



BSI Standards Publication

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

**National foreword**

This Published Document is the UK implementation of CEN ISO/TS 16189:2013.

The UK participation in its preparation was entrusted to Technical Committee TCI/69, Footwear, leather and coated fabrics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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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)

This Technical Specification (CEN/TS) was approved by CEN on 15 July 2013 for provisional application.

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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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## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO/TS 16189 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear*, in collaboration with ISO Technical Committee ISO/TC 216, *Footwear*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

# 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 <sup>a</sup>	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

<sup>a</sup>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.