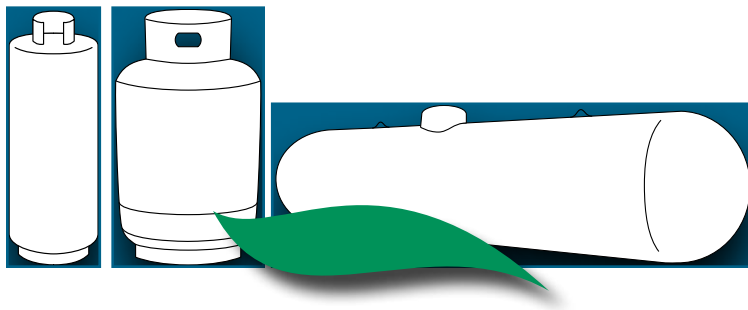




Association québécoise du propane

Depuis 1959  
Expertise et Sécurité

## Technical bulletin on installation standards for propane cylinders and tanks



# GUIDE FOR MUNICIPAL SERVICES AND QUEBEC FIRE SAFETY SERVICES

Update of the 2010 CSA B149.2  
Propane Storage and Handling Code

**EFFECTIVE**  
**JULY 31<sup>ST</sup>, 2010**

## REGULATED AND CONTROLLED INDUSTRY

The propane industry has been structured, organized and controlled by standards for over 50 years and regulate certificates manpower and specialized contractor's licenses. Standards which regulate the installations are approved Canada-wide by the Interprovincial Gas Advisory Council Board of the Canadian Standard Association (CSA). They specify the installation requirements to which the gas industry must comply, so that for each contractor can apply the same rules without interpretation and make sure people and environment are safe.

This document, prepared by the Association québécoise du propane (AQP) for municipalities (Fire Safety Services, Land Use Planning, and Urban Planning), is also intended for the propane industry (distributors, installers, and representatives). Inspectors from the Régie du bâtiment du Québec, other construction trades, and consumers can also use it as a reference tool.

Without substituting codes and standards, this document is a reference guide that brings the size, capacities, and clearances required for cylinder and tank installations, aboveground or underground. This tool has been developed using the codes effective in Quebec, the manufacturers' specifications, and advice and experience from experts who consistently strive to better promote this industry.

## THREE STANDARDS RULE THE PROPANE INDUSTRY

The **CSA B149.1 Natural Gas and Propane Installation Code** applies to the installation of:

- a) appliances, equipment, components, and accessories where gas is to be used for fuel purposes;
- b) piping and tubing extending from the termination of the utility installation or from the distributor's propane tank;
- c) vehicle-refuelling appliances and associated equipment meeting the requirements of a general-purpose appliance to fill a natural-gas-fuelled vehicle and stationary gas engines and turbines.

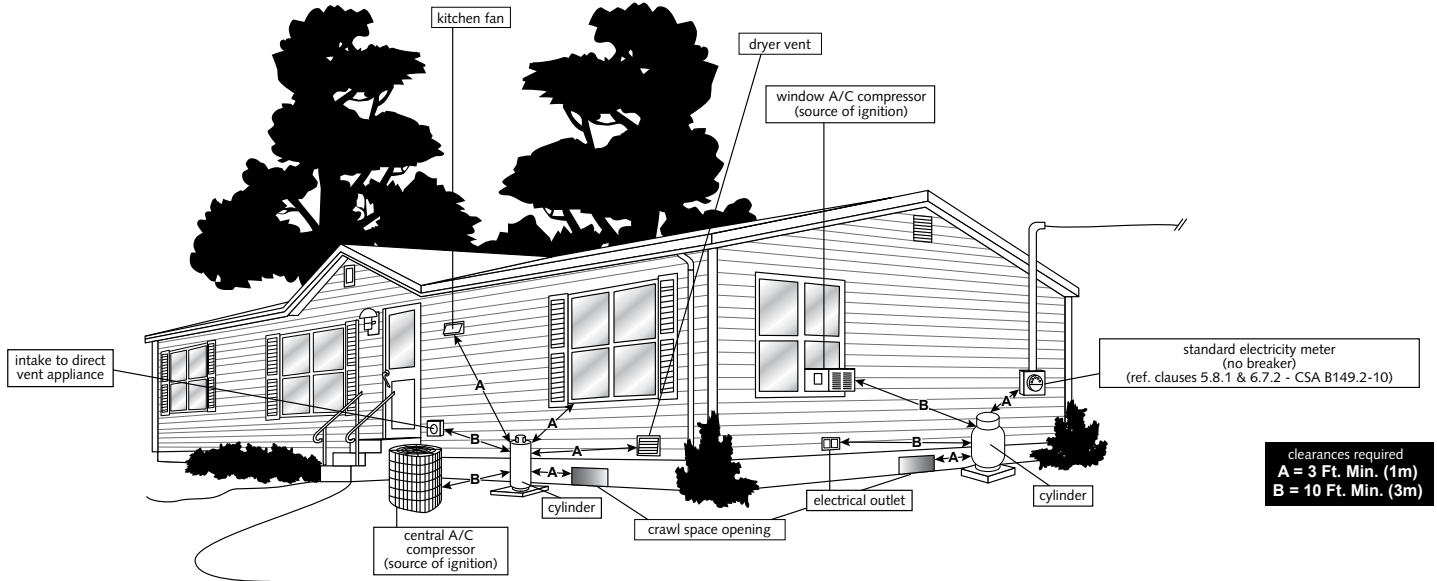
The **CSA B149.2 Propane Storage and Handling Code** applies to:

- a) the storage, handling, and transfer of propane;
- b) the installation of appliances, equipment, components, accessories, and containers on highway vehicles, recreational vehicles, mobile housing, outdoor food service units, and wash-mobiles when propane is to be used for fuel purposes;
- c) propane used as an engine fuel in other than highway vehicles;
- d) the installation of containers and equipment to be used for propane in distribution locations and filling plants.

The **CSA-B149.3-10 Field Approval of Fuel-Related Components on Appliances and Equipment Code** contains the requirements for fuel-related components and accessories and their assembly on an appliance utilizing gas, downstream of the manual shut-off valve specified in Clause 6.18.2 of CSA B149.1. This Code contains additional requirements for process ovens, including bakery ovens, process furnaces, and atmosphere generators operating at approximately atmospheric pressure and used by the industry for the processing of materials.

## CLEARANCES (PROPANE CYLINDERS)

Less than 475 litres (420 lbs) capacity



NOTE: Clearance required between cylinder and heat exchanger:  
10 ft min. (3 m) from air intake and 3 ft min. (1 m) from air outlet

### CYLINDER INSTALLATIONS

Each cylinder shall be set upon a firm, level, weatherproof base, located on consolidated ground at grade level, and shall be equipped with flexible connectors to offset any movement affecting the piping or tubing.

Reference: Clause 6.7.1 – CSA B149.2-10

A cylinder shall be installed outside a building, with the discharge from the cylinder relief valve not less than 3 ft (1 m) on a horizontal plane from any building opening when the opening is below the level of the relief valve discharge; 10 ft (3 m) on a horizontal plane from the air intake of any appliance or air-moving equipment; and 10 ft (3 m) on a horizontal plane from any source of ignition.

Reference: Clause 6.7.2 – CSA B149.2-10

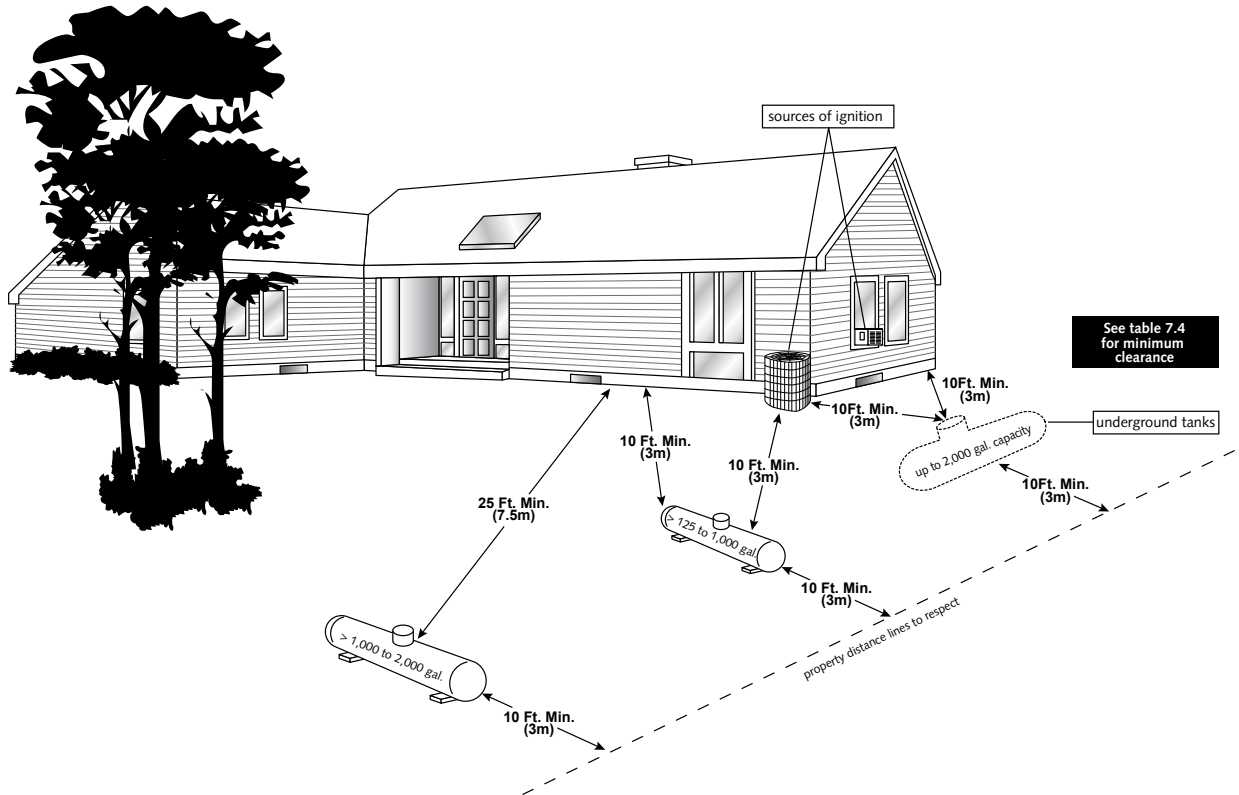
When damage to a cylinder caused by a moving vehicle is possible, protection must be provided by posts or guardrails.

Reference: Clauses 6.7.6 & 7.19.4 – CSA B149.2-10

A maximum of four cylinders manifolded together to form a system may be located within 10 ft (3 m) of a common wall of a building. No more than one such manifolded system may be located against the common wall of a building unless separated by a distance of 10 ft (3 m).

Reference: Clause 6.7.7 – CSA B149.2-10

## CLEARANCE (PROPANE TANKS) More than 125 USWG (475 L) capacity



### LOCATIONS OF CONSUMER TANKS

Every tank shall be located outside the building.

Reference: Clause 7.10.1 – CSA B149.2-10

A tank used in a consumer application shall be located with respect to a property line, building opening, or an adjacent tank in accordance with table 7.4. A tank shall be located with respect to a building wall in accordance with table 7.4, except that: a maximum of four tanks, each less than 125 USWG (475 L), that are manifolded together to form a system may be located against a common wall of a building. Not more than one such manifold system may be located against a common wall of a building unless separated by a distance of 10 ft (3 m);

For aggregate capacities over 125 USWG (475 L) and up to and including 500 USWG (1,900 L), the clearance from building walls may be reduced to 3 ft (1 m) for a single tank, provided that, the building wall is of concrete or masonry construction; there is a minimum of 10 ft (3 m) to the nearest building opening; and the tank is used only for vapour service; and for aggregate capacities over 125 USWG (475 L) and up to and including 5,000 USWG (19,000 L), the clearances from building walls of other than concrete or masonry construction may be reduced to the clearances specified for concrete or masonry wall construction if protection acceptable to the authority having jurisdiction (Régie du bâtiment du Québec) is provided.

Reference: Clause 7.10.2 – CSA B149.2-10

Horizontal tanks with a capacity greater than 2,000 USWG (7500 L) shall be mounted on not more than two concrete saddles or piers and have a space of not less than 24 in (600 mm) between the underside of the tank and the grade level.

Reference: Clause 7.11.4 – CSA B149.2-10

A tank to be installed underground shall be designed and identified by the tank manufacturer for underground service and shall be provided with means for placing it into position without damage to the tank or its protective coating. Any damage to the coating shall be repaired in accordance with the manufacturer instructions before backfilling. Cathodic protection shall be designed and operated to continuously maintain a minimum potential on all buried or submerged surfaces of –850 mV as measured with respect to a copper/copper sulphate reference electrode. This measurement must be checked annually by a propane distributor or any other individual qualified in gas and contractor must have a quality control program approved by the Régie du bâtiment du Québec.

Reference: Clauses 7.8.2 & 7.8.6 – CSA B149.2-10

### Location of above ground tanks for consumer applications limited to vapour withdrawal and/or liquid withdrawal to a vaporizer

Total aggregate water capacity in USWG (L)	Minimum distance between tank and property line, adjacent concrete or masonry building wall with no opening within the specified clearance; source of ignition* Ft (m)	Minimum distance between tank and building wall of other than concrete or masonry construction Ft (m)	Minimum distance between tank and building opening Ft (m)	Minimum distance between tank and adjacent tank† Ft (m)
Up to and including 125 (475)	None‡	None	3 (1)	None
Over 125 (475) up to and including 1,000 (3,800)	10 (3)	10 (3)	10 (3)	3 (1)
Over 1,000 (3,800) up to and including 2,000 (7,800)	10 (3)	25 (7.5)	25 (7.5)	3 (1)
Over 2,000 (7,800) up to and including 5,000 (19,000)	15 (5)	25 (7.5)	25 (7.5)	3 (1)
Over 5,000 (19,000) up to and including 10,000 (38,000)	25 (7.5)	25 (7.5)	25 (7.5)	3 (1)
Over 10,000 (38,000)	§	§	§	§

\* Distances to property lines may be amended by the authority having jurisdiction (Régie du bâtiment du Québec).

† If tanks of multiple tank installation are installed on a common base or pier, the clearances may be reduced at the discretion of the authority having jurisdiction (Régie du bâtiment du Québec).

‡ 10 feet (3 m) from any source of ignition.

§ As chosen by the authority having jurisdiction (Régie du bâtiment du Québec).

Reference: Table 7.4 – CSA B149.2-10

## MODEL AND SIZE OF PROPANE CYLINDERS

(Manufacturing standards require relief valves with a set point (valve opening) of 375 PSIG)

Horizontal (H) Vertical (V) Models	Liquid weight qty in kilograms	Qty in litres*	Qty (USWG)*	Water capacity (W.C.) in pounds*	Height in inches (mm)	Diameter in inches (mm)
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### PORTABLE CYLINDER USED FOR FORKLIFT TRUCKS AND VACUUM

20 lbs (V)	9.1	17.8	4.7	47.9	20.3 (516)	12.3 (312)
33.5 lbs (H)	15.1	29.9	7.9	80.3	28.3 (719)	12.3 (312)
43.5 lbs (H)	19.6	39.0	10.3	103.7	34.1 (866)	12.3 (312)

### PORTABLE CYLINDER USED FOR CAMPING, BARBECUE AND COTTAGE

4.25 lbs (V)	1.9	3.8	1.0	12.0	11.8 (300)	9.1 (231)
11 lbs (V)	4.9	9.8	2.6	26.2	16.8 (427)	9.1 (231)
20 lbs (V)	9.1	17.8	4.7	47.6	17.8 (452)	12.3 (312)
30 lbs (V)	12.5	26.9	7.1	71.5	23.7 (602)	12.3 (312)
40 lbs (V)	18.1	35.6	9.4	95.2	29.3 (744)	12.3 (312)
43.5 lbs (V)	19.6	39.0	10.3	103.6	32.5 (825,5)	12.3 (312)
60 lbs (V)	27.2	53.8	14.2	142.9	44.1 (1 120)	12.0 (305)
100 lbs (V)	45.3	89.3	23.6	239.0	48.7 (1 240)	14.7 (373)

### PORTABLE CYLINDER USED FOR PERMANENT INSTALLATIONS

100 lbs (mini) (V)	45.3	86.6	22.9	238.0	37.1 (942)	18.0 (457)
100 lbs (V)	45.3	89.3	23.6	239.0	48.0 (1,219)	14.7 (373)
200 lbs (V)	90.7	178.7	47.2	474.0	40.0 (1,016)	24.0 (610)
300 lbs (V)	136.1	260.0	68.8	717.7	40.9 (1,038.8)	30.0 (762)
420 lbs (V)	190.5	375.1	99.1	1,000.0	52.0 (1,321)	30.0 (762)

\* Quantities and capacities are limited to 80% of liquid

Note: Cylinders sizes are approximative and may vary according to manufacturer. Conversions from inches to meters are rounded for ease of comparison.



## MODEL AND SIZE OF PROPANE TANKS

(Manufacturing standards require relief valves with a set point (valve opening) of 250 PSIG)

Horizontal (H) Vertical (V) Models	Qty in litres (100%)	Qty in USWG (100%)	Qty in tons	Height (V) Length (H) in inches (mm)	Diameter in inches (mm)
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### ABOVEGROUND TANKS FOR ALL USES

120 USWG (V)	454.2	120	0.2	32 (819)	24 (610)
123 USWG (V)	465.5	123	0.2	52 (1,321)	30 (762)
250 USWG (H)	946.3	250	0.5	87 (2,197)	32 (800)
320 USWG (H)	1,211.2	320	0.6	108 (2,737)	32 (800)
500 USWG (H)	1,892.5	500	1.0	118 (2,997)	37 (951)
1,000 USWG (H)	3,785.0	1,000	1.9	191 (4,848)	41 (1,040)
2,000 USWG (H)	7,570.0	2,000	3.8	285 (7,439)	47 (1,184)

### UNDERGROUND TANKS FOR ALL TYPES OF RESIDENTIAL AND COMMERCIAL USE

120 USWG (H)	454.2	120	0.2	66 (1,673)	24 (610)
250 USWG (H)	946.3	250	0.5	87 (2,197)	32 (800)
320 USWG (H)	1,211.2	320	0.6	108 (2,737)	32 (800)
500 USWG (H)	1,892.5	500	1.0	118 (2,997)	37 (951)
1,000 USWG (H)	3,785.0	1,000	1.9	191 (4,848)	41 (1,040)
2,000 USWG (H)	7,570.0	2,000	3.8	285 (7,439)	47 (1,184)

### ABOVEGROUND TANKS FOR ALL TYPES OF USES AND STORAGE

5,000 USWG (H)	18,925.0	5,000	9.6	390 (9.9 m)	67 (1.8 m)
12,000 USWG (H)	45,424.9	12,000	23.0	539 (13.7 m)	84 (2.1 m)
18,000 USWG (H)	68,137.4	18,000	34.5	491 (12.5 m)	109 (2.8 m)
30,000 USWG (H)	113,562.4	30,000	57.6	791 (20.1 m)	109 (2.8 m)
30,000 USWG (H)	113,562.4	30,000	57.6	562 (14.3 m)	132 (3.3 m)
45,000 USWG (H)	170,343.5	45,000	86.4	822 (20.9 m)	132 (3.3 m)
60,000 USWG (H)	227,124.7	60,000	115.2	1,080 (27.4 m)	132 (3.3 m)
80,000 USWG (H)	302,800.0	80,000	153.5	1,440 (36.6 m)	132 (3.3 m)

Note: Cylinders sizes are approximative and may vary according to manufacturer. Conversions from inches to meters are rounded for ease of comparison. "USWG" means US Water Gallon.



## CYLINDER AND TANK PROTECTION

When containers are installed or stored in locations that do not afford protection from damage from motor vehicles on any street, highway, avenue, alley, or parking lot, they shall be protected by posts or guardrails or by approved devices.

*Reference: Clauses 5.3.2 – CSA B149.2-10*

## CYLINDER AND TANK IDENTIFICATION

As a general rule in the propane industry, propane cylinders and tanks permanently installed are owned by the propane distributors. In case of an emergency situation, it is recommended to contact the distributor directly, his name and emergency phone number are generally indicated on the container.

For more information on propane gas, codes and publications, don't hesitate to contact your local propane distributor or the Association québécoise du propane at [www.propanequebec.com](http://www.propanequebec.com)