CAN/ULC-S652:2016-REV1
(Including Revision 1)

STANDARD FOR TANK ASSEMBLIES FOR THE COLLECTION, STORAGE AND REMOVAL OF USED OIL

ULC Standards
Normes ULC

Standards Council of Canada
Conseil canadien des normes

Underwriters Laboratories of Canada (ULC) was established in 1920 by letters patent issued by the Canadian Government. It maintains and operates laboratories and certification services for the examination, testing and certification of appliances, equipment, materials, constructions and systems to determine their relation to life, fire and property hazards as well providing inspection services.

ULC Standards develops and publishes standards and other related publications for building construction, security and burglar protection, environmental safety, electrical equipment, fire protection equipment, gas and oil equipment, thermal insulation products, materials and systems, energy use in the built environment and electrical utility safety.

ULC Standards is a not-for-profit organization and is accredited by the Standards Council of Canada as a Standards Development Organization.

National Standards of Canada developed by ULC Standards conform to the requirements and guidance established by the Standards Council of Canada. Such standards are prepared using the consensus principle by individuals who provide a balanced representation of interests relevant to the subject area on a national basis.

National Standard of Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

For further information on ULC standards, please contact:

ULC STANDARDS
171 Nepean Street, Suite 400
Ottawa, Ontario K2P 0B4
Telephone: (613) 755-2729
To purchase ULC Standards, visit: www.ulc.ca/ulcstandards

The intended primary application of this standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for the particular application.

Copies of this National Standard of Canada may be ordered from ULC Standards.

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET ANGLAISE

Standard For Tank Assemblies For The Collection, Storage And Removal Of Used Oil, CAN/ULC-S652:2016-REV1

Third Edition, Dated February 2016

Summary of Topics

This March 2019 revision of CAN/ULC-S652:2016 contains revisions to support the National Research Council of Canada program to address Climate Change Adaptation in Canadian Codes and Standards.

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

A "**(REV1)**" marker in Bold will be inserted at the start of the applicable Clause(s) and in the applicable Subsection title(s). The Subsection title markers will appear in the TOC as a result. The markers may be found by searching for the characters "(REV1)". Including the parenthesis in the search term will find the markers, without also finding every page header.

PLEASE NOTE THAT CERTAIN CODES MAY REFER TO A SUPERSEDED VERSION OF THIS STANDARD. IN THOSE INSTANCES, THE RELEVANT VERSIONS ARE AVAILABLE FOR PURCHASE.

No Text on This Page

CAN/ULC-S652:2016-REV1

STANDARD FOR TANK ASSEMBLIES FOR THE COLLECTION, STORAGE AND REMOVAL OF USED OIL

ICS 23.020.10

ULC Standards
Normes ULC

Standards Council of Canada
Conseil canadien des normes

First Edition . . . . . October 1993
Amendment 1 . . . . . June 1995
Second Edition . . . . . May 2008
Errata 1 . . . . . June 2010
THIRD EDITION . . . . . FEBRUARY 2016
REVISION 1 . . . . . MARCH 2019

TABLE OF CONTENTS

ULC STANDARDS COMMITTEE ON STATIONARY STEEL STORAGE CONTAINERS FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS

NAME	AFFILIATION	REGION	CATEGORY
J. Wade (Chair)	ULC Standards	Canada	Non-voting
A. Barker	Technical Standards & Safety Authority	Ontario	Regulator
E. Bourassa	Granby Industries LP	Québec	Producer
A. Crimi	AC Consulting Solutions Inc.	Ontario	General Interest
C. Deschamps	Régie de batiment du Québec	Québec	Regulator
J. Duarte	Chemtura Canada Co./Cie	Canada	User
J. Dutton	Consultant	Newfoundland & Labrador	General Interest
D. Edgecombe	Petroleum Tank Management Association of Alberta	Alberta	Regulator
E. Fernandes	Elfent Ltd	Ontario	User
S. Hyde-Clarke	National Research Council of Canada	Canada	General Interest
S. Jones	SDJ Associates / blueprint2build Inc.	Canada	User
N. Klassen	Westeel	Canada	Producer
P. Legault	Integrated Review Services – Consulting	Canada	User
M. Mailvaganam	Consultant	Ontario	General Interest
G. Nikolic	MHCC Consultants Inc.	Ontario	General Interest
D. Northcotte	Heartland Farm Mutals	Ontario	General Interest
S. Pollock	Steel Tank Institute	USA	User
R. Riegel	UL LLC	USA	Testing & Standards Org
D. Snider	AGI Envirotank	Saskatchewan	Producer
C. Stevenson	Apex Corrosion	Canada	General Interest
H. Sukhu	DTE Industries Ltd.	Ontario	Producer
T. Tidy	Tidy Steel Fab Ltd/Regal Tanks Ltd	British Columbia	Producer
W. Trussler	Ship's Point Consulting	Canada	User
E. Beaulieu (Associate Member)	Les Industries Desjardins Ltee.	USA	Non-voting
C. D'Onofrio (Project Manager)	ULC Standards	Canada	Non-voting

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.

STANDARD FOR TANK ASSEMBLIES FOR THE COLLECTION, STORAGE AND REMOVAL OF USED OIL

PREFACE

This is the Third Edition of the Standard for Tank Assemblies for the Collection, Storage and Removal of Used Oil, CAN/ULC-S652.

This Edition of the Standard has been formally approved by the ULC Standards Committee on Stationary Steel Storage Containers 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.

Appendices B and C, identified as Informative, are for guidance and 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 Third Edition National Standard of Canada is based on, and now supersedes, the Second 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.

This CAN/ULC-S652 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

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

This Standard is intended to be used for conformity assessment.

1 SCOPE

1.1 This Standard sets forth the minimum requirements for the adaptation of tanks or tank assemblies for the collection, storage and removal of *used oil*.

1.2 The stationary installation and use of *used oil* tank assemblies, may be covered by the requirements of the *authority having jurisdiction* and may include by reference, but not limited to the following:

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.

1.3 **(REV1)** Standards for the tanks or tank assemblies covered by this Standard are identified in Section 4, Construction. As a result of revisions to those Standards published in 2019, in addition to traditional safety requirements for tanks that primarily evaluate functional operation, structural integrity, and mitigate fire & environmental hazards from loss of liquid containment under expected normal conditions; optional construction and/or performance requirements, and associated ratings, intended to address more severe conditions associated with the effects of Climate Change are now specified in an optional Climate Change Adaptation Appendix in each of those Standards.

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 Canadian Council of Ministers of the Environment (CCME)
326 Broadway Ave., Suite 400, Winnipeg, MB R3C 0S5
Telephone: (204) 948-2090
www.ccme.ca

• CCME PN 1326 UPD 2013, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products

---

Documents 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 B139 Series-15, Installation code for oil-burning equipment

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

Document Published by the National Research Council of Canada (NRC)
1200 Montreal Road, Bldg. M-58, Ottawa, ON K1A 0R6
Telephone: (613) 993-9101 or 1-877-672-2672
www.nrc-cnrc.gc.ca

• National Fire Code of Canada, 2010

Documents Published by ULC Standards
171 Nepean Street, Suite 400, Ottawa, ON K2P 0B4
Telephone: (613) 775-2729
E-mail: publications@ulc.ca
www.ulc.ca

• CAN/ULC-S601-14, Standard for Shop Fabricated Steel Aboveground Tanks for Flammable and Combustible Liquids

• CAN/ULC-S602-14, Standard for Aboveground Steel Tanks for Fuel Oil and Lubricating Oil

• CAN/ULC-S603-14, Standard for Steel Underground Tanks for Flammable and Combustible Liquids

• CAN/ULC-S603.1-11, Standard for External Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids

• CAN/ULC-S615-14, Standard for Fibre Reinforced Plastic Underground Tanks for Flammable and Combustible Liquids

• CAN/ULC-S653:2016, Standard for Aboveground Horizontal Steel Contained Tank Assemblies for Flammable and Combustible Liquids

• CAN/ULC-S655-15, Standard for Aboveground Protected Tank Assemblies for Flammable and Combustible Liquids

• CAN/ULC-S663-11, Standard for Spill Containment Devices for Flammable and Combustible Liquid Aboveground Storage Tanks

• CAN/ULC-S670-14, Standard for Aboveground Nonmetallic Tanks for Fuel Oil and Other Combustible Liquids

• CAN/ULC-S677-14, Standard for Fire Tested Aboveground Tank Assemblies for Flammable and Combustible Liquids

---

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

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

3.2 *NON-PRESSURE TANK(S)* — A tank that is normally vented to atmosphere and is not intended to accommodate operating pressures at the top of the tank greater than 7 kPa (gauge) nor internal vacuum greater than 300 Pa (gauge).

3.3 *USED OIL* — Previously used petroleum based oil and includes but is not restricted to, lubricating oil, crank-case oil, gear oil, transmission fluid, and hydraulic fluid. It differs from waste oil in that it does not include hazardous waste.

NOTE: Waste oil contaminants include significant quantities of gasoline, solvents, antifreeze, and fresh or salt water.

4 CONSTRUCTION

4.1 GENERAL

4.1.1 This Standard covers *non-pressure tanks* constructed in accordance with the requirements of one or more of the following Standards, as applicable:

A CAN/ULC-S601, Standard for Shop Fabricated Steel Aboveground Tanks for Flammable and Combustible Liquids;

B CAN/ULC-S602, Standard for Aboveground Steel Tanks for Fuel Oil and Lubricating Oil;

C CAN/ULC-S603, Standard for Steel Underground Tanks for Flammable and Combustible Liquids;

D CAN/ULC-S603.1, Standard for External Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids;

E CAN/ULC-S615, Standard for Fibre Reinforced Plastic Underground Tanks for Flammable and Combustible Liquids;

F CAN/ULC-S653, Standard for Aboveground Horizontal Steel Contained Tank Assemblies for Flammable and Combustible Liquids;

G CAN/ULC-S655, Standard for Aboveground Protected Tank Assemblies for Flammable and Combustible Liquids;

H CAN/ULC-S670, Standard for Aboveground Nonmetallic Tank for Fuel Oil and Other Combustible Liquids; or

I CAN/ULC-S677, Standard for Fire Tested Aboveground Tank Assemblies for Flammable and Combustible Liquids.

4.1.2 A *used oil* tank may be of single wall design or be provided with secondary containment.

4.1.3 When a tank is provided with secondary containment, the secondary containment shall be constructed in accordance with the requirements indicated in the applicable Standard listed in Clause 4.1.1.

4.1.4 Where an opening is equipped with a vertical, removable suction pipe (tube), it shall have a maximum open area equivalent to an NPS 3, Schedule 40 pipe, it shall be provided in the top of the tank, with a clearance from the bottom of the tank to the pipe of not less than 50 mm.

4.1.5 The suction pipe (tube) specified in Clause 4.1.4 shall be located in the receptacle described in Clauses 4.2.1 and 4.2.2 or in a separate lockable spill containment device of equivalent capacity.

NOTE: This Standard does not address requirements for spill containment devices. Refer to CAN/ULC-S663, Standard for Spill Containment Devices for Flammable and Combustible Liquid Aboveground Storage Tanks.

4.2 MANUAL DEPOSITION

4.2.1 Tanks intended for the manual deposition of *used oil* shall be equipped with a vented, screened receptacle, having a mesh size that will retain solid materials of a diameter greater than 5 mm.

4.2.2 The receptacle shall have a minimum capacity of 25 L and the top rim shall have a minimum frontal dimension of 305 mm and a minimum open area equivalent to an NPS 12, Schedule 40 pipe. When circular, the inside diameter of the receptacle shall be a minimum of 305 mm.

4.3 VENTING

4.3.1 Emergency and normal vent fittings, as applicable, shall be supplied in accordance with the Standard to which the tank has been constructed.

4.3.2 In addition to the emergency and normal venting requirements, each tank shall be provided with venting to accommodate vacuum evacuation of the stored contents. Vacuum relief venting shall be in accordance with Table 1. Refer to Figures 1 and 2.

NOTE: Further guidance on vacuum relief venting can be found in Appendix B.

4.3.3 When a receptacle as described in Clause 4.2.1 is provided, it shall be equipped with a cover, which will permit venting and can be locked when not in use, and cannot be totally removed from the receptacle.

5 DROP TEST

5.1 Except for utility tanks meeting the requirements of CAN/ULC-S601, Standard for Shop Fabricated Steel Aboveground Tanks for Flammable and Combustible Liquids, aboveground tanks with capacity up to and including 2500 L shall be subject to the drop test as described in Clauses 5.2 and 5.3. Aboveground tank assemblies, which include integral secondary containment, shall be tested as a single unit. Where the tank and secondary containment are supplied as separate components, they shall be separately subjected to the drop test.

5.2 A representative sample of the tank assembly (or component) shall be filled with water up to 25 % of its nominal capacity and all openings sealed. It shall then be suspended with its lowest point at least 1.2 m above a concrete surface. The sample shall be dropped on its normal bottom surface or support structure.

5.3 The sample, water filled in accordance with Clause 5.2, shall then be suspended with its lowest point at least 1.2 m above a concrete surface with its angle of inclination to the concrete surface at approximately 30°. The sample shall be dropped to impact the concrete surface on the bottom/sidewall or shell/head corner.

5.4 Following the drop test, the sample shall be free from leakage when leak tested in accordance with its construction Standard.

5.5 Following the drop test, the tank shall continue to be stable with support structures free from damage that would prevent their proper support of the tank, and the receptacle and cover shall function as intended.

6 MARKING

6.1 Appendix A contains safety related markings and warnings that are required to be in English and French. In addition some Canadian provincial/territorial authorities may require other markings to be in either or both official languages (English and French).

6.2 **(REV1)** In addition to the markings required by the applicable Standard(s) identified in Section 4, Construction, the following information shall be engraved or stamped on a corrosion resistant nameplate permanently attached to the tank and located so as to be readily visible when installed:

A Name of tank manufacturer;

B "USED OIL TANK ASSEMBLY";

C Year of manufacture;

D Metal thickness, mm;

E Maximum operating pressure, 7 kPa;

F Maximum operating vacuum, 300 Pa;

G Emergency venting capacity, m^3/min;

H Nominal capacity, L; and

I Standard number, i.e. CAN/ULC-S652.

NOTE 1: Manufacturers should be aware that the *authority having jurisdiction* may also require that the mark of the certifying agency be included on each tank.

NOTE 2: Products in compliance with optional construction and/or performance requirements specified in the Standards identified in Section 4, Construction, to address Climate Change Adaptation may be additionally marked for each adaptation, as applicable.

NOTE 3: In the context of measures implemented to address Climate Change, "Adaptation" refers to modifying the durability of materials, components or assemblies so as to increase their resistance to environmental loads and extreme events such as flooding, ice accumulation and high wind speeds. By contrast, the term "Mitigation" refers to measures intended to address the causes of Climate Change, such as the reduction of emissions of 'greenhouse gases'.

6.3 Alternate methods of attachment are permissible provided that the nameplate is affixed to the tank in a manner that will destroy the nameplate if removed from the tank. If a pressure-sensitive label, ink, paint-stencilling or other method is used, it shall comply with the requirements of CSA C22.2 No. 0.15, Adhesive labels , or UL 969, Standard for Marking and Labeling Systems, be suitable for outdoor use and exposure to water, UV light and no. 2 fuel oil and have a surface temperature rating within -35 °C to 60 °C.

6.4 Each tank shall be clearly marked, with materials that are resistant to the environment to which the tank is intended to be exposed, with the following information in letters of not less than 10 mm in height in a contrasting colour:

A ″FOR USED OIL ONLY – NOT FOR FLAMMABLE LIQUIDS″ (located at the receptacle);

B ″DO NOT LIFT OR TRANSPORT TANK CONTAINING PRODUCT″ (located at each lift lug or fork lift channel); and

C ″CONSULT WITH THE AUTHORITY HAVING JURISDICTION AND THE INSTALLATION INSTRUCTIONS PRIOR TO INSTALLATION″.

6.5 Each tank shall be marked at the receptacle, if so equipped, with the following international symbols at least 100 mm high in a contrasting colour:

7 INSTALLATION AND MAINTENANCE INSTRUCTIONS

7.1 Complete installation instructions and maintenance recommendations shall accompany each tank assembly and shall include but not be limited to the following information:

A Instruction that the tank installer shall consult with the *authority having jurisdiction* to ensure that the requirements of this Standard as well as all the Federal, Provincial and Local Codes are met prior to installation;

B Location;

C Base preparation;

D Lifting and handling instructions; and

E Venting.

Refer to Appendix C (Informative), Guidance on Installation and Maintenance.

TABLES

TABLE 1
VENT CALCULATIONS BASED ON OPEN AREA

(Reference: Clause 4.3.2 and B1.3)

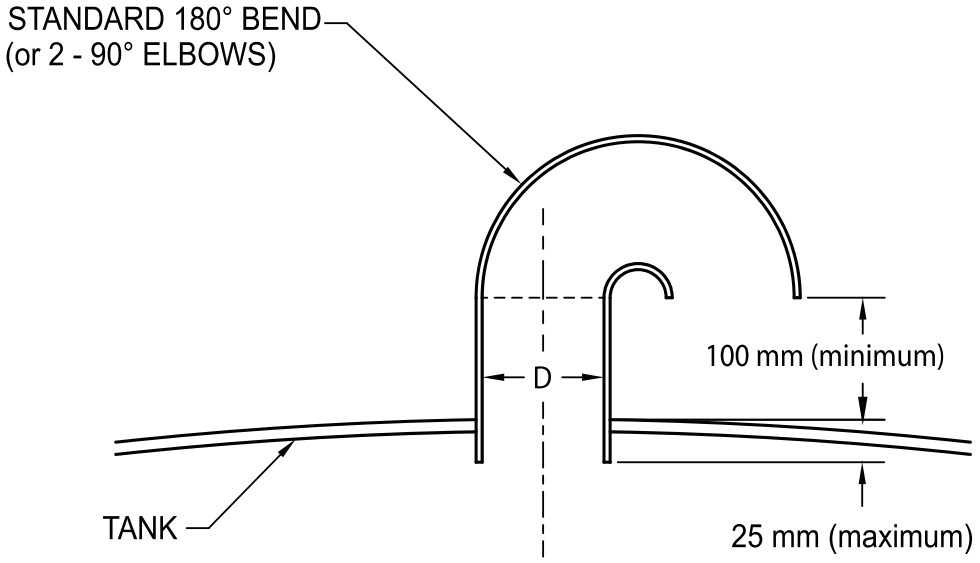
SUCTION PIPE[1] NPS	MIN VENT SIZE "D" NPS (Sch. 40)	PIPE		OPEN AREA		HOOD DIMENSIONS FOR MUSHROOM VENT "TYPE B"	
		O.D. mm (in)	I.D. mm (in)	sq. in.	sq. mm	"a" mm	"b" mm
¾	2	60.3 (2.375)	52.5 (2.067)	3.356	2135	16	13
1	2-½	73.0 (2.875)	62.7 (2.469)	4.788	3089	19	14
1-½	3-½	101.6 (4.000)	90.12 (3.548)	9.887	6379	27	22
2	4	114.3 (4.500)	102.26 (4.026)	12.730	8213	29	22
3	6	168.3 (6.625)	154.05 (6.065)	28.890	18 639	48	35

[1] Suction pipe is installed in accordance with Clause 4.1.4

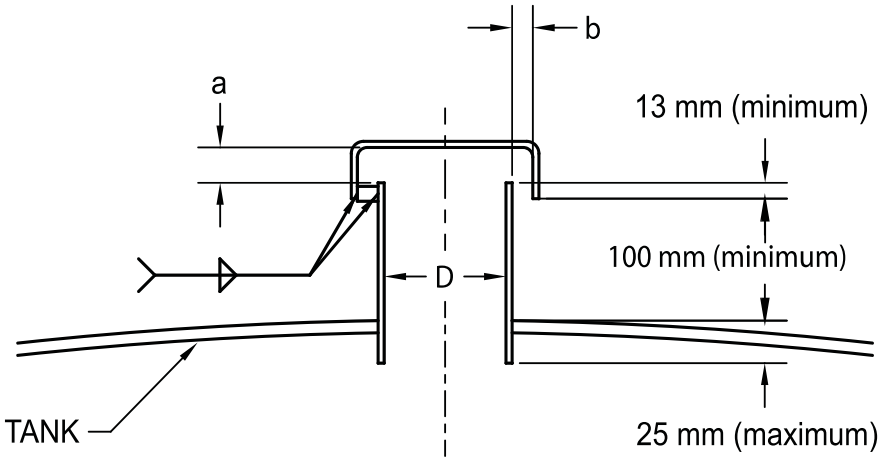
FIGURES

FIGURE 1
TYPE ‘A’ AND ‘B’ VACUUM RELIEF VENTS

(Reference: Clause 4.3.2, B1.4, Figures B1 and B2)



GOOSENECK VENT "TYPE A"

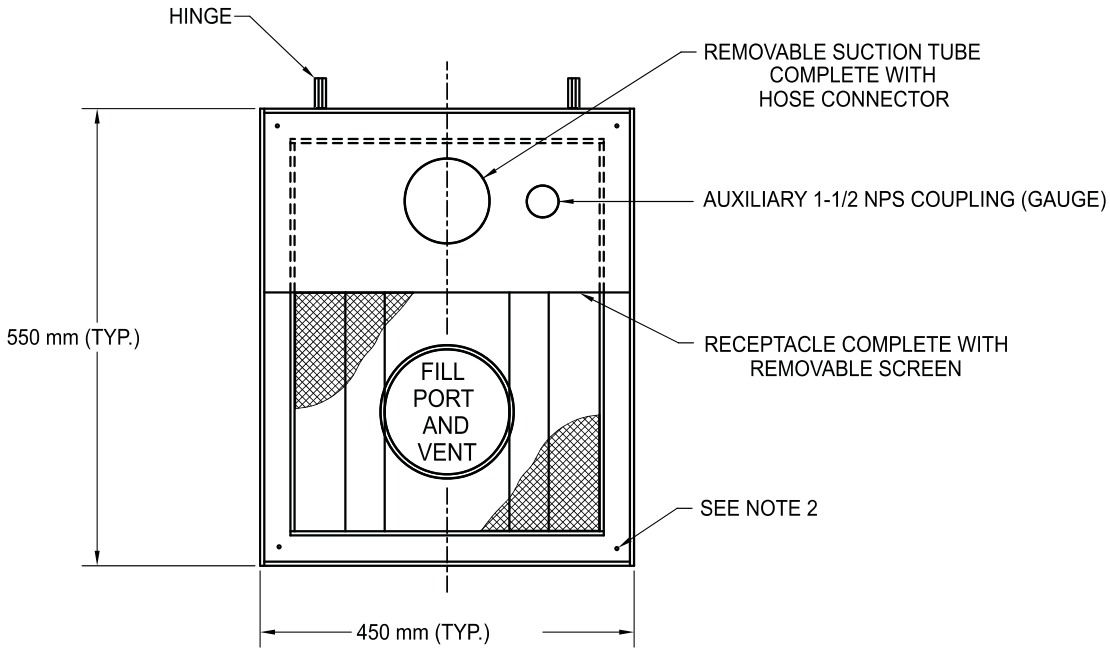


MUSHROOM VENT "TYPE B"

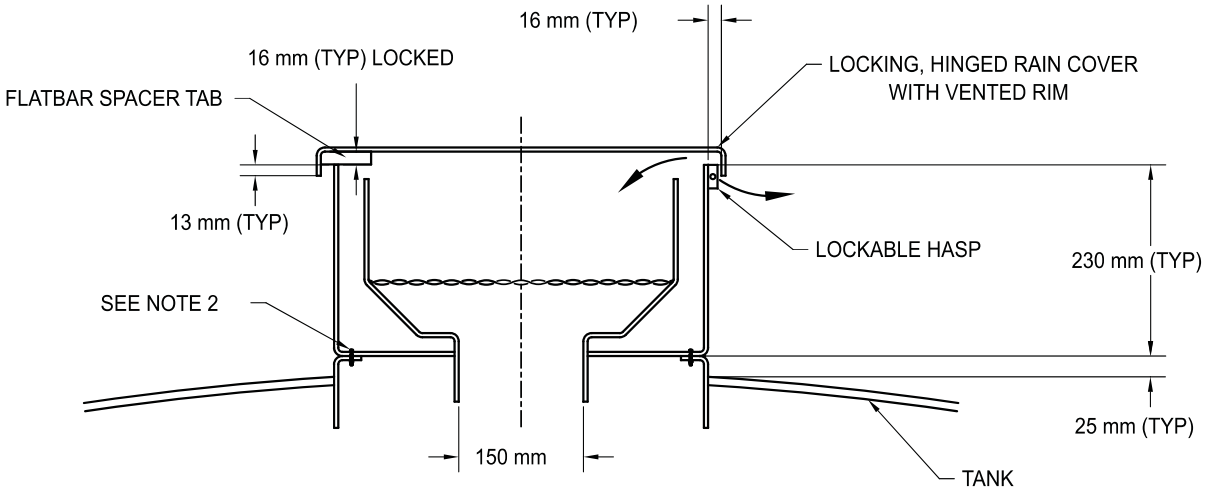
su2286

FIGURE 2
TYPE 'C' VACUUM RELIEF VENT[1]

(Reference: Clause 4.3.2, B1.4, Figures B1 and B2)



CROSS-SECTION THROUGH VENT



su2287

NOTE 1: In this case vacuum venting is built into the receptacle.

NOTE 2: Undo 4 corner bolts, remove spill box to expose access/inspection/cleanout manway.

APPENDIX A (NORMATIVE) – SAFETY RELATED MARKINGS AND WARNINGS

(Reference: Clause 6.1)

TABLE A.1

Safety Related Markings and Warnings – French Translation

Item	Product Markings[a]	Text	Text Reference
1	″USED OIL TANK ASSEMBLY″	Verbatim	6.2B
	« ENSEMBLE RÉSERVOIR D'HUILE USAGÉE »		
2	Metal thickness, ___mm	Verbatim	6.2D
	Épaisseur du métal, ___ mm		
3	Maximum operating pressure, 7 kPa	Verbatim	6.2E
	Pression de service maximale, 7 kPa		
4	Maximum operating vacuum, 300 Pa	Verbatim	6.2F
	Vide de régime maximal, 300 Pa		
5	Emergency venting capacity, ___ m^3/min	Verbatim	6.2G
	Capacité de l'évent de sécurité, ___ m^3/min		
6[b]	"FOR USED OIL ONLY – NOT FOR FLAMMABLE LIQUIDS"	Verbatim	6.4A
	« POUR HUILE USAGÉE SEULEMENT – NE PAS UTILISER POUR DES LIQUIDES COMBUSTIBLES »		
7[b]	″DO NOT LIFT OR TRANSPORT TANK CONTAINING PRODUCT″	Verbatim	6.4B
	« NE PAS TRANSPORTER OU SOULEVER UN RÉSERVOIR CONTENANT DU PRODUIT »		
8[b]	"CONSULT WITH THE AUTHORITY HAVING JURISDICTION AND THE INSTALLATION INSTRUCTIONS PRIOR TO INSTALLATION"	Verbatim	6.4C
	« CONSULTER LES DIRECTIVES D'INSTALLATION DU FABRICANT ET L'AUTORITÉ COMPÉTENTE AVANT L'INSTALLATION »		

[a]The text shown in the table does not represent the actual minimum size and typestyle required.

[b]These are considered safety markings.

APPENDIX B (INFORMATIVE) – GUIDANCE ON VACUUM RELIEF VENTING

(Reference: Clause 4.3.2)

B1 VACUUM RELIEF VENTING

B1.1 Tank assemblies for collection and storage of *used oil* are periodically emptied of their contents by means of a suction pipe and hose connected to a vacuum collector truck. When the *used oil* is drained below the level of the suction pipe immersed in the tank, high volume airflow results.

B1.2 The rapid flow of air removed must be allowed to be replaced in the tank by some venting means (vacuum relief vent) appropriately sized to prevent vacuum pressurization and collapse of the tank.

B1.3 Vacuum relief venting can be calculated using open vent areas from each of the pipes and tank openings, as illustrated in Table 1.

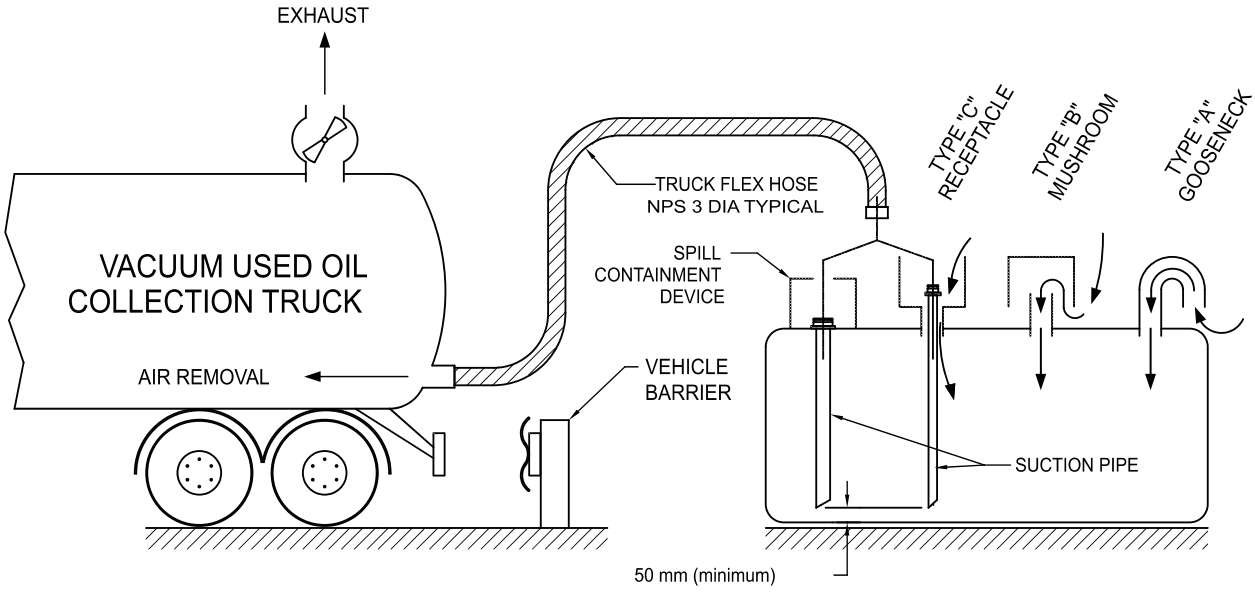
NOTE: Screens installed on vents to prevent entry of foreign materials significantly reduce the open venting area. Vent sizes shown in Table 1 show the minimum sizes of vents required without screens. If vents with screens are used, vent sizes will need to be increased to maintain the minimum open area listed in Column 4 of Table 1.

B1.4 Typical aboveground tank assembly vacuum relief vent configurations are shown in Figure B1. The applicable vacuum relief vent can be sized in accordance with Figures 1 and 2.

B1.5 Typical underground tank assembly vacuum relief vent configurations are shown in Figure B2.

FIGURE B1
TYPICAL VACUUM RELIEF VENTING (ABOVEGROUND TANK ASSEMBLIES)

(Reference Clause B1.4)

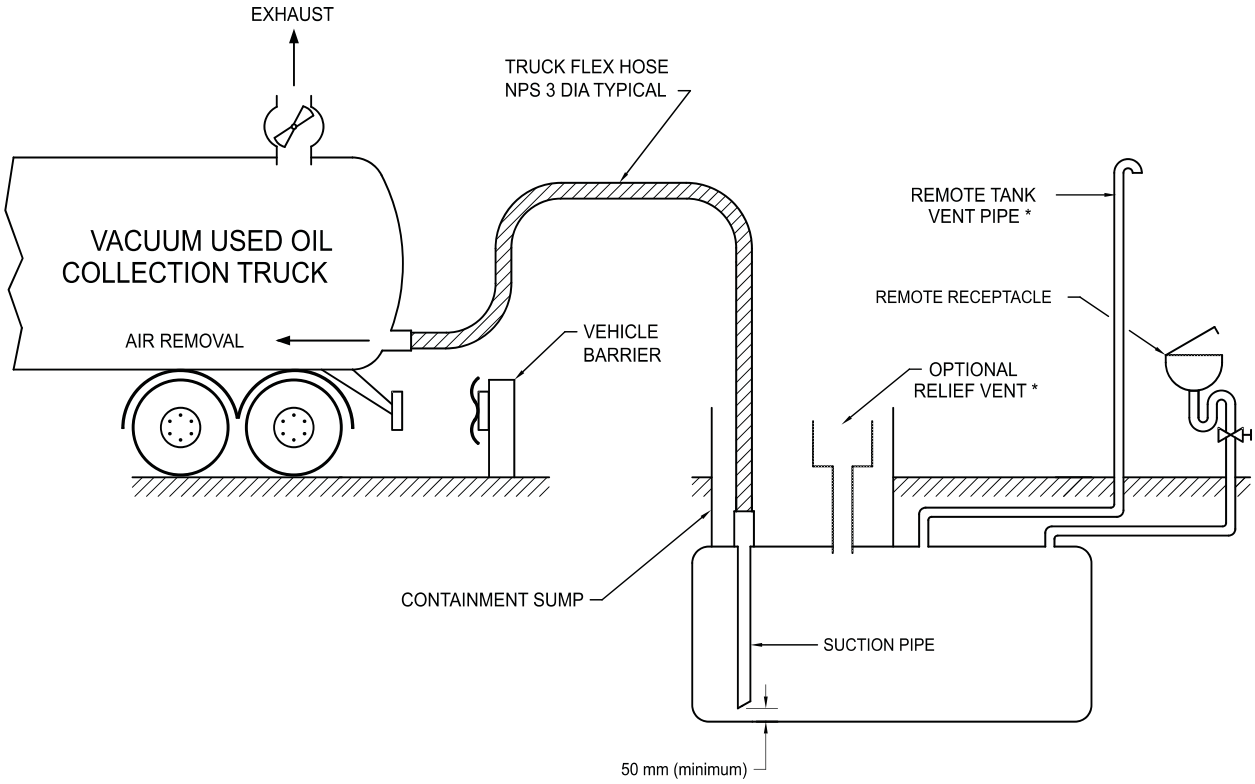


su2288

NOTE: Sizes and dimensions for Type A, B and C vacuum relief vents can be found in Figures 1 and 2.

FIGURE B2
TYPICAL VACUUM RELIEF VENTING (UNDERGROUND TANK ASSEMBLIES)

(Reference Clause B1.5)



SUCTION PIPE INSTALLED IN ACCORDANCE WITH CLAUSE 4.1.4 NPS (Sch. 40)	MINIMUM REMOTE[1] VENT SIZE NPS (Sch. 40)
¾	2
1	3
1½	4
2	6
3	6

[1]As an alternative to the remote pipe vent, the aboveground Type A, B or C may be utilized by extending the vent sleeve (sized in accordance with Figure 1 or 2) to grade.

APPENDIX C (INFORMATIVE) – GUIDANCE ON INSTALLATION AND MAINTENANCE

(Reference: Clause 7.1)

C1 INSTALLATION AND MAINTENANCE

C1.1 The level bed or base to support the tank assembly should be designed using good engineering practice to withstand the loading of the tank assembly plus the loading expressed by 110 % of the maximum stored liquid capacity.

C1.2 The installed tank assembly should be protected from impact vehicular traffic in accordance with the requirements of the *authority having jurisdiction*. The use of bollards in the form of concrete filled NPS 6 Schedule 40 pipe or equivalent, or standard highway guardrails are acceptable means.

C1.3 Venting of the storage tank and any secondary containment should be in accordance with the requirements of the *authority having jurisdiction*. Generally, the normal venting of the tank may be located in such a manner that flammable and combustible vapours from the vent cannot enter into building ventilation systems or come in contact with sources of ignition.

C1.4 Vents should be equipped with weatherproof hoods.

C1.5 The secondary containment should be inspected on a regular basis to confirm that neither water nor stored product is accumulating therein. The inspection may be accomplished by the use of liquid sensing devices located in the secondary containment set to detect the presence of liquid at a maximum of 50 mm above the bottom of the secondary containment. The sensing device should be connected to an audio/visual annunciator appropriately located near personnel workstations.

C1.6 The disposal of any liquid found in the secondary containment should be in accordance with the requirements of the *authority having jurisdiction*.

C1.7 The coating on the external surfaces of the assembly should be checked at least once per year and any necessary repairs made. All coating repairs should be in accordance with the coating manufacturer's instructions.