

**NATIONAL
STANDARD
OF CANADA**

CAN/ULC-S660-08

**STANDARD FOR
NONMETALLIC UNDERGROUND PIPING FOR
FLAMMABLE AND COMBUSTIBLE LIQUIDS**



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TABLE OF CONTENTS

ULC COMMITTEE ON FITTINGS FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS	i
REFERENCE PUBLICATIONS	ii
PREFACE	1
1. SCOPE.....	2
2. GLOSSARY	2
3. CONSTRUCTION	4
4. PERFORMANCE	5
4.1 GENERAL	5
4.2 SHORT TERM PRESSURE TESTS	6
4.2.1 General	6
4.2.2 Leakage Test	7
4.2.3 Hydrostatic Test	7
4.2.4 Breakdown Test	7
4.3 LONG TERM PRESSURE TESTS	8
4.3.1 General	8
4.3.2 Sustained Pressure Test	8
4.3.3 Cyclic Pressure Test	8
4.4 VACUUM TESTS	9
4.4.1 General	9
4.4.2 Static Vacuum Test	9
4.4.3 Cyclic Vacuum Test	9
4.5 FITTING TORQUE TEST	9
4.6 FITTING BENDING TEST	10
4.7 PIPE BENDING TEST	10
4.8 DROP TEST	11
4.9 DROP TEST AFTER CONDITIONING	11
4.10 BALL IMPACT TEST	12
4.11 BALL IMPACT TEST AFTER CONDITIONING	12
4.12 PIPE BURIAL TESTS	13
4.12.1 General	13
4.12.2 Pull Strength Test	13
4.12.3 Puncture Resistance Test	13
4.12.4 Crush Resistance Test	14
4.13 LONG TERM COMPATIBILITY TEST	14
4.14 INTERSTITIAL COMMUNICATION TEST	17
4.15 UV COMPATIBILITY TEST	17
4.16 NONMETALLIC FITTING STRESS CRACK TEST	18
4.17 METALLIC FITTING STRESS CRACK TEST	18
4.18 PERMEATION TEST	18
5. MANUFACTURING AND PRODUCTION TESTS	19
5.1 GENERAL	19
5.2 LEAKAGE TEST	19
6. MARKING	20
7. INSTRUCTIONS	21
TABLES	24

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Documents

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REFERENCE PUBLICATIONS

The documents shown below are referenced in the text of this draft 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 this ULC Standard was approved.

Document Published by the American Society for Testing and Materials
100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 U.S.A.
Telephone: (610) 832-9585, Fax: (610) 832-9555
www.astm.org

- ASTM A653/A 653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- ASTM D2143-00, Standard Test Method for Cyclic Pressure Strength of Reinforced, Thermosetting Plastic Pipe
- ASTM D2412-02, Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- ASTM D2837-04, Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
- ASTM D3567-97, Standard Practice for Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
- ASTM G153-04, Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
- ASTM G155-05, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

Document Published by the Canadian Standards Association (CSA)
5060 Spectrum Way, Mississauga, ON L4W 5N6 Canada
Telephone: (416) 747-4000 or 1-800-463-6727 Fax: (416) 747-2473
www.csa.ca

- CSA B139-04, Installation Code for Oil-Burning Equipment-Seventh Edition

Document Published by the National Task Force on Storage Tanks
For the Canadian Council of Ministers of the Environment
326 Broadway, Suite 400, Winnipeg, MB R3C 0S5 Canada
Telephone: (204) 948-2090 Fax: (204) 948-2125
www.ccme.ca

- CCME PN 1326, 2003, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products

Document Published by the National Research Council Canada (NRC)
Canadian Commission on Building and Fire Codes
1200 Montreal Road, Bldg. M-58, Ottawa, ON K1A 0R6 Canada
Telephone: (613) 993-9101 or 1-877-672-2672 Fax: (613) 949-3042
www.nrc-cnrc.gc.ca

- National Fire Code of Canada 2005
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STANDARD FOR NONMETALLIC UNDERGROUND PIPING FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

PREFACE

This is the First Edition of the ULC Standard for Nonmetallic Underground Piping for Flammable and Combustible Liquids, CAN/ULC-S660-08

This document is an adoption of the technical requirements of, and intends to supersede ULC/ORD-C971-05, of the same title, including Errata 1 (2005) and Amendment 1 (2006).

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

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. Attention is drawn to the possibility that some Canadian authorities may require markings and/or instructions to be in both official languages.

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

Requests for interpretation of this Standard should be sent to the Standards Department of Underwriters' Laboratories of Canada. 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.

This Standard is intended to be used for conformity assessment.



1. SCOPE

1.1 This Standard sets forth minimum requirements for *primary carrier, secondary containment, integral primary/secondary, normal vent and vapour recovery, nonmetallic pipe, fittings, and systems* (products) intended for use *underground* for the distribution of petroleum-base *flammable and combustible liquids*, alcohols, and alcohol-blended fuels as identified in this document.

1.2 For the purpose of this Standard, *flammable and combustible liquids* mean gasoline, fuel oil, kerosene and diesel fuel, including gasoline with small amounts of additives such as detergents, solvents for detergents and anti-icing chemicals; diesel with up to 5% biodiesel and gasoline with up to 15% ethanol or methyl tertiary butyl ether (MTBE).

1.3 The products covered by this Standard are intended for installation and use in accordance with, but not limited to, the following documents:

- A National Fire Code of Canada;
- B CSA B139, Installation Code for Oil-Burning Equipment;
- C CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products; and
- D Regulations of the appropriate *authority having jurisdiction*.

1.4 This Standard covers *nonmetallic* thermoplastic (flexible) and thermoset (*rigid*) plastic *piping* with manufacturer-supplied *fittings* for *underground* use only. The products covered by this Standard have been evaluated for assembly in normal soil applications by *qualified persons* in accordance with the manufacturer's instructions.

1.5 The products covered by this Standard have not been evaluated for applications in *sumps* [more than 300 mm from *sump wall*], as connector *pipe* (between *underground pipe* and dispensing device), aboveground or marine use, or other applications exceeding ambient temperatures of 23 °C.

2. GLOSSARY

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

ASTM REFERENCE FUEL C - Combined 50% Isooctane + 50% Toluene by volume

AUTHORITY HAVING JURISDICTION – The governmental 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.

CHASE PIPE - An *underground pipe* that is used to route *primary carrier, secondary containment, or integral primary/secondary pipe* between storage tanks and containment *sumps*. Typically used to extract the *pipe* without excavation, and is not considered *secondary containment*.

CLOSED SECONDARY CONTAINMENT PIPING SYSTEM - A secondary *pip*ing system with ends normally closed at the tank and *sump* with a minimum rated pressure of 350 kPa.

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.

FITTING - A manufacturer-supplied component designed to connect, branch, or terminate *pipe* sections and contain liquids. Connections may be threaded, welded, crimped, clamped, compressed, thermo fused, solvent welded, or adhesive joined. *Sump* boots are not considered *fittings*.

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.

FLEXIBLE (PIPE/PIPING) - *Pipe* with a manufacturer's recommended minimum bend radius less than or equal to 1.8 m. Typically constructed from thermoplastic materials.

INTEGRAL - Two or more separate components physically joined together or combined at the manufacturer to form a single part. Primary and secondary *pipe* joined in the field with a common *fitting* is not considered *integral*.

INTEGRAL PRIMARY/SECONDARY (PIPE) - A single *pipe*, constructed at the manufacturing site that combines both *primary carrier* and *secondary containment* with an interstitial space that can be monitored for leakage.

METALLIC(S) - *Pipe*, *fittings*, or components primarily consisting of metals (typically corrosion-resistant malleable types such as steel, aluminum, copper, and brass) with or without minor *nonmetallic* components (such as gaskets, seals, sleeves or bushings).

NON-INTEGRAL PRIMARY/SECONDARY PIPE - A *pipe* system with independent primary carrier and *secondary containment* connected in the field with an interstitial space that can be monitored for leakage.

NONMETALLIC (PIPE) - *Pipe*, *fittings*, or components primarily consisting of non-metals (typically polymeric thermoplastics, thermosets or composites) with or without minor *metallic* components (such as foils, braids, tapes, sleeves, or bushings).

NORMAL VENT PIPE - A *pipe* system intended to transfer displaced gases (air and fluid vapours) from the top of a tank to provide atmospheric pressure equalization.

OPEN SECONDARY CONTAINMENT PIPING SYSTEM - A secondary *pip*ing system with ends normally open at the *sump* and a minimum rated pressure of 35 kPa.

PIPE - A long cylindrical thin-walled structure designed for the intended use of *underground* burial and conveying or containing liquids. The *pipe* structure may be formed from homogenous (single material), composite (multiple materials mixed together) or *integral* (individual materials joined as one component) elements.

PIPE OR FITTING SIZE - Nominal or trade size (mm or in) based on inside diameters of *pipe* and *fittings*.

NOTE: Nominal or trade sizes may not be equivalent to the actual measurements.

PIPING SYSTEM(S) / SYSTEM(S) - A combination of *pipes* and *fittings* joined to contain liquids transferred between a storage tank and *sumps* or dispensers (*primary*, *secondary*, or *integral primary/secondary* types) and vapour or air transfer between dispenser or tank to atmosphere.