Designation: ~~F2517 – 17~~ F2517 – 22

Standard Specification for Determination of Child Resistance of Portable Fuel Containers for Consumer Use[1]

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.

1. Scope

1.1 This specification establishes recognized requirements for determining the child resistance of portable ~~gasoline, kerosene, and diesel~~ fuel containers (PFCs) and other types of portable containers intended for use by ~~consumers. This specification does not cover single-trip prepackaged containers.~~consumers to hold, store, and transport liquid fuels such as gasoline, kerosene, and diesel.

1.1.1 ~~"Containers" as defined herein means~~"Portable Fuel Container" is defined in Specification F852 and includes the receptacle for gasoline, kerosene, or diesel ~~fuel, including its spouts, retrofit spouts, caps~~ fuel as well as spouts, caps, and other closure mechanisms and components ~~intended for use by consumers. If any such spout, retrofit spout, cap or other closure mechanism is sold separately for use~~ for use with or on portable gasoline, kerosene, or diesel ~~receptacles, it must be designed to and function in compliance with this specification when installed on any such receptacle.~~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 specification includes gas/oil mixtures as commonly used for two-cycle engines.~~

~~1.3 This specification includes single- and multi-compartment containers.~~

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.

[1] 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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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:*[2]

D3475 Classification of Child-Resistant Packages

F852 Specification for Portable Gasoline, Kerosene, and Diesel Containers for Consumer Use

~~F976~~F2874 Specification for ~~Portable Kerosene and Diesel Containers for Consumer Use~~One Time Use Portable Emergency Fuel Containers (PEFC) for Use by Consumers ~~(Withdrawn 2017)~~

2.2 ~~*CARB Documents:*~~*CSA Standards:*[3]

~~CP-501~~B376 ~~Certification Procedure 501 For Portable Fuel Containers And Spill-Proof Spouts~~Portable containers for gasoline and other petroleum fuels

~~TP-501 Test Procedure for Determining Integrity of Spill-Proof Spouts and Spill-Proof Systems~~

~~TP-502 Test Procedure for Determining Diurnal Emissions from Portable Fuel Containers~~

~~2.3 *Other Document:*~~

~~40 CFR 59.623 What must I include in my application?~~[5]

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 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 ~~and closures shall first meet all requirements of Specifications~~that share similar designs but vary in only color ~~F852~~ andor size, ~~F976 where applicable, and also those feasible and appropriate test requirements of CARB CP-501, TP-501, TP-502, and EPA Regulation 40 CFR 59.623, capable of being adapted to portable fuel containers having CR closures, including~~

[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] The last approved version of this historical standard is referenced on www.astm.org.~~

[3] Available from ~~California Air Resources Board, 1001 "I" Street, Sacramento, CA 95814, http://www.arb.ca.gov.~~Canadian Standards Association (CSA), 178 Rexdale Blvd., Toronto, ON M9W 1R3, Canada, http://www.csagroup.org.

~~ultraviolet (UV) exposure (5.13.1) and immersion (5.11) tests of the closures.~~ 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*—~~Containers, components, and closures~~ Child resistance testing in accordance with Section 5 shall be ~~new with container one-quarter full of water for~~ performed using the smallest container size of the container family and adult use testing in accordance with ~~Sections~~Section ~~4~~6 shall be performed using the largest container size of the container family. Test articles shall be new containers and ~~5.~~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 °C ± 3 °C (73.4 °F ± 5.4 °F) when testing is performed.

~~3.1.3 Individual containers, closed with closures shall be tested as described in Section 4 after having been subjected, in sequence, to:~~

~~3.1.3.1 Low-temperature exposure at 0°F (−17.8°C) for 8 h.~~

~~3.1.3.2 Elevated temperature exposure at 140°F (60°C) for 8 h.~~

~~3.1.3.3 Opening and closing of each closure for 250 cycles.~~

~~3.1.4 Containers shall then be inverted and inspected visually before and after testing to determine any leakage. Containers indicating leakage shall not be used in further testing.~~

4.1.3 *Aftermarket Parts*—~~Containers tested by the methods described in Sections~~Spouts, caps, or other closure mechanisms or components ~~4 and~~sold separately ~~5 shall meet the following specifications:~~ 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.

~~3.1.5.1 Child-resistant effectiveness for each and every closure on a container of not less than 85 %, without a demonstration, and not less than 80 % after a demonstration, of the proper means of opening when 200 children are tested per closure.~~

~~3.1.5.2 *Senior Adult Test*—Containers shall have a senior adult-use effectiveness (SAUE) of not less than 90 % for the senior adult panel test of Section 5 for all closures of the container.~~

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 ~~For testing in accordance with Section 4, containers with multiple closures shall have each closure accessible at the same time as would be the likely scenario that a child would encounter the closure.~~*Child Resistance Test Parameters:*

5.1.1.1 ~~However, for each closure, test~~ Test each child resistance feature using a panel of at least 50 ~~children,~~children and up to 200 ~~children, using a demonstration for that closure.~~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 ~~If the container is stored in a different configuration than when it is being used, test~~ Test with a child panel for each configuration ~~in which it is possible the package will be encountered. (For example, if~~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 ~~in the container and then the spout is attached for use, test it once with the spout out and once with the spout in, with the demonstration appropriate for that configuration.)~~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.

~~4.1.1.3 A failure shall be accessing the liquid using any of the openings, regardless of which opening was demonstrated.~~

5.1.2 ~~Reclosable containers, if assembled by the testing agency, shall be properly secured at least 72 h before beginning the test to allow the materials (for example, the closure liner) to "take a set." Torque-dependent closures shall be secured at the same torque as applied normally by adult consumers. The torque value shall be recorded. Document the method to arrive at the torque value.~~*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.

~~4.1.3 All containers shall be handled so that no damage or jarring will occur during storage or transportation.~~

~~4.1.4 The containers shall be tested at room temperature (23 ± 3°C).~~

5.2 ~~*Child-Resistant Test (Test Subjects/Selection Criteria):*~~ *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 ~~Use from 1 to 4 groups of 50 children, as required under the sequential testing criteria in~~ Document consent ~~Table 1. Consent shall be documented~~ 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.

TABLE 1 Number of ~~Closure Openings: Acceptance (Pass), Continue Testing, and Rejection (Fail) Criteria for the First 5 min and the Full 10 min of the Children's Protocol Test~~

~~Test Panel~~	~~Cumulative Number of Children~~	~~Closure Openings~~					
		~~First 5 min~~			~~Full 10 min~~		
		~~Pass~~	~~Continue~~	~~Fail~~	~~Pass~~	~~Continue~~	~~Fail~~
~~1~~	~~50~~	~~0–3~~	~~4–10~~	~~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+~~

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+

5.2.3 ~~No more than 20 % of the children tested for each closure shall be tested at one site. To assure geographical diversity if testing is completed at a central location, no more than 20 % of the children shall be drawn from a single ZIP code, city, or town.~~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.

~~4.2.3 Each group of children shall be randomly selected as to age, subject to the limitations set forth below.~~

~~4.2.4 Thirty percent of the children in each group shall be of age 42 to 44 months, 40 % of the children in each group shall be of age 45 to 48 months, and 30 % of the children in each group shall be of age 49 to 51 months.~~

5.2.4 ~~The children's ages in months shall be calculated as follows:~~Select each group of children to meet the following criteria:

~~4.2.5.1 Arrange the birth date and test date by the numerical designations for month, day, and year (for example, test date: 8/3/1990; birth date: 6/23/1986).~~

(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.

(c) Test with 40 % of the children in each group between the ages of 45 to 48 months.

(d) Test with 30 % of the children in each group between the ages of 49 to 51 months.

(e) The difference between the number of boys and the number of girls in each age range shall not exceed 10 % of the number of children in that range.

~~4.2.5.2 Subtract the month, day, and year numbers for the birth date from the respective numbers for the test date. It is possible that this will result in negative numbers for the months or days.~~

~~4.2.5.3 Multiply the difference in years by 12 to obtain the number of months in the difference in years and add this value to the number of months that was obtained when the birth date was subtracted from the test date (that is, 4 × 12 = 48; 48 + 2 = 50). This figure either will remain the same or be adjusted up or down by one month, depending on the number of days obtained in the subtraction of the birth date from the test date.~~

~~4.2.5.4 If the number of days obtained by subtracting the days in the birth date from the days in the test date is +16 or more, one month is added to the number of months obtained above. If the number of days is −16 or less, subtract 1 month. If the number of days is between −15 and +15 inclusive, no change is made in the number of months. Thus, for the example given above, the number of days is −20 and the number of months is therefore 50 − 1 = 49 months.~~

5.2.4.1 ~~The difference between the number of boys and the number of girls in each age range shall not exceed 10 % of the number of children~~Calculate the age of each child as described in Appendix X5~~that range. Select children without an obvious or overt physical or mental handicap.~~.

5.2.5 Ensure that the panel participants are not offered a reward or led to believe that a reward will be provided.

5.3 ~~*Child-Resistant Tests (Test Failures)—*~~*Test Article Preparation:* ~~A test failure shall be any child who opens the closure or gains access to the container's contents.~~

5.3.1 Fill each test article to between 15 % and 35 % of its rated capacity with water, secure the closures, and invert to check for leakage. If leakage occurs, the closures may be resecured and the test repeated. Do not conduct testing with containers that exhibit leakage.

5.3.2 Empty each test article and condition it as follows:

5.3.2.1 *Low-temperature Exposure*—Soak continuously at 0 °F (–17.8 °C) for 8 h.

5.3.2.2 *Elevated Temperature Exposure*—Soak continuously at 140 °F (60 °C) for 8 h.

5.3.2.3 *Closure Cycling*—Open and close each 250 times.

5.3.3 Fill each test article to between 15 % and 35 % of its rated capacity with water, secure the closures, and invert to check for leakage. If leakage occurs, the closures may be resecured and the test repeated. Do not conduct testing with containers that exhibit leakage.

5.4 *Child-Resistance Sequential ~~Test~~—Test Procedure:* ~~The sequential test is initially conducted using 50 children, and depending on the results, the criteria in Table 1 determines whether the container is either child resistant or not child resistant or whether further testing is required. Further testing is required if the results are inconclusive and involves the use of one or more additional groups of 50 children each, up to a maximum of 200 children. No individual shall administer the test to more than 30 % of the children tested in each group. Table 1 gives the acceptance (pass), continue testing, and rejection (fail) criteria to be used for the first 5 min and the full 10 min of the children's test. If the test continues past the initial 50-child panel, the container openings shown in Table 1 are cumulative.~~

5.4.1 *Sequential Test*—Groups of 50 children are tested sequentially, up to a maximum of 200 children, to establish that the child-resistance requirements (4.2) are met with high certainty. Testing is continued with a new group when the number of test failures observed during the testing in accordance with 5.5 fall in the 'continue' range of values in Table 1. When the cumulative number of test failures in the first 5 min of testing is below the values given in the inconclusive range in Table 1, the container has shown 85 % child resistance effectiveness without demonstration. When the cumulative number of test failures in the full ten minutes below the values given in the inconclusive range in Table 1, the container has shown 80 % child resistance effectiveness with demonstration.

5.4.2 *Child Resistance Test Failure*—A test failure occurs when the child accesses the liquid from any closure, regardless of which closure was designated and demonstrated. For closures that close automatically, access means dispensing liquid. For closures that do not close automatically, access means opening the closure.

5.4.3 Eliminate the pair of children from the test results if a test has been stopped due to a risk of danger (per 5.6.7).

5.4.4 Include the tests result of a child who has refused to participate (per 5.6.8).

5.5 *Test ~~Procedures~~—Procedures:* ~~The children shall be divided into groups of two. The testing shall be done in a location that is familiar to the children, for example, their customary nursery school. No child shall test more than two closures. When more than one closure is being tested, each closure shall be dissimilar, and they shall be presented to the paired children in random order. This order shall be recorded. The children shall be tested by the procedure incorporated in the following test instructions:~~

5.5.1 ~~Alternatively, testing at a central location after the children are made comfortable in that location shall~~ Test the children in pairs following the child test instructions in 5.6~~be allowed.~~. Test no more than 2 closures, which must have a different functional design and be on a different type of container. Present each container to the paired children in random order and record the order.

NOTE 3—Refer to Classification D3475 for guidance on functional design of CR closures.

5.5.2 Use a timing device (such as a stopwatch) to time the number of seconds it takes the child to open the container and to time the 5-min test periods.

5.6 ~~*Detailed Standardized*~~ *Child Test Instructions:*

~~4.6.1 The children shall have no overt physical or mental handicaps. No child with a permanent or temporary illness, injury, or handicap that would interfere with his/her effective participation shall be included in the test.~~

~~4.6.2 The testing shall take place in a well-lit location that is or becomes familiar to the children and is isolated from all distractions.~~

5.6.1 ~~The tester, or another adult, shall escort a~~ Escort the pair of children to be tested to the test ~~area. The tester shall~~ area and have the tester seat the ~~two children so that there is~~children on the ground with no visual barrier between the children and the tester.

~~4.6.4 The tester shall talk to the children to make them feel at ease.~~

5.6.2 ~~The children shall not be given the~~ Have the tester talk to the children to make them feel at ease. Avoid giving the children the impression that they are in a race or ~~contest. They are not to be told~~ contest or that the test is a game or that it is fun. ~~They are not to be offered a reward.~~

~~4.6.6 The tester shall record all data before, or after, the test so that full attention can be on the children during the test period.~~

~~4.6.7 The tester shall use a stopwatch(s) or other timing devices to time the number of seconds it takes the child to open the container and to time the 5-min test periods.~~

5.6.3 ~~To begin the test, the tester shall hand the children identical containers, indicate~~ Begin the first 5 min test period by handing each child an identical test article and indicating by gesture which ~~opening is being tested and say, "~~closure is the designated closure for this~~Please~~ test. Say, "Please try to open this for me or to get the liquid ~~out.~~out."~~"~~

5.6.4 If a child ~~refuses to participate after the test has started, the tester shall reassure the child and~~opens or unlocks any of the child resistance features, or otherwise accesses the liquid in the container (see 5.4.2~~gently encourage the child to try. If the child continues to refuse, the tester shall~~), thank the child, take the test article from the child, and place it out of reach. Do not ask the child to ~~hold the container in his/her lap until the other child is finished. This pair of children shall not be eliminated from the results unless the refusing child disrupts the participation of the other child.~~open the test article a second time or open any other closure on the test article.

~~4.6.10 Each child shall be given up to 5 min to open his/her container. The tester shall watch the children at all times during the test. The tester shall minimize conversation with the children as long as they continue to attempt to open their containers. The tester shall not discourage the children verbally or with facial expressions. If a child gets frustrated or bored and stops trying to open his/her container, the tester shall reassure the child and gently encourage the child to keep trying (for example, "*Please keep trying to open this for me or to get the liquid out*").~~

5.6.5 ~~The children shall be allowed~~ Allow the children freedom of movement ~~to work on their containers~~ during the test as long as the tester can watch both children (for example, they can stand up, get down on the floor, or bang or pry the ~~package).~~package) and to talk to each other during, and watch each other performing, the test.

~~4.6.12 If a child is endangering himself or others at any time, the test shall be stopped and the pair of children eliminated from the final results.~~

~~4.6.13 The children shall be allowed to talk to each other about opening the containers and shall be allowed to watch each other try to open the containers.~~

5.6.6 ~~A child shall not be allowed~~ Do not allow a child to try to open the other child's ~~container.~~test article.

5.6.7 Stop the test if a child is endangering himself or others at any time.

5.6.8 ~~If a child opens, unlocks any child restraint mechanisms, or otherwise accesses the liquid in the container, the tester shall say, "~~Reassure and gently encourage a child who refuses to participate after the test has started. Ask the ~~thank you," take the container from the child, and put it out of the child's reach. The child shall not be asked to open the container a second time or open any other closure on the container.~~child to hold the test article in his/her lap until the other child is finished if the child continues to refuse.

5.6.9 Minimize conversation with the children as long as they continue to attempt to open their test articles. Avoid discouraging the children verbally or with facial expressions.

5.6.10 ~~At the end of the 5-minute period, the tester shall demonstrate how to open the container using the designated closure if either child has not opened his or her container using the designated closure. The demonstration will include opening and closing only the designated closure. A separate "demo" package shall be used for the demonstration.~~Reassure and gently encourage the child to keep trying (for example, "Please keep trying to open this for me or to get the liquid out.") if a child gets frustrated or bored and stops trying to open his/her test article.

5.6.11 ~~Before beginning the demonstration, the tester shall~~ After 5 min has elapsed, ask the children to set their containers ~~aside. The children shall not be allowed to~~ aside so that they cannot continue to try to open their containers during the demonstration period.

~~4.6.18 The tester shall say, "*Watch me open my container*."~~

5.6.12 ~~Once the tester gets the children's full attention,~~Demonstrate the operation (opening and closing) of the closure designated in 5.6.3~~the tester shall hold the demo container approximately 2 ft (0.6 m) from the children and open or unlock~~ using an identical demonstration test article if either child has not opened his or her test article using the designated closure. Instruct the children to "Watch me open my container," and operate the designated closure normally at a ~~normal speed as if the tester were going to use the contents. There shall be no exaggerated opening movements.~~distance of about 2 ft (0.6 m) from the children without explaining its operation.

~~4.6.20 The tester shall not discuss or describe how to open the container.~~

5.6.13 ~~To begin the second 5-minute period, the tester shall say,~~ "Begin the second 5-min period by saying, "Now ~~Now~~ you try to open your container or get the liquid ~~out.~~out,"" and allowing the children to pick up their test articles. Use the protocols of 5.6.5 to 5.6.10 as required during this test period.

~~4.6.22 If one or both children have not used their teeth to try to open their containers during the first 5 min, the tester shall say immediately before beginning the second 5-min period, "*You can use your teeth if you want to*." This is the only statement that the tester shall make about using teeth.~~

5.6.14 ~~At the end of the test period, the tester shall say,~~ "End the second 5-min test period by asking the children to set their~~Thank you for helping.~~ test articles aside" ~~If children were told that they could use their teeth, the tester shall say, "~~ and saying "Thank you for helping." Also say, "Never~~I know I told you that you could use your teeth today, but you should not put things like this in your mouth again. "~~ ~~In addition, the tester shall say, "Never~~ open containers like this when you are by yourself. This kind of container will have something in it that will make you ~~sick.~~sick.""

~~4.6.24 The children shall be escorted back to their classroom or other supervised area by the tester or another adult.~~

5.6.15 ~~If the children are to participate in a second test, the tester shall have them~~ Have the children stand up and stretch for a short time ~~before beginning the second test. The tester shall take care that the children~~ if they are to participate in a second test. Ensure that they do not disrupt other tests in progress.

5.6.16 Escort the children back to their classroom or other supervised area if their participation is completed.

6. ~~Senior Testing~~ Adult Use Effectiveness Test

6.1 ~~*Senior Adult Panel, Test Subjects—General:*~~ ~~Use a group of 100 senior adults. Recruit a mix of adults that represent the socio-economic profile of the test community. To assure geographical diversity if testing is completed at a central location, no more than 20 % of the adults shall be drawn from a single ZIP code, city, or town. Each group of senior adults shall be randomly selected as to age, subject to the limitations set forth below. Twenty-five percent of the participants shall be 50 to 54 years of age, 25 % of participants shall be 55 to 59 years of age, and 50 % of the participants shall be 60 to 70 years old. Seventy percent of the participants of ages 50 to 59 and ages 60 to 70 shall be female (17 or 18 females shall be apportioned to the 50- to 54-year age group). No individual tester shall administer the test to more than 35 % of the senior adults tested. Select adults with no obvious or overt physical or mental disability.~~

6.1.1 *Overview*—The Adult Use Effectiveness Test ensures that a sufficient portion of adults can open a CR feature. The test is divided into three phases: the first phase is a 5-min familiarization phase; then a 1-min dispensing closure phase; and ending with a 1-min filling closure phase. In each phase, the participant is given tasks to complete. The participant passes if s/he successfully completes certain tasks within the phase time frame.

6.1.2 Conduct testing in well-lit and distraction-free areas.

6.1.3 Test each adult test panel participant individually and not in the presence of other participants or onlookers.

6.1.4 Test only one type of container in a single sitting of an adult panel participant and execute all of the test protocol (6.3) in that sitting.

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

6.1.6 Do not allow an individual tester to conduct testing with more than 35 % of the of the adult test panel members.

6.1.7 *Opening and Closing Instructions*—At any time during the test, an adult test panel participant is allowed to consult instructions provided with the container and digitally available as indicated on the container. Adaptation of access to instructions to test facility or container constraints is permitted (for example, the tester may provide instructions that would normally be accessed by a QR code if the consumer attempts to scan a non-active QR code). The tester will not offer situation-specific opening and closing instructions during the conduct of the test. The tester will not provide any additional information to the adult test panel participant that is not provided or referenced on the market-ready product.

6.1.8 Test tasks are assigned to the adult panel participants using specific and consistent language. Include the tasks assigned and the language used in the test records.

6.1.9 Encourage a participant that stops attempting to complete the assigned task by asking, "Are you finished with that container or would you like to keep trying?"

6.1.10 Correct performance of the assigned tasks is confirmed by the tester. Include the verification method in the test records.

6.1.11 Fill each test article to between 15 % and 35 % of its rated capacity with water, secure the closures, and invert it to check for leakage. If leakage occurs, the closures may be resecured and the test repeated. Do not conduct testing with test articles that exhibit leakage.

~~5.2 *Screening Procedures*—Participants who are unable to open the container being tested in the first 5-min time period are given a screening test. The screening tests for this purpose shall use two containers with conventional (not child-resistant (CR) or "special") closures. The containers shall be the same as those being tested for child resistance but shall have conventional (not child-resistant) closures. Persons who cannot open and close both of the screening containers in 1-min screening tests shall not be counted as participants in the senior adult panel.~~

~~5.3 *Senior Adult Use Effectiveness (SAUE)*—The percentage of adults who both opened all closures of the container in the first (5-min) test period and opened and (if appropriate) properly resecured all closures of the container in the 1-min test period.~~

6.2 *Adult Test ~~Procedures~~—Panel Composition:* ~~The senior adults shall be tested individually rather than in groups of two or more. The senior adults shall receive only such printed instructions on how to open and secure properly the special packaging as will appear on or accompany the container as it is delivered to the consumer. The senior adult panel is tested according to the procedure incorporated in the following senior adult panel test instructions:~~

6.2.1 *Age and Gender Distribution*—The adult test panel is comprised of a total of 100 test participants, selected by age, which result in the distribution shown in Table 2. Include at least 30 female participants. Use test results in the order of testing if more adults are tested than required in Table 2.

6.2.2 *Effective Participation*—Do not perform testing with an adult with a permanent or temporary illness, injury, or disability that would interfere with his/her effective participation in the testing.

TABLE 2 Age and Gender Distribution of Adult Test Panel

Age Range	Number of Participants	Minimum Number of Female Participants
18 to 29	22 – 28	5
30 to 49	45 – 55	15
50 to 70	22 – 28	5
Total	100	30[A]

[A] Note that the minimum number of female participants in each age group will not add up to the minimum total number of female participants needed. The remaining five female participants can be in any age category.

6.2.3 *Geographical Diversity*—Ensure the geographical diversity of the panel participants using one of the following criteria:

6.2.3.1 Test no more than 20 % of adult test panel participants at a single site.

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

6.2.4 *Recruitment of Adult Panel Participants*—Use appropriate language from the adult panel consent form (Appendix X3) to recruit participants.

6.2.5 Verify that selected participants have used a gas can in the preceding two years. It is permissible to use the term "gas can" when verifying previous usage as this is considered a term familiar to the general public for these types of containers.

6.3 *Test ~~Instructions~~—Protocol:* ~~The following test instructions are used for all senior tests. If non-reclosable containers are being tested, the commands to close the package are eliminated.~~

6.3.1 ~~No adult with a permanent or temporary illness, injury, or disability that would interfere with his/her effective participation shall be included in the~~ Set up the test space. Have test articles prepared and ready for the participant to use. Bring the participant into the test space. Introduce the participant to the overall goal of the test.

6.3.2 *Consent Form*—~~Each adult shall~~ Have each adult test panel participant read and sign ~~a~~ the adult test consent form (Appendix X3) ~~before participating. Use any appropriate language from the consent form to recruit potential participants. Before beginning the test, the tester shall say,~~ "and attest to having used a gas can in the preceding two years. An ~~Please read and sign this consent form." If an adult cannot~~ adult unable to read the consent form ~~for any reason (forgot glasses, illiterate, and so forth), he/she~~ shall not participate in the ~~test.~~testing.

~~5.5.3 Each adult shall participate individually and not in the presence of other participants or onlookers.~~

~~5.5.4 The tests shall be conducted in well-lit and distraction-free areas.~~

~~5.5.5 Records shall be filled in before or after the test, so that the tester's full attention is on the participant during the test period. Recording the test times to open and re-secure the container are the only exceptions.~~

~~5.5.6 To begin the first 5-min test period, the tester says, "*I am going to ask you to open and properly close all the caps on these two identical containers according to the instructions found on the caps*." (Specify other instruction locations if appropriate.)~~

~~5.5.7 The first container is handed to the participant by the tester, who says, "*Please open all the caps on this container according to the instructions on the caps*." (Specify other instruction locations if appropriate.)~~

~~5.5.8 Participants are allowed up to 5 min to read the instructions and open and close the package. The tester uses a stopwatch(s) or other timing device to time the opening and resecuring times. The elapsed times in seconds to open the container and to close the container are recorded on the datasheet as two separate times.~~

6.3.3 *Five Minute Familiarization Phase*—~~After 5 min, or when the participant has opened and closed the container, whichever comes first, the tester shall take all test materials from the participant. The participant shall be permitted to remove and replace the closure more than once if the participant initiates these actions. If the participant does not open the container and stops trying to open it before the end of the 5-min period, the tester shall say, "~~This test phase is intended to allow the participant to become familiar with the container and ensure the ~~Are you finished with that container, or would you like to try again?" If the participant indicates that he/she is finished or cannot open the container and does not wish to continue trying, skip to~~ participant can perform certain actions within a reasonable timeframe when presented with the container for the first time.~~5.5.13~~.

6.3.3.1 Introduce the overall goal of following the instructions to use and properly resecure all of the closures. Then allow the participant to access the first test article and start the timing. Identify the location of instructions, if required by the circumstances, during the 5-min test period.

6.3.3.2 Assign each of these tasks to the participant (*1*) preparing the container for use (if applicable), (*2*) dispensing water from the container, (*3*) resecuring the container for storage, (*4*) opening the fill opening closure, and (*5*) resecuring the container for transportation.

6.3.3.3 Record the elapsed time, from the start of this test, for the participant to complete each applicable task. Deduct the time needed to assign the tasks and any time needed to address questions from the participant. The tester may remind the participant of the task without adjusting the time.

6.3.3.4 The participant is successful if s/he dispenses water from the container (Task 2 in 6.3.3.2) and opens the filling opening closure (Task 4 in 6.3.3.2) within 5 min.

6.3.3.5 End this phase when the participant has either completed the assigned tasks, declined to continue trying, or 5 min has elapsed. It is permissible for the participant to repeat any of the tasks on his/her initiative.

6.3.3.6 Remove the participant's access to the test article at the end of this phase.

~~5.5.10 To begin the second test period, the tester shall give the participant another, but identical, container and say, "*This is an identical container. Please open all the caps on it according to the instructions on the caps*." (Specify other instruction locations if appropriate.) After the participant opens the container, the tester says, "*Please close all the caps on the container properly, according to the instructions on the caps*." (Specify other instruction locations if appropriate.)~~

~~5.5.11 The participants are allowed up to 1 min (60 full s) to open and close the container. The elapsed times in seconds to open and close the containers are recorded on the datasheet as two separate times. The time that elapses between the opening of the container and the end of the instruction to close the container is not counted as part of the 1-min test time.~~

6.3.4 *One-minute Dispensing Closure Phase*—~~After the 1-min test, or when the participant has opened and finished closing the container, whichever comes first, the tester shall take all the test materials from the participant. The participant shall not be allowed to handle the container again. If the participant does not open the container and stops trying to open it before the end of the 1-min period, the tester shall say, "~~This test phase is intended to determine whether a participant who is familiar with the container can dispense the ~~Are you finished with that container, or would you like to try again?" If the participant indicates that he/she is finished or cannot open the container and does not wish to continue trying, this shall be counted as a failure of the 1-min test.~~container contents from the dispensing closure and then resecure it in a reasonable amount of time.

6.3.4.1 After successfully completing the 5-min familiarization phase, allow the participant access to another test article and start the timing. Use an identical test article as in the 5-min familiarization phase, however install or unstow the dispensing system (where applicable) prior to allowing the participant access.

6.3.4.2 Assign each of these tasks to the participant: (*1*) dispense water from the dispensing closure of the container, and (*2*) resecure the dispensing closure to a CR condition.

6.3.4.3 Record the elapsed time, from the start of the test, for the participant to complete each task. Deduct the time needed for the tester to assign the tasks and address any time needed to address questions from the participant.

6.3.4.4 The participant is successful if s/he dispenses water from the dispensing closure and resecures it within 1 min. Perform a leak check to verify the test article closure under test has been properly resecured.

6.3.4.5 End this phase when the participant has either completed the assigned tasks, declined to continue trying, or 1 min has elapsed.

6.3.5 *One Minute Fill Opening Closure Phase*—~~Participants who do not open the container in the first 5-min test period are asked to open and close two non-child-resistant screening containers. The participants are given a 1-min test period for each container. The tester shall give the participant a container and say, "~~This test phase is intended to determine whether a participant who is familiar with the container can open the fill ~~Please open and properly close this container." The tester records the time for opening and closing, or 61 s, whichever is less, on the datasheet. The tester then gives the participant the second container and says, "~~opening closure and then resecure it in a reasonable amount of time. This~~Please open and properly close this container.~~ phase may be performed prior to~~" The time to open and resecure, or 61 s,~~ the dispensing closure phase with appropriate adaptation of 6.3.4.1 ~~whichever~~and 6.3.5.1~~is less, shall be recorded on the datasheet.~~ .