

INTERNATIONAL
STANDARD

ISO
4684

IULTCS/IUC
5

First edition
2005-11-01

**Leather — Chemical tests —
Determination of volatile matter**

Cuir — Essais chimiques — Détermination des matières volatiles

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Reference number
ISO 4684:2005(E)
IULTCS/IUC 5:2005(E)

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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 4684 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 289, *Leather*, in collaboration with the Chemistry Commission of the International Union of Leather Technologists and Chemists Societies (IUC Commission, IULTCS), in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement). It is based on IULTCS method IUC 5.

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 — Chemical tests — Determination of volatile matter

1 Scope

This International Standard specifies a method of determination of volatile matter which is applicable to all leather types.

It is not possible to determine the exact moisture content of leather by this method. This is because at elevated temperatures other volatile substances escape and tannins and fats can be oxidized. Some absorbed water may be left in the leather after drying.

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

ISO 4044, *Leather — Preparation of chemical test samples*

3 Principle

Leather samples are finely ground and dried in an oven at $102\text{ °C} \pm 2\text{ °C}$ to constant mass. The volatile matter is expressed as the ratio of the change in mass of the sample to the initial mass before drying.

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1

volatile matter

(leather) loss of mass by leather when dried to constant mass at $102\text{ °C} \pm 2\text{ °C}$, as described in this method

5 Apparatus

Usual laboratory apparatus is required and, in particular, the following.

5.1 **Flat, shallow weighing vessels with ground glass stoppers, or flat open dishes.**

NOTE Small weighing vessels with ground glass stoppers allow more accurate work to be done than do open dishes.

5.2 **Oven**, capable of being maintained at $102\text{ °C} \pm 2\text{ °C}$.

5.3 **Analytical balance**, weighing to an accuracy of 0,001 g.

5.4 **Desiccator**, suitable for cooling the weighing vessels.

6 Sampling and preparation of samples

If possible, sample in accordance with ISO 2418 and grind leather in accordance with ISO 4044. If sampling in accordance with ISO 2418 is not possible (e.g. leathers from finished products such as shoes, garments), details about sampling shall be given along with the test report.

7 Procedure

Weigh, to the nearest 0,001 g, an empty weighing vessel that has been dried at 102 °C prior to weighing and use.

Weigh, to the nearest 0,001 g, approximately 3 g of the sample into the tared weighing vessel and dry at 102 °C ± 2 °C for 5 h.

Cool the vessel and contents for 30 min in a desiccator and weigh. When working with open dishes, not more than one dish should be put into a small desiccator to cool at any one time, and not more than two dishes should be put into a large desiccator.

Repeat the drying, cooling and weighing, but with drying times of 1 h until the further loss in mass does not exceed 3 mg (i.e. 0,1 % of the sample mass), or the total drying time equals 8 h.

Record the final mass of the sample and weighing vessel, and calculate the dried mass of sample.

8 Calculation and expression of results

Calculate the mass fraction of the volatile matter, w , in percent.

$$w = \frac{100(m_1 - m_2)}{m_1} \%$$

where

m_1 is the mass of the sample before drying; and

m_2 is the mass of the sample after drying.

9 Test report

The test report shall include the following information:

- the results obtained;
- a reference to this International Standard, i.e. "ISO 4684:2005";
- a description of the sample tested;
- details of any deviations from the procedure, or special circumstances which may have affected the results.

10 Repeatability

The results of duplicate determinations should not differ by more than 0,2 %, calculated on the original mass of leather. If the duplicates differ by more than 0,2 %, further repeat analysis shall be carried out.

Annex A (informative)

Information for leathers which contain large quantities of oxidizable fats

For leathers which contain large quantities of oxidizable fats, additional useful information may be gained by carrying out the following procedure.

Determine the fats and other solubles by using the method described in ISO 4048 ^[1]. Determine the dry mass of the resultant dichloromethane-extracted leather by drying in accordance with the procedure above. Calculate the total loss of mass, expressed as a percentage of the mass of the prepared sample taken, and subtract the percentage extractable substances, thus giving the percentage volatile matter.

If this procedure is used, full details should be included in the test report.

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Bibliography

- [1] ISO 4048, *Leather — Determination of matter soluble in dichloromethane*

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