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Standard test method for assessing the ignition propensity of cigarettes

Méthode d'essai normalisée pour évaluer le potentiel incendiaire des cigarettes

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 92, *Fire safety*, Subcommittee SC 1, *Fire initiation and growth,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 401, *Reduced Ignition Propensity Cigarettes,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 12863:2010), which has been technically revised. It also incorporates the Amendment ISO 12863:2010/Amd 1:2016 and the Technical Corrigendum ISO 12863:2010/Cor 1:2011.

The main changes are as follows:

— a new Annex G “Physical parameters of filter paper substrates for the determination of ignition propensity of cigarettes” has been added;

— the Bibliography has been updated.

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 very common initiating event in a fatal fire is the dropping of a cigarette onto a bed or piece of upholstered furniture. The burning cigarette heats the furnishing materials to the point where smouldering combustion begins, perhaps followed by a transition to flaming combustion. Since limiting the frequency of ignitions is a principal approach to reducing fire loss, it is desirable to establish a test method for the propensity of a cigarette to ignite soft furnishings.

This document is based, with permission from ASTM International, on ASTM International E2187, S*tandard Test Method for Measuring the Ignition Strength of Cigarettes*, copyright ASTM International.

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Standard test method for assessing the ignition propensity of cigarettes

WARNING — This document involves the use of combustible materials that are exposed to ignition sources. The burning materials emit toxic combustion products. The user shall take proper precautions to avoid thermal injury and inhalation of combustion products. The user shall ensure that all burning has ceased before safely discarding test materials.

1 Scope

This document specifies a test method for testing the capability of a cigarette, positioned on one of three standard substrates, to extinguish or to generate sufficient heat to continue burning, and thus potentially cause ignition of bedding or upholstered furniture. This document is only applicable to factory-made cigarettes that burn along the length of a tobacco column.

This is a performance-based document; it does not prescribe any design features of the cigarette that can lead to improved or degraded performance in the test method. The output of this method has been correlated with the potential for cigarettes to ignite upholstered furniture.

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.

ASTM E2187, *Standard Test Method for Measuring the Ignition Strength of Cigarettes*

ISO 534, *Paper and board — Determination of thickness, density and specific volume*

ISO 536, *Paper and board — Determination of grammage*

ISO 5636-5, *Paper and board — Determination of air permeance (medium range) — Part 5: Gurley method*

ISO 8243, *Cigarettes — Sampling*

ISO 8791-2, *Paper and board — Determination of roughness/smoothness (air leak methods) — Part 2: Bendtsen method*

ISO 13943, *Fire safety — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943 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
determination
single measurement involving a lit cigarette placed on a selected substrate

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3.2
full-length burn
outcome of a determination in which the cigarette continues to burn to or past the front plane of the tipping paper (filter tip cigarettes) or past the tips of the metal pins for non-filter tip cigarettes

3.3
no full-length burn
outcome of a determination in which the cigarette ceases to burn before reaching the front plane of the tipping paper (filter tip cigarettes) or the tips of the metal pins for non-filter tip cigarettes

3.4
substrate
<cigarette testing> horizontal surface consisting of layers of filter paper on which a test cigarette is placed for testing

3.5
test
set of 40 determinations

4 General principle

This test method measures the probability that a cigarette, placed on a heat absorbing substrate, will generate sufficient heat to maintain burning of the tobacco column and potentially initiate a fire. Each determination consists of placing a lit cigarette on one of three standard substrates (3, 10 or 15 layers of filter paper). Observation is made of whether or not the cigarette continues to burn the length of the tobacco column determined, as defined in this document. A test (comprising 40 determinations) is performed to obtain the relative probability that the cigarette will continue burning despite heat abstraction by the substrate.

For use of semi-automated/fully automated systems to perform the test, see Annex F.

5 Apparatus

5.1 General

The usual laboratory apparatus and, in particular, the following shall be used.

5.1.1 Holder, for the filter paper substrate.

5.1.2 Metal rim to compress the layers of filter paper.

5.1.3 Clear enclosure, to protect the test specimens from air currents.

5.1.4 Associated accessories, as defined in this subclause.

The materials of construction shall meet occupational health and safety requirements.

The test apparatus shall be placed under a fume hood to minimize the exposure of personnel to combustion products. Technical drawings of the test chamber given in Annex A shall be followed.

5.2 Test and conditioning environment

5.2.1 General

Cigarettes and filter paper shall be conditioned in one of the two ways described in 5.2.2 and 5.2.3.

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