

CAN/ULC-S664:2017

**STANDARD FOR CONTAINMENT SUMPS, SUMP FITTINGS,
AND ACCESSORIES FOR FLAMMABLE AND COMBUSTIBLE
LIQUIDS**

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CORPORATE HEADQUARTERS

Underwriters Laboratories of Canada
7 Underwriters Road
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Telephone: (416) 757-3611
Fax: (416) 757-9540

REGIONAL OFFICES

PACIFIC OFFICE

13775 Commerce Parkway, Suite 130
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Telephone: (604) 214-9555
Fax: (604) 214-9550

EASTERN OFFICE

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**STANDARD FOR CONTAINMENT SUMPS, SUMP FITTINGS, AND
ACCESSORIES FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS**

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ULC STANDARDS COMMITTEE ON FUELING ACCESSORIES FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

NAME	AFFILIATION	REGION	CATEGORY
M. Mailvaganam (Chair)	M. Mailvaganam -Consultant	Ontario	General Interest
B. Andrew	Veeder-Root	U.S.A.	Producer
A. Barker	Technical Standards & Safety Authority	Ontario	Regulator
M. Bishoff	Lorax Systems, Inc.	Canada	Producer
W. Boyd	Emco Wheaton Retail Corp.	U.S.A.	Producer
K. Crellin	Brugg Piping System, LLC	U.S.A.	Producer
A. Dornan	Environment Canada, Environmental Stewardship Branch	Canada	Regulator
J. Duarte	Chemtura Canada Co./Cie	Canada	User
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D. Edgecombe	Petroleum Tank Management Association of Alberta	Alberta	Regulator
E. Fernandes	Ontario Petroleum Contractors Association	Ontario	User
S. Hyde-Clarke	National Research Council of Canada	Canada	General Interest
S. Jones	SDJ Associates blueprint2build Inc.	Canada	General Interest
P. Legault	Consultant	Canada	User
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D. Northcotte	North Waterloo Farmers Mutual Insurance	Ontario	General Interest
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S. Villeneuve	Vilco, Ltd.	Nova Scotia	User
K. Webster	OPW Fueling Containment Systems, Inc.	U.S.A.	Producer
M. Modéry (Non-voting)	Environment Canada, Environmental Stewardship Branch	Canada	Associate Member
P. Neil (Non-voting)	OPW Fueling Containment Systems, Inc.	U.S.A.	Associate Member
J. Wade (Non-Voting)	ULC Standards	Canada	Associate Member
R. Riegel (Non-voting)	Underwriters Laboratories Inc.	U.S.A.	Associate Member
C. D'Onofrio (Non-voting)	ULC Standards	Canada	Project Manager

This list represents the membership at the time the Committee balloted on the final text of this edition. Since that time, changes in the membership may have occurred.

**ULC STANDARDS TASK GROUP ON CONTAINMENT SUMPS, SUMP FITTINGS, AND
ACCESSORIES FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS**

MEMBER**REPRESENTING**

J. Wade(Chair)	ULC Standards, Canada
B. Bogner	Consultant, Canada
J. Dutton	Consultant, Canada
A. Barker	Technical Standards & Safety Authority, Ontario
D. Edgecombe	Emco Wheaton Retail Corp., U.S.A.
E. Fernandes	Ontario Petroleum Contractors Association, Ontario
M. Mailvaganam	M. Mailvaganam Consultant, Ontario
W. Trussler	Ship's Point Consulting, Canada
K. Webster	OPW Fuel Containment Systems Inc., U.S.A.
R. Riegel	Underwriters Laboratories Inc., U.S.A.
K. O'Donnell(Project Manager)	ULC Standards, Canada

STANDARD FOR CONTAINMENT SUMPS, SUMP FITTINGS, AND ACCESSORIES FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

PREFACE

This is the First Edition of the Standard for Containment Sumps, Sump Fittings, and Accessories for Flammable and Combustible Liquids, CAN/ULC-S664.

This Edition of the Standard has been formally approved by the ULC Standards Committee on Fueling Accessories 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.

Appendix A, identified as Normative, forms a mandatory part of this Standard.

Appendix B, identified as Informative, is for information purposes only.

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 First Edition National Standard of Canada incorporates the requirements of, and now supersedes, ULC/ORD-C107.21, Under-Dispenser Sumps, and ULC/ORD-C58.19, Spill Containment Devices for Flammable Liquid Storage Tanks.

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.

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1 SCOPE

1.1 This Standard sets forth the minimum requirements for *containment sumps*, and associated *sump fittings* and accessories (products) intended for below- or at-grade use as an enclosure for housing of, and access to, underground piping, connector piping, and other fueling system components (such as pumps, valves, sensors, wiring, etc.) in addition to temporary containment of typical liquid *fuels* as identified in this Standard. These products are intended for use in commercial (public) or private (fleet) automotive fueling station applications or similar *fuel* dispensing applications, and piping systems for *fuel* supply of generators, burners or similar equipment. Some *sump fitting* or *sump accessory* products may be optionally evaluated for repair or replacement applications in containment sumps that have been in service.

1.2 *Containment sumps* may be either *primary* or *secondary* constructions of metallic, nonmetallic or composite materials. Typical *containment sump* types are:

- A *Tank sumps* – Sumps intended for installation above underground flammable and combustible liquid storage tanks;
- B *Dispenser sumps* – Sumps intended for installation below flammable and combustible liquid dispensing equipment;
- C *Transition sumps* – Sumps intended for access to liquid or vapour piping run manifolds, fittings and valves in a fueling system; and
- D *Fill/vent sumps* – Sumps intended for housing of fill and/or vent pipe ends, drain valves, gauges or monitors connected to the tank.

1.2.1 *Sump fittings* may be included as either an integral part of the *containment sump*, or as a field installed kit, and may include but are not limited to the following sump applications:

- A *Penetration fittings* – Fittings intended for sealing pipe penetrations through the sump wall;
- B *Termination fittings* – Fittings intended for connecting pipe terminations at the sump wall;
- C *Internal fittings* – Fittings intended for connection of working components inside the sump; and
- D *Test and monitor fittings* – Fittings intended for periodic testing or continuous monitoring of the sump and/or pipe.

1.2.2 *Sump accessories* may be included as either an integral part of the *containment sump*, or as a field installed kit, and may include but are not limited to the following sump applications:

- A *Sump covers* and *sump lids* – Covers or lids intended to limit access to the sump with structural and leak resistance features;
- B *Sump frames* – Frames intended to provide structural support of the sump walls and/or components above or in the sump;
- C *Sump brackets* – Brackets intended to provide structural attachment points for components inside the sump; and
- D *Chase pipe* – Soil pipe intended to provide a structural conduit for routing underground carrier pipe to and from the sump.

1.3 *Containment sumps*, fittings and accessories are intended for containment of automotive *fuels* and exposure to soil fluids that have similar chemical, physical and material compatibility properties as represented by the test liquids in these requirements. Refer to Appendix B (Informative) List of Standards on Fuels, for a list of Standards on *fuels* and other liquids.

1.4 Products covered by this Standard are intended to be installed and used in accordance with, but not limited to, any of the following documents:

- A National Fire Code of Canada, Part 4;
- B CSA B139, Installation code for oil-burning equipment; and
- C CCME PN 1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.

1.5 These products are factory manufactured and intended for on-site field assembly, inspection and leak testing for the specified applications and use conditions by *qualified persons* in accordance with the manufacturer's instructions and local requirements.

1.6 These products are intended to be periodically inspected and maintained for continued service, or taken out of service if necessary by *qualified persons* in accordance with industry recommended practices and/or the manufacturer's instructions.

1.7 These products have not been evaluated for use after natural disasters, fires or exposures to chemicals not representative of the test liquids or excessive physical damage beyond the expected assembly, installation and uses as identified in these requirements.

1.8 These products have not been evaluated for special use applications where exposed to heavy or continuous physical abuses, excessive mechanical stresses; or environments that operate outside of the expected atmospheric conditions and ambient use temperature range.

1.9 These requirements do not cover underground piping products (refer to CAN/ULC-S660, Standard for Nonmetallic Underground Piping for Flammable and Combustible Liquids and CAN/ULC-S667, Standard for Metallic Underground Piping for Flammable and Combustible Liquids).

1.10 These requirements do not cover connector piping products (refer to CAN/ULC-S633, Standard for Flexible Underground Hose Connectors for Flammable and Combustible Liquids).

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

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www.astm.org

- ASTM A653/A653M-15 (E 2016), Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- ASTM D256-90, Standard Test Methods for Impact Resistance of Plastics and Electrical Insulating Materials
- ASTM D396-15, Standard Specification for Fuel Oils
- ASTM D412-87, Standard Test Methods for Rubber Properties in Tension
- ASTM D471-16, Standard Test Method for Rubber Property—Effect of Liquids
- ASTM D638-91, Standard Test Method Tensile Properties of Plastics
- ASTM D664-11 REV A, Standard Test Method for Acid Number of Petroleum Products by Potentiometric Titration
- ASTM D790-91, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- ASTM D910-15, Standard Specification for Leaded Aviation Gasolines
- ASTM D975-15, Standard Specification for Diesel Fuel Oils
- ASTM D1193-06 (R11), Standard Specification for Reagent Water
- ASTM D1655-15 (E15), Standard Specification for Aviation Turbine Fuels
- ASTM D2880-15, Standard Specification for Gas Turbine Fuel Oils
- ASTM D3699-15 REV B (E15), Specification for Kerosine
- ASTM D4814-16 REV A, Standard Specification for Automotive Spark-Ignition Engine Fuel
- ASTM D5797-15, Standard Specification for Methanol Fuel Blends (M51-M85) for Methanol-Capable Automotive Spark-Ignition Engines
- ANSI/ASTM D5798-15, Standard Specification for Ethanol Fuel Blends for Flexible-Fuel Automotive Spark-Ignition Engines
- ASTM D5983-15, Standard Specification for Methyl Tertiary-Butyl Ether (MTBE) for Downstream Blending for Use in Automotive Spark-Ignition Engine Fuel
- ASTM D6227-14, Standard Specification for Unleaded Aviation Gasoline Containing a Non-Hydrocarbon Component
- ASTM D6448-14 (E14), Standard Specification for Industrial Burner Fuels from Used Lubricating Oils
- ASTM D6751-15 REV C (E16), Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels

- ASTM D6823-08 (R13), Standard Specification for Commercial Boiler Fuels With Used Lubricating Oils
 - ASTM D7467-15 REV C (E16), Standard Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20)
 - ASTM G62-87, Standard Test Methods for Holiday Detection in Pipeline Coatings
 - ASTM G153-13, Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
 - ASTM G155-13, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
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- CCME PN 1326 UPD 2015, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products
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- CAN/CGSB-3.18-10, Diesel Fuel for Locomotive-Type Medium-Speed Diesel Engines
 - CAN/CGSB-3.2-11, Heating Fuel Oil
 - CAN/CGSB-3.3-14, Kerosene
 - CAN/CGSB-3.511-93, Oxygenated Automotive Gasoline Containing Ethanol
 - CAN/CGSB-3.514-98, Fuel Methanol (M85) for Automotive Engines
 - CAN/CGSB-3.517-07, Automotive (On-road) Diesel Fuel
 - CAN/CGSB-3.520-05, Automotive Low-Sulphur Diesel Fuel Containing Low Levels of Biodiesel Esters (B1-B5)
 - CAN/CGSB-3.6-00, Regular Sulphur Diesel Fuel
-

Documents Published by CSA Group
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- CSA B139 Series-15, Installation code for oil-burning equipment

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

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- National Fire Code of Canada, 2015

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- CAN/ULC-S633-99, Standard for Flexible Underground Hose Connectors for Flammable and Combustible Liquids
- CAN/ULC-S660-08, Standard for Nonmetallic Underground Piping for Flammable and Combustible Liquids
- CAN/ULC-S667-11, Standard for Metallic Underground Piping for Flammable and Combustible Liquids

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- UL 797-2007 (R2012), Standard for Electrical Metallic Tubing - Steel
- UL 969-1995 (R2014), Standard for Marking and Labeling Systems

3 GLOSSARY

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

3.1 **CONTAINMENT SUMPS** – *Primary* and/or *secondary* atmospheric enclosures of various types (see Clauses 3.1.1 to 3.1.4) for burial below-grade or at-grade. Sumps are designed to provide a connection interface for underground piping, wiring, and accessible housing for fueling system components and other fueling components, and the temporary containment of these liquids in the event of spills or leaks, and when attached to the dispenser, prevent the entrance of run off ground water into the sump.

3.1.1 **DISPENSER SUMPS** – A *containment sump* design with a bottom and partially open top or lid. Intended for attachment to a frame under a liquid dispensing device at a fueling island.

3.1.2 **FILL SUMPS** or **VENT SUMPS** – A *containment sump* design with bottom opening and lid. Intended to interface with tank *fuel* fill or vapour recovery connecting pipe and to house adapters/caps, drain valves, gauges or monitors.

3.1.3 **TANK SUMP** – A *containment sump* design with or without a bottom, and with a lid. Intended for attachment to a manway ring, collar, or connecting pipe above an underground tank.

3.1.4 **TRANSITION SUMPS** – A *containment sump* design with bottom, lid, and some above grade parts. Intended to house liquid or vapour piping manifolds, fittings, valves and other fueling components.

3.2 **FUEL** – Typically, and at least, those liquids identified in Appendix B (Informative), List of Standards on Fuels, that are dispensed in commercial or fleet motor vehicle fueling stations for use in automotive engines (internal combustion or compression ignition).

3.3 **PRIMARY SUMP (PRIMARY)** – A single wall sump construction intended to temporarily contain any liquids leaking from pipe, valves or other liquid conveying components housed inside or above the sump. Internal *primary sump* walls are not intended for long term exposure of contained *fuels*, but may be subjected to long term *fuel* vapour exposures.

3.4 **QUALIFIED PERSON** – A person specifically trained, by the manufacturer or manufacturer's representative, to perform proper field installations of sumps, *sump fittings*, and *sump accessories* in accordance with the manufacturer's instructions.

3.5 **SECONDARY SUMP (SECONDARY)** – The outer wall of a double wall sump construction intended to surround the *primary sump*, temporarily contain any liquids leaking from the *primary sump* or from connecting secondary piping, and to provide fluid communication and monitoring capabilities. Interstitial spaces are not intended for long term exposure of contained *fuels*.

3.6 **SIZE (PIPE SIZE or FITTING SIZE)** – Nominal or trade dimensions (inches or mm) of pipe and fittings based on inside diameters or thread.

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

3.7 **SUMP ACCESSORIES** – Various types (see 3.7.1 to 3.7.4) and designs (bolted, clamped, fused) of mechanical hardware or parts intended to provide structural support of sump walls, fueling system components within sumps, fueling system equipment outside sumps, or loads above the sump. Accessories are typically for new constructions, but may be additionally designed for repair/replacement of in service sumps.

3.7.1 **CHASE PIPE** – Typically a flexible underground nonmetallic soil pipe. Intended to resist earth loading and to provide a structural conduit for routing underground piping to/from the sump, but not to provide rated *fuel* containment.

3.7.2 **SUMP BRACKETS** – Typically a minor rigid structural support connected to the sump wall or frame. Intended to provide a load bearing attachment point for internal fueling system components inside the sump such as valves, pipes, sensors, controls, etc.

3.7.3 **SUMP COVERS and SUMP LIDS** – Typically either a rigid structural plate or semi-rigid cap over the mating sump top opening. Intended to limit access to the sump, to resist surface or ground water entry, and support either working loads (for below-grade lids) or vehicle load (for at-grade covers).

3.7.4 **SUMP FRAMES** – Typically a major rigid structural framework connected to the sump top wall perimeter. Intended to resist earth loading, and to support external equipment or internal component loads, and below-grade lids or at-grade covers.

3.8 **SUMP FITTINGS** – *Primary* and/or *secondary* connections of various types (see Clauses 3.8.1 to 3.8.4) and designs (threaded, clamped, fused), intended for liquid-tight joining or sealing of internal or external piping or other fueling system components to or through sump wall(s). Fittings are typically for new constructions, but may be additionally designed for repair/replacement of in service sumps.