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Tobacco heating systems — Determination of aerosol collected mass and nicotine in the aerosol with a puffing regime according to the ISO 5501 series —

Part 1: Electrically heated tobacco products (eHTPs)

Systèmes de chauffage du tabac — Détermination de la masse d'aérosol collecté et de la nicotine dans l'aérosol avec un régime de fumage conformément à la série ISO 5501 —

Partie 1: Produits de tabac chauffés électriquement (PTCe)

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

A list of all parts in the ISO 18722 series can be found on the ISO website.

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

A tobacco heating system (THS) is a specific combination of a tobacco heating device (THD) and a heated tobacco product (HTP) used together and designed to produce a nicotine-containing aerosol without combustion of the tobacco substrate. An HTP is a product containing a tobacco substrate that is designed to be heated and not combusted by a separate source to produce a nicotine-containing aerosol.

With the emerging development and commercialization of HTPs, there are a number of different approaches to heating the HTP, categorized as electrically, aerosol and carbon HTPs (eHTP, aHTP and cHTP respectively), as described in ISO 6080 [1]. Carbon heated tobacco products (cHTPs) have not been commercially available as of 2022.

In some countries, the regulation of HTPs requires nicotine yields in aerosol. Therefore, there is a necessity to have an international standard in place to get reliable/comparable data on nicotine in the aerosol from THSs, with a specific HTP. Technical investigation of HTPs requires determining aerosol collected mass (ACM) in combination with a specific THD.

This document was developed for the determination of ACM with a gravimetric method, and nicotine yields in trapped eHTP aerosol utilizing gas chromatography coupled with a flame ionization detector. This document is based on the CORESTA recommended method (CRM) 107[2], which was written on the basis of the results obtained in an interlaboratory study conducted in 2021 involving 17 laboratories[3].

No machine puffing regime can represent all human puffing behaviour.

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

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

— Aerosol 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.

WARNING — Regulation and standardization are independent from each other, and standardization does not pre-empt regulation.

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Tobacco heating systems — Determination of aerosol collected mass and nicotine in the aerosol with a puffing regime according to the ISO 5501 series —

Part 1: Electrically heated tobacco products (eHTPs)

1 Scope

This document specifies an analytical method with a puffing regime according to ISO 5501-1 [4] to determine aerosol collected mass (ACM) and nicotine in the aerosol from electrically heated tobacco products, in combination with a specific tobacco heating device (THD).

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 3402, *Tobacco and tobacco products — Atmosphere for conditioning and testing*

ISO 5501-1, *Tobacco heating systems — Definitions and standard conditions for aerosol generation and collection — Part 1: Electrically heated tobacco products (eHTPs)*

ISO 6080, *Tobacco heating systems — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6080 and the following apply.

ISO and IEC maintain terminology 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/

3.1
aerosol collected mass
ACM
mass of aerosol collected on an aerosol trapping system from the operation of a tobacco heating system (THS) by a routine analytical puffing machine

Note 1 to entry: See ISO 4387 [5] for total particulate matter (TPM).

[SOURCE: ISO 5501-3:2024 [6], 3.15]

4 Principle

Aerosol shall be generated and collected as described in ISO 5501-1. The ACM is determined gravimetrically. The collected matter is then extracted with propane-2-ol solution containing internal standard (7.2). The nicotine content of an aliquot of the solution is determined by gas chromatography with flame ionization

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