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Footwear — Critical substances potentially present in footwear and footwear components — Determination of certain organic solvents

Chaussures — Substances critiques potentiellement présentes dans les chaussures et les composants de chaussures — Dosage de certains solvants organiques

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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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).

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.

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Introduction

Industrial organic solvents are often used as ingredients in adhesive, treating agents and coating agents for footwear.

Some organic solvents are toxic. Harmful solvents left in footwear materials can penetrate into the human body through skin contact during wearing and by inhalation after being released from the footwear, harming the health of consumers. Both glycol ethers and amide solvents will form highly toxic compounds after metabolism in the body, which cause permanent damage to the blood and nervous system. Long-term exposure to high concentrations of these compounds can cause cancer. In addition, ethylene glycol ether solvents can cause permanent damage to the female reproductive system.

Due to this potential effect, the listed organic solvents in Annex A are based on those which have been restricted in some regulations (e.g. by the EU regulation No 1907/2006[1] in the European Union, and by the U.S. Environmental Protection Agency). ISO/TR 16178 describes which materials are concerned by this determination.

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Footwear — Critical substances potentially present in footwear and footwear components — Determination of certain organic solvents

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1 Scope

This document specifies a method to quantify residues of certain organic solvents (see Annex A) in footwear materials with gas chromatography-mass spectrometry (GC-MS).

This document is applicable to footwear materials where there is a risk for the presence of certain solvent residues (e.g. solvent present in glues, leather finishing and coated textiles, plastics, rubber).

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, *Laboratory glass and plastic ware — Volumetric instruments — Methods for testing of capacity and for use*

ISO 21061, *Footwear — Chemical tests — General principles on the preparation of samples*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
organic solvent
type of organic chemical in a liquid state which is normally used in textile, leather and polymer materials in the footwear industry

EXAMPLE Glycol ether, amides, pyrrolidone solvents.

4 Principle

The sample is cut in small pieces and extracted with methanol in a sealed vial at 40 °C in an ultrasonic bath for 60 min. An aliquot from the extract is then analysed using a gas chromatograph with a mass selective detector (MSD).

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