



Designation: F3363 – 19

Standard Specification for Unvented Liquid/Gel Fuel-Burning Portable Devices¹

This standard is issued under the fixed designation F3363; 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 These requirements apply to devices that:

1.1.1 Sustain a flame over the fuel surface in an open reservoir;

1.1.2 Sustain a flame that does not require external ventilation to remove the combustion emissions, and are therefore ventless;

1.1.3 Burn a liquid, gelled, or otherwise non-solid fuel in an open reservoir or from a disposable, non-refillable, fuel container;

1.1.4 Have a fuel capacity of 2.5 L (0.67 gal) or less;

1.1.5 Have a power output of 1.47 kW (5000 BTU/h) or less;

1.1.6 Are intended to be easily carried or moved by hand; and

1.1.7 Are intended for indoor use, outdoor use, or both.

1.2 These requirements do not apply to devices that:

1.2.1 Are candles;

1.2.2 Are intended to cook or warm food;

1.2.3 Burn solid fuels, as determined by the test method described in Test Methods [D4359](#); or

1.2.4 Do not have an open reservoir such as a refillable oil lamp, outdoor garden, or table torch intended to burn combustible fuel using a wick to sustain the flame (see [Appendix X1](#)).

1.3 This specification prescribes minimum safety requirements for devices to help ensure a reasonable degree of safety for normal use, thereby improving personal safety and reducing fires, deaths, and injuries.

1.4 This specification is not intended to replace other safety practices such as adult supervision, close monitoring of product when in use, and fire detection, alarm, or suppression systems.

1.5 The values stated in SI units are to be considered standard. The values in parentheses are explanatory or approximate information.

1.6 This specification is used to measure and describe the response of materials, products, or assemblies to heat, flame,

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and forces under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.

1.7 *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.*

1.8 *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

[D3828](#) Test Methods for Flash Point by Small Scale Closed Cup Tester

[D4359](#) Test Method for Determining Whether a Material Is a Liquid or a Solid

[E136](#) Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *candle, n*—one or more wicks supported by a material that constitutes a fuel which is solid, semi-solid, or quasi-rigid at room temperature 20 to 27°C (68 to 80°F); it can also contain additives that are used for color, scent, stability, or to modify the burning characteristics; the combined function of which is to sustain a light-producing flame.

3.1.2 *combustible liquid, n*—a liquid that has a flashpoint at or above 60°C (140°F), as determined by the test method described in Test Methods [D3828](#).

3.1.3 *flammable liquid, n*—a liquid that has a flashpoint below 60°C (140°F), as determined by the test method described in Test Methods [D3828](#).

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.

3.1.4 *fuel, n*—a material that is burned to produce light, heat, or power.

3.1.5 *fuel-burning feature, n*—a component intended to contain fuel and intended to produce a flame.

3.1.5.1 *Discussion*—Examples of fuel-burning features include non-refillable canisters, refillable canisters with wicks, and integral fuel reservoirs with wicks.

3.1.6 *integral fuel reservoir with a wick, n*—fuel reservoir with an installed wick or wick media that is part of the device that fuel can be poured into and is designed to allow the fuel to burn.

3.1.7 *noncombustible material, n*—a material that will not combust or ignite under usage conditions.

3.1.7.1 *Discussion*—Materials that pass Test Method E136 are considered noncombustible.

3.1.8 *non-refillable canister, n*—a replaceable fuel container that is intended to allow the fuel supplied within the container to burn, then be discarded upon complete consumption of the fuel.

3.1.8.1 *Discussion*—A non-refillable canister may include a wick.

3.1.8.2 *Discussion*—A non-refillable canister is one that is intended to be disposed of after use and not refilled.

3.1.9 *non-removable wick, n*—a wick or wick media within a fuel burning feature that cannot be removed without the use of tools.

3.1.10 *open reservoir, n*—a reservoir intended to contain fuel that is not enclosed.

3.1.11 *refillable canister with a wick, n*—a replaceable fuel container with an installed wick or wick media that is required for the fuel to burn.

3.1.12 *wick, n*—a piece of material that draws up fuel to flame by capillary action.

3.1.13 *wick media, n*—a volume-filling material that draws up fuel to a flame by capillary action.

4. Requirements

4.1 General Requirements:

4.1.1 When tested in accordance to 5.1, water shall not be able to accumulate in any location in the device that is intended to support or hold a fuel burning feature, except:

4.1.1.1 If the device only uses pourable combustible liquid, is labeled accordingly, and the device has a fuel-burning feature with a non-removable wick.

4.1.1.2 If the device sustains a flame apart from the refueling area, the refueling area is a separate location from the flame and at least a distance of 7.5 cm (3 in.).

4.1.2 Devices shall be made of noncombustible material, or combustible materials with a physical barrier or other technology that completely prevents the flame from coming into contact with the combustible materials.

4.1.3 The device shall be supplied with a means of completely covering the fuel surface such that the flame will permanently extinguish within 10 seconds.

NOTE 1—A detached snuffer capable of permanently extinguishing the flame in 10 seconds is sufficient to meet this requirement.

4.2 Devices labeled or intended for use indoors when tested in accordance to 5.2:

4.2.1 Shall have a room dry oxygen concentration at or above 19.5 V% for the duration of the test.

4.2.2 Shall have a room carbon monoxide concentration at or below 50 ppm for the duration of the test.

4.3 All devices when tested in accordance to the Static Stability test, 5.3:

4.3.1 Shall not tip over in any position tested.

4.3.2 Shall not spill liquid in any position tested.

5. Test Methods

5.1 Liquid Accumulation Test:

5.1.1 *Test Summary*—Water is poured in all locations of the device that would typically hold a flame. This test evaluates whether the device can accumulate fluids.

5.1.2 *Hazards*, [reserved].

5.1.3 *Apparatus*:

5.1.3.1 A means of pouring water.

5.1.3.2 A leveled and permeable surface.

5.1.3.3 A collector basin.

5.1.3.4 A method to measure water quantity.

5.1.4 *Procedure*:

5.1.4.1 In accordance to the manufacturer's instructions, place the device on a leveled and permeable surface.

5.1.4.2 Place a sufficiently large collector basin below the device and permeable surface.

5.1.4.3 Identify all fuel burning areas, locations in the device intended to support a fuel burning feature.

5.1.4.4 Select one of the locations identified in 5.1.4.3.

5.1.4.5 Determine the amount of water to pour by using a volume equivalent to the manufacturer's maximum recommended reservoir fuel volume.

5.1.4.6 Pour the water into the selected fuel burning area.

5.1.4.7 Wait 30 seconds and measure the amount of water in the basin.

5.1.4.8 Repeat 5.1.4.5 to 5.1.4.7 until all identified locations in 5.1.4.3 are tested.

5.1.5 *Calculation of Results*—The device is considered to accumulate water if less than 85 % of the water accumulates in the basin after pouring into any fuel burning area.

5.2 Indoor Usage Test:

5.2.1 *Test Summary*—The device is placed in a sealed room and operated until the fuel is completely combusted. The dry oxygen and carbon monoxide concentrations are monitored at three locations and averaged together.

5.2.2 *Hazards—Warning*—There is an inherent risk when working with and around open flames and in the presence of products of combustion.

5.2.2.1 Use appropriate personal protective equipment.

5.2.2.2 Ensure the flame is out and the fuel burning feature is cool before refueling the device.

5.2.2.3 Keep fire suppression equipment capable of mitigating the potential fire situations readily available.

5.2.2.4 Only enter confined spaces with products of combustion after the confined space has been fully ventilated and the air is safe to breathe.