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STANDARD
OF CANADA

CAN/ULC-S620:2016

STANDARD FOR HOSE NOZZLE VALVES FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

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STANDARD FOR HOSE NOZZLE VALVES FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

PREFACE

This is the Fourth Edition of the Standard for Hose Nozzle Valves for Flammable and Combustible Liquids, CAN/ULC-S620.

This Edition of the Standard has been formally approved by the ULC Standards Committee on Fittings for Flammable and Combustible Liquids.

This Standard has been developed in compliance with the requirements of SCC for accreditation of a Standards Development Organization.

Only metric SI units of measurement are used in this Standard. If a value for measurement is followed by a value in other units in parentheses, the second value may be approximate. The first stated value is the requirement.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

This Fourth Edition National Standard of Canada is based on, and now supersedes, the Third Edition.

Attention is drawn to the possibility that some of the elements of this Canadian standard may be the subject of patent rights. ULC Standards shall not be held responsible for identifying any or all such patent rights.

Requests for interpretation of this Standard should be sent to ULC Standards. The requests should be worded in such a manner as to permit a “yes” or “no” answer based on the literal text of the requirement concerned.

The review and action to revise or reaffirm this Standard will not exceed 5 years from the date of publication, unless the Standard is identified as fitting within a stabilized category, whereby the review will commence within the appropriate time frame set out by ULC Standards.

This Standard is intended to be used for conformity assessment.

1 SCOPE

1.1 This Standard sets forth the minimum requirements for *hose nozzle valves* that are intended to be used to control the flow of *flammable and combustible liquids*. They are of the types used in motor fuel dispensing equipment.

1.2 *Valves* covered by this Standard are for use with *flammable and combustible liquids* which are handled at temperatures within the range of -40 °C to +50 °C at a working pressure of not less than 350 kPa.

1.3 These requirements cover *hose nozzle valves* of the *automatic* or *manually operated* type, to the exclusion of types operated wholly or partially by electricity. They may form a part of an assembly that provides for additional functions of service, the requirements of which are outside the scope of this Standard.

1.4 These requirements do not apply to *hose nozzle valves* incorporating a vapour recovery feature.

2 REFERENCE PUBLICATIONS

2.1 The documents shown below are referenced in the text of this Standard. Unless otherwise stated elsewhere in this Standard such reference shall be considered to indicate the edition and/or revisions of the document available at the date on which the Committee approved this ULC Standard.

Document Published by the American Society of Mechanical Engineers (ASME)
3 Park Avenue, New York, NY 10016-5990 U.S.A.
Telephone: 800-843-2763
www.asme.org

• ANSI/ASME B1.20.1-2013, Pipe Threads, General Purpose (Inch)

Documents Published by American Standard Testing and Materials (ASTM)
100 Barr Harbour Drive, West Conshohocken, PA 19428-2959 U.S.A.
Telephone: (610) 832-9585
www.astm.org

• ASTM D471-2012, Standard Test Method for Rubber Property-Effect of Liquids
• ASTM D573-2015, Standard Test Method for Rubber-Deterioration in an Air Oven

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Document Published by the CSA Group
178 Rexdale Boulevard, Toronto, ON M9W 1R3 Canada
Telephone: (416) 747-4000 or 1-800-463-6727
www.csagroup.org

• CSA C22.2 No. 0.15-15, Adhesive labels

Document Published by the National Research Council Canada (NRC)
1200 Montreal Road, Bldg M-58, Ottawa, ON K1A 0R6 Canada
Telephone: (613) 993-2463 or 1-877-672-7990
www.nrc-cnrc.gc.ca

• National Fire Code, 2010

Documents Published by Underwriters Laboratories Inc. (ULI)
333 Pfingsten Road, Northbrook, IL 60062-2096, U.S.A.
Telephone: (847) 272-8800
www.ul.com

• UL 746C-2004 (R2014), Standard for Polymeric Materials - Use in Electrical Equipment Evaluations
• UL 969-1995 (R2014), Standard for Marking and Labeling Systems

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3 GLOSSARY

NOTE: Terms used in this Standard that are in *italic* print are defined as follows:

3.1 *ASTM IRM 903 / IRM 903* — A high swelling petroleum base oil described in ASTM D471, Standard Test Method for Rubber Property-Effect of Liquids.

3.2 *ASTM REFERENCE FUEL H* — 85 % [combined 50 % Isooctane + 50 % Toluene by volume] + 15 % Anhydrous Denatured Ethanol by volume.

3.3 *AUTHORITY HAVING JURISDICTION* — The government body responsible for the enforcement of any part of this Standard or the official or agency designated by that body to exercise such a function.

3.4 *FLAMMABLE AND COMBUSTIBLE LIQUID* — Gasoline, fuel oil, kerosene and diesel fuel, including gasoline with small amounts of additives such as detergents, solvents for detergents and anti-icing chemicals; and gasoline with up to 15 % ethanol or 5 % biodiesel.

NOTE: Although not applied in this Standard, several other Standards published by the ULC Standards Committee on Fittings for Flammable and Combustible Liquids also include the following definitions; COMBUSTIBLE LIQUID - Any liquid having a flash point at or above 37.8 °C and below 93.3 °C and as defined in the National Fire Code of Canada, and FLAMMABLE LIQUID - Any liquid having a flash point below 37.8 °C and having a vapour pressure not exceeding 275 kPa (absolute) at 37.8 °C and as defined in the National Fire Code of Canada.

3.5 *HOSE NOZZLE VALVE / VALVE* — A device designed to control the flow of *flammable and combustible liquids* and intended to be installed at the outlet of a dispensing hose.

3.6 *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. The *valve* incorporates a mechanism, which will actuate closure of the *valve* when liquid reaches a predetermined point on the spout.

3.7 *HOSE NOZZLE VALVE-MANUALLY OPERATED* — A *hose nozzle valve* which is manually held open during the entire filling operation and closes only upon release of the manual force.

4 CONSTRUCTION

4.1 GENERAL

4.1.1 *Hose nozzle valves* shall be of either the *automatic* or *manually operated* types.

4.1.2 The spout of an *automatic hose nozzle valve*, equipped with an integral hold open or latching device, shall be equipped with a means whereby it may be securely held within the vehicle fill pipe during the filling operation.

4.1.3 *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, it shall automatically unlatch when it is returned to the dispenser. Refer to Clause 5.11.5.

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

4.1.4 A *valve* shall include all of the components necessary for its normal function and installation.

4.1.5 Convenient means shall be provided for the purpose of making any necessary field adjustment.

4.1.6 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 requirements of Subsection 5.12, Endurance Test. The means to secure the disc shall not rely upon cement or adhesive.

4.1.7 A brazing material used for joining fluid confining parts of a *valve* shall have a melting point (solidus temperature) not less than 538 °C.

4.1.8 Protective guards or covers shall be of a design that will not cause malfunction under normal usage.

4.2 HOSE NOZZLE VALVES

4.2.1 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 and the closing action shall be in the direction of fluid flow.

4.2.2 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 the requirements of Subsection 5.8, Guard Strength Test.

4.2.3 An operating lever shall possess ample strength to resist bending or breaking when tested in accordance with Subsection 5.12, Endurance Test.

4.2.4 *Hose nozzle valve* spouts shall be of corrosion-resistant material.

4.2.5 The spouts of *hose nozzle valves* shall conform to the following dimensions:

A For use with non-leaded gasoline, the spout terminal end shall have an outside diameter not greater than 22 mm; or

B For use with diesel fuel, the spout terminal end shall have an outside diameter greater than 24 mm.

4.3 ELECTRICAL CONTINUITY

4.3.1 A *hose nozzle valve* fitting for use with *flammable and combustible liquids* shall be constructed so as to provide electrical continuity from end to end across the one or more joints, so that when the *valve* is installed, continuity is provided for grounding of static charges.

4.3.2 Electrical continuity shall be inherent in the construction and shall not be accomplished by a jumper wire.

4.4 MATERIALS

4.4.1 Fluid confining or operating parts of a *valve* shall have sufficient strength and durability to ensure safe and reliable service.

4.4.2 To comply with Clause 4.4.1, a material for fluid confining parts used in a *hose nozzle valve*, except a *valve* disc or soft seat, a seal ring, a diaphragm, or a gasket or a vacuum cap shall have a melting point (solidus temperature) of not less than 343 °C and an ultimate tensile strength of not less than 69 MPa at 94 °C

4.4.3 A part in contact with the fluid to be handled shall be resistant to the action of such fluid.

4.4.4 If corrosion of a part will interfere with the proper function of a *valve*, the part shall be of a corrosion resistant material or be provided with a corrosion resistant protective coating.

4.4.5 A protective coating shall provide resistance against corrosion to a degree not less than that provided by the protective coatings specified in Clause 4.4.6.

4.4.6 Zinc plating shall have a thickness of not less than 0.013 mm except on parts where threads constitute the major portion of the area, in which case the thickness of the zinc plating shall be not less than 0.0038 mm.

4.5 BODIES

4.5.1 Joints in a body constructed of two or more parts shall be prevented from loosening as a result of the turning effort exerted by connecting or disconnecting fittings.

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

4.6 SPRINGS

4.6.1 A spring shall be guided and arranged to minimize binding, buckling or other interference with its free movement.

4.7 OPERATING MECHANISMS

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

4.8 END CONNECTIONS

4.8.1 A *hose nozzle valve* shall be provided with pipe threads for connection fittings and shall be constructed with a section to serve as a wrench grip.

4.8.2 Pipe threads shall be in accordance with the requirements of the ANSI/ASME B1.20.1, Pipe Threads, General Purpose (Inch).

5 PERFORMANCE

5.1 GENERAL

5.1.1 Except as otherwise indicated, representative samples shall be subjected to the tests described in these requirements. Additional samples of parts constructed of non-metallic materials, such as seal materials and *valve* seat discs, are generally required for physical and chemical tests.

5.1.2 A *valve* shall be investigated for the service conditions for which it is to be recommended, such as ambient and liquid temperature and liquid pressure.

5.1.3 Leakage tests on fittings intended to handle *flammable and combustible liquids* shall employ kerosene as the test medium.

5.1.4 Water or other non-hazardous liquid shall be used to develop the required pressure in accordance with Subsection 5.3, Hydrostatic Strength Test.

5.2 DEFORMATION TEST

5.2.1 Joints in a *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 Clauses 5.2.2 through 5.2.6.

5.2.2 The sample *valve* used in this test shall be rigidly anchored or otherwise supported.

5.2.3 A length of Schedule 80 steel pipe shall be connected to a female pipe threaded section of the body, the male threads having first been lubricated with SAE No. 10 machine oil.

5.2.4 Each pipe shall then be tightened to the torque specified in Table 1.

5.2.5 After the torque force has been applied to each connected pipe, the test sample shall be subjected to the requirements of Subsection 5.7, External Leakage Test.

5.2.6 Upon removal of the pipe from the test sample, the *valve* shall be examined for loosening of body joints.

5.3 HYDROSTATIC STRENGTH TEST

5.3.1 All parts of a *valve*, which are subjected to pressure during normal usage, shall withstand, without rupture or permanent deformation, a hydrostatic pressure of at least 5 times the rated pressure of the *valve* when tested in accordance with Clauses 5.3.2 and 5.3.3.

5.3.2 Prior to the beginning of this test, a *valve* shall be found in conformance with the requirements for deformation as described in Subsection 5.2, Deformation Test.

5.3.3 The test pressure shall be held for at least 1 min.

5.4 ELECTRICAL CONTINUITY TEST

5.4.1 The electrical resistance across a *hose nozzle valve* for use with *flammable and combustible liquids* shall not exceed 0.5 MΩ.

5.4.2 The electrical continuity determination shall be made using a resistance-indicating instrument.