BS EN 15973:2011

BSI Standards Publication

Rubber- or plastic-coated fabrics — Upholstery fabrics — Resistance to soiling

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee TCI/24, Physical testing of textiles.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Rubber- or plastic-coated fabrics - Upholstery fabrics - Resistance to soiling

Supports textiles revêtus de caoutchouc ou de plastique - Étoffes d'ameublement - Résistance à la salissure

Mit Kautschuk oder Kunststoff beschichtete Textilien - Möbelstoffe - Verhalten gegenüber Anschmutzen

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Foreword

This document (EN 15973:2011) has been prepared by Technical Committee CEN/TC 248 “Textiles and textile products”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2011, and conflicting national standards shall be withdrawn at the latest by September 2011.

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1 Scope

This European standard specifies a test method for assessing resistance to soiling and cleanability of coated fabrics for upholstery. This European standard is applicable to upholstery fabrics with a coating on the wear face.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 20105-A03, *Textiles — Tests for colour fastness — Part A03: Grey scale for assessing staining (ISO 105-A03:1993)*

EN ISO 2231, *Rubber- or plastics-coated fabrics — Standard atmospheres for conditioning and testing (ISO 2231:1989)*

EN ISO 12945-2, *Textiles — Determination of fabric propensity to surface fuzzing and to pilling — Part 2: Modified Martindale method (ISO 12945-2:2000)*

EN ISO 12947-1, *Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 1: Martindale abrasion testing apparatus (ISO 12947-1:1998)*

ISO 105-F09, Textiles — *Tests for colour fastness — Part F09: Specification for cotton rubbing cloth*

3 Terms and definitions

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

3.1
coated fabric
fabric with an adherent, discrete continuous layer of rubber and/or plastic based material on one or both surfaces (see EN 13360)

3.2
soiling
process of transferring one or more unwanted substances to the surface of a material

NOTE The term "staining": a special case of soiling caused by one or more dyes or pigments.

3.3
cleanability
property of the coated fabric to be restored to its original appearance after cleaning

4 Principle

This method provides a procedure for exposing test specimens to the influence of soiling material under defined conditions, their cleaning and following visual assessment. For soiling three different types of soiling substances are used:

a) solid soil and dyes transferred by a soiling cloth;

b) an aqueous soil and

c) an oily soil.

After soiling and a conditioning period the specimens are cleaned. The specimens are visually assessed before and after cleaning.

5 Apparatus and materials

5.1 Martindale apparatus, according to EN ISO 12947-1.

5.2 Pilling specimen holder heads, for the Martindale apparatus (5.1), including the auxiliary mandrel device for specimen mounting, as defined in EN ISO 12945-2.

Pilling specimen holder fitted with ring weight and the nominal 12 kPa loading piece (sum of the mass of the applied load and the mass of the specimen holder assembly of (1 010 ± 15) g).

NOTE 1 This exerts a nominal pressure of 1,6 kPa on the test specimen during the test.

NOTE 2 The use of the mandrel is necessary to correctly mount the soiling cloth on the holder and to avoid contact with the soiling surface of the cloth.

Use the option that forms a Lissajous figure with a (60 ± 1) mm stroke. It should be noted that this stroke differs from the standard machine setting for the textile pilling test.

WARNING — Some Martindale apparatus have been designed such as the clamping ring is fastened around the abradant table with protuberant screws. Such screws do not allow mechanically the free movement of the pilling specimen holder heads, and then, such apparatus are not available to perform this test method.

5.3 Wool felt underlay, according to EN ISO 12945-2, cut to a diameter of (90 ± 1) mm, for the pilling holder (5.2).

5.4 Wool felt underlay, according to EN ISO 12947-1, cut to a diameter of (140 ± 1) mm, for the abrading table of the Martindale apparatus (5.1).

5.5 Circular sample cutters, for the specimen and soiling cloth, one cutter with a diameter of at least 140 mm.

5.6 Pipettes, for application of the liquids, accurate to at least 0,1 ml.

5.7 Glass plates, size at least 150 mm x 150 mm.

5.8 Cotton cloth, according to ISO 105-F09, dimension: 70 mm x 70 mm pieces for soiling and pieces of about 150 mm square for cleaning.

5.9 Soil for dry soiling

Soiling cloth[1)] cut to a diameter 140 mm with following properties:

— denim with 100 % cotton,

— 450 g/m² (24,5 threads per cm in warp direction, 19,5 threads per cm in weft direction),

— dyeing with 2,3% indigo blue and 0,5% sulphuric black,

— soiled with carbon black / olive oil, both at (4 ± 1) g/m².

5.10 Aqueous soil, "instant" coffee (freeze dried) without sugar[2)], mixed (2,5 ± 0,1) g coffee to (240 ± 5) ml water at 60 °C to 80 °C and cooled to 40 °C.

5.11 Oily soil, paraffin oil (liquid, pure grade, CAS 8012-95-1) containing 0,1 % β-carotin (CAS 7235-40-7; purity ≥ 95 %).

5.12 Cleaning agent, sodium lauryl ether sulphate (CAS 9004-82-4), 0,5 % solution in water.

5.13 Grey scale, in accordance with EN 20105-A03.

5.14 Other soils and cleaning solutions can be used if requested by the customer, information to be reported.

5.15 Hot air woven, set up to maintain (80 ± 2)°C.

6 Preparation and conditioning of test specimens

Cut the following specimens for the different procedures:

a) for dry soiling: two specimens 140 mm diameter

b) for aqueous soiling: two specimens 100 mm x 100 mm

c) for oily soiling: two specimens 100 mm x 100 mm

d) for assessment: one specimen about 50 mm x 100 mm

Condition the specimens at least 24 h at 20 °C and 65 % relative humidity or at 23 °C and 50 % relative humidity (according to EN ISO 2231 – respectively, climate A or B).

7 Procedure

Perform all described tests in duplicate.

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1) "EMPA 128" is the trade-name of a product supplied by EMPA. This information is given for the convenience of users of this European Standard and does not constitute an endorsement by CEN of the product named. Equivalent products may be used if they can be shown to lead to the same results.

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7.1 Dry soiling

7.1.1 Carry out the soiling procedure on the abrading table of the Martindale abrasion machine (5.1). Fit the coated textile test specimen backed with the wool felt underlay (5.4) on the abrading table (lower position) with the test side facing upwards as described in EN ISO 12945-2. Check the specimens and backing wool felt are centrally positioned in the clamp of the abrading table.

7.1.2 Fit the soiling cloth (5.9), backed with wool felt underlay (5.3), to the pilling holder head (5.2) of the Martindale abrasion machine (5.1) using the auxiliary mandrel device for specimen mounting as described in EN ISO 12945-2. Check for the soiling side of the soiling cloth being on the outside and the cloth and the wool felt underlay are centrally positioned in the clamp of the holder.

The soiling cloth is normally prepared by printing the soiling preparation to one side of the cloth. Be careful that the soiling side is used to rub against the surface of the coated textile.

7.1.3 Adjust the Martindale machine settings for the Lissajous figure with stroke of (60 ± 1) mm.

7.1.4 Mount the pilling holder with the soiling cloth on the Martindale apparatus. Add immediately the loading piece and run 1000 rubs as defined in EN ISO 12947-1.

7.1.5 Remove the pilling holder with the soiling cloth immediately after finishing 1000 rubs. The soiling cloth can be discarded. Remove the specimen from the Martindale table.

7.1.6 Place the specimen in the dark for (24 ± 4) h at 20 °C and 65 % relative humidity or at 23°C and 50 % relative humidity (according to EN ISO 2231 – respectively, climate A or B).

If required, a part of the soiled specimen can be aged, directly after soiling, (24 ± 0,5) h at (80 ± 2) °C in a hot air oven (5.15). After ageing the specimens shall be placed 1 h at 20 °C and 65 % relative humidity or at 23 °C and 50 % relative humidity (according to EN ISO 2231 – respectively, climate A or B) before cleaning.

7.1.7 Clean the specimen as described in 7.4, allow it to dry and condition the specimen in the dark for at least 16 h at 20 °C and 65 % relative humidity or at 23 °C and 50 % relative humidity (according to EN ISO 2231 – respectively, climate A or B).

Assess the soiled and cleaned specimen as described in 7.5.

7.2 Aqueous soiling

7.2.1 Place the specimen flat on a glass plate (5.7). Place a 70 mm x 70 mm piece of cotton cloth (5.8) in the centre of the specimen surface. Apply (2,0 ± 0,1) ml of aqueous soil so that all liquid remains uniformly on the cotton cloth.

NOTE For mesh fabrics or perforated materials, apply (1,0 ± 0,1) ml, if necessary. This quantity should be reported.

7.2.2 Store the specimen on a glass plate together with the soil and the cotton cloth for (4 ± 0,5) h at 20 °C and 65 % relative humidity or at 23 °C and 50 % relative humidity (according to EN ISO 2231 – respectively, climate A or B).

7.2.3 Remove the cotton cloth. Remove carefully any excess soil using a new dry cotton cloth patting the surface of the specimen dry without rubbing.

7.2.4 Clean the specimen as described in 7.4, allow it to dry and condition the specimen in the dark for at least 16 h at 20 °C and 65 % relative humidity or at 23 °C and 50 % relative humidity (according to EN ISO 2231 – respectively, climate A or B).

7.2.5 Assess the soiled and cleaned specimen as described in 7.5.

7.3 Oily soiling

7.3.1 Place the specimen flat on a glass plate (5.7). Place a 70 mm x 70 mm piece of cotton cloth (5.8) in the centre of the specimen surface. Apply (2,0 ± 0,1) ml of oily soil slowly on the cotton cloth. Take care that all liquid remains on the cotton cloth.

NOTE For mesh fabrics or perforated materials, apply (1,0 ± 0,1) ml, if necessary. This quantity shall be reported.

7.3.2 Store the specimen on a glass plate together with the soil and the cotton cloth in the dark for (4 ± 0,5) h at 20 °C and 65 % relative humidity or at 23 °C and 50 % relative humidity (according to EN ISO 2231 – respectively, climate A or B)

7.3.3 Remove the cotton cloth. Remove carefully any excess soil using a new dry cotton cloth patting the surface of the specimen dry without rubbing.

7.3.4 Clean the specimen as described in 7.4, allow it to dry and condition the specimen in the dark for at least 16 h at 20 °C and 65 % relative humidity or at 23 °C and 50 % relative humidity (according to EN ISO 2231 – respectively, climate A or B).

7.3.5 Assess the soiled and cleaned specimen as described in 7.5.

7.4 Cleaning

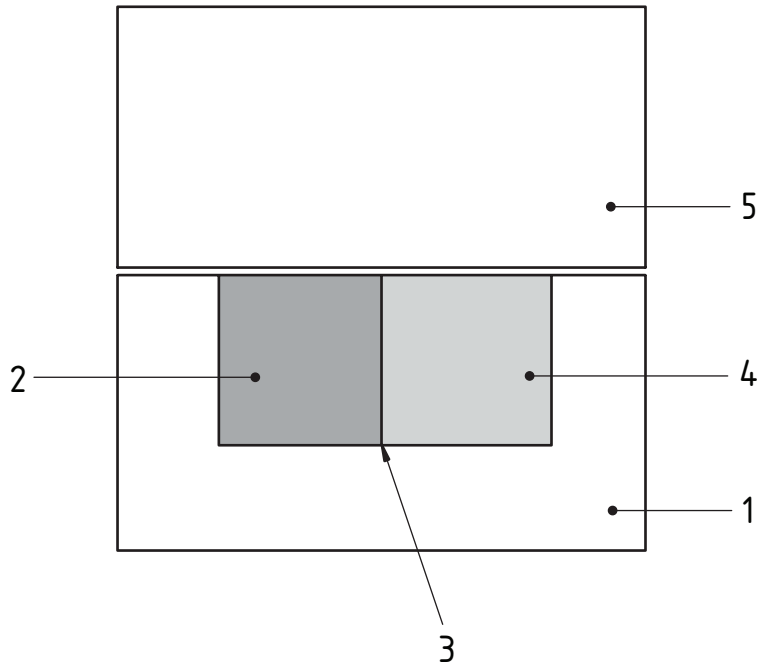
7.4.1 Clean only 50 % of the soiled area. The other part of the soiled area is needed to assess the soiling effect without cleaning.

7.4.2 To clean the specimen, immerse a 150 mm x 150 mm cotton cloth (5.8) in the cleaning solution (5.12). Gently wring the cloth to remove the excess of liquid. Use the cloth to blot the soil from the outside of the soiling inwards. When necessary rotate the cloth to clean area of the cloth and continue blotting. Use sufficient pressure to contact the soil, but not as much as to distort the surface of the specimen. Continue cleaning until no colour transfer is apparent on the white cotton cloth.

7.5 Assessment of soiled and cleaned specimens

7.5.1 Assess the soiled area as well as the soiled and cleaned area of all specimens in accordance to EN 20105-A03. Compare with an untreated reference specimen.

For a better assessment, it is useful to cut the specimens into equal pieces perpendicular to the borderline between cleaned and not cleaned area (see Figure 1).



Key

1 a half of treated specimen
2 soiled area
3 borderline between soiled and soiled and cleaned area
4 soiled and cleaned area
5 untreated reference specimen

Figure 1 — Assessment of specimens

7.5.2 Report the lowest rating of the two test specimens.

If the grey scale ratings of both tested specimens differ more than half rating, then repeat the test with two new specimens. Report the lowest rating of the two additional test specimens.

8 Test report

The test report shall include at least the following information:

a) reference to this European Standard;

b) description of the coated textile tested;

c) details of the soils used;

d) conditioning and testing climate;

e) number of rubbing cycles used for dry soiling;

f) grey scale ratings obtained for soiling of the test specimens after soiling as well as after soiling and cleaning for each soil (see example, in Annex A);

g) any deviation from this standard.

Annex A
(informative)

Example for report of results

Table A.1 — Results of resistance to soiling

	grey scale (EN 20105-A03) after soiling	grey scale (EN 20105-A03) after soiling and cleaning
dry soil (soiling cloth, 1000 rub cycles)	2-3	4
aqueous soil (instant coffee)	4	4-5
oily soil (oil with dye)	3-4	4

Bibliography

EN 13360, *Rubber- or plastics-coated fabrics — Terminology*

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