Gas Safety

Syllabus

for

Class B Gas Fitter

Certificate of Qualification Examination

September 13, 2004
1. **Prerequisites to obtain a class B gas fitter certificate of qualification**

   An applicant for a class B gas fitter’s certificate of qualification must meet the requirements of the *Safety Standards Act* and applicable regulation.

2. **Scope of class B gas fitter certificate of qualification**

   A class B gas fitter’s certificate of qualification shall entitle the holder, while employed by a gas contractor, to install and alter:

   2.1 atmospheric appliances with draft hoods which bear the certification mark of an approved testing agency;
   2.2 other appliances and vents up to and including 220 kW, (750,000 Btu’s);
   2.3 piping and atmospheric vents.

3. **Subject Areas of Study**

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<th>Percentage (%) on Exam</th>
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<tr>
<td><strong>3.1 Safety Standards Act and applicable regulation</strong></td>
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<tr>
<td>3.1.1 Certificates of qualification</td>
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<td>3.1.2 Duties of licensed gas contractor and permit holder</td>
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<td>3.1.3 Requirements for permits</td>
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<td>3.1.4 Regulated product standards and certification</td>
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<td>3.1.5 Inspections</td>
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<td>3.1.6 Technical requirements</td>
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<td>3.1.7 Fees</td>
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<tr>
<td><strong>3.2 Gas Properties</strong></td>
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<tr>
<td>3.2.1 Sources, Contents (Natural &amp; Propane)</td>
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<td>3.2.2 Specific Gravity</td>
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<td>3.2.3 Flammable Limits</td>
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<td>3.2.4 Ignition Temperature</td>
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<td>3.2.5 Flame Speed</td>
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<td>3.2.6 Toxicity</td>
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<td>3.2.7 State (liquid &amp; gaseous)</td>
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</table>
3.3 **Combustion**
3.3.1 Perfect Combustion
3.3.2 Products of Combustion & Volumes
3.3.3 Air Required
3.3.4 CO
3.3.5 Air (Combustion, excess & dilution)
3.3.6 Flue Gas Analysis
3.3.7 Combustion Efficiency

5%

3.4 **Regulators**
3.4.1 Principle of Operation
3.4.2 Types-Service, System, Appliance
3.4.3 2psig & Higher
3.4.4 Relief & Vents
3.4.5 Sizing
3.4.6 Regulations

5%

3.5 **Appliances**
3.5.1 B.C. Gas Code (Part 6 B149)
3.5.2 Hot Air Furnaces & Duct Systems
3.5.3 Boilers (Pool Htrs) & HW Heating
3.5.4 Water Heating, Storage & Instantaneous
3.5.5 Residential Gas Range
3.5.6 Clothes Dryers
3.5.7 Fireplaces (all types)
3.5.8 Commercial Kitchen Appliances
3.5.9 Make-up Air (Direct & Indirect)
3.5.10 Infra Red Heating
3.5.11 Conversion from other Fuels
3.5.12 Miscellaneous Appliances

5%

3.6 **Combustion Air Sizing**
3.6.1 Regulations
3.6.2 Sizing under 400m
3.6.3 Sizing over 400m
3.6.4 Louver Sizing

5%
### Venting Sizing

- **3.7.1 Purposes**
- **3.7.2 Principles**
- **3.7.3 House as a System**
- **3.7.4 Draft Control**
- **3.7.5 Materials**
- **3.7.6 Sizing Tables & Notes**
- **3.7.7 Sizing Multiple**
- **3.7.8 Direct Vent**
- **3.7.9 Installation**
- **3.7.10 Fan, Forced & Induced**
- **3.7.11 Regulations**
- **3.7.12 Vent Sizing**

#### Burners

- **3.8.1 Principles**
- **3.8.2 Lifting, Flashback & Problems**
- **3.8.3 Orifice Types**
- **3.8.4 Pressure & Orifice**
- **3.8.5 Orifice Tables & Sizing**
- **3.8.6 Input & Output**
- **3.8.7 Converting (Natural to/from Propane)**
- **3.8.8 High Altitude**

#### Meter Clocking

- **3.9.1 Gas Meter Operation**
- **3.9.2 Metric Meters**
- **3.9.3 Clocking Formula**
- **3.9.4 Clocking Low Pressure**
- **3.9.5 Pressure Correction**
- **3.9.6 Clocking High Pressure**

#### Controls

- **3.10.1 Electric Valves**
- **3.10.2 Non-electric Valves**
- **3.10.3 Combination Valves**
- **3.10.4 Water Heater Valves**
- **3.10.5 Gas Range Valves**
- **3.10.6 Flame Safeguard Systems & Purpose**
- **3.10.7 Thermocouples**
- **3.10.8 Pilot Generators**
- **3.10.9 Flame Rods**
- **3.10.10 Spark Control Modules**
### 3.11 Electrical
- **3.11.1** Electrical Theory  
- **3.11.2** AC & DC  
- **3.11.3** Magnetism  
- **3.11.4** Circuits, Series & Parallel  
- **3.11.5** Symbols  
- **3.11.6** Diagrams, Schematic & Ladder  
- **3.11.7** Millivolt  
- **3.11.8** Meters & Trouble Shooting  
- **3.11.9** Polarity & Phasing  
- **3.11.10** Single Thermocouples  
- **3.11.11** Pilot Generators  
- **3.11.12** Millivolt Trouble Shooting  

#### Percentage (%) on Exam
- **10%**

### 3.12 Pipe Sizing
- **3.12.1** Related Regulations  
- **3.12.2** Materials (Natural & Propane)  
- **3.12.3** Joining Pipe  
- **3.12.4** Flow & Pressure Drop  
- **3.12.5** Sizing Tables  
- **3.12.6** Sizing Low & 2psig  
- **3.12.7** High Pressure (Combined)  
- **3.12.8** Manual Shut-offs  
- **3.12.9** Testing Piping  
- **3.12.10** Cathodic Protection  
- **3.12.11** Pipe Sizing  

#### Percentage (%) on Exam
- **20%**

### 3.13 Servicing
- **3.13.1** Wiring diagrams  
- **3.13.2** Controls  
- **3.13.3** Ignition Systems  
- **3.13.4** Trouble Shooting Electrical Problems  
- **3.13.5** Trouble shooting Venting Problems  
- **3.13.6** Trouble Shooting Appliance Operation  
- **3.13.7** Trouble Shooting Burner Operation  
- **3.13.8** Checking Regulators  

#### Percentage (%) on Exam
- **5%**

**Total**  
- **100%**

### B.C. Electrical Code Regulation 2002
- **20 questions**