Designation: F976 – 08

Standard Specification for Portable Kerosene and Diesel Containers for Consumer Use[1]

This standard is issued under the fixed designation F976; 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 nationally recognized performance requirements common to both kerosene and diesel portable containers for reuse by the consumer. Only color and marking are differentiated. The test medium specified for chemical resistance is kerosene due to the more aggressive nature of kerosene on elastomers and other materials of construction.

1.2 This specification does not include single-trip prepackaged containers.

1.3 This standard is not a fire risk assessment standard, or a fire test standard, but a specification for portable kerosene containers for consumer use.

1.4 The following precautionary caveat pertains 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 and health practices and determine the applicability of regulatory limitations prior to use.* Additional precautionary information is given in Section 6.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

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

D794 Practice for Determining Permanent Effect of Heat on Plastics (Withdrawn 1998)[3]

D975 Specification for Diesel Fuel Oils

D999 Test Methods for Vibration Testing of Shipping Containers

D2561 Test Method for Environmental Stress-Crack Resistance of Blow-Molded Polyethylene Containers

D2565 Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications

D3435 Specification for Plastic Containers (Jerry Cans) for Petroleum Products (Withdrawn 1987)[3]

D3699 Specification for Kerosine

F926 Specification for Cautionary Labeling of Portable Kerosine and Diesel Containers for Consumer Use

F2234 Specification for Spill Resistant Fueling Systems for Portable Fuel Containers for Consumer Use

G23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials (Withdrawn 2000)[3]

2.2 *ANSI Standard:*

B71.1b1977 Supplement to Safety Specifications for Power Lawn Mowers, Lawn and Garden Tractors, and Lawn Tractors[4]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *diesel, n*—a hydrocarbon mixture obtained from petroleum distillation with variations in pour point depending upon make up as specifiedin Specification D975.

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

3.1.3 *portable kerosene/diesel containers, n*—vessels designed to be carried by hand and used to transport fuels from distribution point to use point.

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

3.1.5 *rated capacity, n*—the volume indicated on the container. It may also be termed nominal capacity or maximum filling level.

3.1.6 *spout, n*—a component through which the contents of the container can be dispensed.

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[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.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

3.1.7 *total volume, n*—rated capacity plus any remaining space within the container.

4. Requirements

4.1 The container shall evidence good workmanship and meet the following requirements:

4.1.1 All container tests shall be conducted after closures are secured with torque values specified in Specification F2234 (see Table 1).

4.2 *Color*—Kerosene containers shall be predominately medium blue in color. Diesel containers shall be predominantly medium yellow in color. Pigments, coatings, or other means used to impart color shall not be affected by kerosene.

4.3 *Capacity*—The maximum rated capacity shall be 25 L (6.6 gal).

4.3.1 The total volume of a container shall exceed its rated capacity by at least 5 %.

4.3.2 Capacity shall be determined with the container and its contents at 23 ± 2°C (75 ± 3.6°F).

4.4 *Stability*—Each container shall not upset when tested in accordance with 7.1.

4.5 *Handle*—Each container shall be provided with a handle. The container shall not leak or evidence any handle detachment when tested in accordance with 7.2.

4.6 *Drop Strength*—Containers shall show no evidence of rupture, cracks, or leakage when tested in accordance with 7.3.

4.7 *Internal Pressure*—Containers shall show no evidence of leakage when tested in accordance with 7.4.

4.8 *Durability:*

4.8.1 *Aging*—This requirement applies only to nonmetallic containers. The material for the container shall retain at least 70 % of its original tensile strength when tested in accordance with 7.5.1 and 7.5.2.

4.8.2 *Permeability*—This requirement applies only to nonmetallic containers. The filled container shall not have a weight loss greater than 1 % when tested in accordance with 7.6.

4.8.3 *Kerosene Resistance*—This requirement applies only to nonmetallic containers. The container material shall show no pitting, crazing, softening, bubbling, cracking, tackiness, or decomposition when tested in accordance with 7.7.1. The material shall retain at least 60 % of its tensile yield strength when tested in accordance with 7.7.2.

4.8.4 *Stress Cracking*—This requirement applies only to containers molded of polyethylene. The container shall not crack in 120 h when tested in accordance with 7.8.

4.8.5 *Corrosion Resistance*—This requirement applies only to metal containers and/or metal components of containers. No leakage shall be evident when tested in accordance with 7.9.

4.8.6 *Heat Resistance*—This requirement applies only to nonmetallic containers. The container shall not leak when tested in accordance with 7.10.

TABLE 1 Torque Requirements

Outer Diameter of Closure	Closing Torque, Nm (lbf·in.)
Less than 51 mm (2 in.)	2.8 (25)
51 mm (2 in.) and greater	5.6 (50)

4.9 *Openings*—Openings in containers shall be provided with a means of closure.

4.9.1 *Pouring*—The opening intended for pouring shall have an integral pouring spout, or it shall accept a pouring spout supplied with the container. The pouring spout shall be designed to permit kerosene to be poured without leakage.

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

4.9.3 *Filling*—The opening intended for filling the container shall have a minimum inside diameter of 31.7 mm (1.25 in.).

4.9.4 *Kerosene Resistance*—This requirement applies only to nonmetallic components. Closures, pouring spout, venting devices, and gaskets shall be resistant to aging and the action of kerosene when tested in accordance with 7.11.

4.10 *Closures*—Closures on the containers shall not leak when tested in accordance with 7.12.

5. Retest and Rejection

5.1 If any failure occurs, an additional container may be tested if the failure is judged to be nonrepresentative of production.

6. Precautions

6.1 Kerosene is used in some of the following tests. Cautionary standards for handling and disposal of hazardous materials should be observed. Containers containing kerosene should not be opened in the presence of open flame or other sources of ignition.

7. Test Methods

7.1 *Stability*—Fill a sample container with water at 23 ± 2°C (75 ± 3.6°F) to its rated capacity by volume. Secure the closures as in transportation and storage. Place the container with its base on an inclined plane forming an angle of 20° with the horizontal. During the test, rotate the container about its vertical axis so that stability can be checked with the sample facing any direction.

7.2 *Handle Strength*—Fill a sample container with an equivalent weight of water at 23 ± 2°C (75 ± 3.6°F) to its rated kerosene capacity. Secure the closures as in transportation and storage. Secure one end of a 9.5-mm (0.375-in.) diameter manila rope about 2 m (6.5 ft) long to a rigid point of suspension and attach the other end so as to distribute the load across the container handle. Suspend the container from the rope for 1 min, then raise 305 mm (12 in.) from the suspended position and allow to fall freely.

7.3 *Drop Strength Test*—Fill the container to its nominal capacity with water at 23 ± 2 °C (75 ± 5 °F) and secure the closures. Drop it, free fall, onto a flat, solid surface. Make drops in the following sequence: one drop on the bottom, one drop on a bottom corner, and one drop on a side. The distance of fall shall be 1.8 m (6 ft). Make the same tests with another container filled with a blend of 50 % glycol and 50 % water and with both the container and its contents cooled to −18 ± 1 °C (0 ± 2 °F). For these latter tests, the distance of fall shall be 1.2 m (4 ft).

NOTE 1—The location of the spout is considered to be the front of the container. The side is considered to be approximately 90° to either left or right of the nozzle area.

7.4 *Internal Pressure Test:*

7.4.1 *Hydrostatic Pressure Test*—Fill the container to its total volume with water at 23 ± 2°C (75 ± 5°F) and secure the closures. Increase the internal pressure to a gage pressure of 138 kPa (20 psi) and maintain for 2 min. Conduct the same test with a container filled to its total volume with water at 60 ± 3°C (140 ± 5°F). For plastic containers, apply the pressure by inserting and securing an adapter through a drilled hole in a flat, heavy section of the container wall, and not on a pinch-off or parting line. For metal containers, the pressure can be applied through the fill or pour closure.

7.5 *Aging Test*—Perform the following two tests. In both tests, determine tensile strength in accordance with Test Method D638 using five specimens and Speed C.

7.5.1 *Test 1*—Test the specimens for 2000 h in accordance with Procedure B of Practice D2565 using Type B or BH apparatus or for 1400 h in accordance with Practice G23 using a Type E carbon-arc weathering device (see Note 2). The test cycle for each method shall consist of 102 min of light followed by 18 min of light and spray. If Practice G23 is used, the blackbody temperature shall be 62.8°C (145°F). In cases of disagreement, Practice D2565 shall be the referee method.

NOTE 2—Limited data indicate that carbon-arc exposure is much more severe than xenon-arc exposure; therefore, less exposure time is required when using the carbon-arc equipment.

7.5.2 *Test 2*—Test the specimens for 60 days in accordance with Recommended Practice D794, except that the oven temperature shall be 87 ± 2°C (189 ± 3.6°F).

7.6 *Permeability Test*—Fill the container to its rated capacity with Specification D3699 No. 1K Kerosene and secure the closures. Weigh the container accurately. After storage for 30 days at 23 ± 2°C (75 ± 3.6°F), reweigh the container and calculate the weight loss.

7.7 *Kerosene Resistance Test:*

7.7.1 *Visual Test*—Upon completion of the permeability test in 7.6, empty the container and cut apart in a manner to allow visual inspection of all interior surfaces.

7.7.2 *Immersion Test*—Condition at least 20 specimens, taken from untested container, measuring about 125 mm (5 in.) by 16 mm (0.625 in.) at 23 ± 2°C (75 ± 3.6°F) for 18 h. Immerse specimen in Specification D3699 No. 1K Kerosene. Use the remaining ten specimens as a control. Following exposure for 30 days, remove ten specimens from the solution and test to determine tensile yield strength in accordance with Test Method D638 using Speed C.

7.8 *Stress Cracking Test*—Test two containers in accordance with Procedure B of Test Method D2561, except do not expose the outside of the containers to the stress cracking agent.

7.9 *Corrosion Resistance Test*—Six container samples shall be filled to their nominal capacity with water. The closures shall be secured as in transportation and storage. The containers shall be tested in accordance with Practice B117. The containers shall be exposed to a spray of 5% salt solution for 21 days, after which they shall be allowed to dry for 4 h at room temperature.

7.10 *Container Material Heat Resistance Test*—Determine the resistance of the container filled with water to a momentary exposure to heat and flame in accordance with 7.10.1 and 7.10.2. *These test methods should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions.*

7.10.1 *Test 1*—Fill a container completely with water at 23 ± 2°C (75 ± 3.6°F). Adjust a 9.5-mm (⅜-in.) diameter bunsen burner, using natural gas having a calorific value of approximately 37 MJm^3 (1000 Btu/ft^3) so that the outer blue flame is 25 mm (1 in.) in length and the inner blue cone is 9.5 mm (⅜ in.) long. The temperature of the flame just above the inner cone shall be a minimum of 930°C (1700°F) and the temperature of the flame, 19 mm (¾ in.) above the burner shall be a minimum of 288°C (550°F). Tilt the burner about 18° from the normal 90° impingement and hold the tip of the burner 19 mm (¾ in.) away from the container for 75 s. Test the container on the side, bottom, and any corner and examine for leaks. If the design of the container is such that it cannot be filled completely with water, apply the flame only to those areas that are water backed.

7.10.2 *Test 2*—Fill a container completely with water at 23 ± 2°C (75 ± 3.6°F). Heat a 12.7-mm (½-in.) diameter steel rod, 150 mm (6 in.) long, to 260 ± 6°C (500 ± 10.8°F) and immediately place on the bottom of an inverted container and allow it to cool to 23 ± 2°C (75 ± 3.6°F). Repeat this procedure, except place the heated rod on a side wall of the container. Examine the container for leaks.

7.11 *Kerosene Resistance Tests:*

7.11.1 A part made of an elastomer that may be affected by aging shall not crack or show visible evidence of deterioration following exposure for70 h in an air oven at a temperature of 100 ± 2°C (212 ± 3.6°f.)

7.11.2 A nonmetallic part other than an elastomer that may be affected by aging shall not crack or show visible evidence of deterioration following exposure for 168 h in an air oven at a temperature of 100 ± 2°C (212 ± 3.6°F).

7.11.3 A nonmetallic part in contact with kerosene shall not show excessive volume change or loss of weight, when considered on the basis of its intended function, following immersion in Specification D3699 No. 1K Kerosene in accordance with Test Method D471 at 23 ± 2°C (75 ± 3.6°F) for 70 h.

7.11.4 A change in volume of not more than 25 % swelling or 1 % shrinkage and a weight loss (extraction) of not more than 10 % is considered as indicating compliance with 7.11.3.

7.12 *Closure Test*—Fill the container to its nominal capacity with water at 23 ± 2°C (75 ± 5°F) and secure the closures. Test the filled container in accordance with Procedure A of Test Methods D999 for 2 h. After the 2-h test, invert the container for 5 min without tightening the closures.

7.13 *Precision and Bias*—Precision statements will be included in subsequent revisions after interlaboratory and intralaboratory comparisons are instituted, completed and properly evaluated.

8. Marking

8.1 The container shall be labeled in accordance with Specification F926.

8.2 The container shall be clearly marked with at least one of the following:

8.2.1 The manufacturer's name,

8.2.2 The private labeler's name, and

8.2.3 An identifying symbol.

8.3 The container shall be marked with its rated capacity in litres and in gallons.

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

9. Keywords

9.1 diesel containers; diesel storage; flammable liquids containers, portable; kerosene containers; kerosene storage

APPENDIX

(Nonmandatory Information)

X1. RATIONALE FOR SPECIFICATIONS FOR PORTABLE KEROSENE CONTAINERS FOR CONSUMER USE (F976)

X1.1 Scope (Section 1)

X1.1.1 Paragraphs 1.1 and 1.3 clarify the intent of Task Group F15.10 to produce a standard specification for performance embodying criteria of manufacture that are developed and defined in terms of materials of construction, behavior or petroleum products to be contained, and reasonably foreseeable patterns of usage by consumers. The task group decided not to include single-trip prepackaged containers because of their uniquely different purpose upon entering the stream of commerce and because of their consequently different priorities in design, materials, and construction.

X1.1.2 The task group also decided at the inception of work on this standard to include both metallic and nonmetallic containers because a performance specification is the objective. The pre-existing Specification D3435 provided a basis for many of the requirements and some of the test methods in this specification, thus simplifying the task group's efforts to blend into a single document specifications for containers made of two quite dissimilar kinds of materials. It was, however, necessary to distinguish between metallic and nonmetallic containers in some of the test methods because of the distinctly different thermal and mechanical properties of the materials. Criteria for mechanical performance of metal containers were, in part, determined by a cooperative testing program using sample containers furnished by manufacturer-members of Task Group F15.10 and conducted by Underwriters Laboratories, Inc.

X1.2 Referenced Documents (Section 2)

X1.2.1 ASTM standards and others referenced throughout the standard have been listed in Section 2.

X1.3 Terminology (Section 3)

X1.3.1 *kerosene*—the ASTM specification for kerosene was adopted because it is an established standard.

X1.3.2 *portable kerosene container*—this definition clarifies the specific containers that are being addressed in the standard.

X1.3.3 *pouring vent*— to explain the use of the term "pouring vent," a definition was adapted from the CSA Standard B376-M1980, Portable Containers for Gasoline and Other Petroleum Fuels.

X1.3.4 *rated capacity*—the task group selected the term it would use for indicating the usable volume of the container and related it to other commonly used terms that have the same meaning.

X1.3.5 *spout*—the task group selected "spout" instead of "nozzle" since a nozzle is normally the dispensing mechanism found at a gasoline filling station. The definition was adapted from that in CSA Standard B376-M1980, Portable Containers for Gasoline and Other Petroleum Fuels.

X1.3.6 *total volume*—this definition clarifies that the total size of the container and its rated capacity may be different.

X1.4 Requirements (Section 4)

X1.4.1 *Color*—Blue is selected as the specified color due to present use by the preponderance of container manufacturers and by existing regulations such as The Massachusetts Board of Fire Prevention Regulation #527 CMR 5.04 (18) "Portable Containers for Kerosene." The task group debated at length the inclusion or deletion of the word "predominantly" and how much of the surface area should be blue. It was decided to leave it in but not specify a percentage, although " appreciably more than half" is intended.

X1.4.2 *Capacity*—A negative response received from a labeling standard ballot objected to the 20-L (5.2-gal) specification and recommended that the defined capacity be changed to 25 L (6.6 gal) since containers are not being made in this size and because this capacity would include Canadian containers of imperial gallon size.

X1.4.2.1 After review, the value of 5 % for expansion was agreed upon as being consistent with acceptable existing standard and practices.

X1.4.2.2 After discussion, the values of 23 ± 2°C (75 ± 3.6°F) were chosen as representative of conditions used in industrial testing.

X1.4.3 *Stability*—The stability requirement was deemed necessary to address container upset.

X1.4.4 *Handle*—The requirement for a securely attached handle was recognized as necessary for the proper handling of a filled container. Handle distortion was discussed and such distortion was not deemed a failure mode.

X1.4.5 *Drop Strength*—This requirement was deemed necessary to address catastrophic failure from accidental dropping in use.

X1.4.6 *Internal Pressure*—This requirement was deemed necessary to address the structural integrity of the container when subjected to internal pressure variations.

X1.4.7 *Durability:*

X1.4.7.1 *Aging*—The value of 70 % tensile strength retention for nonmetallic containers was accepted in view of its historical use. Testing performed on plastics at the time 70 % was originally adopted showed that it was practical. Experts confirmed that for polyethylene, 70 % is practical.

X1.4.7.2 *Permeability*—The task group has been made aware of the National Bureau of Standards (NBS) computations that indicate that a 7-gal high-density-polyethylene (HDPE) gasoline container having a 3 % permeability (by weight) may produce a flammable mixture in a closed car trunk within 1 day and in a closed 960 cubic foot garage after 30 days. However, the task group has also been made aware that of the approximately 50 HDPE containers tested by the UL under its classification program, none had a permeability greater than 1 % and that there are no known instances of incidents involving the ignition of gasoline vapor evolved from a closed HDPE container. The task group decided on the 1 % permeability limit because it appears that HDPE containers in actual use that have a permeability of 1 % or less have a good safety record.

X1.4.7.3 *Kerosene Resistance*—On the advice of consulting technical experts, the task group deleted the retention requirement for elongation. The 60 % retention of tensile strength was retained in view of its historical acceptance, but the characteristic of the tensile strength was clarified to be the tensile yield strength. This test is exclusively applicable to nonmetallic containers.

X1.4.7.4 *Stress Cracking*—The recommended test is exclusively applicable to polyethylene containers. The test duration value of 120 h was accepted as developed for Specification D3435. There appears to be no supportive data for a change of this value. It was recognized that an appropriate test procedure and test medium will have to be selected for plastics materials other than polyethylene.

X1.4.7.5 *Corrosion Resistance*—A degree of corrosion resistance is deemed necessary for metallic containers; whereas, plastic containers are inherently corrosion resistant. However, a suitable test method has not been developed. The standard therefore states that this requirement will be added later when the corrosion test is defined and validated.

X1.4.7.6 *Heat Resistance*—This requirement for nonmetallic containers is deemed necessary to preclude the loss of container integrity when it is briefly subjected to a small heat source such as hot engine manifold or muffler and also to ensure adequacy and uniformity of container wall thickness.

X1.4.8 *Openings*—The need for an appropriate opening and closure was deemed obvious.

X1.4.8.1 *Pouring*—The task group agreed that experience in the use of containers confirms the need for a pouring spout. In view of the combustible nature of kerosene, leakage and spillage must be kept to a practical minimum while pouring. Closed container leakage is deemed to be covered by the internal pressure test. A siphon may be provided but is not to be construed as a substitute for a pouring spout.

X1.4.8.2 *Pouring Vent*—Such vents are deemed necessary to effect steady fluid flow.

X1.4.8.3 *Filling*—The specified minimum opening diameter was chosen as being adequate to accept dispensing nozzles usually found at retail filling stations.

X1.4.8.4 *Kerosene Resistance*—Since kerosene is to be carried and stored in the containers, their components and gaskets must be resistant to kerosene.

X1.5 Precautions (Section 6)

X1.5.1 This statement was considered necessary to signal the combustible nature of kerosene because kerosene is specified as a test liquid for certain tests described in this specification.

X1.6 Test Methods (Section 7)

X1.6.1 *General*—The tests appearing in Specification and in Massachusetts Regulation 527 CMR 5.04 (18) “Portable Containers for Kerosene” have been accepted as written and justified by the respective developing committees. As the requirements in Sections 4 and 8 were considered, the references in Section 7 were reviewed.

X1.6.2 *Stability*—The need was determined for inclusion of a stability test with the portable container configured in the storage condition. No evidence was presented to persuade the task group to increase the stability angle above 20° which was chosen as a baseline inclination consistent with existing standards.

X1.6.3 *Handle Strength*—Water was confirmed as a suitable test fluid. It was noted that the test includes a factor of safety due to the higher specific gravity of water compared with kerosene. Also, the choice of water was made in consideration of its noncombustible properties. A discussion about the method of attachment of the rope to the portable container handle resulted in the task group’s acceptance of an interpretation permitting one or more turns to be used in attaching the rope to the handle. Therefore, at the tester’s option, point loading or distributed loading on the handle may be used. The task group considered one drop versus three drops. One drop of 12 in. with the portable container filled to rated capacity with water includes a 1.25-factor of safety due to the weight of water and was accepted by the task group because the container is not necessarily believed to be likely to experience more than one such drop.

X1.6.4 *Drop Strength Test*—The drop strength test was divided into two tests according to its application to metal

containers and to plastic containers. It was recognized that the mode of failure for metal differs from that for plastic and that the purpose of the drop tests are to establish a means of evaluating an acceptable level of strength for containers of each material.

X1.6.4.1 *Drop Strength (Metallic Containers)*—It was noted that metal's physical properties are unaffected by ambient temperatures likely to be encountered in normal usage. The drop strength test for metal containers therefore need not evaluate brittleness as is associated with some plastics at low temperatures. Water equal in volume to the containers rated capacity was selected to prevent a potentially hazardous condition during the test. The additional weight of water compared with that of gasoline provides a margin of safety. The height of drop was selected as a result of testing a number of containers of different manufacturers. It was determined that containers that are capable of successfully surviving three drops from 33 in. are suitable for consumer use. The investigative testing was conducted by Underwriters Laboratories, Inc. A search for accident data revealed none related to product failure.

X1.6.4.2 *Drop Strength (Plastic Containers)*—This test is adopted verbatim from Specification D3435.

X1.6.5 *Internal Pressure Test:*

X1.6.5.1 *Hydrostatic Pressure Test*—This test is adapted from the one specified for plastic containers by Specification D3435. However, it was noted that metal's physical properties are unaffected by ambient temperatures likely to be encountered in normal usage. The internal pressure test for metal containers, therefore, need not evaluate the effect of temperature extremes on the strength of the material. The purpose of the internal pressure test was determined to be an evaluation of the seams and joints of the container. Specification D3435 specifies that the test container be filled to nominal capacity (rated volume) before pressure is increased to 20 psi, thus leaving a vapor space and possibly having one or more seams and joints above the liquid level. Pressure is presumably applied as air-pressure. This standard specifies that the test container be filled to its total volume (liquid full), that is, without a vapor space, and the test conducted with either air pressure or water pressure. In this case, all seams and joints would be below the liquid level and thus be tested for liquid tightness.

X1.6.6 *Aging Test*—The task group adopted the existing tests in Specification D3435 paragraph 5.10 in view of the application to nonmetallic containers only.

X1.6.6.1 *Test 1*—After lengthy discussion it was the concensus that the current accelerated weathering requirement was not severe enough to ensure a reasonable outdoor exposure life in high UV areas. It was determined that an arbitrary increase in the required exposure to double that now required could be made without extensive developmental testing and would provide a measure of improvement. It was noted that in special cases where even longer outdoor exposure life was required, it would be taken care of by local regulatory bodies. The test procedure was adopted from Specification D3435, paragraph 5.10.1.

X1.6.7 *Permeability Test*—This test applies only to nonmetallic containers and was adapted from Specification D3435, paragraph 5.11.

X1.6.8 *Kerosene Resistance Test:*

X1.6.8.1 *Visual Test*—This test applies only to nonmetallic containers and was adopted from Specification D3435, paragraph 5.12.1.

X1.6.8.2 *Immersion Test*—In consultation with experts, it was learned that tests have shown the immersed samples reach equilibrium in less than 30 days and to conduct a longer test is unnecessary. The other test procedures and parameters were adopted from Specification D3435, paragraph 5.12.2.

X1.6.9 *Stress Cracking Test*—This test applies only to nonmetallic containers and was adopted from Specification D3435, paragraph 5.13.

X1.6.10 *Corrosion Resistance Test*—Test methods are being investigated by a subgroup of F15.10. In view of the status of the standard as a temporary emergency standard, the task group elected not to delay it pending development of a suitable corrosion resistance standard procedure that be added later. Rationale for this section will be developed concurrently with the test methods.

X1.6.11 *Container Material Heat Resistance Tests*—These tests apply only to nonmetallic containers and are not considered to be fire safety standards. They were adopted in part from Specification D3435, paragraph 5.14 as follows:

X1.6.11.1 (7.10.1) paragraph 5.14.3.1

X1.6.11.2 (7.10.2) paragraph 5.14.3.2

X1.6.12 *Kerosene Resistance Tests*—These tests apply only to nonmetallic components of kerosene containers and were adopted from standard test methods of ASTM as indicated and the criteria normally used for testing plastics subject to use with kerosene.

X1.6.13 *Closure Test*—The presently published test in Test Methods D999 was adapted for both plastic and metallic containers. This is a test of the container filled to its nominal capacity to determine closure integrity after a period of vibration such as would be experienced during vehicular transportation.

X1.6.14 *Precision and Bias*—Precision statements will require collection and collation of test data from manufacturers and independent test laboratories. Interlaboratory and intralaboratory test program methodology must first be agreed upon, tests designed, program costs determined and administrative responsibilities fixed. Funds must be obtained or pledged. Testing must be done and results distributed. Only then will data of sufficient quality be available for proper evaluation as a basis for precision statements to be included in future revisions of the standard. Task Group F15.10 has not yet addressed this matter.

X1.7 Retest and Rejection (Section 5)

X1.7.1 This section is a standard ASTM paragraph.

X1.8 Marking (Section 8)

X1.8.1 *General*—In view of the combustible nature of kerosene, it was deemed essential that containers be identified

and certain additional information included. Identification of the container is necessary for the purpose of traceability to the manufacturer. The task group developed a separate standard for labeling and this standard will be appropriately referenced. Also, it was determined that the markings need to be legible.

X1.8.2 *Marking Durability*—The task group adopted existing applicable requirements to ensure longevity and integrity of the marking system.