UL 2586

STANDARD FOR SAFETY

Hose Nozzle Valves

UL Standard for Safety for Hose Nozzle Valves, UL 2586

First Edition, Dated April 29, 2011

Summary of Topics

This revision of ANSI/UL 2586 includes an update to standard references and clarifications.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated August 24, 2018.

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HISTORICAL NOTE

Prior to the first edition, the requirements for the products covered by this standard were included in the Standard for Valves for Flammable Fluids, UL 842.

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UL 2586

Standard for Hose Nozzle Valves

First Edition

April 29, 2011

This ANSI/UL Standard for Safety consists of the First Edition including revisions through October 2, 2018.

The most recent designation of ANSI/UL 2586 as an American National Standard (ANSI) occurred on October 1, 2018. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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INTRODUCTION

1 Scope

1.1 These requirements cover hose nozzle valves that are intended to be used for the control of flammable and combustible liquids. They are of the type used in motor fuel dispensing equipment. Hose nozzle valves covered by this standard are for use with flammable fluids which are handled at temperatures within the range of minus 29°C (minus 20°F) to 52°C (125°F) and an operating pressure of minimum 50 psi (350 kPa).

1.2 These requirements cover hose nozzle valves of the manually operated and automatic pressure operated type.

When they form a part of an assembly which provides for additional functions or service, the requirements are outside the scope of these requirements.

1.3 These requirements do not cover the following:

a) Hose nozzle valves for handling liquids under cryogenic conditions.

b) Hose nozzle valves for general refinery service, offshore and pipe line terminals, natural gas processing plants, gas distribution systems, petrochemical processing facilities, or the like.

c) Hose nozzle valves operated wholly or partially by electricity or battery.

1.4 For hose nozzle valves intended to be used with gasoline/ethanol blends with nominal ethanol concentrations above 10%, refer to the Standard for Hose Nozzle Valves for Gasoline and Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85 Percent (E0 – E85), UL 2586A, for additional requirements.

1.5 For additional requirements for hose nozzle valves for diesel fuel, biodiesel fuel, diesel/biodiesel blends with nominal biodiesel concentrations up to 20 Percent (B20), Kerosene, and Fuel Oil refer to the Standard for Hose Nozzle Valves for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends with Nominal Biodiesel Concentrations up to 20 Percent (B20), Kerosene, and Fuel Oil, UL 2586B.

1.6 Requirements for the installation and use of these dispensing devices are included in the Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 30A.

2 General

2.1 Components

2.1.1 Except as indicated in 2.1.2, a component of a product covered by this standard shall comply with the requirements for that component.

2.1.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or

b) Is superseded by a requirement in this standard.

2.1.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.1.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

2.1.5 A hose nozzle valve with an integral swivel shall be additionally evaluated to the Electrical-Continuity and Operation Tests in the Standard for Emergency Breakaway Fittings, Swivel Connectors and Pipe-Connection Fittings for Petroleum Products and LP-Gas, UL 567. The force is to be applied at the point on the swivel farthest from the joint. When necessitated by the swivel construction, this test is to be conducted on additional samples of the swivel with the load applied on the opposite side of the plane of rotation. See UL 567, Figures 15.1 – 15.3 for examples.

2.2 Units of measurement

2.2.1 When a value for measurement is followed by a value in other units in parentheses, the first stated value is the requirement.

2.3 Undated references

2.3.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

3 Glossary

3.1 FLAMMABLE AND COMBUSTIBLE FLUIDS – Diesel, gasoline, and kerosene not in excess of 50 pounds per square inch (psi) (344.8 kPa). The fuels are formulated in accordance with Regulation of Fuels and Fuel Additives, 40CFR80, and the following:

a) Gasoline formulated in accordance with the Standard Specification for Automotive Spark-Ignition Engine Fuel, ASTM/ANSI D4814;

b) Gasoline/ethanol blends at levels designated as ″gasohol″ (E10) or less formulated in accordance with ASTM/ANSI D4814, when blended with denatured fuel ethanol formulated in accordance with the Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel, ASTM/ANSI D4806;

c) Diesel fuel formulated in accordance with the Standard Specification for Diesel Fuel Oils, ASTM/ANSI D975;

d) Kerosene formulated in accordance with the Standard Specification for Kerosine, ASTM/ANSI D3699; and

e) Fuel oil (heating fuel) formulated in accordance with the Standard Specification for Fuel Oils, ASTM D396.

3.2 HOSE NOZZLE VALVE, AUTOMATIC – A hose nozzle valve which is held open during the entire filling operation. It may be held open by manual force or by an integral hold-open or latching device. It incorporates a mechanism that shuts off the flow of liquid during refueling operations to prevent overflow from the fill opening when liquid reaches a predetermined point on the spout.

3.3 HOSE NOZZLE VALVES – A self-closing device designed to control the flow of flammable and combustible liquids at an operating pressure of minimum 50 psi (345 kPa). It is intended for use at the outlet end of a hose for dispensing flammable liquids.

3.4 HOSE NOZZLE VALVE, MANUALLY OPERATED – A hose nozzle valve that is manually held open during the entire filling operation and closes only upon release of the manual force.

3.5 HOSE NOZZLE VALVE, VAPOR RECOVERY – A system constructed to capture vapors displaced during filling operations. The vapors are not processed during the course of this activity.

a) Assist Nozzle – A vacuum or pump is used to draw the vapors back to tank.

b) Balance Nozzle – Displacement of vapors from tank being fill forces the vapor back into the storage tank.

3.6 SEALS, DYNAMIC – A seal that is subject to mechanical movement or other applied forces that result in movement or flexing of the seal under normal use conditions.

3.7 SEALS, STATIC – A seal that is not subject to mechanical movement or other applied forces other than compressing forces that are applied during installation, after which, the seal is held in place during normal use conditions.

CONSTRUCTION

4 Assembly

4.1 General

4.1.1 A hose nozzle valve shall include all of the components required for its intended function and installation.

4.1.2 A seat disc shall be attached to its poppet or holder or otherwise assembled so as to prevent it from becoming dislocated under service conditions as determined by the Hose Nozzle Endurance Test, Section 18. The means to secure the disc shall not rely upon cement or adhesive.

4.1.3 A brazing material used for joining liquid confining parts of a valve shall have a melting point (solidus temperature) of minimum 538°C (1000°F).

4.2 Hose nozzle valves

4.2.1 A hose nozzle valve shall be of the manually-operated or of the automatic type. A manually-operated valve requires the valve to be manually held open during the entire filling operation without the aid of hold-open devices or latches, but is capable of closing automatically. An automatic valve requires the valve to:

a) Be manually opened, but is capable of being held open during the filling operation by a latch or other device and

b) Is provided with automatic closing features.

Exception: A hose nozzle valve for use in salt water or boat yard environments shall be of the automatic closing type without a latch-open device.

4.2.2 Automatic hose nozzle valves equipped with an integral hold open or latching device shall be so designed that, if left in the latched position after the flow has been stopped by means other than the automatic feature of the hose nozzle, it shall automatically unlatch when it is returned to the dispenser, See Automatic hose nozzle valve, 15.1.2.

NOTE: This includes hose nozzle valves that close with a no pressure/no flow mechanism, as well as interlock hose nozzles valves that unlatch when removed from car fill pipe or when hung on the dispenser.

4.2.3 A hose nozzle valve shall be of the normally closed type. It shall be self-closing upon the manual or automatic release of the operating lever.

4.2.4 A guard shall be provided to guide or protect the free end of an operating lever and to prevent opening of the valve or damage to an operating part if the valve is dropped. A guard shall be of such strength as to permit operation of the valve subsequent to its being subjected to mechanical strength tests. See the Hose Nozzle Valve Guard Strength Test, Section 14.

4.2.5 An operating lever shall possess the strength required to resist bending or breaking when tested in accordance with these requirements. See the Hose Nozzle Endurance Test, Section 18.

4.2.6 The closing action of a hose nozzle valve shall be in the direction of fluid flow. A seat seal or valve disc shall consist of resilient material and shall provide proper seating of a disc.

4.2.7 A hose nozzle valve shall be equipped with a spout not exceeding 12 inches (305 mm) in length. Nozzles shall be of corrosion resistant material, such as brass, aluminum, or stainless steel.

4.2.8 A sand casting employed as a pressure confining part of a hose nozzle valve shall have a wall thickness of minimum 0.094 inch (2.38 mm).

4.2.9 The means for attaching a spout to an automatic valve body shall permit ready replacement of a spout with the use of ordinary hand tools.

4.2.10 A hose nozzle valve shall be constructed so as to provide electrical continuity from end to end across all joints so that when in use, continuity is provided for grounding of static charges. Such continuity shall be inherent in the construction and shall not be accomplished by a jumper wire. See the Electrical Continuity Test, Section 22.

4.2.11 A hose nozzle valve intended for use in salt water marine or boat yard environments shall be constructed so as to comply with the applicable construction and performance requirements except that the tests specified in Sections 14, 15, 17, 21, and 22 are to be conducted following exposure to a salt enriched atmosphere as described in 23.2 – 23.6.

Exception: A hose nozzle valve is not required to operate in accordance with the requirements of Section 15 when, due to accumulation of salt in the sensing port, the hose nozzle valve does not operate to deliver fluid.

5 Materials

5.1 Liquid-confining parts of a hose nozzle valve or operating parts shall have the strength and durability to provide reliable service of the parts and of the assembly, when failure of the part allows leakage or hazardous operation.

5.2 To conform to 5.1, a material other than a valve disc or soft seat, a seal ring, a diaphragm, a gasket or vacuum or pressure caps shall have a melting point (solidus temperature) of minimum 343°C (650°F) and a tensile strength of minimum 10,000 psi (69 MPa) at 94°C (201°F).

5.3 When atmospheric corrosion of a part interferes with the intended function of a valve or permits external leakage, the part shall be of a corrosion resistant material or be provided with a corrosion resistant coating.

5.4 A coating complying with 5.3 shall provide resistance against corrosion to a degree not less than that provided by the coatings specified in 5.5.

5.5 Cadmium plating shall not be used. Zinc plating shall be minimum 0.0005 inch (0.013 mm) thick other than on parts where threads constitute the major portion of the area, in which case the thickness of the cadmium or zinc plating shall be minimum 0.00015 inch (0.0038 mm).

5.6 A hose nozzle valve intended for use in salt water marine or boat yard environments shall be resistant to corrosion so as to comply with the requirements of the Salt Spray Test, Section 23.

5.7 A plant fiber gasket used to seal a fluid-retaining joint shall be not more than 1/32 inch (0.8 mm) thick. A cork composition gasket shall be shellacked in place on one side and coated with graphite on the other. A synthetic rubber gasket shall have a thickness of not less than 1/64 inch (0.4 mm) and not more than 3/32 inch (2.4 mm).

6 Bodies and Covers

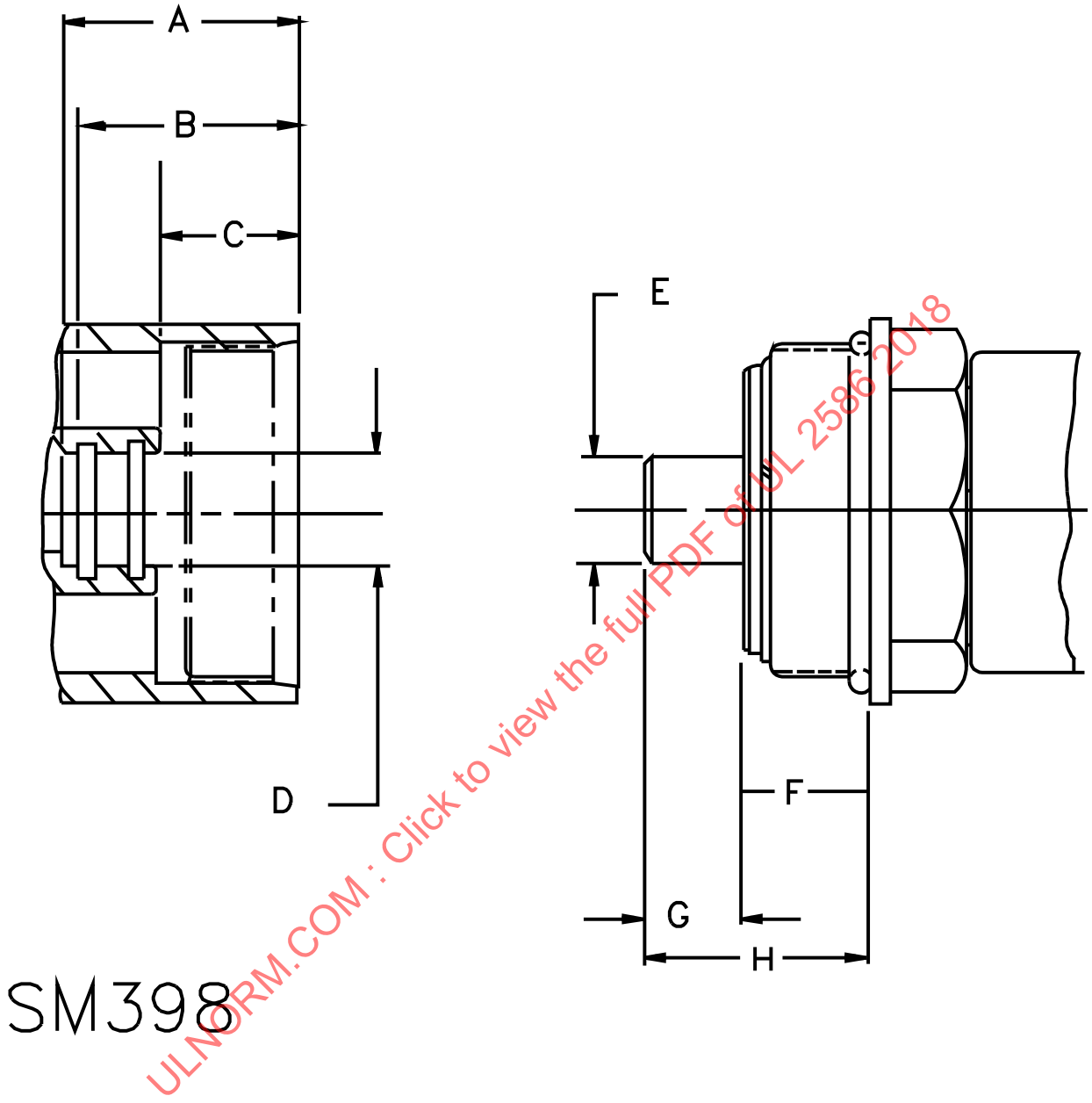
6.1 A threaded section of a body intended for the connection of pipe shall have a section to serve as a wrench grip.

6.2 Pipe threads shall be in accordance with the Standard for Pipe Threads, General Purpose (Inch), ANSI/ASME B1.20.1.

Exception: Hose nozzle valves intended for use in installations where pipe fittings incorporate other than NPT type threads shall be permitted to be provided with pipe threads complying with a national pipe thread standard compatible with those fittings. The pipe thread type shall be identified in accordance with 29.5.

6.3 The couplings provided on coaxial type vapor recovery hose assemblies shall have male 1-7/8 - 12-SAE straight threads when the inner hose is intended to dispense the liquid fuel into the vehicle and 1-1/4 inch - 18 SAE Straight, M34 by 1.5 metric thread or 1 inch - 11-1/2 NPT threads , as required when the outer hose is intended to dispense the liquid fuel into the vehicle. All fittings are to be designed to fit the accessories connected to the hose couplings to form a leak tight connection. Coaxial type connections shall also have the dimensions as indicated in Figure 6.1.

Figure 6.1
Coaxial type connection



Item	Inch	(mm)
A	1.45 min	36.8 min
B	1.26 max	32.0 max
C	0.78 min	19.8 min
D	0.668 – 0.672	17.0 – 17.1
E	0.660 – 0.664	16.8 – 16.9
F	0.78 max	19.8 max
G	0.56 min	14.2 min
H	1.31 – 1.45	33.3 – 36.8

6.4 If the end connections of a vapor recovery fitting do not conform to the requirements specified in (above), the installation instructions which accompany each fitting shall indicate the specific equipment which is to be connected to the fitting.

6.5 Joints in a body formed of two or more parts shall be prevented from loosening as the result of the turning effort exerted by connecting or disconnecting piping. See the Deformation Test, Section 11.

6.6 Openings for bolts or screws used for assembly shall not extend through the outer walls of a body into a liquid-handling section.

7 Diaphragms

7.1 A diaphragm shall be protected from damage.

7.2 Metal parts coming in contact with a diaphragm shall have no sharp edges, burrs, projections, or the like which cause chafing or abrasion of the diaphragm.

8 Springs

8.1 A spring shall be guided and arranged to minimize binding, buckling, or other interference with its free movement. When required, ends of a spring shall be closed and squared.

9 Operating Mechanisms

9.1 Screws and nuts used to attach operating parts to movable members shall be upset or otherwise locked to prevent loosening.

9.2 A manually-operated mechanism of a hose nozzle valve shall provide free movement of all parts.

PERFORMANCE

10 General

10.1 Except as otherwise indicated, representative samples of each type of hose nozzle valve are to be subjected to the tests described in these requirements. Additional samples of parts constructed of nonmetallic materials, such as seal materials and valve seat discs, shall be provided as required for physical and chemical tests.

10.2 Leakage tests for the portions of liquid handling hose nozzle valves are to be conducted using a source of aerostatic pressure. When leakage is observed, the tests shall be repeated with kerosene or a solvent considered equivalent to ″white gasoline″ that has a Kauri Butanol value of 44.

10.3 Water or other liquid is not prohibited from being used for developing the required pressure in a hydrostatic pressure strength test.

11 Deformation Test

11.1 Joints in a hose nozzle valve shall not leak, nor shall there be evidence of loosening of joints, distortion, or other damage resulting from the stress imposed on pipe-threaded sections when tested in accordance with these requirements.

11.2 The sample hose nozzle valve used in this test is to be rigidly anchored or otherwise supported. A length of Schedule 80 pipe is to be connected to a female pipe threaded section of the body, the male threads having first been lubricated with SAE No. 10 machine oil. Each pipe is then to be tightened to the torque specified in Table 11.1.

Table 11.1
Torque requirements for pipe connections

Pipe size, nominal inches	Outside diameter, inches	(mm)	Torque, pound-inches	N·m
1/2	0.840	21.34	800	90
3/4	1.050	26.67	1000	113
1	1.315	33.40	1200	137
1-1/4	1.660	42.16	1450	164
1-1/2	1.900	48.26	1550	175

11.3 After the torque force has been applied to each connected pipe, the test sample is to be subjected to the External Leakage Test, Section 12.

11.4 Upon removal of the pipe from the test sample, the assembly is to be examined for loosening of body joints.

11.5 If external leakage is noted at the thread joint between the pipe and body, the joint is to be remade using a pipe joint sealing material and retested for leakage.

12 External Leakage Test

12.1 The external leakage test is conducted on as received samples and after the Hose Nozzle Valve Guard Strength Test, Section 14, Pull Test, Section 16, Sensitivity Test, Section 17, and Hose Nozzle Endurance Test, Section 18.

12.2 The inlet of the test valve is to be connected to a system capable of supplying clean aerostatic or hydrostatic pressure as the test medium. All external leakage tests employing an aerostatic pressure source are to be maintained for at least 1 minute. All external leakage tests employing a liquid as the test medium are to be maintained for at least 5 minutes. The outlet of the hose nozzle valve is to be sealed. The test medium is to be admitted and maintained at the specified test pressure.

12.3 A hose nozzle valve is considered as complying when no leakage is observed. For leakage tests employing an aerostatic pressure source, with the fluid-containing parts of the test valve are submerged in enough water to cover the entire hose nozzle valve while under the test pressure, no bubbles indicating leakage are to be observed.

12.4 A hose nozzle valve shall not leak through stem or body seals or other joints, or show evidence of porosity in castings when liquid-confining parts under rated operating pressure are subjected to any gauge pressure between 0 and 25 psi (172 kPa) with the valve in the open position and the outlet closed.

12.5 If a hose nozzle valve is provided with a vapor return portion, the valve shall also be checked for leakage as indicated in 12.2 at 3/4 psig.

13 Seat Leakage Test

13.1 The seat leakage test is conducted on as received samples and after the Hose Nozzle Valve Guard Strength Test, Section 14, Sensitivity Test, Section 17, and Hose Nozzle Endurance Test, Section 18.

13.2 The inlet of the test valve is to be connected to a system capable of supplying clean aerostatic or hydrostatic pressure as the test medium. All seat leakage tests employing aerostatic pressure source are to be maintained for at least 1 minute. All seat leakage tests employing a liquid as the test medium are to be maintained for at least 5 minutes.

13.3 A hose nozzle valve shall not leak through stem or body seals or other joints, or show evidence of porosity in castings when liquid-confining parts under rated operating pressure are subjected to any gauge pressure between 0 and 75 psi (518 kPa) with, the valve in the closed position.

14 Hose Nozzle Valve Guard Strength Test

14.1 An operating lever guard of a hose nozzle valve shall protect the lever and valve operating parts from damage when tested as described below.

14.2 Prior to the beginning of this test, a hose nozzle valve is to be found in compliance with the requirements for external and seat leakage. See 12.4 and 13.1.

Exception: When alternate non-metallic materials are used for the hose nozzle valve guard, the prior and after leakage tests are not required.

14.3 The test valve is to be attached to a 10 foot (3.1 m) length of appropriate diameter size gasoline hose. The valve is to be dropped from a height of 4 feet (1.2 m) onto a concrete floor, employing the hose in a manner which tends to make the operating lever guard strike the floor first as specified in 14.4.

14.4 For all hose nozzle valves, the test sample is to be dropped ten times. For hose nozzle valves that have a nonmetallic operating lever guard assembly and/or a nonmetallic vacuum cap the test sample is to be dropped ten times on the guard and ten times on the vacuum cap. The spout of the test sample need not incorporate a shear groove or machined weak section, even though such is normally provided in the assembly. When the spout breaks off during the test, it shall be replaced and the test continued. At the completion of this test, the operating lever guard is to remain intact. The test nozzle valve is to function as intended when operated as specified in 15.1.1.

Exception No. 1: A hose nozzle valve that uses the same material for the operating lever guard and the plastic vacuum cap only needs the drop test conducted on both parts after conditions a and b. The remaining conditions (c, d, e, and f) and drop tests only need to be conducted on the lever guard. Refer to 14.6 for the different conditions.

Exception No. 2: When alternate non-metallic materials are used for the hose nozzle valve guard, testing to verify operation as specified in 15.1.1 is not required.

14.5 Following completion of the tests in 14.3 and 14.4, the test valve is to conform to the requirements for external and seat leakage. See 12.4 and 13.1.

14.6 For all hose nozzle valves that have a nonmetallic lever guard assembly and/or a nonmetallic vacuum cap shall be conditioned at the following temperatures and fluids;

a) 24 hours at minus 40°C;

b) 60 days at 100°C;

c) 168 hour exposure to vapors of ASTM Reference Fuels C and H;

d) 720 h UV and water, or 1000 h Xenon;

e) after three cycles of (1) 24 hours at 80°C, 96 ±4 percent RH, (2) 24 h at minus 40°C (3) 24 h at 80°C and (4) 24 h at minus 40°C.

Exception No. 1: Acetal polymers are not subjected to fluids in (c).

Exception No. 2: The 720 h UV (d) is not required if the material has a UL 746C outdoor use rating and the exposure to UV light, water exposure and immersions tests have been conducted.

A different sample shall be used for each conditioning and after each conditioning the nonmetallic lever guard assembly and/or a nonmetallic vacuum cap shall be drop as described in 14.3.

After the ten drops the guard assembly and/or a nonmetallic vacuum cap shall not break or crack.

15 Operation Test

15.1 Automatic hose nozzle valve

15.1.1 An automatic hose nozzle valve shall function as intended when operated at least ten times at each notch setting. The inlet flow pressure is to be limited to a gauge pressure of 8 psi (55 kPa) using an acceptable pumping unit, flow regulator, and pressure regulator. The resultant flow is to be measured. When the flow rate exceeds 5 gallons per minute at an inlet pressure of 8 psig, the test is to be conducted at a flow rate of 5 gallons (19 L) per minute at any resulting inlet flow pressure.

Exception: The valve is not prohibited from being operated at a flow rate of 5 gallons per minute at any resulting inlet flow pressure when this is followed by operating the valve at an inlet flow pressure of 8 psi at any resulting flow rate.

15.1.2 Automatic hose nozzle valves equipped with an integral hold open or latching device shall shut off or cease the flow of liquid when tested as described below.

15.1.2.1 A sample of the hose nozzle valve shall be connected to a pump with a control valve in the piping to limit the pressure and flow of kerosene or Soltrol 170.

15.1.2.2 For nozzles with a ″no pressure-no flow″ feature the nozzle was latched open at the flow rates indicated below. With the nozzle held or latched open, the supply pump was shut down and the pressure was allowed to drop to zero. The supply was than turned on again to determine if the nozzle automatically closed. This was repeated 10 times at each flow rate.

15.1.2.3 For nozzles with an ″Interlock″ feature the nozzle was latched open at the flow rates as indicated below while the operator manually pulls the interlock device to activate the nozzle mechanism. While the liquid was flowing and the nozzle held or latched open, the operator released the interlock to determine if the nozzle automatically closed. This is repeated 10 times in each flow rate.

Flow Rates

a) High latch (high flow) position with inlet flow pressure at 150 kPa (21.75 psig); and

b) Low latch (low flow) with inlet flow pressure at 55 kPa (8 psig).

15.2 Bellows Secondary Shut Off Operation

15.2.1 Hose nozzles valves designed with a bellows secondary shut off feature shall shutoff operation to the nozzle when operated as intended. This test shall be repeated after the Secondary Shut off Operation Test, Section 19.

16 Pull Test

16.1 An automatic hose nozzle valve shall shear or break off so as to separate the valve body from the spout when subjected to a right angle pull force of not more than:

a) 150 pounds (668 N) for a nozzle with a spout diameter less than 1 inch (25.4 mm) or

b) 180 pounds (801 N) for a nozzle with a spout diameter of 1 inch to 1-1/4 inch.

16.2 Compliance with 16.1 is capable of being obtained by a weak section groove in the spout located not more than 1 inch (25.4 mm) from the end of the valve body or body adapter and designed to fracture upon application of the specified right angle pull force or less. To determine conformance with the requirement, tests are to be conducted with the spout portion of the valve fixed at the designed break or shear point, and the specified right angle pull force applied using a length of gasoline hose of the same size as the inlet of the nozzle attached to the test sample at the inlet end of the valve body.

16.3 Following the test specified in 16.1 and 16.2, the spout shall be replaced and the valve shall be in compliance with the requirements for external and seat leakage requirements. See 12.4 and 13.1.

17 Sensitivity Test

17.1 An automatic hose nozzle valve latch shall stop the flow of liquid or unlatch when the valve is released from a fill opening or upon impact with the driveway.

17.2 Compliance with 17.1 is to be determined by a series of tests in which a sample valve is inserted into a simulated fill opening having its bottom edge located 22 inches (559 mm) above a concrete floor. Prior to the test, the sample is to be attached to a 10 foot (3.05 m) length of gasoline hose of the same size as the inlet of the nozzle. The test is conducted by pulling the sample from the opening at both slow and fast rates in a manner such that the valve strikes the concrete before the hose. Five trials are to be made at each rate with the valve latched in each of its hold-open positions.

17.3 With reference to the test sequence specified in 17.2 ″slow″ is considered to be just fast enough to cause release from the fill opening, and ″fast″ is considered to be a rapid motion as could result from a fast-accelerating automobile driving away from a dispensing device.

17.4 Following the test specified in 17.1 and 17.2, the valve shall be in compliance with the requirements for external leakage and seat leakage. See 12.1 and 13.1.

18 Hose Nozzle Endurance Test

18.1 A hose nozzle valve shall perform as intended for at least 100,000 cycles of operation when handling the fluid in accordance with 18.6 at the rated temperature in accordance with 18.7 and with rated pressure on the valve seat with the valve in the closed position. There shall be no external leakage, no sticking of the valve, nor shall the valve become inoperative, and in the case of an automatic hose nozzle valve, the automatic shut off shall shutoff the flow of the liquid. Required corrosion protection shall not be impaired.

18.2 Prior to the beginning of this test, the hose nozzle valve is to be found in conformance with the requirements for deformation, operation, external leakage and seat leakage.

18.3 Following the completion of the endurance test, the test valve shall comply with the requirements for operation, external and seat leakage.

18.4 An endurance test is to be conducted in a manner which subjects the discharge side of a hose nozzle valve to a flow of 10 GPM ± 1 GPM fluid. A hose nozzle valve is to be operated during this test at its maximum rated pressure with the valve in the closed position.

18.5 An endurance test is to be conducted at a rate not faster than 10 times per minute. A strainer having a straining element with screening openings not smaller than those of a 50-mesh screen is to be installed in the supply line near the inlet to the valve.

18.6 The fluid to be handled by a hose nozzle valve during an endurance test shall be kerosene or Soltrol 170 for valves for gasoline and similar liquids.

18.7 The endurance test is to be conducted with the air ambient at 70 ±10°F (21 ±5.5°C) when the specified temperature rating is within the range of minus 20°F (minus 29°C) to 125°F (52°C).

19 Bellows Secondary Shut Off Operation Test

19.1 A hose nozzle valve with a bellows secondary shut off that has a feature shall perform as intended for 6,000 cycle of operation. The sample shall be pressurized at its rated pressure with the valve in the closed position. The hose nozzle valve shall then be operated as intended to start the flow of the fluid and then the shut off mechanism shall be activated. The flow of test fluid shall shut off.

20 Visible Discharge Indicator Tests

20.1 Thermal shock test

20.1.1 A visible discharge indicator shall withstand without evidence of cracking or breakage a sudden temperature reduction from an initial temperature 212 ±2°F (100 ±1°C) to 32 ±2°F (0 ±0.2°C).

20.1.2 Three samples of the indicator are to be condition in water for 15 minutes at 212 ±2°F (100 ±1°C). Immediately after the 15 minutes the samples shall be plunged into water maintained at 32 ±2°F (0 ±0.2°C) and then checked for cracking or breakage.

20.2 Drop test

20.2.1 A hose nozzle valve shall protect the visible discharge indicator from damage when tested as described below.

20.2.2 Prior to the beginning of this test, three samples of the hose nozzle valve shall be tested for external leakage.

20.2.3 The samples from the external leakage test were dropped from a height of 4 ft against the edge of a concrete block ten times. Each impact was on the visible discharge indicator or on the edges that protect the visible discharge indicator.

20.2.4 After the ten impacts the external leakage test shall be repeated.

21 Hydrostatic Strength Test

21.1 All parts of a valve which are subjected to pressure during intended use shall withstand, without rupture or permanent deformation, a hydrostatic pressure of five times the rated pressure of the valve.

21.2 Prior to the beginning of this test, a valve is to comply with the requirements for deformation and external leakage test specified in Sections 11 and 12.

21.3 The pressure is to be raised slowly to the required test pressure and held for at least 1 minute with the hose nozzle valve in the closed position.

22 Electrical Continuity Test

22.1 The electrical resistance across a hose nozzle valve shall not exceed 0.5 megohm.

22.2 The electrical continuity determination is to be made using a resistance indicating instrument.

22.3 Three samples of a hose nozzle valve in the ″as received″ condition shall be subjected to this test.

22.4 Those same three samples shall be rechecked for electrical continuity while under pressure in accordance with the External Leakage Test, Section 12.

22.5 One of these samples after having been subjected to the requirements of the Hose Nozzle Endurance Test, Section 18, and the remaining two samples, after having been subjected to the requirements of the Deformation Test, Section 11, shall be rechecked for electrical continuity, while under pressure in accordance with the External Leakage Test, Section 12.

23 Salt Spray Test

23.1 A hose nozzle valve intended for use in salt water marine or boat yard environments shall operate freely without sticking or binding after being tested as specified in 23.2 – 23.6.

23.2 The samples are to be mounted on a test fixture to simulate the intended orientation. The inlet connection is to be plugged during the test.

23.3 Each sample is to be subjected to 1000 hours of exposure using a 5 percent by weight sodium chloride solution in de-ionized water. The ph value of the collected solution is to be between 6.5 and 7.5 and with a specific gravity of 1.0255 – 1.0400 at 25°C (77°F). The temperature of the chamber is to be maintained at 35 ±2°C (95 ±4°F) throughout the test.

23.4 The apparatus for salt spray (fog) testing is to consist of a fog chamber with internal dimensions of 48 by 30 by 36 inches (1.22 by 0.76 by 0.91 m), a salt solution reservoir, a supply of conditioned compressed air, one dispersion tower constructed in accordance with Standard Practice for Operating Salt Spray (Fog) Apparatus, ASTM B117, for producing a salt fog, specimen supports, provision for heating the chamber, and the required means of control.

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23.5 The dispersion tower for producing salt fog is to be located in the center of the chamber and is to be supplied with humidified air at a gauge pressure of 17 – 19 psi (0.12 – 0.13 MPa), so that the salt solution is aspirated as a fine mist or fog into the interior of the chamber.

23.6 Drops of solution that accumulate on the ceiling or cover of the chamber are not to drop on the sample. Drops of solution that fall from the samples are not to be recirculated, but are to be removed by a drain located in the bottom of the apparatus.

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