Designation: F2201 – 20

Standard Consumer Safety Specification for Utility Lighters[1]

This standard is issued under the fixed designation F2201; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This consumer safety specification covers all flame-producing consumer products commonly known as utility lighters (also known as grill lighters, fireplace lighters, lighting rods, or gas matches) and such similar devices as defined in 3.1.14. Matches are specifically excluded from this specification; flame-producing products intended for igniting cigars, pipes, and cigarettes are also specifically excluded from this safety specification and are covered in Consumer Safety Specification F400.

1.2 This specification establishes requirements for utility lighters to ensure a reasonable degree of safety for normal use and reasonably foreseeable misuse of such utility lighters by users.

1.3 Utility lighters, being flame-producing devices, as do all flame sources, present a potential hazard to the user. This specification cannot eliminate all hazards, but it is intended to minimize potential hazards of utility lighters to users.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 The following precautionary caveat pertains only to the test methods portion, Section 8, of this specification *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D2163 Test Method for Determination of Hydrocarbons in Liquefied Petroleum (LP) Gases and Propane/Propene Mixtures by Gas Chromatography

D2598 Practice for Calculation of Certain Physical Properties of Liquefied Petroleum (LP) Gases from Compositional Analysis

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2.2 *Other Standards:*

UL 1439 Test for Sharpness of Edges on Equipment[3]

ISO 7941 Commercial Propane and Butane – Analysis by Gas Chromatography[4]

16 CFR Part 1500 Federal Hazardous Substances Act Regulations[5]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *flame, n*—the result of combustion of fuel that produces heat and often light that is visible to the naked eye under normal or subdued lighting conditions.

3.1.2 *flame height, n*—a linear distance from the tip of the visible flame to the end of the shield.

3.1.3 *flaring, n*—a variance of flame height from the steady-state flame condition.

3.1.4 *fuel, n*—a butane, isobutane, propane, or other liquefied hydrocarbon, or a mixture containing any of these, whose vapor pressure at 24 °C (75 °F) exceeds a gage pressure of 103 kPa (15 lbf/in.^{2}).

3.1.5 *fuel reservoir, n*—a structure that stores the fuel prior to release.

[1] This consumer safety specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.02 on Safety Standards for Lighters.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, http://www.ul.com.

[4] Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, http://www.iso.org.

[5] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

3.1.6 *ignite, v*—to produce a flame with a utility lighter by activating the self-contained ignition and fuel release systems of that utility lighter in the intended manner.

3.1.7 *ignition system, n*—the system that generates a spark to ignite the fuel, such as a piezo mechanism or battery.

3.1.8 *nozzle, n*—the end of the fuel discharge system.

3.1.9 *postmixing burning utility lighter, n*—a gas utility lighter in which fuel and air are mixed at the point of combustion.

3.1.10 *premixing burner utility lighter, n*—a gas utility lighter in which fuel and air are mixed before being supplied for combustion.

3.1.11 *shield, n*—a structure that totally or partially surrounds the nozzle of the utility lighter.

3.1.12 *spitting or sputtering, n*—a flame phenomenon of a utility lighter wherein the escape of non-evaporated or liquid fuel produces a shower of burning liquid droplets that separate from the main flame.

3.1.13 *sustained self-ignition, n*—the propagation of a flame by other than deliberate manual operation, such as by dropping the utility lighter, so as to cause the ignition system to be activated, producing a flame, and the flame to continue to burn.

3.1.14 *utility lighter, n*—a hand-held, flame-producing device with a manually-operated ignition system, 4 in. or greater in length when in the fully extended position, employing a fuel as defined in 3.1.4, used primarily to ignite items such as candles, fuel for fireplaces, charcoal or gas-fired grills, camp stoves, lanterns, fuel-fired appliances or devices, pilot lights, or a combination of these.

3.1.14.1 *utility lighter, adjustable, n*—a utility lighter that is received by the user with a mechanism for the user to manually vary the height of the flame.

3.1.14.2 *utility lighter, dual flame, n*—utility lighter that employs a burner valve system(s) that produces more than one type of flame (premixing and postmixing), which allows for a flame to be produced independently and separately (one flame at a time), or dependently and concurrently (multiple flames at a time).

3.1.14.3 *utility lighter, multiple flame, n*—utility lighter that employs a burner valve system(s) that produces more than one flame of the same type (premixing or postmixing), which allows for a flame to be produced independently and separately (one flame at a time), or dependently and concurrently (multiple flames at a time).

3.1.14.4 *utility lighter, non-adjustable, n*—a utility lighter that has a flame height preset by the manufacturer and is not provided with a mechanism to adjust the flame height.

3.1.14.5 *utility lighter, non-refillable (disposable), n*—a utility lighter that is received by the user with a supply of fuel and that is not intended to be refueled.

3.1.14.6 *utility lighter, refillable, n*—a utility lighter that is intended to be refueled either by transferring fuel from an external container or by inserting a new prepackaged fuel reservoir.

3.1.14.7 *utility lighter, self-extinguishing, n*—a utility lighter that, once ignited, requires continuous intentional and positive action to maintain a flame and that is subsequently extinguished upon the termination of such positive action.

3.1.15 *valve, n*—the component of a utility lighter that controls the input or release of fuel.

4. General Requirements

4.1 *Flame Generation*—In order to minimize the possibility of inadvertent or self-ignition, utility lighters shall require a deliberate manual operation to produce a flame. These operations shall conform to at least one of the following requirements:

4.1.1 A system such that a positive action on the part of the user is required to generate and maintain a flame.

4.1.2 A system that requires two or more independent motions to generate a flame.

4.1.3 A system that requires an actuating force equal to or greater than 15 N (3.4 lbf) to generate a flame (see Fig. 1 for an example of test methods).

4.2 *Flame Control*—The maximum attainable flame height for utility lighters shall be limited with a setting, by product design, or by both. For adjustable flame height utility lighters, the maximum flame height that a user will obtain on first igniting the utility lighter without adjustment shall also be limited. These limits shall comply with the following requirements when tested in accordance with 8.1:

FIG. 1 Block Diagram for a Typical Example of Test Method for Measuring the Flame Generation Actuating Force as Specified in 4.1.3

4.2.1 Nonadjustable postmixing burner utility lighters, as defined in 3.1.9 and 3.1.14.4, in the user's hands shall have a maximum attainable flame height of no more than 100 mm (4 in.) with the flame directed vertically upward and when tested in accordance with 8.1.

4.2.2 Nonadjustable premixing burner utility lighters, as defined in 3.1.10 and 3.1.14.4, in the user's hands shall have a maximum attainable flame height of no more than 75 mm (3 in.) with the flame directed vertically upward when tested in accordance with 8.1.

4.2.3 Adjustable, postmixing burner utility lighters, as defined in 3.1.9 and 3.1.14.1, shall not be capable of producing a flame height greater than 150 mm (6.0 in.) with the flame directed vertically upward when deliberately adjusted by the user to the manufacturer's design limit for maximum flame height and when tested in accordance with 8.1.

4.2.4 Adjustable, premixing burner utility lighters, as defined in 3.1.10 and 3.1.14.1, shall not be capable of producing a flame height greater than 75 mm (3 in.) with the flame directed vertically upward when deliberately adjusted by the user to the manufacturer's design limit for maximum flame height and when tested in accordance with 8.1.

4.2.5 Adjustable, postmixing burner utility lighters, as defined in 3.1.9 and 3.1.14.1, shall have the flame height adjusted by the manufacturer in such a manner that the utility lighter, when first ignited by the user without changing the adjustment, will not produce a flame height in excess of 100 mm (4 in.) with the flame directed vertically upward and when tested in accordance with 8.1.

4.2.6 Adjustable, premixing burner utility lighters, as defined in 3.1.10 and 3.1.14.1, shall have the flame height adjusted by the manufacturer in such a manner that the utility lighter, when first ignited by the user without changing the adjustment, will not produce a flame height in excess of 60 mm (2.5 in.) with the flame directed vertically upward and when tested in accordance with 8.1.

4.2.7 Adjustable, postmixing burner utility lighters, as defined in 3.1.9 and 3.1.14.1, shall be capable of producing a flame not in excess of 75 mm (3 in.) with the flame directed vertically upward when set at the lowest possible flame height and when tested in accordance with 8.1.

4.2.8 Adjustable, premixing burner utility lighters, as defined in 3.1.10 and 3.1.14.1, shall be capable of producing a flame not in excess of 50 mm (2 in.) with the flame directed vertically upward when set at the lowest possible flame height and when tested in accordance with 8.1.

4.3 *Flame-Height Adjustment*—Adjustable utility lighters, as defined in 3.1.14.1, shall require a deliberate action on the part of the user either to decrease or to increase the flame height when the utility lighter is used in the normal fashion.

4.3.1 For flame-height adjustment features that protrude from the body of the utility lighter, it shall require a minimum actuating force of 1 N (0.25 lbf) applied over the entire range of adjustment in a tangential direction (see Fig. 2 for an example).

4.3.2 Adjustable utility lighters having rotary movement flame-height adjustment features approximately at right angles to the flame shall perform as follows:

4.3.2.1 When the flame-height adjustment feature of the utility lighter is held so the flame is oriented vertically upward and the user is facing the flame-height adjustment, moving the actuator to the left shall produce a decrease in flame height.

4.3.3 Adjustable utility lighters requiring motion of the flame-height adjustment feature approximately parallel to the flame axis shall decrease or increase the flame height according to the direction of the movement.

4.3.4 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.

4.3.5 Adjustable utility lighters shall indicate the direction of movement to produce a higher or lower flame height. On utility lighters the direction of movement shall be permanently imprinted or engraved on the utility lighter. Such information

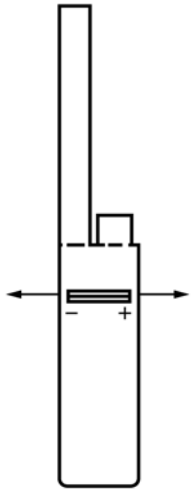

FIG. 2 Block Diagram for a Typical Example of Test Method for Measuring the Flame Height Adjustment Feature Actuating Force as Specified in 4.3.1