

INTERNATIONAL STANDARD

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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
ISO 10833:2001(E)

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 10833 was prepared by Technical Committee ISO/TC 219, *Floor coverings*.

This second edition cancels and replaces the first edition (ISO 10833:1992), which has been technically revised.

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

1 Scope

This International Standard describes 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 normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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 10361:2000, *Textile floor coverings — Production of changes in appearance by means of Vettermann drum and hexapod tumbler testers*

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions in ISO 2424 as well as the following apply.

3.1 delamination

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

3.2 fraying

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 at an acute angle 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 in accordance with ISO 9405.

5 Apparatus

5.1 Drum tester, conforming to 5.1.1 of ISO 10361:2000, including a vacuum cleaner with an air change rate at the nozzle of 25 l/s to 40 l/s. See Figure 1.

5.2 Steel ball, fitted with six cylindrical rubber studs these being fitted so as to be equally spaced from each other on the surface of the ball. The mass of the ball without rubber studs shall be $(7\,000 \pm 100)$ g. The diameter of the ball shall be $(120 \pm 0,2)$ mm. See Figure 2.

A standard 14 stud ball with eight studs removed is not acceptable because of the wear it causes to the drum segments.

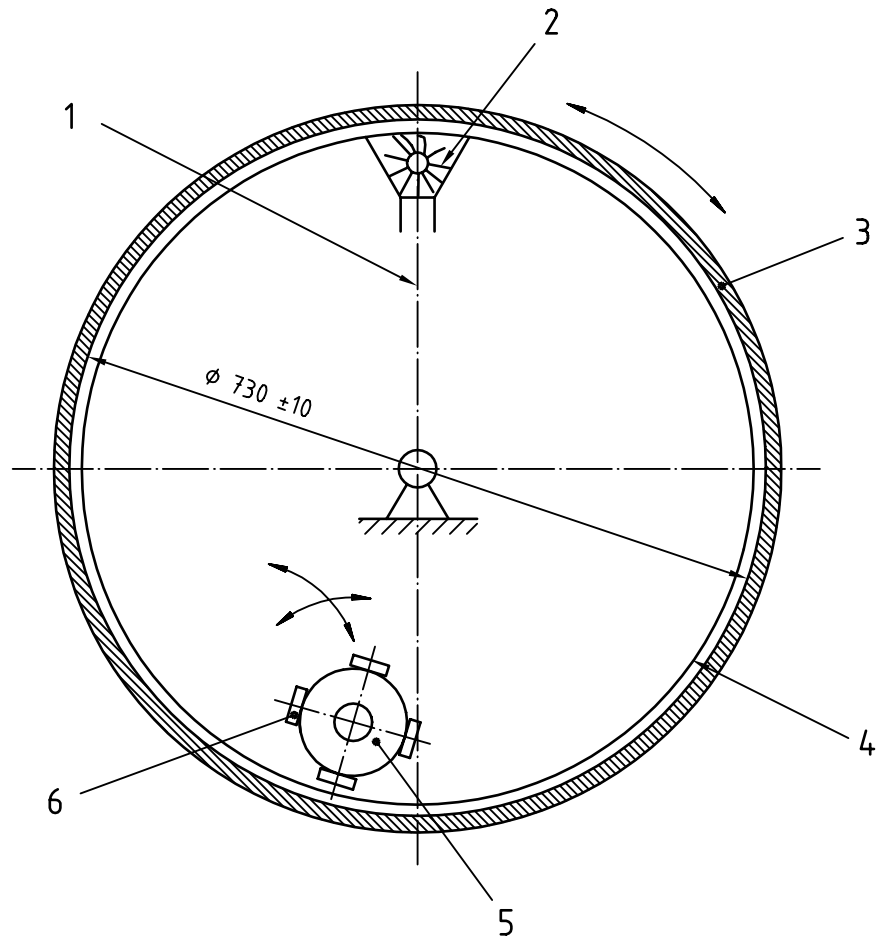
5.3 Rubber studs, conforming to ISO 10361 that are replaced before each test.

5.4 External vacuum cleaner, upright type with rotating brush and beater bar.

5.5 Single-sided adhesive tape, of width ≥ 50 mm.

5.6 Double-sided adhesive tape, of width ≥ 50 mm.

Dimensions in millimetres

**Key**

- 1 Vacuum extraction of brushed fibres
- 2 Circular brush
- 3 Metal drum
- 4 Vulcanized fibre backing sheet
- 5 Steel ball
- 6 Rubber stud

Figure 1 — Vettermann drum

Dimensions in millimetres
Surface roughness in micrometres

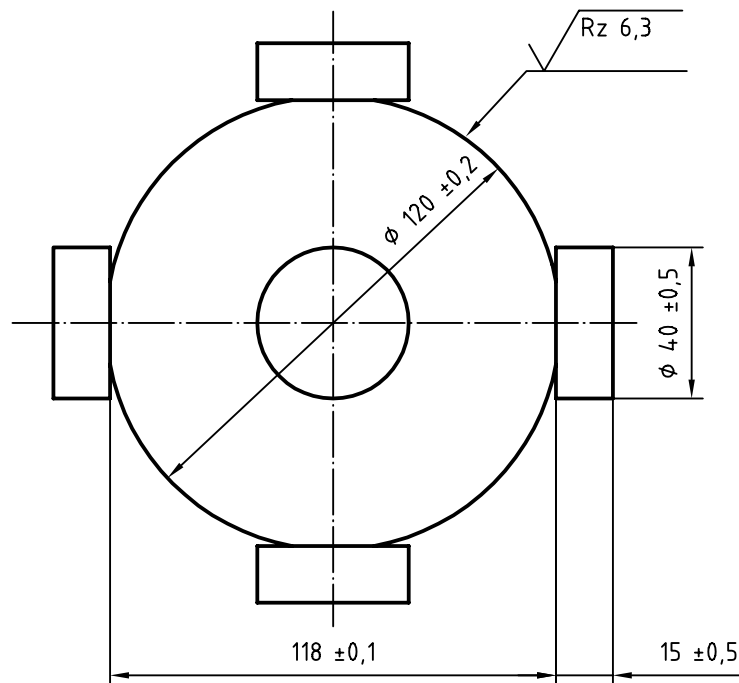


Figure 2 — Steel ball

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

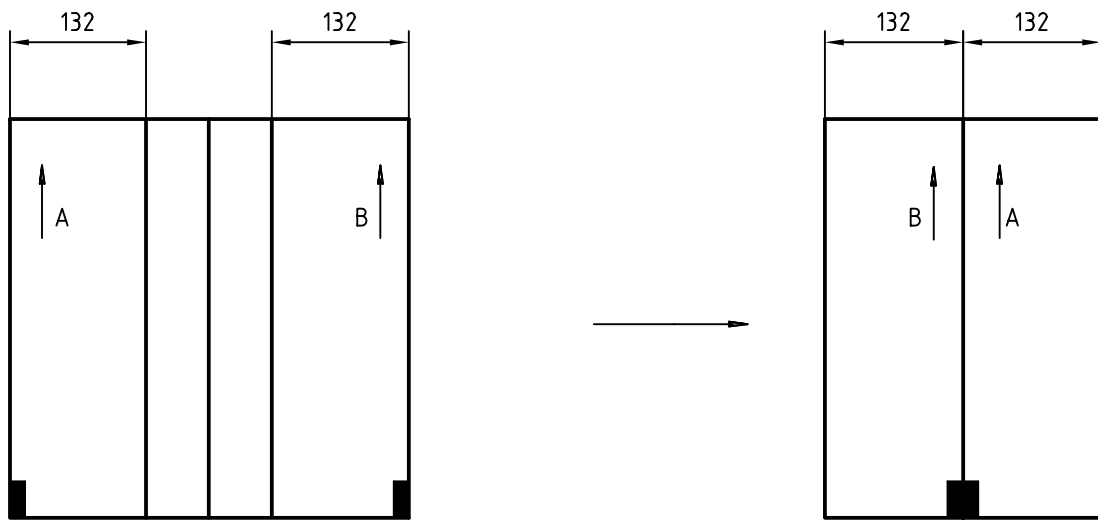
Take at least four tiles of dimensions 500 mm \times 500 mm or of lesser dimensions, but not smaller than 265 mm \times 265 mm.

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

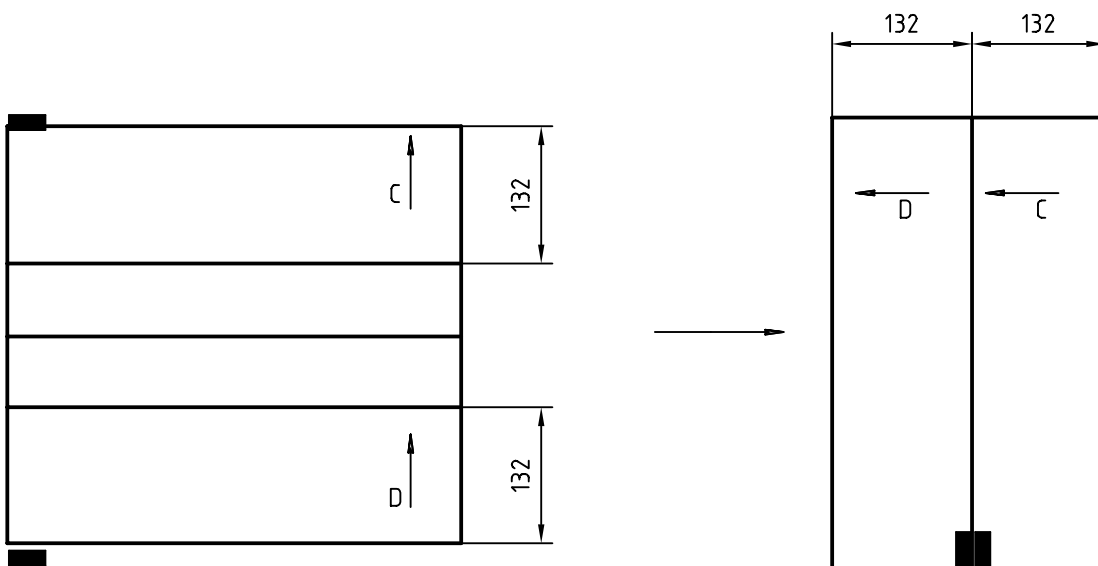
From the tiles cut a total of eight specimens of width approximately 132 mm, four of them in the direction of manufacture and four in the transverse direction (crosswise), as shown in Figure 3.

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

Dimensions in millimetres



a) Direction of manufacture



b) Transverse direction

Figure 3 — Specimen preparation by cutting of tiles

6.2 Preparation of specimens

6.2.1 Sheet materials

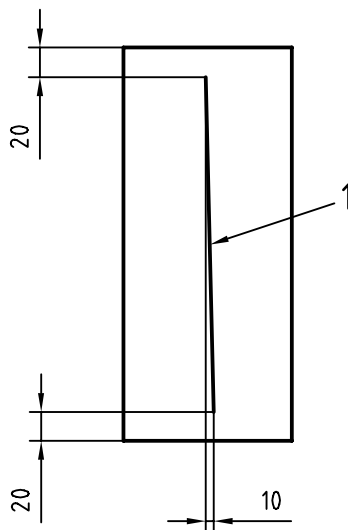
Make a cut in the centre of the test specimens making an acute angle with the direction of manufacture (see Figure 4). The cut shall cross at least one pile row. The cut shall be made with a sharp cutting tool (carpet knife or a press cutter) cutting from the pile side through pile and backing.

Connect the two sides of the cut test specimens on the back with single-sided adhesive tape (5.5). Apply the adhesive tape firmly. Ensure that the two edges are as close as possible.

Attach double-sided adhesive tape (5.6) along the entire specimen length and positioned over the single-sided adhesive tape.

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

Dimensions in millimetres



Key
1 Cut

Figure 4 — Setting of cut in specimens of sheet materials

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 using the single-sided adhesive tape.

Attach double-sided adhesive tape along the entire specimen length and position over the single-sided tape.

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 Procedure

Remove the protective layer from the double-sided adhesive tape on the back of the test specimen. Fix the four specimens on the inside of the drum tester (5.1) 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.

Place the steel ball (5.2) in the drum.

Set the revolution counter to 11 000 cycles and switch the machine on.

Operate the vacuum continuously throughout the test.

After the test clean the test specimens with the external vacuum cleaner (5.4) making four passes in each direction along the length of the specimen, the last pass being in the direction of pile lay.

9 Assessment

Check by close inspection and note the type of damage as defined in clause 3, in particular:

- degradation of the cut edges;
- number of tufts removed from one or several rows of pile (cut pile products);
- number of yarns pulled out with a length greater than one loop (loop pile products);
- if there has been delamination and if so the length and width of the delaminated area.

Note in which part of the floor covering the damage occurred.

10 Test report

The test report shall include the following information:

- a) reference to this International Standard, i.e. ISO 10833;
- b) identification of the product tested including the type, origin, manufacturer's reference number;
- c) sampling details;
- d) the result of the test as in clause 9;
- e) details of any deviations from the procedure described in this International Standard which might have an influence on the results.

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