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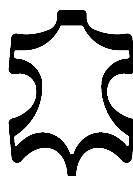
**Leather — Tests for colour fastness —  
Colour fastness to migration into  
plasticized poly(vinyl chloride)**

*Cuir — Essais de solidité des teintures — Solidité des teintures à la  
migration dans du poly(chlorure de vinyle) plastifié*

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Reference number  
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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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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International Standard ISO 15701 was prepared by the Fastness Tests Commission of the International Union of Leather Technologists and Chemists Societies (IUF Commission, IULTCS). It is based on IUF 442 published in *J. Soc. Leather Tech. Chem.*, **56**, pp. 395-400 (1972) with a minor amendment in **65**, p. 128 (1981), and declared an official method of the IULTCS in 1973 and reconfirmed in 1989.

Annexes A and B of this International Standard are for information only.

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# Leather — Tests for colour fastness — Colour fastness to migration into plasticized poly(vinyl chloride)

## 1 Scope

This International Standard specifies a method for assessing the propensity of dyes and pigments to migrate from leather to a synthetic substrate by determining the transfer of colour from the leather to white plasticized poly(vinyl chloride) in contact with it.

This method is suitable for leather of all kinds at any stage of processing.

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## 2 Normative references

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

ISO 105-A01:1994, *Textiles — Tests for colour fastness — Part A01: General principles of testing.*

ISO 105-A03:1993, *Textiles — Tests for colour fastness — Part A03: Grey scale for assessing staining.*

ISO 105-A04:1989, *Textiles — Tests for colour fastness — Part A04: Method for the instrumental assessment of the degree of staining of adjacent fabrics.*

IUP 2, *Sampling.*

### 3 Principle

The side under test of the leather specimen is placed on a white-pigmented sheet of plasticized poly(vinyl chloride) and the resultant composite specimen is exposed to heat under pressure in a suitable apparatus. The transfer of colour from the leather to the white sheet is assessed with the standard grey scale for assessing staining and, if applicable, any change in hue of the staining is also assessed.

The use of standard sheets of plasticized poly(vinyl chloride) makes it possible to determine the tendency of colour to migrate from the leather to synthetic materials used in conjunction with the leather.

If the leather has a finish, the test may be carried out with the finish intact or broken.

The general colour fastness testing principles used are in accordance with those described in ISO 105-A01, taking into account the differences between textile substrates and leather.

### 4 Apparatus and materials

Ordinary laboratory apparatus and

**4.1 Test apparatus**<sup>1)</sup>, in which the composite specimen can be subjected, between glass plates, to a uniform pressure of 7,4 N/m<sup>2</sup> (750 g/cm<sup>2</sup>).

**4.2 Oven**, maintained at 50 °C ± 2 °C.

**4.3 Sheet of plasticized poly(vinyl chloride)**<sup>2)</sup>, pigmented white, approximately 0,5 mm thick, measuring 50 mm x 30 mm.

**4.4** If the finish is to be broken, **fine-grained abrasive paper**, grade P180, as defined in the P-series grain size standard published by the Federation of European Producers of Abrasive Products (FEPA)<sup>3)</sup>.

**4.5 Grey scale for assessing staining**, complying with ISO 105-A03 or an **instrumental system for assessing staining**, complying with ISO 105-A04.

### 5 Test specimen

If the leather piece available for testing is a whole hide or skin, then first take a sample in accordance with IUP 2.

<sup>1)</sup> Examples of suitable apparatus available commercially are given in annex A.

<sup>2)</sup> Examples of suitable commercial sources for the prepared sheets of polyvinyl chloride and the specifications are given in annex A.

<sup>3)</sup> FEPA Standard 43-GB-1984, obtainable from The British Abrasive Federation, P.O. Box 58, Trafford Park Road, Trafford Park, Manchester M17 1JD, United Kingdom.

**5.1** If the leather has no finish, or if it has a finish but is to be tested with the finish intact, simply cut out a representative test specimen measuring 30 mm x 20 mm.

**5.2** If the leather has a finish and is to be tested with the finish broken, prepare the test specimen as follows:

Cut out a piece of leather measuring about 80 mm x 60 mm and lay it out, finish side down, on a sheet of abrasive paper (4.4), measuring about 150 mm x 200 mm, held flat on a work surface. Load the upper side of the piece of leather uniformly with a 1 kg weight. Move the piece of leather 100 mm to and fro on the abrasive paper, carrying out 10 to-and-fro cycles.

NOTE 1 With practice, the same roughening effect can be achieved holding the abrasive paper in the hand.

Brush the roughened area thoroughly to remove all dust. From the roughened area of the leather, cut out a test specimen measuring 30 mm x 20 mm.

The fact that the finish has been broken shall be mentioned in the test report.

**5.3** Make up a composite specimen by placing the test specimen, with the side to be tested face down, in the centre of a 50 mm x 30 mm sheet of the plasticized poly(vinyl chloride) sheet (4.3).

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### 6 Procedure

**6.1** Place the composite specimen between two glass plates, place the plates in the apparatus (4.1) and load with a 4,5 kg weight (corresponding to a pressure of 750 g/cm<sup>2</sup> on the leather). The loading weight shall be preheated in the oven (4.2) at 50 °C ± 2 °C for at least 2 h. It is possible to test several composite specimens simultaneously, but care shall be taken to place each centrally between two plates so that pressure is exerted evenly over the specimen surfaces.

**6.2** Place the apparatus in the oven at 50 °C ± 2 °C for 16 h.

NOTE 2 Different test temperatures may be appropriate for assessing particular aspects of colour migration, such as for example the higher temperatures encountered in some processing procedures.

**6.3** On completion of the heat treatment, remove the weight from the composite specimens and allow them to cool to room temperature.

**6.4** As soon as the composite specimens have cooled, separate them into their component elements and assess any staining of the plasticized poly(vinyl chloride) sheet with the grey scale (4.5). This is done by assessing, either visually in accordance with ISO 105-A03 or instrumentally in accordance with ISO 105-A04, the contrast between that part of the poly(vinyl chloride) sheet which has been in contact with the specimen and that part which has not. If any dust or loose fibres adhere to the poly(vinyl chloride), remove them by wiping with a damp cloth before assessment.

If required, the staining on the back of the poly(vinyl chloride) sheet may also be assessed.

NOTE 3 The assessment of the staining of the poly(vinyl chloride) sheet must be carried out immediately after the composite specimen has cooled, since the stain often migrates over time into the sheet, thus decreasing the intensity of the staining on the side being assessed.

If necessary, an intermediate assessment may also be made, for example, after heating the weighted composite specimen for only 2 h.

If the colour of the staining on the poly(vinyl chloride) sheet is different from the colour of the leather, note the hue of the staining.

## 7 Test report

The test report shall include the following information:

- a) a reference to this International Standard;
- b) a description of the type of leather tested;
- c) an indication as to which surface of the leather was tested;
- d) whether there was a finish and, if so, if the test was carried out with the finish broken;
- e) the test temperature, if not 50 °C;
- f) the grey scale method used and the grey scale rating obtained for the staining of the plasticized poly(vinyl chloride), describing also the hue of the staining where it differs from that of the leather;
- g) details of any deviations from the procedure;
- h) the date of the test.

## Annex A (informative)

### Commercial sources for apparatus and materials

Examples of suitable products available commercially are given below. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of these products.

#### A.1 Apparatus

The recommended apparatus is the "Hydrotest" (manufactured by, for instance, Karl Schröder KG, D-69469 Weinheim, Germany) which consists of a stainless-steel frame, into which fits precisely a piston of mass 4,5 kg and cross-section 115 mm x 60 mm, and glass plates of the same cross-section and about 1,5 mm thick. Plates made of, for example, poly(methyl methacrylate) are not suitable because in time they may become distorted and discoloured.

Any other apparatus may be used, provided it gives the same results: for example, the Perspiration Tester of the American Association of Textile Chemists and Colorists.

#### A.2 Poly(vinyl chloride) sheets

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It is advisable to use material which has been prepared for the purpose, for example standard plasticized poly(vinyl chloride) in the form of sheets containing 12 pieces of 50 mm x 30 mm and obtainable from EMPA Testmaterials, Mövenstrasse 12, CH-9015 St. Gallen-Winkeln, Switzerland.

These sheets are made from a compound of the following composition, calendered at 150 °C ± 5 °C:

Poly(vinyl chloride)		48,0 % ± 1,0 %	
Plasticizers:	dibutyl phthalate	24,0 %	
	dioctyl phthalate	24,0 %	48,0 % ± 1,0 %
Stabilizer, lead-free			1,0 %
Pigment:	titanium dioxide (anatase)		3,0 %
			100,0 %

NOTE 4 It is necessary that the quality of the plasticizers used (dibutyl and dioctyl phthalates) is such that the sheets are white. Suitable poly(vinyl chloride) can be obtained, for example, from Lonza AG, Basle (Type G). It is necessary for the stabilizers to be free from lead, and an example of a suitable product is Advastab BC 74 from Deutsche Advance Produktion GmbH, Marienberg über Bensheim a.d. Bergstrasse, Germany.

**Annex B**  
(informative)

**Bibliography**

- [1] IUF 120, *General principles of colour fastness testing of leather.*

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