
**Footwear — Critical substances
potentially present in footwear
and footwear components —
Determination of Nitrosamines**

*Chaussure — Substances critiques potentiellement présentes dans
les chaussures et les composants de chaussure — Détermination des
nitrosamines*



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Foreword

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This document was prepared by Technical Committee ISO/TC 216, *Footwear*.

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Footwear — Critical substances potentially present in footwear and footwear components — Determination of Nitrosamines

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1 Scope

This document specifies a method for the determination of the content of 12 kinds of Nitrosamines (see [Annex A](#)) in footwear and footwear components by using solvent extraction and Gas chromatography with mass selective detector (GC-MS).

This document is applicable to rubber in footwear materials.

NOTE ISO/TR 16178 defines which materials are concerned by this determination.

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 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

Extract Nitrosamines in the sample with methanol using an ultrasonic bath. The extract is concentrated in a rotary vacuum evaporator and purified by passing through C₁₈ solid-phase separation column. The Nitrosamines in test solutions are analysed by GC-MS, using full scan detection mode for qualitative analysis and selected ion monitoring (SIM) mode for quantitative analysis with an external standard solution.

5 Reagents and materials

Unless otherwise specified, all the reagents used are chromatographic grade.

5.1 Methanol, CAS number: 67-56-1.