
**Footwear — Critical substances
potentially present in footwear and
footwear components —**

**Part 1:
Determination of phthalate with
solvent extraction**

*Chaussures — Substances critiques potentiellement présentes dans les
chaussures et les composants des chaussures —*

Partie 1: Détermination des phtalates par extraction au solvant



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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Reagents	2
5.1 Chemicals	2
5.2 Standard solutions	2
5.2.1 Target phthalates — Stock solution	2
5.2.2 Internal standard — Stock solution	2
5.2.3 Calibration solutions	3
5.2.4 Extraction solution with internal standard (optional)	3
6 Apparatus	3
7 Sampling	4
8 Test procedure	4
8.1 Extraction	4
8.1.1 Ultrasonic extraction	4
8.1.2 Alternative extraction procedure for PVC materials	4
8.1.3 Preparation of a method blank	5
8.2 Determination with GC-MS	5
9 Expression of results	5
9.1 Calibration curve	5
9.2 Determination of the phthalates content	5
9.2.1 For each phthalate	5
9.2.2 When a sum of phthalates is requested	6
9.3 Performance of the test method	6
10 Test report	6
Annex A (informative) Information on some identified phthalates	8
Annex B (informative) Information on some identified phthalates	9
Annex C (informative) Suitable gas chromatography-mass spectrometry (GC-MS) apparatus and detection limits for determination of phthalates	11
Annex D (informative) Results of the interlaboratories tests – Method using toluene extraction (8.1.1)	13
Annex E (informative) Example of a chromatogram for selected phthalates	15
Annex F (informative) Comparison of extraction of phthalates by using toluene and THF	16
Bibliography	18

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).

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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.

This document was prepared by Technical Committee ISO/TC 216, *Footwear*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 16181-1, together with ISO 16181-2, cancels and replaces ISO/TS 16181:2011, which has been technically revised.

The main changes compared to the previous edition are as follows:

- addition of number of phthalates from 7 to 26;
- addition of new [Clause 2](#) and [Clause 3](#), and renumbering of subsequent clauses;
- replacement of “n-hexane/acetone” with “toluene” and alternative “tetrahydrofuran” as extraction solution;
- splitting of former [Clause 3](#) into [Clauses 5](#) and [6](#), with technical modification;
- technical revision of [Clauses 4](#) and [5](#);
- deletion of [5.2.4](#);
- addition of [Clause 9](#);
- addition of [Annex D](#).

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.

Footwear — Critical substances potentially present in footwear and footwear components —

Part 1:

Determination of phthalate with solvent extraction

WARNING — The use of this document can involve hazardous materials, operations and equipment. It does not purport to address all of the safety or environmental problems associated with its use. It is the responsibility of users of this document to take appropriate measures to ensure the safety and health of personnel and the environment prior to application of the document, and to determine the applicability of regulatory limitations for this purpose.

1 Scope

This document specifies a test method to determine the qualitative and quantitative presence of phthalate compounds (see [Annex A](#)) in footwear and footwear components.

NOTE 1 A list of relevant materials potentially containing phthalates can be found in ISO/TR 16178:2012, Annex A or in CEN/TR 16417.

NOTE 2 This test method can also be used to determine phthalates other than those listed in [Annex A](#), subject to validation.

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 4787:2010, *Laboratory glassware — Volumetric instruments — Methods for testing of capacity and for use*

3 Terms and definitions

No terms and definitions are listed in this document.

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

The test sample is extracted using toluene at 60 °C in an ultrasonic bath for 1 h. An aliquot is then analysed using a gas chromatograph (GC) with a mass selective detector (MS).

All the abbreviations of phthalates used are given in [Annex A](#).

When compared with ISO 16181-2, the two analytical methods should give similar trends but not necessarily the same absolute result. Therefore, in cases of dispute, the method in this document shall be used in preference to ISO 16181-2.