
INTERNATIONAL STANDARD 2095

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Carpets — Determination of mass of effective pile per unit area that can be shorn away from the substrate

Tapis-moquettes — Détermination de la masse du velours utile par unité de surface pouvant être séparé du soubassement par tondage

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

International Standard ISO 2095 was developed by Technical Committee ISO/TC 38, *Textiles*, and was circulated to the member bodies in December 1975.

It has been approved by the member bodies of the following countries :

Belgium	India	Romania
Brazil	Iran	South Africa, Rep. of
Bulgaria	Ireland	Spain
Canada	Israel	Sweden
Czechoslovakia	Italy	Switzerland
Denmark	Mexico	Turkey
Finland	Netherlands	United Kingdom
France	New Zealand	U.S.A.
Germany	Norway	U.S.S.R.
Hungary	Poland	Yugoslavia

No member body expressed disapproval of the document.

This International Standard cancels and replaces ISO Recommendation R 2095-1971, of which it constitutes a technical revision.

Carpets — Determination of mass of effective pile per unit area that can be shorn away from the substrate

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the mass of effective pile per unit area of a carpet that can be shorn away from the substrate. It is applicable to carpets with a pile of cut and/or looped yarn.

2 REFERENCES

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

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

3 PRINCIPLE

Measurement of the masses of specimens of known dimensions, before and after pile has been shorn.

4 APPARATUS

4.1 **Rule**, graduated in millimetres.

4.2 **Scissors or knife** (manually or electrically operated).

4.3 **Carpet shearing or band-knife machine**, capable of shearing the pile close to the substrate. The particulars of the shearing machine and details of its operation shall be agreed between the parties interested in the test results.

4.4 **Press and cutter** or other apparatus, for cutting carpet pieces, either circular or square in shape, of known area (A_2) not less than 25 000 mm².

4.5 **Balance**, accurate to 0,01 g.

5 ATMOSPHERE FOR CONDITIONING AND TESTING

The specimen shall be conditioned and the test conducted in one of the standard atmospheres for testing textiles as specified in ISO 139.

6 TEST SPECIMENS

Test four specimens of carpet selected according to the directions in ISO 1957.

Cut, with the scissors or knife, each specimen at least 200 mm × 200 mm with the sides parallel and perpendicular to the warp (or to the machine production direction) and so that they do not contain the same warp or weft threads.

7 PREPARATION OF TEST SPECIMENS

Lay out the specimens flat, singly, and with the use surface uppermost, in the chosen standard atmosphere for testing textiles for 24 h or until they reach equilibrium, whichever is the longer. Equilibrium should be deemed to have been reached when successive weighings, carried out at intervals of not less than 2 h, of the specimens exposed to the moving air show no progressive change in mass greater than 0,25 %.

8 TEST PROCEDURE

8.1 Determine the mass (m_1), in grams, of each specimen to the nearest 0,01 g.

8.2 Measure the length and width, in millimetres, each at four places on the back of each specimen, to the nearest millimetre.

8.3 Shear the pile from the specimen.

When using clippers, use forward strokes in all directions. Shear as close as possible to the substrate by running the points of the comb and cutter along the substrate without digging in. Avoid plucking any tufts or damaging the substrate. It is not necessary to shear to the edges of the specimen provided that an area of at least 25 000 mm² in the centre is closely shorn.

When using a band knife machine, keep on repeating the process with the roller being set progressively lower until it is as low as possible without damaging the substrate. At each setting insert the specimen into the machine several times, each time in a different direction. After each process brush the pile upright.

Brush, blow or suction-clean the specimen during and/or after shearing. Continue shearing until no further significant amount of pile yarn dust falls away when the specimen is shaken, pile down, over a smooth surface of contrasting colour.

8.4 After shearing, unless the total area of the specimen is completely shorn without damage to the substrate, and can be used to estimate the mass per unit area of the substrate, cut a completely shorn piece of not less than 25 000 mm² from the centre of the specimen, using the press and cutter (4.4). In either case, the substrate in the area taken shall be undamaged.

8.5 Condition each shorn piece in the standard atmosphere chosen for testing specified in clause 5, until successive weighings at intervals of 2 h show no progressive change in mass greater than 0,25 %. Record the final conditioned mass (m_2), in grams, of the shorn area to the nearest 0,01 g.

9 EXPRESSION OF RESULTS

9.1 From the measurements made as described in 8.2, calculate for each specimen the average length and width, in millimetres, and hence the area in square millimetres (A_1).

9.2 Calculate the total mass per unit area (m_1/A_1) of carpet for each specimen separately, in grams per square millimetre.

9.3 Determine the area (A_2), in millimetres, of each specimen of shorn carpet as described in 8.4.

9.4 Calculate the mass per unit area (m_2/A_2) for each area of shorn carpet as described in 8.4, in grams per square millimetre.

9.5 For each specimen, calculate the mass of effective pile above the substrate per unit area, in grams per square metre to the nearest gram per square metre, using the formula

$$10^6 \left(\frac{m_1}{A_1} - \frac{m_2}{A_2} \right)$$

9.6 Calculate the mean value and the coefficient of variation (V) of the results of the four specimens tested

and use this to determine the total number of test specimens required to give 95 % confidence limits of ± 6 % from the formula

$$n = \left(\frac{t V}{6} \right)^2$$

where

n is the number of specimens required;

t is the appropriate value for Student's t .

i.e.

if $V \leq 4$ %, then the four specimens tested are a sufficient number;

if $V \leq 5,5$ %, test a further two specimens (total six);

if $V \leq 7$ %, test a further four specimens (total eight);

if $V > 7$ %, test a further eight specimens (total twelve).

Then calculate the mean and coefficient of variation of all specimens tested, and the 95 % confidence limits, using the formula

$$\text{Confidence limits} = \pm \left(\frac{t V}{\sqrt{n}} \right)$$

10 TEST REPORT

The test report shall include the following information :

- a) a statement that the test was conducted in accordance with this International Standard;
- b) the standard atmosphere for testing used (temperate or tropical);
- c) the mass of effective pile above the substrate per unit area for each specimen, in grams per square metre;
- d) the mean mass of effective pile above the substrate per unit area, in grams per square metre;
- e) the number of specimens tested;
- f) the coefficient of variation and the 95 % confidence limits of all specimens tested;
- g) the type of shearing apparatus used;
- h) details of any operations not included in this International Standard or regarded as optional.