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**Rubber- or plastics-coated  
fabrics — Determination of abrasion  
resistance —**

**Part 1:  
Taber abrader**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**  
*Supports textiles revêtus de caoutchouc ou de plastique —  
Détermination de la résistance à l'usure —  
Partie 1: Appareil d'essai d'abrasion Taber*

[ISO 5470-1:2016](https://standards.iteh.ai/catalog/standards/sist/775fe1d7-989c-4049-8b9a-dd0da4e90941/iso-5470-1-2016)

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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.

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](http://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](http://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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html)

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

This second edition cancels and replaces the first edition (ISO 5470-1:1999) which has been technically revised. The changes are as follows:

- in [Clause 4](#), a non-flexible cardboard support or a solid board equivalent to it for thin sample fixation has been added as [4.9](#) and the part of the body text related to it in the third paragraph of [4.1](#) has also been added accordingly;
- in [Clause 5](#), the test piece diameter has been changed from 114 mm to the range of 105 mm to 115 mm and the key 2 in [Figure 1](#) has been changed accordingly;
- the text in [7.2](#) has been revised.

ISO 5470 consists of the following parts, under the general title *Rubber- or plastics-coated fabrics — Determination of abrasion resistance*:

- *Part 1: Taber abrader*
- *Part 2: Martindale abrader*

## Introduction

It has long been accepted that some of the parameters associated with the Taber test as given in ISO 5470:1980 needed to be more closely specified if reasonable reproducibility (*R*) was to be obtained. Much of the work is now completed and has been acknowledged by ISO/TC 61 in publishing ISO 9352, which employs a zinc plate as a means of calibrating the initial abrasive power of the wheels. This does not, however, entirely overcome the problem of clogging or maintaining abrasion properties between and during tests. It may also be regarded as expensive and time-consuming.

This part of ISO 5470 permits the approach in ISO 9352 to be adopted if so desired. However, the major disadvantages of the Taber abrader are that:

- a) end points can be somewhat subjective unless a gravimetric technique is employed;
- b) only a small strip of material is abraded;
- c) because of the velocity of interfacial friction, localized heating of the coating polymer can cause softening and thus be less representative of abrasive wear in service;
- d) the 6 mm diameter hole in the centre of the test piece does not permit post-abrasion assessments of properties such as hydrostatic heat resistance or resistance to chemical reagents.

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# Rubber- or plastics-coated fabrics — Determination of abrasion resistance —

## Part 1: Taber abrader

**WARNING** — Persons using this International Standard should be familiar with normal laboratory practice. This International 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

This part of ISO 5470 describes a method of assessing the abrasive wear resistance of coated fabrics using the Taber abrader.

### 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 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 525, *Bonded abrasive products — General requirements*

ISO 2231, *Rubber- or plastics-coated fabrics — Standard atmospheres for conditioning and testing*

ISO 2286 (all parts), *Rubber- or plastics-coated fabrics — Determination of roll characteristics*

ISO 5084, *Textiles — Determination of thickness of textiles and textile products*

ISO 6103, *Bonded abrasive products — Permissible unbalances of grinding wheels as delivered — Static testing*

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1

##### **abrasive wheel**

small grinding wheel faced with abrasive paper

### 3.2

#### abrasive wear

progressive loss of material from the abraded surface of a rubber or plastics material resulting from the cutting or scratching action of an abrasive wheel

## 4 Apparatus

**4.1 Abrasion machine** (see [Figures 1](#) and [2](#)), consisting of a housing of compact design, a flat circular turntable designed to carry the test piece, a pair of hinged arms to which abrasive wheels can be attached, a motor for rotating the turntable in the plane of its surface, a counter for indicating the number of revolutions executed by the turntable, a device enabling the test to be stopped automatically after a predetermined number of revolutions, and a suction attachment for removing debris.

The abrasive wheels, which are attached to the free ends of the hinged arms, are free to rotate. Their peripheral surfaces rest on the surface of the test piece. The abrasive wheels are rotated, in opposite directions, by the friction between each wheel and the rotating test piece. At the point of contact between wheel and test piece, the direction of travel of the outer surface of the wheel makes an acute angle with the direction of travel of the test piece, and this angle extends in opposite directions for each wheel. The position of the abrasive wheels relative to the centre of the turntable is shown in [Figure 1 b](#)).

The test piece is clamped to the turntable by means of a central threaded rod with a nut and washer. For measuring thin test pieces the samples can be fixed on a non-flexible supporting cardboard by a double-sided adhesive tape of suitable size. The test piece attached to the cardboard or a solid board equivalent to it can be clamped on the test piece holder of the testing machine and removed easily for weighing. The vertical distance from the centre of the pivot point of the hinged arms to the surface of the turntable is approximately 25 mm. (standards.iteh.ai)

The turntable shall be flat and fixed to the drive shaft. When the turntable is rotated, no point on a 45 mm radius circle traced on its horizontal surface shall oscillate vertically through more than 0,05 mm about its mean position. The turntable shall have a nominal diameter of 100 mm and its speed of rotation shall be 72 rev/min when a 60 Hz power supply is used and 60 rev/min when a 50 Hz supply is used.

The two arms carrying the abrasive wheels shall be symmetrical and able to oscillate freely about a horizontal axis. The method of attaching the wheels, e.g. by means of ball-bearings, shall permit free rotation. In the test position, the mounting bosses shall be co-axial and positioned in such a way that the vertical projection of their common axis on to the plane of the turntable is  $19,1 \text{ mm} \pm 0,1 \text{ mm}$  from a parallel line passing through the axis of the turntable [see [Figure 1 a](#)].

The distance between the inside face of each abrasive wheel and the centre point shall be  $26,2 \text{ mm} \pm 0,1 \text{ mm}$ .

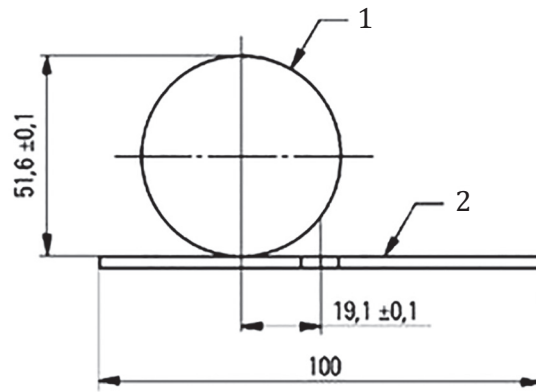
Each arm shall be constructed in such a way as to permit a counterweight to be fitted to balance the mass of the arm against that of the abrasive wheel and to permit additional weights of known mass to be added (see [4.5](#)).

The arms should preferably be designed so that, without any counterweights or additional masses, each would exert a force of 2,5 N on the test piece.

A rotating-turntable twin-wheel abrader of this kind can be used with a test piece of 105 mm to 115 mm in diameter having a central 6 mm diameter hole, thus making available a 54 mm wide test strip, although the wear zone [see [Figure 1 b](#)]] is only approximately 13 mm to 14 mm wide (the width of the wheel plus the effect of the contact angle).



Dimensions in millimetres

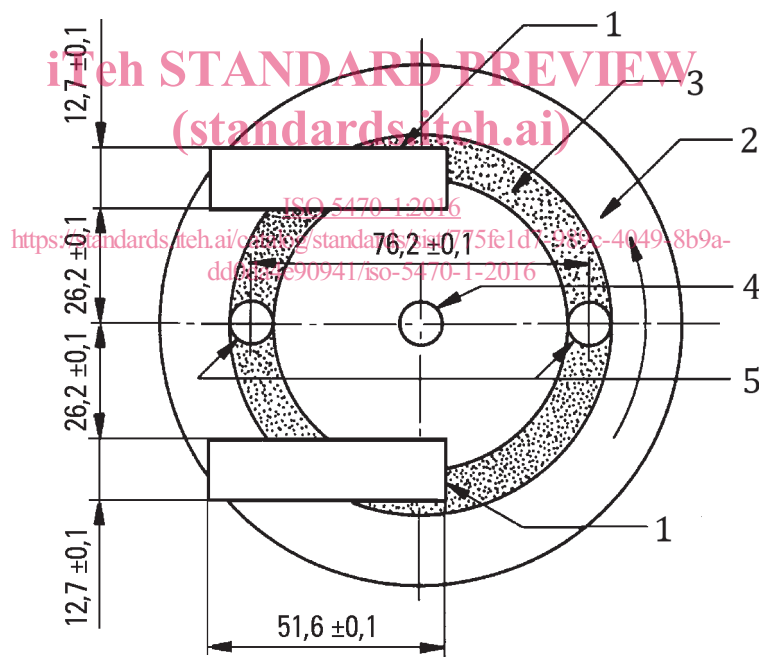


**Key**

- 1 abrasive wheels
- 2 test piece, diameter 105 mm to 115 mm

**a) Side view**

Dimensions in millimetres



**b) Plan**

**Key**

- 1 abrasive wheels
- 2 test piece, diameter 105 mm to 115 mm
- 3 wear zone
- 4 hole, diameter 6,35 mm
- 5 suction nozzles, diameter 8 mm ± 0,5 mm

**Figure 1 — Diagrammatic arrangement of abrasion machine**