

INTERNATIONAL
STANDARD

ISO
26082-2

IULTCS/IUP
53-2

First edition
2012-07-01

**Leather — Physical and mechanical test
methods for the determination of
soiling —**

**Part 2:
Tumbling method**

iTeh STANDARD PREVIEW
*Cuir — Méthodes d'essai physique et mécanique de détermination de la
salissure —
(standards.iteh.ai)
Partie 2: Méthode par culbutage*

ISO 26082-2:2012

<https://standards.iteh.ai/catalog/standards/sist/dfced3a4-bc40-42ba-9c1a-542381db96ef/iso-26082-2-2012>



Reference number
ISO 26082-2:2012(E)
IULTCS/IUP 53-2:2012(E)

© ISO 2012

iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 26082-2:2012

<https://standards.iteh.ai/catalog/standards/sist/dfced3a4-bc40-42ba-9c1a-542381db96ef/iso-26082-2-2012>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2012

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 26082-2 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 289, *Leather*, in collaboration with the Physical Tests Commission of the International Union of Leather Technologists and Chemists Societies (IUP Commission, IULTCS) 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 sampling and the testing of leather. ISO recognizes IULTCS as an international standardizing body for the preparation of test methods for leather.

ISO 26082 consists of the following parts, under the general title *Leather — Physical and mechanical test methods for the determination of soiling*:

- *Part 1: Rubbing (Martindale) method*
- *Part 2: Tumbling method*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 26082-2:2012

<https://standards.iteh.ai/catalog/standards/sist/dfced3a4-bc40-42ba-9c1a-542381db96ef/iso-26082-2-2012>

Leather — Physical and mechanical test methods for the determination of soiling —

Part 2: Tumbling method

1 Scope

This part of ISO 26082 specifies a tumbling method which is intended to determine the resistance of all forms of leather to visible soiling through repeated contact with soiled objects. It provides a physical pretreatment routine for leathers that may be vulnerable to loss of soiling resistance in service.

2 Normative references

The following referenced documents are indispensable for the application 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-F09, *Textiles — Tests for colour fastness — Part F09: Specification for cotton rubbing cloth*

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

ISO 2419, *Leather — Physical and mechanical tests — Sample preparation and conditioning*

ISO 12947-1, *Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 1: Martindale abrasion testing apparatus*

3 Principle

A controlled soiling treatment comprising multiple impacts with soiled felt pads is applied to a specimen. This is achieved by tumbling the felt pads within a rotating container into one end of which the specimen is fixed. The change in colour of a standard fabric fixed at the other end of the rotating cylinder is used to determine the end-point of the soiling treatment. A pretreatment to simulate wear may be applied to leathers that are vulnerable to a loss of soiling resistance in service.

4 Reagents

4.1 Synthetic sebum¹⁾, containing (mass fractions):

Free fatty acids	18,0 %
Beef tallow	32,8 %
Fatty acid triglycerides	3,6 %
Lanoline	18,3 %
Cholesterol	3,7 %
Hydrocarbon mixture	12,0 %
Stearate mixture (cutina type)	11,6 %

4.2 Acetone (GPR).

4.3 Butanone (GPR).

4.4 White spirit (CAS No. 64742-48-9) (GPR).

4.5 Colloidal graphite²⁾, having $(18 \pm 0,5)$ % graphite in a water-based dispersion that is miscible with the synthetic sebum solution.

STANDARD PREVIEW
(standards.iteh.ai)

5 Apparatus

ISO 26082-2:2012
<https://standards.iteh.ai/catalog/standards/sist/dfced3a4-bc40-42ba-9c1a-542381db96ef/iso-26082-2-2012>

Use usual laboratory apparatus and, in particular, the following.

5.1 Suitable tumbling soiling machine³⁾ (see Figure 1), capable of rotating at (24 ± 2) r/min with the facility to change the direction of rotation at 10 min operating intervals, incorporating the following:

- at least four cylinders each of which is
 - of internal length (300 ± 10) mm, and
 - of internal diameter (100 ± 5) mm;
- equipped at each end with a removable lid which maintains the required internal cylinder length and an annular test specimen retaining collar of internal diameter of not less than 75 mm;
- located lengthways in the plane of rotation;

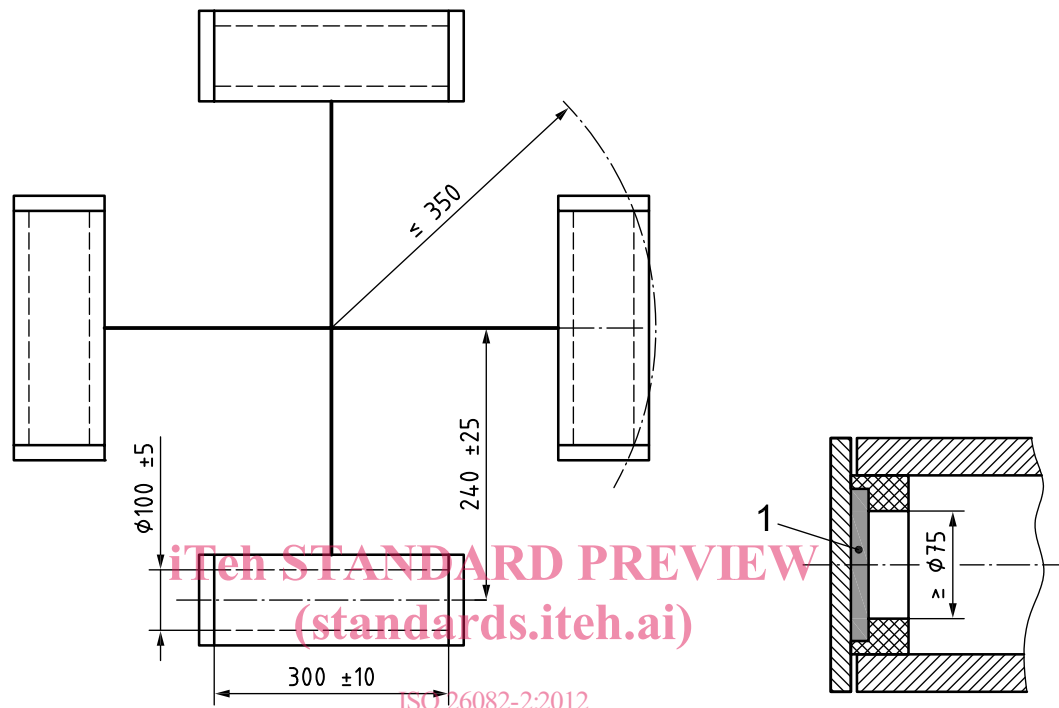
1) A suitable product is: Synthetic Sebum 09 D, available from WFK Testgewebe GmbH, Christenfeld 10, D-41379 Bruggen-Bracht, Germany. This information is given for the convenience of users of this part of ISO 26082 and does not constitute an endorsement by ISO of this product.

2) A suitable product is: Aquadag 18 %, available from Acheson Industries (Europe) Ltd., c/o Postbox 1, 9679 ZG Scheemda, The Netherlands. This information is given for the convenience of users of this part of ISO 26082 and does not constitute an endorsement by ISO of this product.

3) Suitable equipment can be obtained from SATRA Technology Centre, Kettering, UK, NN16 8SD. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of these products.

- mounted with the centre point of its longitudinal axis at a distance of (240 ± 25) mm from the axis of rotation and its longitudinal axis tangential to this radial line;
- of such dimensions that no point within the cylinders is further than 350 mm from the axis of rotation.

Dimension in millimetres



Key

- 1 bleached cotton cloth or leather test specimen, as required

Figure 1 — Schematic (not to scale) diagram of a suitable tumbling soiling machine

5.2 White felt cubes⁴⁾, containing a minimum 90 % wool and of density $0,30 \text{ g/cm}^3$ to $0,40 \text{ g/cm}^3$, with sides measuring $(12,5 \pm 0,5)$ mm. 160 felt cubes are required.

5.3 Oven capable of maintaining a temperature of $(60 \pm 2)^\circ\text{C}$ with local exhaust ventilation and in an ignition risk-free environment.

5.4 Undyed, desized, cotton rubbing cloth, as specified in ISO 105-F09, cut into circles of diameter (96 ± 1) mm. A minimum of six is required.

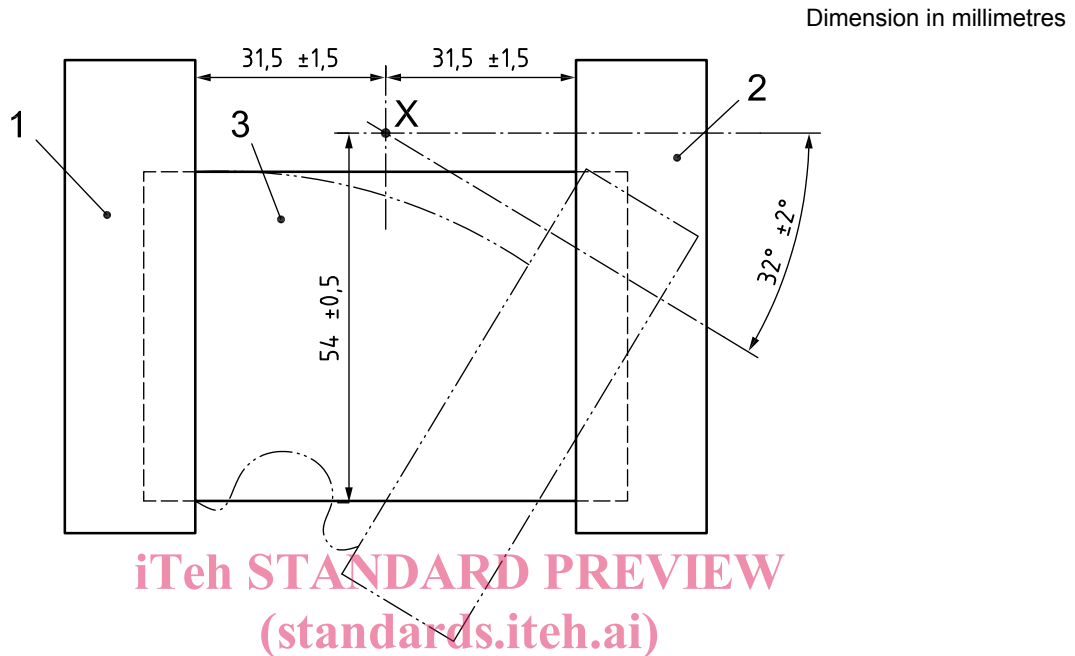
5.5 Colorimeter, complying with ISO 105-A04 and using CIE 10° observer and illuminant D_{65} . For a sphere-type colorimeter, “spectrally included” shall be used.

5.6 Grey scale, with half step ratings for assessing the degree of staining as described in ISO 105-A03 for white leathers or ISO 105-A02 for other colours.

4) A suitable product can be obtained from Naish Felts Ltd, Wilton, Salisbury SP2 0HD, UK. This information is given for the convenience of users of this part of ISO 26082 and does not constitute an endorsement by ISO of this product.

5.7 Suitable Maeser-type machine, incorporating the following:

5.7.1 Pair or pairs of V-shaped clamps, which are (63 ± 3) mm apart and in the same horizontal plane, into which the test specimen can be clamped. Each clamp shall have a "V" form with an internal angle of $(31 \pm 1)^\circ$ and an internal tip radius of $(7,5 \pm 0,5)$ mm.



Key

- X pivot point
 - 1 stationary clamp (5.7.2)
 - 2 moveable clamp (5.7.3)
 - 3 test specimen
- ISO 26082-2:2012
<https://standards.iteh.ai/catalog/standards/sist/dfced3a4-bc40-42ba-9c1a-542381db96ef/iso-26082-2-2012>

Figure 2 — Side view of test specimen in "V" shaped clamps

5.7.2 One stationary clamp.

5.7.3 One moveable clamp, which shall pivot about a point X which is midway $(31,5 \pm 1,5)$ mm between the clamps such that the lower end of the clamps move together (see Figure 2).

5.7.4 A pivot point X (see Figure 2), which shall be $(54,0 \pm 0,5)$ mm above the internal face of the clamp at the tip of the "V" and the flexing angle through which the clamp moves shall be $(32 \pm 2)^\circ$.

5.7.5 A method of applying a simple harmonic motion to the moveable clamp (5.7.3) so that it pivots toward the stationary clamp (5.7.2) and back to its original position at a rate of (90 ± 5) cycles/min.

5.7.6 A means of counting the number of cycles of the moveable clamp (5.7.3).

5.8 Martindale abrasion testing apparatus, as described in ISO 12947-1, if required (see 6.4).

5.9 Silicon carbide paper, of grit size 180 and possibly higher, if required (see 6.4).

6 Sampling and sample preparation

6.1 Cut four circular test specimens of diameter (96 ± 1) mm from the leather under test in accordance with ISO 2418 or by ensuring that no specimen is taken from within 50 mm of the edges. If the leather has a grain pattern, select the specimens to be representative of the overall surface texture/appearance.

6.2 Cut four approximately (50×55) mm rectangles of the leather under test following the sampling procedure in 6.1. These are going to be used as reference samples in the assessment (7.4.2).

6.3 Condition the test specimens (6.1 and 6.2) and cotton discs (5.4) in accordance with ISO 2419 and carry out the test in this environment.

6.4 If required, finished or coated leathers that are vulnerable to loss of soiling resistance in service due to deterioration of the surface may be subjected to a physical pretreatment regime prior to testing. The following regime simulates the natural abrasion and flexing that occurs in upholstery leathers in service:

- 100 revolutions with silicon carbide paper of grit size 180, using an abrasion machine complying with that described in ISO 12947-1, with the material under test mounted on the base plate and the abradent paper in the test specimen carrier while applying a nominal contact pressure of 12 kPa;
- followed by 100 000 cycles dry flexing using a machine as described in 5.7.

The abrasion process is intended to be light and superficial, it should not expose the substrate. If excessive abrasion is produced, a less severe abrasive paper with a higher grit size number or reduced contact pressure than specified above should be used and reported according to 8 f).

Unfinished leathers (e.g. aniline, nubuck and suede) are normally only tested in the new condition. If wear simulation is required, a less severe abrasive paper or reduced contact pressure than specified above should be used, or abrasion can be omitted and the sample flexed only. Details of the pretreatment used shall be reported according to 8 f).

7 Procedure

WARNING — When preparing the following soiling solution and soiled cubes, work with local exhaust ventilation in an ignition risk-free environment and wearing chemical resistant gloves and eyewear.

7.1 Preparation of the soiling solution

7.1.1 Weigh out $(145,0 \pm 0,5)$ g of synthetic sebum (4.1) as specified and place into a one-litre beaker and gently warm over water until the sebum liquefies.

7.1.2 Dilute the sebum with approximately 220 ml of acetone (4.2), followed by approximately 220 ml of butanone (4.3) and then by 25,0 ml of white spirit (4.4).

7.1.3 Add $(0,90 \pm 0,01)$ ml of colloidal graphite (4.5) to the diluted sebum solution.

7.1.4 If the solution has solidified, agitate the solution and heat gently over water on a hot plate or water bath, until liquid. **The solution shall be used immediately after preparation and not stored.** This solution is adequate enough to soak 160 felt cubes (5.2). For a greater number of cubes, increase all components of solution proportionally.

7.2 Preparation of the soiled cubes

7.2.1 Immerse a batch of felt cubes (5.2) in the soiling solution (7.1) for approximately 3 min to 5 min to saturate. (A convenient batch size is 20 or 40 cubes.)