

1. Codes, acts, and regulations

Overview

Purpose

The aims of the gas industry are to:

- convey gas as potential energy to a place or appliance;
- ignite the gas; and
- use the energy to perform a useful purpose.

The responsibility of those involved in the gas industry is to achieve these aims in a safe and organized manner. From the time a developer conceives a gas system to the time the system comes online, an individual or a group of individuals must take responsibility for the various phases along the way.

Gas technicians/fitters must stay aware of the duties, responsibilities, and regulations governing the entire industry if they wish to play their part in making the process proceed smoothly.

Objectives

At the end of this Chapter, you will be able to:

- identify the agencies and bodies that govern gas and propane installations;
- describe the scope of installation codes and acts;
- locate sections in CSA B149.1 *Natural gas and propane installation code*;
- locate information in Section 4, General, of CSA B149.1 *Natural gas and propane installation code*; and
- locate sections in CSA B149.2 *Propane storage and handling code*.

Terminology

| Term | Abbreviation (symbol) | Definition |
|------|-----------------------|---|
| Act | | Government-legislated legal documents that determine the powers of inspectors, directors, etc., as well as enable the government to write regulations |
| Code | | Typically helps define best practices for products, services, and processes Government regulatory bodies adopt this to help address safety concerns for consumers and businesses |



CSA Group Gas Trade Training Materials – Red Seal Alignment

| Red Seal | | CSA Gas Trade Unit | 1 | 2 | 3 | 4 | 4A | 5 | 6 | 7 | 8 | 9 |
|--|---|---|--------|--|--|---|---|-----------------------------|--|--------------------|---|--------------------------------|
| | | Title | Safety | Fasteners, Tools and Testing Instruments | Properties, Characteristics, and Safe Handling of Fuel Gases | Utilization Codes, Acts and Regulations | Utilization Codes, Acts, and Regulations – Ontario Supplement | Introduction to Electricity | Technical Manuals, Specifications, Drawings and Graphs | Customer Relations | Introduction to Piping and Tubing Systems | Introduction to Gas Appliances |
| 2014 Red Seal Block | 2014 Red Seal Task | | | | | | | | | | | |
| A - Common Occupational Skills | B - Gas Piping Preparation and Assembly | Task 1 Performs safety-related functions. Maintains and uses tools and equipment. Plans and prepares for installation, service and maintenance. | ✓ | ✓ | ✓ | | | | | | | |
| C - Venting and Air Supply Systems | D - Controls and Electrical Systems | Task 4 Fits tube and tubing for gas piping systems. Task 5 Fits plastic pipe for gas piping systems. Task 6 Fits steel pipe for gas piping systems. | | | | | | | | | ✓ | |
| E - Installation of Systems and Equipment | | Task 7 Installs venting. Task 8 Installs air supply system. Task 9 Installs draft control systems. | | | | | | | | | ✓ | ✓ |
| F - Testing & Commissioning of Gas-fired Systems | | Task 10 Selects and installs electronic components. Task 11 Selects and installs electrical components. Task 12 Installs automation and instrumentation control systems. | | | | | | ✓ | | | | |
| G - Servicing Gas-fired Systems | | Task 13 Installs gas-fired system piping and equipment. Task 14 Installs gas-fired system components. Task 15 Installs propane storage and handling systems. | | | | | | | | | ✓ | ✓ |
| | | Task 16 Tests gas-fired systems. Task 17 Commissions gas-fired systems. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| | | Task 18 Maintains gas-fired systems. Task 19 Repairs gas-fired systems. Task 20 Decommission gas-fired systems. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |

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| Term | Abbreviation (symbol) | Definition |
|------------|-----------------------|--|
| Regulation | | Legal directives that focus on specific areas |
| Standard | | Defines an agreed-upon way to produce products, perform certain processes, or supply materials in a regular, repeatable manner |

Agencies and bodies that govern natural gas and propane installations

Federal, provincial, and territorial acts and regulations can reference safety and installation standards and codes.

| Standards | Codes |
|--|---|
| <p>Standards define an agreed-upon way to produce products, perform certain processes, or supply materials in a regular, repeatable manner.</p> <p>They are normally narrower in scope than a code and cover a limited range of issues.</p> <p>Referencing them in an adopted code or jurisdictional regulation allow them to obtain the force of law.</p> | <p>Codes typically help define best practices for products, services, and processes.</p> <p>Government regulatory bodies adopt them to help address safety concerns for consumers and businesses.</p> <p>In general, codes are much broader in scope than a standard and cover a wider range of issues. The various provinces, territories, and jurisdictions that adopt codes also give them the force of law.</p> <p>Codes often reference other standards, giving them additional visibility and weight within the industries that use them.</p> |

The regulations and requirements under which the gas industry must work are numerous and vary from jurisdiction to jurisdiction throughout the world. This section describes some of the responsibilities of various agencies and bodies governing local gas industries. These references are in alphabetical arrangement for ease of reference.

Agencies/organizations

| Agency | Abbreviation | Description |
|--|--------------|--|
| CSA Group | CSA | <p>CSA organization has accreditation to develop standards and codes including the CSA B149 series of installation codes.</p> <p>North America and other nations recognize CSA Group to provide testing and certification services for a broad range of product categories, including electrical, gas-fired, plumbing, personal protective equipment and others, to applicable approved standards.</p> |
| Intertech Testing Services | ITS | ITS is an agency that has accreditation to test appliances, equipment, components, and accessories to an applicable approved standard. |
| Propane Gas Association of Canada | PGAC | PGAC is one of a number of organizations responsible for registering the persons who re-qualify refillable propane cylinders. |
| Transport Canada | TC | TC is the federal department that oversees the transportation of dangerous goods through Canada and certifies propane cylinders. |
| United States Department of Transportation | US DOT | The U.S. DOT has federal jurisdiction over the various transportation modes. The department is also responsible for transportation safety improvements and enforcement in the U.S. |
| Underwriters Laboratories Inc. | UL | UL is the organization that has accreditation to test and certify appliances, equipment, components, and accessories to applicable approved standards. A product certified by UL for Canada will bear the marking "cUL". |
| Underwriters Laboratories of Canada | ULC | ULC is the organization that accreditation to test and certify appliances, equipment, components, and accessories to applicable approved standards. It also has accreditation to develop standards. It certifies the majority of vent materials that Canada uses. |

Governmental authorities

Federal, provincial, and territorial authorities with jurisdiction in Canada have the mandate to govern the safe handling, installation, servicing, use, and maintenance of natural gas and propane equipment. Usually, a regulatory function (i.e., one that writes regulations/bulletins) and an inspection function handle this. The specific ministry and/or agency responsible varies from jurisdiction to jurisdiction.

Table 1-1 lists the applicable provincial ministry and department or agency for each Canadian jurisdiction.

**Table 1-1
Canadian authorities having jurisdiction over the safe handling, installation,
servicing, use, and maintenance of natural gas and propane equipment**

| Jurisdiction | Regulatory authority | Inspection authority |
|---------------------------|--|---|
| Federal | Human Resources and Skills Occupational Safety, Health, and Fire Prevention Division | |
| Alberta | Municipal Affairs Plumbing and Gas Safety Standards | Safety Codes Council |
| British Columbia | British Columbia Safety Authority (BCSA) | British Columbia Safety Authority (BCSA) |
| Manitoba | Manitoba Underwriters Laboratories Inc. (UL) Labor and Immigration Mechanical & Engineering Branch | |
| New Brunswick | Department of Public Safety Safety Code Services (SCS) | |
| Newfoundland and Labrador | Department of Government Services and Lands | |
| Northwest Territories | Department of Public Works and Services | |
| Nova Scotia | Department of Labour and Advanced Education | |
| Nunavut | Government of Nunavut Dept. of Community & Government Services | |
| Ontario | Ministry of Consumer Services | Technical Standards and Safety Authority (TSSA) |
| Prince Edward Island | Department of Labour | |
| Québec | Régie du bâtiment du Québec | |
| Saskatchewan | SaskPower Corporation | |
| Yukon | Community & Transportation Services Public Safety Branch | |

Note: Under recently adopted federal legislation, the Agreement for Internal Trade (AIT) now enables gas technician/fitter certificate holders to apply to different provincial jurisdictions for similar level gas certification without further examination, testing, or interview. Check with the provincial authority in question in order to apply as an "Out-of-Province Candidate" and receive their equivalent certification.

The scope of installation codes and acts

The installation codes and acts for natural gas and propane cover very specific installations. The following information on the scope of each Code and Act details what it applies to and what is excluded.

Natural gas and propane installation code, CSA B149.1

The *Natural gas and propane installation code*, CSA B149.1, establishes the essential requirements and minimum standards for the installation of natural gas and propane appliances and equipment.

Note: The Code only applies to certain natural gas and propane applications. It is the gas technician's/fitter's responsibility to determine whether the Code is suitable for the specific application.

Suitable applications

| This Code applies to the installation of... | This Code does not apply to... |
|--|--|
| <ul style="list-style-type: none"> Appliances, equipment, components, and accessories where you will use gas for fuel purposes Piping and tubing systems extending from the termination of the utility installation or from the distributor's propane tank Vehicle-refuelling appliances and associated equipment meeting the requirements of a general-purpose appliance to fill a natural-gas-fueled vehicle Stationary gas engines and turbines | <ul style="list-style-type: none"> Marine or pipeline terminals Gas that works as feedstock in petroleum refineries or chemical plants Utility pipeline distribution and transmission pipelines Storage and handling of liquefied natural gas or underground reservoirs for natural gas Installation of NGV fuel systems, containers, and refuelling stations Storage and utilization of compressed natural gas on boats Installation of vehicle-refuelling appliances when NGV storage containers are installed as part of the system Refrigerated storage or underground reservoirs for propane Propane used on boats Propane used as a propellant in aerosol containers Butane fuel cylinders of 175 g capacity or less The installation of containers and equipment to be used for propane in distribution locations and filling plants and on tank trucks, tank trailers, and cargo liners Propane used as refrigerant |

Propane storage and handling code, CSA B149.2

The *Propane storage and handling code* aims to establish essential requirements and minimum standards for the storage and handling of propane, as well as the installation of appliances, equipment, and containers on highway vehicles, recreational vehicles, mobile housing, food service Units, and wash-mobiles for regulatory adoption.

Note: The Code only applies to certain propane applications. It is the gas technician's/fitter's responsibility to determine whether the Code is suitable for the specific application.

Suitable applications

| This Code applies to... | This Code does not apply to... |
|--|--|
| <ul style="list-style-type: none"> Storage, handling, and transfer of propane Propane used as an engine fuel in other than motor vehicles Installation, operation, and maintenance of containers and equipment that you will use for propane at customer locations, distribution locations and filling plants | <ul style="list-style-type: none"> Transportation of propane Manufacture, selection, and use of standardized means of containment under the Transportation of Dangerous Goods Act and Regulations Marine or pipeline terminals New containers which have not contained propane or used containers identified as having been purged to less than 5% of the LEL as determined by a calibrated meter Gas that works as feedstock in petroleum refineries or chemical plants Utility pipeline distribution and transmission pipelines Refrigerated storage or underground reservoirs for propane Propane used on boats Propane used as a propellant in aerosol containers Butane fuel cylinders of 6.2 oz (175 g) capacity or less Any equipment extending downstream from the inlet to any container pressure regulator (commonly referred to as first-stage regulator) The installation of propane fuel system components and tanks on vehicles covered by CSA B149.5 Propane used as refrigerant |

Acts and regulations

Acts are government-legislated legal documents that determine the powers of inspectors, directors, etc., as well as enable the government to write regulations. Regulations are legal directives that focus on specific areas.

Table 1-2 lists acts and regulations that pertain to installation requirements for natural gas and propane equipment in the Canadian provinces and territories.

Important: While the listed acts and regulations are current at the time of writing, they do change from time to time. The gas technician/fitter should obtain copies of the current acts and regulations, read them, and become familiar with them.

Table 1-2
Provincial Acts and Regulations pertaining to installation requirements
(not all-inclusive)

| Province/territory | Acts | Regulations |
|---|---------------------------------------|--|
| Alberta www.gov.ab.ca | Safety Codes Act - R5. A 2000, S-1 | Administrative Items Regulation - Alberta Regulation 16/2004 With amendments up to and including Alberta Regulation 53/2016 Certification and Permit Regulation - Alberta Regulation 295/2009 With amendments up to and including Alberta Regulation 229/2018 Gas Code Regulation - Alberta Regulation 111/2010 With amendments up to and including Alberta Regulation 193/2015 Motor Vehicle Gas Conversions Regulation - Alberta Regulation 210/2001 |

(Continued)

Table 1-2 (Continued)

| Province/territory | Acts | Regulations |
|---|---|---|
| | | With amendments up to and including Alberta Regulation 179/2015 |
| | Revised Statutes of Alberta 2000 Chapter A-42 Current as of June 12, 2013 Apprenticeship and Industry Training Act | Gasfitter Trade Regulation Alberta Regulation 279/2000 With amendments up to and including Alberta Regulation 164/2017 |
| | | Gas Utility Operator Occupation Regulation Alberta Regulation 278/2000 With amendments up to and including Alberta Regulation 5/2015 |
| British Columbia http://www2.gov.bc.ca/ | Safety Standards Act | Gas Safety Regulation Note: Check the Cumulative Regulation Bulletin 2014 and 2015 for any non-consolidated amendments to this regulation that may be in effect. [Includes amendments up to B.C. Reg. 150/2011, August 12, 2011] |
| Manitoba www.gov.mb.ca | Gas and Oil Burner Act - C.C.S.M.C, G30 This version is current as of Jan. 18, 2019. | Gas and Oil Burner Regulation Man. Reg. 104/87 R This version is current as of May 26, 2015. |
| New Brunswick www.gov.nb.ca | Boiler and Pressure Vessel Act A.N.B. 1976, c. B-7.1 | N.B. Reg. 84-176 Propane, Natural and Medical Gas N.B. Reg. 84-177 Standards |
| Newfoundland and Labrador www.gov.nf.ca | Public Safety Act S.N.L. 1996, c. P-41.01 | Boiler, Pressure Vessel and Compressed Gas Regulations Nfld. Reg. 119/96 |
| Northwest Territories www.gov.nt.ca | Gas Protection Act | Gas Protection Regulations |
| | Fire Prevention Act | Propane Cylinder Storage Regulations |

(Continued)

Table 1-2 (Continued)

| Province/territory | Acts | Regulations |
|--|---|--|
| | www.justice.gov.nt.ca/en/files/legislation/fire-prevention/fire-prevention.a.pdf | R-094-91 |
| Nova Scotia https://beta.novascotia.ca/ | Fire Safety Act S.N.S. 2002, c. 6 | Fuel Safety Regulations N.S. Reg. 11/2011 |
| | Apprenticeship and Trades Qualification Act - S.N.S, 2003, c.1 | Gas Fitter Trade Regulations Revised Statutes of Nova Scotia, c.17 subsection 41(1), 1989 r. 1999 |
| Nunavut www.gov.nu.ca | Consolidation of Gas Protection Act R.S.N.W.T. 1988, c.G-2 | Consolidation of Gas Protection Regulations R.R.N.W.T. 1990, c.G-1 |
| Ontario www.ontario.ca | Technical Standards and Safety Act | Fuel Industry Certificates O. Reg. 215/01 |
| | Last amendment: 2018, c. 7, s. 12-24. | Gaseous Fuels O. Reg. 212/01 |
| | | Propane Storage and Handling O. Reg. 211/01 |
| PEI www.princeedwardisland.ca | Fire Prevention Act R.S.P.E.I. 1988, c. F-11 consolidation of this Act, current to May 30, 2012 | Codes and Standards Order E. C. 16/85 |
| | Boilers and Pressure Vessels Act R.S.P.E.I. 1988, Cap. B-5 consolidation of this Act, current to December 7, 2012 | Regulations made under the Boilers and Pressure Vessels Act R.S.P.E.I. 1988, Cap. B-5 including amendments to December 31, 1994 |
| Québec www.quebec.ca | Gas Distribution Act R.S.Q., c. D-10 | Regulation Respecting Gas and Public Safety R.R.Q., c. D-10, r.4 |
| | | Règlement sur le remboursement des dépenses occasionnées à la Régie du bâtiment du Québec par l'exécution de la Loi sur la |

(Continued)

Table 1-2 (Concluded)

| Province/territory | Acts | Regulations |
|--|--|--|
| | | distribution du gaz R.R.Q., c. D-10, r.8 |
| Saskatchewan www.saskatchewan.ca | Gas Inspection Act R.S.S. 1993, c. G-3.2, As amended by the Statutes of Saskatchewan, 1996, c.9; 1998, c.22; 1999, c.C-38.01; 2004, c.11; 2013, c.S-15.1; 2015, c.F-15.11; and 2018, c.42. | Gas Inspection Regulations, c. G-3.2, Reg. 1, as amended by Saskatchewan Regulations 32/96, 37/2000, 90/2004, 12/2005, 46/2008, 128/2010 and 105/2015. |
| | Gas Licensing Act Chapter G-4.1 of the Statutes of Saskatchewan, 1988-89, as amended by the Statutes of Saskatchewan, 1993, c.G-3.2; 1997, c.4; 1998, cP-42.1; and 2018, c.42. | The Gas Licensing Regulations Chapter G-4.1 Reg (effective July 8, 1998) as amended by Regulations 34/91, 63/92 and 75/2014. |
| Yukon www.gov.yk.ca | Gas Burning Devices Act R.S, Y. 2002, c.101 | Gas Regulations Y.O.I.C. 1998/213 |

Sections in the Natural gas and propane installation code (CSA B149.1)

Below is a brief outline of the sections in CSA B149.1, *Natural gas and propane installation code*, which contains 10 sections:

| Section/ clause | Title | This Section contains... |
|----------------------------|------------------------|---|
| 1 | Scope | The scope of the Code |
| 2 | Reference publications | A listing of the publications referenced throughout the Code |
| 3 | Definitions | Definitions of terms used throughout the Code |
| 4 | General | General requirements regarding the approval and installation of appliances, accessories, components, equipment, and materials See additional information on Clause 4 of CSA B149.1 <i>Natural gas and propane installation code</i> below. |

| Section/ clause | Title | This Section contains... |
|--------------------|---|--|
| 5 | Pressure controls | Requirements on allowable pressures in various types of buildings and devices for controlling pressures |
| 6 | Gas piping systems | Minimum requirements for the material, size, pressure allowance at specific locations, installation, protection, testing, purging, and identification of piping and tubing systems, hose, and fittings |
| 7 | Installation of specific types of appliances | Minimum installation requirements for boilers, pressure boosters, carbon dioxide generators, conversion burners, commercial cooking appliances, residential ranges, clothes dryers, furnaces, heaters, decorative appliances and gas logs, hot-plates, incinerators, lighting, refrigerators, direct vent appliances, and stationary engines |
| 8 | Venting Systems and Air Supply for Appliances | Minimum requirements for venting systems and air supply for appliances |
| 9 | Natural Gas Compressors and Cylinders | Minimum requirements for installation of natural gas compressors, and cylinder filling, storage, and utilization |
| 10 | Residential fuelling appliances (RFAs) and vehicle fueling appliances (VRAs) used for natural gas without Storage | Minimum requirements for the installation of vehicle refuelling appliances without storage |

Section/Clause 4, General

The General section (Clause 4) of CSA B149.1, *Natural gas and propane installation code*, contains pertinent information on the general requirements for gas and propane installations. Clause 4 contains 25 subsections:

| Subsection | Title |
|------------|--|
| 4.1 | Application |
| 4.2 | Approval of appliances, accessories, components, equipment, and material |
| 4.3 | Responsibilities of the installer |
| 4.4 | Training and quality of labour |
| 4.5 | Suitability of use |
| 4.6 | Meter and service regulator installations |
| 4.7 | Electrical connections and components |

| Subsection | Title |
|------------|--|
| 4.8 | Mobile homes and recreational vehicles |
| 4.9 | Hazardous and corrosive locations |
| 4.10 | Smoking |
| 4.11 | Isolation of safety devices |
| 4.12 | Leak detection |
| 4.13 | Appliance clearances to combustible material |
| 4.14 | Accessibility |
| 4.15 | Outdoor installations |
| 4.16 | Appliances in garages |
| 4.17 | Appliance ductwork connections |
| 4.18 | Combined heating systems |
| 4.19 | Appliances protected by automatic fire-extinguishing systems |
| 4.20 | Control of appliances with self-energized pilots |
| 4.21 | Defective heat exchangers |
| 4.22 | High-altitude installations |
| 4.23 | Protection of appliances from physical damage |
| 4.24 | Odorization |
| 4.25 | Mobile homes and recreational vehicles |

Sections in the Propane storage and handling code (CSA B149.2)

Below is a brief outline of the sections in CSA B149.2 *Propane storage and handling code*, which contains 11 sections:

| Section | Title | This Section contains... |
|---------|--|---|
| 1 | Scope | The scope of the Code |
| 2 | Reference publications | A listing of the publications referenced throughout this Code |
| 3 | Definitions | Definitions of terms used throughout this Code |
| 4 | General | General requirements regarding the approval and installation of appliances, accessories, components, equipment, and materials |
| 5 | General requirements for propane and propane equipment | Requirements for the odorization of propane, the filling and protection of containers, and the use of equipment |

| Section | Title | This Section contains... |
|---------|--|--|
| 6 | Cylinder systems | Requirements for cylinders, cylinder filling, storage, transportation, and installation, and the equipment used with cylinder systems |
| 7 | Tank systems, filling plants, and refill centres | Requirements for propane tanks, fittings, and equipment, the filling, installation, and location of consumer tanks, container filling plants, container refill centres, and the installation of dispensing devices |
| 8 | Tank trucks, tank trailers, and cargo liners | Requirements for the tanks, fittings, and equipment used on tank trucks, tank trailers, and cargo liners and the parking, repair, and servicing of such vehicles |
| 9 | Vaporizers | Requirements for indirect- and direct-fired vaporizers and their installation |
| 10 | Annexes | Annexes A to R display after Section 9. |

Assignment Questions – Chapter 1

1) Match the following definitions with the correct terms:

- a) Acceptable to the authority having jurisdiction: Direct-vent appliance
- b) A primarily vertical shaft that encloses at least one flue for conducting flue gases outdoors: Pressure regulator
- c) an appliance constructed so that all the combustion air is supplied directly from, and the products of combustion are vented directly to, the outdoors by independent enclosed passageways connected directly to the appliance: Approved
- d) A device, either adjustable or non-adjustable, for controlling and maintaining, within acceptable limits, a uniform outlet pressure: Chimney

2) Indicate True or False:

A venting system removes flue gases to the outdoors by means of a chimney, vent connector vent, or a natural or mechanical exhaust system,

- a) True
- b) False

- 3) Which of the following describes a continuous pilot?
- A pilot that is automatically lighted each time there is a call for heat, and that is cut off automatically at the end of the trial-for-ignition period of the main burner
 - A pilot that burns without turndown throughout the entire time the burner is in service, whether the main burner is firing or not.
 - A pilot that is automatically lighted each time there is a call for heat, and that burns during the entire period that the main burner is firing.
- 4) Indicate True or False:
- An enclosed structure is the entire building in which an appliance is installed.
- False
 - True
- 5) What type of burner is not equipped with a mechanical device for supplying combustion air?
- Forced-draft burner
 - Fan-assisted burner
 - Natural-draft burner
- 6) Match the maximum gas pressures (in psig) permitted inside the following buildings.
- | | |
|--|---|
| a) One- and two-family dwellings and row housing: | 20 psig (140 kPa) |
| b) Residential (other than one- and two-family dwellings and row housing): | 5 psig (35 kPa) or 20 psig (140 kPa) |
| c) Hotels and motels: | 66 psig (450 kPa) for natural gas and 20 psig (140 kPa) for propane |
| d) Care or detention and assembly buildings: | 5 psig (35 kPa) or 20 psig (140 kPa) |
| e) Commercial buildings: | 66 psig (450 kPa) for natural gas and 20 psig (140 kPa) for propane |
| f) Industrial buildings: | 2 psi (14kPa) |
| g) Central-heating plants: | 5 psig (35 kPa) or 20 psig (140 kPa) |
- 7) Where can you determine the volume of gas to be used for sizing pipe systems to an appliance?
- The appliance rating plate or the appliance manufacturer
 - The back of the Codebook
 - In the Regulation