



Designation: PS 119 – 01

Provisional Standard Specification for Child-Resistant Portable Gasoline Containers for Consumer Use¹

This provisional standard is issued under the fixed designation PS 119; the number immediately following the designation indicates the year of original adoption.

1. Scope

1.1 This provisional specification establishes recognized requirements for child-resistant portable gasoline containers intended for use by consumers. This specification does not cover single-trip prepackaged containers.

1.2 This provisional specification is not a fire hazard standard, but a specification for containers.

1.3 This provisional specification is intended to be technically equivalent to 16CFR1700.15 and 16CFR1700.20.

1.4 Provisional standards² achieve limited consensus through approval of the sponsoring subcommittee.

2. Referenced Documents

2.1 ASTM Standards:

F 852 Specification for Portable Gasoline Containers for Consumer Use³

PS 91 Provisional Specification for Portable Gasoline and Kerosine Spill Resistant Fueling Systems for Consumer Use³

2.2 Federal Standards:⁴

16CFR1700.15 Poison Prevention Packaging Standards (Child Resistant)

16CFR1700.20 Testing Procedure for Special Packaging

3. Requirements

3.1 General Requirements:

3.1.1 Containers and closures shall first meet all requirements of either Specification F 852 or Provisional Specification PS 91.

3.1.2 Containers shall meet all requirements listed in 3.1.3-3.1.3.4 when tested by Sections 4 and 5.

3.1.3 Containers tested by the methods described in Sections 4 and 5 shall meet the following specifications:

3.1.3.1 Child-resistant effectiveness of not less than 85 %, without a demonstration, and not less than 80 % after a demonstration, of the proper means of opening such container.

3.1.3.2 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.

3.1.3.3 The container shall continue to function with the effectiveness specifications set forth in paragraph 3.1.3.1 and 3.1.3.2 of this section when in actual contact with the substance contained therein. This requirement may be satisfied by appropriate scientific evaluation of the compatibility of the substance with the container to determine that the chemical and physical characteristics of the substance will not compromise or interfere with the proper functioning of the container.

3.1.3.4 The container shall also continue to function with the effectiveness specifications set forth in paragraph 3.1.3.1 and 3.1.3.2 of this section for the number of openings and closings customary for its size and contents. This requirement may be satisfied by appropriate technical evaluation based on physical wear and stress factors, force required for activation, and other such relevant factors which establish that, for the duration of normal use, the effectiveness specifications of the container would not be expected to lessen.

4. Test Procedure

4.1 General:

4.1.1 Reclosable containers, if assembled by the testing agency, shall be properly secured at least 72 hours prior to beginning the test to allow the materials (for example, the closure liner) to “take a set.”

4.1.2 If assembled by the testing agency, torque-dependent closures shall be secured at the same on-torque as applied on the packaging line. Application torques must be recorded in the test report.

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 not be exposed to extreme conditions of heat or cold.

4.1.5 The containers shall be tested at room temperature.

4.1.6 All containers to be tested shall be new and empty of contents.

4.2 Child Resistant Test (Test Subjects/Selection Criteria):

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

4.2.2 No more than 20 % of the children in each group shall be tested at or obtained from any given site.

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 (30 %) of the children in each group

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² Provisional standards exist for two years subsequent to the approval date.

³ Annual Book of ASTM Standards, Vol 15.07.

⁴ Code of Federal Regulations, available from U.S. Government Printing Office, Washington, DC 20402.

TABLE 1 Number of 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 | Package 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+ |

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.

4.2.5 The children's ages in months shall be calculated as follows:

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).

4.2.5.2 Subtract the month, day, and year numbers for the birth date from the respective numbers for the test date. This may 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 (i.e., $4 \times 12 = 48$; $48 + 2 = 50$). This figure either will remain the same or be adjusted up or down by 1 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, 1 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.

4.2.5.5 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. The children selected should have no obvious or overt physical or mental handicap.

4.3 *Child Resistant Tests (Test Failures)*—A test failure shall be any child who opens the special packaging or gains access to its contents.

4.4 *Sequential Test*—The sequential test is initially conducted using 50 children, and, depending on the results, the criteria in Table 1 determine whether the package 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 package openings shown in Table 1 are cumulative.

4.5 *Test 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 or regular kindergarten. No child shall test more than two containers. When more than one special package is being tested, each package shall be of a different ASTM type 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:

4.6 *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-lighted location that is familiar to the children and that is isolated from all distractions.

4.6.3 The tester, or another adult, shall escort a pair of children to the test area. The tester shall seat the two children so that there is 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.

4.6.5 The children shall not be given the impression that they are in a race or contest. They are not to be told 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 prior to, 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 package and to time the 5-min test periods.

4.6.8 To begin the test, the tester shall hand the children identical containers and say, "PLEASE TRY TO OPEN THIS FOR ME."

4.6.9 If a child refuses to participate after the test has started, the tester shall reassure the child and gently encourage the child to try. If the child continues to refuse, the tester shall ask the child to hold the package 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.

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 try to open the package").

4.6.11 The children shall be allowed freedom of movement to work on their packages 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).

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 packages and shall be allowed to watch each other try to open the packages.

4.6.14 A child shall not be allowed to try to open the other child's container.

4.6.15 If a child opens his/her container, the tester shall say, "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.

4.6.16 At the end of the 5-min period, the tester shall demonstrate how to open the container if either child has not opened his or her container. A separate "demo" package shall be used for the demonstration.

4.6.17 Prior to beginning the demonstration, the tester shall ask the children to set their containers aside. The children shall not be allowed to continue to try to open their containers during the demonstration period.

4.6.18 The tester shall say, "WATCH ME OPEN MY PACKAGE."

4.6.19 Once the tester gets the children's full attention, the tester shall hold the demo container approximately two feet from the children and open the container at a normal speed as if the tester were going to use the contents. There shall be no exaggerated opening movements.

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

4.6.21 To begin the second 5-min period, the tester shall say, "NOW YOU TRY TO OPEN YOUR CONTAINERS."

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.

4.6.23 The test shall continue for an additional 5 min or until both children have opened their containers, whichever comes first.

4.6.24 At the end of the test period, the tester shall say, "THANK YOU FOR HELPING." If children were told that they could use their teeth, the tester shall say, "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 MIGHT HAVE SOMETHING IN IT THAT WOULD MAKE YOU SICK."

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

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

5. Senior Testing

5.1 *Senior-Adult Panel, Test Subjects*—Use a group of 100 senior adults. Not more than 24 % of the senior adults tested shall be obtained from or tested at any one site. 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. The adults selected should have no obvious or overt physical or mental disability.

5.2 *Screening Procedures*—Participants who are unable to open the packaging being tested in the first 5-min time period, are given a screening test. The screening tests for this purpose shall use two packages with conventional (not child-resistant (CR) or "special") closures. One closure shall be a plastic snap closure and the other a CT plastic closure. Each closure shall have a diameter of 28 mm \pm 18 %, and the CT closures shall have been resecured 72 hours before testing at 10 inch-pounds of torque. The containers for both the snap- and CT-type closures shall be round plastic containers, in sizes of 2 \pm 1/2 oz for the CT-type closure and 8 drams \pm 4 drams for the snap-type closure. Persons who cannot open and close both of the screening packages 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 the package in the first (5-min) test period and opened and (if appropriate) properly resecured the package in the 1-min test period.

5.4 *Test Procedures*—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 properly secure 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:

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

5.5.1 No adult with a permanent or temporary illness, injury, or disability that would interfere with his/her effective participation shall be included in the test.

5.5.2 Each adult shall read and sign a consent form prior to participating. Any appropriate language from the consent form may be used to recruit potential participants. Before beginning the test, the tester shall say, "PLEASE READ AND SIGN THIS CONSENT FORM." If an adult cannot read the consent form for any reason (forgot glasses, illiterate, etc.), he/she shall not participate in the test.

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-lighted 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 resecure the package 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

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CLOSE THESE TWO IDENTICAL PACKAGES ACCORDING TO THE INSTRUCTIONS FOUND ON THE CAP." (Specify other instruction locations if appropriate.)

5.5.7 The first package is handed to the participant by the tester, who says, "PLEASE OPEN THIS CONTAINER ACCORDING TO THE INSTRUCTIONS ON THE CAP." (Specify other instruction locations if appropriate.) After the participant opens the package, the tester says, "PLEASE CLOSE THE CONTAINER PROPERLY, ACCORDING TO THE INSTRUCTIONS ON THE CAP." (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 resealing times. The elapsed times in seconds to open the package and to close the package are recorded on the data sheet as two separate times.

5.5.9 After 5 min, or when the participant has opened and closed the package, whichever comes first, the tester shall take all test materials from the participant. The participant may remove and replace the closure more than once if the participant initiates these actions. If the participant does not open the package and stops trying to open it before the end of the 5-min period, the tester shall say, "ARE YOU FINISHED WITH THAT PACKAGE, OR WOULD YOU LIKE TO TRY AGAIN?" If the participant indicates that he/she is finished or cannot open the package and does not wish to continue trying, skip to 5.5.13.

5.5.10 To begin the second test period, the tester shall give the participant another, but identical, package and say, "THIS IS AN IDENTICAL PACKAGE. PLEASE OPEN IT ACCORDING TO THE INSTRUCTIONS ON THE CAP." (Specify other instruction locations if appropriate.) If the package contains product, the tester shall say, "PLEASE EMPTY THE (PILLS, TABLETS, CONTENTS, etc.) INTO THIS CONTAINER." After the participant opens the package, the tester says, "PLEASE CLOSE THE PACKAGE PROPERLY, ACCORDING TO THE INSTRUCTIONS ON THE CAP." (Specify other instruction locations if appropriate.)

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

5.5.12 After the 1-min test, or when the participant has opened and finished closing the package, whichever comes first, the tester shall take all the test materials from the participant. The participant shall not be allowed to handle the package again. If the participant does not open the package and stops trying to open it before the end of the 1-min period, the tester shall say, "ARE YOU FINISHED WITH THAT PACKAGE, OR WOULD YOU LIKE TO TRY AGAIN?" If the participant indicates that he/she is finished or cannot open the package and does not wish to continue trying, this shall be counted as a failure of the 1-min test.

5.5.13 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 packages. The participants are given a 1-min test period for each package. The tester shall give the participant a package and say, "PLEASE OPEN AND PROPERLY CLOSE THIS CONTAINER." The tester records the time for opening and closing, or 61 s, whichever is less, on the data sheet. The tester then gives the participant the second package and says, "PLEASE OPEN AND PROPERLY CLOSE THIS CONTAINER." The time to open and resecure, or 61 s, whichever is less, shall be recorded on the data sheet.

5.5.14 Participants who cannot open and resecure both of the non-child-resistant screening packages are not counted as part of the 100-seniors panel. Additional participants are selected and tested.

5.5.15 No adult may participate in more than two tests per sitting. If a person participates in two tests, the packages tested shall not be the same ASTM type of package.

5.5.16 If more adults in a sex or age group are tested than are necessary to determine SAUE, the last person(s) tested shall be eliminated from that group.

5.5.17 Records shall be kept of the number of adults unable to open and of the number of the other adults tested who fail to properly resecure the special packaging. The number of adults who successfully open the special packaging and then properly resecure the special packaging (if resealing is appropriate) is the percent of adult-use effectiveness of the special packaging. In the case of unit packaging, the percent of adult-use effectiveness shall be the number of adults who successfully open a single (unit) package.

6. Records

6.1 Manufacturers of special packaging shall maintain summaries of data resulting from tests conducted in accordance with this protocol.

6.2 *Adult-Resecuring Procedure*—The adult-resealing test shall be used where an objective determination (for example, visual or mechanical) that a package is properly resealed cannot be made. The adult-resealing test is performed as follows:

6.2.1 After the adult participant in either the senior-adult test or the younger-adult has resealed the package, or at the end of the test period (whichever comes first), the tester shall take the package and place it out of reach. The adult participant shall not be allowed to handle the package again.

6.2.2 The packages that have been opened and appear to be resealed by adults shall be tested by children according to the child-test procedures to determine if the packages have been properly resealed. The packages are given to the children without being opened or resealed again for any purpose.

6.2.3 Using the results of the adult tests and the tests of apparently-resealed packaging by children, the adult use effectiveness is calculated as follows:

6.2.3.1 *Adult Use Effectiveness*:

6.2.3.2 The number of adult opening and resealing failures, plus the number of packages that were opened by the children during the full 10-min test that exceeds 20 % of the apparently-resealed packages, equals the total number of failures.

6.2.3.3 The total number of packages tested by adults (which is 100) minus the total number of failures equals the



percent adult-use effectiveness.

7. Recommendations

7.1 The following instructions and procedures are recommended for use where appropriate.

7.1.1 Report Format for Child Test:

7.1.1.1 Identification:

(1) Close-up color photograph(s) clearly identifying the package and showing the opening instructions on the closure.

(2) Product name.

(3) Product manufacturer.

(4) Closure model (trade name—for example, “KLIK & SNAP”).

(5) Closure size (for example, 28 mm).

(6) Closure manufacturer.

(7) Closure material and color(s) (for example, white polypropylene).

(8) Closure liner material.

(9) TAC seal material.

(10) Opening instructions (quote exactly, for example, “WHILE PUSHING, DOWN, TURN RIGHT”). Commas are used to separate words that are on different lines.

(11) Symbols, numbers, and letters found inside the closure.

(12) Package model.

(13) Package material and color.

(14) Net contents.

(15) Symbols, numbers, and letters on the bottom of the package.

(16) Other product identification, for example, EPA Registration Number.

7.1.1.2 Procedures:

(1) Describe all procedures for preparing the test packages.

(2) Describe the testing procedures.

(3) Describe all instructions given to the children.

(4) Define an individual package failure.

7.1.1.3 Results:

(1) Openings in each 5-min period and total openings for males and for females in each age group.

(2) Opening methods (for example, normal opening, teeth, etc.).

(3) Mean opening times and standard deviation for each 5-min test period.

(4) The percentage of packages tested at each site as a percentage of total packages.

(5) The percentage of packages tested by each tester as a percentage of total packages.

(6) Child-resistant effectiveness for the first 5-min period and for the total test period.

7.1.2 Report Format for Adult-Resecuring Test:

7.1.2.1 Identification:

(1) Close-up color photograph(s) clearly identifying the package and showing the top of the closure.

(2) Product name and the number of tablets or capsules in the package.

(3) Product manufacturer.

(4) Closure model (trade name).

(5) Closure size (for example, 28 mm).

(6) Closure manufacturer.

(7) Closure material and color(s) (for example, white polypropylene).

(8) Closure liner material.

(9) Symbols, numbers, and letters found inside the closure.

(10) TAC seal material.

(11) Opening instructions (Quote exactly, for example, “WHILE PUSHING, DOWN, TURN RIGHT”). Commas are used to separate words that are on different lines.

(12) Package model.

(13) Package material and color.

(14) Net contents.

(15) Symbols, numbers, and letters on the bottom of the package.

(16) Other product identification, for example, EPA Registration Number.

7.1.2.2 Procedures:

(1) Describe all procedures for preparing the test packages.

(2) Describe the testing procedures in detail.

(3) Describe all instructions given to participants.

(4) Define an individual package failure and the procedures for determining a failure.

7.1.2.3 Results:

7.1.3 Report Format for Adult Test:

7.1.3.1 Total packages opened and total packages resecured; packages opened by males and by females; and packages resecured by males and by females.

7.1.3.2 Mean opening times and standard deviation for total openings, total openings by females, and total openings by males.

7.1.3.3 Mean resecuring times and standard deviation for total resecurings, total resecurings by females and total resecurings by males.

7.1.3.4 The percentage of packages tested at each site as a percentage of total packages.

7.1.3.5 The percentage of packages tested by each tester as a percentage of total packages.

7.1.3.6 Methods of opening (for example, normal opening, pried closure off, etc.)

7.1.4 Report Format for Child Test:

7.1.4.1 Openings in each 5-min period, and total openings, for males and females in each age group.

7.1.4.2 Opening methods.

7.1.4.3 Mean opening times and standard deviation for each 5-min test period.

7.1.4.4 The percentage of packages tested at each site as a percentage of total packages.

7.1.4.5 The percentage of packages tested by each tester as a percentage of total packages.

7.1.4.6 Consent Forms—The Commission uses the following consent forms for senior-adult testing reclosable and unit-dose packaging, respectively.

7.1.4.7 Reclosable packages.

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