International Standard ISO 3416

Textile floor coverings — Determination of thickness loss after prolonged, heavy static loading

Revêtements de sol textiles — Détermination de la perte d'épaisseur après application prolongée d'une charge statique élevée

Second edition — 1986-11-15

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3416 was prepared by Technical Committee ISO/TC 38, *Textiles*.

This second edition cancels and replaces the first edition (ISO 3416-1975), clauses 4 and 7 of which have been technically revised.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

INTERNATIONAL STANDARD   **ISO 3416-1986 (E)**

Textile floor coverings — Determination of thickness loss after prolonged, heavy static loading

1 Scope and field of application

This International Standard specifies a method for determination of thickness loss of textile floor coverings after prolonged, heavy static loading. It is applicable to all textile floor coverings of uniform thickness and construction. It does not apply to other textile floor coverings unless the areas of different thickness or construction can be separately tested.

NOTE — A method for determination of thickness loss of textile floor coverings after brief, moderate static loading is given separately in ISO 3415.

2 References

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

ISO 1765, *Machine-made textile floor coverings — Determination of thickness.*

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

3 Principle

Subjection of a test specimen to a prolonged, heavy static loading treatment, the thickness being measured before loading and after various recovery periods.

4 Apparatus

4.1 Thickness tester, with circular presser foot of area between 300 and 1 000 mm^2 and capable of measuring thickness to an accuracy of 0,1 mm at the standard pressure of 2,00 $\pm$ 0,2 kPa* as defined in ISO 1765.

4.2 Five alloy specimen plates, each measuring 100 mm $\times$ 100 mm and approximately 6 mm thick.

4.3 Static loading machine, capable of applying a pressure of 700 kPa through a circular presser foot of radius at least

2 mm larger than the radius of the presser foot of the thickness tester, and which is constrained to move vertically. A suitable apparatus is described in the annex.

4.4 Double-sided adhesive tape.

4.5 Straightedge, for example a ruler, for brushing the surface of the specimen.

5 Atmosphere for conditioning and testing

The specimens shall be conditioned and all measurements made in the standard atmosphere for conditioning and testing textiles specified in ISO 139.

Preconditioning in a dry atmosphere before conditioning in the standard atmosphere for testing is not required.

6 Test specimens

Cut out at least five specimens, each measuring 100 mm $\times$ 100 mm, following the sampling procedure specified in ISO 1957.

7 Preparation of test specimens

7.1 Attach double-sided adhesive tape across the four corners of a specimen plate, pressing down firmly to ensure adhesion. Measure to the nearest 0,1 mm the thickness d_1 of the plate in the centre at the standard pressure.

7.2 Remove any backing paper and mount a test specimen, use-surface uppermost, on to the prepared specimen plate, pressing down at the corners sufficiently to ensure adhesion.

7.3 For specimens with a pile, lightly brush the use-surface, firstly against, then with, the direction of pile lean, using a straightedge. Allow the mounted test specimens to condition in the standard atmosphere for testing textiles, flat, singly and use-surface uppermost, for at least 24 h.

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* 1 kPa = 10^3 N/m^2

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8 Procedure

8.1 General

Conduct the test in the standard atmosphere for testing textiles. Make all determinations of thickness to the nearest 0,1 mm.

8.2 Measurement of initial thickness

Measure the thickness of the conditioned and mounted specimen at the standard pressure (see 4.1) in the centre to obtain the total thickness d_2 of test specimen and plate.

8.3 Application of pressure

Place the measured specimen on the static loading machine so that the presser foot is central, and apply the specified pressure. Leave undisturbed for 24 h.

8.4 Measurement of thickness after recovery

Remove the mounted specimen from the static loading machine, place it on the thickness tester and re-measure the thickness of the assembly within the compressed area after recovery for 2 min.

Leave the specimen use-surface uppermost and without load during recovery periods and re-measure the thickness after total recovery times of 1 h and 24 h at the same place of the compressed area.

NOTE — It is most convenient, if several static loading machines are used in conjunction with one thickness tester, to test several specimens at the same time.

9 Expression of results

9.1 Calculate the original thickness of each specimen by the difference $d_2 - d_1$ and express the result in millimetres, to the nearest 0,1 mm.

9.2 Calculate the thickness losses at each stage, for each specimen, to the nearest 0,1 mm.

9.3 Calculate the arithmetic mean of the results (original thickness and thickness loss at each recovery stage).

10 Test report

The test report shall include the following particulars :

a) that the procedure was conducted in accordance with this International Standard, and details of any operations not included, or optional;

b) the original thickness of each specimen and the mean original thickness;

c) the thickness loss at each recovery stage for each specimen and the arithmetic mean of the results for each recovery stage.

Annex

Static loading machine

(This annex forms an integral part of the Standard.)

A suitable static loading machine, meeting the requirements specified in 4.3, is based upon a lever system as shown in the figure below. In this, A is a fixed pivot point and the loading beam is extended backwards for counter-weight C to balance the weight of the beam. B is an oilite bearing constraining the circular presser foot P to move vertically and apply the load to the test specimen S.

The ratio y/x is chosen so that mass m applies a pressure of 700 kPa on the circular presser foot of area A mm².

$$m = 7\,A \times \frac{x}{y} \times 10^{-2}\,\text{kg}$$