



Installation Code for Oil-Burning Equipment B365-17

Installation code for solid-fuel-burning appliances and equipment
Yukon Housing
Contractor's Breakfast
April 2019

Presented by
Ken Alaric & Stan Dueck





CSA B139 Series 19 CHANGES

This presentation will addresses some changes to **CSA B139 SERIES:19 "Installation code for oil-burning equipment"** which supersedes the 2015 edition of B139 Series-15:

CSA B139 SERIES:19

"Installation code for oil-burning equipment"

NOTE: This is not a comprehensive presentation of all the changes and the installer is responsible for acquainting themselves fully with the new edition of **CSA B139 SERIES:19**.





Preface: This is the tenth edition of CSA B139, Installation code for oilburning equipment. It supersedes the previous editions published in 2015, 2009, 2004, 2000, 1991, 1976, 1971, 1962, and 1957.

There are four Parts to CSA B139 Series 19;

- CSA B139.1.0:19, General requirements for (Part 3 Buildings) large installations,
- CSA B139.1.1:19, General requirements for stationary engines,
- CSA B139.1.2:19, General requirements for special installations,
- CSA B139.2:19, Installation code for (Part 9 Buildings) oil-burning equipment for residential and small commercial buildings,

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The major changes to this edition include:

- The addition of annual visual inspection of fuel oil tank, tubing, piping and fuel oil filters for leakage in CSA B139.1.0 and in CSA B139.2;
- Clarification that the external parts of the body of a fuel-containing device, component, or accessory installed in an oil line has a melting point of not less than 538 °C (CSA B139.1.0);





- a new requirement where an external pressure relief valve is installed at an oil pump discharge and downstream of a check valve:
- the ullage space of the main tank to which the pressure-relief valve is piped is at least the volume of piping between the check valve and the automatic valve; and
- the supply line into the auxiliary supply tank is equipped with a means of anti-siphon where a drop tube is installed (CSA B139.1.0);





- the requirements for loop systems have been clarified to apply to elevated installations only (CSA B139.1.0);
- a new requirement limiting the acceptance of tanks conforming to API 650 to field erected tanks with capacities that exceed 175 000 L (CSA B139.1.0);
- a new requirement applying to auxiliary tanks operating in a continuous overflow condition (CSA B139.1.0);





- A new requirement limiting installation storage and supply tanks within tank protection levels II, III, IVA or IVB in buildings of noncombustible construction in conformance with Division B, Part 3 of the National Building Code of Canada (CSA B139.1.0);
- A clarification that vent pipes where the opening faces downward without a vent cap is not considered sufficient to prevent the ingress of foreign objects and blockage by ice build-up (CSA B139.1.0);





- New requirements have been added for fill pipes or vent pipes recessed into the façade of a building (CSA B139.1.0);
- New requirements have been added for through-the wall venting for appliances installed under CSA B139.1.0;
- New requirements to remove an aboveground or underground tank system that has not been used for more than 3 years (CSA B139.1.0)





- New requirements have been added for diesel engines driving fire pumps (CSA B139.1.1 – Stationary Engines);
- a new requirement has been added, permitting the operating temperature for an indoor engine supply tank that can exceed 38 °C (CSA B139.1.1 – Stationary Engines);
- However, residential and small commercial outdoor aboveground and indoor tanks shall be located and operated so that the temperature of the oil in the tank will not exceed 38 °C (CSA B139.2)





- A clarification that engine service rooms require a non-combustible, liquid-tight sill, or ramp to a height corresponding to 10% of the volume of the largest tank in the room, and at least 150 mm (6 in) high (CSA B139.1.1 – Stationary Engines);
- New requirements have been added for through-the-wall venting of engine exhausts (CSA B139.1.1 – Stationary Engines);





- A new requirement has been added, prohibiting outdoor installation of oil return lines (CSA B139.2); and
- New requirements for through-the-wall venting for condensing appliances (CSA B139.2).
- The Reference Publications have been expanded and updated.





CSA B139.1.0:19 - General requirements for large installations (Part 3 Buildings)

The Introduction in this Edition of CSA B139 have been changed to point form;

CSA B139 Series, Installation code for oil-burning equipment, is arranged in four parts:

- a) CSA B139.1.0 covers general requirements for large installations.
- b) CSA B139.1.1 covers general requirements for stationary oil-burning engine installations.
- c) CSA B139.1.2 covers general requirements for special oil-burning equipment installations.
- d) CSA B139.2 covers general requirements for residential and small commercial building installations.





CSA B139.1.0:19 - General requirements for large installations

Scope 1.1

This Code specifies minimum requirements for the installation of large oil-burning equipment (*Part 3 Buildings*)

Note: The intent of this Code is to apply to multi-unit residential, commercial, institutional, and industrial buildings in accordance with the provincial building code or, in the absence of such regulation, the National Building Code of Canada.





CSA B139.1.0:19 - General requirements for large installations

Scope 1.7

This Code does not apply to

- a) process equipment installed in refineries;
- b) appliances installed in park model trailers, recreational vehicles, and marine craft;
- c) portable devices such as lamps, blowtorches, melting pots, and weed burners;
- d) integral fuel tanks of 45 L (10 gal) capacity or less on internal combustion engines; or
- e) portable oil-burning equipment within the scope of CSA-B138.1 and CSA-B138.2.





CSA B139.1.0:19 - General requirements for large installations Reference Publications 2 – Have been updated Definitions 3 – A few new definitions have been added

CSA B139.1.1:19 - General requirements for stationary engines

Scope 1.1

This Code specifies minimum requirements for the installation of oil-fuelled stationary engines used for

- a) the generation of electrical power for buildings;
- b) the generation of electrical power in accordance with CSA C282;
- c) the generation of electrical power in accordance with CSA Z32; and
- d) directly connected shaft power for building equipment, industrial equipment, and emergency equipment.

Note: Examples of "building equipment" include air compressors and refrigeration equipment; "industrial equipment" includes pumps, compressors, hoisting equipment; and "emergency equipment" includes fire pumps. This Note does not impose limits on types of driven equipment.





CSA B139.1.2:19 - General requirements for special installations Scope 1.1

This Code applies to the installation of appliances, equipment, components, and accessories where oil is used for fuel purposes in

- a) used-oil-burning appliances;
- b) central oil distribution systems;
- c) construction heaters and fuel systems; and
- d) vehicle heaters.





CSA B139.2:19 - Installation code for oil-burning equipment for residential and small commercial buildings (Part 9 Buildings)

Introduction CSA B139.2 concerns the installation of low-capacity boilers, furnaces, air heaters, domestic water heaters, and similar residential-type appliances, including the associated ancillary equipment, installed in residential and small commercial buildings. Users should note that the design of fuel systems anticipated in this Code might not be subject to provincial legislation requiring sealing of the design and provision of construction review services by an engineer.

Where the installation does not meet the restrictions and limitations imposed by this Code, the installation is to be installed in accordance with CSA B139.1.0.





CSA B139.2:19 - Installation code for oil-burning equipment for residential and small commercial buildings (Part 9 Buildings)

Scope 1.1

This Code applies to the installation of appliances, equipment, components, and accessories where oil is used for fuel purposes in applications that include

- a) space heating;
- b) service water heating; and
- c) small process application





Scope 1.2

This Code applies to the installation of appliances and associated equipment where

- a) the building is a residential or commercial building as defined by the National Building Code of Canada, does not exceed 3 storeys in building height, and does not exceed 600 m2 (6458 ft2) in building area;
- b) the individual or total appliance fuel input rating does not exceed 9.5 L/h (2.5 GPH);





Scope 1.2

This Code applies to the installation of appliances and associated equipment where

- c) the maximum fuel input rate to all appliances connected to a common chimney does not exceed 205 kW (700 kBtu/h);
- d) supply tanks do not exceed an individual capacity of 2500 L (550 gal), nor do they exceed a total capacity of 5000 L (1100 gal) for each premises; and





Scope 1.2

This Code applies to the installation of appliances and associated equipment where

e) no fuel pumps other than appliance integrally mounted fuel pumps are used.

Note: The intent of this Code is to apply to residential buildings and small commercial buildings in accordance with the provincial building code or, in the absence of such regulations, in accordance with Part 9 of the National Building Code of Canada.

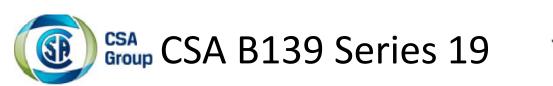




6.3.6

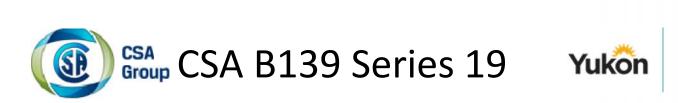
Tanks shall not impede the means of egress from a building.

Note: Means of egress are considered to be unimpeded if a minimum clearance of 1.5 m (5 ft) exists between all parts of the tank and the edges of adjacent building openings (such as doors or windows) and exit ways (such as corridors, passages, lanes, stairways, and ramps).

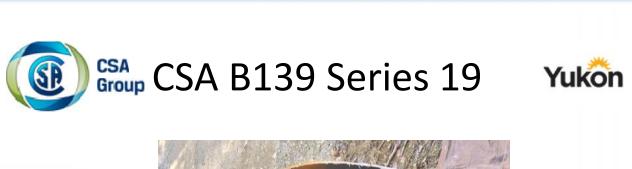




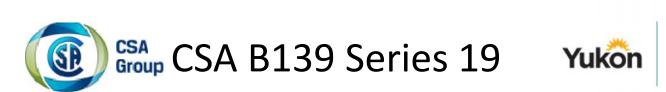
























RE: Requirements for the Installation of Smoke and Carbon Monoxide Alarms

The 2015 Edition of the National Building Code requires the installation of smoke alarms and carbon monoxide (CO) alarms. Smoke Alarms conforming to CAN/ULC-S531, "Smoke-Alarms," shall be installed in conformance with CAN/ULC-S553;

- In each sleeping room; not within a dwelling unit, and
- In each sleeping room within a care occupancy, and
- In each sleeping room within a dwelling unit, and





- In a location between the sleeping rooms, and remainder of the storey, & if the sleeping rooms are served by a hallway, the smoke alarm shall be located in the hallway, and
- There shall be at least one smoke alarm installed on each storey, of a dwelling unit, including basements, and
- Ancillary spaces and common spaces not in dwelling units in a house with a secondary suite, and
- Smoke alarms shall be installed on or near the ceiling, and





Requirements for the Installation of Smoke Alarms (Cont.)

 Smoke alarms shall be installed with permanent connections to an electrical circuit, have no disconnect switch between the overcurrent device and the smoke alarm, be provided with a battery as an alternative power source that can continue to provide power to the smoke alarm for a period of no less than 7 days in the normal condition, followed by 4 minutes of alarm, and





- Where more than one smoke alarm is required in a dwelling unit, the smoke alarms shall be wired so that the activation of one alarm will cause all alarms within the dwelling unit to sound, and
- A manually operated device shall be incorporated within the circuitry of a smoke alarm installed in a dwelling unit so that the signal emitted by the smoke alarm can be silenced for a period of not more than 10 min, after which the smoke alarm will reset and sound again if the level of smoke in the vicinity is sufficient to re-actuate it.





- Smoke alarms in a house with a secondary suite shall be wirelessly interconnected or interconnected by hard-wiring so that the activation of any smoke alarm causes all smoke alarms within the house & secondary suite to sound.
- If a building is not supplied with electrical power, smoke alarms are permitted to be battery-operated.





- If instructions are necessary to describe the maintenance and care required for smoke alarms to ensure continuing satisfactory performance, they shall be posted in a location where they will be readily available to the occupants.
- Residential suites are permitted to be equipped with smoke detectors in lieu of smoke alarms, provided a fire alarm system has been installed in conformance with CAN/ULC-S524, "Installation of Fire Alarm Systems".





RE: Requirements for the Installation of Smoke and Carbon Monoxide Alarms

The 2015 Edition of the National Building Code requires the installation of smoke alarms and carbon monoxide (CO) alarms.

Carbon Monoxide (CO) Alarms conforming to CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices," shall be installed in every building with a residential or care occupancy that contains a fuel-burning appliance or an attached garage;





Requirements for Installing Carbon Monoxide Alarms (Cont.)

- Have no disconnect switch between the overcurrent device and the CO alarm, where the CO alarm is powered by the dwelling unit's electrical system, and
- Be mechanically fixed at a height recommended by the manufacturer.





Requirements for Installing Carbon Monoxide Alarms (Cont.)

- Where a room contains a solid-fuel-burning appliance, a CO alarm shall be mechanically fixed:
 - at the manufacturer's recommended height where these instructions specifically mention solid-fuelburning appliances, or
 - in the absence of specific instructions related to solidfuel-burning appliances, on or near the ceiling.





- Where a fuel-burning appliance is installed in a suite of residential or care occupancy, a CO alarm shall be installed:
 - inside each bedroom, or
 - outside each bedroom, within 5m of each bedroom door, measured following corridors and doorways.





- Where a fuel-burning appliance is installed in a service room that is not in a suite of residential or care occupancy, a CO alarm shall be installed:
 - either inside each bedroom, or
 - if outside, within 5 m of each bedroom door, measured following corridors and doorways, in every suite of residential occupancy that shares a wall or floor/ceiling assembly with the service room, and
 - in the service room.



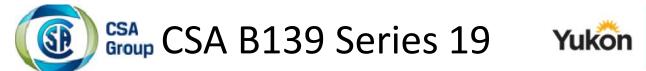


- For each suite of residential or care occupancy that shares a wall or floor/ceiling assembly with an attached garage or that is adjacent to an attic or crawl space that is adjacent to an attached garage, a CO alarm shall be installed:
 - inside each bedroom, or
 - outside each bedroom, within 5m of each bedroom door, measured following corridors and doorways.





- Where CO alarms are installed in a house with a secondary suite including their common spaces, the CO alarms shall be wired so that the activation of any one CO alarm causes all CO alarms within the house with a secondary suite including their common spaces to sound.
- Battery-operated carbon monoxide alarms are permitted,
 but they must be mechanically fixed to a surface.





When a a fuel-fired appliance is installed or replaced in a building with a residential or care occupancy, the National Building Code (NBC) also requires that smoke alarms and carbon monoxide (CO) alarms be installed in conformance with the NBC.





When a a fuel-fired appliance is installed or replaced in a building with a residential or care occupancy, the National Building Code (NBC) also requires that smoke alarms and carbon monoxide (CO) alarms be installed in conformance with the NBC.





Mechanical System Minimum Performance Efficiency Rating

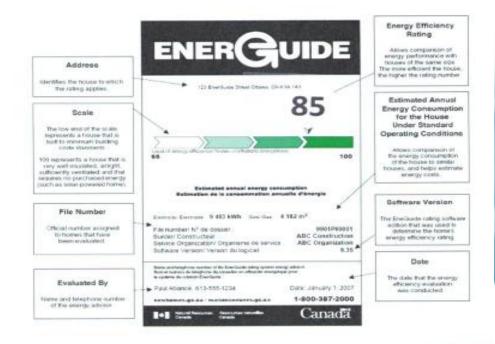
Mechanical Systems	
Heating System	Minimum Performance
Air Source Heat Pumps - split	SEER 14.5 EER 11.5 HSPF 7.1
Air Source Heat Pumps – single package	SEER 14.0 EER 11.0 HSPF 7.0
Gas Fired Boilers	AFUE≥ 90%
Oil Fired Boilers	AFUE ≥ 85%
Gas Fired Warm Air Furnaces	AFUE ≥ 92%
Oil Fired Warm Air Furnaces	AFUE ≥ 85%
Gas Fired Unit Heaters	E t 82%
Oil Fired Unit Heaters	E t 80%
Solid Burning Fuel Appliances	EPA 40 CFR or CSA B415.1
fireplaces must be sealed direct vent a	and pilot light on demand or intermittent ignition
Service Water Heating	80%
Gas fired Hot Water Tanks and Tankless	8070
Heaters	80%
Oil Tired Tankless Hot Water Heaters	78%
Oil Fired Hot Water Tank	7070
Heat Recovery Ventilators (Sensible Recov	very Efficiency)
City of Whitehorse	64% @ -25° C
Yukon – if required	55% @ -25° C
there are other means to	deliver heated air to habitable rooms
that may be used, but a	ventilation system must be installed

http://www.housing.yk.ca/pdf/1 designer builder information package.pdf





Sample EnerGuide Label







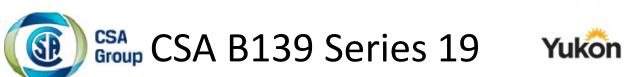
Canad'ä

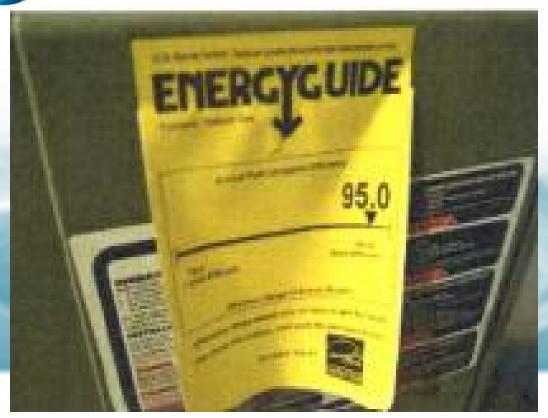
ENER GUIDE

Annual Fuel Utilization Efficiency (AFUE) Oil-fired forced-air furnace with a high efficiency motor

90.0

78% — more energy-efficient → 96%

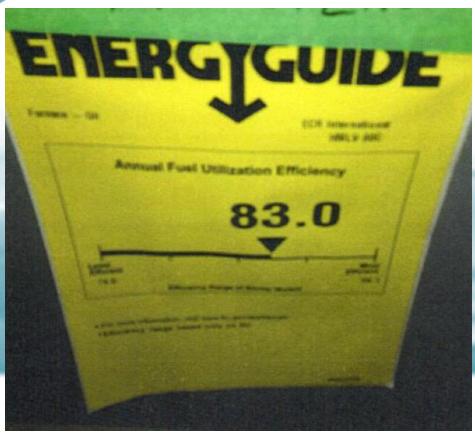






CSA Group CSA B139 Series 19









Q&A's REGARDING TANK INSTALLATION & B139-19

The following is a list of possible questions and answers that may arise in reference to the TANK section of the new B139-19, accompanied by comprehensive answers that might be helpful while in the field. Also included are a number of other questions surrounding proper tank installation in general.

If clarification is needed on any of the code changes in B139-19, please contact the appropriate authority having jurisdiction.





Q - Can I install a steel tank outdoors?

A— Any single-wall steel tank installed outdoors must have a secondary containment designed for outdoor use (ie. Covered tank) or be a double-bottom with interstitial monitoring. This requirement does not apply to non-metallic tanks.





Q- Must I install a double wall steel tank indoors?

A— NO. This requirement is only for tanks installed outdoors.





Q— What about existing outdoor steel tank installations?

A— If the tank was installed prior to 2019, and it was installed, inspected and approved to the code of the day of when it was installed, then you should check with your insurance company. Also any steel tank, regardless of age, should be checked annually to ensure that there are no signs of oil leaking from the tank or from the oil lines.





Q -How long can a home/business owner keep an existing steel tank?

A- All equipment shall be maintained at least once per year as stated in Annex L, Maintenance – Residential Installations.

Tanks shall be visually inspected and replaced if necessary.

Tanks in unconditioned spaces and outdoors shall be tested for water and pumped if necessary.





Q—In the past, insurance companies have stated outdoor steel tanks are good for 15 years. Does this still hold?

A—Insurance companies set internal company policies for oil tank installations. Homeowners should check with their individual agents for their specific policy details. A tank still must be inspected on an annual basis. If a tank is deemed unfit, the age is irrelevant.





Q -When a new tank is being installed, does it have to be filled?

A— The installer has to test the tank and connections for leaks. They can pressure test for a minimum of 10 minutes or hydrostatic test during the first fill. It is the installers responsibility to test the new installation. (6.9.2)





Q - Can old product be transferred into a new steel tank?

A- The transfer of contaminated oil can significantly shorten the life span of a new steel tank and may affect tank warranty. There are various methods to reduce the likelihood of contamination during product transfer, but the only sure thing is no product transfer. The Installation requirements for above-ground domestic oil tanks states transfer should be avoided and recommends only new fuel be introduced into the new tank after replacement. (6.9.4)





Q – Indoor or outdoor installations; which is preferred?

A- Indoor installations are always preferred by the industry. The house offers protection from the environment and from vandalism. As well, small leaks can be detected sooner, less condensation takes place, and fuel atomizes better at room temperature.





Q - Should a home/business owner be able to detect an oil odour from an oil tank that's installed indoors?

A— Absolutely. Fuel has offensive aromatics that should alert you to a problem. If an odour is detected, there must be (1) a leak in the fill and vent piping or (2) a leak in the tank itself or (3) a leak in the line/filter from tank to burner or (4) a leak involving the fuel pump. Property owners need not 'get used' to the smell of heating oil.





Q – If an oil tank is located inside a garage, does it need to have posts installed to protect it from vehicular movement?

A—YES. The new code states that unless the tank is protected by its' location, the tank and anything attached to the tank (piping, oil lines etc.) must be protected from vehicular movement/traffic. If an automobile can hit the tank, it needs protection. (6.4)





Q —When replacing an existing outside oil tank that is currently located on the property line, can the new tank be installed in the same location?

A- No. There are no 'grandfather rules' that allow for new installations on the property line. Code requirements state the tank must be at least 5' from the property line. (7.3.3)





Q – When installing a new tank indoors, do the fill and vent pipes need to be replaced?

A— Fill and vent pipes are part of the tank storage system and must meet the code of the day. Today's code states Fill pipes shall be steel (black iron) or galvanized (zinc Coated black iron), however, no cast 90's are allowed. The fill and vent must drain 1/4" per foot, and the vent cap must be screened. The likelihood of existing fill and vent pipes meeting all code requirements today, is very slim. It's better to count on replacement.(8.1.6)(8.3.6)





Q - What is the right way to pipe together two fuel tanks?

A— Figure 10a, 10b and 11 in the new B139-19 show the only acceptable configuration to pipe-out multiple tanks. The main concerns are overfills and pressurization of the vessels. Failure to install tanks according to these methods could lead to product spills.





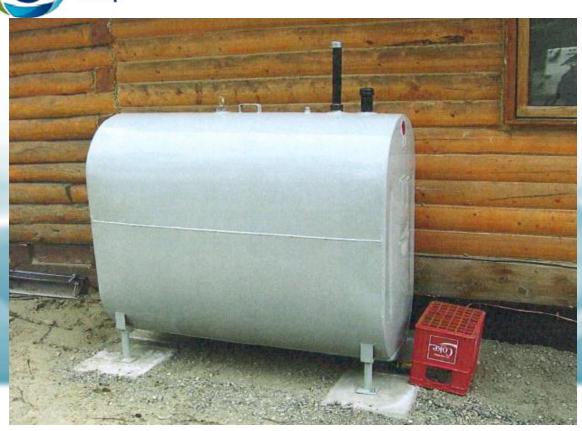
Q – Does a top connected fuel line require a de-aerator?

A— When fuel oil is subjected to a vacuum, air in the oil will be extracted and cause problems not only with the pump, but also after drip and carbon deposits.



CSA Group CSA B139 Series 19





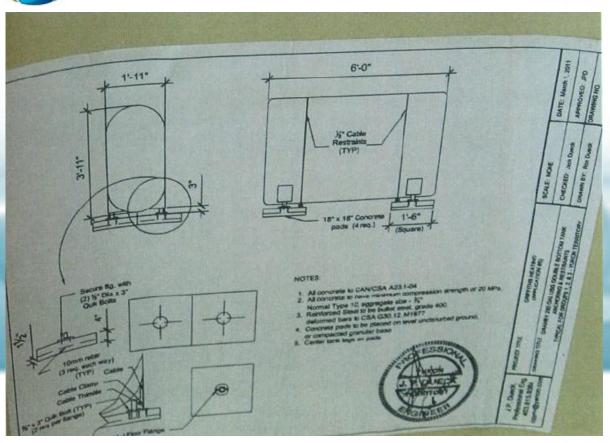




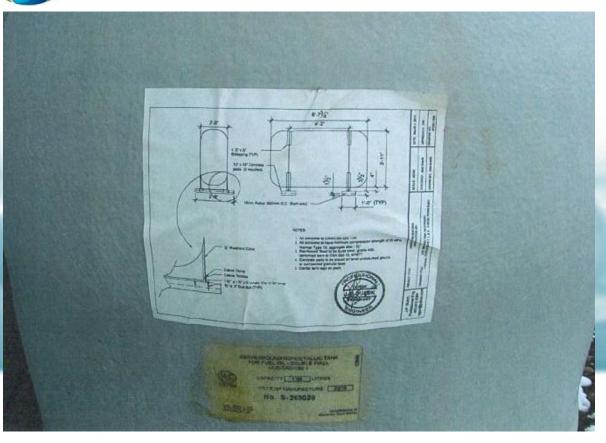


CSA Group CSA B139 Series 19 Yukon









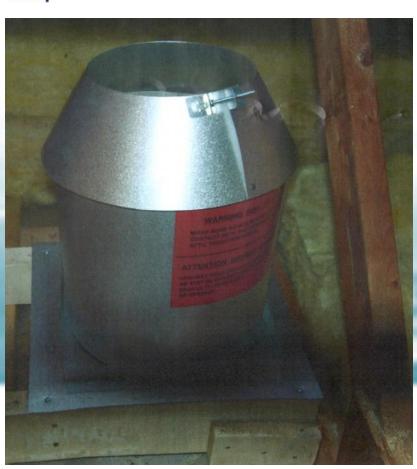






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Chimney in a chase without sleeve, sleeve had to be installed,

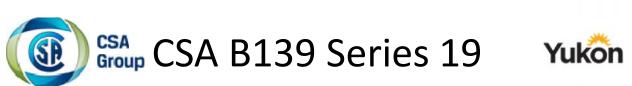
Inspection of a chimney in a chase is required to be Inspected before it is enclosed to ensure that if a sleeve is required it has been installed, all clearances to combustibles have been met, floor and ceiling support kits and required fire stopping at each floor have all been installed.



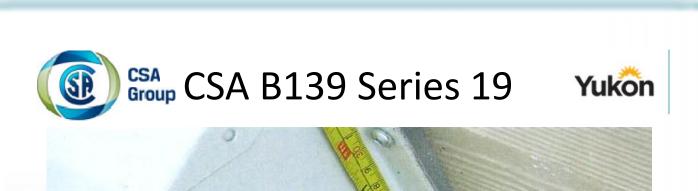
CSA Group CSA B139 Series 19 Yukon











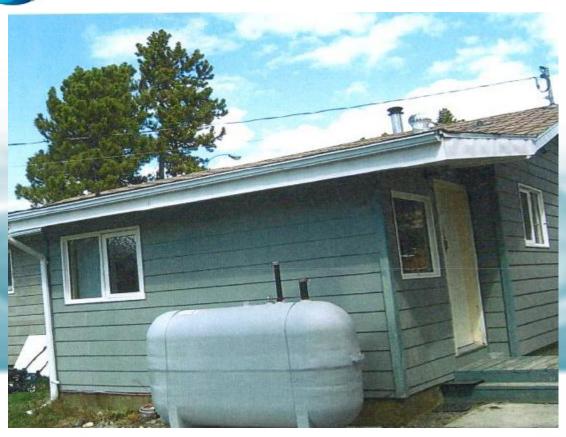


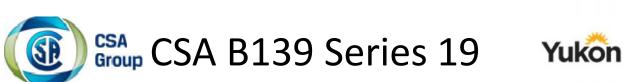
















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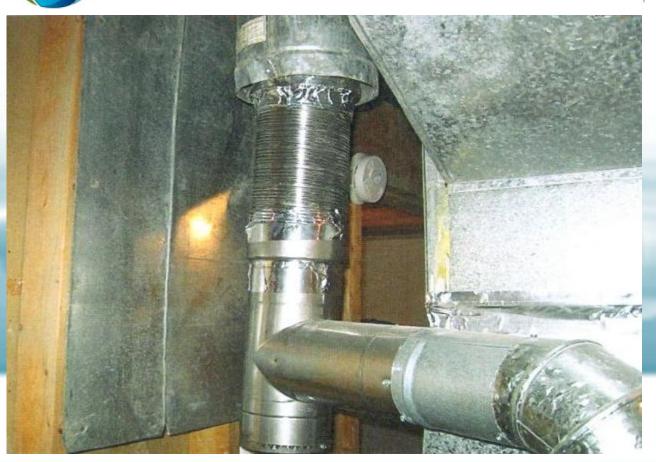


















CSA B139 Series 19 Oil-Burning Equipment

Questions?

Presented by

Ken Alaric and Stan Dueck





CSA B365-17 CHANGES

This presentation will addresses some changes to **CSA B365-17 "Installation code for solid-fuel-burning appliances and equipment"** which supersedes the 2010 edition of B365-10:

CSA B365-17 "Installation code for solid-fuelburning appliances and equipment"

NOTE: This is not a comprehensive presentation of all the changes and the installer is responsible for acquainting themselves fully with the new edition of **CSA B365-17**





Preface: This is the eighth edition of CSA B365, Installation code for solid-fuel-burning appliances and equipment. It supersedes the previous editions published in 2010, 2001, 1991, 1987, 1984, 1982, and 1980.

Significant changes in this edition include updated reference publications and revised requirements for wall pass-throughs, flue pipes, breech pipes, thimbles, and cookstove clearance measurements.

https://store.csagroup.org/ccrz__ProductDetails?viewState=DetailView&cartID=&portalUser=&store=&cclcl=en_US&sku=B365-17





Scope: No changes.

Reference Publications: Have been expanded and updated.

Definitions: A few new definitions have been added.

General Requirements: ULC S609 for pellet vents have been

added.

Venting Flue Gases: 6.3.4 Where a breech pipe passes through an interior wall of combustible construction to a masonry chimney, additional requirements have been added.





Venting Flue Gases: 6.4.6 Where a flue pipe passes through an interior wall of combustible construction, additional requirements have been added.

Installation of Ducts: 9.2.2 Supply air ducts, a Note have been added.

Additional requirements for solid-fuel-burning add-on furnaces and add-on boilers: Table 2 Clearances to combustible material for uncertified appliances using solid fuel, a Note has been added regarding clearance requirements for cookstoves.































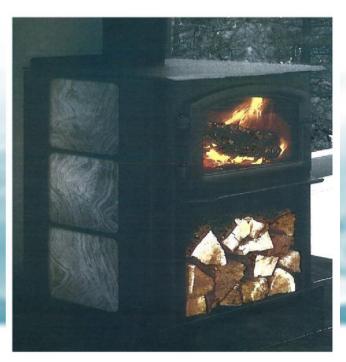
















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