CSA Unit 4 Gas Industry Codes, Acts, and Regulations Chapter 1

The gas industry aims to convey gas as potential energy to a place or appliance, ignite the gas, and use the energy to perform a useful purpose. Those involved in the industry must achieve these aims safely and in an organized manner. Gas technicians and fitters must stay aware of the duties, responsibilities, and regulations governing the entire industry to ensure smooth operations and safety compliance.

Created by

MK **by Mike Kapin**

Purpose of Gas Industry Regulations

Convey Gas as Potential Energy

Transport gas safely to appliances and locations where it will be used

Ignite the Gas

Control the combustion process in a safe and efficient manner

Use Energy for Useful Purpose

Convert the gas energy into heat, mechanical power, or other useful applications

Learning Objectives

Identify Governing Agencies

Identify the agencies and bodies that govern gas and propane installations

Describe Code Scope

Describe the scope of installation codes and acts

Locate Code Sections

Locate sections in CSA B149.1 Natural gas and propane installation code

Find General Information

Locate information in Section 4, General, of CSA B149.1 Natural gas and propane installation code

Propane Storage Code

Locate sections in CSA B149.2 Propane storage and handling code

Key Terminology

Term	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
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

Red Seal Gas Trade Units

Unit 1: Safety

Unit 2: Fasteners, Tools and Testing Instruments

Unit 3: Properties, Characteristics, and Safe Handling of Fuel Gases

Unit 4: Utilization Codes, Acts and Regulations

Unit 5: Introduction to Electricity

Unit 6: Technical Manuals, Specifications, Drawings and Graphs

Unit 8: Customer Relations

Unit 9: Introduction to Piping and Tubing Systems

Red Seal Tasks and Blocks

Block A - Common Skills

- Task 1: Performs safety-related functions
- Task 2: Maintains and uses tools and equipment
- Task 3: Plans and prepares for installation, service and maintenance

Block B - Gas Piping 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

Block C - Venting and Air Supply Systems

- Task 7: Installs venting
- Task 8: Installs air supply system
- Task 9: Installs draft control systems

Red Seal Tasks and Blocks (Continued)

Block D - Electrical Systems and Controls

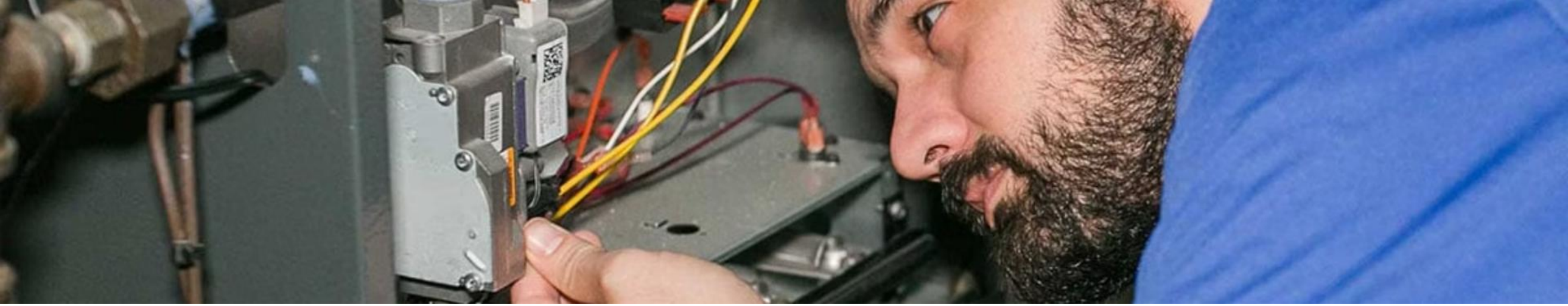
- Task 10: Selects and installs electronic components
- Task 11: Selects and installs electrical components
- Task 12: Installs automation and instrumentation control systems

Block E - Installation of Systems and Equipment

- Task 13: Installs gas-fired system piping and equipment
- Task 14: Installs gas-fired system components
- Task 15: Installs propane storage and handling systems

Block F - Testing & Commissioning of Gas-fired Systems

- Task 16: Tests gas-fired systems
- Task 17: Commissions gas-fired systems



Red Seal Tasks and Blocks (Final)

Block G - Servicing Gas-fired Systems

Task 18: Maintains gas-fired systems

Block G - Servicing Gas-fired Systems

Task 19: Repairs gas-fired systems

Standards vs. Codes

Standards

Standards define an agreed-upon way to produce products, perform certain processes, or supply materials in a regular, repeatable manner. They are normally narrower in scope than a code and cover a limited range of issues. Referencing them in an adopted code or jurisdictional regulation allow them to obtain the force of law.

Codes

Codes typically help define best practices for products, services, and processes. Government regulatory bodies adopt them to help address safety concerns for consumers and businesses. 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.

Codes often reference other standards, giving them additional visibility and weight within the industries that use them.

Appliance Type / Type d'appareil :

Manufacturer / Fabricant :

Model & Serial / Modèle et Série :

Agencies and Organizations

CSA Group

CSA organization has accreditation to develop standards and codes including the CSA B149 series of installation codes. North America and other nations recognize CSA Group to provide testing and certification services for a broad range of product categories.

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.

More Agencies and Organizations

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.

Regulatory Function

Responsible for writing regulations and bulletins that govern gas installations

Inspection Function

Responsible for ensuring compliance with regulations through field inspections

Provincial and Territorial Authorities

Jurisdiction	Regulatory authority	Inspection authority
Federal	Human Resources and Skills	Occupational Safety, Health, and Fire Prevention Division
Alberta	Municipal Affairs	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)

More Provincial and Territorial Authorities

Jurisdiction	Regulatory authority	Inspection authority
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)

Final Provincial and Territorial Authorities

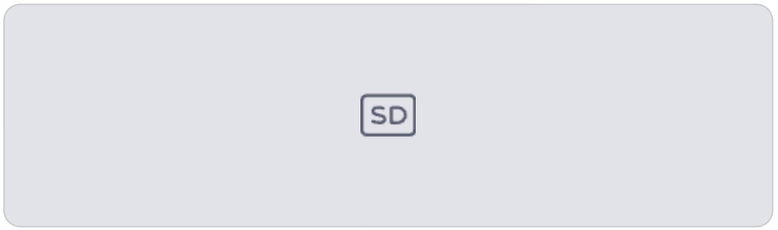
Jurisdiction	Regulatory authority	Inspection authority
Prince Edward Island	Department of Labour	
Québec	Régie du bâtiment du Québec	
Saskatchewan	SaskPower Corporation	
Yukon	Community & Transportation Services	Public Safety Branch

Note: Under recently adopted federal legislation, the Agreement for Internal Trade (AIT) now enables gas technicians/fitters to apply to different provincial jurisdictions for similar level certification without further testing, or interview. Check with the provincial authority in mind and receive their equivalent certification.

Natural Gas and Propane Installation Code

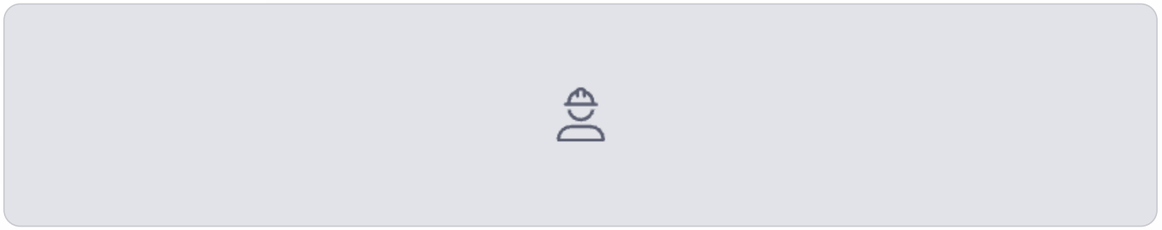
CSA B149.1

Natural gas and propane installation code



Essential Requirements

Establishes standards for installations



Safety Focus

Ensures safe installation practices

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.

CSA B149.1 Suitable Applications

This Code applies to the installation of:

- 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
- 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

CSA B149.1 Non-Applicable Situations

- Marine or pipeline terminals
- Utility pipeline distribution and transmission pipelines
- Installation of NGV fuel systems, containers, and refuelling stations
- Propane used as a propellant in aerosol containers
- Gas that works as feedstock in petroleum refineries or chemical plants
- Storage and handling of liquefied natural gas or underground reservoirs for natural gas
- Propane used on boats
- Butane fuel cylinders of 175 g capacity or less

Propane Storage and Handling Code

CSA B149.2

Propane storage and handling code

2

Essential Requirements

Establishes standards for storage and handling

Safety Focus

Ensures safe storage and handling practices

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.

CSA B149.2 Suitable Applications

This Code applies to:

- 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

- 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

CSA B149.2 Non-Applicable Situations

- 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
- Gas that works as feedstock in petroleum refineries or chemical plants
- Utility pipeline distribution and transmission pipelines
- Refrigerated storage or underground reservoirs for propane

More CSA B149.2 Non-Applicable Situations

- 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

Acts are government-legislated legal documents that determine the powers of inspectors, directors, etc., as well as enable the government to write regulations.

Regulations

Regulations are legal directives that focus on specific areas.

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

Alberta Acts and Regulations

Acts

- Safety Codes Act - R5. A 2000, S-1
- Revised Statutes of Alberta 2000 Chapter A-42 Current as of June 12, 2013
- Apprenticeship and Industry Training Act

Regulations

- 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 With amendments up to and including Alberta Regulation 179/2015
- 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 and Manitoba Acts and Regulations

British Columbia

Acts:

- Safety Standards Act

Regulations:

- 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

Acts:

- Gas and Oil Burner Act - C.C.S.M.C, G30 This version is current as of Jan. 18, 2019.

Regulations:

- Gas and Oil Burner Regulation Man. Reg. 104/87 R This version is current as of May 26, 2015.

New Brunswick and Newfoundland Acts and Regulations

New Brunswick

Acts:

- Boiler and Pressure Vessel Act A.N.B. 1976, c. B-7.1

Regulations:

- N.B. Reg. 84-176 Propane, Natural and Medical Gas
- N.B. Reg. 84-177 Standards

Newfoundland and Labrador

Acts:

- Public Safety Act S.N.L. 1996, c. P-41.01

Regulations:

- Boiler, Pressure Vessel and Compressed Gas Regulations Nfld. Reg. 119/96

Northwest Territories and Nova Scotia Acts and Regulations

Northwest Territories

Acts:

- Gas Protection Act
- Fire Prevention Act

Regulations:

- Gas Protection Regulations
- Propane Cylinder Storage Regulations R-094-91

Nova Scotia

Acts:

- Fire Safety Act S.N.S. 2002, c. 6
- Apprenticeship and Trades Qualification Act - S.N.S, 2003, c.1

Regulations:

- Fuel Safety Regulations N.S. Reg. 11/2011
- Gas Fitter Trade Regulations Revised Statutes of Nova Scotia, c.17 subsection 41(1), 1989 r. 1999

Nunavut and Ontario Acts and Regulations

Nunavut

Acts:

- Consolidation of Gas Protection Act R.S.N.W.T. 1988, c.G-2

Regulations:

- Consolidation of Gas Protection Regulations R.R.N.W.T. 1990, c.G-1

Ontario

Acts:

- Technical Standards and Safety Act Last amendment: 2018, c. 7, s. 12-24.

Regulations:

- Fuel Industry Certificates O. Reg. 215/01
- Gaseous Fuels O. Reg. 212/01
- Propane Storage and Handling O. Reg. 211/01

Prince Edward Island and Québec Acts and Regulations

Prince Edward Island

Acts:

- Fire Prevention Act R.S.P.E.I. 1988, c. F-11 consolidation of this Act, current to May 30, 2012
- Boilers and Pressure Vessels Act R.S.P.E.I. 1988, Cap. B-5 consolidation of this Act, current to December 7, 2012

Regulations:

- Codes and Standards Order E. C. 16/85
- 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

Acts:

- Gas Distribution Act R.S.Q., c. D-10

Regulations:

- 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 batiment du Québec par l'exécution de la Loi sur la distribution du gaz R.R.Q., c. D-10, r.8

Saskatchewan and Yukon Acts and Regulations

Saskatchewan

Acts:

- 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 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.

Regulations:

- Gas Inspection Regulations, c. G-3.2, Reg. 1, as amended by Saskatchewan Regulations 321 96, 37/2000, 90/2004, 12/2005, 46/2008, 128/2010 and 105/2015.
- 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

Acts:

- Gas Burning Devices Act R.S, Y. 2002, c.101

Regulations:

- Gas Regulations Y.O.I.C. 1998/213

CSA B149.1 Code Sections Overview

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
5	Pressure controls	Requirements on allowable pressures in various types of buildings and devices for controlling pressures

More CSA B149.1 Code Sections

Section/clause	Title	This Section contains
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

Final CSA B149.1 Code Sections

Section/clause	Title	This Section contains
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 4 - General Requirements

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.

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

More Section 4 - General Requirements

4.6 Meter and service regulator installations

4.7 Electrical connections and components

4.8 Mobile homes and recreational vehicles

4.9 Hazardous and corrosive locations

4.10 Smoking

More Section 4 - General Requirements (Continued)

4.11 Isolation of safety devices

4.12 Leak detection

4.13 Appliance clearances to combustible material

4.14 Accessibility

4.15 Outdoor installations

Final Section 4 - General Requirements

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

Last Section 4 - General Requirements

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

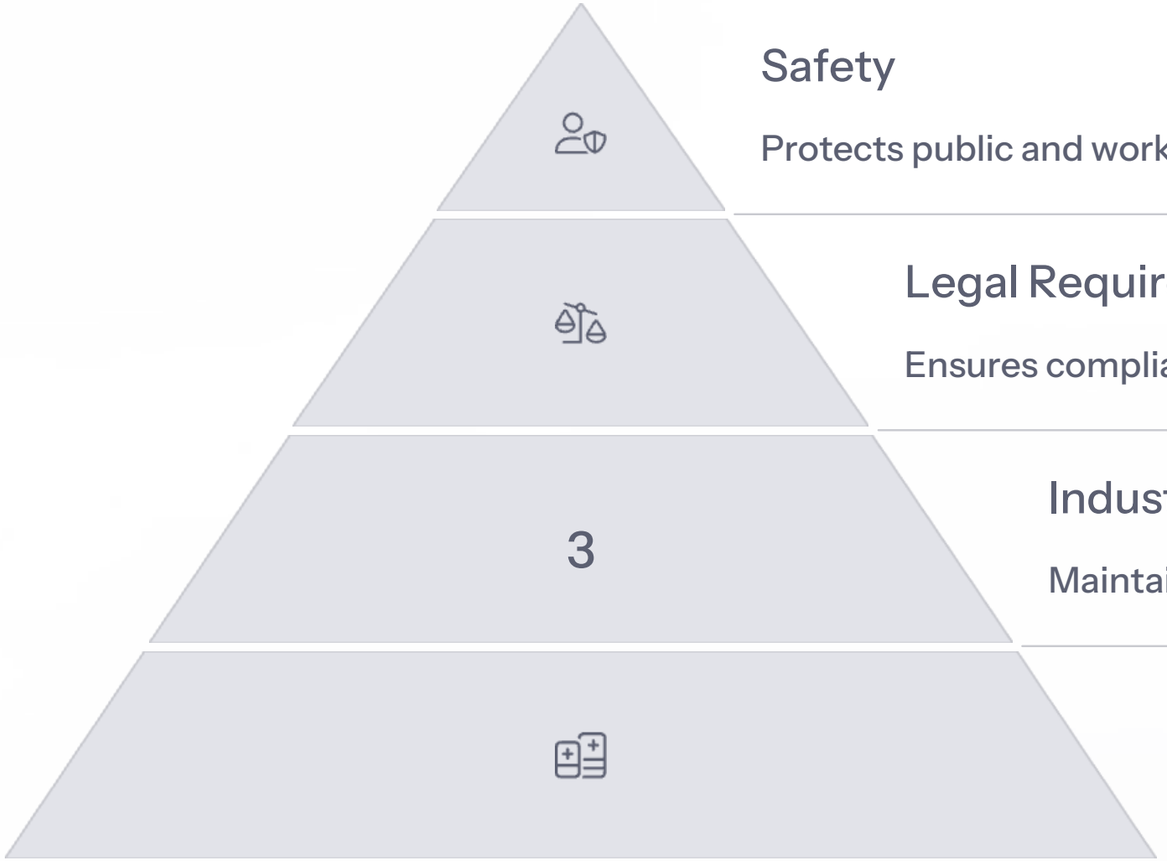
CSA B149.2 Code Sections Overview

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

More CSA B149.2 Code Sections

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

Importance of Code Compliance



Safety

Protects public and workers from hazards

Legal Requirements

Ensures compliance with laws and regulations

Industry Standards

Maintains consistent quality and practices

Insurance Coverage

Prevents claim denials due to non-compliance

Gas technicians and fitters must understand and comply with all applicable codes and regulations to ensure installations are safe, legal, and meet industry standards. Non-compliance can result in safety hazards, legal penalties, insurance claim denials, and professional liability.

Gas Technician Responsibilities

Know the Codes

Stay current with all applicable codes, standards, and regulations

2 Maintain Certification

Keep all required licenses and certifications up to date

3 Proper Installation

Install equipment according to manufacturer specifications and code requirements

Testing and Verification

Thoroughly test all installations to ensure safe operation

Documentation

Maintain proper records of all installations and inspections

Staying Current with Code Changes

Regular Code Review

Set aside time to review code updates and amendments on a regular schedule

Professional Associations

Join industry associations that provide updates on code changes and interpretations

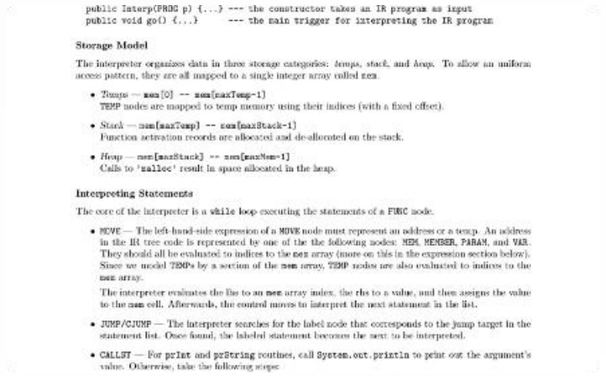
Continuing Education

Attend workshops, seminars, and training sessions focused on code requirements

Regulatory Notifications

Subscribe to regulatory authority newsletters and bulletins for timely updates

Code Interpretation Resources



```
public Interp(PROG p) {...} --- the constructor takes an IR program as input
public void go() {...}      --- the main trigger for interpreting the IR program
```

Storage Model

The interpreter organizes data in three storage categories: *temps*, *stack*, and *heap*. To allow an uniform access pattern, they are all mapped to a single integer array called `mem`.

- Temps — `mem[0] -- mem[maxTemp-1]`
  `TEMP` nodes are mapped to temp memory using their indices (with a fixed offset).
- Stack — `mem[maxTemp] -- mem[maxStack-1]`
  Function activation records are allocated and de-allocated on the stack.
- *Heap* — `mem[maxStack] -- mem[maxMem-1]`
  Calls to `'malloc'` result in space allocated in the heap.

Interpreting Statements

The core of the interpreter is a `while` loop executing the statements of a `FUNC` node.

- `MOVE` — The left-hand-side expression of a `MOVE` node must represent an address or a temp. An address in the IR tree code is represented by one of the the following nodes: `MEM`, `MEMBER`, `PARAM`, and `VAR`. They should all be evaluated to indices to the `mem` array (more on this in the expression section below). Since we model `TEMP`s by a section of the `mem` array, `TEMP` nodes are also evaluated to indices to the `mem` array.
  The interpreter evaluates the lhs to an `mem` array index, the rhs to a value, and then assigns the value to the `mem` cell. Afterwards, the control moves to interpret the next statement in the list.
- `JUMP/CJUMP` — The interpreter searches for the label node that corresponds to the jump target in the statement list. Once found, the labeled statement becomes the next to be interpreted.
- `CALLST` — For `prInt` and `prString` routines, call `System.out.println` to print out the argument's value. Otherwise, take the following steps:

Code Interpretation Guides

Published resources that explain code requirements in plain language with examples and illustrations

Regulatory Authorities

Official sources for code interpretations and clarifications on specific requirements

Industry Associations

Professional groups that provide guidance, training, and resources for understanding code requirements

Code Enforcement Process

Permit Application

Submit required documentation and plans for review before beginning work

Plan Review

Authorities review plans for code compliance before approving permits

Inspections

Official inspections at various stages of installation to verify compliance

Final Approval

Final inspection and certification that the installation meets all code requirements

Common Code Violations

Insufficient Clearances

Not maintaining required distances between appliances and combustible materials

Improper Venting

Incorrect installation of venting systems leading to potential carbon monoxide hazards

Piping Violations

Using incorrect materials, improper sizing, or inadequate support for gas piping

Pressure Testing Failures

Not properly testing gas lines for leaks or using incorrect test pressures

Accessibility Issues

Installing equipment in locations that don't allow for proper service access

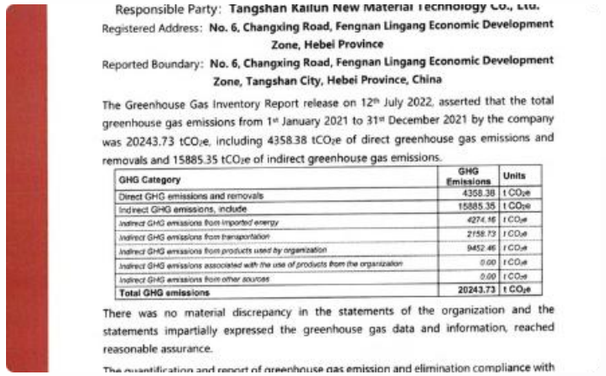
Code Compliance Documentation

Permits

Official authorization to perform gas installation work, issued by the authority having jurisdiction

Inspection Reports

Documentation of official inspections verifying code compliance at various stages



Responsible Party: **Tangshan Kailun New Material Technology Co., Ltd.**
Registered Address: **No. 6, Changxing Road, Fengnan Lingang Economic Development Zone, Hebei Province**
Reported Boundary: **No. 6, Changxing Road, Fengnan Lingang Economic Development Zone, Tangshan City, Hebei Province, China**

The Greenhouse Gas Inventory Report release on 12th July 2022, asserted that the total greenhouse gas emissions from 1st January 2021 to 31st December 2021 by the company was 20243.73 tCO_2e, including 4358.38 tCO_2e of direct greenhouse gas emissions and removals and 15885.35 tCO_2e of indirect greenhouse gas emissions.

GHG Category	GHG Emissions	Units
Direct GHG emissions and removals	4358.38	t CO_2e
Indirect GHG emissions, include	15885.35	t CO_2e
Indirect GHG emissions from imported energy	4274.16	t CO_2e
Indirect GHG emissions from transportation	2158.73	t CO_2e
Indirect GHG emissions from products used by organization	9452.46	t CO_2e
Indirect GHG emissions associated with the use of products from the organization	0.00	t CO_2e
Indirect GHG emissions from other sources	0.00	t CO_2e
Total GHG emissions	**20243.73**	**t CO_2e**

There was no material discrepancy in the statements of the organization and the statements impartially expressed the greenhouse gas data and information, reached reasonable assurance.

The quantification and report of greenhouse gas emission and elimination compliance with

Certification Documents

Final documentation certifying that installations meet all applicable code requirements

Importance of Proper Training

95%

Accident Reduction

Percentage of gas-related incidents that can be prevented with proper training and code compliance

30%

Efficiency Increase

Average improvement in installation efficiency when technicians are well-trained in code requirements

40%

Callback Reduction

Decrease in service callbacks when installations are performed by properly trained technicians

Code Compliance Benefits

Safety Assurance

Properly installed gas systems minimize risks to occupants and property

System Efficiency

Code-compliant installations operate at optimal efficiency, reducing energy costs

Equipment Longevity

Correctly installed systems typically have longer operational lifespans

Legal Protection

Compliance with codes provides legal protection for installers and property owners

Insurance Coverage

Insurance companies may deny claims for incidents involving non-compliant installations

Code Compliance Challenges

Keeping Up with Changes

Codes are regularly updated, requiring technicians to stay current with new requirements

- Subscribe to code update notifications
- Attend regular training sessions
- Join professional associations

Regional Variations

Code requirements can vary between jurisdictions, creating challenges for technicians who work across different areas

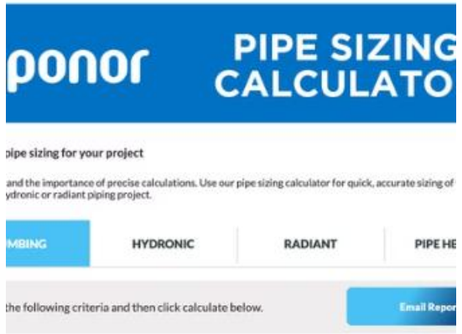
- Maintain reference materials for each jurisdiction
- Build relationships with local inspectors
- Document regional differences

Interpretation Differences

Different inspectors may interpret code requirements differently

- Request written interpretations when unclear
- Document previous inspection approvals
- Consult with regulatory authorities

Code Compliance Tools



Gas technicians rely on various specialized tools to ensure code compliance during installation and inspection. These include leak detectors, manometers for pressure testing, combustion analyzers, pipe sizing calculators, carbon monoxide detectors, and pipe threading tools. Using the right tools is essential for verifying that installations meet all safety and performance requirements specified in the applicable codes.

Code Enforcement Authorities

Code Adoption Process

Code Development

Standards organizations develop and update codes based on research and industry input

Regulatory Review

Government authorities review codes for adoption into regulations

Official Adoption

Codes are officially adopted through legislative or regulatory processes

4 Implementation

Industry implements new requirements, often with transition periods

Enforcement

Authorities begin enforcing new code requirements

Code Development Organizations

CSA Group

Develops the B149 series of codes for natural gas and propane installations in Canada

National Fire Protection Association (NFPA)

Develops codes related to fire safety aspects of gas installations

American National Standards Institute (ANSI)

Coordinates the U.S. voluntary standards system and approves standards developed by other organizations

Code Compliance Inspection Process

Pre-Installation Planning

Review plans and specifications for code compliance before beginning work

Rough-In Inspection

Inspection of piping, venting, and other components before they are concealed

Pressure Testing

Testing gas piping systems for leaks according to code requirements

Final Inspection

Comprehensive inspection of the completed installation to verify full compliance

Documentation

Providing all required documentation and certifications to authorities and customers

Code Compliance for Different Gas Types

Natural Gas

Natural gas installations must comply with specific sections of the B149.1 code that address the unique properties and requirements of natural gas systems.

- Lower pressure requirements
- Specific piping materials and sizing
- Utility connection requirements
- Specific venting requirements

Propane

Propane installations must comply with both B149.1 and B149.2 codes, addressing both installation and storage/handling requirements.

- Higher pressure considerations
- Storage tank requirements
- Cylinder handling procedures
- Specific clearance requirements

Code Compliance for Different Building Types

Residential Buildings

Single-family homes and small multi-unit buildings have specific requirements for appliance types, venting, and gas line sizing

Multi-Unit Residential

Larger residential buildings require special considerations for gas distribution systems, metering, and emergency shutoffs

Commercial Buildings

Commercial installations often involve larger equipment, higher pressures, and more complex distribution systems

Industrial Facilities

Industrial applications may require specialized equipment, higher pressures, and additional safety measures

Institutional Buildings

Schools, hospitals, and other institutions have stringent safety requirements and often need redundant systems

Code Compliance for Special Applications

Food Service Equipment

Commercial kitchens require specific ventilation, fire suppression, and gas control systems

Temporary Installations

Construction sites and events have special requirements for temporary gas service

Outdoor Applications

Patio heaters, grills, and other outdoor equipment have specific installation requirements

Mobile and Manufactured Housing

Factory-built housing has unique requirements for gas connections and appliance installation

Recreational Vehicles

RVs have specialized requirements for propane systems and appliances

Future Trends in Gas Codes and Regulations

Environmental Considerations

Increasing focus on emissions reduction and environmental impact

2 Renewable Gas Integration

New standards for hydrogen blending and renewable natural gas

Smart Technology

Requirements for connected appliances and automated safety systems

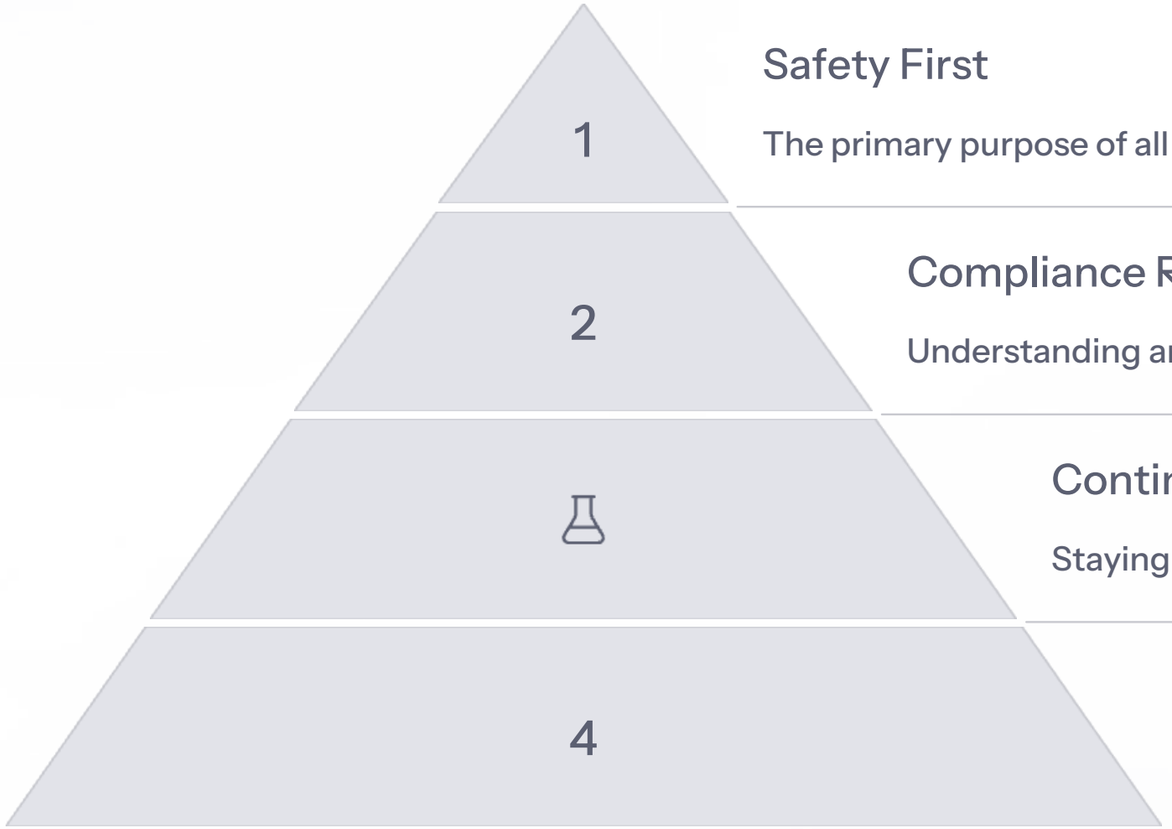
4 Energy Efficiency

Stricter standards for appliance efficiency and system performance

5 Enhanced Safety Measures

Advanced leak detection and automatic shutoff requirements

Summary: Gas Industry Codes and Regulations



Safety First

The primary purpose of all gas codes and regulations

Compliance Requirements

Understanding and following all applicable codes

Continuous Learning

Staying current with changing requirements

Professional Responsibility

Gas technicians must ensure safe, compliant installations

Gas industry codes and regulations provide the essential framework for ensuring that gas installations are safe, efficient, and reliable. Gas technicians and fitters must have a thorough understanding of these requirements and stay current with changes to maintain professional competence. By following these standards, the gas industry can continue to provide safe and effective energy solutions for residential, commercial, and industrial applications.

CSA Unit 4

Chapter 2
Policies Governing Gas Technicians'/Fitters' Scope of Responsibilities and Limitations

Provincial or territorial acts, regulations, or other official documents govern the scope of work that technicians/fitters holding certain qualifications, certificates, or licenses may perform. This presentation focuses on how to find information on this scope of work.

Purpose of Understanding Scope of Work

Regulatory Compliance

Understanding the governing documents that define what work can be performed

Qualification Awareness

Knowing what tasks are permitted based on specific certificates, licenses, or qualifications

Professional Boundaries

Recognizing the limitations of one's professional scope

Learning Objectives

Understand Certificate Scope

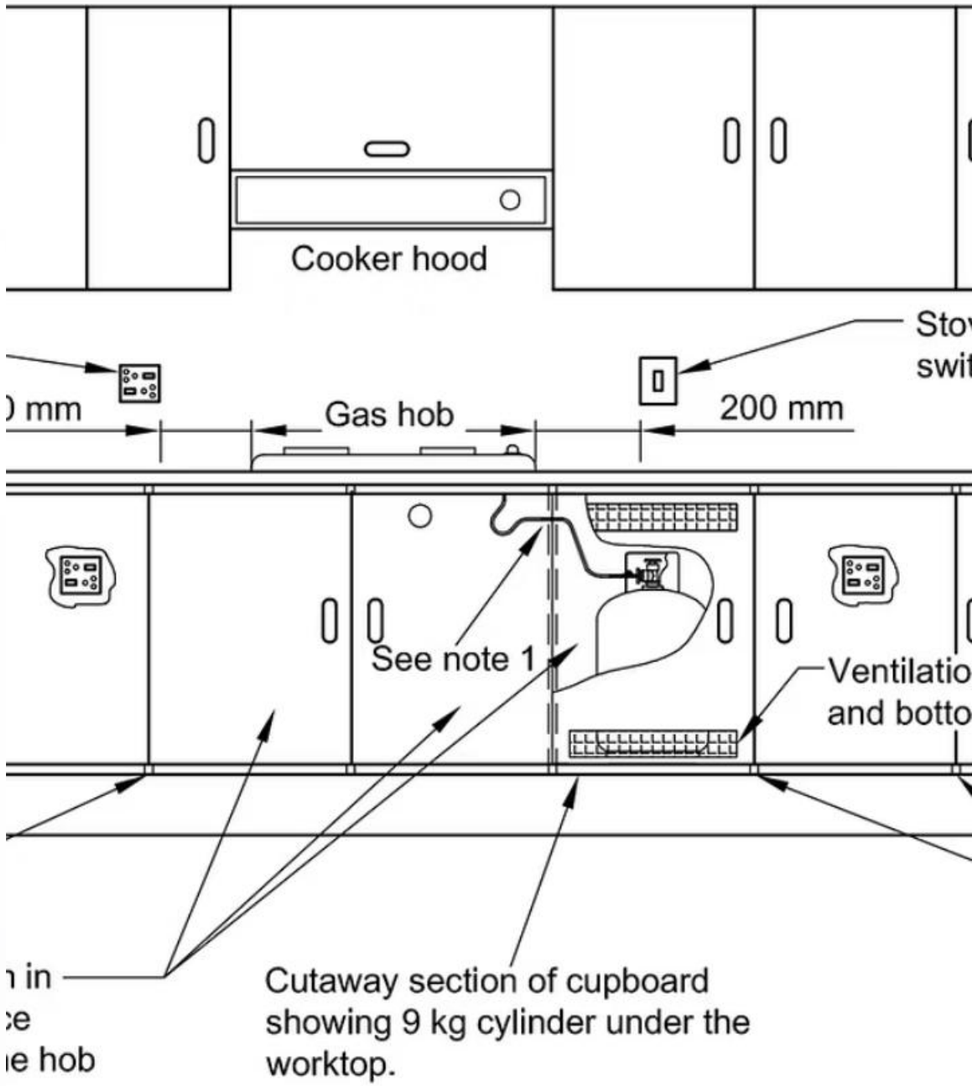
Describe the scope of work covered by different certificates, licenses, or qualifications

Identify Other Trades' Work

Identify the work to be performed by other trades or technicians/fitters

Apply Knowledge

Apply this understanding to daily work situations and decision-making



es not pass through the solid partition or divider between the cu
hosetail (see figure 5) on each side passes through and is fixe
is attached to the hosetail in the cupboard in which the cylind
d to the hosetail in the cupboard space under the hob.

Acetate (cellulose triacetate)—A slow-burning base material frequently used for motion picture films. Also, in sheet form, for overlay cels.

Action—The movement of the subject within the camera field of view. Also, such movement as represented on film.

Angle—With reference to the subject, the direction from which a picture is taken. The camera-subject relationship in terms of their immediate surroundings.

Animated Zoom—A zoom effect achieved by making progressive changes in the sizes of artwork, rather than by moving the camera toward or away from the subject, in contrast with a continuous movement of the camera or a zoom accomplished by the adjustment of a variable focal length lens.

Animation—The technique of synthesizing apparent mobility of inanimate objects or drawings through the medium of cinematography. The term is also used for the sequence of drawings made to create the movement, and for the movement itself when seen on the screen.

Animation Board—Adjustable drawing board adapted by the addition of registration pegs to the needs of artists and designers.

Animation Camera—A motion picture camera with special capability for animation work, which usually includes frame and footage counters, the ability to expose a single frame at a time, reverse-filming capability, and parallax-free viewing.

Animation Stand—A specially designed unit for holding and photographing artwork, in which the camera, lighting equipment, registration device, platen, and compound table are an integral part.

Answer Print—The first combined picture and sound print, in release form, offered by the laboratory to the producer for his acceptance. It is usually studied carefully to determine whether changes are required prior to release printing.

Aperture—(1) *Lens:* The orifice, usually an adjustable iris, which limits the amount of light passing through a lens. (2) *Camera:* In motion picture cameras, the mask opening that defines the area of each frame exposed. (3) *Projector:* In motion picture projectors, the mask opening that defines the area of each frame projected.

Background—(1) *Artwork:* The setting against (or over) which animation takes place. (2) *Live Action:* The character or objects appearing farthest from the camera.

Backlighting—Light transmitted from beneath drawing or a cel to produce a silhouette or to illum nate transparent colors applied to an acetate base.

Barn Doors—Opaque sheet-metal plates hinged to tl front of a light to permit control of the light.

Beat—The musical tempo (of the sound track) us for timing animation action.

Blank—A cel without a drawing, used in photograph to keep the number of cel levels constant throughо a scene to avoid changes of background color.

Blow Up (part of frame)—In transferring an ima by means of an optical printer, it is possible to e large a properly proportioned fraction of the origin image to full frame size in the copy.

Bumper Footage—Extra footage of the opening ar final scenes in an animated film, which is added standard procedure.

Burn In—The photographic double exposure of a tit or other subject matter over previously exposed fil

Burnish—To fix in position by friction that is pr duced by rubbing a surface with a tool having smooth, rounded end.

Cel—A transparent sheet of cellulose acetate or sim lar plastic serving as a support or overlay for dra ings, lettering, etc, in animation and title work. (T avoid possible confusion with biological "cells," tl preferred spelling is with one "l".) Cels are usual punched to fit pegs on the artist's easel and/or tl platen of the animation stand to help register su cessive cels during artwork and photography.

Cel Level—The number of separate cels placed or over the other (over a common background) and ph tographed at the same time.

Clean-Up—Making finished layout drawings fro roughs. Removing surplus ink, paint, fingerprint and dust from cels before photography.

Close-Up—A detail photographed with a long foc length lens, or from such a short distance that only small portion of the subject fills a frame of film.

Color Correction—Alteration of tonal values of colore objects or images by the use of light filters, eith with camera or printer.

Color Model—A specimen cel designed in conjunctio with the background of each subject, painted in co ors or tones as a guide to the painting of the who scene.

Key Terminology

Term	Definition
Limitation	Task that gas technicians/fitters may perform
Responsibility	Task that gas technicians/fitters must perform

Understanding Scope of Work

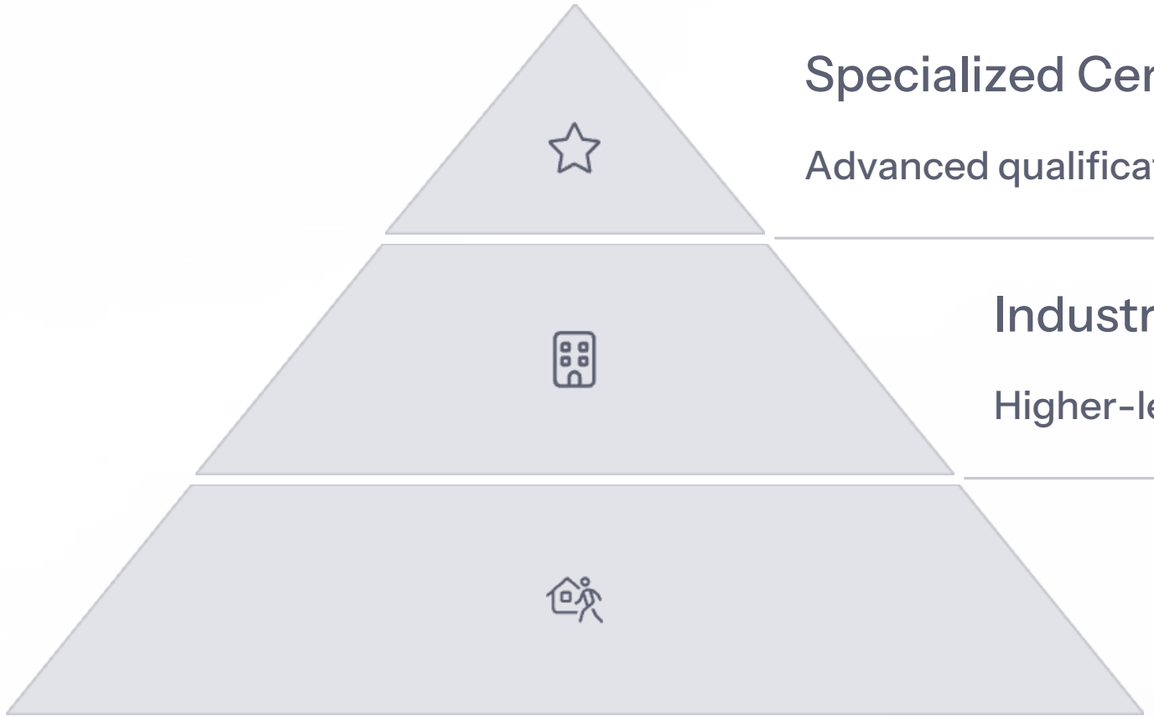
Jurisdictional Knowledge

A gas technician/fitter must understand the responsibilities and limitations of the licenses, qualifications he or she possesses for the jurisdiction in which he or she will work.

Regional Variations

This will vary from jurisdiction to jurisdiction. Refer to Table 1-2 in Chapter 1, Codes, acts, and regulations to identify the applicable act, regulation, or other document and where to obtain a copy.

Tiered Certification System



Specialized Certifications

Advanced qualifications for specific systems

Industrial/Commercial

Higher-level certification for complex systems

Residential

Basic certification for residential equipment

Most jurisdictions have a tiered system, i.e., a number of levels of gas technicians/fitters having specific job responsibilities and limitations. Typically at least two levels are defined: one covering residential and the other on industrial/commercial gas/propane equipment. Other levels or classes exist in some jurisdictions.

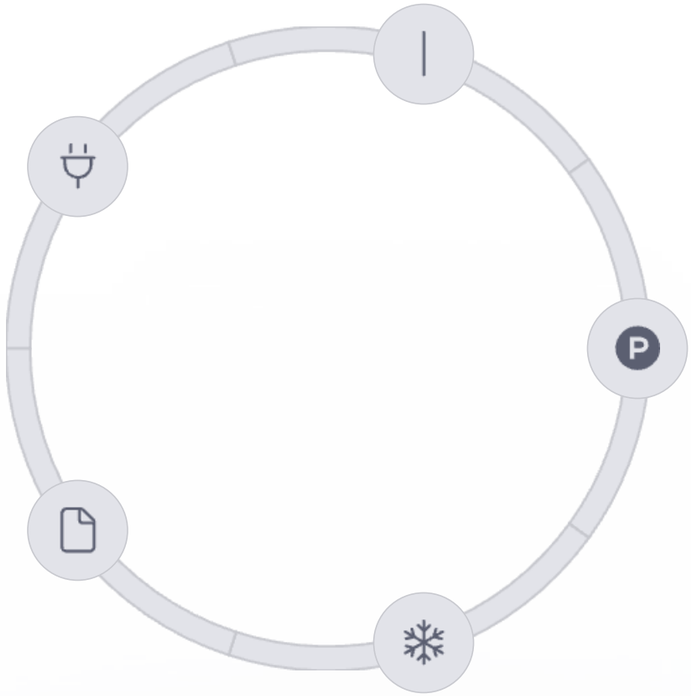
Work of Other Trades

Electrical

Wiring, electrical connections, and power supply work

Warranty Claims

Customer warranty service requirements



Plumbing

Water connections, drainage, and pipe fitting

Sheet Metal

Ductwork, venting, and metal fabrication

Refrigeration

Cooling systems and refrigerant handling

When a gas technician/fitter must do work that does not fall within the scope of his or her certificate, license, or qualification, work may fall under these other trades.

Important Limitations

Certificate Limitations

The technician/fitter must not perform work that is not allowed by the limitations of his or her certificate, license, or qualification.

Each level of certification has specific boundaries that must be respected to ensure safety and regulatory compliance.

Knowledge Limitations

The technician/fitter must not perform work if he or she is unsure of how to perform the work properly or safely.

Even if technically permitted by certification, work should not be attempted without proper knowledge and confidence in one's abilities.

Jurisdictional Differences

Identify Jurisdiction

Determine which province or territory you're working in

Research Regulations

Find the specific acts and regulations that apply

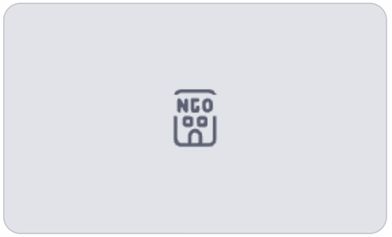
Verify Certification

Ensure your certification is valid for that jurisdiction

Confirm Scope

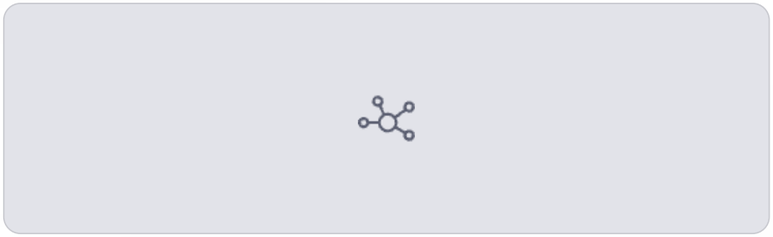
Understand what work you can legally perform

Finding Regulatory Information



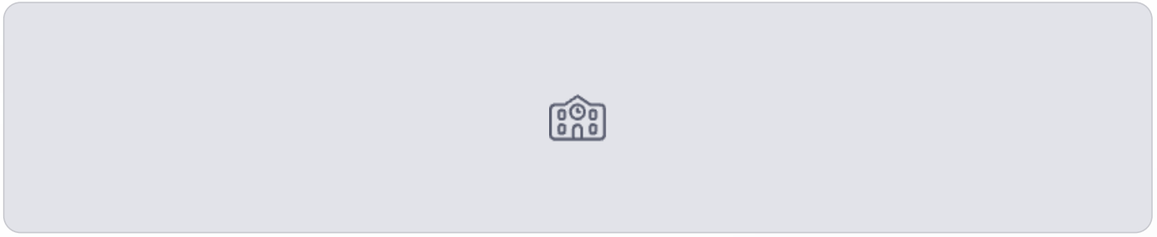
Government Websites

Official provincial/territorial regulatory bodies



Industry Associations

Professional organizations and trade groups



Training Institutions

Schools and certification programs

Refer to Table 1-2 in Chapter 1, Codes, acts, and regulations to identify the applicable act, regulation, or other document and where to obtain a copy.

Residential vs. Commercial Certification

Residential Certification

- Domestic appliances
- Home heating systems
- Residential water heaters
- Lower BTU equipment
- Standard venting systems

Commercial/Industrial Certification

- High-capacity equipment
- Complex control systems
- Industrial processes
- Higher BTU ratings
- Specialized venting requirements

Electrical Work Boundaries

Gas Technician May Perform

- Basic electrical troubleshooting
- Replacement of direct components
- Testing of safety circuits

Requires Licensed Electrician

- New electrical installations
- Panel modifications
- Wiring upgrades
- Complex electrical repairs

Plumbing Work Boundaries

Gas Technician Scope

Connection of gas appliances to existing plumbing

Plumber Required

Installation of new water lines or drains

Shared Responsibility

Coordination on combination systems

Dual Certification

Some technicians hold both qualifications

Sheet Metal Work Boundaries

Ductwork Installation

Typically performed by sheet metal workers

Venting Systems

May require specialized certification

Equipment Connections

Often within gas technician scope

Custom Fabrication

Requires sheet metal training

Refrigeration Work Boundaries

Refrigerant Handling

Requires specific environmental certification

Cooling System Repairs

Typically performed by refrigeration technicians

Heat Pump Service

May require dual certification

Integrated Systems

Often requires collaboration between trades

Warranty Work Considerations

Review Warranty Terms

Understand what work is covered under manufacturer warranty

Verify Authorization

Confirm you're authorized to perform warranty service

Perform Approved Work

Complete only the work specified in warranty claim

Document Properly

Maintain records for warranty reimbursement

Safety Considerations

1st

Priority

Safety must always be the primary consideration

0

Accidents

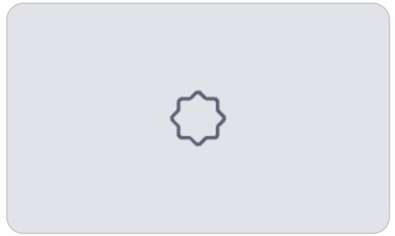
Goal for incidents when working within proper scope

100%

Compliance

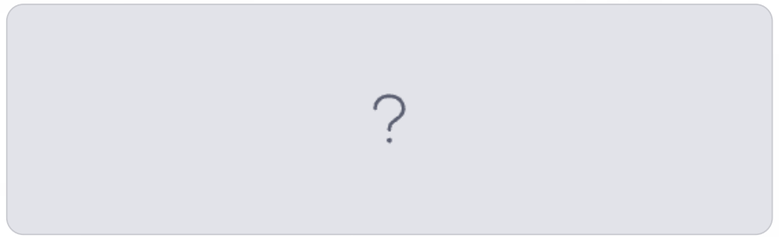
Required adherence to safety regulations

When to Refer Work to Others



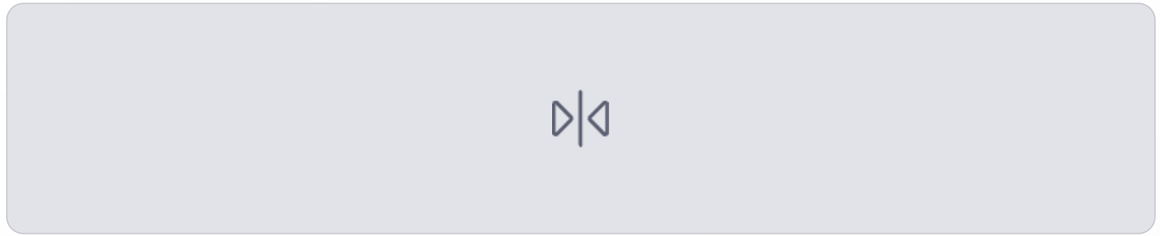
Outside Your Certification

Work requires different license or qualification



Knowledge Gap

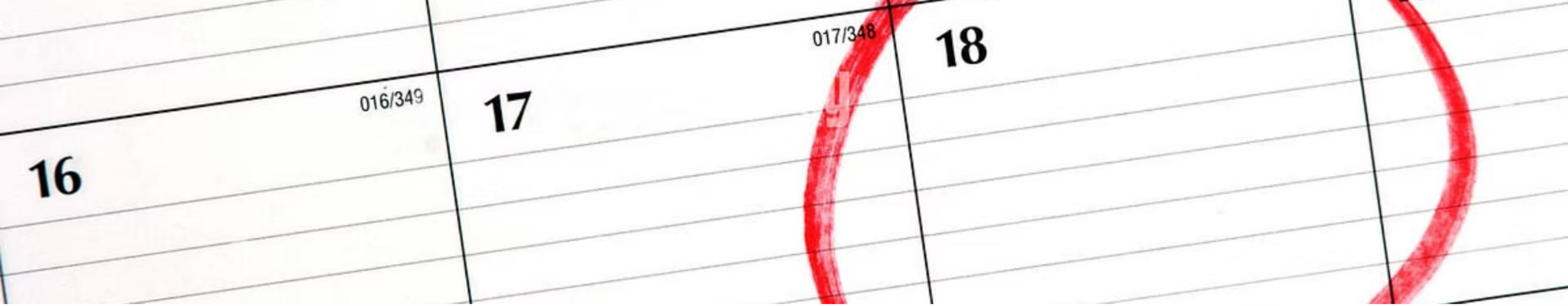
Unsure how to perform work properly or safely



Specialized Equipment Needed

Work requires tools or equipment you don't possess

The technician/fitter must not perform work if he or she is unsure of how to perform the work properly or safely.



Certification Renewal Requirements

Initial Certification

Complete required training and examination

Active Practice

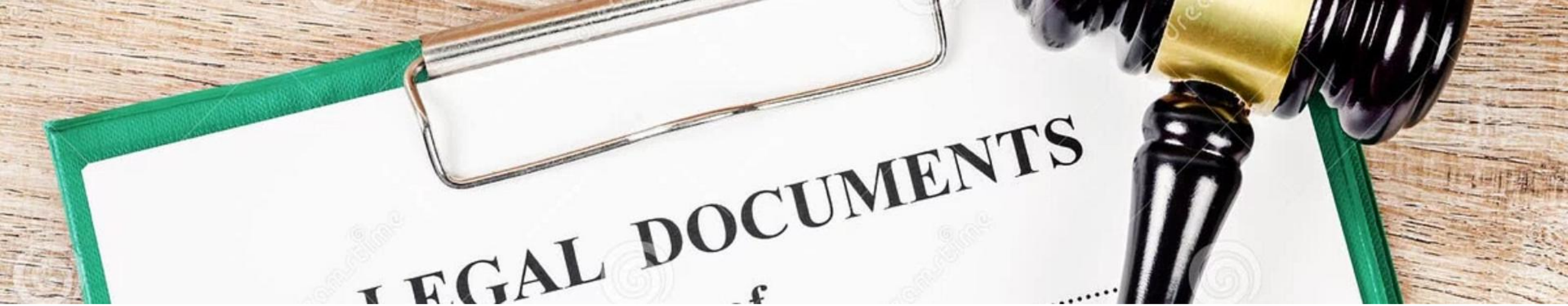
Maintain regular work within scope of certification

Continuing Education

Complete required professional development

Renewal Process

Submit documentation and fees before expiration



Consequences of Working Outside Scope

Legal Consequences

- Fines and penalties
- License suspension or revocation
- Legal liability for damages

Safety Risks

- Potential for serious accidents
- Carbon monoxide exposure
- Fire or explosion hazards

Professional Impact

- Damage to reputation
- Loss of insurance coverage
- Difficulty finding employment

Documentation Requirements

Tenant Renewal Inspection

Property	Tenant	Date
[redacted]	[redacted]	2020-03-26

Summary

Lease Renewal Status	Yes, I am interested and ready to finalize a renewal addendum.
Tenant (s)	No change from current lease. Changes as applicable:
Tenant (s) on Renewal	[redacted]
Animals	Luna: adult, female, German Shephard (emotional support animal)
Smoke / CO Detectors	Smoke / CO Detectors tested okay.
HVAC Filter (s)	Not Accessible. Last Filter Change: I Don't Know.
Critical Repairs	
Other Repairs	

Other Tenant Comments

Tenant Signature

EETC Certified Technician

THIS ACKNOWLEDGES THAT

John Doe

HAS SUCCESSFULLY COMPLETED
THE EQUIPMENT & ENGINE TRAINING COUNCILS
CERTIFICATION TEST IN

FOUR STROKE ENGINE

ON THIS 22nd DAY OF FEBRUARY, 2022

Erik Sides

ERIK SIDES, EXECUTIVE DIRECTOR, EETC

CERTIFICATION EXPIRES: FEBRUARY 22, 2

THE MISSION OF THE EETC IS TO SERVE THE POWI
EQUIPMENT INDUSTRY THROUGH
EDUCATION, TESTING AND CERTIFICATION

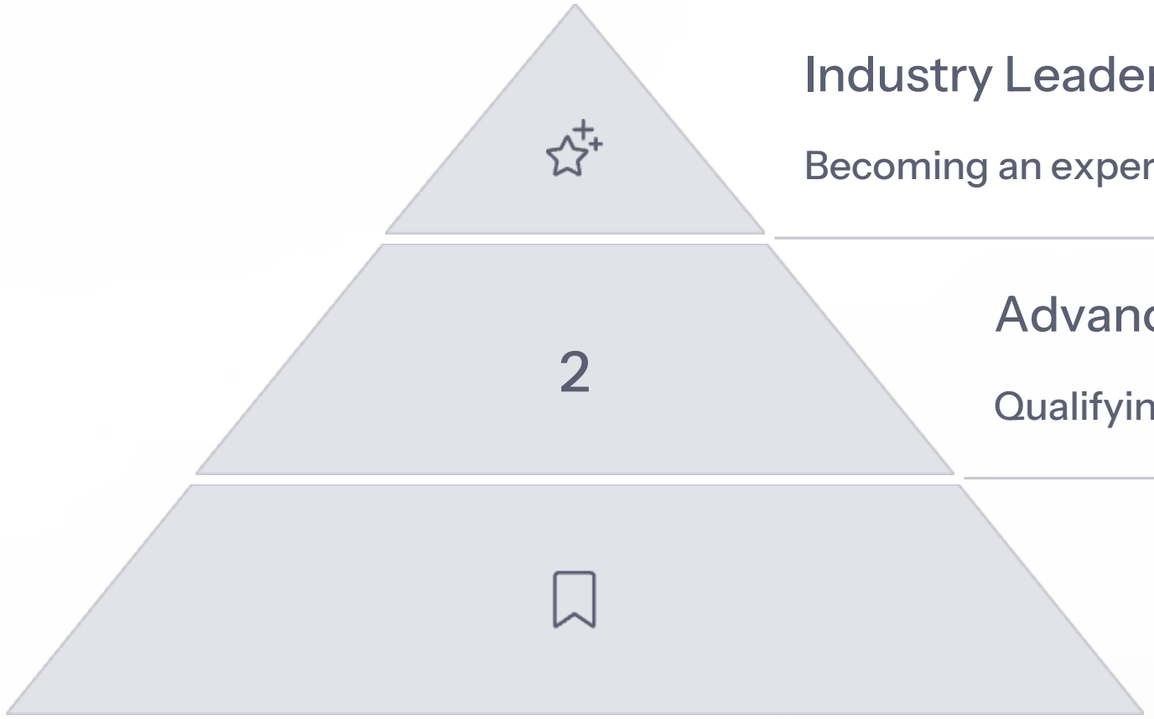
MAINTENANCE
GISTRATION RECORD FO

Maintenance Registration Record Form

mber	date	repair address	maintenance objec	Repair man	contact number	Repair fees

Proper documentation is essential for demonstrating compliance with scope of work requirements. Always maintain copies of permits, inspection reports, and certification documents.

Continuing Education Importance



Industry Leadership

Becoming an expert in specialized areas

Advanced Certification

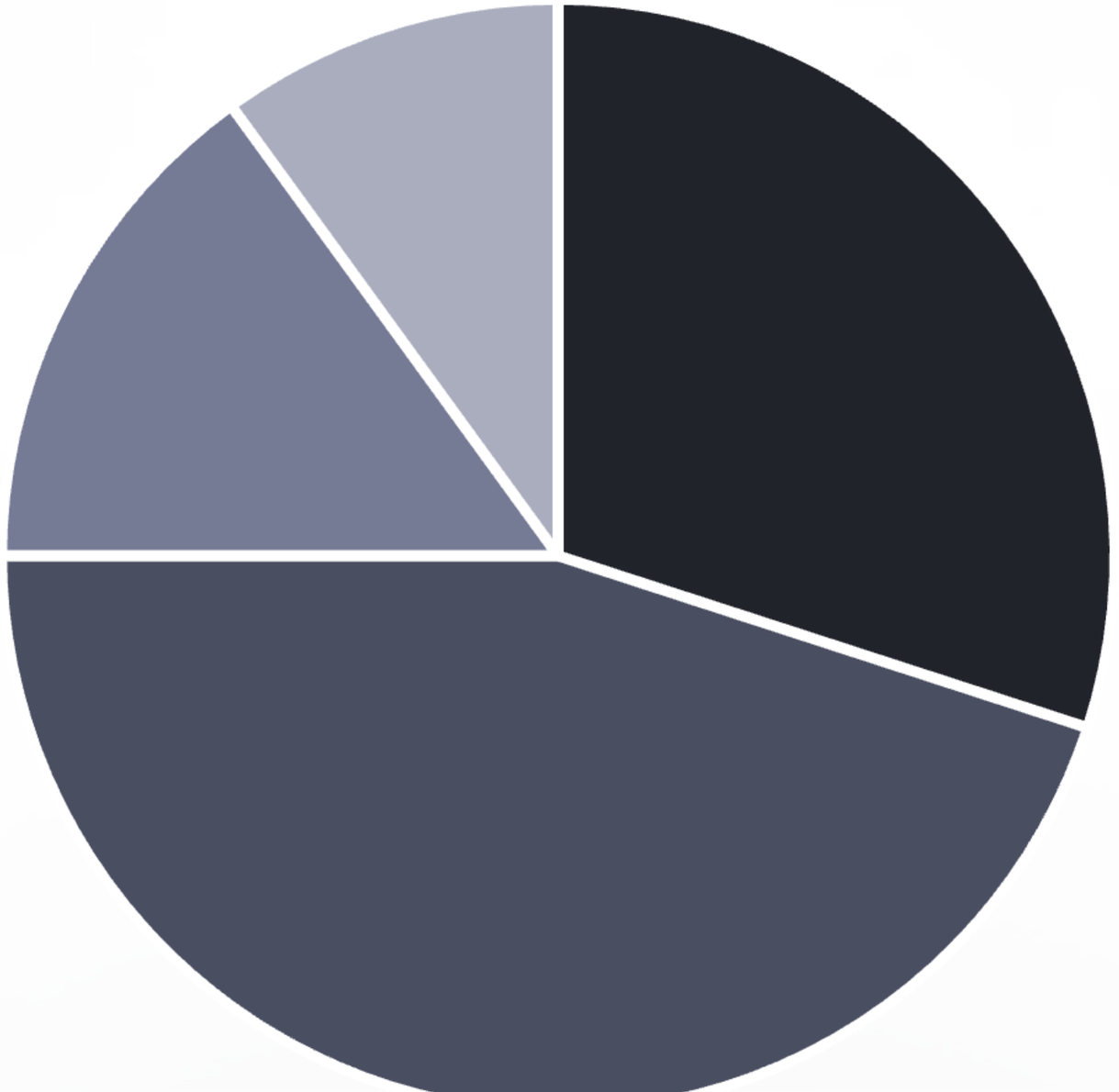
Qualifying for higher-level licenses

Knowledge Updates

Staying current with changing regulations

Continuing education helps gas technicians/fitters maintain awareness of their scope of work as regulations and technologies evolve. Regular training ensures you understand both your responsibilities and limitations.

Cross-Jurisdictional Considerations



Specialized Equipment Considerations

Commercial Kitchen Equipment

May require specific commercial certification and knowledge of food service safety requirements

Industrial Boilers

Often requires advanced certification and specialized training for high-pressure systems

Laboratory Equipment

May involve unique safety protocols and precision requirements beyond standard certification

Propane vs. Natural Gas Certification

Natural Gas Certification

- Pipeline distribution systems
- Lower pressure considerations
- Utility coordination requirements
- Specific venting requirements

Propane Certification

- Storage tank regulations
- Higher pressure systems
- Delivery system requirements
- Cold weather considerations

Dual Certification

Many jurisdictions require separate or additional certification for working with propane systems compared to natural gas systems.

Some jurisdictions offer combined certification that covers both fuel types.

Emergency Response Limitations

Initial Assessment

Gas technicians can perform initial safety assessment

Basic Mitigation

Shutting off gas supply and securing the area

Professional Coordination

Contacting emergency services and utility companies when situation exceeds scope

Documentation

Recording actions taken within scope of certification

Apprenticeship and Supervision Requirements

Apprentice

Must work under direct supervision of certified technician

2 Entry-Level Certification

Can perform limited scope of work independently

Journeyperson

Broader scope of independent work

Master Level

Can supervise others and perform all aspects of work

Code Update Impacts on Scope

Code Revisions

Regular updates to gas codes and standards

Certification Requirements

Possible changes to what each level can perform

Practice Adaptation

Adjusting work methods to comply with new standards

Training Updates

Learning new requirements and procedures

Professional Ethics and Scope

Honesty About Limitations

Ethical obligation to inform clients when work is outside your scope

Professional Referrals

Maintaining a network of other qualified professionals for referrals

Protecting Public Safety

Prioritizing safety over business considerations

Continuous Learning

Commitment to staying informed about scope boundaries

Summary: Key Points About Scope of Work

Jurisdictional Awareness

Understanding that scope varies by location

Certification Limitations

Working only within permitted boundaries

Trade Boundaries

Recognizing when to involve other trades

Safety First

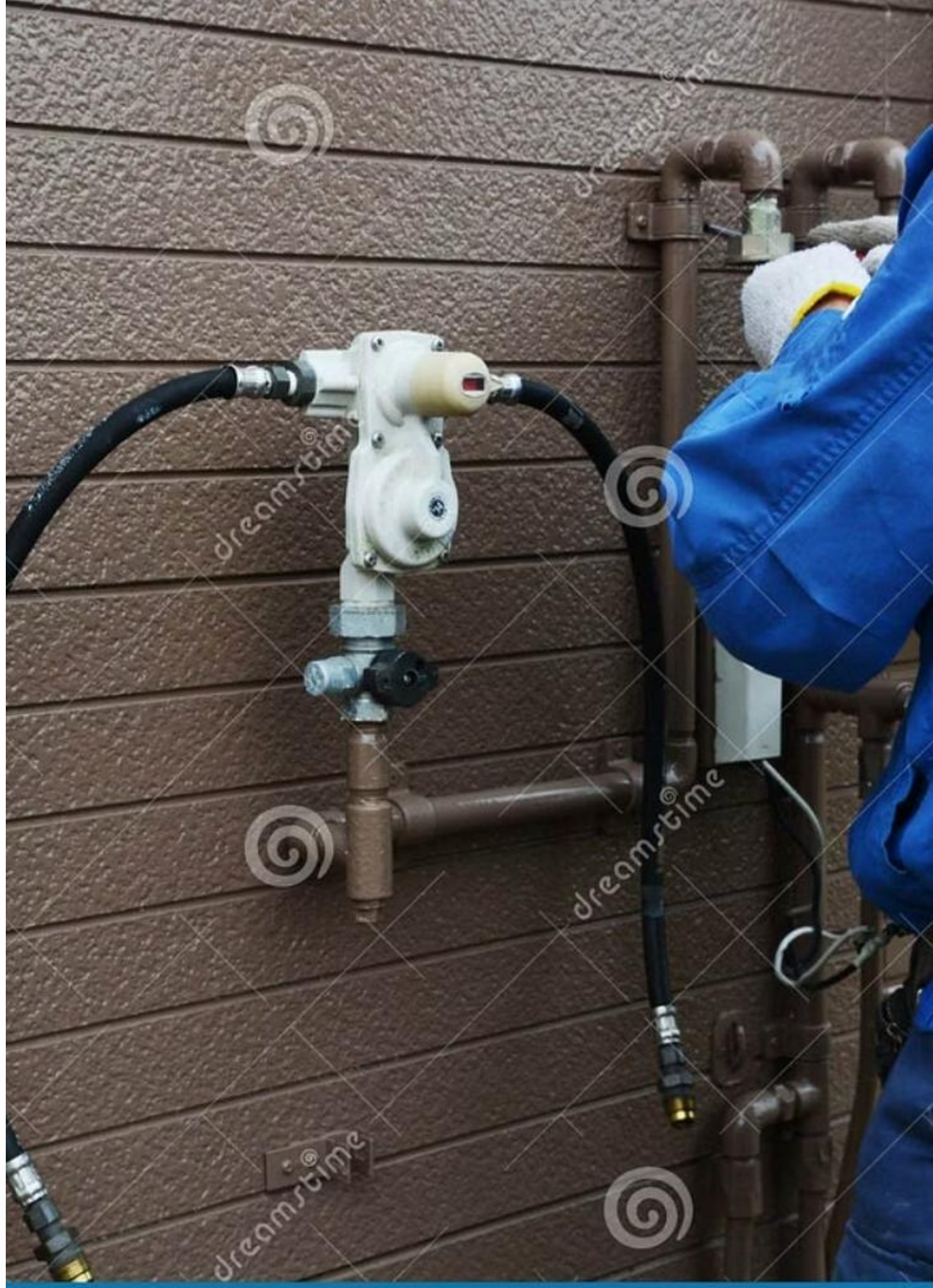
Never performing work without proper knowledge

A gas technician/fitter must understand the responsibilities and limitations of the licenses, qualifications he or she possesses for the jurisdiction in which he or she will work. The technician/fitter must not perform work that is not allowed by the limitations of his or her certificate, license, or qualification, and must not perform work if he or she is unsure of how to perform the work properly or safely.

CSA Unit 4

Chapter 3
Additional Codes, Acts, and Regulations for Gas and Propane Installations

Gas technicians and fitters must be familiar with various codes, acts, and regulations that affect gas and propane installations beyond the primary standards. These additional requirements ensure safety, proper installation, and compliance across different aspects of gas and propane work.



Checklist to ensure compliance with RTA*	
Full service of each landlord provided gas appliance including:	
☐	- clean dust and debris from appliances including burner, pilot, fan, filters and air intakes
☐	- check the integrity of the heat exchanger
☐	- check the appliance gas supply and operating pressures
☐	- check that the gas appliance burner ignition is reliable and complete
☐	- check for any gas appliance flame abnormality
☐	- check the operation of the gas appliance, including safety devices
☐	- complete a combustion spillage (carbon monoxide) test on all heating appliances and internal, open flued appliances
For each gas installation & appliance:	
☐	- check pressure retention on the main gas line
☐	- ensure safe access for servicing & adjustment
☐	- check that electrically safe
☐	- check that gas installations, including gas cookers, are adequately restrained to avoid tipping over
☐	- check that gas installations meet clearance requirements from any combustible surfaces
☐	- where LPG cylinders are present, check that they and associated gas components are installed correctly
☐	- check that there is adequate ventilation for appliances to act safely
☐	- check that gas isolation valves are installed, as required
☐	- check gas appliances for evidence of certification

* Reflects the requirements in AS/NZS 5601-2004 and AS4575:2019 Gas appliances - Servicing of Type A Appliances, as at October 2021

Provider name: _____

Checked by: _____

Purpose of Additional Codes and Regulations

Safety Assurance

Ensure installations meet comprehensive safety standards across multiple regulatory domains

Regulatory Compliance

Provide clear guidelines for technicians to follow when performing installations

Public Protection

Safeguard consumers and workers from potential hazards related to gas and propane

Professional Standards

Establish consistent quality benchmarks across the industry

Learning Objectives

Identify Additional Codes

Recognize the various codes beyond CSA B149.1 and B149.2 that impact gas and propane installations

Understand Related Acts

Comprehend how different legislative acts affect installation practices

Apply Regulations

Know how to implement regulatory requirements in daily work

Maintain Compliance

Ensure all work meets the standards set by multiple regulatory bodies

TECHNICIAN

IING AND EXAM

Workplace Hazardous Materials Information System (WHMIS)

Definition

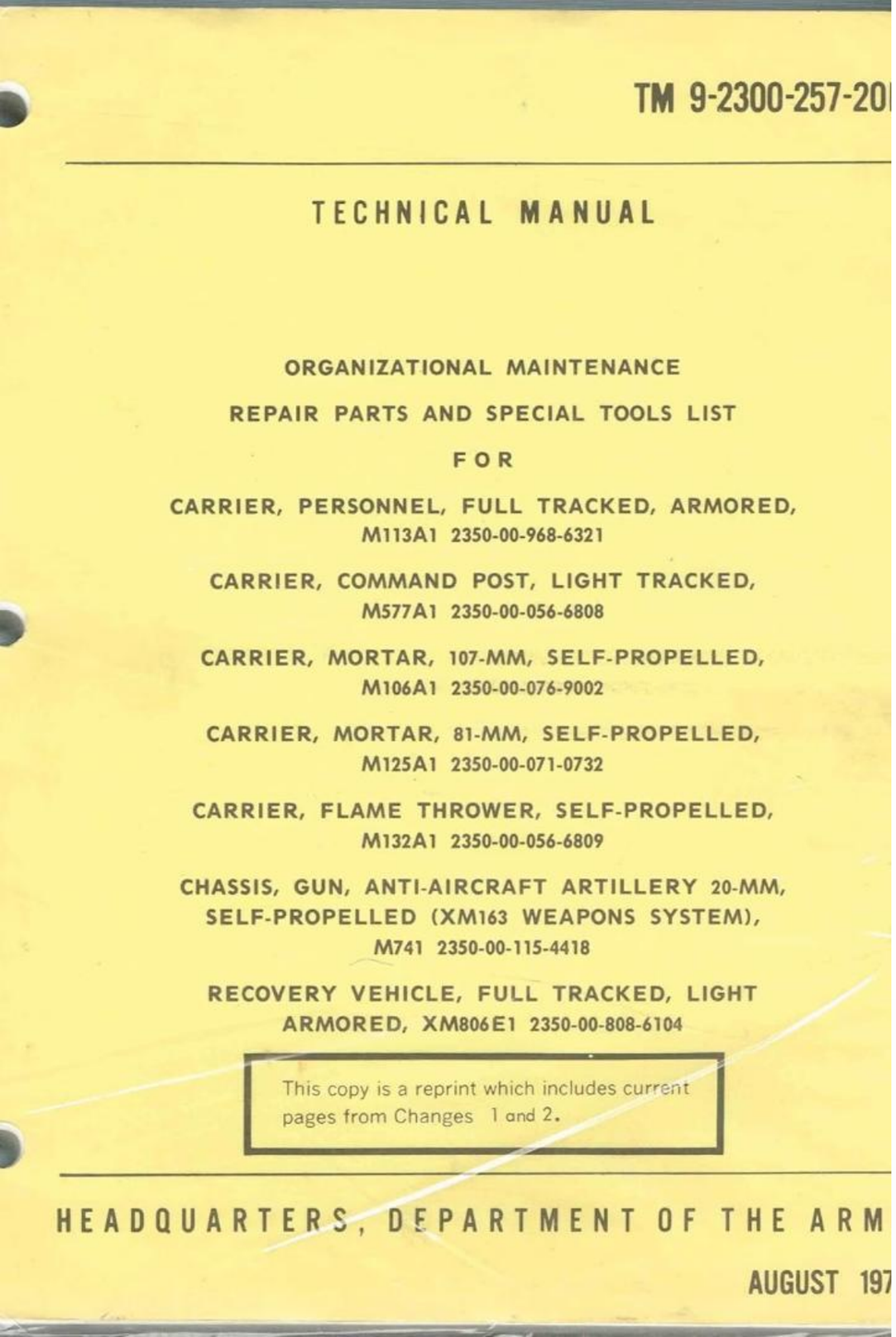
WHMIS provides workers, employers, and suppliers of materials with vital information about hazardous materials in the workplace

Purpose

Ensures that all parties have access to information needed to safely handle, store, and dispose of hazardous materials used in gas and propane installations

Relevance

Gas technicians regularly work with materials that fall under WHMIS regulations, making compliance essential for workplace safety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TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE

REPAIR PARTS AND SPECIAL TOOLS LIST

FOR

CARRIER, PERSONNEL, FULL TRACKED, ARMORED,
M113A1 2350-00-968-6321

CARRIER, COMMAND POST, LIGHT TRACKED,
M577A1 2350-00-056-6808

CARRIER, MORTAR, 107-MM, SELF-PROPELLED,
M106A1 2350-00-076-9002

CARRIER, MORTAR, 81-MM, SELF-PROPELLED,
M125A1 2350-00-071-0732

CARRIER, FLAME THROWER, SELF-PROPELLED,
M132A1 2350-00-056-6809

CHASSIS, GUN, ANTI-AIRCRAFT ARTILLERY 20-MM,
SELF-PROPELLED (XM163 WEAPONS SYSTEM),
M741 2350-00-115-4418

RECOVERY VEHICLE, FULL TRACKED, LIGHT
ARMORED, XM806E1 2350-00-808-6104

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HEADQUARTERS, DEPARTMENT OF THE ARM

AUGUST 197

Key Terminology

Term	Abbreviation	Definition
Workplace Hazardous Materials Information System	WHMIS	Provides workers, employers, and suppliers of materials with vital information about hazardous materials in the workplace

Primary Installation Codes

CSA B149.1

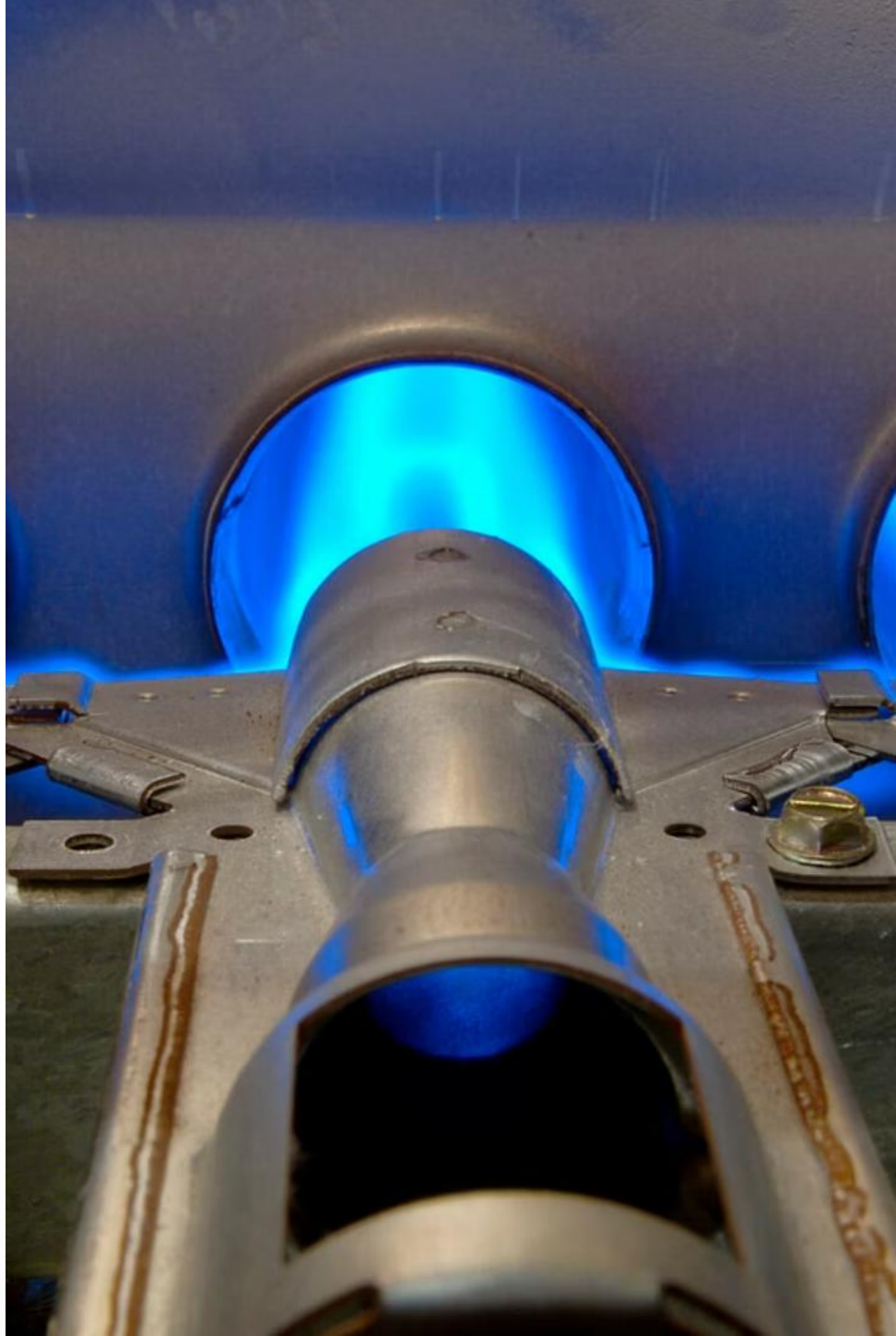
Natural gas and propane installation code

CSA B149.2

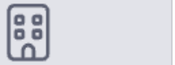
Propane storage and handling code

Provincial Acts

Region-specific regulations governing installations



Building Codes



National Building Codes

Comprehensive standards for construction

Ventilation Requirements

Specifications for proper air exchange

Chimney Standards

Construction and clearance requirements

Clearance Specifications

Safe distances from manufactured chimneys

Electrical Codes

Canadian Electrical Code

National standard for electrical installations

Accessibility Clearances

Requirements for access to electrical components

Separate Circuits

Specifications for dedicated electrical circuits

Wire Sizing

Proper gauge requirements for different applications

Switch Requirements

Standards for electrical switches on gas equipment

Permits and Inspections

Required documentation and verification processes

CSA B149.3 Code

Full Title

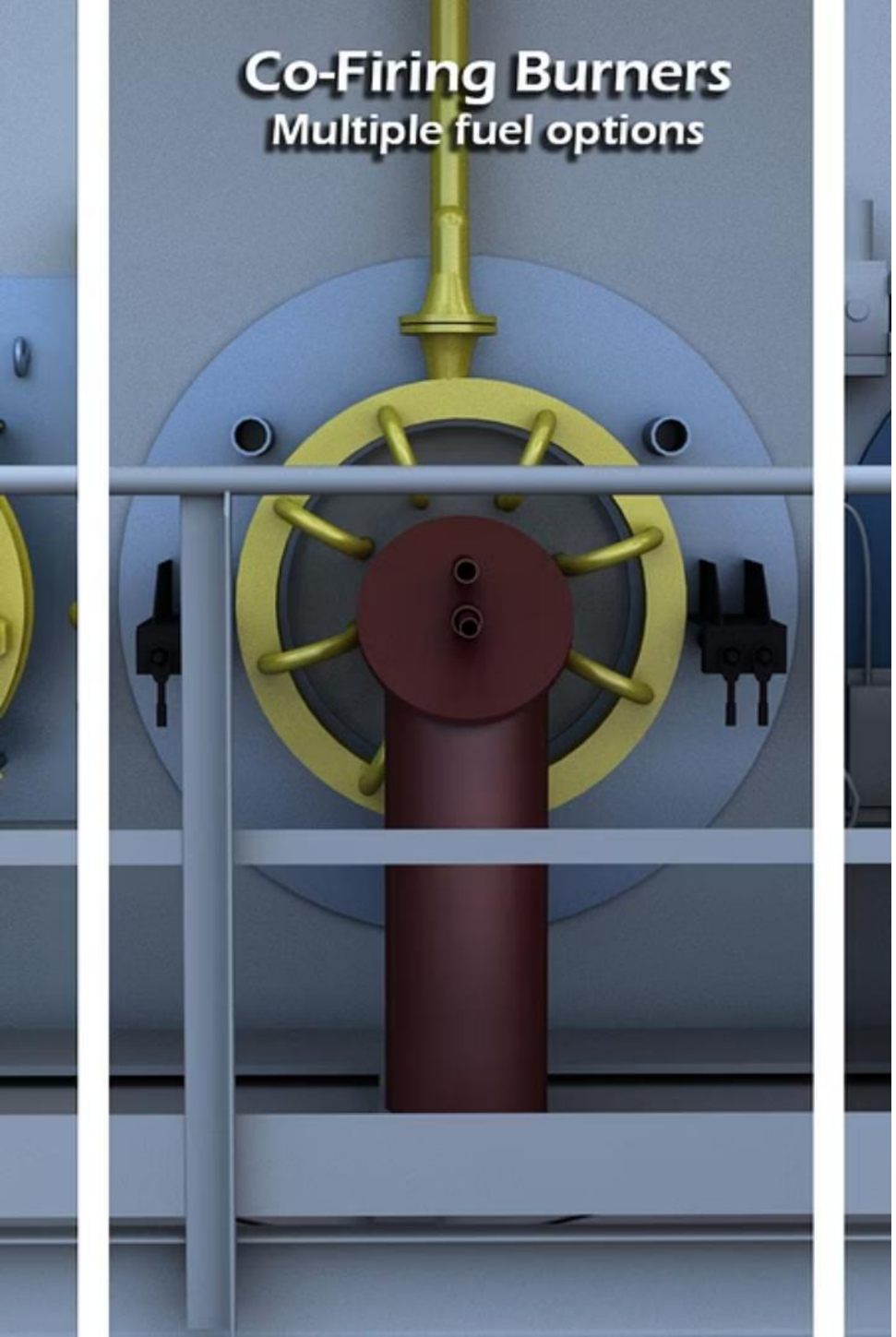
Code for the Field Approval of Fuel-burning Appliances and Equipment

Purpose

Contains requirements for fuel-related components and accessories and their assembly on appliances utilizing gas

Valve Train Diagrams

Includes detailed schematics for proper component assembly and configuration



Application of CSA B149.3

New, Non-certified Appliances

Applies to all inputs for which there is no approved standard

Equipment Assembly

Governs proper component configuration and installation

Upgrading Existing Appliances

Required when modifications are made to certified or non-certified appliances

Field Approval Process

Establishes procedures for on-site verification of compliance

Occupational Health and Safety Act

Provincial Authority

Each province sets its own occupational health and safety acts and regulations

These provincial standards may vary in specific requirements but share common safety principles

Primary Purpose

To protect the health and safety of workers in all industries, including gas technicians

Establishes employer responsibilities, worker rights, and reporting procedures for workplace hazards

See Unit 1 Safety for more detailed information on OHSA requirements

Trades Qualification Act

Job Descriptions

Defines specific roles and responsibilities

Qualifications

Establishes required credentials

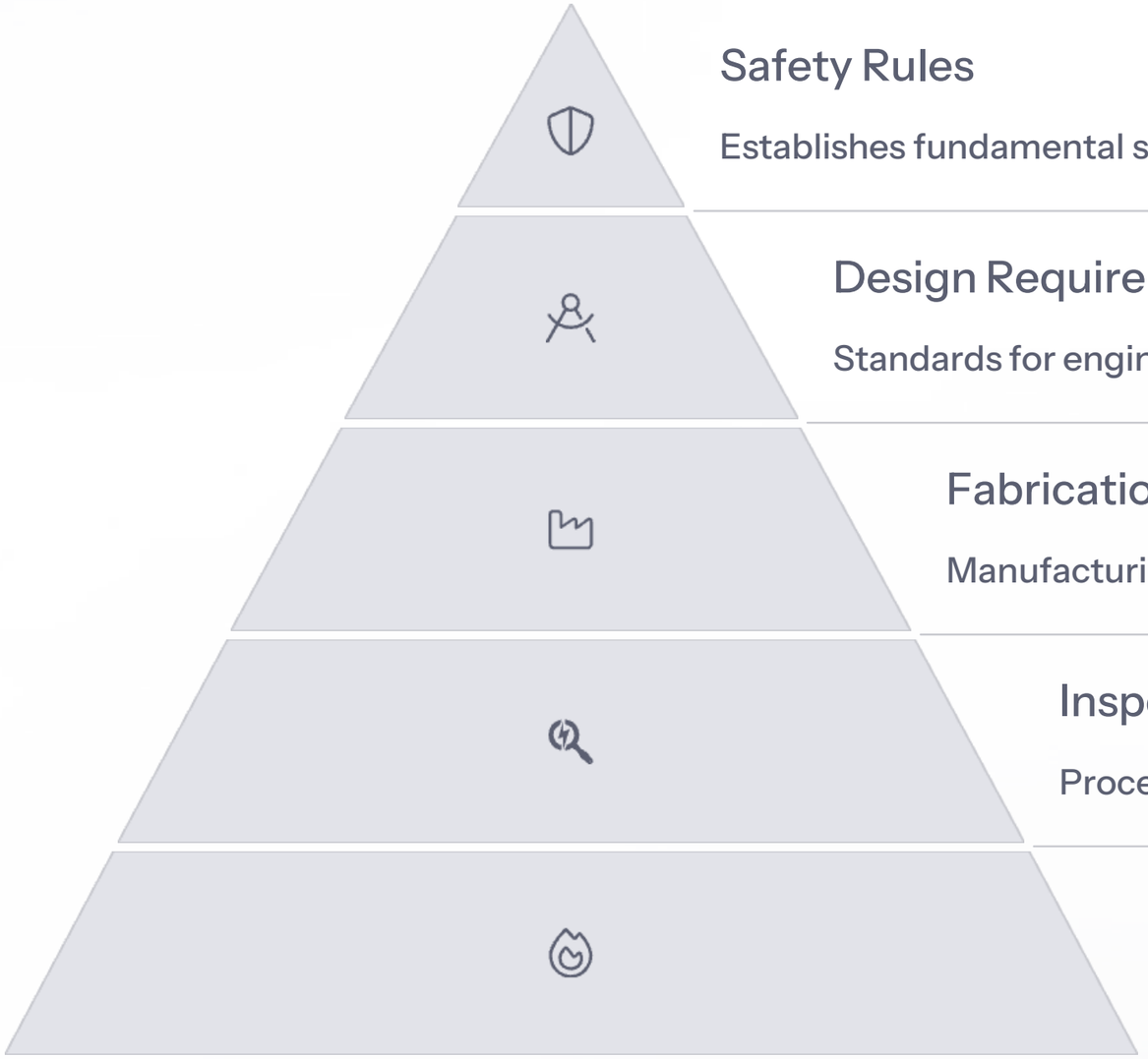
Certification

Regulates licensing and renewal processes

Scope of Work

Outlines permitted activities for each trade

Boiler and Pressure Vessels Act



Safety Rules

Establishes fundamental safety principles

Design Requirements

Standards for engineering and construction

Fabrication Standards

Manufacturing specifications for vessels

Inspection Protocols

Procedures for verification during construction

Welding Regulations

Standards for gas piping connections

Transportation of Dangerous Goods Act

Federal Jurisdiction

An act of the federal government regulating the transport and handling of goods deemed to be dangerous under the Act

Propane Classification

Includes specific provisions for the transport of propane as a dangerous good

Safety Requirements

Establishes protocols for safe transportation, including container specifications, vehicle requirements, and emergency procedures

Documentation

Mandates proper shipping papers, placarding, and training certifications for transporters

Workplace Hazardous Materials Information System (WHMIS)

Legal Framework

WHMIS regulations lay out the legal steps that employers and suppliers of hazardous products must follow to ensure protection of workers' health and safety

Three Main Elements

- Labelling of hazardous materials
- Material safety data sheets/safety data sheets
- Education and training programs

WHMIS 2015 Updates

February 2015

WHMIS updated to align with the United Nations (UN)'s Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

International Alignment

Harmonization with global standards for chemical classification and labeling

Canadian Differences

Important to note that Canada's regulations do have differences from the UN GHS

Further Information

See Unit 1 Safety > Chapter 3. Hazardous Materials Chapter for more details

Material Safety Data Sheets (MSDS) and Safety Data Sheets (SDS)

MSDS (under original WHMIS)

Technical bulletins that provide detailed information about hazardous products

Include handling procedures, hazard identification, and emergency measures

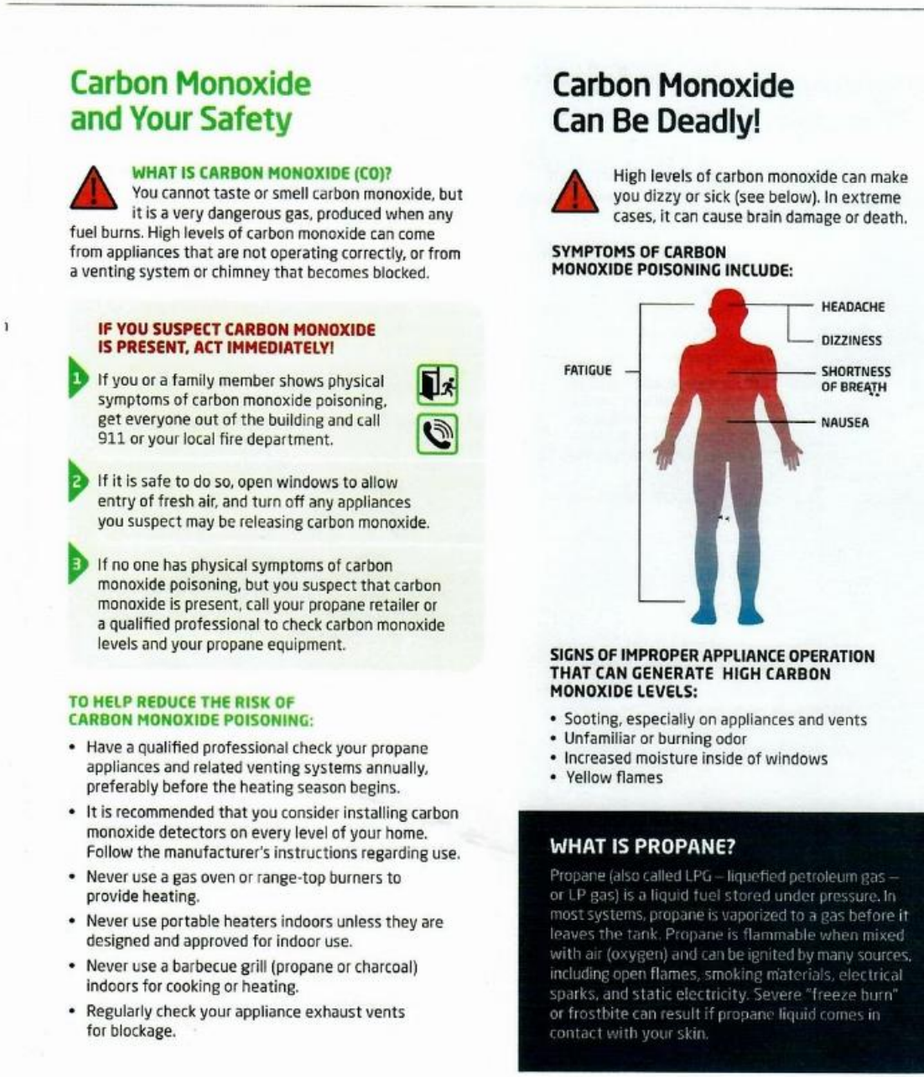
SDS (under WHMIS 2015)

Updated format for technical information about hazardous products

Standardized 16-section format aligned with international standards

Additional Information

See Unit 1 Safety > Chapter 3. Hazardous materials for further information



Carbon Monoxide and Your Safety

WHAT IS CARBON MONOXIDE (CO)?
You cannot taste or smell carbon monoxide, but it is a very dangerous gas, produced when any fuel burns. High levels of carbon monoxide can come from appliances that are not operating correctly, or from a venting system or chimney that becomes blocked.

IF YOU SUSPECT CARBON MONOXIDE IS PRESENT, ACT IMMEDIATELY!

1. If you or a family member shows physical symptoms of carbon monoxide poisoning, get everyone out of the building and call 911 or your local fire department.
2. If it is safe to do so, open windows to allow entry of fresh air, and turn off any appliances you suspect may be releasing carbon monoxide.
3. If no one has physical symptoms of carbon monoxide poisoning, but you suspect that carbon monoxide is present, call your propane retailer or a qualified professional to check carbon monoxide levels and your propane equipment.

TO HELP REDUCE THE RISK OF CARBON MONOXIDE POISONING:

- Have a qualified professional check your propane appliances and related venting systems annually, preferably before the heating season begins.
- It is recommended that you consider installing carbon monoxide detectors on every level of your home. Follow the manufacturer's instructions regarding use.
- Never use a gas oven or range-top burners to provide heating.
- Never use portable heaters indoors unless they are designed and approved for indoor use.
- Never use a barbecue grill (propane or charcoal) indoors for cooking or heating.
- Regularly check your appliance exhaust vents for blockage.

Carbon Monoxide Can Be Deadly!

High levels of carbon monoxide can make you dizzy or sick (see below). In extreme cases, it can cause brain damage or death.

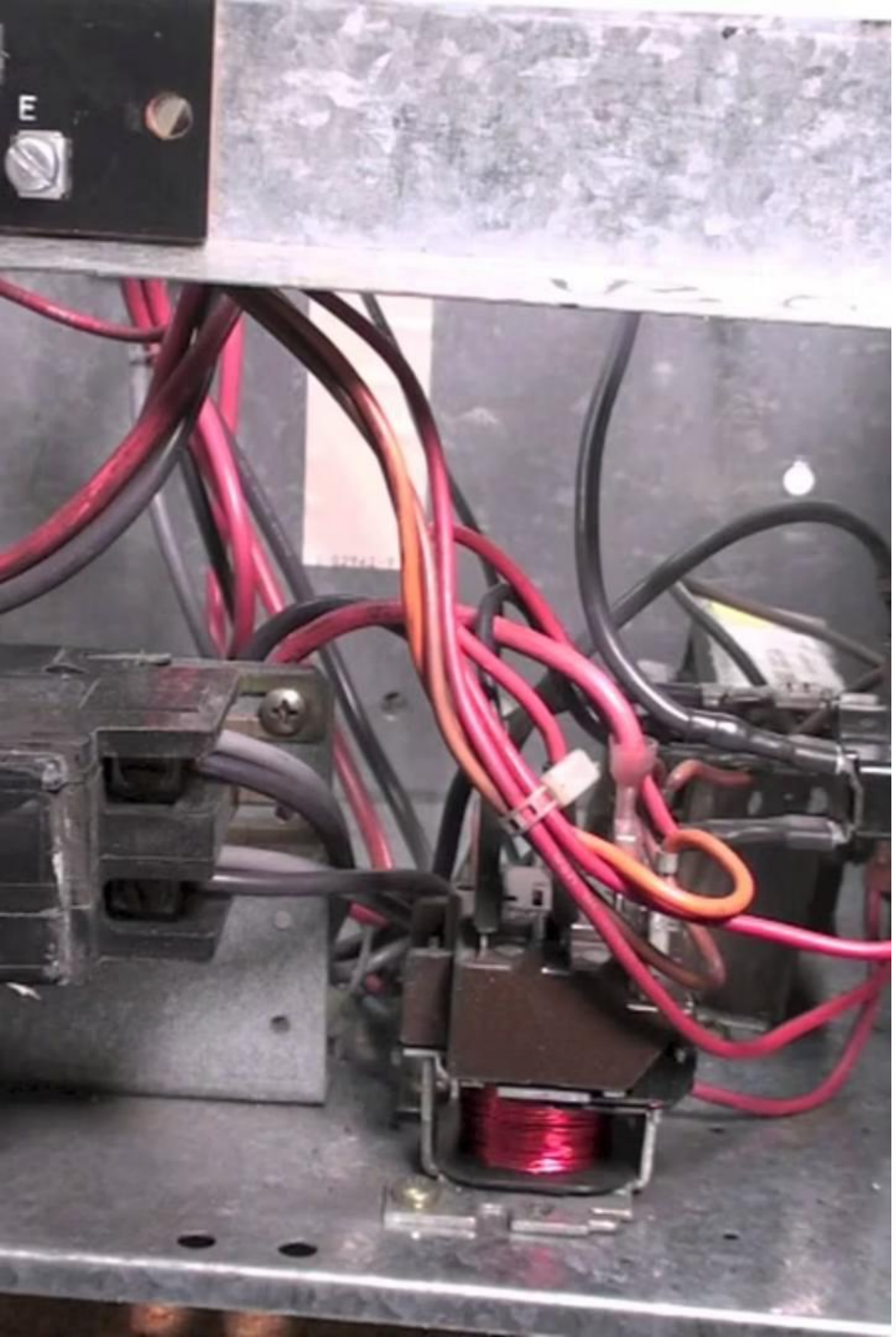
SYMPTOMS OF CARBON MONOXIDE POISONING INCLUDE:

SIGNS OF IMPROPER APPLIANCE OPERATION THAT CAN GENERATE HIGH CARBON MONOXIDE LEVELS:

- Sooting, especially on appliances and vents
- Unfamiliar or burning odor
- Increased moisture inside of windows
- Yellow flames

WHAT IS PROPANE?

Propane (also called LPG – liquefied petroleum gas – or LP gas) is a liquid fuel stored under pressure. In most systems, propane is vaporized to a gas before it leaves the tank. Propane is flammable when mixed with air (oxygen) and can be ignited by many sources, including open flames, smoking materials, electrical sparks, and static electricity. Severe "freeze burn" or frostbite can result if propane liquid comes in contact with your skin.



CSA Z240.4.1 - Manufactured Homes

Publication Source

Published by CSA Group as part of CSA Z240 MH Series, Manufactured homes

Application Scope

Requirements applicable to the installation of gas-burning appliances in new manufactured homes

Special Considerations

Addresses unique challenges of gas installations in factory-built housing

Safety Focus

Ensures proper ventilation, clearances, and connections in confined spaces

CSA Z240.4.2 - Recreational Vehicles

Publication Details

Published by CSA Group as part of CSA Z240 RV Series, Recreational vehicles

Application Scope

Requirements applicable to the installation of propane appliances and equipment in recreational vehicles

Vehicle Types Covered

Folding camping trailers, fifth-wheel trailers, motor homes, truck campers, and travel trailers

Safety Emphasis

Addresses unique challenges of propane use in mobile environments

Relationship Between Codes and Acts

Installation Codes

Technical standards for proper installation

- CSA B149.1
- CSA B149.2
- CSA B149.3

Legislative Acts

Legal framework for enforcement

- OHSA
- Trades Qualification Act
- Boiler and Pressure Vessels Act

Regulations

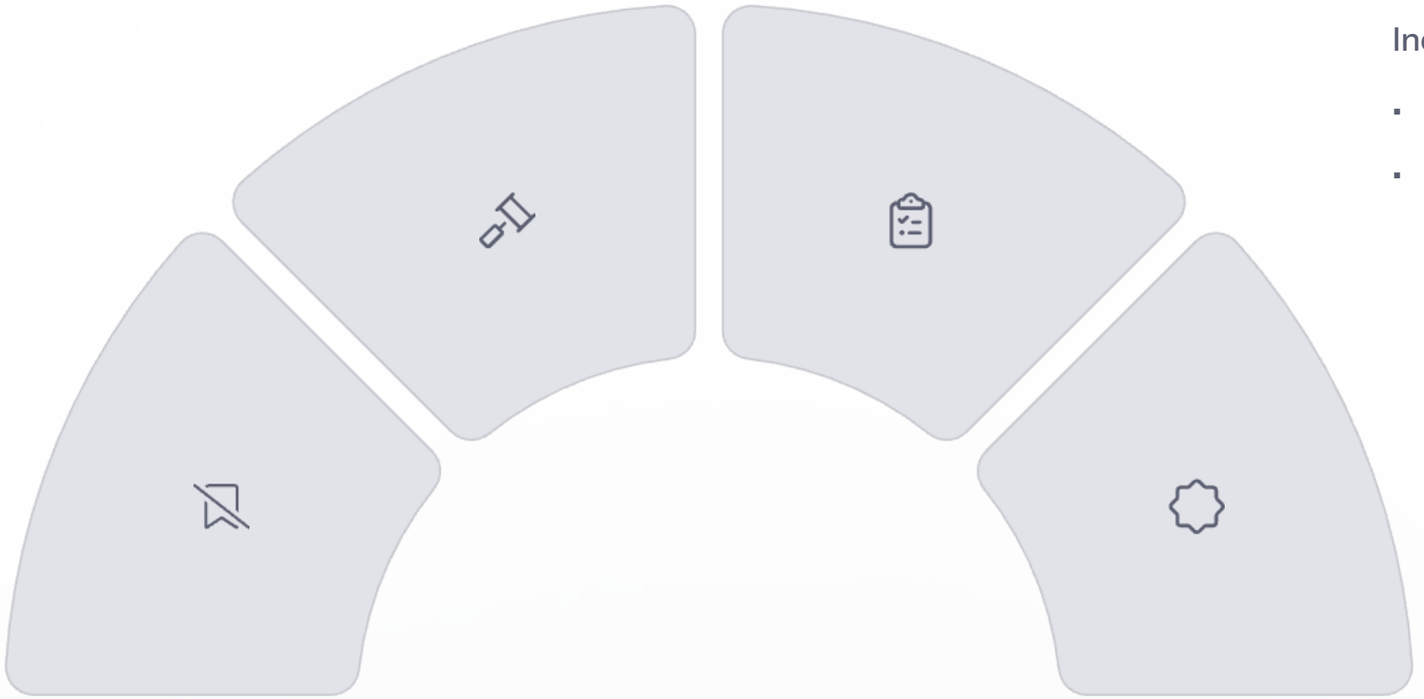
Specific rules under acts

- WHMIS
- Provincial regulations

Standards

Industry-accepted practices

- CSA Z240.4.1
- CSA Z240.4.2



Importance of Building Codes for Gas Installations

3

Key Areas

Ventilation, chimneys, and clearances are the primary building code concerns for gas installations

2

Code Levels

Both national and provincial building codes may apply to a single installation

30%

Ventilation Requirements

Percentage of installation issues related to inadequate ventilation

Ventilation Requirements in Building Codes

Air Supply

Building codes specify minimum requirements for combustion air supply to gas appliances

- Room volume calculations
- Air exchange rates
- Direct outdoor air connections

Exhaust Systems

Standards for removing combustion products safely from the building

- Vent sizing requirements
- Termination clearances
- Materials specifications

Special Applications

Additional requirements for specific installations

- Commercial kitchens
- Enclosed spaces
- High-efficiency appliances

Chimney Requirements in Building Codes

Height Requirements

Minimum height above roof line

2

Construction Standards

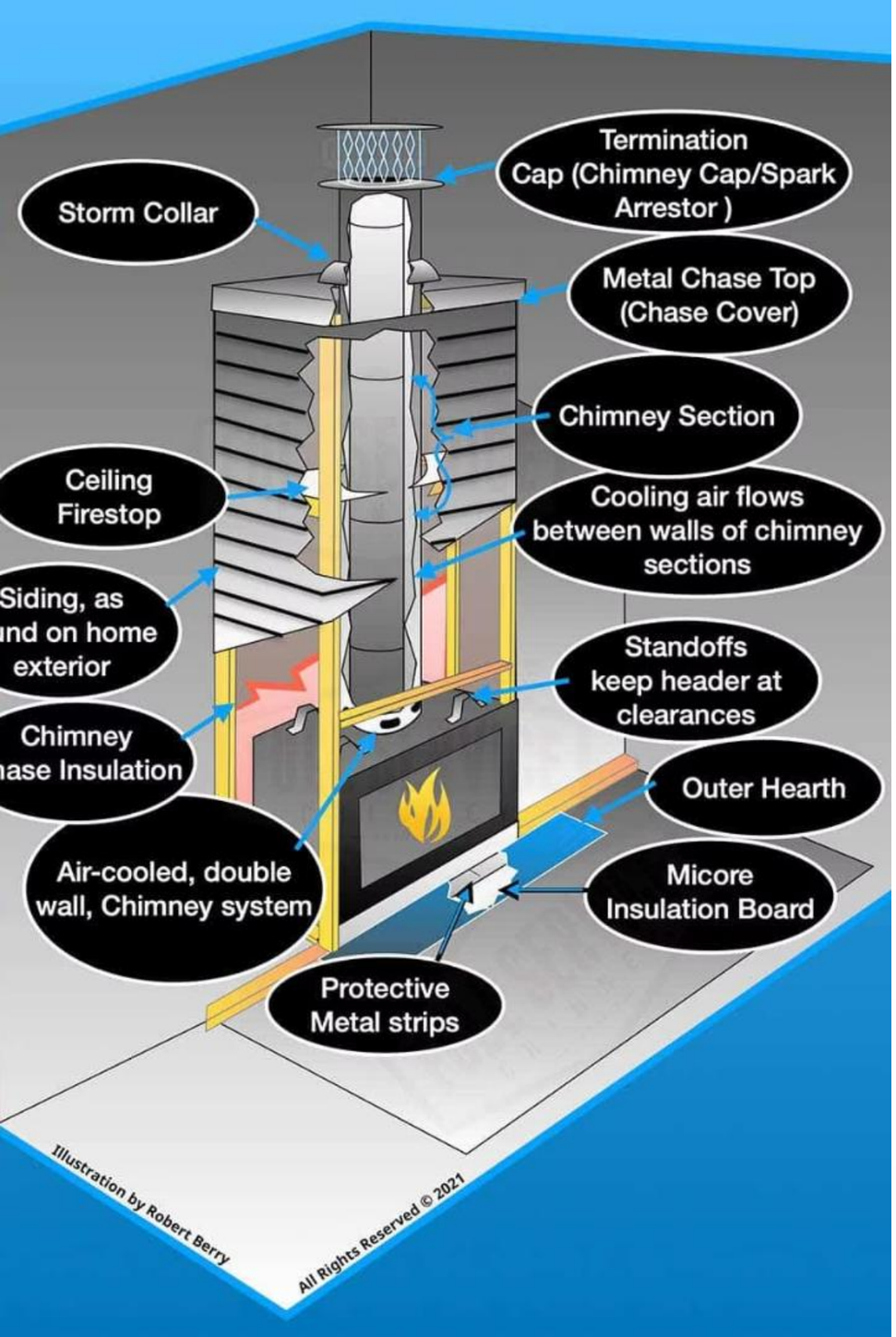
Materials and assembly specifications

Draft Considerations

Proper air flow for combustion gases

Fire Safety Measures

Preventing heat transfer to combustibles



Clearances from Manufactured Chimneys

Combustible Materials

Building codes specify minimum distances between manufactured chimneys and any combustible materials

These clearances vary based on chimney type, appliance BTU input, and local code requirements

Roof Penetrations

Special requirements for where chimneys pass through roofs

Includes flashing, support, and fire-stopping specifications

Exterior Clearances

Minimum distances from chimney termination to windows, doors, and adjacent structures

Designed to prevent re-entry of combustion gases into buildings

Electrical Code Requirements for Gas Appliances

Accessibility

Clear access to electrical connections

Dedicated Circuits

Separate electrical supply for appliances

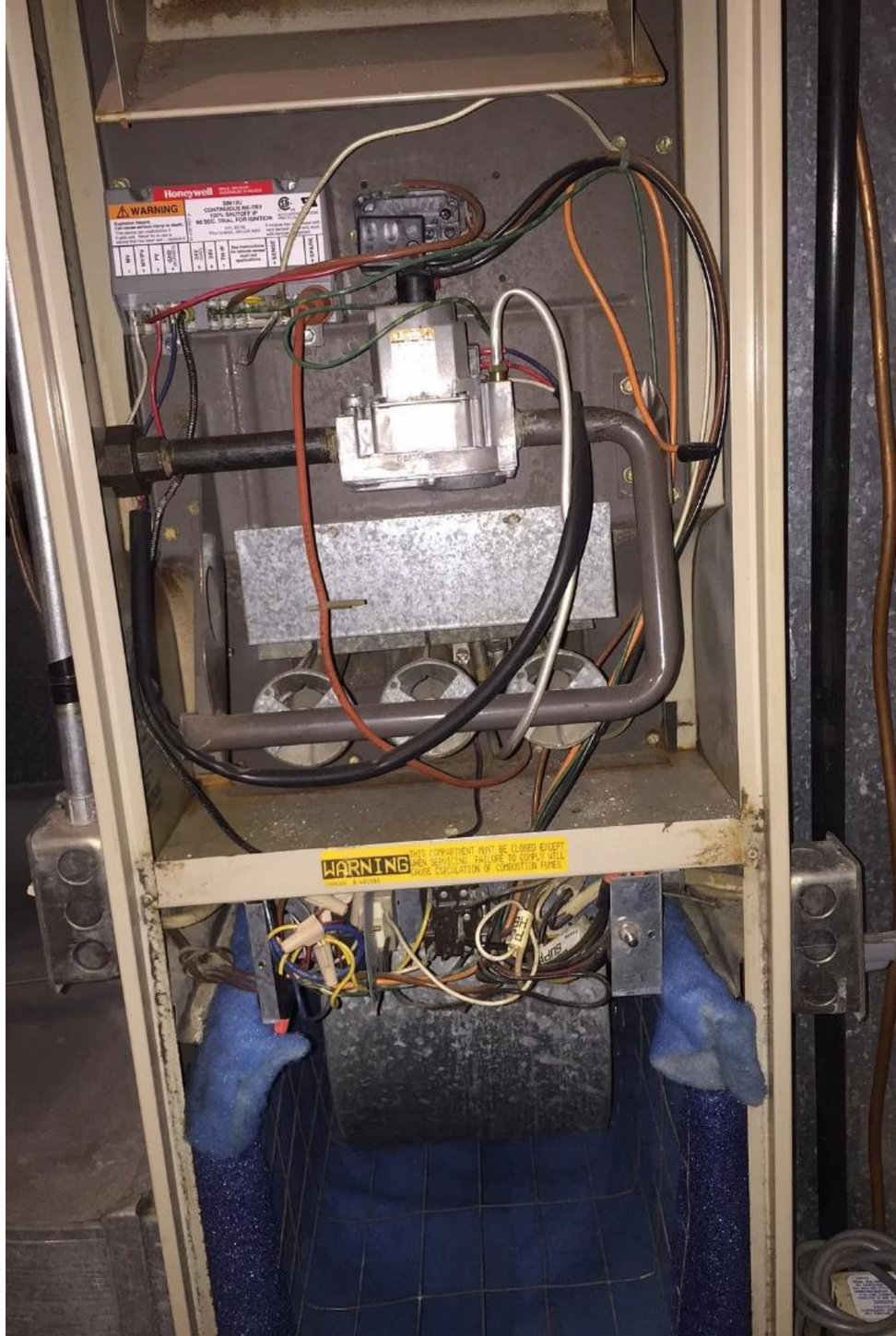
Wire Sizing

Proper gauge for amperage requirements

4

Switch Requirements

Disconnect means within sight of equipment



Electrical Permits and Inspections

Permit Application

Required before beginning electrical work on gas appliance installations

Must be obtained by qualified person as defined by provincial regulations

Installation According to Code

All electrical connections must comply with Canadian Electrical Code and provincial amendments

Includes proper grounding, wire protection, and connection methods

Inspection Process

Licensed electrical inspector must verify compliance before system is energized

May require multiple inspections for rough-in and final connections

Documentation

Final inspection certificate must be obtained and maintained with installation records

Required for warranty validation and insurance purposes

Field Approval Process Under CSA B149.3

Documentation Review

Examination of design specifications

Component Inspection

Verification of proper parts and assembly

Approval Issuance

Certification of compliance with standards

Testing Procedures

Performance and safety verification

Valve Train Diagrams in CSA B149.3

Purpose

Valve train diagrams provide standardized configurations for fuel delivery systems on gas appliances

They ensure proper sequencing of components for safe operation and combustion control

Components Covered

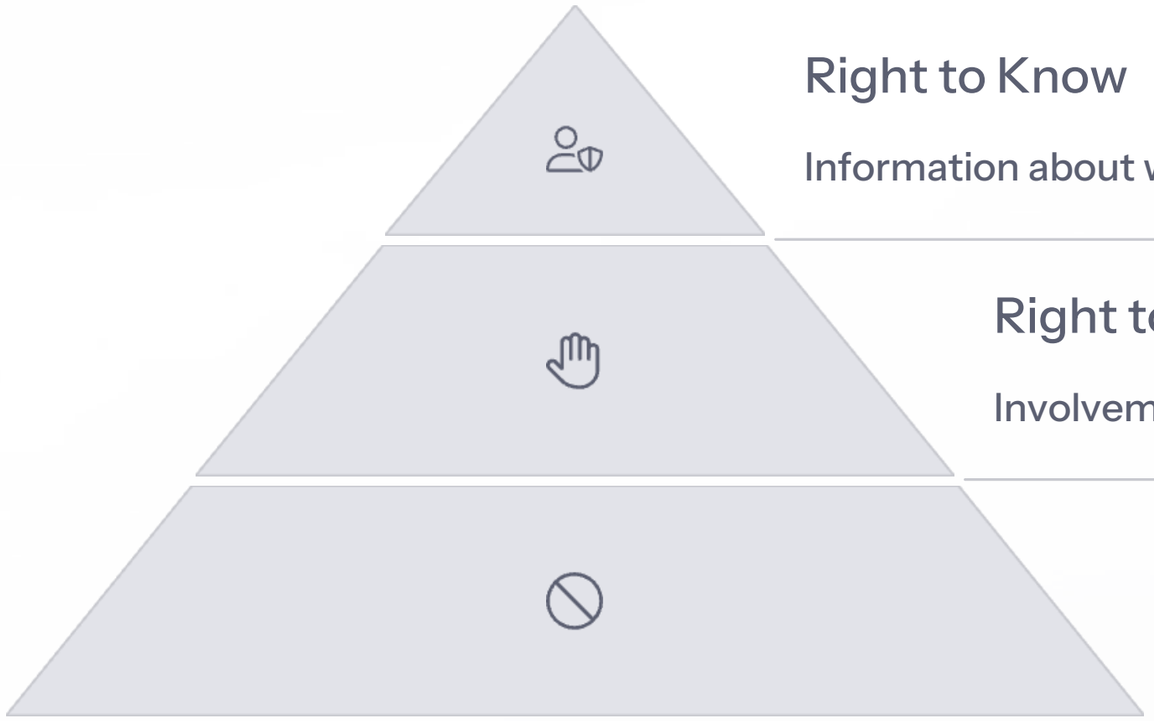
- Manual shut-off valves
- Pressure regulators
- Safety shut-off valves
- Vent valves
- Pressure switches
- Proving devices

Application

Required for non-certified appliances and when upgrading existing equipment

Configurations vary based on input rating, application type, and safety requirements

Worker Protection Under OHSA



Right to Know

Information about workplace hazards

Right to Participate

Involvement in health and safety programs

Right to Refuse

Declining unsafe work without reprisal

SAFETY TRAINING

For Owners

Employer Responsibilities Under OHSA

Provide Safe Equipment

Ensure all tools and equipment meet safety standards

2 Establish Procedures

Develop and implement safe work practices

Train Workers

Provide adequate instruction on hazards and safety

Supervise Effectively

Monitor work to ensure compliance with safety procedures

Trades Qualification Requirements

Licensing Levels

Provincial trades qualification acts establish different certification levels for gas technicians

Each level permits specific types of work and installations

Training Requirements

Mandated education and practical experience hours

Examinations to verify knowledge and competence

Scope Limitations

Clear definitions of what work can be performed by each trade and certification level

Restrictions on crossing into other trade domains

Renewal Process

Continuing education requirements

Regular recertification to maintain current knowledge

Propane Tanks Under Pressure Vessels Act

Registration

All propane tanks must be registered with provincial authorities

Inspection

Regular examination by certified inspectors

Certification

Must bear appropriate certification stamps

Recertification

Periodic testing and recertification requirements

Welding Regulations for Gas Piping

Welder Certification

Under the Boiler and Pressure Vessels Act, only certified welders can perform welding on gas piping systems

Certification requires specific training and testing for pressure piping applications

Welding Procedures

All welding must follow approved procedures that meet code requirements

Procedures must be documented and available for inspection

- Material specifications
- Joint preparation
- Welding process parameters
- Post-weld treatment

Inspection Requirements

Welded connections must be inspected according to code requirements

May include visual inspection, radiography, or other non-destructive testing methods

Propane Transport Requirements

Vehicle Specifications

Special requirements for vehicles transporting propane

Hazard Placarding

Proper identification of dangerous goods being transported

Documentation

Required shipping papers and emergency response information

Driver Training

Specialized certification for transporting dangerous goods

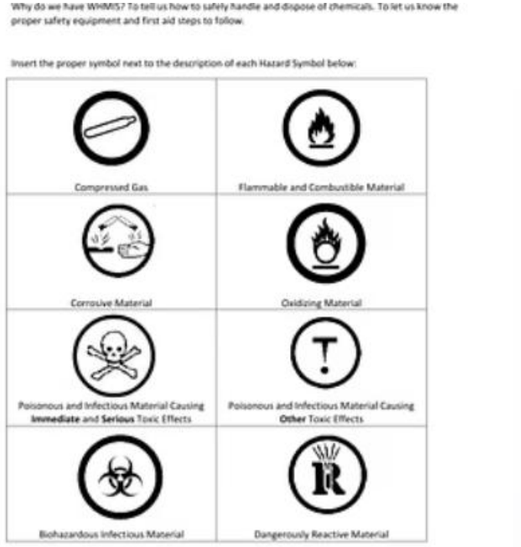
Route Restrictions

Limitations on where propane can be transported

Emergency Equipment

Required safety equipment for transport vehicles

WHMIS Labeling Requirements


Why do we have WHMIS? To tell us how to safely handle and dispose of chemicals. To let us know the proper safety equipment and first aid steps to follow.

Insert the proper symbol next to the description of each Hazard Symbol below:

Compressed Gas	Flammable and Combustible Material
Corrosive Material	Oxidizing Material
Poisonous and Infectious Material Causing **Immediate** and **Serious** Toxic Effects	Poisonous and Infectious Material Causing **Other** Toxic Effects
Biohazardous Infectious Material	Dangerously Reactive Material

WHMIS Education and Training

1

General Education

Understanding WHMIS principles and symbols

Workplace-Specific Training

Procedures for specific hazardous materials

Refresher Training

Regular updates on changing requirements

Safety Data Sheet Requirements

SDS Sections

1. Identification
2. Hazard identification
3. Composition/information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls/personal protection

SDS Sections (continued)

1. Physical and chemical properties
2. Stability and reactivity
3. Toxicological information
4. Ecological information
5. Disposal considerations
6. Transport information
7. Regulatory information
8. Other information

Accessibility Requirements

Must be readily available to workers

Updated when new information becomes available

Required for all hazardous products in the workplace

Must be in both official languages (English and French)

Manufactured Home Installation Considerations

Space Constraints

CSA Z240.4.1 addresses the unique challenges of limited space in manufactured homes

Special clearance requirements that differ from standard residential installations

Ventilation Challenges

Specific requirements for ensuring adequate combustion air in factory-built housing

May require direct vent appliances or dedicated air intake systems

Mobility Considerations

Standards for gas connections that accommodate potential movement of the structure

Requirements for securing appliances against movement during transport

Access Requirements

Specifications for service access to gas appliances and connections

May require special access panels or installation locations

Recreational Vehicle Propane Systems

Storage Requirements

Specifications for propane cylinder mounting and protection

Distribution System

Standards for piping, fittings, and pressure regulation

Appliance Installation

Requirements for cooking, heating, and refrigeration equipment

Testing Procedures

Leak testing and system verification protocols

RV Types Covered by CSA Z240.4.2

Folding Camping Trailers

Collapsible trailers with canvas sides and propane systems for cooking and heating

Fifth-Wheel Trailers

Large trailers that connect to a pickup truck bed with comprehensive propane systems

Motor Homes

Self-propelled recreational vehicles with integrated propane systems for multiple appliances

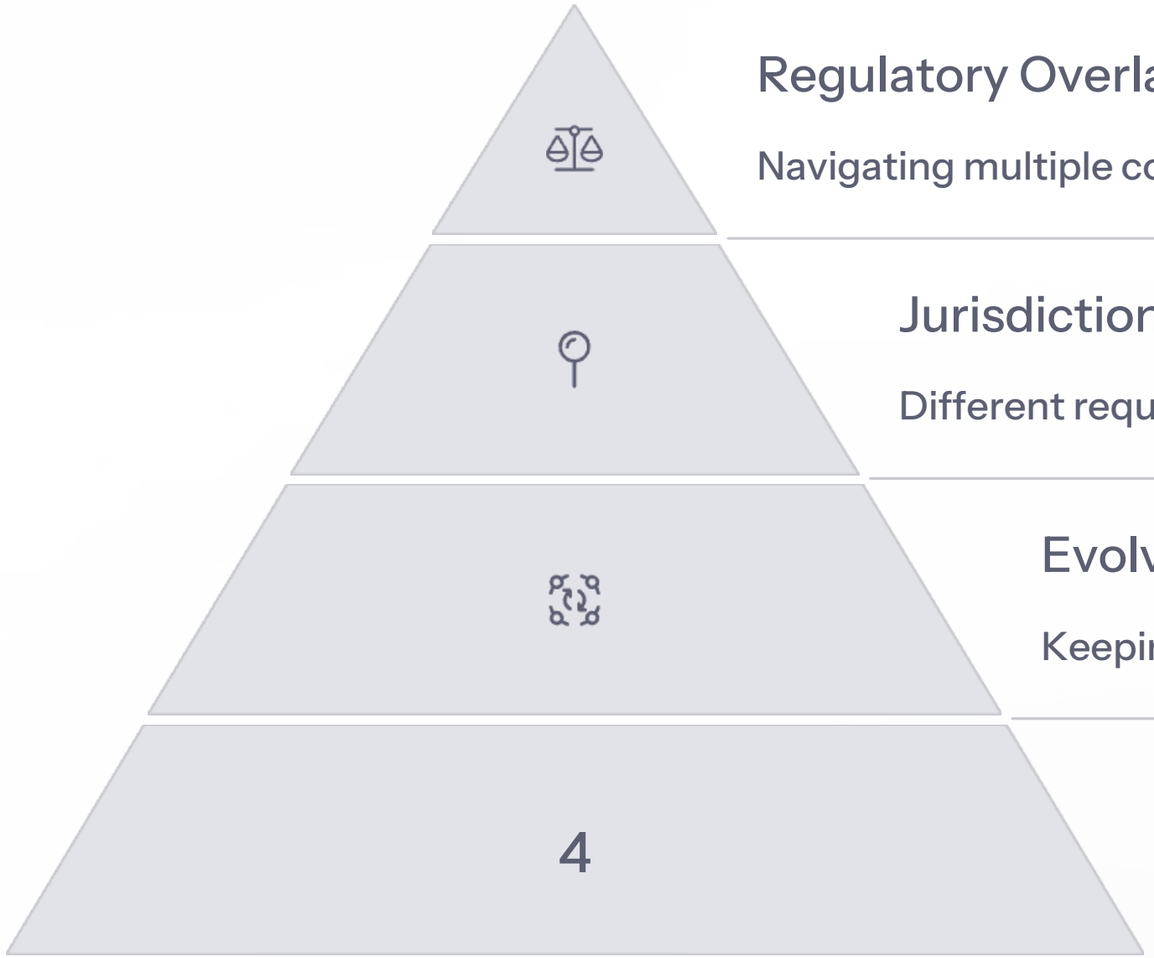
Truck Campers

Units that mount in pickup truck beds with compact propane systems

Travel Trailers

Towable RVs with propane systems for cooking, heating, and refrigeration

Compliance Challenges for Gas Technicians



Regulatory Overlap

Navigating multiple codes and regulations

Jurisdictional Variations

Different requirements across provinces

Evolving Standards

Keeping current with changing regulations

Documentation Requirements

Maintaining proper records for multiple authorities

Strategies for Regulatory Compliance

Continuous Education

Regularly update knowledge of codes and regulations through formal training and industry publications

Participate in manufacturer training sessions for specific equipment

Documentation Systems

Maintain organized records of permits, inspections, and compliance documentation

Develop checklists based on multiple code requirements to ensure comprehensive compliance

Professional Networking

Establish relationships with inspectors and regulatory authorities

Participate in industry associations to stay informed of regulatory changes

Digital Resources

Utilize mobile applications and online tools for code reference and compliance verification

Subscribe to regulatory update services for immediate notification of changes

Consequences of Non-Compliance

$10K+

Potential Fines

Regulatory penalties for code violations

100%

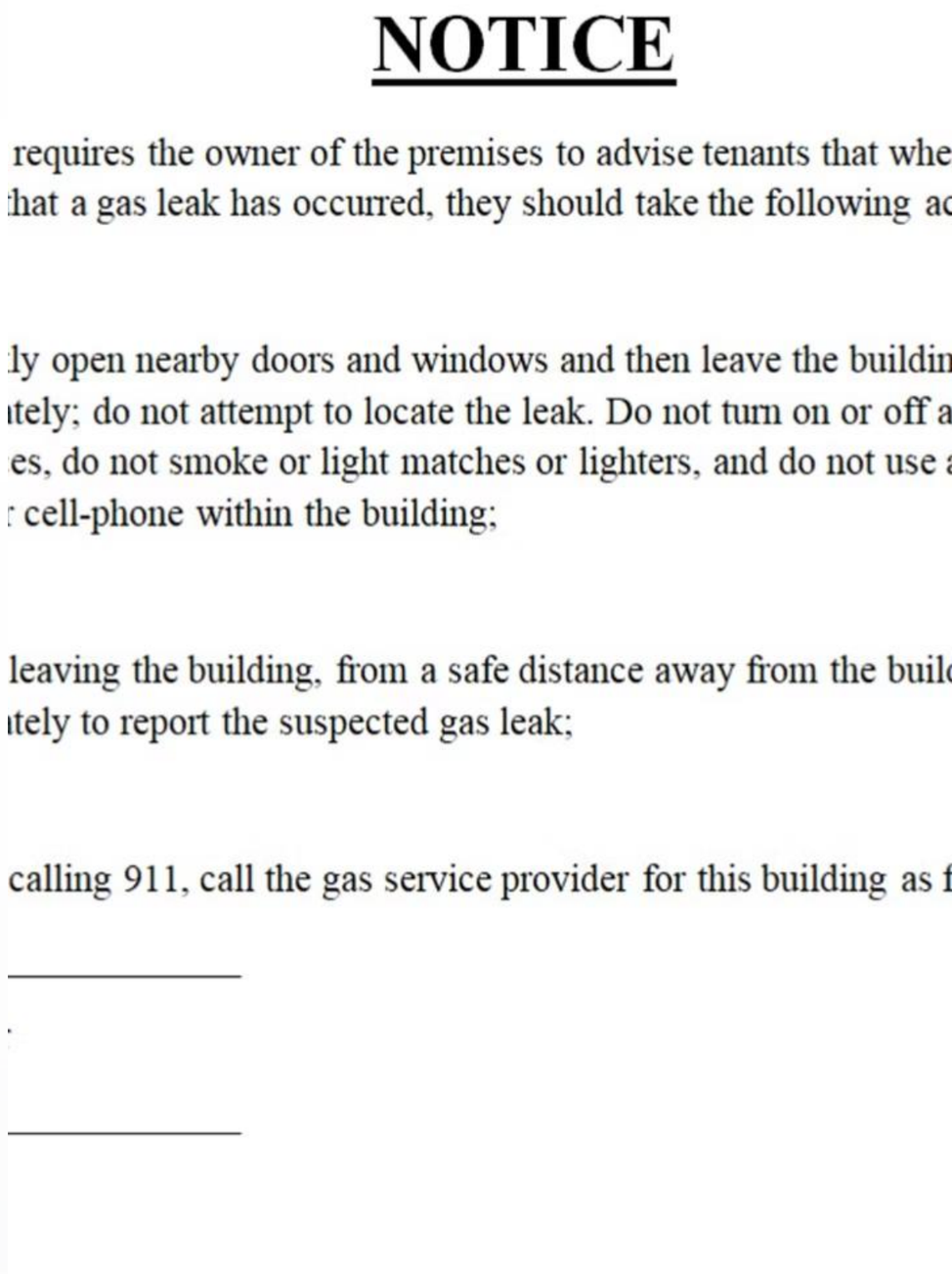
Liability Exposure

Personal and professional responsibility for incidents

0

Insurance Coverage

Amount typically provided for non-compliant installations



NOTICE

requires the owner of the premises to advise tenants that whe
hat a gas leak has occurred, they should take the following ac

ly open nearby doors and windows and then leave the buildin
tely; do not attempt to locate the leak. Do not turn on or off a
es, do not smoke or light matches or lighters, and do not use a
cell-phone within the building;

leaving the building, from a safe distance away from the build
tely to report the suspected gas leak;

calling 911, call the gas service provider for this building as f

Inspection and Enforcement Mechanisms

Permit Review

Initial assessment of planned work

Site Inspections

Physical verification of compliance

Violation Notices

Documentation of non-compliance issues

Enforcement Actions

Penalties and remediation requirements

Coordination Between Regulatory Authorities

Building Department

Oversees structural and ventilation requirements

Issues building permits and occupancy certificates

Coordinates with gas authorities on chimney and ventilation approvals

Gas Authority

Regulates gas piping and appliance installations

Issues gas permits and conducts specific inspections

Works with electrical inspectors on appliance connections

Electrical Authority

Oversees electrical connections to gas equipment

Issues electrical permits for gas appliance installations

Coordinates with gas inspectors on control systems

Future Trends in Gas and Propane Regulation

Environmental Considerations

Increasing focus on emissions and efficiency standards

Digital Compliance Tools

Electronic permitting and inspection systems

International Harmonization

Greater alignment with global standards

Smart Appliance Integration

New regulations for connected gas equipment

Resources for Code and Regulatory Information

Official Publications

- CSA Group standards and codes
- Provincial regulatory documents
- Technical Safety Authority bulletins

Industry Associations

- Canadian Gas Association
- Propane Gas Association of Canada
- Heating, Refrigeration and Air Conditioning Institute of Canada

Training Providers

- Technical training institutes
- Manufacturer training programs
- Continuing education courses

Digital Resources

- Online code subscription services
- Mobile reference applications
- Regulatory update newsletters

Keeping Current with Regulatory Changes

Regular Code Cycles

Most codes are updated on a 3-5 year cycle

Bulletin Subscriptions

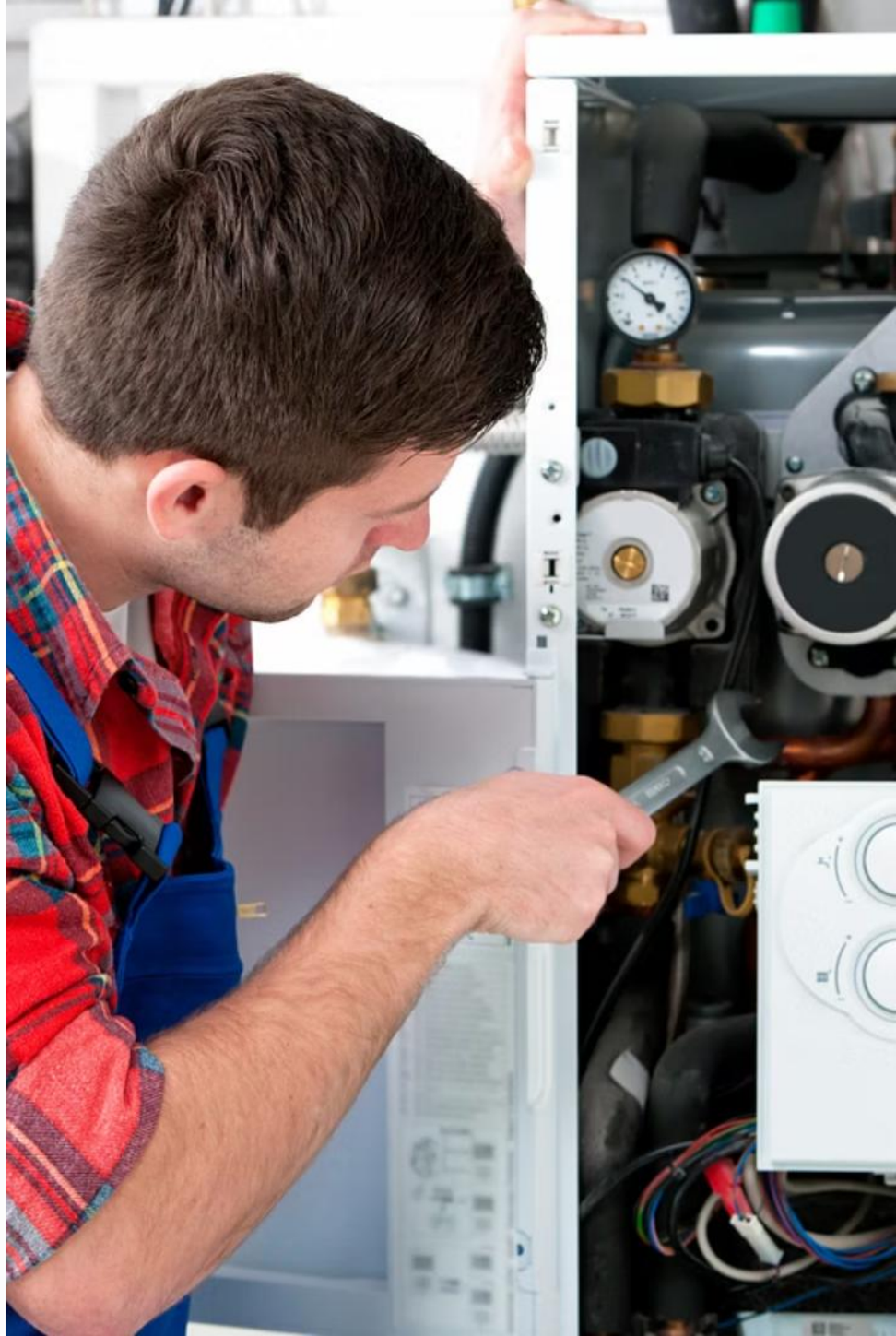
Sign up for regulatory authority notifications

Association Membership

Join industry groups that provide regulatory updates

Continuing Education

Participate in regular code update training



Practical Application of Multiple Codes

Project Assessment

Determine which codes and regulations apply to the specific installation

Consider building type, appliance specifications, and jurisdictional requirements

Comprehensive Planning

Create installation plans that address all applicable code requirements

Identify potential conflicts between different regulatory standards

Permit Acquisition

Obtain all necessary permits from relevant authorities

Building, gas, electrical, and pressure vessel permits as required

Coordinated Inspections

Schedule inspections in the proper sequence to ensure comprehensive compliance

Address any deficiencies promptly and according to inspector guidance

Summary of Additional Codes, Acts, and Regulations

Building Codes

Ventilation, chimneys, and clearances

Electrical Codes

Connections, circuits, and safety

CSA B149.3

Field approval of fuel-burning appliances

OHSA

Worker safety and protection

Trades Qualification

Licensing and scope of work

Pressure Vessels

Tank and piping standards

Transportation

Dangerous goods handling

WHMIS

Hazardous materials information