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**Leather — Tests for colour fastness —
Colour fastness to saliva**

Cuir — Essais de solidité des coloris — Solidité des coloris à la salive

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Apparatus and materials	2
6 Reagents	2
7 Test specimens	3
8 Procedure	3
9 Evaluation	4
10 Precision	4
11 Test report	4
Bibliography	5

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.

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by the Fastness Tests Commission of the International Union of Leather Technologists and Chemists Societies (IUF Commission, IULTCS) in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 289, *Leather*, the secretariat of which is held by UNI, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

IULTCS, originally formed in 1897, is a world-wide organization of professional leather societies to further the advancement of leather science and technology. IULTCS has three Commissions, which are responsible for establishing international methods for the sampling and testing of leather. ISO recognizes IULTCS as an international standardizing body for the preparation of test methods for leather.

Leather — Tests for colour fastness — Colour fastness to saliva

1 Scope

This document specifies a method for determining the colour fastness to saliva of all kinds of leathers, independent of the colouring procedure applied.

The method uses an artificial saliva solution to simulate whether colouring materials can migrate from leather to the mouth or to the mucous membranes.

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

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

ISO 105-A05, *Textiles — Tests for colour fastness — Part A05: Instrumental assessment of change in colour for determination of grey scale rating*

ISO 2418, *Leather — Chemical, physical and mechanical and fastness tests — Sampling location*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

EN 15987, *Leather — Terminology — Key definitions for the leather trade*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15987 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Principle

A piece of filter paper is soaked in artificial saliva solution and placed in contact with the leather to be tested. The composite specimen is left for (120 ± 5) min at (37 ± 2) °C. The leather specimen and the filter paper are then dried, and the change in colour of the leather and the staining of the filter paper assessed with the grey scales.

The general colour fastness testing principles shall be in accordance with those described in ISO 105-A01, taking into account that the substrate is leather.

5 Apparatus and materials

- 5.1 **Filter paper**, for qualitative analyses, medium-dense.
- 5.2 **Adhesive tape**, colourless, self-adhesive plastic tape, about 12 mm wide.
- 5.3 **Film**, cling film (as used in households).
- 5.4 **Desiccator**, with a grid to support the leather specimen.
- 5.5 **Oven**, maintained at $(37 \pm 2) ^\circ\text{C}$.
- 5.6 **pH meter**.
- 5.7 **Volumetric flask**, 1000 ml.
- 5.8 **Grey scale for assessing staining**, in accordance with ISO 105-A03.
- 5.9 **Grey scale for assessing change in colour**, in accordance with ISO 105-A02.
- 5.10 **Spectrophotometer or colorimeter for assessing change in colour and staining**, complying with ISO 105-A04 and ISO 105-A05.

6 Reagents

Unless otherwise specified, all reagents shall be of analytical grade.

- 6.1 **Demineralised water**, at least grade 3 in accordance with ISO 3696.
- 6.2 **Hydrochloric acid solution**, $c(\text{HCl}) = 1 \%$ (mass fraction).
- 6.3 **Artificial saliva salt solution**, pH value $6,8 \pm 0,1$, prepared as specified in [Table 1](#).

Table 1 — Composition of artificial saliva salt solution ^a

Reagents	Mass fraction ^b g/l
Magnesium chloride ($\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$)	0,17
Calcium chloride ($\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$)	0,15
Dipotassium hydrogen phosphate ($\text{K}_2\text{HPO}_4 \cdot 3\text{H}_2\text{O}$)	0,76
Potassium carbonate (K_2CO_3)	0,53
Sodium chloride (NaCl)	0,33
Potassium chloride (KCl)	0,75
1 % (mass fraction) hydrochloric acid	To be added until a pH value of $6,8 \pm 0,1$ is achieved.
^a See Reference [1].	
^b Tolerances are ± 1 % of the mass.	

6.4 Preparation of artificial saliva solution.

To prepare 1 l of saliva solution, dissolve the weighed-out potassium and sodium salts in about 900 ml of demineralised water (6.1) in a 2 l beaker. Then add calcium chloride and magnesium chloride and stir until all the reagents are dissolved. Check the pH of this solution with a pH meter (5.6), stir and add the 1 % (mass fraction) hydrochloric acid solution (6.2) drop by drop until a stable pH value of $6,8 \pm 0,1$ is achieved. Transfer to a 1 l volumetric flask (5.7) and make up to volume with demineralised water.

Smaller volumes can be prepared as required.

Protect from light and check the pH of the solution before use. Usually, the artificial saliva solution is stable for two weeks. Discard it if the pH is not within $6,8 \pm 0,1$.

7 Test specimens

7.1 If the piece of leather available for testing is a whole hide or skin, then first take a sample in accordance with ISO 2418.

7.2 Test specimens shall be rectangular pieces of leather, at least 120 mm long and at least 40 mm wide.

8 Procedure

8.1 From the filter paper (5.1) cut a strip approximately 15 mm wide and up to 80 mm long.

8.2 Soak the filter paper strip in the artificial saliva solution (6.4).

8.3 Place the soaked filter paper strip (8.2) on the leather specimen surface to be tested, making sure that there is close contact between the leather surface and the soaked filter paper. If the leather specimen is not flat, attach the filter paper strip to the leather specimen with, for example, adhesive tape (5.2) or film (5.3). For this purpose, the adhesive tape shall cover the filter paper strip over its entire length, and at least 10 mm shall project over both ends of the strip so that it can adhere to the dry areas of the specimen.

The test shall be carried out on the wearing surface, which is the exposed or visible face of the leather when used in its intended application. This is usually the grain side of leather. However, the wearing surface of some leathers may be otherwise dressed or finished, or mechanically buffed, such as suede and nubuck.

8.4 Put some water (6.1) in the bottom of the desiccator and pre-heat it in the oven (5.5) to $(37 \pm 2) ^\circ\text{C}$. Without removing the desiccator from the oven, place the composite specimen, prepared as described in 8.3, in the desiccator (5.4) on a grid (above the water) at $(37 \pm 2) ^\circ\text{C}$ for (120 ± 5) min.

8.5 At the end of the (120 ± 5) min period, remove the composite specimen from the desiccator; separate the filter paper and the leather specimen and dry both by hanging them in air at room temperature.

9 Evaluation

9.1 When the composite specimen is dry, using D65 illumination according to ISO 105-A01, visually assess the staining of the filter paper, using the appropriate grey scale (5.8) in accordance with ISO 105-A03. Also assess the change in colour (5.9) of the leather specimen in accordance with ISO 105-A02.

9.2 Alternatively, provided the staining and colour change is even, the grey-scale staining and colour difference can be assessed instrumentally (5.10) in accordance with ISO 105-A05 and ISO 105-A04 respectively. This shall be indicated in the test report.

10 Precision

For the visual grey-scale evaluations an inter-person precision of ± 0.5 grey-scale units is normal.

11 Test report

The test report shall include the following information:

- a) a reference to this document, i.e. ISO 20701;
- b) a description of the type of leather tested and which surface of the leather was tested;
- c) the numerical grey-scale rating obtained for the staining of the filter paper;
- d) the numerical grey-scale rating obtained for the change in colour of the leather specimen;
- e) details of any deviations from the procedure specified.