BS 4655 : 1986
UDC 684.733:677.488.3:620.178.1

British Standard Method for

Determination of pile loss of cut-pile and non-loop pile upholstery fabrics

Méthode de détermination de l'épaisseur perdue des tissus d'ameublement en velours coupé et en velours non bouclé

Verfahren zur Bestimmung der Florabnutzung bei Polsterstoffen mit geschnittenem (oder schlingenfreiem) Flor

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Foreword

This revision of this British Standard has been prepared under the direction of the Furniture and Household Equipment Standards Committee, and supersedes the 1970 edition which is withdrawn. The previous method, designed to indicate large losses in mass due to pile removal known to occur in some upholstery fabrics in use, was based on an abrasion machine specified in BS 5690. Experience has shown that this test was not sufficiently stringent. The method now described makes use of a testing device, normally used in assessing colour fastness to rubbing as described in section X12 of BS 1006. Interlaboratory trials have shown the method to be reproducible and more realistic than the previous one.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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Method

1 Scope

This British Standard describes a method of determining the tendency of all types of cut-pile or non-loop pile upholstery fabrics to lose pile by abrasion against underlying fillings to the extent whereby the loss of pile is visually significant when the surface of the fabric is viewed. The method is primarily intended for plain velvets or for patterned velvets containing pile of uniform height.

NOTE 1. To the extent that this tendency to lose pile is highly dependent upon the nature of the underlying filling and the mode of construction of the furniture, and that the assessment of visually significant pile loss is made subjectively, this test may be considered as giving an indication only of the tendency to lose pile by this means. The test may not reproduce conditions which might apply when the fabric is in use.

NOTE 2. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Principle

The reverse side of a fabric specimen is rubbed, with a reciprocating motion by a reference abradant fabric, under controlled conditions, after which the effect on the face of the fabric, in terms of pile tufts or fibre removed, is visually assessed against a grading scale.

3 Apparatus

3.1 *A suitable testing device*, as described in 4.1.2 of section X12 of BS 1006, except that the downward force on the finger is 12 N.

NOTE. The arrangement of the testing device complete with reference abradant fabric and test specimen is shown in figure 1.

The finger is fitted with a screw clamp which enables a sample of reference abradant fabric to be fitted over the finger.

On the upper surface of the arm, directly above the finger, is a fixture which enables a weight piece (3.2) to be rested and retained during the test.

3.2 *Weight piece*, of dimensions suitable for fixing to the top of the moving arm of the testing device directly above the finger. The mass is such as to ensure that the total downward force on the finger during the test is 12 N.

NOTE. On most commercial testing devices the additional force on the arm to provide the required test force is 3 N, equivalent to a mass of 306 g.

3.3 *Reference abradant fabric*, consisting of an expanded PVC coated fabric from which the top surface has subsequently been removed. The expanded PVC exposed is in the form of a tough cellular foam, similar in physical characteristics to polyurethane foam used as upholstery filling, and has a suede-like surface*.

4 Atmosphere for conditioning and testing

The standard temperate atmosphere for conditioning and testing shall be as defined in BS 1051.

5 Preparation of test specimens

5.1 From the sample of fabric to be tested, take three test specimens each measuring 230 mm × 50 mm with the longer dimension corresponding to the width direction of the fabric. In the case of multi-patterned fabrics, select the specimens such that representative areas of pattern are tested; in the case of face-to-face woven velvets, select one set of three specimens from an area with the maximum amount of long pile ends on the back of the sample, since these areas are those most susceptible to pile loss due to abrasion against underlying fillings.

Where more than one area needs to be tested, carry out the test on three test specimens from each area.

In the case of figured velvets, representative areas shall include maximum available areas of uninterrupted pile, and in the case of velvets containing patterned and plain areas, parts of the pattern containing the largest areas of plain pile available shall be sampled as well as patterned areas. If the structure of the velvet is such that pile yarns bridge the patterned areas by running along the back of the velvets, then the areas containing most of this type of pile shall also be sampled.

5.2 Condition each test specimen in the standard temperate atmosphere for testing textiles, as specified in clause 4, for at least 16 h and carry out the test under these conditions.

6 Procedure

6.1 Raise the movable arm of the testing device and mount one specimen, with the pile downwards, on and between the rows of pins on the testing device platform and the row of pins on the tension wheel. Turn the tension wheel to tension the specimen between the pins before tightening it to clamp the specimen.

6.2 Mount a suitably sized circle of the reference abradant fabric (3.3) face downwards on the end of the finger fixed to the movable arm of the testing device (3.1) and clamp it in position using the screw clamp. Renew the reference abradant fabric for each specimen to be tested.

*For details of the source of supply of a suitable abradant fabric, apply to Enquiry Section, BSI, Linford Wood, Milton Keynes, MK14 6LE, enclosing a stamped addressed envelope for reply.

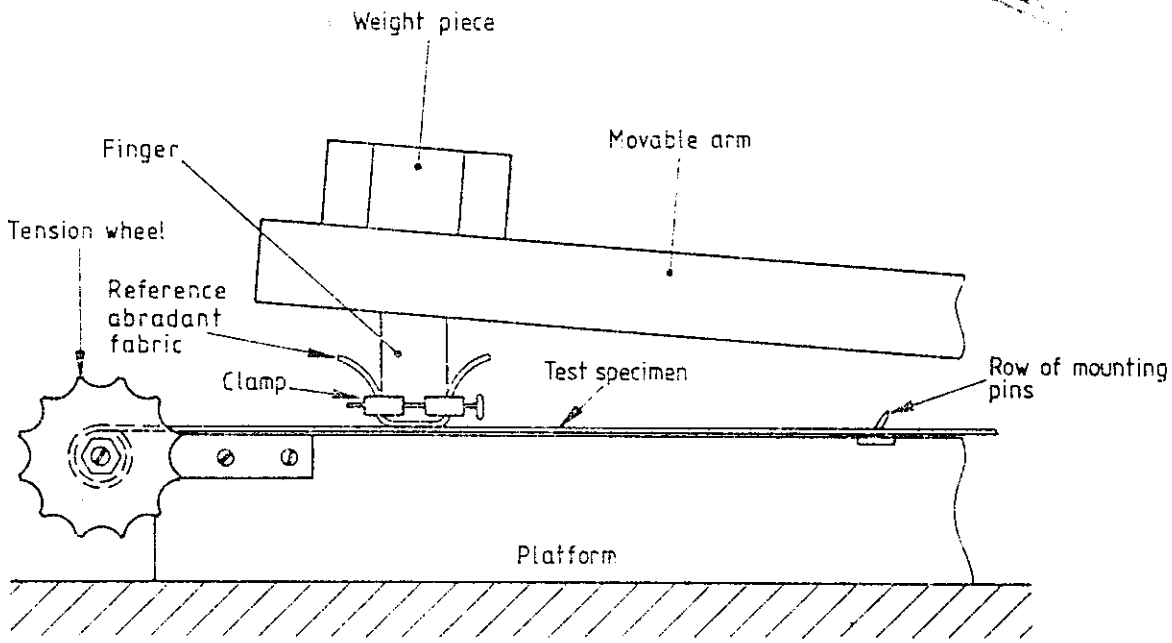

Figure 1. Arrangement of testing device with reference abradant fabric and test specimen in position

6.3 Lower the movable arm of the testing device onto the test specimen and mount the weight piece on the upper side of the arm above the finger.

6.4 Subject the back of the fabric to 30 rub cycles (i.e. 30 movements in each direction) at a rate of one cycle per second. Lightly mark the limits of the area subjected to abrasion, then remove the test specimen prior to assessment.

NOTE. Pins, or small self-adhesive labels, lightly affixed to the pile surface are convenient means of marking the specimen.

6.5 Assess the fabric, under the conditions of illumination specified in BS 950 : Part 1, by direct comparison with an equivalent untested area of the same fabric. For figured and patterned fabric, carry out the comparison by replacing the tested specimen within the exact area from which it was cut. In particular, assess boundary areas between pile and non-pile sections of the fabric.

Visually assess the effect of the test on the face of the fabric in terms of pile tufts or fibre removed, using the subjective scale given in table 1.

The grades of assessment of the effect on the pile surface (and on the back where this needs to be carried out) refer to the tested area only of each specimen. Record the maximum effect on the test specimen.

6.6 Repeat the procedure on each test specimen.

Table 1. Pile loss rating

Pile loss rating	Description
N	No visible effect
I	Isolated single tufts of pile missing, giving rise to a pinhoied type of appearance
D	Small discrete areas devoid of several adjacent tufts of pile
C	A continuous band of pile removed along the line of test

7 Test report

The test report shall include the following particulars:

(a) the number and date of this British Standard, i.e. BS 4655 : 1986;

(b) the date of the test;

(c) the pile loss rating for each specimen tested;

(d) if, in the case of patterned velvet, the loss of pile is restricted to, or more noticeable on, specific areas of the pattern;

(e) if, in the case of patterned or figured velvets, the loss of pile is predominant in boundary areas of the pattern, and also whether these coincide with pile yarns running along the back of the velvet between adjacent lengthways portions of the surface pile pattern containing the colours of these yarns;

(f) if the pile loss is more noticeable at the ends of the rubbed area, i.e. where the direction of rub reverses;

(g) details of any deviation from the specified procedure.

If the test report includes descriptions characterized under the headings (d) and (e) above, clearly describe the specific areas affected in order to assist identification without reference to sight of the test specimens. Include in the description of the test areas the criteria used to select these areas as given in 5.1.

Publications referred to

BS 950	Specification for artificial daylight for the assessment of colour Part 1 Illuminant for colour matching and colour appraisal
BS 1006	Methods of test for colour fastness of textiles and leather
BS 1051	Glossary of terms relating to the conditioning, testing and mass determination of textiles
BS 5690*	Method of test for determination of the abrasion resistance of fabrics

*Referred to in the foreword only.

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The following BSI references relate to the work on this standard:
Committee reference FHM/7 Draft for comment 85/35290 DC

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Furniture and Household Equipment Standards Committee (FHM/-) to Technical Committee FHM/7, upon which the following bodies were represented:

Association of Consulting Scientists
Association of Master Upholsterers
British Furniture Manufacturers' Federated Associations
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