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Textile floor coverings — Determination of resistance to damage at cut edges using the modified Vettermann drum test

Revêtements de sol textiles — Détermination de la résistance des joints par l'essai au tambour Vettermann modifié

Reference number
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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

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Foreword

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is Technical Committee ISO/TC 219, *Floor coverings*.

This third edition cancels and replaces the second edition (ISO 10833:2001), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the preparation (including the cutting) of the specimen in the case of sheet material have been updated;

— the assessment and evaluation of the fraying resistance characteristic have been updated.

Textile floor coverings — Determination of resistance to damage at cut edges using the modified Vettermann drum test

1 Scope

This document specifies a method to determine the susceptibility of textile floor coverings to mechanical damage at cut edges.

It is applicable to all textile floor coverings both as sheet materials and as tiles.

2 Normative references

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 139, *Textiles — Standard atmospheres for conditioning and testing*

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 10361:2015, *Textile floor coverings — Production of changes in appearance by means of Vettermann drum and hexapod tumbler tester*

3 Terms and definitions

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

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

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

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

3.1
delamination
separation of the use-surface and/or foundation/primary substrate of a textile floor covering from the secondary backing

3.2
fraying
damage or loss of pile or substrate material of a textile floor covering from a cut edge

3.3
tufting out
loss of tufts from the use-surface of a textile floor covering

3.4
sprouting
release and appearance during use of extra-long tuft legs, which were accidentally trapped within the pile of a textile floor covering during manufacture

3.5
laddering
shooting
loss of consecutive loops of the same column from the use-surface of a textile floor covering

4 Principle

A steel ball with six rubber studs rolls freely inside a rotating drum which is lined with the textile floor covering specimens.

On sheet materials, a cut is made along the length of the specimens in a groove such that the cut edges are stressed in the test.

Tiles are put together so that the original edges of the tiles form the joint which is stressed in the test.

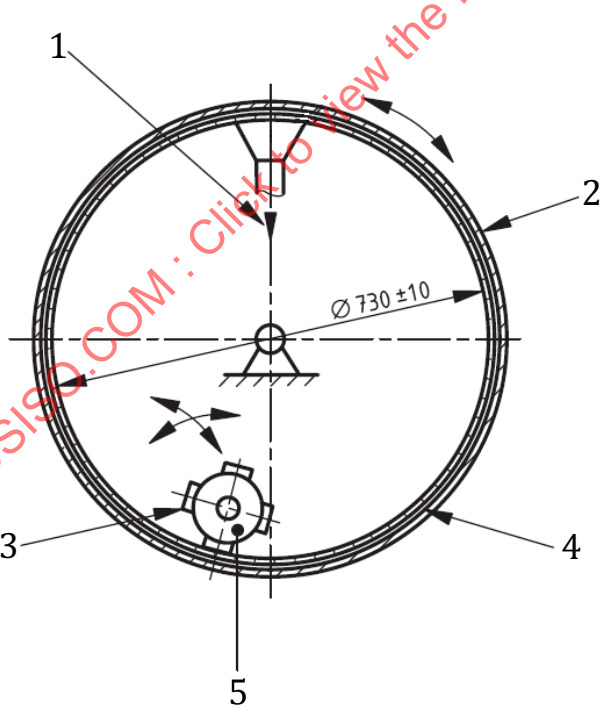
After the test, the appearance of the fatigued cut edges is assessed.

5 Apparatus

Equivalent products may be used if they can be shown to lead to the same results.

5.1 Vettermann-drum tester, conforming to ISO 10361:2015, 5.1.1, including a vacuum cleaner with an air change rate at the nozzle of minimum 25 l/s, as described in Figure 1.

Dimensions in millimetres



Key

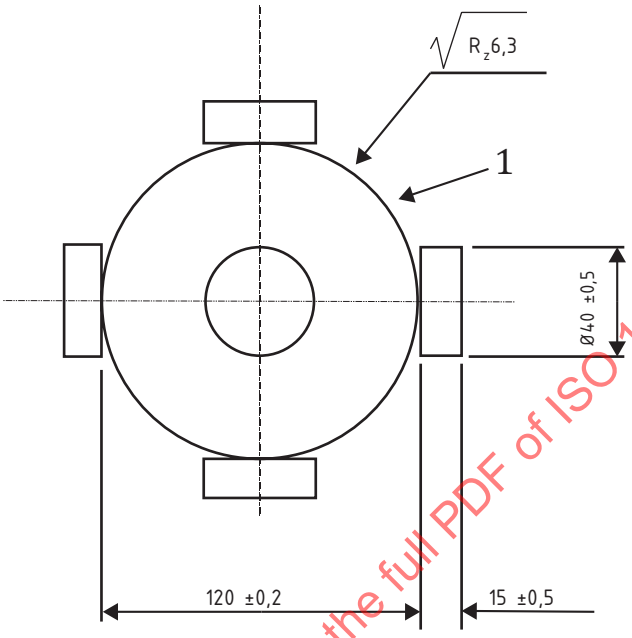
1 extraction of brushed fibres
2 metal drum
3 rubber stud
4 fixing plate in vulcanised fibre
5 steel ball (see Figure 2)

Figure 1 — Vettermann drum tester

5.2 Steel ball, (see Figure 2) shall be fitted with six cylindrical rubber studs, which are equally spaced from each other on the surface of the ball.

The mass of the ball without rubber studs shall be (7 000 ± 100) g. The diameter of the ball shall be (120 ± 0,2) mm.

Dimensions in millimetres



Key

1 steel ball

Figure 2 — Design of steel ball

5.3 Rubber studs, conforming to ISO 10361:2015, 5.1.2 which are replaced before each test.

5.4 External vacuum cleaner, of the upright type with a rotating brush.

5.5 Fixation tape (single-sided adhesive tape), for the fixation of carpet skirtings; recommended width of the tape is 50 mm.

5.6 Double sided adhesive tape, as commonly used for textile floor coverings; recommended width of the tape is 50 mm.

5.7 Knife, for cutting flat woven textile floor coverings, e.g. a carpet cutter.

6 Sampling and preparation of specimens

6.1 Sampling

6.1.1 General

Sampling shall be carried out in accordance with ISO 1957.

6.1.2 Sheet materials

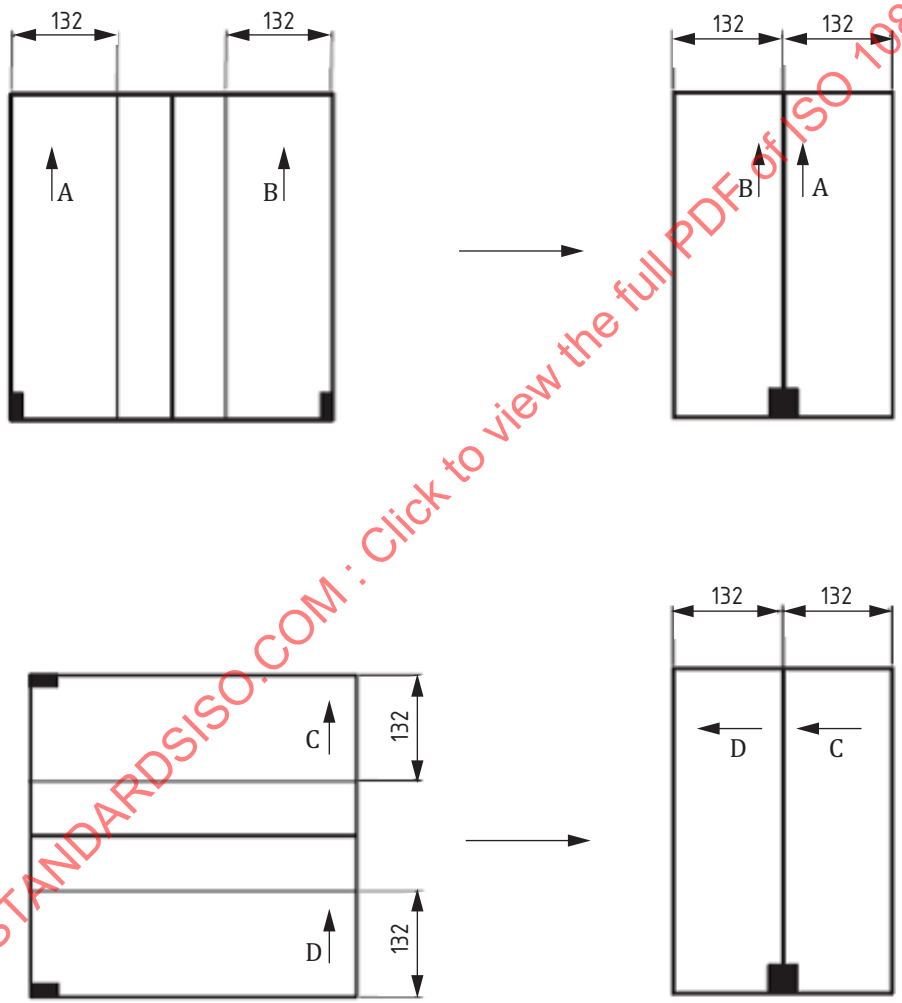
Take four test specimens approximately 570 mm long (in the direction of manufacture) and approximately 265 mm wide. The longitudinal edge of the specimens shall be parallel to the direction of manufacture.

6.1.3 Tiles

Take at least four tiles of dimensions 500 mm by 500 mm or of lesser dimensions, but not smaller than 265 mm by 265 mm.

Before cutting, mark the corners of the tiles and the direction of manufacture on the back of the specimen as shown in Figure 3.

Dimensions in millimetres



a) Direction of manufacture **b) Crosswise direction**

Key

A, B, C, D specimen label

⟶ direction of manufacture

Figure 3 — Specimen preparation by cutting of tiles

From the tiles, cut a total of eight specimens of width approximately 132 mm, four of them in the direction of manufacture, as shown in Figure 3 a) and four crosswise, as shown in Figure 3 b).

Ensure that the drum is filled to capacity using fillers of similar height and construction.

6.2 Preparation of specimens

6.2.1 Sheet materials

Make a cut in the centre of the test specimens in the direction of manufacture according to the installation guidelines of the carpet manufacturer. If no guidelines are available, the cut shall be made straight between two loop or tuft columns. For flat woven carpets, the ground warp shall not be damaged. The cut shall be made with a sharp knife cutting from the pile side through pile and backing. One edge may be cut totally. At the other edge, the cut shall stop 20 mm before the specimen ends.

Connect the two sides of the cut test specimens on the back with single-sided adhesive tape of 50 mm width. Apply the adhesive tape firmly. Ensure that the two edges are as close as possible.

If necessary, attach double adhesive along the entire specimen length and positioned over the single-sided adhesive tape.

Cover both ends of the test specimens with a 50 mm wide single-sided adhesive tape to prevent fraying during the test.

If necessary, remove frayed and sprouting parts of damaged tufts with a sharp cutting tool.

If in practice the edges are sealed with glue, the cut edges of the specimens may likewise be sealed with glue.

6.2.2 Tiles

Prepare four test specimens of each floor covering as shown in Figure 3, two to test the original tile cut edges in the direction of manufacture (pieces A and B) and two in the transverse direction (pieces C and D).

Make up four composite test specimens with the original cut edge in the centre.

Position the edges in the centre of the specimen as close to each other as possible and fix in position by the single-sided adhesive tape.

If necessary, attach double-sided adhesive tape along the entire specimen length and position over the single-sided tape.

If necessary, remove frayed and sprouting parts of damaged tufts with a sharp cutting tool.

7 Atmosphere for conditioning and testing

Condition the test specimens (face up) in the standard atmosphere for textiles as defined in ISO 139 for at least 24 h. Conduct the test in this atmosphere.

8 Procedures

If necessary, remove the protective layer from the double adhesive tape on the back of the test specimen. Fix the four specimens firmly on the inside of the drum with the use surface towards the centre of the drum.

In placing the specimens, ensure that the sides lie within the retaining segments. Insert the test specimens between the retaining segments and clamp firmly.