 Abrasion tool - (25 X 75) mm (see Figure 2)

2 Hose sample - (135 ± 15) mm long

ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/bf0e7b74-30fb-4446-8271-8f0a9a50fb28/iso-dis-20444

Figure 1 — Typical test apparatus

Traversing arrangement shall be designed to ensure that:

a) the mid-point of the traversed length is coincident with the mid-point of the assembled hose and mandrel;

b) the axes of the abrading tool and hose are mutually perpendicular at the mid-point;

c) the plane of travel is parallel to the longitudinal axis of the test piece.

5.2 A recording device, capable of recording the number of cycles completed and of being pre-set to terminate the test after completion of the specified number of cycles.

5.3 Means of applying a vertical force *F* to the abrading tool at the point of contact with the test piece.

5.4 A mandrel, of appropriate length for the test apparatus, on to which the test piece will fit tightly. It is essential that the mandrel is a tight fit in the test piece to prevent distortion of the test piece under the action of the abrading tool.

For accurate determinations, it is recommended that the mandrel is made of lightweight materials and is of hollow section, so that it is capable of supporting the abrading load but its mass is kept to an absolute minimum.

5.5 Abrading material, of (25 ± 2) mm × (75 ± 2) mm , P80 grit, coarse, Al_2O_3, fastened to a smooth hard surface as shown in Figure 2.

NOTE Information about P80 grit can be found in ISO 6344-1 and ISO 6344-2

© ISO 2020 – All rights reserved

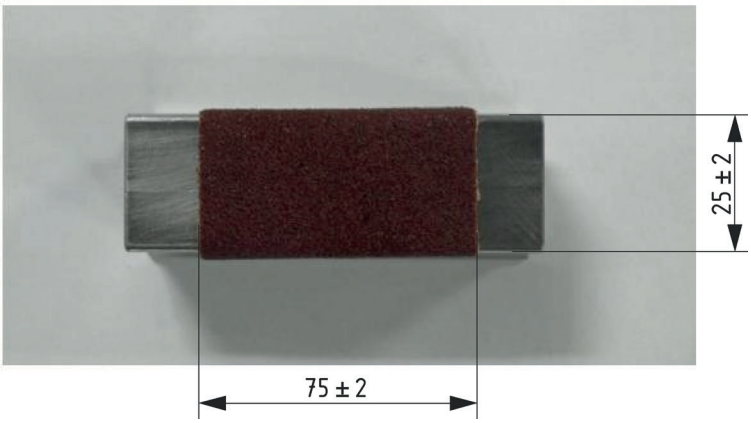


Figure 2 — Typical abrasion tool

6 Test pieces

Each test piece shall be a sample of hose of length (140 ± 15) mm. A minimum of three test pieces shall be tested.

Selection of test pieces is permitted to ensure that there are no surface irregularities greater than 0,5 mm and that they are free from surface contamination.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

7 Conditioning of test pieces

No test shall be carried out within 24 h of manufacture.

ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/bf0e7b74-30fb-4446-8271-8f0a9a50b22e/iso-dis-20444

For evaluation, which is intended to be comparable, the test shall be carried out within 6 months from the date of manufacture.

Before testing, test pieces shall be conditioned for at least 3 h at the standard temperature and humidity of (23 ± 2) °C and (50 ± 5) % relative humidity or (27 ± 2) °C and (65 ± 10) % relative humidity, in accordance with ISO 23529. This 3 h period may be part of the 24 h interval after manufacture.

8 Procedure

Temperatures and humidities for testing shall be in accordance with ISO 23529.

For each hose specimen to be tested, start the test with a new test piece of abrading material. Replace the abrading material when the number of cycles reaches 1 000 cycles.

Mount the assembled test piece and mandrel in the apparatus, ensuring that the test piece is restrained from axial and/or rotational movement.

Prepare the abrasion machine for test by aligning the abrading tool to either end of its travel for stop/reverse.

Place the abrading tool in contact with the test piece using the 25 mm side facing as shown in Figures 1 and 2, and apply the vertical static force F as specified in the relevant product standard, or if not specified, use a force of (45,0 ± 0,5) N, and start the machine. Continue until the specified number of cycles in the relevant hose standard has been completed or until exposure of the reinforcement, if it occurs before reaching the specified number, then remove the test assembly from the apparatus. See Figure 3 for reinforcement exposure.

© ISO 2020 – All rights reserved



Key

a 1 wire visible = no failure

b failure = start to get wire visible

c failure = wire visible

Figure 3 — Reinforcement exposure

Annex A is supplied as a recommendation for calculating the number of cycles, if it is not included in the relevant product standard.

9 Test report

The test report shall include the following information:

a) a reference to this document and year of publication (i.e. ISO 20444:YYYY);

b) a full description of the hose tested, including the relevant hose standard;

c) the vertical static force *F* applied;

d) the temperature at which the test was carried out;

e) the number of cycles specified in the relevant hose standard;

f) the number of cycles completed, or the number of cycles to the reinforcement exposure, if it occurs before reaching the specified number;

g) any observations on the nature of wear, particularly any evidence of exposure of reinforcement;

h) any deviations from the procedure;

i) any unusual features observed;

j) the date of the test.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/bf0e7b74-30fb-4446-8271-8f0a9a50fb2e/iso-dis-20444

10 Identification statement (Reference to this document)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this document:

"Tested in accordance with ISO 20444, *Rubber and plastics hoses — Determination of abrasion resistance of the outer cover – Abrasion tests where the hose is rotated against a reciprocating abrasion tool*".

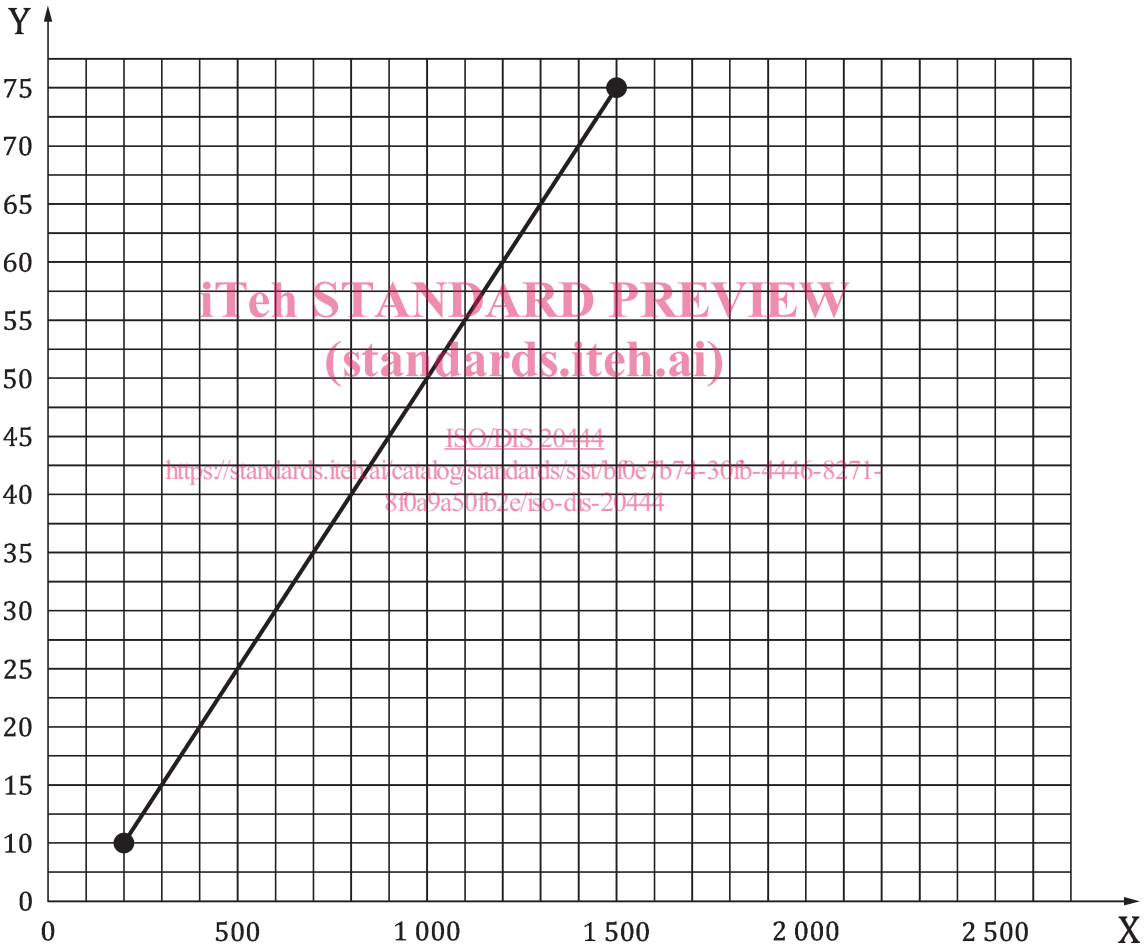
© ISO 2020 – All rights reserved

Annex A
(Informative)

Recommendations for abrasion cycles required

Utilizing the mass lost to determine acceptability, will result in test results variations, since both the size of the hose and the density (specific gravity) of the rubber or thermoplastic material need to be taken into account.

Figure A.1 shows the recommended minimum number of abrasion cycles before reinforcement exposure for the respective hose outside diameters (OD).



iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/DIS 20444
https://standards.iteh.ai/catalog/standards/sist/bf0e7b74-30fb-4446-8271-8f0a9a50fb2e/iso-dis-20444

Key

X Number of Abrasion Cycles

Y Hose OD in mm

Figure A.1 — Recommended minimum number of abrasion cycles before reinforcement exposure

© ISO 2020 – All rights reserved