



**CSA B139 Series:24**  
National Standard of Canada



# Installation code for oil-burning equipment



# Legal Notice for Standards

Canadian Standards Association (operating as “CSA Group”) develops standards through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA Group administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

## Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document’s fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party’s intellectual property rights. CSA Group does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA Group makes no representations or warranties regarding this document’s compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA GROUP, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA GROUP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA Group is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA Group accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA Group is a private not-for-profit company that publishes voluntary standards and related documents. CSA Group has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

## Intellectual property rights and ownership

As between CSA Group and the users of this document (whether it be in printed or electronic form), CSA Group is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA Group’s and/or others’ intellectual property and may give rise to a right in CSA Group and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by treaty or by law, CSA Group reserves all intellectual property rights in this document.

## Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA Group shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

## Authorized use of this document

This document is being provided by CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF form.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way, or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.



# ***Standards Update Service***

## ***CSA B139 Series:24 January 2024***

**Title:** *Installation code for oil-burning equipment*

To register for e-mail notification about any updates to this publication

- go to [www.csagroup.org/store/](http://www.csagroup.org/store/)
- click on **CSA Update Service**

The **List ID** that you will need to register for updates to this publication is **2130185**.

If you require assistance, please e-mail [techsupport@csagroup.org](mailto:techsupport@csagroup.org) or call 416-747-2233.

Visit CSA Group's policy on privacy at [www.csagroup.org/legal](http://www.csagroup.org/legal) to find out how we protect your personal information.

**Canadian Standards Association (operating as “CSA Group”)**, under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users — including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

More than 10 000 members indicate their support for CSA Group’s standards development by volunteering their time and skills to Committee work.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in fourteen countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to  
CSA Group  
178 Rexdale Boulevard  
Toronto, Ontario, M9W 1R3  
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](http://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 wellbeing, 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](http://www.scc.ca).

Standards Council of Canada  
600-55 Metcalfe Street  
Ottawa, Ontario, K1P 6L5  
Canada



Cette Norme Nationale du Canada est disponible en versions française et anglaise.

*Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users to judge its suitability for their particular purpose.*

®A trademark of the Canadian Standards Association, operating as “CSA Group”

*National Standard of Canada*

*CSA B139 Series:24*

***Installation code for oil-burning  
equipment***



*®A trademark of the Canadian Standards Association,  
operating as "CSA Group"*



*Published in January 2024 by CSA Group  
A not-for-profit private sector organization  
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3*

*To purchase standards and related publications, visit our Online Store at  
[www.csagroup.org/store/](http://www.csagroup.org/store/) or call toll-free 1-800-463-6727 or 416-747-4044.*

*ICS 27.060.10, 97.100.40  
ISBN 978-1-4883-4857-0*

*© 2024 Canadian Standards Association  
All rights reserved. No part of this publication may be reproduced in any form whatsoever  
without the prior permission of the publisher.*

# Contents

Technical Committee on Installation of Oil Burning Equipment 21

Preface 25

## CSA B139.1.0:24, *General requirements for large installations*

**0 Introduction** 28

**1 Scope** 28

- 1.1 Installation requirements for large oil-burning equipment 28
- 1.2 Installation of oil-fuelled appliances and equipment 28
- 1.3 Installation and alteration requirements for oil-burning equipment 28
- 1.4 Ancillary equipment installation requirements 29
- 1.5 Maintenance requirements for oil-burning equipment 29
- 1.6 Recommended precautions for filling tanks 29
- 1.7 Items not applicable 29
- 1.8 Terminology 29
- 1.9 Dual measurements 29

**2 Reference publications** 31

**3 Definitions** 38

**4 General requirements** 51

- 4.1 Acceptable equipment 51
  - 4.1.1 Oil-burning equipment requirements 51
  - 4.1.2 Compliance to CSA B140 Series standards 51
  - 4.1.3 Potable water system compliance 52
- 4.2 Responsibilities of the installer 52
  - 4.2.1 Initial activation 52
  - 4.2.2 Before leaving a new installation 52
  - 4.2.3 Posting of instructions 52
  - 4.2.4 Conversion from a different energy source 52
  - 4.2.5 Replacement 53
- 4.3 Quality of work 53
  - 4.3.1 Skillful and thorough workmanship 53
  - 4.3.2 Personnel qualifications and training 53
- 4.4 Suitability of equipment and chimney 53
  - 4.4.2 Installer responsibilities 53
- 4.5 Accessibility 53
- 4.6 Electrical features 54
- 4.7 Gas features 54
- 4.8 Supply of fuel oil 54
- 4.9 Hazardous atmosphere 54
  - 4.9.1 Installation environment 54
  - 4.9.2 Installation restrictions 54
- 4.10 Fuel oil filters and strainers 54

4.10.1	Oil filter requirements for oil line-mounted devices	54
4.10.2	Fuel oil filter requirements	54
4.10.3	Filter requirements for nozzle sizes less than 2.8 L/h	54
4.10.4	Oil filters and strainers conformity	55
4.11	Preheating of fuel oils	55
4.11.1	Fuel oil heating and handling	55
4.11.2	Steam coil usage in supply tank	55
4.11.3	Pressure-relief valve requirement for pressure-reducing valves	55
4.11.4	Steam line preheater condensate handling	55
4.11.5	Hot water coil connection	55
4.11.6	Hot water line preheater safety requirements	55
4.11.7	Electric preheater temperature control	55
4.11.8	Oil strainer installation in fuel line	56
4.11.9	Piping and tubing requirements for electrical resistance heating	56
4.12	Emergency shut-off devices	56
4.12.1	Emergency shut-off device for oil burner installation	56
4.12.2	Valve with fusible link for float valve appliances	56
4.13	Appliance clearances to building construction	56
4.13.1	Clearance to combustibles	56
4.13.2	Clearance to non-combustibles	57
4.14	Servicing and maintenance clearances	57
4.15	Appliance installation — General requirements	57
4.15.1	Installation requirements	57
4.15.2	Appliance support	57
4.16	Appliance installation in garages	57
4.16.1	Installation in garages	57
4.16.2	Installations in repair garages	57
4.17	Appliance installation in aircraft hangars	58
4.17.1	Location of appliance in aircraft hangar	58
4.17.2	Fan-forced air-heating system air openings height requirements	58
4.17.3	Heater installation height requirement — Storage and servicing areas	58
4.17.4	Heater installation height requirement — Repair or shop area	58
4.17.5	Location of suspended or elevated heaters in aircraft hangars	58
4.18	Outdoor installations	58
4.18.1	Outdoor use certification	58
4.18.2	Outdoor appliance installation on concrete base	58
4.18.3	Location requirements for outdoor rooftop installations	58
4.18.4	Protection against weather and physical damage	58
4.18.5	Accessibility for inspection and servicing	59
4.18.6	Roof access requirements for appliances	59
4.18.7	Roof installation requirements	59
4.18.8	Guardrail requirements	59
4.18.9	Flue gas circulation prevention	59
4.19	Maintenance	59
4.19.1	Inspection and maintenance	59
4.19.2	Maintenance requirements	59
4.19.3	Water testing	60
4.19.4	Visual inspection and replacement of components	60

<b>5</b>	<b>Fuel-containing devices, piping, tubing, valves, and fuel oil pumps</b>	<b>60</b>
5.1	Fuel-containing devices	60
5.1.1	Melting point requirements for external parts of fuel-containing devices	60
5.1.2	Items with melting points below 538 °C (1000 °F)	60
5.1.3	Design requirements	60
5.2	Piping and tubing — Aboveground installations	60
5.2.1	General	60
5.2.2	Joints and connections — Above ground	63
5.2.3	Concealed piping installation	63
5.2.4	Rooftop piping installation	63
5.3	Piping and tubing — Underground installations	64
5.4	Valves and pipeline devices	64
5.4.1	Support of valves and other devices	64
5.4.2	Shut-off valve	64
5.4.3	Pressure-relief valve	66
5.4.4	Automatic shut-off valve	66
5.4.5	Constant-level valve	67
5.5	Fuel oil pumps	67
5.5.1	Fuel oil pumps suitability	67
5.5.2	Maximum inlet pressure for fuel oil pump	67
5.5.3	Fuel pump protection against excessive pressure	67
5.5.4	Maximum lift for fuel oil pump	67
5.5.5	Burner fuel oil pumps located above supply tank	68
5.5.6	External pressure-relief valve installation	68
5.5.7	Auxiliary supply tank level control	68
5.6	Elevated installation	68
5.6.1	General	68
5.6.2	Fuel oil pumps — Additional requirements	68
<b>6</b>	<b>General requirements for aboveground fuel oil tanks</b>	<b>69</b>
6.1	General	69
6.2	Construction and operating conditions	69
6.2.1	Construction	69
6.2.2	Operating pressure	70
6.2.3	Operating temperature	70
6.3	Support, installation, foundations, and anchorage	71
6.3.1	Support requirements	71
6.3.2	Tank installation	71
6.3.3	Tank support and stability	71
6.3.4	Earthquake-resistant design	71
6.3.5	Means of egress	71
6.3.6	Tank clearances	72
6.3.7	Tank installation requirements	72
6.3.8	Tank slope for bottom outlet	72
6.3.9	Tank openings sealing	72
6.4	Outdoor tank foundations	72
6.4.1	Foundations for outdoor tanks	72
6.4.2	Outdoor tank location and protection	73
6.5	Gauging of tanks	73

- 6.5.1 Liquid level determination 73
- 6.5.2 Tank gauges and level indicators 73
- 6.5.3 Gauging restrictions inside buildings 73
- 6.5.4 Dipstick opening design 73
- 6.5.5 Glass sight gauge or other gauging device location 73
- 6.6 Removal or disconnection of appliances 73
- 6.6.1 Removal of oil-burning appliance for conversion to another form of energy 73
- 6.6.2 Outlet tightness requirements 74

## **7 Tanks installed inside buildings — Capacity and protection 74**

- 7.1 General 74
- 7.1.1 Tanks installed inside buildings or underground tank vault structures 74
- 7.1.2 Tank protection 74
- 7.2 Tank capacity 74
- 7.2.1 Tank capacity requirements for indoor storage and supply tanks 74
- 7.2.2 Auxiliary supply tank capacity requirements 74
- 7.2.3 Engine supply tanks located in an engine service room 75
- 7.2.4 Installation of storage and supply tanks in non-combustible buildings 75
- 7.3 Tank protection levels 80
- 7.4 Storage rooms 80
- 7.4.1 Tank storage rooms 80
- 7.4.2 Tank storage room separation 80
- 7.4.3 Tank storage room separation from adjacent properties or buildings 81
- 7.4.4 Floor drains in tank storage rooms 81
- 7.4.5 Location of sumps for sanitary drainage or sub-soil drainage 81
- 7.5 Tank secondary containment 82
- 7.6 Protected storage rooms 82
- 7.7 Protected tanks 82
- 7.8 Dedicated tank buildings 83
- 7.8.1 Dedicated use of tank storage buildings 83
- 7.8.2 Dedicated tank building requirements 83
- 7.9 Underground tank vaults 83
- 7.9.1 Underground tank vault use 83
- 7.9.2 Underground tank vault requirements 83
- 7.9.3 Vault roof design and construction 83
- 7.9.4 Separation and protection of tank vaults 84
- 7.9.5 Adjacent buildings 84
- 7.9.6 Vault access stairs from adjacent building 84
- 7.9.7 Horizontal access door for separate access stair to vault 84
- 7.10 Room leak detection 84
- 7.11 Fire detection 84

## **8 Outdoor aboveground fuel oil tanks — Capacity and protection 84**

- 8.1 General 84
- 8.2 Tanks located above ground level 85
- 8.3 Tanks located at ground level — Capacity and location 85
- 8.3.1 Separation distance requirements for supply or storage tanks 85
- 8.3.2 Minimum separation distance 85
- 8.3.3 Supply or storage tank location 85

8.3.4	Protection of supply and storage tanks	86
8.3.5	Nonmetallic supply tanks conformity	86
8.4	Piping	86
8.4.1	Aboveground outdoor tank piping shut-off valve requirement	86
8.4.2	Pressure-relief device for aboveground outdoor piping	86
8.4.3	Prevention of siphoning in fuel supply line	86
8.5	Fill pipes	86
8.6	Protection from vehicles	86
8.6.1	Tank protection	86
8.6.2	Posts for tank protection	86
8.6.3	Guardrails for tank protection	87
8.6.4	Location of posts or guardrails for tank protection	87
8.7	Tank secondary containment	87
8.7.1	General	87
8.7.2	Tanks with secondary containment	87
8.7.3	Tanks contained by external dikes	88
<b>9</b>	<b>Underground tanks and piping</b>	<b>90</b>
9.1	Underground tanks	90
9.1.1	Underground tanks conformance	90
9.1.2	Underground tank installation requirements	91
9.1.3	Installation restrictions	91
9.1.4	Excavation near foundation footings	91
9.1.5	Minimum clearances for underground tanks	91
9.1.6	Damaged underground tank	91
9.1.7	Tank removal and prohibition of relocation	91
9.1.8	Inspection and repair of tank coating/cladding or jacketing	91
9.1.9	Rigging and lowering of underground tanks	92
9.1.10	Selection and application of bedding, backfill, and cover materials	92
9.1.11	Protection from vehicular traffic and loading	92
9.1.12	Equipment contact with pavement	92
9.1.13	Observation well requirement for underground tank installation	92
9.2	Prevention of tank flotation	92
9.2.1	Installation below water table	92
9.2.2	Restraint of tanks	92
9.2.3	Tank restraints design for hydrostatic pressure resistance	93
9.2.4	Bedding or backfill material thickness requirement	93
9.2.5	Anchor straps or ground anchors for steel underground tanks	93
9.2.6	Anchor straps and ground anchors tightening and load ratings	93
9.2.7	Petroleum product ballasting requirements	93
9.2.8	Petroleum product ballast monitoring	93
9.3	Fill/dip pipes	94
9.3.1	Fill pipe location	94
9.3.2	Spill containment device for fill pipe	94
9.3.3	Direct fill pipe requirements	94
9.3.4	Filling/dipping	94
9.3.5	Remote fill pipe extension above grade level	95
9.4	Steel tanks — Corrosion protection	95
9.4.1	Corrosion protection system for underground metallic tank systems	95

- 9.4.2 Impressed-current system design certification 95
- 9.4.3 Jacketed tank installation requirements 95
- 9.4.4 Corrosion protection for metallic piping in direct contact with backfill 95
- 9.4.5 Installation and verification of impressed-current cathodic protection system 95
- 9.4.6 Impressed-current cathodic protection system records 95
- 9.4.7 Requirements for new underground steel tank system 95
- 9.4.8 Bonding of steel tanks and metallic piping for upgraded cathodic protection system 95
- 9.4.9 Electrical isolation of new underground steel tanks 96
- 9.4.10 Impressed current interlock and alarm 96
- 9.4.11 Impressed-current cathodic protection system recording requirements 96
- 9.4.12 Cathodic protection monitoring and testing 96
- 9.5 Leak detection — Tanks 96
  - 9.5.1 Continuous positive leak detection of double-wall tanks 96
  - 9.5.2 Interstitial space leak detection system interlock and alarm 97
  - 9.5.3 Water level monitoring and notification 97
  - 9.5.4 Commissioning testing of tank system 97
- 9.6 Tank venting 97
  - 9.6.1 Piping for underground and aboveground vent pipes 97
  - 9.6.2 Venting requirements 97
  - 9.6.3 Underground vent piping requirements 97
  - 9.6.4 Weatherproof hood or vent cap 97
  - 9.6.5 Underground tank venting 98
  - 9.6.6 Vent pipe termination and clearances 98
  - 9.6.7 Vent piping slope and traps 98
  - 9.6.8 Vent riser termination 98
- 9.7 Underground piping and sumps 98
  - 9.7.1 Piping 98
  - 9.7.2 Fittings and joints 100
  - 9.7.3 Protection of underground piping 101
  - 9.7.4 Sumps 102
- 9.8 Addition or removal of tanks 103
  - 9.8.1 Adding or removing underground tanks 103
  - 9.8.2 Confirmation of existing tank corrosion protection systems 103

## **10 Tank connections 104**

- 10.1 Supply tank fill pipe 104
  - 10.1.1 Fill opening or fill pipe requirement 104
  - 10.1.2 Fill opening and entry requirements 104
  - 10.1.3 Overfill protection device for fuel oil tanks 104
  - 10.1.4 Fill pipe installation 104
  - 10.1.5 Pressurized fill installation requirements 104
  - 10.1.6 Fill pipe design and installation 104
  - 10.1.7 Valve installation requirements 104
  - 10.1.8 Fill pipe requirements for supply tank 105
  - 10.1.9 Location of fill pipe entry 105
  - 10.1.10 Fill pipe location 105
  - 10.1.11 Fill pipe installation requirements 105
  - 10.1.12 Fill pipe recess 105
  - 10.1.13 Tank-filling connection accessibility 106

10.2	Common fill pipe for multiple aboveground supply tanks	106
10.2.1	Common fill pipe for multiple supply tanks	106
10.2.2	Interconnection of supply tanks	106
10.2.3	Common fill pipe for two tanks	107
10.2.4	Aboveground supply tank filling requirements	107
10.3	Auxiliary supply tank fill pipe	107
10.3.1	Level control device for auxiliary supply tank	107
10.3.2	Auxiliary supply tank filling	108
10.3.3	Auxiliary supply tank with fail-safe automatic valve	108
10.3.4	Auxiliary supply tank venting with separate level control device	108
10.3.5	Auxiliary supply tank fuel line anti-siphon requirement	108
10.4	Appliance supply pipe for connected tanks greater than 2500 L (550 gal)	108
10.5	Tank venting	108
10.5.1	General	108
10.5.2	Venting of tanks installed indoors	110
10.5.3	Common venting of tanks	115
10.6	Venting of auxiliary supply tanks	116
10.6.1	General	116
10.6.2	Venting through an overflow pipe	116
10.6.3	Venting to atmosphere	117

## **11 Air for combustion and venting 119**

11.1	General	119
11.1.1	Installation requirements for proper combustion and safe operation	119
11.1.2	Location of appliances	119
11.1.3	Air supply and ventilation	119
11.2	Air intakes	119
11.2.1	Outdoor air introduction and combustion-air duct connection	119
11.2.2	Outdoor air supply requirements	119
11.2.3	Combustion air ducting system design and construction	120
11.2.4	Outdoor combustion air intake location	120
11.2.5	Interlocking of combustion air damper	120
11.2.6	Free area calculation with screens	120
11.3	Specially engineered installations	120
11.3.1	General	120
11.3.2	Mechanical air systems	120

## **12 Venting products of combustion 121**

12.1	General	121
12.1.1	Venting of combustion products	121
12.1.2	Venting system connection	121
12.1.3	Venting system connection restrictions	121
12.1.4	Venting facilities	121
12.1.5	Venting requirements	121
12.1.6	Chimney performance	121
12.1.7	Chimney vent size requirements	122
12.1.8	Chimney vent connection	122
12.1.9	Chimney exhaust capability and automatic fuel shut-off	122
12.1.10	Chimney flue height extension	122

12.1.11	External insulation or refractory lining for metal chimneys and vent connectors	122
12.1.12	Location of metal chimneys outdoors	122
12.1.13	Support of metal chimneys	123
12.2	Certified chimneys	123
12.3	Uncertified metal chimneys — Flue-gas temperatures of 538 °C (1000 °F) and less	123
12.3.1	Requirements for uncertified metal chimneys	123
12.3.2	Requirements for fabrication and installation of uncertified metal chimneys	123
12.3.3	Construction materials for uncertified metal chimneys	123
12.3.4	Material thickness	124
12.3.5	Welding and joint requirements	124
12.4	Uncertified metal chimneys — Flue-gas temperatures over 538 °C (1000 °F)	124
12.5	Masonry and concrete chimneys	124
12.6	Special venting arrangements	124
12.7	Vent connector and related equipment	124
12.7.1	Vent connectors	124
12.7.2	Vent connector damper	127
12.7.3	Draft regulator	128
12.7.4	Heat reclaimers	128
12.8	Building construction clearances	129
12.8.1	Non-combustible construction	129
12.8.2	Combustible construction	129
12.8.3	Roof penetrations	130
12.8.4	Exterior wall penetrations	131
12.8.5	Chimney enclosures	131
12.9	Installation requirements for through-the-wall vents	132
12.9.1	General	132
12.9.2	Installation	132
<b>13</b>	<b>Tests</b>	<b>133</b>
13.1	General	133
13.2	Appliances	133
13.2.1	Tests and observations	133
13.2.2	Test point location	134
13.2.3	Flue-gas pressure	134
13.2.4	Smoke density	134
13.2.5	Temperature	134
13.2.6	Analysis of flue gases	135
13.2.7	Functioning of safety and operating controls	135
13.2.8	Fuel input	135
13.3	Underground tanks	135
13.3.1	General	135
13.3.2	Frequency and methods of leak detection testing and monitoring	135
13.3.3	Precision leak test	137
13.3.4	Leak detection testing and monitoring methods	137
13.3.5	Leak detection testing of underground tanks	138
13.4	Leak testing of aboveground piping or tubing	139
13.4.1	Leak testing of aboveground piping	139
13.4.2	Pneumatic testing of aboveground piping or tubing	139
13.4.3	Isolation of tank from test pressure	139

13.4.4	Testing of pump discharge and auxiliary supply tank overflow piping and tubing	139
13.4.5	Pressure testing	140
13.4.6	Leak-detection testing	140
13.4.7	Leakage detection	140
13.4.8	Leakage test and retest	140
13.4.9	Pressure measurements using calibrated measuring instruments	140
13.5	Leak testing of underground piping or tubing	140
13.5.1	Underground piping pressure testing	140
13.5.2	Leakage test for exposed piping systems	140
13.5.3	Leak detection for underground piping systems	140
13.5.4	Leakage test	140
13.5.5	Pressure measurement requirements	140
13.5.6	Pressure testing limit	141
13.5.7	Leakage testing of underground double-wall containment piping or tubing	141
13.5.8	Testing of double-wall piping interstitial space	141
13.5.9	Hydrostatic testing of sumps	141
13.6	Testing of new or replacement tanks	141
13.6.1	Testing of tanks with secondary containment or double-wall construction	141
13.6.2	Leak testing of supply or storage tank and connections	141
13.6.3	Tank and connection leak testing	141
13.6.4	Tank cleaning and oil transfer	142
13.7	Leak testing of uncertified chimneys	142

## Annexes

Annex A (informative)	— Referenced product and material publications	143
Annex B (normative)	— Venting requirements — Tables and figures	146
Annex C (informative)	— General recommendations for the third-party auditor, installer, service provider, operator, and wholesaler/retailer of used-oil-burning equipment	184
Annex D (informative)	— Calculation of vent piping equivalent length	187
Annex E (informative)	— Tanks for central oil distribution systems	194
Annex F (informative)	— Appropriate refractory-type combustion chamber data for gun-type furnace-conversion oil burners	195
Annex G (informative)	— Filling operations	197
Annex H (informative)	— Fuel tanks and water contamination	198
Annex I (normative)	— Maintenance — Aboveground and underground tanks, and underground piping	199
Annex J (normative)	— Maintenance — Residential installations	201
Annex K (informative)	— Operational practices for environmental protection	206
Annex L (informative)	— Combustion air proving safety interlocks	208
Annex M (informative)	— Best practices for outdoor tank installations located on or near permafrost	210
Annex N (informative)	— Recommended practices for the support and securement of outdoor tank installations located in flood-prone and high-velocity wind conditions	212
Annex O (informative)	— Glossary	220

---

**CSA B139.1.1:24, General requirements for stationary engines**

<b>0</b>	<b>Introduction</b>	224
<b>1</b>	<b>Scope</b>	224
1.1	Installation requirements for oil-fuelled stationary engines	224
1.2	Relationship with CSA B139.1.0	224
1.3	Terminology	224
1.4	Dual measurements	224
<b>2</b>	<b>Reference publications</b>	225
<b>3</b>	<b>Definitions</b>	225
<b>4</b>	<b>Engine installation</b>	225
4.1	Engines	225
4.1.1	Engine components and accessories exempt from this Code	225
4.1.2	Engine enclosure exhaust piping	226
4.1.3	Protection of hose connectors	227
4.2	Filters	227
4.2.1	Oil filter and water separator requirements	227
4.2.2	Fusible-link valve requirements	227
4.3	Engine systems with sub-base fuel tanks	227
4.3.1	Vent pipes termination	227
4.3.2	Venting of engine system supply tanks	227
4.4	Trailer-mounted engine-generators	227
4.5	Fire pumps conforming to NFPA 20	228
4.5.1	General	228
4.5.2	Tank construction	228
4.5.3	Tank supports	228
4.5.4	Tank capacity	228
4.5.5	Tank venting	228
4.5.6	Tank connections	228
4.5.7	Tank overfill protection	229
4.5.8	Fuel flexible connections	229
4.5.9	Clearance to combustibles	229
4.5.10	Spark-arresting mufflers	229
4.5.11	Fuel maintenance systems	229
<b>5</b>	<b>Engine fuel piping, tubing, and fittings</b>	230
5.1	Engine fuel piping	230
5.1.1	Flexible fuel piping connections to engine	230
5.1.2	Fuel return line termination	230
5.1.3	Fuel return line with drop tube	230
5.2	Stainless steel tubing and fittings	230
<b>6</b>	<b>Tanks</b>	231
6.1	General	231

- 6.2 Engine supply tanks — Installation 231
  - 6.2.1 Requirements for tanks supplying engines 231
  - 6.2.2 Fuel line entry fittings on engine supply tank 231
  - 6.2.3 Electric power supply for level control and valves 231
- 6.3 Venting of engine supply tanks 231
- 6.4 Operating temperature 231
  - 6.4.1 Operating temperature for indoor engine supply tank 231
  - 6.4.2 Outdoor engine supply tank temperature 231
  - 6.4.3 Engine supply tank oil temperature confirmation 232
- 6.5 Engine supply tanks — Capacity and protection 232
  - 6.5.1 Indoor installation 232
  - 6.5.2 Outdoor installations — At grade level 235
  - 6.5.3 Outdoor installations — Above ground-level storey 235
- 6.6 Protection against siphon leaks 235
  - 6.6.1 Definition of aggregate capacity of engine supply tanks 235
  - 6.6.2 Protection from siphon leaks 235
  - 6.6.3 Engine supply tank siphon protection system 235
- 7 Air for combustion and venting 239**
  - 7.1 General 239
    - 7.1.1 Automatic dampers for outdoor air openings 239
    - 7.1.2 Ventilation inlet air damper operation 239
  - 7.2 Combustion air damper interlocks 239
    - 7.2.1 Interlocking of combustion air damper and engine start 239
    - 7.2.2 Interlocking of combustion air damper with stationary engines in service room 239
    - 7.2.3 Combustion air damper interlock requirements for emergency generators, standby generators, and firewater pumps 239
    - 7.2.4 Combustion air damper interlock exemption for non-emergency engine-driven equipment 240
- 8 Venting products of combustion 240**
  - 8.1 General 240
    - 8.1.1 Exhaust stacks compliance with metal chimneys requirements 240
    - 8.1.2 Exhaust piping arrangement 240
    - 8.1.3 Flexible connector for exhaust piping 240
    - 8.1.4 Exhaust piping sizing 240
    - 8.1.5 Exhaust stack termination 240
    - 8.1.6 Exhaust system installation 240
    - 8.1.7 Exhaust system insulation 241
    - 8.1.8 Exhaust system design 241
    - 8.1.9 Over-pressure relief device termination 241
    - 8.1.10 Engine exhaust stack passing through radiator exhaust duct 241
  - 8.2 Exhaust stack — Flue-gas temperatures of 538 °C (1000 °F) and less 241
  - 8.3 Special requirements for skin-tight enclosures 242
    - 8.3.1 Vertical discharge of combustion gases from skin-tight enclosures 242
    - 8.3.2 Combustion venting through sidewall of skin-tight enclosure 242
  - 8.4 Installation requirements for through-the-wall vents 242
    - 8.4.1 General 242
    - 8.4.2 Installation 243

- 9 Pressure test of uncertified metal exhaust stacks 244**
  - 9.1 Pressure testing of exhaust stacks inside buildings 244
  - 9.2 Hydraulic pressure testing of uncertified metal exhaust stacks 244
- 

### **CSA B139.1.2:24, General requirements for special installations**

- 0 Introduction 246**
- 1 Scope 246**
  - 1.1 Oil-burning appliances and equipment installation 246
  - 1.2 Field installation of burners and combustion control systems 246
  - 1.3 Relationship with CSA B139.1.0 246
  - 1.4 Terminology 246
  - 1.5 Dual measurements 247
- 2 Reference publications 247**
- 3 Definitions 247**
- 4 Used-oil-burning appliances 247**
  - 4.1 Prohibition on use 247
  - 4.2 Installation 247
    - 4.2.1 Installation and maintenance requirements 247
    - 4.2.2 Used oil use restrictions 247
    - 4.2.3 Filter medium installation in supply line 247
    - 4.2.4 Suction line placement and entry for used-oil-burning equipment 247
  - 4.3 Markings for used-oil-burning equipment 247
  - 4.4 Tank capacity 248
  - 4.5 Tank fill pipes, openings, and fittings 248
    - 4.5.1 Location of fill pipe for used-oil supply tank inside building 248
    - 4.5.2 Fill line shut-off valve to prevent vapour entry 248
    - 4.5.3 Fuel transfer pump overfill protection 248
  - 4.6 Tests 248
    - 4.6.1 Smoke density 248
    - 4.6.2 Logbook 248
- 5 Field installation of burners 248**
- 6 Central oil distribution systems 248**
  - 6.1 General 248
    - 6.1.1 Central oil distribution system conformity 248
    - 6.1.2 Connection to central oil distribution system 249
    - 6.1.3 Equipment suitability and installation 249
    - 6.1.4 Ventilation and temperature requirements 249
    - 6.1.5 Pipe joining requirements 249
  - 6.2 Maintenance 249
  - 6.3 Tanks 249
  - 6.4 Piping 249
    - 6.4.1 Oil supply and distribution 249

- 6.4.2 Underground oil distribution mains 249
- 6.5 Valves 250
  - 6.5.1 Manual shut-off valve installation 250
  - 6.5.2 Automatic shut-off device for oil service pipeline 250
  - 6.5.3 Oil pressure limitation at appliance inlet 250
  - 6.5.4 Manual-reset device for oil supply shut-off 250
  - 6.5.5 Manual-reset device exemption for gravity tank supply 250
  - 6.5.6 Application to buildings divided into separate units 250
  - 6.5.7 Main shut-off valve installation requirements 250
- 6.6 Pumps 251
- 6.7 Piping test 251
- 7 Construction heaters 251**
  - 7.1 Construction heater conformity 251
  - 7.2 Location of construction heaters 251
  - 7.3 Vent pipe connection 251
  - 7.4 Ventilation requirements for construction heaters in confined spaces 251
  - 7.5 Combustible materials and debris clearance 251
  - 7.6 Support, securing, and protection 251
  - 7.7 Installation of fuel tank for construction heaters 251
  - 7.8 Installation and use of direct-fired construction heaters 252
  - 7.9 Delivery requirements 252
  - 7.10 Installation, servicing, and operation requirements 252
  - 7.11 Responsibilities of owner/user 252
- 8 Vehicle heaters 253**
  - 8.1 General 253
    - 8.1.1 Heaters for automobiles, buses, transport trucks, and cargo trailers 253
    - 8.1.2 Heater type 253
    - 8.1.3 Fuel leakage drainage 253
    - 8.1.4 Combustion air and exhaust 253
    - 8.1.5 Circulating air intake and duct sealing 253
  - 8.2 Installation 253
    - 8.2.1 Clearances to combustible materials 253
    - 8.2.2 Location and protection of heater 253
    - 8.2.3 Guarding of moving parts 253
    - 8.2.4 Heater and enclosure fastening 253
    - 8.2.5 Assembly and installation to prevent disassembly upon vehicle overturn 254
    - 8.2.6 Accessibility and serviceability 254
    - 8.2.7 Fuel system movement protection 254
    - 8.2.8 Fuel supply and safety 254
    - 8.2.9 Heater installation and exit route accessibility 254
    - 8.2.10 Electrical power requirements 254
    - 8.2.11 Combustion and high-limit controls 254
    - 8.2.12 Telltale indicator lights 254
    - 8.2.13 Heater controls location and accessibility 254

---

**CSA B139.2:24, Installation code for oil-burning equipment for residential and small commercial buildings**

- 0 Introduction** 256
- 1 Scope** 256
  - 1.1 Oil-fired appliances and equipment installation 256
  - 1.2 Installation of appliances and associated equipment in small buildings 256
  - 1.3 Installation and alteration of oil-burning equipment 256
  - 1.4 Ancillary equipment installation requirements 257
  - 1.5 Maintenance requirements for oil-burning equipment 257
  - 1.6 Recommended precautions for filling tanks 257
  - 1.7 Exclusions 257
  - 1.8 Terminology 257
  - 1.9 Dual measurements 257
  - 1.10 Figures and tables 258
- 2 Reference publications** 258
- 3 Definitions** 258
- 4 Appliance installation** 258
  - 4.1 Applicability 258
  - 4.2 Acceptable equipment 258
    - 4.2.1 Oil-burning equipment requirements 258
    - 4.2.2 Certification requirements 258
    - 4.2.3 Potable water system certification 258
  - 4.3 Responsibilities of the installer 258
    - 4.3.1 Initial activation 258
    - 4.3.2 Before leaving a new installation 258
    - 4.3.3 Manufacturer's instructions 259
    - 4.3.4 Conversion from a different energy source 259
    - 4.3.5 Replacement 259
  - 4.4 Quality of work 259
    - 4.4.1 Skillful and thorough workmanship 259
    - 4.4.2 Personnel qualifications 259
  - 4.5 Suitability of equipment and chimney 260
    - 4.5.1 Installer responsibilities 260
    - 4.5.2 Equipment design and installation requirements 260
  - 4.6 Accessibility 260
  - 4.7 Electrical features 260
  - 4.8 Gas features 260
  - 4.9 Supply of fuel oil 260
  - 4.10 Hazardous atmosphere 260
    - 4.10.1 Installation restrictions 260
    - 4.10.2 Installation restrictions in hazardous locations 261
  - 4.11 Oil filters and strainers 261
    - 4.11.1 Oil filter requirements for oil line-mounted devices 261

- 4.11.2 Fuel oil filter, canister, or strainer assembly 261
- 4.11.3 Filter and containment device requirements 261
- 4.11.4 Filter requirements for nozzle sizes less than 2.8 L/h 261
- 4.11.5 Oil filter and strainer conformity 261
- 4.12 Preheating of fuel oils 261
  - 4.12.1 Fuel oil heating provision 261
  - 4.12.2 Electric preheater temperature control 262
  - 4.12.3 Electrical heating requirements for piping and tubing 262
- 4.13 Emergency shut-off devices 262
  - 4.13.1 Emergency shut-off device 262
  - 4.13.2 Valve with fusible link for appliances using float valve and supply tank >41 L 262
- 4.14 Appliance clearances to building construction — Clearance to combustibles 262
  - 4.14.1 Clearances to combustible construction 262
  - 4.14.2 Clearance marking on appliance certification plate 262
  - 4.14.3 Oil appliance clearances 263
- 4.15 Servicing and maintenance clearances 263
- 4.16 Appliance installation — General requirements 263
  - 4.16.1 Installation requirements 263
  - 4.16.2 Floor and support requirements 263
- 4.17 Appliance installation in garages 263
  - 4.17.1 Installation in garages 263
  - 4.17.2 Installation in repair garages 263
- 4.18 Appliance installation outdoors 263
  - 4.18.1 Outdoor use certification 263
  - 4.18.2 Outdoor installation on concrete base 263
  - 4.18.3 Location requirements for outdoor rooftop installations of oil-burning equipment 264
  - 4.18.4 Protection against weather and physical damage 264
  - 4.18.5 Accessibility for inspection and servicing 264
  - 4.18.6 Flue gas circulation prevention 264
- 4.19 Spill or leak response 264
- 5 Fuel-containing devices, piping and tubing, and valves 264**
  - 5.1 Fuel-containing devices 264
    - 5.1.1 Melting point requirement for external parts of fuel-containing devices 264
    - 5.1.2 Oil line-mounted fuel-containing device or accessory installation requirements 264
    - 5.1.3 Installation of certified automatic oil de-aerator 264
  - 5.2 Piping and tubing — Aboveground installations 265
    - 5.2.1 Piping and tubing requirements 265
    - 5.2.2 Fill or vent pipes construction 265
    - 5.2.3 Piping size requirements for oil-burning appliances 265
    - 5.2.4 Flexible connector requirements 265
    - 5.2.5 Support and protection of piping and tubing 265
    - 5.2.6 Piping and tubing routing and support 265
    - 5.2.7 Building member strength preservation 266
    - 5.2.8 Supports for oil piping 266
    - 5.2.9 Piping protection 266
    - 5.2.10 Sleeve material and installation 266
    - 5.2.11 Piping outlet extension requirements 266
    - 5.2.12 Corrosion protection for piping and tubing 266

5.2.13	Piping or tubing installation in solid flooring	266
5.3	Joints and connections	266
5.4	Rooftop piping installation	267
5.5	Piping and tubing — Underground installations	267
5.6	Valves and pipeline devices	267
5.6.1	Support of valves and other devices	267
5.6.2	Shut-off valve	267
5.6.3	Pressure-relief valve	267
5.6.4	Automatic shut-off valve	268
5.6.5	Constant-level valve	268
<b>6</b>	<b>Aboveground fuel oil tanks</b>	<b>268</b>
6.1	General	268
6.2	Construction and operating conditions	269
6.2.1	Construction	269
6.2.2	Operating pressure	269
6.2.3	Operating temperature	269
6.3	Support, installation, foundations, and anchorage	270
6.3.1	Support requirements for supply tanks	270
6.3.2	Tank installation	270
6.3.3	Tank support and installation	270
6.3.4	Tank location and anchorage	270
6.3.5	Earthquake resistance	270
6.3.6	Means of egress	271
6.3.7	Tank clearance requirements	271
6.3.8	Tank installation requirements	271
6.3.9	Bottom outlet tank installation	271
6.3.10	Tank openings sealing	271
6.3.11	Accessible opening for metallic tank in top draw or end outlet configuration	271
6.4	Vehicular protection	272
6.5	Outdoor tank foundations	272
6.5.1	Tank foundation requirements	272
6.5.2	Site preparation	272
6.5.3	Support requirements for outdoor tanks	272
6.5.4	Foundation support elevation above surrounding grade	273
6.5.5	Reinforced concrete slab foundation	273
6.5.6	Reinforced concrete patio stones for horizontal tanks	273
6.5.7	Secondary containment and leak monitoring	273
6.6	Elevated tank installations in designated areas	274
6.6.1	Aboveground tank installation on elevated stand	274
6.6.2	Access to tank-filling connection	274
6.7	Gauging of tanks	274
6.7.1	Liquid level determination	274
6.7.2	Tank gauges and level indicators	274
6.7.3	Gauging restrictions inside buildings	274
6.7.4	Dipstick opening design	274
6.7.5	Location of glass sight gauge or gauging device	274
6.8	Removal or disconnection of appliances	275
6.8.1	Removal of oil-burning appliance for conversion to another form of energy	275

6.8.2	Outlet tightness requirements	275
6.9	Testing of new or replacement tanks	275
6.9.1	Leak testing of supply tank and connections	275
6.9.2	Tank and connection leak testing	275
6.9.3	Testing of tanks with secondary containment	276
6.9.4	Tank-to-tank oil transfer restrictions	276
<b>7</b>	<b>Supply tanks — Capacity and protection</b>	<b>276</b>
7.1	Indoor tanks	276
7.1.1	Supply tanks for building installation	276
7.1.2	Tank capacity and supply line restrictions	276
7.1.3	Supply tanks installation in attached garage	276
7.1.4	Supply tanks located above lowest storey capacity limit	276
7.1.5	Firewall separation	276
7.1.6	Oil return lines on indoor tanks	276
7.2	Outdoor tanks installed above the ground level	277
7.3	Outdoor tanks installed at ground level	277
7.3.1	Tank with a capacity of 2500 L (550 gal) or less	277
7.3.2	Total capacity greater than 2500 L (550 gal)	277
7.3.3	Protection and location of supply tanks	277
7.3.4	Outdoor supply tank configuration	277
7.3.5	Oil supply line installation for outdoor tanks	277
7.3.6	Piping installation requirements	278
7.3.7	Installation of piping or tubing from tank to building	278
7.3.8	Oil return lines installation	278
7.4	Multiple end- or bottom-connected supply tanks	278
7.4.1	Supply tanks using end or bottom connections	278
7.4.2	Interconnection of supply tanks	278
7.5	Pressure-filled multiple top-connected supply tanks	278
7.5.1	Installation of pressure-filled multiple top-connected supply tanks indoors	278
7.5.2	Interconnected tanks with top-mounted manifolds	279
<b>8</b>	<b>Tank connections</b>	<b>279</b>
8.1	Tank fill pipes, openings, and fittings	279
8.1.1	Fill opening or fill pipe location	279
8.1.2	Fill opening and fill pipe entry cover	279
8.1.3	Fill pipe installation	280
8.1.4	Fill pipe design and installation	280
8.1.5	Supply tank fill pipe diameter	280
8.1.6	Location of fill pipe entry	280
8.1.7	Fill pipe installation near buildings	280
8.2	Overfill protection	280
8.2.1	Tank vent alarm and gauge requirements	280
8.2.2	Tank vent alarm and fill-limiting device requirements	280
8.2.3	Release prevention barrier material and placement	281
8.3	Tank venting — Venting of supply tanks	281
8.3.1	Venting of supply tanks	281
8.3.2	Emergency vent connection requirements	281
8.3.3	Vent pipe requirements	281

- 8.3.4 Vent pipe installation 282
- 8.3.5 Vent pipe connection 282
- 8.3.6 Venting requirements 282
- 8.3.7 Vent pipe termination — Elevation 282
- 8.3.8 Vent pipe termination — Building adjacency 282
- 8.3.9 Vent pipe and fuel oil return line cross-connection 283
- 8.3.10 Venting requirements for multiple connected tanks 283
- 9 Air for combustion and venting 283**
  - 9.1 General 283
    - 9.1.1 Combustion air and ventilation 283
    - 9.1.2 Inspection for potential depressurization 283
    - 9.1.3 Installation requirements for oil-burning appliances 283
    - 9.1.4 Location of oil-burning appliances 283
    - 9.1.5 Combustion air and ventilation 283
    - 9.1.6 Outdoor combustion air intake location 283
    - 9.1.7 Duct cross-sectional flow area and minimum dimension 284
    - 9.1.8 Interlocking of dampers with oil-burning appliances 284
  - 9.2 Appliance installations 284
    - 9.2.1 Requirements for residential-type installations 284
    - 9.2.2 Combustion air inlet or mechanical air-supply system 284
    - 9.2.3 Combustion air supply from outdoors 284
    - 9.2.4 Combustion and ventilation air supply 284
    - 9.2.5 Combustion and external ventilation air supply 285
    - 9.2.6 Methods for meeting the requirements of Clause [9.2.5](#) 285
    - 9.2.7 Ventilation and combustion air supply requirements for limited room appliances 285
  - 9.3 Louvres and grilles 285
- 10 Venting products of combustion 285**
  - 10.1 Inspection and repair of existing chimneys 285
    - 10.1.1 Chimney flue examination 285
    - 10.1.2 Chimney replacement or repair 286
  - 10.2 General 286
    - 10.2.1 Venting facilities and products of combustion 286
    - 10.2.2 Venting of oil-burning appliances 286
    - 10.2.3 Venting system connections 286
    - 10.2.4 Oil-burning appliance venting system connection 286
    - 10.2.5 Venting requirements for solid-fuel-fired appliances 286
  - 10.3 Chimneys — General 286
    - 10.3.1 Chimney connection requirement 286
    - 10.3.2 Chimney inspection 287
    - 10.3.3 Chimney performance requirements 287
    - 10.3.4 Chimney vent size and base temperature for new appliance, burner, or chimney installation 287
    - 10.3.5 Chimney vent connections 287
    - 10.3.6 Chimney exhaust capability and automatic fuel shut off 287
    - 10.3.7 Metal chimney liner installation 287
    - 10.3.8 Chimney flue height requirements 287
  - 10.4 Certified chimneys 288

- 10.5 Uncertified chimneys 288
  - 10.5.1 Construction requirements for masonry and concrete chimneys 288
  - 10.5.2 Metal chimney restrictions 288
- 10.6 Special venting arrangements 288
- 10.7 Vent connectors 288
  - 10.7.1 Vent connector diameter 288
  - 10.7.2 Vent collar size transition 288
  - 10.7.3 Vent connector support and gas-tightness 288
  - 10.7.4 Vent connector material requirements 288
  - 10.7.5 Installation requirements for vent connector 289
  - 10.7.6 Vent connector construction and sizing 289
  - 10.7.7 Requirements for retrofitting with a vent connector without a dilution device 289
  - 10.7.8 Mechanical securing of joints in vent connectors 289
  - 10.7.9 Vent connector routing 289
  - 10.7.10 Venting of appliances 289
  - 10.7.11 Chimney flue serving oil-burning and gas-fired appliances 290
  - 10.7.12 Vent connector passing through combustible wall or partition 290
  - 10.7.13 Vent connector passing through combustible walls or partitions when total flue-gas temperature is 400 °C (750 °F) or less 290
- 10.8 Vent connector dampers 290
  - 10.8.1 Vent connector restrictions 290
  - 10.8.2 Interlocking of manually operated dampers 291
  - 10.8.3 Automatically operated dampers for draft control 291
  - 10.8.4 Automatically operated damper design 291
  - 10.8.5 Installation of automatic vent pipe dampers 291
  - 10.8.6 Baffles for reducing peak draft 291
- 10.9 Draft regulators 291
  - 10.9.1 Draft regulator conformance 291
  - 10.9.2 Draft regulator installation 291
  - 10.9.3 Draft regulator installation location 291
  - 10.9.4 Location and mounting of draft regulator 291
- 10.10 Installation requirements for through-the-wall vents 292
  - 10.10.1 General 292
  - 10.10.2 Installation 292
- 11 Tests 293**
  - 11.1 Tests and observations 293
  - 11.2 Requirements 294
    - 11.2.1 Test point location 294
    - 11.2.2 Flue gas pressure 294
    - 11.2.3 Smoke density 294
    - 11.2.4 Temperature 294
    - 11.2.5 Analysis of flue gases 295
    - 11.2.6 Functioning of safety and operating controls 295
    - 11.2.7 Fuel input 295
  - 11.3 Leak testing of aboveground piping or tubing 295
    - 11.3.1 General 295
    - 11.3.2 Pneumatic pressure test 295
    - 11.3.3 Vacuum test 296

**12 Maintenance 296**

# Technical Committee on Installation of Oil Burning Equipment

<b>P. Seager</b>	H. H. Angus and Associates Ltd., Toronto, Ontario, Canada <i>Category: General Interest</i>	<i>Chair</i>
<b>M. Beaulieu</b>	Roth Industries Inc., Shefford, Québec, Canada <i>Category: Producer Interest</i>	<i>Vice-Chair</i>
<b>C. Deschamps</b>	Régie du bâtiment du Québec, Québec, Québec, Canada <i>Category: Regulatory Authority</i>	<i>Vice-Chair</i>
<b>D. A. Balcha</b>	Manitoba Office of the Fire Commissioner, Winnipeg, Manitoba, Canada <i>Category: Regulatory Authority</i>	
<b>C. Baumgartner</b>	Natural Resources Canada, Ottawa, Ontario, Canada <i>Category: General Interest</i>	
<b>S. Bennet</b>	Albany Pump Company Ltd., Newmarket, Ontario, Canada <i>Category: Producer Interest</i>	
<b>M. Berkel</b>	Marius Berkel Consulting and Inspection Services, Kitchener, Ontario, Canada	<i>Non-voting</i>
<b>A. Bonello</b>	Waleco Inc., Mississauga, Ontario, Canada	<i>Non-voting</i>
<b>M. Bouchard</b>	Granby Industries LP, Cowansville, Québec, Canada	<i>Non-voting</i>
<b>M. Buzdugan</b>	Corporation des maîtres mécaniciens en tuyauterie du Québec (CMMTQ), Montréal, Québec, Canada <i>Category: User Interest</i>	
<b>J. J. Dutton</b>	Consultant, St. John's, Newfoundland and Labrador, Canada	<i>Non-voting</i>

<b>B. Dykxhoorn</b>	Edward Fuels (a Division of Mcdougall Energy Inc.), Goderich, Ontario, Canada	<i>Non-voting</i>
<b>D. Edgecombe</b>	Edmonton, Alberta, Canada <i>Category: General Interest</i>	
<b>G. Ellis</b>	Total Power Ltd., Mississauga, Ontario, Canada	<i>Non-voting</i>
<b>P. Fowler</b>	Nova Scotia Department of Labour, Skills and Immigration, Dartmouth, Nova Scotia, Canada	<i>Non-voting</i>
<b>M. R. Freill</b>	Mark 1 Engineering Ltd., Dartmouth, Nova Scotia, Canada <i>Category: Producer Interest</i>	
<b>J. G. Ghanime</b>	Modern Niagara Building Services, Vaughan, Ontario, Canada	<i>Non-voting</i>
<b>S. Hazell</b>	Wilson Fuel Co., Lower Sackville, Nova Scotia, Canada <i>Category: User Interest</i>	
<b>S. Hiscock</b>	Nova Scotia Community College, Dartmouth, Nova Scotia, Canada	<i>Non-voting</i>
<b>K. H. Jamieson</b>	Kenstruct Ltd./Ontario Petroleum Contractors Association, Pefferlaw, Ontario, Canada <i>Category: General Interest</i>	
<b>O. Jones</b>	Toromont Power Systems, Brampton, Ontario, Canada	<i>Non-voting</i>
<b>P. Legault</b>	Intergrated Review Services, Ottawa, Ontario, Canada <i>Category: User Interest</i>	
<b>Y. Legault</b>	Granby Industries LP, Granby, Québec, Canada <i>Category: Producer Interest</i>	
<b>R. MacCormack</b>	Province of Prince Edward Island, Charlottetown, Prince Edward Island, Canada <i>Category: Regulatory Authority</i>	

<b>S. MacNamara</b>	MacNamara Fuels, Newmarket, Ontario, Canada	<i>Non-voting</i>
<b>M. Mailvaganam</b>	Toronto, Ontario, Canada <i>Category: General Interest</i>	
<b>M. Mari</b>	Origin and Cause, Ancaster, Ontario, Canada <i>Category: General Interest</i>	
<b>K. McPhee</b>	Gencare Service Ltd., London, Ontario, Canada	<i>Non-voting</i>
<b>A. Mejia</b>	Imperia Engineering Partners, Milford, Massachusetts, USA	<i>Non-voting</i>
<b>M. Modery</b>	Environment and Climate Change Canada, Gatineau, Québec, Canada	<i>Non-voting</i>
<b>N. Nasiri</b>	Fuels Safety Consulting Services Inc. (FSCS), Richmond Hill, Ontario, Canada	<i>Non-voting</i>
<b>B. Parent</b>	Cummins Canada ULC, Candiac, Québec, Canada	<i>Non-voting</i>
<b>A. P. Perrie</b>	APM Heating and Cooling, Durham, Ontario, Canada	<i>Non-voting</i>
<b>B. Sudic</b>	CIMA, Vaughan, Ontario, Canada	<i>Non-voting</i>
<b>H. Sukhu</b>	Structural Tank Equipment and Maintenance, Toronto, Ontario, Canada <i>Category: Producer Interest</i>	
<b>R. Sumabat</b>	Technical Standards and Safety Authority (TSSA), Toronto, Ontario, Canada <i>Category: Regulatory Authority</i>	
<b>G. Thong-Kielo</b>	Flex Consulting (2293428 Ontario Ltd.), Mississauga, Ontario, Canada	<i>Non-voting</i>
<b>C. Wessner</b>	Government of the Northwest Territories, Yellowknife, Northwest Territories, Canada <i>Category: Regulatory Authority</i>	

---

<b>G. Wintonic</b>	UL Standards and Engagement, Ottawa, Ontario, Canada	<i>Non-voting</i>
<b>J. A. Wood</b>	Ontario Petroleum Transporters and Technicians Association, Newburgh, Ontario, Canada <i>Category: User Interest</i>	
<b>E. Young</b>	IREC Thermal Group Ltd., Edmonton, Alberta, Canada	<i>Non-voting</i>
<b>N. Shrewsbury-Gee</b>	CSA Group, Toronto, Ontario, Canada	<i>Project Manager</i>

# Preface

This is the eleventh edition of CSA B139, *Installation code for oil-burning equipment*. It supersedes the previous editions published in 2019, 2015, 2009, 2004, 2000, 1991, 1976, 1971, 1962, and 1957.

The major changes to this edition include

- shut-off valve requirements updated to add ANSI/CAN/UL/ULC 842;
- new definition for press-connect fitting (CSA B139.1.0);
- oils having flash points above 38 °C (100 °F) have added classification requirements (CSA B139.1.0);
- clarifications for piping or tubing in solid flooring (CSA B139.1.0);
- requirements for visibility of press-connect fittings (CSA B139.1.0);
- new requirements for auxiliary supply tanks located in storage and service rooms (CSA B139.1.0);
- additional clarifications for tanks with secondary containment (CSA B139.1.0);
- clarifications for fittings and joints (CSA B139.1.0);
- correction to clause reference for supply tank fill pipes (CSA B139.1.0);
- removed the capability of oil tank levels to be visually determined (CSA B139.1.0);
- requirements added for permanent structure for fill point access (CSA B139.1.0)
- removal of Annex C due to CSA B140.2.3 being withdrawn (CSA B139.1.0);
- removal of Annex E due to overlapping requirements in the CSA B140 host of standards (CSA B139.1.0);
- clarification to 45 L capacity for integral supply tanks (CSA B139.1.1);
- additional requirements that take into consideration site conditions on tank oil temperatures (CSA B139.1.1);
- requirements for engine exhaust stack locations (CSA B139.1.0 and CSA B139.1.1);
- new requirements for skin-tight enclosures (CSA B139.1.1); and
- clarifications for burners not being interchangeable parts (CSA B139.2.0).

This Code is considered suitable for use for conformity assessment within the stated scope of the Code.

This Code was prepared by the Technical Committee on Installation of Oil Burning Equipment, under the jurisdiction of the Fuels and Appliances Strategic Steering Committee, and has been formally approved by the Technical Committee.

This Code has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

## Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *Although the intended primary application of this Code is stated in its Scope, it is important to note that it remains the responsibility of the users of the Code to judge its suitability for their particular purpose.*
- 3) *This Code was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Code.*
- 4) *To submit a request for interpretation of this Code, please send the following information to [inquiries@csagroup.org](mailto:inquiries@csagroup.org) and include “Request for interpretation” in the subject line:*
  - a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*
  - b) *provide an explanation of circumstances surrounding the actual field condition; and*