



Designation: F2517 – 22<sup>ε1</sup>

# Standard Specification for Determination of Child Resistance of Portable Fuel Containers for Consumer Use<sup>1</sup>

This standard is issued under the fixed designation F2517; 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.

<sup>ε1</sup> NOTE—Subsections 5.6.3, 5.6.10, 5.6.12, and X3.1 were corrected editorially in August 2022.

## 1. Scope

1.1 This specification establishes recognized requirements for determining the child resistance of portable fuel containers (PFCs) and other types of portable containers intended for use by consumers to hold, store, and transport liquid fuels such as gasoline, kerosene, and diesel.

1.1.1 “Portable Fuel Container” is defined in Specification F852 and includes the receptacle for gasoline, kerosene, or diesel fuel as well as spouts, caps, and other closure mechanisms and components for use with or on portable gasoline, kerosene, or diesel receptacles.

1.1.2 This specification is also applicable to spouts, caps, or other closure mechanisms sold separately for use with or on a fuel container.

1.1.3 This specification does not cover one-time use portable emergency fuel containers conforming to Specification F2874.

1.2 This standard addresses the effectiveness of the child resistance (CR) device only after closure cycling, but does not address closure effectiveness:

- 1.2.1 When at high or low temperatures,
- 1.2.2 After thermal aging of polymers,
- 1.2.3 After exposure to sunlight,
- 1.2.4 After exposure to intended fuels, and
- 1.2.5 After physical abuses, such as drops or impacts.

NOTE 1—Please see Appendix X2 for additional information on these exemptions.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *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.*

1.5 *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>

- D3475 Classification of Child-Resistant Packages
- F852 Specification for Portable Gasoline, Kerosene, and Diesel Containers for Consumer Use
- F2874 Specification for One Time Use Portable Emergency Fuel Containers (PEFC) for Use by Consumers

### 2.2 CSA Standards:<sup>3</sup>

- B376 Portable containers for gasoline and other petroleum fuels

## 3. Terminology

### 3.1 Definitions:

3.1.1 *dispensing system, n*—a component, or a combination of components, used for dispensing fuel from a container.

3.1.2 *closure, n*—any combination of components, including dispensing system components, that functionally seal any intended opening and prevents the stored fuel or its vapors from escaping during transportation and storage.

3.1.3 *filling opening, n*—opening intended to be used for the addition of fuel to the container which may also be the same opening used for dispensing fuel.

3.1.4 *portable fuel container (PFC), n*—a single or multi-compartment vessel intended for use by consumers to transport

<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.

Current edition approved June 1, 2022. Published July 2022. Originally approved in 2005. Last previous edition approved in 2017 as F2517 – 17. DOI: 10.1520/F2517-22E01.

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

<sup>3</sup> Available from Canadian Standards Association (CSA), 178 Rexdale Blvd., Toronto, ON M9W 1R3, Canada, <http://www.csagroup.org>.

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 vessel including those supplied by manufacturers other than the PFC manufacturer.

## 4. Requirements

### 4.1 General Requirements:

4.1.1 Containers that share similar designs but vary in only color or size, up to a maximum of 32 L (8.45 U.S. gal) rated capacity, shall be considered a container family.

NOTE 2—Aspects which should be common in a container family include similar positioning of child resistance features on the receptacle, design of the child resistance features, gasket material and design and specification of O-rings and seals.

4.1.2 *Test Articles*—Child resistance testing in accordance with Section 5 shall be performed using the smallest container size of the container family and adult use testing in accordance with Section 6 shall be performed using the largest container size of the container family. Test articles shall be new containers and each test article may be used for testing up to five (5) panel participants. Test articles shall be handled so that no damage or jarring will occur during storage or transportation and shall be at room temperature ( $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$  ( $73.4^{\circ}\text{F} \pm 5.4^{\circ}\text{F}$ ) when testing is performed.

4.1.3 *Aftermarket Parts*—Spouts, caps, or other closure mechanisms or components sold separately for use with or on a container shall be demonstrated to comply with this specification for each container or container family for which the parts are identified as compatible.

### 4.2 Child Resistance Requirements:

4.2.1 *Without Demonstration*—Container closures shall achieve not less than 85 % child resistance effectiveness when tested in accordance with Section 5 in the first 5-min test period preceding the demonstration of the proper means of opening the designated closure.

4.2.2 *With Demonstration*—Container closures shall achieve no less than 80 % child resistance effectiveness when tested in accordance with Section 5 in the second 5-min test period following the demonstration of the proper means of opening the designated closure.

4.3 *Adult Functional Requirement*—Containers shall have an adult-use effectiveness (AUE) of not less than 90 % for the adult panel test of Section 6.

## 5. Child Resistance Test Procedure

### 5.1 General:

#### 5.1.1 Child Resistance Test Parameters:

5.1.1.1 Test each child resistance feature using a panel of at least 50 children and up to 200 children.

5.1.1.2 Test containers with multiple child resistance features with each feature accessible at the same time as would be the likely scenario that a child would encounter the container.

5.1.1.3 Test with a child panel for each configuration of the container for those containers where the configuration intended for storage and transportation is different from the configuration for dispensing (for example, when the spout is stored under the filling opening closure and attached for pouring). If the CR feature (for example, the filling opening closure) is the same for both configurations, then test the filling opening closure in the configuration intended for transportation and storage and the dispensing system in the configuration for dispensing.

#### 5.1.2 Test Environment:

5.1.2.1 Conduct the testing in a location that is familiar to the children, for example their customary nursery school. Alternatively, conduct the testing at a central location after making the children comfortable in that location.

5.1.2.2 Conduct the testing in a test area that is well-lit and where the children are isolated from all distractions.

5.1.2.3 An individual tester shall not conduct testing with more than 30 % of the of the child test panel.

5.1.2.4 Record all data, except the timing of the testing, before or after the conduct of the test to allow the tester's full attention to be on the children during the test period.

#### 5.2 Child Resistance Test Panel:

5.2.1 Use from 1 to 4 groups of 50 children, as required under the sequential testing criteria in Table 1.

5.2.2 Document consent for each child participating in the testing, at the child or site level. If the testing is conducted at a central location, a consent form (Appendix X4) shall be completed for each child participating in the testing.

5.2.3 Ensure the geographical diversity of the panel participants using one of the following criteria:

5.2.3.1 Test no more than 20 % of child test panel participants at a single site.

5.2.3.2 Select no more than 20 % of the child test panel participants from a single geographical indicator (such as zip code, postal code, city or town) if testing is conducted at a central location.

5.2.4 Select each group of children to meet the following criteria:

(a) Select children without an obvious or overt physical or mental disability.

(b) Test with 30 % of the children in each group between the ages of 42 to 44 months.

**TABLE 1 Number of Test Failures**

| Test Panel | Cumulative Number of Children | Test Failures |          |      |             |          |      |
|------------|-------------------------------|---------------|----------|------|-------------|----------|------|
|            |                               | First 5 min   |          |      | Full 10 min |          |      |
|            |                               | Pass          | Continue | Fail | Pass        | Continue | Fail |
| 1          | 50                            | 0 – 3         | 1 – 10   | 11+  | 0 – 5       | 6 – 14   | 15+  |
| 2          | 100                           | 4 – 10        | 11 – 18  | 19+  | 6 – 15      | 16 – 24  | 25+  |
| 3          | 150                           | 11 – 18       | 19 – 25  | 26+  | 16 – 25     | 26 – 34  | 35+  |
| 4          | 200                           | 19 – 30       | ...      | 31+  | 26 – 40     | ...      | 41+  |