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Resilient floor coverings — Determination of dimensional stability and curling after exposure to heat

Revêtements de sol résilients — Détermination de la stabilité dimensionnelle et de l'incurvation après exposition à la chaleur

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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 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.

This document was prepared by Technical Committee ISO/TC 219, *Floor coverings*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 134, *Resilient, textile and laminate floor coverings,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 23999:2018), which has been technically revised.

The main changes are as follows:

— cross-references within the document have been updated;

— update to the dimensional stability and curling calculation sections of the method;

— update of Annex A with more detailed calculation.

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.

Resilient floor coverings — Determination of dimensional stability and curling after exposure to heat

1 Scope

This document specifies a method for determining dimensional stability and curling of resilient floor coverings, in the form of sheets, tiles or planks after exposure to heat.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminology 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/

3.1
dimensional stability
ability of a resilient floor covering to retain its original dimensions after exposure to heat, under specified conditions

3.2
curling
vertical deformation appearing on the specimen after exposure to a heat treatment, under specified conditions

3.3
domed material
area of specimen that does not lie flat against support plate when centred

4 Principle

4.1 Dimensional stability

The relative change in distance between marks or a specific location on a test specimen is measured before and after exposure to a heat treatment, under specified conditions. In the case of tiles and planks, measurements may be made using a block and dial gauge assembly.

4.2 Curling

The vertical deformations are measured in the test specimen after the specified heat treatment.

Test specimens are placed in an oven at an elevated temperature, after which curling and dimensional stability are determined. In the case of domed material or where material exhibits negative curling, turn the test specimen over to measure inverted or with the back of the sample facing up. Measure curling and mark appropriately as negative curling.

5 Apparatus

5.1 Oven

The oven shall be thermostatically controlled and ventilated, capable of being maintained at a uniform temperature of 80 °C ± 2 °C. If a temperature setting other than 80 °C is utilized, mark the test sheet as appropriate and verify the oven's capability to maintain a uniform temperature set point.

In operation, ensure that radiation from the heating element does not directly reach the test specimens or support plates.

5.2 Support plates

The support plates shall be of metal, e.g. aluminium or stainless steel, of dimensions larger than the test specimen and not less than 1,5 mm in thickness. Ensure that the support plates are kept smooth and polished so that surface friction does not interfere with free shrinkage or growth of the test specimens. The plates shall be flat and free of convex or concave distortion and fully support the sample (e.g. a wire rack support plate is not acceptable.).

The shapes and dimensions of the apparatus specified in 5.1 and 5.2 shall be such that:

a) curling can be measured without removing the test specimens from the support plates, except in the case of domed material or where material exhibits negative curling;

b) the distance between the plates and the vertical walls of the oven shall be more than 50 mm;

c) the vertical distance between the support plates and between the plates and the oven shall be more than 100 mm.

5.3 Measuring device

5.3.1 Measuring equipment

The measuring equipment for sheet, tile and plank products, shall preferably be an optical bench for non-contact dimensional stability measurements or block and dial gauge apparatus, see examples shown in Figure 2, Figure 3 and Figure 4. The equipment shall have a range of at least 200 mm and a precision of ± 0,02 mm. For many types of optical benches, ensure that the test specimen is properly seated against the base horizontal index guide when a specific measurement is being taken. Test specimens with concave or convex edges can be read incorrectly.

5.3.2 Micrometer

For sheet, tile or plank (partial) specimens, the micrometer shall be pillar-mounted drop gauge device. Alternative measurement systems may be used provided they are accurate to at least 0,1 mm e.g. feeler gauges.

5.3.3 Rigid plate

For sheet or tile test specimens, a rigid plate of steel, squared and finished, of dimensions 240 mm × 240 mm with holes for the scores (see Figure 1) shall be used. For planks, especially more rigid planks, the preferred method to measure dimensional stability is with a block and dial set-up, although a rigid plate set-up can be utilized.

5.3.4 Square template

For sheet or tile specimens, a square or rectangular template, of side 610 mm, 508 mm, 305 mm or 229 mm for example, shall be used.

Dimensions in millimetres

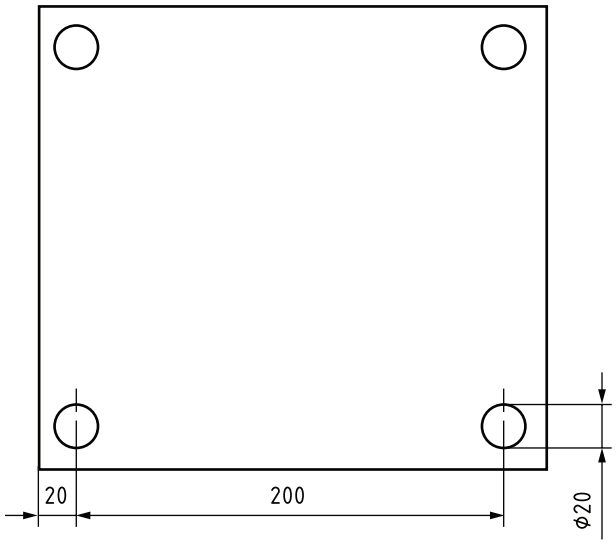
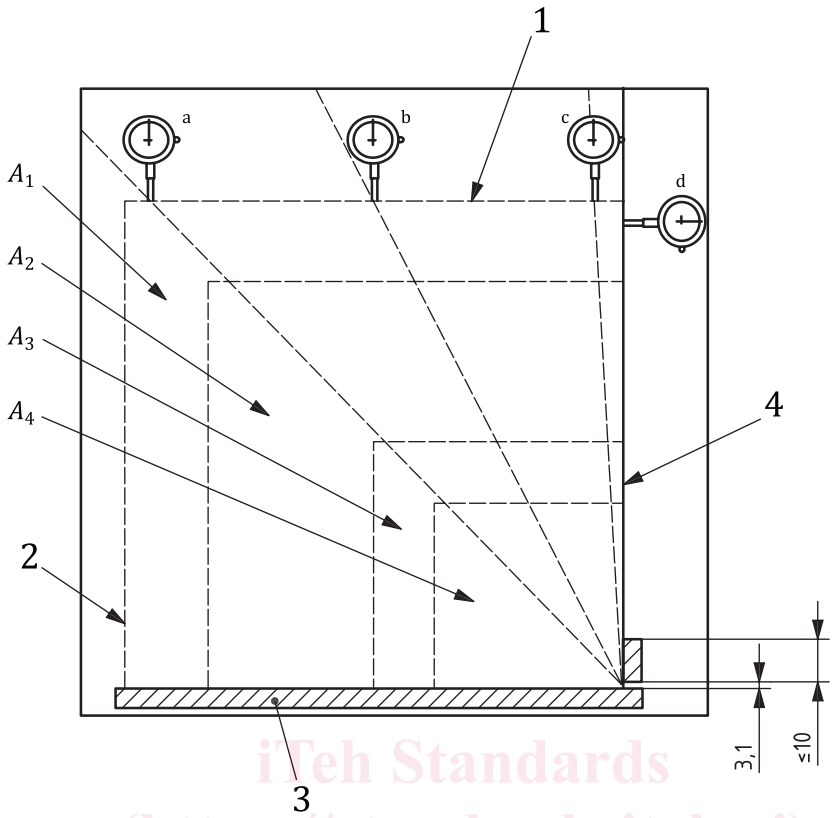


Figure 1 — Rigid steel plate example

5.3.5 Block and dial gauge (appropriate for tile or plank size to be measured)

For tile or plank (partial) test specimens only, a block and dial gauge as shown in Figure 2, Figure 3 or Figure 4 examples, shall be used.

Dimensions in millimetres



Key

1	edge 1	A_1	template 610 mm × 610 mm
2	edge 2	A_2	template 508 mm × 508 mm
3	edge 3	A_3	template 305 mm × 305 mm
4	edge 4	A_4	template 229 mm × 229 mm

a Within 10 % of the corner of the tile edge.

b Within the central 10 % of the tile edge.

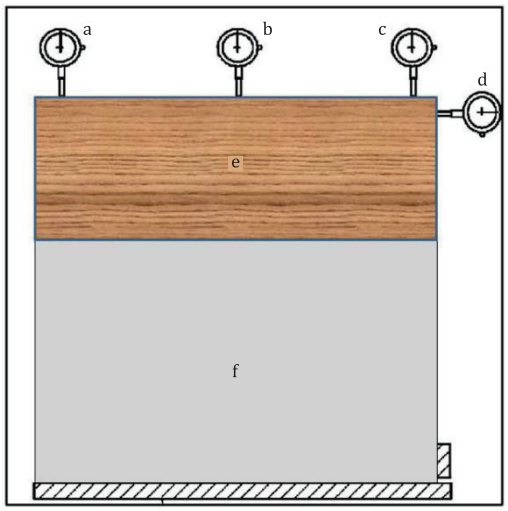
c Within 10 % of the corner of the tile edge.

d Within 10 % of the corner of the tile edge.

Figure 2 — Example apparatus for measuring tile side length, straightness and squareness

5.3.6 Calibrated shim or spacer block

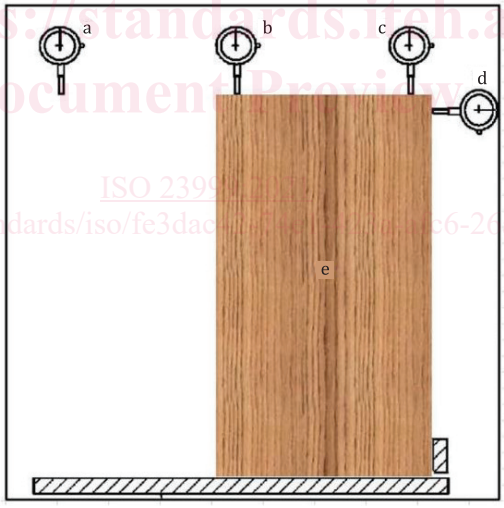
The calibrated shim or spacer block allows to measure plank width differences utilizing the block and dial gauge apparatus.



Key

a dial micrometer
b dial micrometer
c dial micrometer
d dial micrometer
e example plank, e.g.152,4 mm × 609,6 mm
f example plank, e.g. 457,2 mm × 609,6 mm

Figure 3 — Example shim block/plank measurement set-up — width



Key

a dial micrometer
b dial micrometer
c dial micrometer
d dial micrometer
e example plank

Figure 4 — Example plank measurement set-up — length

5.4 Scoring device

A scoring device, e.g. a single edge razor blade, scalpel or scribe point, can be used.

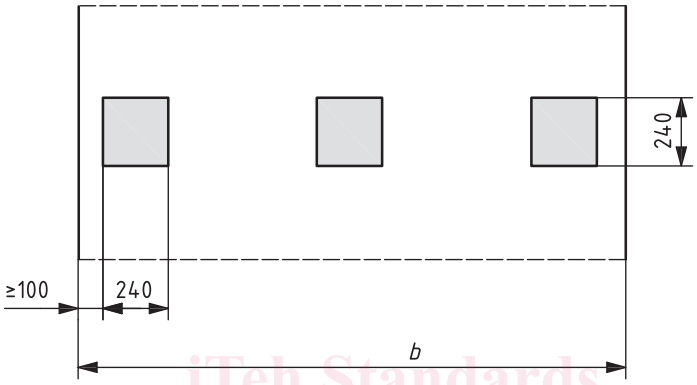
6 Test specimens

6.1 General

For sheet material, before cutting the test specimens, lay out the product as flat as possible and mark the direction of manufacture.

Cut out three, nominal 240 mm square test specimens, at equal distance, from the sample material (see Figure 5). The distance between the outer edge of the sample and nearest edge of the test specimen shall be at least 100 mm. The test specimen edges shall be parallel/transverse to the direction of manufacture.

Dimensions in millimetres



Key

b total width

Figure 5 — Cutting of test specimens from sheet or roll product

6.2 Plank width

Specimen(s) shall have sufficient width to permit use of a minimum of two micrometers when taking measurements (see Figure 4).

For tiles and planks, remove product from package, discard top and bottom tile or plank, spread them out, then randomly select three test specimens. The direction of manufacture shall, if possible, be marked on each test specimen. Tiles and planks, if less than 610 mm in width and or length, should be tested as manufactured. If testing samples have profiled edges, it can be easier to cut the profiled edging off, making sure to achieve clean, straight and squared cut edges for testing purposes. Make every effort to not distort or excessively stress samples during cutting process. For tiles and/or planks longer and/or wider than 610 mm, the dimension(s) over 610 mm shall be cut down to 610 mm for testing using this method. Take precaution to achieve a clean, straight cut if testing using a block and dial gauge set-up.

7 Conditioning

Condition the test specimens on a flat surface, such as a table surface, to ensure that they are in contact with the support plate uniformly during the measurements.

Condition the test specimens at a temperature of 23 °C ± 2 °C and relative humidity of 50 % ± 5 % for a minimum of 24 h.