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

GB/T 33390-2026

Replacing GB/T 33390-2016

**Footwear - Chemical tests - Determination of
dimethylformamide**

鞋类 化学试验方法 二甲基甲酰胺的测定

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document replaces GB/T 33390-2016 "Determination of Limits for Dimethylformamide in Footwear and Footwear Components".

Compared with GB/T 33390-2016, the main technical changes in the revised version are as follows, apart from structural adjustments and editorial modifications.

- a) Reagent requirements have been changed (see 5.2 and 5.3, 4.1 in the 2016 edition);
- b) Storage requirements for internal standard working solutions and target compound working solutions have been added (see 5.5.2 and 5.6.2);
- c) The operating temperature requirements for the ultrasonic water bath device have been increased (see 6.4);
- d) The specimen size requirements have been changed (see 7.1, 6.1 in the 2016 edition);
- e) Extraction requirements have been changed (see 7.2, 6.2 in the 2016 edition);
- f) The requirements for creating standard curves have been changed (see 8.1, 7.1 in the 2016 version);
- g) The method limits of quantitation have been changed (see Chapter 10, Chapter 9 in the 2016 edition);

h) The test report requirements have been changed (see Chapter 11, Chapter 10 of the 2016 edition).

This document is modified to adopt ISO 16189:2021 "Footwear - Limits of substances present in footwear and footwear components - Dimethylformamide in footwear materials".

Test methods for quantitative determination of amines.

This document has undergone the following structural adjustments compared to ISO 16189:2021.

---Added sections 5.1, 5.2~5.6 corresponding to sections 5.1~5.5 of ISO 16189:2021;

---Added sections 6.1, 6.2~6.8 to correspond to sections 6.1~6.7 of ISO 16189:2021.

The technical differences between this document and ISO 16189:2021, and the reasons therefor, are as follows.

---ISO 4787 (see 6.1) has been replaced with the normatively referenced GB/T 12810 to adapt to my country's technical conditions and increase operability.

Actual nature;

---Added requirements for volumetric flasks (see 6.9), increasing operability and eliminating ambiguity;

---Added pipette requirements (see 6.10), increased operability, and eliminated ambiguity.

The following editorial changes have been made to this document.

---To harmonize with existing standards, the standard title has been changed to "Chemical Test Methods for Footwear. Determination of Dimethylformamide";

---ISO/T R16178.2021 has been replaced by GB/T 29292-2024, which is cited as information.

---The footnote at point 5.1 in the original ISO document has been removed;

---ISO 21061 has been replaced by GB/T 45063, which is cited in the informational reference.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China National Light Industry Council.

This document is under the jurisdiction of the National Technical Committee on Standardization of Footwear (SAC/TC305).

1 Scope

This document describes the determination of dimethylformamide (DMF) content in footwear and footwear components containing polyurethane (PU) coating materials. method.

Note 1: In the footwear industry, DMF is not required for PU during injection molding (reaction molding). However, DMF may be used for PU coating materials.

Note 2: Dimethylformamide is abbreviated as DMF, DMFa, and DMFo. This document uses DMF.

Note 3: The test materials involved in the methods described in this document are shown in Table 1 of GB/T 29292-2024.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 12810 Laboratory glassware - Calibration and use of glass volumetric instruments (GB/T 12810-2021, ISO 4787.

2010, NEQ)

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4 Principles

The sample was cut into small pieces, placed in a sealed vial, and extracted with methanol in a 70°C ultrasonic water bath for 1 hour. A certain amount of the extract was then subjected to gas chromatography-mass spectrometry.

The analysis was performed by chromatography-mass spectrometry (GC-MS).

5.1 General Rules

Unless otherwise specified, all reagents should be of analytical grade.

5.2 Dimethylformamide (DMF)

CAS No.. 68-12-2, the highest purity standard sample/standard substance available.

5.3 Dimethylformamide-d7 (DMF-d7)

CAS No.. 4472-41-7, the highest purity standard sample/standard substance available.

5.4 Methanol

CAS No.. 67-56-1.