

ICS 61.060
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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 32440.2-2024

**Footwear - Chemical tests - Determination of phthalate - Part 2:
Without solvent extraction**

鞋类 化学试验方法 邻苯二甲酸酯的测定 第2部分：非溶剂萃取法
(English Translation)

Issued on: November 28, 2024

Implemented on: June 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is part 2 of GB/T 32440 "Footwear Chemical Test Methods - Determination of Phthalates". GB/T 32440 the following parts have been published.

--- Part 1: Solvent extraction method;

--- Part 2: Non-solvent extraction method.

This document modifies ISO 16181-2:2021 "Footwear - Limited quantities of substances in footwear and footwear components - Part 2: Non-solvents" Determination of phthalates by extraction method.

This document has the following structural adjustments compared to ISO 16181-2:2021.

--- Adjust the "Explanation of analysis results of different methods" in Chapter 4 Principles to Chapter 1;

--- Swap Chapter 5 and Chapter 6, adjust the first paragraph of Chapter 6 in ISO 16181-2:2021 to 5.1, and the subsequent serial numbers will be postponed accordingly;

--- Deleted the suspension section in 6.4 of ISO 16181-2:2021 and adjusted the note to 5.5.2;

--- Adjust the first paragraph of Appendix A to A.1, and the subsequent serial numbers shall be postponed accordingly;

--- Adjust the first paragraph of Appendix C to C.1, and the subsequent serial numbers will be postponed accordingly.

The technical differences between this document and ISO 16181-2:2021 and their reasons are as follows.

--- Changed the scope of application of the standard (see Chapter 1) to eliminate ambiguity and increase operability;

--- ISO 16181-1 (see Chapter 1) has been replaced by the normative reference GB/T 32440.1 to adapt to my country's technical conditions.

Increase operability;

--- Changed the sample material type requirements (see Chapter 7) to be consistent with Chapter 1 and Appendix F;

--- Changed the requirements for grinding and screening of non-uniform materials in sampling (see Chapter 7) to be consistent with Appendix B.

The following editorial changes were made to this document.

--- In order to coordinate with the existing standards, the name of the standard is changed to "Footwear Chemical Test Methods Determination of Phthalates Part 2 Points. Non-solvent extraction method;

--- In "Reagents and Materials", add CAS number and delete the relevant content in Table A.1 to facilitate the use of the document;

--- Changed the order of Appendix D and Appendix E in Chapter 8;

--- Changed the final results of DHNUPD of sample 1 and sample 2 in Table A.3 of informative Appendix A;

--- Changed Figures D.1 and D.2 in the informative Appendix D;

--- Unified test data of different samples in informative Appendix F are in Table F.1.

Introduction

Phthalate is a general term for esters formed by phthalic acid. Phthalate is mainly used in polyvinyl chloride materials to play a plasticizing role.

After being absorbed into the body, phthalates interfere with the endocrine system and reproductive system, thus potentially causing danger to the human body.

The content of phthalates has become a focus of increasing concern for consumers. GB/T 32440 "Footwear Chemical Test Methods Phthalates the purpose of this standard is to provide a basis for the determination of phthalates in footwear and footwear components and is intended to consist of two parts.

--- Part 1: Solvent extraction method. Solvent extraction method for the determination of phthalates in footwear and footwear components Take the lead and establish operational, traceable and verifiable procedures.

--- Part 2: Non-solvent extraction method. Non-solvent extraction method for the determination of phthalates in footwear and footwear components.

The extraction method should be based on the reagent to establish an operational, traceable and verifiable procedure.

Both methods are suitable for determining certain concentrations of phthalates in footwear and footwear components.

Under these circumstances, solvent extraction has higher accuracy and wider application range.

Chemical test methods for footwear - Phthalates Determination of chlorinated compounds - Part 2: Non-solvent extraction method Warning---The use of this document may involve hazardous materials, operations, and equipment. It is not intended to address all safety or environmental issues. It is the responsibility of the user of this document to take appropriate measures to ensure the safety and health of personnel and the environment and to determine before use the applicability of regulatory restrictions for this purpose.

1 Scope

This document describes the determination of specific phthalates by pyrolysis/thermal desorption gas chromatography-mass spectrometry (Py/TD-GC-MS).

Methods (see Appendix A).

This document applies to all types of footwear materials except metal.

NOTE: See CEN/T R16417 for a list of specific phthalates to which this document applies.

Compared with GB/T 32440.1, these two analysis methods have similar trends, but the results are not necessarily absolutely the same.

In case of any dispute, GB/T 32440.1 shall prevail.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 32440.1 Chemical test methods for footwear - Determination of phthalates - Part 1:
Solvent extraction method (GB/T 32440.1-2023,ISO 16181-1:2021,MOD)

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 Principle

The sample is introduced directly into the pyrolyzer, where the phthalates are thermally cracked at a specific heating zone and then transferred to the gas chromatograph.

The diformate compounds were separated by gas chromatography capillary column and detected by mass spectrometry.

5.1 General

All chemical reagents should be tested for contamination and blank value before use.

5.2 N-Hexane

CAS number. 110-54-3.