

ICS 61.060

English Version

**Footwear - Critical substances potentially present in footwear
and footwear components - Test method to quantitatively
determine dimethylformamide in footwear materials (ISO/TS
16189:2013)**

Chaussures - Substances critiques potentiellement
présentes dans la chaussure et les composants de
chaussure - Méthodes d'essai pour déterminer
quantitativement le diméthylformamide dans les matériaux
de chaussure (ISO/TS 16189:2013)

Schuhe - Möglicherweise in Schuhen und
Schuhbestandteilen vorhandene kritische Substanzen -
Prüfverfahren zur quantitativen Bestimmung von
Dimethylformamid in Schuhwerkstoffen (ISO/TS
16189:2013)

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Foreword

This document (CEN ISO/TS 16189:2013) has been prepared by Technical Committee CEN/TC 309 "Footwear", the secretariat of which is held by AENOR, in collaboration with Technical Committee ISO/TC 216 "Footwear".

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Endorsement notice

The text of ISO/TS 16189:2013 has been approved by CEN as CEN ISO/TS 16189:2013 without any modification.

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Footwear — Critical substances potentially present in footwear and footwear components — Test method to quantitatively determine dimethylformamide in footwear materials

1 Scope

This Technical Specification specifies a method to determine the amounts of dimethylformamide (DMFo) in footwear and footwear components containing polyurethane (PU) coated material.

NOTE In the footwear industry, when PU is injected (reaction moulded), this process does not require the use of DMFo. DMFo can be used for PU coated material.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TR 16178:2012, *Footwear — Critical substances potentially present in footwear and footwear components*

3 Method principle

The sample is cut into small pieces and extracted with methanol in a sealed vial at 70 °C in an ultrasonic bath. An aliquot of the extract is analysed with GC-MS in SIM mode.

ISO/TR 16178:2012, Table 1 defines which materials are concerned by this determination.

4 Reagents and solvents

4.1 Reagents

The substances are given in [Table 1](#).

Table 1 — Reagents

Number	Substances	CAS Number ^a	Purity
1	Dimethylformamide (DMFo)	68-12-2	Certificated standard
2	Dimethylformamide-d7 (DMFo-d7)	4472-41-7	Certificated standard
3	Methanol	67-56-1	Analytical grade

^a CAS: Chemical Abstract Service.

4.2 Stock solutions

4.2.1 Internal standard — Stock solution (1 000 mg/l)

10 mg of DMFo-d7 is weighted with an accuracy of 0,1 mg in a 10 ml volumetric flask and filled up to the mark with methanol. The content is further transferred in an amber 10 ml vial with PTFE stopcock and kept at 4 °C.