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Cigarettes — Determination of nicotine in total particulate matter from the mainstream smoke — Gas-chromatographic method

Cigarettes — Dosage de la nicotine dans la matière particulaire totale du courant principal de fumée — Méthode par chromatographie en phase gazeuse

Reference number
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products*.

This fourth edition cancels and replaces the third edition (ISO 10315:2013), which has been technically revised.

The main changes compared to the previous edition are as follows.

— The term "smoke condensate(s)" has been replaced with either “total particulate matter” or "total particulate matter from the mainstream smoke" throughout the document.

— Extraction solution and calibration solutions stored at low temperature, are equilibrated to ambient temperature before use (5.7).

— The linear regression equation for calibration is calculated by regression analysis with the area ratios in accordance with the nicotine concentrations (7.3).

— Data in Clause 9 have been replaced with the results of ISO/TR 19478-1.

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

This document may be considered as part of a set produced by ISO/TC 126 which describes the determination of total and nicotine-free dry particulate matter (NFDPM) in total particulate matter from the mainstream smoke. The set comprises ISO 3308, ISO 3402, ISO 4387, ISO 8243, ISO 10315 (this document) and ISO 10362-1.

A related International Standard, ISO 3400, determines total alkaloids, whereas this document determines only nicotine by virtue of the gas-chromatographic separation. Occasionally, differences can occur because of minor amounts of alkaloids other than nicotine in some types of tobacco.

Annex A provides information about the use of this method in conjunction with or simultaneously with the gas-chromatographic method of water determination specified in ISO 10362-1.

No machine smoking regime can represent all human smoking behaviour.

— It is recommended that cigarettes also be tested under conditions of a different intensity of machine smoking than those specified in this document.

— Machine smoking testing is useful to characterize cigarette emissions for design and regulatory purposes, but communication of machine measurements to smokers can result in misunderstandings about differences in exposure and risk across brands.

— Smoke emission data from machine measurements may be used as inputs for product hazard assessment, but they are not intended to be nor are they valid as measures of human exposure or risks. Communicating differences between products in machine measurements as differences in exposure or risk is a misuse of testing using ISO standards.

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Cigarettes — Determination of nicotine in total particulate matter from the mainstream smoke — Gas-chromatographic method

WARNING — The use of this document can involve hazardous materials, operations and equipment. This document does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of any other restrictions prior to use.

1 Scope

This document specifies a method for the gas-chromatographic determination of nicotine in total particulate matter from the mainstream smoke. The smoking of cigarettes and the collection of mainstream smoke are carried out according to ISO 4387.

NOTE ISO 20778 and ISO 22253 provide the determination method of nicotine in smoke with an intense smoking regime.

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 4387, *Cigarettes — Determination of total and nicotine-free dry particulate matter using a routine analytical smoking machine*

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 https://www.electropedia.org/

4 Principle

The total particulate matter from the mainstream smoke, which shall be obtained in accordance with ISO 4387, is dissolved in an extraction solution containing an internal standard. The nicotine content of an aliquot of the smoke extract is determined by gas chromatography, and the nicotine content in the total particulate matter from the mainstream smoke is calculated.

NOTE In countries not in a position to use the gas-chromatographic method, reference is made to ISO 3400 for the determination of total nicotine alkaloids. In such cases, values obtained using the method described in ISO 3400 can be used with the addition of a note in the expression of results.

5 Reagents

Use only reagents of recognized analytical reagent grade.

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