



International Standard

**ISO
20701**

**IULTCS
IUF 427**

Leather — Tests for colour fastness — Colour fastness to saliva

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

**Second edition
2024-08**

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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.

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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For an explanation of 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 www.iso.org/iso/foreword.html.

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.

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*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 20701:2017), which has been technically revised.

The main changes are as follows:

- in [Clauses 2, 4 and 9](#) the leather specific reference, ISO 7906, has been included;
- alignment with the revised terminology in ISO 2418:2023.

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.

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-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, mechanical and fastness tests — Position and preparation of specimens for testing*

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

ISO 7906, *Leather — Tests for colour fastness — General principles of testing*

ISO 15115, *Leather — Vocabulary*

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 ISO 15115 and EN 15987 apply.

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 Principle

A piece of filter paper is soaked in artificial saliva solution and placed in contact with the leather to be tested. The composite test piece is left for (120 ± 5) min at (37 ± 2) °C. The leather test piece 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 principles of testing for colour fastness shall be in accordance with those described in ISO 7906.

5 Apparatus and materials

The usual laboratory apparatus and, in particular, the following shall be used.

5.1 Filter paper, cellulose-type for qualitative analyses, e.g. grade 1. The size of the filter paper is such to allow strips of approximately 15 mm wide and up to 80 mm long to be cut.

NOTE The pore size and thickness are not relevant as it is not being used as a filter.

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, 1 000 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, conforming 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

Reagents	Mass fraction ^a 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 Tolerances are $\pm 1 \%$ 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 approximately 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 Leather specimen and test pieces

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

7.2 Cut test pieces from the specimen. Test pieces shall be rectangular pieces of leather, approximately 100 mm long and 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 test piece surface to be tested, making sure that there is close contact between the leather surface and the soaked filter paper. If the leather test piece is not flat, attach the filter paper strip to the leather with, for example, adhesive tape (5.2), film (5.3) or other suitable methods of fixation. 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 test piece.

NOTE Many leather test pieces are flat and no method of fixation is required.

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 Add water (6.1) to the desiccator (5.4) until it is filled up to half way below the grid. The bottom of the desiccator shall be completely covered with water. Place the desiccator in the oven (5.5) and pre-heat to $(37 \pm 2) ^\circ\text{C}$. Without removing the desiccator from the oven, place the composite test piece prepared as described in 8.3 in the desiccator 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 test piece from the desiccator, separate the filter paper and the leather test piece and dry both by hanging them in air or placing them on a grid at room temperature.

9 Evaluation

9.1 When the composite material is dry, visually assess the staining of the filter paper using D65 illumination according to ISO 7906, using the appropriate grey scale (5.8) in accordance with ISO 105-A03. Also assess the change in colour (5.9) of the leather test piece 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](#)) using a 15 mm or less aperture, in accordance with ISO 105-A05 and ISO 105-A04, respectively. The aperture used shall be indicated in the test report.

10 Precision

For the visual grey-scale evaluations, an inter-person precision of $\pm 0,5$ 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 20701:2024;
- b) a description of the type of leather tested and which surface of the leather was tested;
- c) the grey-scale method of evaluation used in [Clause 9](#);
- d) the numerical grey-scale rating obtained for the staining of the filter paper;
- e) the numerical grey-scale rating obtained for the change in colour of the leather test piece;
- f) details of any deviations from the procedure specified;
- g) any unusual features observed;
- h) the date of the test.

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