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Plastics-coated fabrics for upholstery —

Part 1: Specification for PVC-coated knitted fabrics

Supports textiles revêtus de plastique pour ameublement et garniture —

Partie 1: Spécifications des étoffes tricotées revêtues de PVC

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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 document 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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This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products (other than hoses)*.

This fourth edition cancels and replaces the third edition (ISO 7617-1:2001), which has been technically revised.

The main changes are as follows:

— ISO 105-B01 has been replaced by ISO 105-A01;

— ISO 3303:1990 has been replaced with ISO 3303-2;

— reference to ISO 4674-1 has been added;

— reference to ISO 7854:1995 has been deleted;

— references to ISO 32100 and EN 15977:2011 have been added;

— new specification of ageing conditions have been added to 6.4.4;

— “w“ has been replaced with “≥” in Tables 1 to 4;

— property indication has been altered in Table 2;

— test methods and property requirements have been changed in Tables 2 to 4;

— Annexes B, D and E have been removed; Annex C is now Annex B;

— the specification of the abradant in B.2 has been changed;

— the size of test specimens in B.3 has been changed.

A list of all parts in the ISO 7617 series can be found on the ISO website.

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.

Plastics-coated fabrics for upholstery —

Part 1:
Specification for PVC-coated knitted fabrics

1 Scope

This document specifies requirements for coated fabrics for upholstered furniture for interior use, obtained by applying to one side of a weft-knitted base cloth a substantially continuous coating of a suitably plasticized polymer of vinyl chloride, or a copolymer the major constituent of which is vinyl chloride. Such coatings are known as poly(vinyl chloride) (PVC) coatings.

This document covers fabrics coated with solid PVC. It also covers two grades with coatings consisting of a layer of expanded PVC.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 105-A01, *Textiles — Tests for colour fastness — Part A01: General principles of testing*

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 105-B02, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test*

ISO 105-X12, *Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing*

ISO 1419:2019, *Rubber- or plastics-coated fabrics — Accelerated-ageing tests*

ISO 1421:2016, *Rubber- or plastics-coated fabrics — Determination of tensile strength and elongation at break*

ISO 2231, *Rubber- or plastics-coated fabrics — Standard atmospheres for conditioning and testing*

ISO 2286-1, *Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 1: Methods for determination of length, width and net mass*

ISO 2286-2, *Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 2: Methods for determination of total mass per unit area, mass per unit area of coating and mass per unit area of substrate*

ISO 2286-3, *Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 3: Method for determination of thickness*

ISO 2411, *Rubber- or plastics-coated fabrics — Determination of coating adhesion*

ISO 3303-2, *Rubber- or plastics-coated fabrics — Determination of bursting strength — Part 2: Hydraulic method*

ISO 4674-1:2023, *Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 1: Constant rate of tear methods*

ISO 5470-2:2021, *Rubber- or plastics-coated fabrics — Determination of abrasion resistance — Part 2: Martindale abrader*

ISO 5978, *Rubber- or plastics-coated fabrics — Determination of blocking resistance*

ISO 5981:2007, *Rubber- or plastics-coated fabrics — Determination of resistance to combined shear flexing and rubbing*

ISO 6451, *Plastics coated fabrics — Polyvinyl chloride coatings — Rapid method for checking fusion*

ISO 32100, *Rubber- or plastics-coated fabrics — Physical and mechanical tests — Determination of flex resistance by the flexometer method*

EN 15977:2011, *Rubber or plastic coated fabrics — Mechanical properties — Determination of the elongation under load and the residual deformation*

3 Terms and definitions

No terms and definitions are listed in this document.

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 https://www.electropedia.org/

4 Sampling

If individual rolls can be identified with manufacturing batches, at least one sample shall be taken from each batch in the consignment. Each sample shall be regarded as being representative of its source and suitable measures shall be taken to preserve the identity between the samples and batch numbers.

If individual rolls cannot be identified in this way, the number of samples to be regarded as being representative of the bulk shall be fixed by agreement between the interested parties. Such samples shall be drawn at random.

5 Testing and compliance

Samples shall first be subjected to the preliminary examination described in 6.1, which enables grossly defective coated fabrics to be rejected immediately. If the samples satisfy this examination, testing shall continue as follows:

— Tests shall be carried out on a set of test specimens selected from each sample in accordance with Annex A. If testing shows that the test specimens meet the requirements of Tables 1 to 4, the bulk of the coated fabric represented by the sample shall be deemed to meet the requirements of this document.

— If any of the set of specimens tested do not meet any of the appropriate requirements given in Tables 1 to 4, the tests can be repeated based on an agreement between the interested parties. For this purpose, two further samples shall be taken from the same source as the original sample, and test specimens shall be taken from each sample so that duplicate tests can be conducted. If all the re-test results meet the appropriate requirements of Tables 1 to 4, then the bulk represented by the samples from which the specimens for re-testing were taken, together with the original samples, shall be deemed to meet the requirements of this document. If any of the results of the re-tests do not meet the appropriate requirements of Tables 1 to 4, then the bulk represented by those samples shall be deemed not to meet the requirements of this document.

6 Requirements

6.1 Preliminary inspection

6.1.1 General

A preliminary inspection shall be carried out as specified in 6.1.2 and 6.1.3, before conducting a detailed examination and expensive tests, in order to ensure that the samples do not exhibit easily detectable unacceptable faults. If such faults are detected, the inspection shall be stopped and the sample shall be considered as not meeting the requirements of this document. This shall be stated in the test report.

6.1.2 Visual inspection

The coating shall be uniformly applied and shall be free of visible flaws or cracks. Indicated local flaws are admitted, but no test specimen shall be cut less than 5 cm from the flaw.

When examined under a magnification of ×6, the coating shall be substantially free of pinholes. Carry out the inspection by examining 10 areas, each measuring 2 cm × 2 cm, evenly distributed over the usable width and length of the sample. The mean pinhole density shall not be more than 10 per square decimetre (i.e. 2,5 times the total count shall be <10). This requirement does not apply to products stated to be microperforated.

NOTE 1 Special cleaning instructions are normally provided with products that are stated to be microperforated .

Unless the coating is intentionally transparent, the knitted base fabric shall not be visible through the coating. Its profile shall also not be visible, either when the coated fabric is slack or when a slight tension is applied by hand. Its presence shall also not be apparent by virtue of any printing or surface lacquer which may be present. If the base fabric is visible in any of these ways, testing may be continued but the visibility of the base fabric shall be reported in the test report.

NOTE 2 It is possible that the surface is marked with the pattern of the back surface if the roll has been wound too tight. Such marks are reversible and acceptable. They can be easily identified by heating a piece of coated fabric for a few minutes in an oven at a temperature around 100 °C: this makes the marking due to tight winding disappear.

It shall be possible to bend the coated fabric through an angle of 180°, with its coated face outwards, without any noticeable whitening. If whitening appears, testing may be continued, but the appearance of the whitening shall be reported in the test report.

6.1.3 Fusion

Verify the state of fusion of the coating to the base fabric in accordance with ISO 6451. Stop testing if the components are not fused together satisfactorily.

6.2 Colour, embossing and finish

The quality of the colour, embossing and finish of the coated fabric, whether the material is plain or multicoloured, shall be subject to agreement between the interested parties. This agreement shall be based on a reference sample, and on illustrations or other ways of indicating acceptable deviations from the reference sample.

Colours shall be compared under the conditions stipulated in ISO 105-A01.

Instrumental measurement of the colour difference between a specimen and the agreed reference sample may be performed, if agreed between the interested parties. However, such methods are not without problems. The result is influenced by the gloss and the state of the surface of the coated fabric. In addition, the presence of embossing and small differences in gloss induce variations, which can be large, in the results, while the colour itself remains the same. The use of a spectrophotometer equipped with an integrating sphere is mandatory but allows these variations to be only partly eliminated. It is recommended therefore that, before carrying out any instrumental colour measurements on unknown samples, the interested parties conduct comparative trials in order to determine precisely the optimum conditions of measurement

and to define tolerances, using samples which have already been adjudged acceptable or not by examination in accordance with ISO 105-B01.

Gloss can be evaluated by means of a glossmeter or reflectometer, which measures specular reflection. The sensitivity of such an apparatus varies with the angle of incidence, to an extent depending on the degree of gloss or dullness: 20 °, 60 ° and 85 ° are the angles of incidence normally selected for glossy, semi-glossy and matt-coated fabrics. However, sensitivity is poor for highly matt materials. Moreover, reflection can vary noticeably from place to place on the surface depending on the embossing pattern. Bearing these reservations in mind and the fact that response can vary from one apparatus to another, parties which decide to evaluate gloss in this manner should preferably verify, in advance, the reproducibility of the apparatus used for the coated fabrics to be tested.

6.3 Dimensions

6.3.1 Usable width

The usable width of the coated fabric, measured in accordance with ISO 2286-1, shall be as agreed between the interested parties.

6.3.2 Length of coated fabric in a roll

The length of material in a roll, measured in accordance with ISO 2286-1, shall be as agreed between the interested parties, including selected lengths and accepted tolerances.

When, exceptionally, the coated fabric is supplied as pre-cut pieces, the concepts of length and width become meaningless. In this case, the shape and dimensions of the pieces, as well as the tolerances on the dimensions, should preferably be defined by agreement between the interested parties. It is recommended that the agreement include a scale drawing.

6.3.3 Thickness

The thickness of the coated fabric, measured in accordance with ISO 2286-3 under a pressure of 2 kPa, shall meet the requirements of Table 1.

6.4 Physical requirements

6.4.1 Mass of coating per unit area

The mass of coating per unit area, measured in accordance with ISO 2286-2, shall meet the requirements of Table 1.

6.4.2 Mechanical properties

The coated fabric shall meet the requirements of Table 2.

6.4.3 Surface properties

The coated fabric shall meet the requirements of Table 3.

6.4.4 Properties after ageing

After accelerated ageing for 168 h at (70 ± 1) °C and a relative humidity not less than 95 % under the conditions described in ISO 1419:2019, Clause 6, method C (Tropical test), the coated fabric shall meet the requirements of Table 4.

6.4.5 Fire behaviour

It is not possible to specify a priori performance requirements for fire behaviour; finished items, which are made up of coated fabrics and include various fillings and structures, shall meet risk requirements. These risks depend directly on the place and environment of use. However, it is strongly recommended that manufacturers of coated fabrics give the users information regarding fire behaviour so that they may manufacture furnishings that meet safety regulation requirements as well as possible.

Table 1 — Thickness of coated fabric and mass of coating per unit area

Property	Unit	Solid coating	Slightly expanded coating	Expanded coating	Test method
Total mass of coating per unit area	g/m^2	≥ 480	≥ 480	≥ 600	ISO 2286-2
Thickness of coated fabric (nominal)	mm	0,75 to 1,0	0,85 to 1,15	1,10 to 1,40	ISO 2286-3
Tolerance on thickness	mm	±0,07	±0,10	±0,15	

Table 2 — Mechanical-property requirements

Property	Unit	Solid coating	Slightly expanded coating	Expanded coating	Test method
Maximum tensile force					ISO 1421:2016, Clause 8, method 1
Longitudinal	N/5 cm	≥ 380	≥ 380	≥ 380	
Transverse		≥ 250	≥ 250	≥ 250	
Elongation at break					ISO 1421:2016, Clause 8, method 1
Longitudinal	%	≥ 50	≥ 50	≥ 50	
Transverse		≥ 100	≥ 100	≥ 100	
Tear load					ISO 4674-1:2023, Clause 4, method 1
Longitudinal	N	≥ 44	≥ 31	≥ 44	
Transverse		≥ 44	≥ 31	≥ 44	
Bursting strength	kPa	≥ 700	≥ 400	≥ 700	ISO 3303-2
Static elongation					EN 15977, settings for upholstery
Longitudinal	%	≥ 5	≥ 5	≥ 5	
Transverse		≥ 20	≥ 20	≥ 20	
Elastic recovery (permanent elongation)					EN 15977, settings for upholstery
Longitudinal	%	≤ 4	≤ 4	≤ 4	
Transverse		≤ 10	≤ 10	≤ 10	
Resistance to flexing	cycles / grading of change	100 000 / ≤ 1	100 000 / ≤ 1	100 000 / ≤ 1	ISO 32100
or					
Shear flexing and rubbing	strokes	50 000	50 000	50 000	ISO 5981:2007, 8.2, method B
Abrasion resistance	cycles	700, no apparition of the foam layer	700, no apparition of the foam layer	700, no apparition of the foam layer	ISO 5470-2:2021, 8.1, method 1, with silicon carbide paper of grade P180

Table 2 *(continued)*

Property	Unit	Solid coating	Slightly expanded coating	Expanded coating	Test method
Abrasion resistance of the finishing, dry conditions	cycles / grade	51 200 / ≤ 2	51 200 / ≤ 2	51 200 / ≤ 2	ISO 5470-2:2021, 8.1, method 1, with wool abradant
Abrasion resistance of the finishing, wet conditions	cycles / grade	25 600 / ≤ 2	25 600 / ≤ 2	25 600 / ≤ 2	ISO 5470-2:2021, 8.1, method 1, with wool abradant
Coating adhesion					
Longitudinal	N/5 cm	≥ 30	≥ 30	≥ 30	ISO 2411
Transverse		≥ 20	≥ 20	≥ 20	

Table 3 — Surface properties

Property	Test method	Solid coating	Slightly expanded coating	Expanded coating
Print wear	Annex B	≥ 3	≥ 3	≥ 3
Colour fastness to light	ISO 105-B02	≥ 6	≥ 6	≥ 6
Colour fastness to dry rubbing	ISO 105-X12	≥ 4-5	≥ 4-5	≥ 4-5
Colour fastness to wet rubbing	ISO 105-X12	≥ 4-5	≥ 4-5	≥ 4-5
Colour fastness to rubbing with soapy water [a]	ISO 105-X12	≥ 4-5	≥ 4-5	≥ 4-5
Blocking resistance	ISO 5978	Separation without surface damage		

[a] The same conditions as for wet rubbing apply, but water is replaced by a 4 % aqueous solution of soap.

Table 4 — Properties after ageing

Property	Unit	Solid coating	Slightly expanded coating	Expanded coating	Test method
Resistance to flexing	cycles / grading of change	30 000 / ≤ 1	30 000 / ≤ 1	30 000 / ≤ 1	ISO 32100
Resistance to shear flexing and rubbing	strokes	50 000	50 000	50 000	ISO 5981:2007, 8.2, method B

7 Marking

Each roll of coated fabric shall be supplied with a label with the following information:

a) the name and/or trade mark of the manufacturer, and all details necessary for identification of the coated fabric;

b) the grade of coated fabric: coating solid, slightly expanded or expanded;

c) the roll number, and the batch number if this is necessary to trace the coated fabric;

d) the colour;

e) the length of coated fabric in the roll;

f) the usable width;

g) a reference to this document (i.e. ISO 7617-1:20—).

8 Test report

The test report shall include at least the following:

a) a reference to this document (i.e. ISO 7617-1:20—);

b) all details necessary for complete identification of the coated fabric tested;

c) the grade of coated fabric (solid, slightly expanded or expanded coating);

d) all details necessary for identification of the testing authority;

e) an indication of conformity or non-conformity with this document, and in the latter case a clear indication of the property or properties which led to non-conformity;

f) details of the results obtained for the tests specified in 6.4.1 to 6.4.5;

g) any observations resulting from the examinations specified in 6.1 and 6.2;

h) the usable width of the coated fabric and the length of coated fabric in the rolls, as determined in 6.3.1 and 6.3.2;

i) the thickness of the coated fabric as determined in 6.3.3;

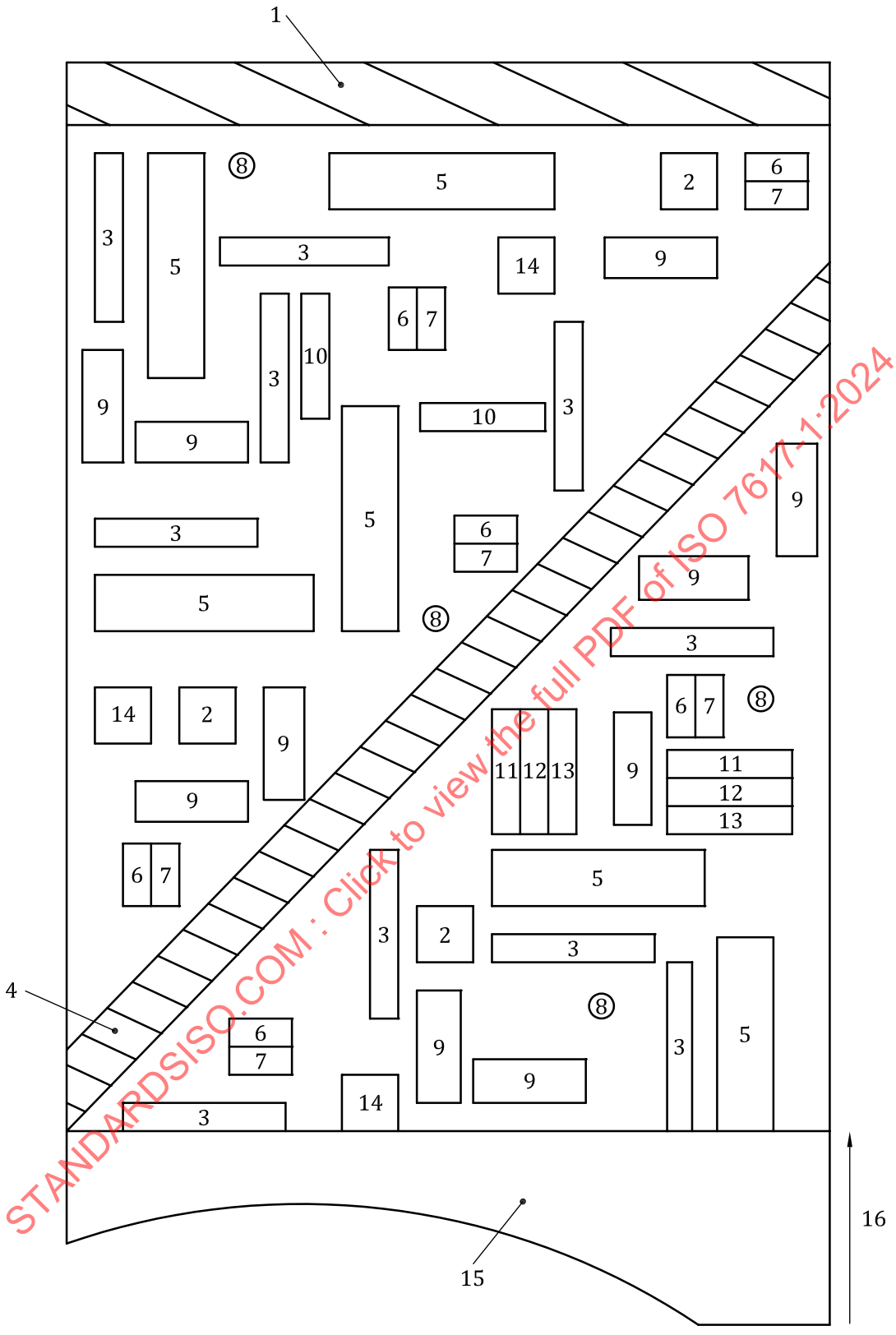
j) details of any deviations from the specified procedures, as well as any additional observations which may have a bearing on the results;

i) the date of the test.

Annex A
(normative)

Method of selecting test specimens

Test specimens shall be selected from the sample in accordance with the scheme illustrated in Figure A.1, which shows the positions from which the specimens for each type of test shall be taken. Specimens for the preliminary inspection and the assessment of appearance shall be taken from an area outside the area that is reserved for the other specimens. The visual inspection using a ×6 lens for the detection of pinholes (see 6.1.2), however, shall be made in the diagonal area indicated. Specimens required for colour-fastness testing shall, if possible, include all colours present. If this is impossible, specimens shall be taken in such a way that each colour is included in at least two specimens. The position of such specimens are not critical, and they may be taken at any suitable position across the usable width.



Key

1 thickness determination
2 mass of coating per unit area
3 tensile strength and elongation at break
4 bursting strength and inspection for pinholes
5 elongation under constant load and elastic recovery
9 coating adhesion
10 print wear
11 colour fastness to dry rubbing
12 colour fastness to wet rubbing
13 colour fastness to rubbing with soapy water

6 flexing (or shear flexing and rubbing) before ageing
7 flexing (or shear flexing and rubbing) after ageing
8 abrasion 9
14 blocking resistance
15 preliminary inspection and appearance
16 longitudinal (machine) direction

Figure A.1 — Scheme for selection of test specimens