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**Leather — Organic fluorine —**

**Part 1:**

**Determination of the non-volatile  
compound content by extraction  
method using liquid chromatography/  
tandem mass spectrometry detector  
(LC-MS/MS)**

*Cuir — Fluor organique —*

*Partie 1: Détermination de la teneur en composés non volatils par  
une méthode d'extraction utilisant la chromatographie en phase  
liquide couplée à un détecteur par spectrométrie de masse en tandem  
(LC-MS/MS)*

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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 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](http://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](http://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 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](http://www.iso.org/iso/foreword.html).

This document was prepared by the Chemical Test Commission of the International Union of Leather Technologists and Chemists Societies (IUC 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.

A list of all parts in the ISO 23702 series can be found on the ISO website.

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](http://www.iso.org/members.html).

## Introduction

The group of per- and poly-fluorinated compounds (PFC) consists of more than 800 substances. The most well-known are perfluorooctanoic sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA).

Perfluorooctanoic sulfonic acid (PFOS) is classified as persistent, bio-accumulative and toxic (PBT). PFOS and its salts are restricted and regulated in many countries regarding its marketing and use (see References [3] and [4]).

Perfluorooctanoic acid (PFOA) and its salts are suspected of having a similar risk profile to PFOS.

A number of long chain per- and poly-fluorinated compounds have been included in the EU Candidate List of Substances of Very High Concern (SVHC), which is available at <https://echa.europa.eu/candidate-list-table>.

The regulatory thresholds for restricted per- and poly-fluorinated compounds limit the use to a level below which they cannot be meaningfully used. The thresholds need to take into consideration the possible presence of unavoidable impurities and unintentional trace contaminants.

The long chain, fully fluorinated anions are non-volatile. They are heat stable and resistant to breaking down in the environment. The per- and poly-fluorinated compounds have been widely used in many industries, including in oil-, soil- and water-repellent finishes for textiles, leather products, paper, furniture and carpets.



# Leather — Organic fluorine —

## Part 1:

# Determination of the non-volatile compound content by extraction method using liquid chromatography/tandem mass spectrometry detector (LC-MS/MS)

## 1 Scope

This document specifies a test method for detection and quantification of extractable neutral, ionic, long, medium and short chain perfluorinated and poly-fluorinated substances in leather and coated leather.

This document, taking into account the three-dimensional distribution of the fibres within leather, makes the evaluation of the perfluorinated and poly-fluorinated substances with respect to the mass.

Classes of regulated compounds listed in [Annex A, Table A.1](#), include acids, telomers, sulfonates and sulphonamide alcohols. Classes of other non-regulated compounds that can be determined by this document are defined in [Annex B, Table B.1](#).

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

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

ISO 4044:2017, *Leather — Chemical tests — Preparation of chemical test samples*

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 and the following 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/>

### 3.1

#### **analyte**

substance or chemical constituent that is subjected to measurement

[SOURCE: CEN/TS 15968:2010, 3.1]

### 3.2

#### **constituent**

pure chemical material and substance of which a material is composed