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Lighters — Safety specifications

Briquets — Spécifications de sécurité

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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

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 61, *Plastics*, Subcommittee SC 4, *Burning behaviour*.

This fifth edition cancels and replaces the fourth edition (ISO 9994:2005), which has been technically revised.

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

— Clause 2, 3.22, 3.23, subclause 4.2.2.4, subclause 4.2.3, subclause 4.2.4, subclause 4.7, subclause 6.1.2, subclause 6.11.2.2.9 and subclause 6.11.2.2.10 have been added.

— term number 3.6, subclause 4.2.2.3, subclause 4.5, subclause 5.1, subclause 5.7, Figure 4, subclause 6.3.2.7, subclause 6.7.4, subclause 6.9.3.3, subclause 6.10.4, subclause 6.12.3, subclause 7.3.1, subclause 7.4, Figure 5, Figure 7 and Annex A have been modified.

— Bibliography has been deleted.

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.

Introduction

Lighters, being flame-producing devices, can, as do all flame sources, present a potential hazard to users. The safety specifications given in this document cannot eliminate all hazards, but are intended to reduce potential hazards to users.

This document is intended to be revised periodically to consider flame height reduction for the various technologies in line with technological progress.

Lighters — Safety specifications

WARNING — Persons using this document should be familiar with normal laboratory practice, if applicable. This document does not purport to address all the safety concerns, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to determine the applicability of any other restrictions.

1 Scope

This document specifies requirements for lighters to ensure a reasonable degree of safety for normal use or reasonably foreseeable misuse of such lighters by users.

This document applies to all flame-producing products commonly known as cigarette lighters, cigar lighters and pipe lighters.

It does not apply to matches and flame-producing products intended solely for igniting materials other than cigarettes, cigars, and pipes.

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 7941, *Commercial propane and butane — Analysis by gas chromatography*

UL 1439, *Tests for Sharpness of Edges on Equipment*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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 http://www.electropedia.org/

3.1
lighter
manually operated flame-producing device, employing a petrochemical derivative as a fuel, normally used for deliberately igniting cigarettes, cigars and pipes, and which might foreseeably be used to *ignite* (3.21) materials such as paper, wicks, candles and lanterns

Note 1 to entry: Lighters are specifically not intended for use as candles or as flashlights, or for other uses requiring an extended burn time.

3.2
fluid lighter
lighter (3.1), with an exposed wick, that employs as fuel liquid hydrocarbons such as hexane whose gauge vapour pressure at 24 °C does not exceed 34,5 kPa

3.3
gas lighter
lighter (3.1) that employs as fuel liquefied hydrocarbons such as *n*-butane, isobutane and propane whose gauge vapour pressure at 24 °C exceeds 104 kPa

3.4
postmixing burner lighter
gas lighter (3.3) in which fuel is supplied for combustion and air is supplied at the point of combustion

3.5
premixing burner lighter
gas lighter (3.3) in which fuel and air are mixed before being supplied for combustion

3.6
non-refillable lighter
disposable lighter
lighter (3.1) marketed with an integral supply of fuel and that is not intended to be refilled with fuel

3.7
refillable lighter
lighter (3.1) intended to be refuelled either by transferring fuel from an external container or by inserting a new prefilled fuel reservoir

3.8
adjustable lighter
lighter (3.1) provided with a mechanism for the user to vary the *flame height* (3.13)

3.9
non-adjustable lighter
lighter (3.1) that is not provided with a user-accessible mechanism to adjust the *flame height* (3.13)

Note 1 to entry: The flame height is preset by the manufacturer.

3.10
automatically adjusting pipe lighter
lighter (3.1) characterized by an automatic increase in *flame height* (3.13) when tilted from an upright position, designed specifically for lighting pipes

3.11
self-extinguishing lighter
lighter (3.1) that, once ignited, requires continuous intentional and positive action to maintain a *flame* (3.20) and that is subsequently extinguished by the termination of such positive action

3.12
non-self-extinguishing lighter
lighter (3.1) that, once ignited, does not require intentional or positive action by the user to maintain a *flame* (3.20) and requires a subsequent deliberate user action to extinguish the flame

3.13
flame height
linear distance from the tip of the visible *flame* (3.20) to the top of the shield or, in the absence of a shield, from the tip of the visible flame to the bottom of the exposed wick or the top of the *burner valve orifice* (3.16)

3.14
shield
structure that totally or partially surrounds the *burner valve orifice* (3.16) of a *gas lighter* (3.3) or the wick of a *fluid lighter* (3.2)

3.15
burner valve
component of a *gas lighter* (3.3) which controls the release of fuel

3.16
burner valve orifice
tip of the *burner valve* (3.15) from which fuel is released

3.17
flaring
variation of *flame height* (3.13) from the steady-state flame condition

3.18
sustained self-ignition
propagation of a *flame* (3.20) by other than deliberate manual operation so as to cause the ignition element to be activated and the flame to continue to burn

EXAMPLE By dropping the lighter.

3.19
spitting
sputtering
flame phenomenon of a *gas lighter* (3.3) wherein the escape of non-evaporated liquefied gas produces a shower of burning liquid droplets which separate from the main flame

3.20
flame
result of combustion of fuel that produces heat and often light which could be visible with the naked eye under normal or subdued lighting conditions

3.21
ignite
to produce a *flame* (3.20) with a *lighter* (3.1) by activating the self-contained ignition and fuel release systems of that lighter in the intended manner

3.22
dual flame type lighter
lighter (3.1) that employs a burner valve system(s) that produces more than one type of flame (premixing and postmixing), which could be produced independently and separately (one flame type at a time), or dependently and concurrently (multiple flame types at a time)

3.23
multiple flame type lighter
lighter (3.1) that employs a burner valve system(s) that produces more than one flame of the same type of flame (premixing or postmixing), which could be produced independently and separately (one flame at a time), or dependently and concurrently (multiple flames at a time)

4 Functional requirements

4.1 Flame generation

In order to minimize the possibility of inadvertent ignition, or self-ignition, lighters shall require a deliberate manual operation to produce a flame. This operation shall conform to at least one of the following requirements:

a) positive action on the part of the user shall be required to generate and maintain a flame;

b) two or more independent actions by the user shall be required to generate a flame;

c) an actuating force equal to, or greater than, 15 N shall be required to generate a flame (see Figure 1 or Figure 2).

4.2 Flame heights

NOTE Maximum flame heights specified in this document, for both postmixing burner lighters and premixing burner lighters, are intended to be reconsidered periodically with a view to gradual reduction in line with technological progress.

4.2.1 Non-adjustable lighters

4.2.1.1 Non-adjustable fluid lighters shall not be capable of producing a flame height greater than 120 mm when tested in accordance with 6.2.

4.2.1.2 Non-adjustable, postmixing and premixing burner lighters shall not be capable of producing a flame height greater than 50 mm when tested in accordance with 6.2.

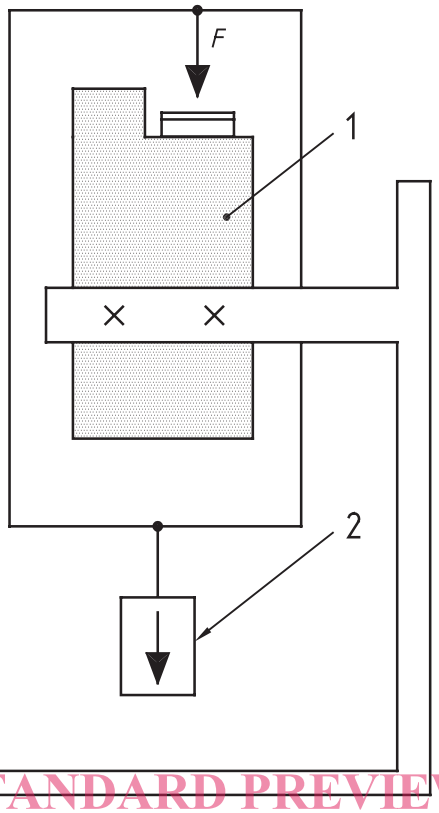
4.2.2 Adjustable lighters

4.2.2.1 For adjustable lighters as defined in 3.8, the maximum flame height that a user will obtain under different conditions of use shall comply with the following requirements when tested in accordance with 6.2.

4.2.2.2 Adjustable (refillable or non-refillable) postmixing burner lighters shall have the flame height adjusted by the manufacturer in such a manner that the lighter, when first ignited by the user — without changing the adjustment — will not produce a flame height greater than 100 mm.

4.2.2.3 Adjustable refillable postmixing burner lighters shall not be capable of producing a flame height greater than 120 mm when deliberately adjusted by the user to the manufacturer's design limit for maximum flame height.

4.2.2.4 Adjustable non-refillable postmixing burner lighters shall not be capable of producing a flame height greater than 100 mm when deliberately adjusted by the user to the manufacturer's design limit for maximum flame height.



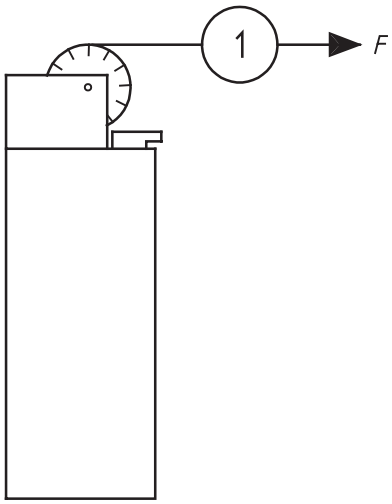
Key

1 lighter

2 mass

F flame-generation actuating force

Figure 1 — Application of flame-generation actuating force as specified in 4.1 c) — Push-button actuator



Key

1 force gauge

F flame-generation actuating force

Figure 2 — Application of flame-generation actuating force as specified in 4.1 c) — Rotary actuator

4.2.2.5 Adjustable premixing burner lighters shall have the flame height adjusted by the manufacturer in such a manner that the lighter, when first ignited by the user — without changing the adjustment — will not produce a flame height greater than 60 mm.

4.2.2.6 Adjustable premixing burner lighters shall not be capable of producing a flame height greater than 75 mm when deliberately adjusted by the user to the manufacturer's design limit for maximum flame height.

4.2.2.7 Adjustable postmixing and premixing burner lighters shall not be capable of producing a flame height greater than 50 mm when set at the lowest possible flame height.

4.2.2.8 Automatically adjusting pipe lighters shall not be capable, in any position, of producing a flame height greater than 100 mm.

4.2.2.9 The maximum attainable flame height for lighters shall be limited by pre-setting or by product design, or both.

4.2.3 Dual flame type lighter

For each type of flame of a dual flame type lighter, the flame height shall comply with the corresponding requirement for that type of flame provided in 4.2.1 or 4.2.2.

4.2.4 Multiple flame type lighter

For multiple flame type lighters, the flame height of each flame shall comply with the corresponding requirement provided in 4.2.1 or 4.2.2.

4.3 Flame-height adjustment

4.3.1 Adjustable lighters as defined in 3.8 shall require a deliberate action on the part of the user either to decrease or to increase the flame height when used in the normal manner. Adjustable lighters shall bear an indication showing the direction of movement of the adjusting mechanism required to produce a higher or lower flame.

4.3.2 On lighters whose adjusting mechanisms conform to 4.3.3 and 4.3.4, the direction of movement shall be permanently imprinted or engraved on the lighter in the vicinity of the adjusting mechanism and readily visible and understandable.

4.3.3 Gas lighters having rotary-movement flame-control actuators approximately at right-angles to the flame shall perform as follows:

a) when the flame-control actuator is at the top of the lighter and the lighter is held so that the flame is oriented vertically upward, and the user is facing the flame-control actuator, moving the actuator to the left shall produce a decrease in flame height;

b) when the flame-control actuator is at the bottom of the lighter, and the lighter is held so that the user is facing the actuator, a clockwise movement shall produce a decrease in flame height.

4.3.4 For gas lighters requiring movement of the flame-control actuator approximately parallel to the flame axis, the flame height shall decrease or increase in accordance with the direction of the movement.

4.3.5 If the flame-control actuator protrudes from the body of the lighter, it shall require a minimum actuating force of 1 N applied over the entire range of adjustment in a tangential direction (see Figure 3).