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**Textile floor coverings — Production  
of changes in appearance by means of  
Vettermann drum and hexapod tumbler  
tester**

*Revêtements de sol textiles — Production de changements d'aspect au  
moyen d'essais au tambour Vettermann et au tambour pour hexapode*

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 10361 was prepared by Technical Committee ISO/TC 219, *Floor coverings*.

This second edition cancels and replaces the first edition (ISO 10361:2000), which has been technically revised.

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## Introduction

This International Standard describes two instruments used for fatiguing textile floor covering specimens and the production of changes in appearance in laboratory simulation of wear. This document was originally published as a type 2 Technical Report. ISO/TC 219 then decided to revise the document in order to publish it as an International Standard.

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# Textile floor coverings — Production of changes in appearance by means of Vettermann drum and hexapod tumbler tester

## 1 Scope

This International Standard describes procedures for using the Vettermann drum tester and the hexapod tumbler tester to produce changes in appearance for all textile floor coverings due to changes in surface structure and colour produced by mechanical agencies. It does not include pilling or colour changes due to other agencies.

Changes produced by these drum testers are assessed in accordance with the applicable assessment standard.

## 2 Normative 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 139, *Textiles — Standard atmospheres for conditioning and testing*

ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)*

ISO 1957, *Machine-made textile floor coverings — Selection and cutting of specimens for physical tests*

ISO 2424, *Textile floor coverings — Vocabulary*

ISO 9405, *Textile floor coverings — Assessment of changes in appearance*

ISO 7619-1:2010, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2424 apply.

## 4 Principle

A steel ball or a hexapod with studs rolls randomly inside a rotating drum which is lined with the textile floor covering specimens.

After fatiguing, the change in appearance of the specimens is assessed in accordance with the applicable assessment standard.

## 5 Method A — Vettermann drum method

### 5.1 Apparatus

**5.1.1 Vettermann drum tester**, with a metal drum of the following dimensions (see Figure 1):

- internal diameter: (730 ± 10) mm;
- internal depth: (270 ± 5) mm;

- effective depth: (240 ± 7) mm;
- thickness of curved surface: (8 ± 0,5) mm.

The drum shall be capable of rotating at a speed of  $(0,266 \pm 0,016)$  rad s<sup>-1</sup> [(16 ± 1) rev/min] and shall have facilities for reversing the direction of rotation every 5 min with approximately 1 s stationary time. The drum system shall incorporate a revolution counter, and specimens shall be held in place by four adjustable retaining segments (thickness 15 mm ± 1 mm) on each side wall of the drum.

Loose pile fibres shall be removed by means of a free-running brush mounted so as to be in light contact with the surface of the specimens, and the fibres extracted by a vacuum cleaner. Figure 1 illustrates the drum in cross-section.

A vulcanized-fibre backing sheet of size 2 320 mm × 270 mm × 1,5 mm thick and of density 1,1 g/cm<sup>3</sup> to 1,3 g/cm<sup>3</sup> at 20 °C is loosely laid inside the drum shell on the working side.

The sheet remains permanently in the drum.

**5.1.2 Steel ball**, fitted with 14 cylindrical rubber studs located so as to be equally spaced on the ball surface. The studs shall be replaceable and screwed into flat faces machined into the surface of the ball (see Figure 2).

Diameter of the ball: (120 ± 0,2) mm

Distance between diametrically opposed flat stud-mounting faces: (118 ± 0,1) mm

Mass without studs: (6 800 ± 100) g

Mass with 14 studs: (7 600 ± 100) g

Each stud shall consist of a light grey natural rubber disc attached to a steel backing plate having an integral mounting screw.

Specification of the studs: <https://standards.iteh.ai/catalog/standards/sist/46eb60ad-8b1e-43ff-a292-d57fa0cc410c/iso-10361-2012>

Thickness of metal plate: 3 mm

Diameter: (40 ± 0,5) mm

Height (without spiral drill): (15 ± 0,5) mm      Spiral drill: Metric 8

Hardness of studs: Shore A (47 ± 3) measured according to ISO 7619-1:2010, reading after 3 s

After each test, replace two opposite studs with new ones.<sup>1)</sup> The two studs that have been used longest shall be replaced first. The studs shall be stored in a dark room at between 18 °C and 23 °C, but not longer than 18 months.

**5.1.3 Vacuum cleaner**, having a width of suction head at least equal to the width of the specimens.

1) Replacement studs for the Vettermann drum tester can be obtained from:

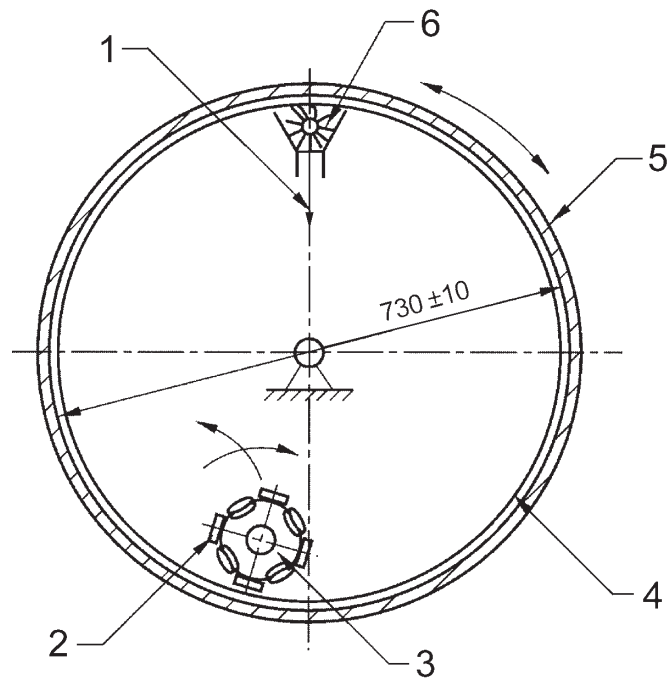
— Artech Rubber BV Ijslandsestraat 8 7202 CL Zutphen Netherlands ([info@artechrubber.nl](mailto:info@artechrubber.nl)).

— TFI Charlottenburger Allee 41 52068 Aachen Germany [postmaster@tfi-online.de](mailto:postmaster@tfi-online.de) Studs can be tested by: Elastomer Research Testing BV PO box 2149 7420 AC Deventer Netherlands ([info@ertbv.nl](mailto:info@ertbv.nl)).

This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.



Dimensions in millimetres



**Key**

- 1 extraction of brushed fibres
- 2 rubber stud
- 3 steel ball
- 4 vulcanized-fibre backing sheet
- 5 metal drum
- 6 circular brush

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**Figure 1 — Vettermann drum tester**