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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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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 7617 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

ISO 7617 consists of the following parts, under the general title *Plastics-coated fabrics for upholstery*:

- *Part 1: Specification for PVC-coated knitted fabrics*
- *Part 2: Specification for PVC-coated woven fabrics*
- *Part 3: Specification for polyurethane-coated woven fabrics*

Annexes A to D of this part of ISO 7617 form an integral part of the standard. Annex E is for information only.

Plastics-coated fabrics for upholstery —

Part 1: Specification for PVC-coated knitted fabrics

1 Scope

This part of ISO 7617 specifies requirements for coated fabrics for upholstered furniture, manufactured by applying to one side of a single jersey weft-knitted base cloth a substantially continuous coating of a suitably plasticized polymer of vinyl chloride, or a co-polymer the major constituent of which is vinyl chloride. Such coatings are known as polyvinyl chloride (PVC) coatings. The present specification covers fabrics coated with solid PVC and two grades (V and X) with coatings having a layer of expanded PVC.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7617. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7617 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 105-A02 : 1987, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour.*

ISO 105-B01 : 1988, *Textiles — Tests for colour fastness — Part B01: Colour fastness to light: Daylight.*

ISO 105-B02 : 1988, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test.*

ISO 105-X12 : 1987, *Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing.*

ISO 176 : 1976, *Plastics — Determination of loss of plasticizers — Activated carbon method.*

ISO 2231 : 1973, *Fabric coated with rubber or plastics — Standard atmospheres for conditioning and testing.*

ISO 2286 : 1986, *Rubber- or plastics-coated fabrics — Determination of roll characteristics.*

ISO 2411 : 1973, *Fabrics coated with rubber or plastics — Determination of the coating adhesion.*

ISO 3303 : 1979, *Rubber- or plastics-coated fabrics — Determination of bursting strength.*

ISO 5978 : 1979, *Rubber- or plastics-coated fabrics — Determination of blocking resistance.*

ISO 7854 : 1984, *Rubber- or plastics-coated fabrics — Determination of resistance to damage by flexing (dynamic method).*

3 Technical requirements

3.1 Physical requirements

The material shall comply with the appropriate requirements of table 1.

3.2 Colour fastness requirements

The material shall comply with the requirements of table 2.

3.3 Visual examination

The coating of the material shall be uniformly applied and shall be free from visible flaws and cracks and when viewed under a magnification of X 10 shall be substantially free from pin holes. The base fabric, unless coated with an unpigmented coating, shall not be visible when viewed from the coated side.

3.4 Colour, grain and finish

The colour, grain and finish of the material, whether in single-colour or multicolour effects, shall be agreed between the purchaser and the supplier.

Colours shall be compared under the conditions stipulated in ISO 105-B01.

3.5 Width of material

The usable width of material when measured in accordance with ISO 2286 shall be as agreed between the purchaser and the supplier. For this purpose, the term "usable width" means the width of material that is coated in such a manner that it complies with the requirements of 3.3.

3.6 Skin coat

When tested in accordance with annex D, no specimens shall exhibit any exposure of the expanded layer after the number of rubs specified in table 1.

3.7 Flammability

A method of test for determination of the flammability characteristics of these materials shall be included as a mandatory requirement to be complied with in the absence of other, more stringent requirements of national authorities.*)

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 representa-

tive 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 purchaser and the supplier. Such samples shall be drawn at random.

5 Testing and compliance

Tests shall be conducted on a set of specimens selected from each sample.

The method of selecting specimens from each sample shall be in accordance with the requirements of annex A. If the specimens after testing comply with the appropriate requirements given in table 1 and table 2, the bulk of the coated fabric which the sample represents shall be deemed to comply with the requirements of this part of ISO 7617.

Table 1 – Physical requirements

Property	Limit	Requirements			Method of test
		Solid PVC coating (type 1)	PVC coating with an expanded layer included (type 2)		
			Grade V	Grade X	
Total mass/unit area (g/m ²) ¹⁾	min.	590	760	795	ISO 2286
Base fabric mass/unit area (g/m ²) ¹⁾	min.	110	75	110	ISO 2286
Coating mass/unit area(g/m ²) ¹⁾	min.	480	685	685	ISO 2286
Bursting strength (kPa)	min.	690	380	690	ISO 3303 Method B
Coating adhesion (N per 50 mm width)	min.	26	26	26	ISO 2411
Elongation (%) longitudinal transverse	min. min.	10 40	15 50	10 40	} Annex B
Tension set (% of actual elongation)	max.	33	33	33	
Flex cracking (cycles) ²⁾	min.	400 000	400 000	400 000	ISO 7854
Heat ageing (% coating mass loss)	max.	5	5	5	ISO 176
Print wear (change in appearance) (grey scale rating)	min.	3	3	3	Annex C
Thickness (mm) at 2 kPa mean minimum individual reading	min. min.	— —	1,09 0,97	1,27 1,14	} ISO 2286
Skin coat resistance; no exposure of cellular layer (rub cycles)	min.	—	700	700	
Blocking resistance	—	Separation without damage to surface			ISO 5978

1) The inclusion of minimum values for total mass/unit area and coating mass/unit area does not imply that a minimum value for base fabric mass/unit area may be calculated by subtraction.
2) In the event of dispute, Schildknecht apparatus shall be employed.

*) Details of the method to be employed for this purpose are under consideration by ISO/TC 136, Furniture.

If any of the specimens tested do not comply with any of the appropriate requirements given in table 1 and table 2, the tests which the specimens have failed shall be repeated twice. 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 may be conducted. If all the re-test results comply with the appropriate requirements of table 1 and/or table 2, 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 comply with the requirements of this part of ISO 7617. If any of the results of the re-tests do not comply with the appropriate requirements of table 1 or table 2, the bulk represented by those samples shall be deemed not to comply with the requirements of this part of ISO 7617.

6 Marking

Each roll of fabric shall have a label attached bearing the following information:

- a) the name and/or distinctive mark of the manufacturer and an identification reference for that material;
- b) the batch number;
- c) the colour;
- d) the length;
- e) the usable width;
- f) the reference number of this part of ISO 7617 (i.e. ISO 7617-1) and the appropriate type and grade reference.

Table 2 — Colour fastness requirements

Property	Limit	Requirements			Method of test
		Solid PVC coating	PVC coating with an expanded layer included		
			Grade V	Grade X	
Colour fastness to artificial light (xenon arc)	min.	6	6	6	ISO 105-B02
Colour fastness to rubbing (wet and dry)	min.	4	4	4	ISO 105-X12

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Annex A
(normative)

Method of selecting test specimens

The specimens for testing 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, except that the specimens required for testing colour fastness to light shall be selected from any suitable portion of the sample. In the case of multicolour samples, the specimen shall if possible include all colours. If it is not possible to include all colours, sufficient specimens shall be taken to enable all colours to be tested.

Key to figure A.1

- M Mass determinations
- E Elongation (longitudinal direction)
- E Elongation (transverse direction)
- Bursting strength (as shown)

- Ad Coating adhesion
- Fl Resistance to flex cracking (longitudinal direction)
- Fl Resistance to flex cracking (transverse direction)
- E Elongation and tension set
- Ag Heat ageing
- Rb Colour fastness to rubbing (wet and dry)
- P Print wear
- S Skin coat resistance
- B Blocking resistance

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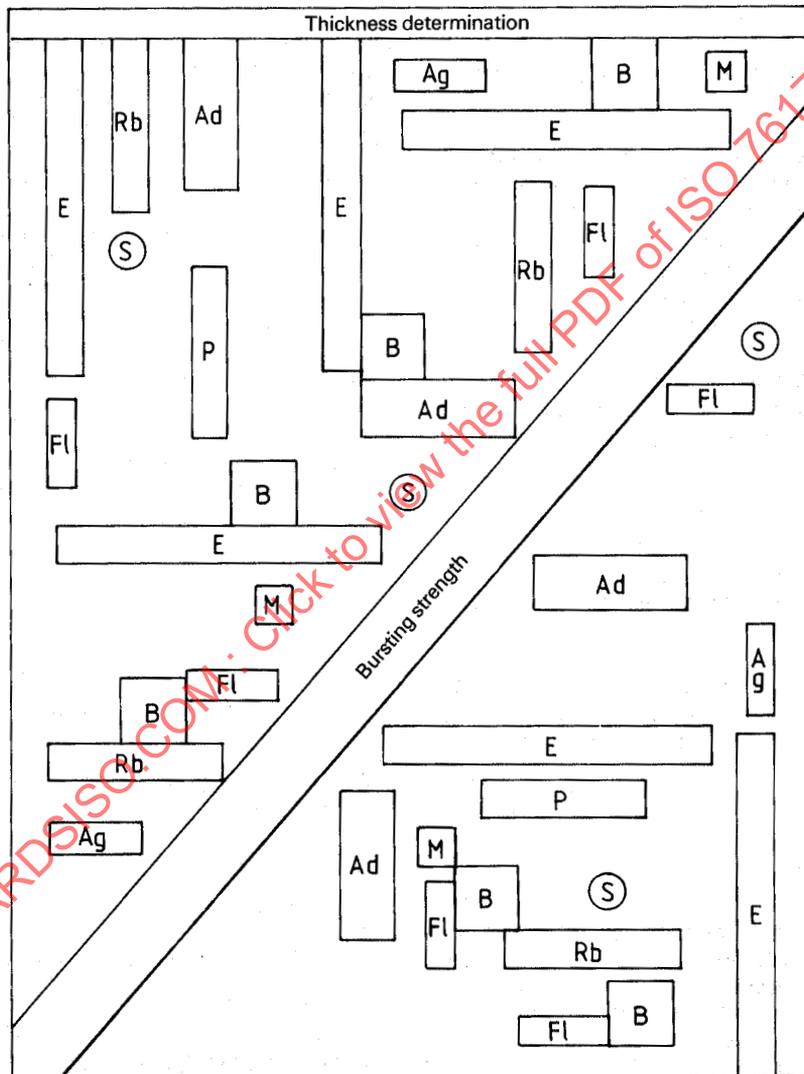


Figure A.1 – Scheme for selection of test specimens

Annex B (normative)

Determination of elongation and tension set for a constant load

B.1 General

Tension set, sometimes known as permanent set, is the residual elongation in a test strip of coated fabric, after it has been subjected to tension loading for a given time and then allowed to recover for a given time.

Tension set may be measured after stretching under a given load or to a given elongation.

There are a number of variables involved in testing tension set. For example the load or degree of extension, the duration of loading and of recovery, and the temperature and humidity prior to and during the test. In addition, repeated loading and recovery after the first cycle usually results in increased elongation and tension set, tending to a maximum, under constant conditions of temperature and humidity.

An infinite variety of conditions are therefore available. The method used consists of the application of a 10 kgf load to a test specimen 50 mm wide for 10 min followed by 10 min relaxation.

In the case of materials of low extensibility, in order to obtain a sufficiently high degree of accuracy, it may be necessary to use longer test specimens and modify the method of calculation of the result. In all cases, the exact conditions of test should be stated.

It may be desired to know the load needed to produce a particular elongation or tension set. This may be determined by carrying out the test at a number of suitably selected loads and by interpolation of the results.

B.2 Apparatus

Two grips capable of accommodating test specimens 50 mm wide are required for this test. One grip is capable of being attached to a rigid support so that, when the test specimen is inserted centrally and normally, it hangs in the vertical plane. The other grip is so constructed that dead loads may be added to it to bring the total up to 10 kgf.

A scale graduated in millimetres is also required.

B.3 Test specimens

Cut three specimens each 450 mm × 50 mm with the length in the longitudinal direction, and three specimens of the same size but with the length parallel to the cross-direction. Space the selection so as to cover fairly evenly the full width and available length of the sample, avoiding uncoated edges or selvage ends. Identify each specimen accordingly.

B.4 Procedure

Condition the specimens in accordance with ISO 2231, unless otherwise stated. Carry out the tests in an atmosphere similar to that used for conditioning.

Draw lines across each specimen at right angles to its longest dimension 100 mm from each end and 250 mm apart. Draw a third line to cut these two lines at their mid point. Make all measurements along this line.

Insert a specimen centrally and normally in the fixed grip so that the pencilled line at one end is not less than 50 mm from the jaws. Insert the other end of the specimen similarly in the loose grip. Attach the fixed grip to the support.

Apply smoothly a load that will bring the mass of the loose grip up to 10 kg and note the time. At the end of 10 min, measure and record to the nearest 0,5 mm the distance L_1 between the lines.

Remove the load, withdraw the specimen from the grips and place it on a flat surface. Ten minutes after removing the load, re-measure and record to the nearest 0,5 mm the distance L_2 between the lines.

Repeat the procedure with the remaining specimens.

B.5 Expression of results

B.5.1 The elongation, expressed as a percentage, is given by the formula

$$\frac{L_1 - 250}{250} \times 100$$

where L_1 is the extended length, in millimetres.

B.5.2 The tension set, expressed as a percentage of the extension, is given by the formula

$$\frac{L_2 - 250}{L_1 - 250} \times 100$$

where L_2 is the extended length after recovery, in millimetres.

B.5.3 Calculate the elongation and tension set for each specimen and report the means for the set of three specimens in each direction to the nearest 0,2 %.

If the conditions of test vary from the standard above (e.g. in relation to specimen length), the conditions shall be reported.

Annex C (normative)

Determination of resistance to print wear

C.1 Principle

A specimen is subjected to 500 cycles of simple harmonic abrasion using a known abradant under a known pressure. It is then assessed for colour difference with an unabraded portion using the grey scale for assessing change in colour.

C.2 Apparatus

The apparatus shall be as described in ISO 105-X12 with the following modifications.

- a) The weight-piece applied to the rubbing finger, or peg, shall be such that a total mass of 1 500 g is brought to bear on the glass plate.
- b) Use as the abradant a cotton fabric, desized, scoured and bleached, free from fluorescent brightening agents, and having a fluidity not greater than 8, a mass per unit area of 93 g/m² and a construction of 40 ends/cm, 39 picks/cm, 11,36 tex warp and 9,23 tex weft in plain weave.
- c) Grey scale for assessing change in colour (see ISO 105-A02).

C.3 Test specimens

Cut out two specimens of coated fabric, each 230 mm × 50 mm, one with its length parallel to the longitudinal direction of the sample and the other with its length parallel to the transverse direction. Also cut out two circular pieces of the bleached cotton fabric each 30 mm in diameter, avoiding lumps and neps.

NOTE — Initially four circular pieces of abradant cotton fabric can be cut out and a double thickness of cotton cloth mounted on the peg, so that only the outermost layer coming into contact with the coated fabric specimen needs to be renewed at each test.

C.4 Procedure

Condition the test specimens and bleached cotton fabric in accordance with ISO 2231.

Using the clamps, mount the test specimen securely on the bed of the machine with the coated side uppermost and under sufficient tension to hold the specimen flat. To do this with coated fabrics having a knitted base cloth, it has been found necessary to stretch the specimen approximately 9 %.

Wipe the coated surface of the specimen with a clean, dry cloth to remove dust before testing.

Secure the conditioned bleached cotton fabric to the base of the brass peg, making sure that the face of the sateen is presented to the specimen under test, i.e. with the ribbed side of the bleached cotton fabric in contact with the brass peg. Lower the peg on to the specimen and run the machine for 500 cycles. Repeat the procedure using the second specimen and bleached cotton fabric.

Assess the degree of surface print wear on the specimens, using the grey scale as comparator in accordance with ISO 105-A02. If one specimen exhibits greater print wear than the other, the worse result of the two shall be taken as the test result.

C.5 Expression of results

Report the change in colour between the abraded and unabraded portions of the test specimen by reference to the grey scale for assessing change in colour.