



Gas Safety

Syllabus

For

Gas Appliance Service

Certificate of Qualification Examination

(Formerly Class C)

1. Prerequisites to obtain a gas appliance service certificate of qualification

An applicant for a gas appliance service certificate of qualification must have successfully completed a course in gas appliance service training acceptable to a provincial safety manager.

2. Scope of work that may be performed by an individual holding a gas appliance service certificate of qualification

A gas appliance service certificate of qualification entitles the holder to perform the servicing of the following gas systems while employed by a licensed gas contractor or under an appropriate permit:

- a. gas appliances installed for residential use, or
- b. light commercial appliances up to an input of 82 kW (280,000 Btu).

The gas appliance service certificate of qualification is intended for the servicing (maintenance) and repair of gas fired residential and light commercial appliances. It does not allow or include the following:

- a. the installation of new or replacement appliances,
- b. the installation of gas piping, and
- c. the repair or installation of venting.

An appliance service technician certification is not a prerequisite to a Class B gas fitter certification. Individuals who acquire this certification and wish to obtain a class B gas fitter certification must also complete a recognized apprenticeship program.

3. Subject Areas of Study

[Safety Standards Act](#), [Safety Standards General Regulation](#) and [Gas Safety Regulation](#).

	Percentage (%) on exam
3.1 Regulations	5%
3.1.1	Appliance Service Technician Qualification Permissions
3.1.2	Appliance Service Technician Qualification Responsibilities
3.1.3	Contractor Licenses
3.1.4	Safety Manager and Safety Officer powers
3.1.5	Additional provincial technical requirements
3.1.6	Appliance certification
3.2 Gas Properties	5%
3.2.1	Contents (Natural & Propane)
3.2.2	Specific Gravity

3.2.3	Flammable Limits	
3.2.4	Ignition Temperature	
3.2.5	Flame Speed	
3.2.6	Toxicity	
3.2.7	State (Liquid and Gaseous)	
3.3	Combustion	10%
3.3.1	Perfect Combustion	
3.3.2	Products of Combustion and Volumes	
3.3.3	Air Required	
3.3.4	Carbon Monoxide	
3.3.5	Air (Combustion, Excess and Dilution)	
3.3.6	Flue Gas Analyzers and Analysis	
3.3.7	Combustion Efficiency	
3.4	Regulators	13%
3.4.1	Principle of Operation	
3.4.2	Types-Service, Line Pressure, Appliance	
3.4.3	Low Pressure Systems	
3.4.4	Two Stage Propane regulation	
3.4.5	2 PSIG	
3.4.6	High Pressure	
3.4.7	Venting of Regulators	
3.4.8	Sizing	
3.5	Venting Systems and Air Supply for Appliances	4%
3.5.1	Purposes	
3.5.2	Types of Venting Systems and Principles	
3.5.3	House as a System and Residential Depressurization	
3.5.4	Draft Control	
3.5.5	Materials	
3.5.6	Direct Vent	
3.5.7	Installation Practices	
3.5.8	Fan, Forced and Induced	
3.5.9	Vent Sizing	
3.5.10	Combustion Air Sizing	
3.5.11	Make-up Air Sizing up to 400 MBTU	
3.5.12	Make-up Air Systems	
3.6	Pipe and Tubing Systems and Fittings	4%
3.6.1.1	Materials and Practices	
3.6.1.2	Joints and Appliance Connections	
3.6.1.3	Volume and Pressure Drop	
3.6.1.4	Sizing Tables	
3.6.1.5	Sizing Low and 2 PSIG	
3.6.1.6	Manual Shut-offs	
3.6.1.7	Flexible Metallic Connectors and Hoses	
3.6.1.8	Testing Piping Systems	

3.7 Electrical

15%

- 3.7.1 Electrical Theory
- 3.7.2 AC and DC
- 3.7.3 Magnetism
- 3.7.4 Series & Parallel Circuits
- 3.7.5 Symbols
- 3.7.6 Diagrams, Schematic and Ladder
- 3.7.7 Millivolt Systems
- 3.7.8 24 Volt Systems
- 3.7.9 Circuit Testing
- 3.7.10 Polarity and Phasing
- 3.7.11 Thermocouples
- 3.7.12 Powerpiles and Pilot Generators
- 3.7.13 Components and Wiring
- 3.7.14 Flame Rectification
- 3.7.15 Troubleshooting Electrical Circuits

3.8 Appliances

15%

- 3.8.1 B.C. Gas Code (Part 7 B149.1)
- 3.8.2 Hot Air Furnaces and Duct Systems
- 3.8.3 Boilers and Hot Water Heating
- 3.8.4 Domestic Water Heaters, Storage and Tankless
- 3.8.5 Residential Cooking Appliances
- 3.8.6 Clothes Dryers
- 3.8.7 Fireplaces
- 3.8.8 Commercial Cooking Appliances (ranges, salamanders, deep fat fryers, char broilers, steamers, stockpot burners, wok cookers, griddles & convection ovens)
- 3.8.9 Unit Heaters
- 3.8.10 Roof Top Units
- 3.8.11 Barbeques
- 3.8.12 Infrared Heating
- 3.8.13 Gas Refrigerators
- 3.8.14 Conversion from other Fuels
- 3.8.15 Direct Vent Space Heaters
- 3.8.16 Wall Furnaces
- 3.8.17 Miscellaneous Appliances

3.9 Burners

5%

- 3.9.1 Principles
- 3.9.2 Primary & Secondary Air (Requirements and Adjustments)
- 3.9.3 Pilot Burners
- 3.9.2 Burner Types
- 3.9.5 Lifting, Flashback & Problems
- 3.9.6 Orifice Types
- 3.9.7 Pressure and Orifices

- 3.9.8 Orifice Tables & Sizing
- 3.9.9 Input & Output
- 3.9.10 Converting (Natural gas to/from Propane)
- 3.9.11 High Altitude

3.10 Controls

10%

- 3.10.3.1 Pilot Valves
- 3.10.3.2 Limit Controls and Safety Switches
- 3.10.3.3 Electric Valves
- 3.10.3.4 Non-Electric Valves
- 3.10.5 Combination Valves
- 3.10.6 Water Heater Valves
- 3.10.7 Gas Range Valves
- 3.10.8 Oven Controls (Thermostats)
- 3.10.9 Oven Safety Controls
- 3.10.10 Griddle Thermostats
- 3.10.11 Deep Fat Fryer Thermostats
- 3.10.12 Boiler/Hot Water Aquastats
- 3.10.13 Fireplace Control Valves
- 3.10.14 Safety Shutoff Valves
- 3.10.15 Flame Safeguard Systems
- 3.10.16 Flame Rods
- 3.10.17 Hot Surface Ignitors
- 3.10.18 Spark Control Modules
- 3.10.19 Hot Surface Ignitor Modules

3.11 Appliance Servicing

11%

- 3.11.1 Wiring Diagrams
- 3.11.2 Lubricating Gas Valves
- 3.11.3 Controls
- 3.11.4 Ignition Systems
- 3.11.5 Troubleshooting Millivolt Systems
- 3.11.6 Troubleshooting Electrical Problems
- 3.11.7 Troubleshooting Venting Problems
- 3.11.8 Troubleshooting Appliance Operation
- 3.11.9 Troubleshooting Gas Fireplaces
- 3.11.10 Troubleshooting Burner Operation
- 3.11.11 Checking Regulators (Operation and Lock-up)
- 3.11.12 Checking Heat Exchangers
- 3.11.13 Commission of Appliances (Pressure set-up, Temperature Rise, Air Adjustment, Stack Temperature, Motor Amperage, CO, CO₂, O₂)
- 3.11.14 Fan Motors
- 3.11.15 Adjusting Fan Belts

3.12 Meter Clocking

3%

- 3.12.1 Gas Meter Operation
- 3.12.2 Metric and Standard Meters
- 3.12.3 Rotary Meters
- 3.12.4 Clocking Formula
- 3.12.5 Clocking Low Pressure
- 3.12.6 Pressure Correction Factor
- 3.12.7 Clocking 2 PSIG
- 3.12.8 Clocking High Pressure