INTERNATIONAL STANDARD

ISO 17175

First edition
2017-11

Bidis — Determination of total and nicotine-free dry particulate matter using a linear routine analytical smoking machine

Bidis — Détermination de la matière particulaire totale et de la matière particulaire anhydre et exempte de nicotine au moyen d'une machine à fumer analytique de routine

Reference number
ISO 17175:2017(E)

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

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

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Introduction

A bidi (also spelt as beedi) is a hand-made smoking article made by rolling the tobacco filler consisting of air-cured, sun-cured and/or other suitable tobacco variety in Tendu (*Diospyrus* spp.) or Ashriti (*Bauhinia* spp.) leaf. The wrapper leaf is a forest product. Bidis are either conical or cylindrical in shape available in various lengths from 55 mm to 90 mm. Nearly 50 % of the weight of a bidi is contributed by the non-tobacco leaf wrapper.

A conical bidi is completely closed at the broad end (lighting end) by folding and tucking in the wrapper while the flattened narrow end (mouth end) is partly closed and is secured with a thread or any other means to prevent unfolding of the wrapper.

A filter bidi will have a filter plug on one end while the lighting end will be completely closed by folding and tucking in the wrapper leaf.

The components of bidis (tobacco filler and non-tobacco wrapping leaf) are natural products which cause intrinsic variability in bidis. The variability is further increased by the way these components are put together to produce a bidi.

Bidis form an important segment of smoking articles on a global level, are consumed in a large number of countries and hence an International Standard on the analysis of bidi smoke is justified.

The method allows bidis to be smoked on a routine analytical linear smoking machine using a strictly controlled set of parameters and collection of total particulate matter from smoke for further analysis. Thus, it enables the determination of nicotine-free dry particulate matter (NFDPM) and nicotine in bidis, when smoked by this procedure, to be compared and ranked on the basis of machine yield.

Experience and knowledge gained from the use of analytical cigarette-smoking machines have highlighted a need to specify certain requirements, which are addressed in this document.

No machine smoking regime can represent all human smoking behaviour:

— machine smoking testing is useful to characterize bidi 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 misuse of testing using ISO standards.

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Bidis — Determination of total and nicotine-free dry particulate matter using a linear routine analytical smoking machine

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 regulatory limitations prior to use.

1 Scope

This document specifies methods for the determination of total particulate matter and for the subsequent determination of nicotine-free dry particulate matter present in the smoke from bidis generated and collected using a routine analytical smoking machine.

The smoking method described is suitable for routine analytical smoking machines which are equipped with a suitable bidi holder complying with the requirements of 5.8. The method is equally suitable for rotary machines after due validation.

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 3308:2012, *Routine analytical cigarette-smoking machine — Definitions and standard conditions*

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

ISO 4387:2000, *Cigarettes — Determination of total and nicotine-free dry particulate matter using a routine analytical smoking machine*

ISO 10315, *Cigarettes — Determination of nicotine in smoke condensates — Gas-chromatographic method*

ISO 10362-1, *Cigarettes — Determination of water in smoke condensates — Part 1: Gas-chromatographic method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3308, ISO 3402 and ISO 4387 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
butt length
length of unburnt bidi remaining at the moment when the smoking is stopped

[SOURCE: ISO 3308:2012, 3.2, modified — “cigarette” has been replaced by “bidi”.]

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3.2
puff volume
volume leaving the butt end of a bidi and passing through the *smoke trap* (3.7)

[SOURCE: ISO 3308:2012, 3.8, modified — "cigarette" has been replaced by "bidi".]

3.3
puff number
number of puffs necessary to smoke a bidi to a specified *butt length* (3.1)

[SOURCE: ISO 3308:2012, 3.9, modified — "cigarette" has been replaced by "bidi".]

3.4
puff frequency
number of puffs in a given time

[SOURCE: ISO 3308:2012, 3.10]

3.5
puff termination
termination of the connection of the port to the suction mechanism

[SOURCE: ISO 3308:2012, 3.11]

3.6
bidi holder
device for holding the mouth end of a bidi during smoking

[SOURCE: ISO 3308:2012, 3.14, modified — "cigarette" has been replaced by "bidi".]

3.7
smoke trap
device for collecting such part of the smoke from a sample of bidis as is necessary for the determination of specified smoke components

[SOURCE: ISO 3308:2012, 3.15, modified — "cigarette" has been replaced by "bidi".]

3.8
channel
element of a smoking machine consisting of one or more *bidi holders* (3.6), one trap and a means of drawing a puff through the trap

[SOURCE: ISO 3308:2012, 3.17, modified — "cigarette" has been replaced by "bidi".]

3.9
mainstream smoke
all smoke which leaves the butt end of a bidi during the *smoking process* (3.13)

[SOURCE: ISO 3308:2012, 3.20, modified — "cigarette" has been replaced by "bidi".]

3.10
total particulate matter
crude smoke condensate
TPM
that portion of the *mainstream smoke* (3.9) which is trapped in the *smoke trap* (3.7), expressed as milligrams per bidi

[SOURCE: ISO 4387:2000, 3.1, modified — "cigarette" has been replaced by "bidi".]

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3.11
dry particulate matter
dry smoke condensate
DPM
total particulate matter (3.10) after deduction of its water content, expressed as milligrams per bidi

[SOURCE: ISO 4387:2000, 3.2, modified — "cigarette" has been replaced by "bidi".]

3.12
nicotine-free dry particulate matter
nicotine-free dry smoke condensate
NFDPM
dry particulate matter (3.11) after deduction of its nicotine content, expressed as milligrams per bidi

[SOURCE: ISO 4387:2000, 3.3, modified — "cigarette" has been replaced by "bidi".]

3.13
smoking process
use of a smoking machine to smoke bidis from lighting to final puff

[SOURCE: ISO 4387:2000, 3.4, modified — "cigarette" has been replaced by "bidi".]

3.14
smoking run
specific *smoking process* (3.13) to produce such smoke from a sample of bidis as is necessary for the determination of the smoke components

[SOURCE: ISO 4387:2000, 3.5, modified — "cigarettes" has been replaced by "bidis".]

3.15
bidi laboratory sample
bidi sample received in the laboratory for inspection or testing

[SOURCE: ISO 4387:2000, 3.6, modified — the term "laboratory sample" has been replaced by "bidi laboratory sample" and the definition has been revised.]

3.16
bidi conditioning sample
bidis taken randomly from the laboratory sample for conditioning prior to selection and tests

[SOURCE: ISO 4387:2000, 3.8, modified — the term "conditioning sample" has been replaced by "bidi conditioning sample" and the definition has been revised.]

3.17
bidi test sample
bidis for test selected by mass and length from the conditioned *bidi laboratory sample* (3.15)

[SOURCE: ISO 4387:2000, 3.7, modified — the term "test sample" has been replaced by "bidi test sample" and the definition has been revised.]

3.18
bidi test portion
group of selected and marked bidis prepared for a single determination and which is a random sample from the test sample

[SOURCE: ISO 4387:2000, 3.9, modified — the term "test portion" has been replaced by "bidi test portion" and the definition has been revised.]

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