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## Standard Specification for Portable Gasoline, Kerosene, and Diesel Containers for Consumer Use<sup>1</sup>

This standard is issued under the fixed designation F852/F852M; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

### 1. Scope

1.1 This specification establishes performance requirements for portable gasoline, kerosene, and diesel containers intended for reuse by the consumer. This specification also covers reusable containers for gas/oil mixtures commonly used for two-cycle engines and reusable dual-compartment containers for separate gas and oil storage.

1.2 This specification is not a fire hazard standard, but a specification for portable gasoline, kerosene, and diesel containers for consumer use.

1.3 This specification defines performance requirements for systems that can effectively reduce fuel spillage and emissions when used in accordance with the manufacturer's (marked) warnings, operating instructions, and limitations of use. This specification does not provide assurance that systems meeting the requirements are suited to all fueling applications and conditions.

1.4 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems has the potential to result in non-conformance with the standard.

1.5 The following precautionary caveat applies only to the Test Method portion, Section 7, 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.* See Section 6 for additional precautionary information.

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:<sup>2</sup>

- A370 Test Methods and Definitions for Mechanical Testing of Steel Products
- B117 Practice for Operating Salt Spray (Fog) Apparatus
- D471 Test Method for Rubber Property—Effect of Liquids
- D638 Test Method for Tensile Properties of Plastics

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.10 on Standards for Flammable Liquid Containers.

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<sup>2</sup> 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.

D975 Specification for Diesel Fuel  
D999 Test Methods for Vibration Testing of Shipping Containers  
D2561 Test Method for Environmental Stress-Crack Resistance of Blow-Molded Polyethylene Containers  
D3699 Specification for Kerosene  
D4814 Specification for Automotive Spark-Ignition Engine Fuel  
D5798 Specification for Ethanol Fuel Blends for Flexible-Fuel Automotive Spark-Ignition Engines  
F839 Specification for Cautionary Labeling of Portable Gasoline, Kerosene, and Diesel Containers for Consumer Use  
F2517 Specification for Determination of Child Resistance of Portable Fuel Containers for Consumer Use  
F3326 Specification for Flame Mitigation Devices on Portable Fuel Containers  
G153 Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials  
G155 Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials

2.2 *ANSI Standard*.<sup>3</sup>

B71.1b1977 Supplement to Safety Specifications for Power Lawn Mowers, Lawn and Garden Tractors, and Lawn Tractors

### 3. Terminology

#### 3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *container, n*—main vessel of the PFC, intended to hold and carry fuel, including components permanently affixed to it and excluding removable spouts, closures, and other components.

3.1.2 *closure, n*—any combination of components that functionally seals any intended opening and prevents the stored fuel from escaping during storage and transport.

3.1.3 *diesel, n*—hydrocarbon/FAME mixture obtained from petroleum distillation and/or biomass processing, which may contain up to 20 % Bio Diesel, such as specified in Specification D975.

3.1.4 *filling opening, n*—opening intended to be used for the addition of fuel to the PFC, which may also be the same opening used for pouring.

3.1.5 *flame mitigation device, FMD, n*—device permanently installed in a container to prevent the propagation of an external ignition into the PFC.

3.1.6 *gasoline, n*—a hydrocarbons/alcohol mixture obtained from petroleum distillation and/or biomass processing, generally containing small amounts of additives, suitable for use as a fuel in spark-ignition, internal combustion engines per specifications such as Specification D4814 or D5798 (which may contain up to 85 % alcohol oxygenates, typically ethanol).

3.1.7 *kerosene, n*—hydrocarbon mixture obtained from petroleum distillation as specified in Specification D3699.

3.1.8 *portable fuel container, PFC, n*—single- or multi-compartment vessel intended for use by consumers to transport gasoline, gas/oil mixtures (or separate compartments of gas and oil), diesel, or kerosene from their distribution points to the consumer's storage and use points, including all of the components intended for use on or with the container including those supplied by manufacturers other than the PFC manufacturer.

3.1.9 *pouring spout, n*—component through which the contents of the PFC can be dispensed.

3.1.10 *pouring vent, n*—part of the PFC enabling free entry of air to replace the liquid being poured out.

3.1.11 *rated capacity, n*—volume indicated on the PFC; may also be termed nominal capacity or maximum filling level.

3.1.12 *total volume, n*—rated capacity plus any remaining space within the PFC.

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<sup>3</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

## 4. Requirements

4.1 *General*—The complete portable fuel container (PFC) system shall show evidence of good workmanship and meet the following requirements:

4.1.1 All PFC tests shall be conducted after closures are secured with torque values specified in [Table 1](#).

4.2 *Color*—The PFCs intended for gasoline shall be predominately red in color. PFCs intended for kerosene shall be predominantly medium blue in color. PFCs intended for diesel containers shall be predominantly medium yellow in color. Pigments, coatings, or other means used to impart color shall not be affected by the intended fuel.

4.3 *Capacity*—The PFC rated capacity shall be a maximum of 25 L [6.6 gal].

4.3.1 The total volume shall exceed the rated capacity by at least 5 %.

4.3.2 Capacity shall be determined with the container and its contents at 23.5 °C ± 2.5 °C [74.5 °F ± 4.5 °F].

4.4 *Flame Mitigation*—In accordance with Specification [F3326](#), a flame mitigation device shall be provided in each PFC opening.

4.5 *Child Resistance*—In accordance with Specification [F2517](#), closures of each PFC opening shall be child resistant.

4.6 *Stability*—The PFC shall not upset when tested in accordance with [7.1](#).

4.7 *Handle*—The PFC shall be provided with a handle. The PFC shall not leak when tested in accordance with [7.2](#).

4.8 *Drop Strength*—The complete PFC system shall not leak when tested in accordance with [7.3](#).

4.9 *Internal Pressure*—The PFC container shall not leak (bubble on the container) when tested in accordance with [7.4](#) at 207 kPa [20 psi] with closures installed.

4.10 *Heat Resistance*—The PFC container shall not leak when tested in accordance with [7.10](#). Any burning that occurs shall not continue for more than 5 s after the heat source is removed; self-extinguish without causing the PFC to leak.

4.11 *Permeability*—The filled PFC shall not have a weight loss greater than 1 % when tested in accordance with [7.6](#).

NOTE 1—Compliance with more stringent regulatory requirements (for example, from the California Air Resource Board (CARB) or the Environmental Protection Agency (EPA)) is acceptable proof of meeting the permeability requirement.

4.12 *Durability*:

4.12.1 *Container Material Fuel Resistance*—The PFC container material shall show no pitting, crazing, softening, bubbling, cracking, tackiness, or decomposition and the material shall retain at least 70 % of its tensile yield strength when tested in accordance with [7.7.1](#).

4.12.2 *PFC Fuel Resistance*—There shall be no evidence of deterioration or leakage of the pouring spout and closures when tested in accordance with [7.7.2](#).

4.12.3 *Stress Cracking*—The PFC container, if made of blow molded polyethylene, shall not crack in 120 h when tested in accordance with [7.8](#).

**TABLE 1 Torque Requirements**

Outer Diameter of Closure	Closing Torque, Nm [lb·in.]
Less than 51 mm [2 in.]	2.8 [25]
51 mm [2 in.] and greater	5.6 [50]

4.12.4 *Corrosion Resistance*—This requirement applies only to metal PFCs or metal components of a PFC. No leakage shall be evident when tested in accordance with 7.9.

4.12.5 *Aging*—The material of a plastic PFC container shall retain at least 70 % of its original tensile strength when tested in accordance with 7.5 (7.5.1 and 7.5.2).

4.13 *Openings and Closures*—All openings in PFCs shall be provided with a means of closure. Closures shall not leak when tested in accordance with 7.11.

4.13.1 *Filling Opening*—The opening intended for filling the PFC shall have a minimum inside diameter of 31.7 mm [1.25 in.].

4.13.2 *Pouring Vent*—The PFC shall be provided with a vented pouring spout or other means for venting the container during pouring.

4.13.3 *Pouring Spout*—The opening intended for pouring shall have a pouring spout designed to permit gasoline, kerosene, or diesel to pour without leakage. PFCs shall not leak when tested in accordance with 7.12.

NOTE 2—Compliance with alternative regulatory requirements, for example from the California Air Resource Board (CARB) or the Environmental Protection Agency (EPA), is acceptable proof of meeting the requirement in 4.13.3.

## 5. Markings

5.1 The PFC shall be labeled in accordance with Specification F839.

5.2 The PFC shall be clearly marked with at least one of the following:

5.2.1 The manufacturer's name,

5.2.2 The private labeler's name, and

5.2.3 An identifying symbol.

5.3 The PFC shall be marked with its rated capacity in litres and in U.S. gallons.

5.4 Marking durability shall comply with the applicable requirements of ANSI B71.1b1977.

5.5 Additional markings, for example, as required by other authorities, are permitted.

## 6. Precautions

6.1 Flammable and combustible fuels are used in some of the following tests. Cautionary standards for handling and disposal of hazardous materials need to be observed. Do not open containers containing fuel in the presence of an open flame or other source of ignition.

## 7. Test Methods

7.1 *Stability Test*—Fill a sample PFC with water at  $23.5\text{ }^{\circ}\text{C} \pm 2.5\text{ }^{\circ}\text{C}$  [ $74.5\text{ }^{\circ}\text{F} \pm 4.5\text{ }^{\circ}\text{F}$ ] to its rated capacity by volume. Secure the closures as in transportation and storage. Place the PFC in its intended storage orientation with its base on an inclined plane forming an angle of  $20^{\circ}$  with the horizontal. During the test, rotate the PFC about its vertical axis so that stability can be checked with the sample facing any direction. Test at  $90^{\circ}$ ,  $180^{\circ}$ ,  $270^{\circ}$ , and  $360^{\circ}$ . Test in each orientation for 1 min.

7.2 *Handle Strength*—Fill a sample PFC with an equivalent weight of water at  $23.5\text{ }^{\circ}\text{C} \pm 2.5\text{ }^{\circ}\text{C}$  [ $74.5\text{ }^{\circ}\text{F} \pm 4.5\text{ }^{\circ}\text{F}$ ] to its rated fuel capacity. Secure the closures as intended for transportation and storage. One end of a 9.5 mm [0.375 in.] diameter manila rope about 2 m [6.5 ft] long shall be secured to a rigid point of suspension and the other end attached so as to distribute the load across the container handle. Suspend the PFC from the rope for 1 min, then raise it 305 mm [12 in.] from the suspended position and allow it to fall freely.