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COURSE 962908

Weatherization Guide Chapters 3 & 4

Exam Material

Uscontractorlicense LLC

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Summary Of This Course

WEATHERIZATION GUIDE CHAPTERS 3 & 4

Approved by the

Wisconsin Department of Safety and Professional Services Safety and Buildings Division

Course Identification Number 962908

Educational Credit Hours: 6 Hours

Course Provider:

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Chapters 3 and 4 of the Weatherization Field Guide emphasize improving energy efficiency, occupant safety, and equipment performance through proper installation, testing, and maintenance of heating systems and household appliances. Chapter 3 focuses on replacing, servicing, and diagnosing furnaces, boilers, heat pumps, and distribution systems. It stresses accurate equipment sizing, duct sealing and insulation, combustion safety testing, airflow verification, steady-state efficiency measurements, carbon monoxide testing, proper venting, condensate management, and compliance with manufacturer instructions and applicable codes. Regular maintenance, combustion analysis, and customer education are essential for safe, efficient operation.

Chapter 4 addresses electrical baseload measures that reduce household energy consumption. It covers the installation and replacement of high-efficiency refrigerators, freezers, lighting, and clothes washers using approved energy-efficient equipment. The chapter emphasizes proper removal and recycling of obsolete appliances, safe installation practices, verification of equipment performance, and maximizing long-term energy savings while maintaining customer safety, comfort, and reliable operation.

This Course is approved for the following electrical Registrations/Certifications or Licenses:

Dwelling Contractor Qualifier	6 Hours of Continuing Education	
Commercial Building Inspector	6 Hours of Continuing Education	
UDC HVAC Inspector	6 Hours of Continuing Education	

This course is a distance learning or e-learning course, which allows the attendee to complete the course on their time schedule.

Course Outline

This course is a distance learning or e-learning course, which allows the attendee to complete the course on their time schedule.

3.12 Replacing Space Heaters

3.13 Replacing Wood Stoves

3.14 Venting Combustion Gases

3.15 Combustion Air

- **3.15.1 Unconfined Space Combustion Air**
- **3.15.2 Confined Space Combustion Air**
- **3.15.3 Net -Free Area**
- **3.15.4 Sizing Combustion-Air Openings**

3.16 Thermostats

Chapter 4: Base Load Measures

Exam

180 questions related to the reference materials are used to test the attendee on their comprehension of the materials. A 70% score will need to be attained in order to pass this course.

Answer Sheet(s)

2 bubble style answer sheets are included. When you are finished with the exam, you may return the answer sheets for grading to:

By Mail: Uscontractorlicense LLC
PO Box 268
Platteville, Wisconsin 53818

By Email: michael@uscontractorlicense.com

By Fax: 608-571-0096

Once we get the answer sheets back, we will graded them, enter your hours into the attendance portal and email or mail you back your certificate of completion(s). You will be responsible for renewing your license with the DSPS at www.license.wi.gov website.

Any questions, please contact us at 608.348.6688

Weatherization Guide Chapters 3 & 4 Exam

Questions 1 thru 4 can be found in Section 3.1 - Heating and Cooling Systems

1. What is the primary focus of Chapter 3?

A. Air sealing only
B. Electrical upgrades only
C. Heating and cooling system improvements
D. Roofing replacement

2. Heating and cooling work should be completed by:

A. Homeowners
B. General laborers
C. Volunteers
D. Qualified professionals

3. Which testing must be completed on all heating systems?

A. Blower door testing only
B. Refrigerant testing only
C. Combustion safety testing
D. Pressure pan testing only

4. Gas and oil heating systems also require:

A. Radon testing
B. Duct blasting
C. Water quality testing
D. Steady-state efficiency (SSE) testing

Questions 5 thru 28 can be found in Section 3.2 - General Heating System Replacement

5. Replacement heating systems must meet minimum efficiency standards listed in the:

A. NEC
B. ASHRAE Handbook
C. AHRI Directory of Certified Product Performance
D. EPA Energy Guide

6. Wood heater installations must comply with:

A. NFPA 13
B. NEC 250
C. NFPA 211
D. OSHA 1926

7. Before removing an existing heating system, workers should disconnect:

A. Fuel supply only
B. Electrical only
C. Ducts only
D. All applicable utilities including refrigerant, plumbing, electrical, ducts, vents, and fuel

8. New heating systems must be installed according to:

A. Customer preference
B. Manufacturer instructions only
C. Local code only
D. Manufacturer instructions and applicable state and local codes

9. Existing fuel supply lines should be:

A. Always replaced
B. Eliminated
C. Left disconnected
D. Reused whenever possible

10. Existing heating equipment should be:

A. Stored in the basement
B. Sold to the homeowner
C. Left in place
D. Properly removed and disposed of

11. A replacement heating system must include:

A. A warranty card only
B. Maintenance log only
C. An owner's manual located on or near the unit
D. A duct diagram

12. Heating equipment sizing should be based on:

A. Existing furnace size
B. Customer preference
C. Neighboring homes
D. Post-retrofit heating load calculations

13. An acceptable sizing method includes:

A. ACCA Manual D
B. Manual S only
C. ACCA Manual J
D. Manual N

14. Boiler sizing should consider:

A. Roof insulation
B. Foundation type
C. Terminal device capacity and domestic hot water load
D. Window style

15. Gas piping must comply with:

A. NEC only
B. OSHA only
C. NFPA 54 and Wisconsin Uniform Dwelling Code
D. IRC only

16. Existing CSST that is improperly bonded must be:

A. Removed
B. Painted
C. Wrapped
D. Bonded to the electrical grounding system

17. New heating equipment requires:

A. Shared lighting circuit
B. Extension cord
C. Multi-plug adapter
D. A dedicated electrical circuit

18. Condensate pumps may share:

A. Kitchen circuit
B. Bathroom GFCI
C. Laundry circuit
D. The heating system's dedicated circuit

19. Flue gas oxygen, stack temperature, and CO levels should be:

A. Ignored
B. Estimated
C. Compared with previous systems
D. Adjusted to manufacturer's specifications

20. Tested steady-state efficiency should:

A. Equal room temperature
B. Match blower speed
C. Meet or exceed rated AFUE
D. Equal fuel pressure

21. Condensate piping should terminate at:

A. Outside grade
B. Roof drain
C. Sump pump
D. An appropriate drain

22. A condensate pump should be installed when:

A. Always
B. Never
C. Gravity drainage is not adequate or creates a tripping hazard
D. The furnace is over 100,000 BTU

23. Chimney openings from removed appliances should be:

A. Left open
B. Covered with insulation
C. Used for storage
D. Sealed and marked as no longer functional

24. Remaining naturally vented appliances must:

A. Be replaced
B. Be disconnected
C. Have larger vents
D. Draft properly

25. Heating system safety mechanisms should be:

A. Replaced annually
B. Ignored
C. Disabled
D. Tested for proper operation

26. Customers should receive:

A. Utility rebates only
B. New thermostat only
C. Warranty registration
D. Operation, maintenance, and safety instruction

27. A service tag must include:

A. Furnace model only
B. AFUE rating only
C. Fuel type only
D. Service organization name, address, phone number, and installation date

28. Heating systems in crawl spaces should be:

A. Installed after insulation
B. Installed after vapor barriers
C. Left until final inspection
D. Completed before other crawl-space work

Questions 29 thru 30 can be found in Section 3.3 - Forced-Air Furnace Replacement

29. Furnace fan speed should be adjusted to maintain:

A. Maximum blower noise
B. Lowest airflow
C. Highest gas pressure
D. Manufacturer temperature rise limits

30. Holes through the furnace jacket should be sealed using:

A. Masking tape
B. Silicone only
C. Cardboard
D. UL 181 foil tape or mastic

Questions 31 thru 44 can be found in Section 3.4.1 - Forced-Air Furnace Air Distribution

31. Ductwork modifications may be needed when:

A. Furnace color changes
B. Filter is new
C. Temperature rise remains outside specifications
D. Fuel price increases

32. Supply ducts should generally be:

A. Oversized
B. Flexible only
C. Routed through attics
D. As short as practical

33. Registers should be located where they are:

A. Behind furniture
B. Near closets
C. High on ceilings
D. Least likely to be blocked

34. Return air grilles should preferably be located:

A. Crawl space
B. Garage
C. Attic
D. Central heated area of the main floor

35. New duct systems should be designed according to:

A. Manual J
B. Manual S
C. Manual N
D. ANSI/ACCA Manual D

36. Duct terminations should follow:

A. NEC
B. OSHA
C. ANSI/ACCA Manual T
D. Manual J

37. Supply registers should NOT be added to:

A. Bedrooms
B. Living rooms
C. Hallways
D. Combustion Appliance Zones (unless intentionally heated)

38. Return grilles should:

A. Always be added to CAZs
B. Be oversized
C. Vent attics
D. Not be installed in the CAZ

39. Supply and return ducts should be mechanically fastened using:

A. Glue
B. Staples
C. Nails
D. Screws

40. Furnace-to-duct joints should be sealed using:

A. Cloth tape only
B. Packing tape
C. Rope
D. UL 181-approved materials such as mastic

41. New ducts in unconditioned spaces should be insulated to at least:

A. R-4
B. R-6
C. R-5
D. R-8

42. Ductwork exposed to the exterior should be insulated to:

A. R-8
B. R-10
C. R-6
D. R-12

43. New branch supply ducts should include:

A. Smoke detector
B. Thermostat
C. Pressure switch
D. Balancing damper

44. Building spaces such as crawl spaces should:

A. Always be used as plenums
B. Replace return ducts
C. Increase airflow
D. Not be used as plenums or ducts

Questions 45 thru 53 can be found in Section 3.4.2 - Duct Leakage

45. The preferred target when testing duct leakage with a pressure pan is:

A. Less than 10 Pascals
B. Less than 5 Pascals
C. Less than 2 Pascals
D. Less than 1 Pascal at each register or grille

46. Which duct leaks should receive the highest priority for sealing?

A. Interior conditioned-space supply ducts
B. Basement ceiling leaks
C. Ducts located outside the pressure boundary
D. Return grilles in conditioned space

47. Return duct leakage in the combustion appliance zone (CAZ) can:

A. Improve efficiency
B. Increase furnace output
C. Depressurize the CAZ and increase backdrafting risk
D. Eliminate combustion gases

48. Supply duct leakage to the outside may:

A. Improve indoor air quality
B. Reduce furnace temperature
C. Depressurize the CAZ and introduce moisture into unheated spaces
D. Increase AFUE

49. Return duct leaks in unheated spaces can:

A. Improve ventilation
B. Increase combustion efficiency
C. Draw pollutants into the home's air stream
D. Prevent condensation

50. The preferred material for sealing ducts is:

A. Cloth duct tape
B. Aluminum tape only
C. Silicone only
D. Duct mastic

51. Mastic should generally be applied at least:

A. 1/32 inch thick
B. 1/8 inch thick
C. 1/4 inch thick
D. 1/16 inch thick

52. Reinforcing mesh or UL 181 tape should be used on joints wider than:

A. 1/4 inch
B. 1/2 inch
C. 1 inch
D. 1/8 inch

53. Tape alone should not be relied upon because it:

A. Increases airflow
B. Reduces insulation
C. Improves leakage
D. Will not reliably hold duct joints together long term

Questions 54 thru 57 can be found in Section 3.4.3 - Duct Insulation

54. Ducts in unconditioned spaces should be insulated to:

A. R-4
B. R-6
C. R-10
D. R-8 minimum

55. Exterior exposed ducts require insulation of at least:

A. R-6
B. R-8
C. R-10
D. R-12

56. Duct insulation should be installed:

A. Before duct sealing
B. Without sealing joints
C. After painting
D. After completing duct sealing

57. Bare duct surfaces in unconditioned spaces should:

A. Be painted
B. Remain exposed
C. Be wrapped with plastic
D. Be fully insulated

Questions 58 thru 70 can be found in Section 3.4.4 - Measuring System Air Flow

58. Furnace airflow significantly affects:

A. Gas meter readings
B. Fuel color
C. Chimney height
D. Temperature rise

59. Low airflow commonly causes:

A. Higher AFUE
B. Lower static pressure
C. Excessive temperature rise
D. Better comfort

60. A common cause of low airflow is:

A. Clean filters
B. Properly sized ducts
C. New blower motor
D. Dirty furnace filter

61. Another common cause of low airflow is:

A. Proper return ducts
B. Balanced registers
C. Dirty evaporator (A) coil
D. Low outdoor temperature

62. Restricted supply ducts can result in:

A. Lower furnace efficiency only
B. Better comfort
C. Reduced airflow
D. Increased humidification

63. Before measuring airflow, technicians should:

A. Replace the furnace
B. Remove all registers
C. Ask occupants about comfort problems
D. Replace the thermostat

64. Before airflow testing, technicians should inspect:

A. Windows
B. Roof shingles
C. Plumbing
D. Filters, blower, and A-coil

65. The flow-plate meter measures:

A. Fuel pressure
B. Water pressure
C. Chimney draft
D. Distribution airflow

66. External Static Pressure (ESP) measures:

A. Gas pressure only
B. Fuel input
C. Water pressure
D. Resistance to airflow through the duct system

67. ESP equals:

A. Supply pressure only
B. Return pressure only
C. Difference between gas pressures
D. The sum of the absolute values of supply and return pressures

68. Increasing ESP generally causes:

A. Higher airflow
B. Better combustion
C. Higher AFUE
D. Lower airflow

69. Manufacturer maximum ESP for most standard air handlers is approximately:

A. 0.10 IWC
B. 0.25 IWC
C. 0.75 IWC
D. 0.50 IWC

70. An ESP above approximately 1.0 IWC may indicate:

A. Perfect airflow
B. Excellent duct sizing
C. Low fuel pressure
D. Restricted ductwork or plugged filters/coils

Questions 71 thru 75 can be found in Section 3.4.5 - Measuring Temperature Rise

71. Temperature rise is calculated by:

A. Return minus supply
B. Outdoor minus return
C. Furnace minus room
D. Supply temperature minus return temperature

72. Temperature rise testing should be performed:

A. Immediately after startup
B. Before ignition
C. During blower cleaning
D. After the furnace reaches steady state

73. Return air temperature is measured:

A. At the chimney
B. At the register
C. In the return drop before the filter
D. Outside the home

74. Supply temperature should be measured:

A. At the thermostat
B. Inside the burner
C. Within six feet of the supply plenum
D. At the chimney cap

75. When several main ducts exist, use:

A. The average reading
B. The lowest reading
C. Outdoor temperature
D. The highest supply temperature reading

Questions 76 thru 81 can be found in Section 3.4.6 - Filters

76. Minimum furnace filter rating supplied to customers is:

A. MERV 2
B. MERV 4
C. MERV 5
D. MERV 6 or higher

77. One acceptable filter option is:

A. One disposable filter only
B. Two fiberglass filters
C. No filter
D. Six disposable 1–2 inch filters

78. Another acceptable option is:

A. Window filter
B. Furnace screen
C. Foam insert
D. One washable filter

79. Filters should:

A. Be loosely installed
B. Cover half the intake
C. Require tools to replace
D. Completely cover the blower intake or return

80. Filters should be:

A. Permanently attached
B. Hidden
C. Difficult to remove
D. Easy to replace

81. Magnetic filter covers are acceptable only if they:

A. Increase airflow
B. Are decorative
C. Are painted
D. Provide an adequate air seal

Questions 82 thru 99 can be found in Section 3.5 - Boiler Replacement

82. Boiler replacement requires completion of:

A. Radon checklist
B. Pressure pan checklist
C. Blower door checklist
D. Hot Water Boiler Replacement Checklist

83. Boiler sizing should consider:

A. Roof color
B. Window style
C. Design heat loss and room-by-room heat loss
D. Number of smoke alarms

84. Existing boiler systems should be flushed:

A. Only if leaking
B. Never
C. Every month
D. Until water runs clean or per manufacturer instructions

85. Isolation valves should be installed:

A. Only on return piping
B. At the chimney
C. At the thermostat
D. Near the boiler supply and return connections

86. Each heating zone should have:

A. One thermostat only
B. No shutoff valve
C. Shared circulator
D. Its own shutoff valve

87. Pressure relief valves should be:

A. Decorative only
B. Sized by customer preference
C. Omitted on new boilers
D. Properly rated and sized for the boiler

88. A backflow preventer is required on the:

A. Supply plenum
B. Flue connector
C. Condensate line
D. Feed-water side of the boiler fill system

89. The drain opening on a backflow preventer should face:

A. Ceiling
B. Wall
C. Boiler
D. The floor

90. A boiler system should include a properly sized:

A. Blower motor
B. Draft inducer
C. Zone thermostat
D. Expansion tank

91. The circulator pump should be installed:

A. Before the expansion tank on the suction side
B. At the chimney
C. On the return only
D. Near the downstream side of the expansion tank

92. Return-water temperature for oil boilers should remain above:

A. 100°F
B. 120°F
C. 130°F
D. 150°F

93. Return-water temperature for non-condensing gas boilers should remain above:

A. 90°F
B. 110°F
C. 130°F
D. 160°F

94. Piping bypasses or mixing valves help prevent:

A. Air leakage
B. Draft loss
C. Fuel starvation
D. Condensation inside the boiler

95. Condensing boilers require:

A. Masonry chimneys only
B. Single-wall vent pipe
C. Atmospheric venting
D. Condensation-resistant venting with condensate drains

96. Piping between a boiler and an indirect water heater should be:

A. Left bare
B. Painted
C. Wrapped in plastic
D. Insulated

97. Boilers installed below grade should be:

A. Installed directly on the floor
B. Installed below flood level
C. Hidden behind walls
D. Installed above known flood levels whenever practical

98. Before installing a replacement boiler, the chimney should be inspected for:

A. Paint color
B. Roof pitch
C. Window clearances
D. Proper sizing and deterioration

99. Standard-efficiency boilers should receive a full-closure electric vent damper:

A. Never
B. Only if required by the customer
C. Only on propane systems
D. Where feasible

Questions 100 thru 106 can be found in Section 3.5.1 - High-Efficiency (≥ 90%+) Boilers

100. High-efficiency boilers generally have efficiencies of:

A. 70% or higher
B. 80% or higher
C. 85% or higher
D. 90% or higher

101. High-efficiency boilers are commonly called:

A. Atmospheric boilers
B. Gravity boilers
C. Draft boilers
D. Condensing boilers

102. Lower return-water temperatures in condensing boilers:

A. Reduce efficiency
B. Increase gas consumption
C. Eliminate combustion
D. Increase condensation and efficiency

103. Outdoor reset controls adjust:

A. Gas pressure
B. Chimney draft
C. Blower speed
D. Supply-water temperature according to outdoor temperature

104. The outdoor temperature sensor should generally be installed on a:

A. South wall
B. East wall
C. Roof
D. North-facing exterior wall

105. High-efficiency boiler water chemistry may require testing for:

A. Chlorine only
B. Oxygen only
C. Humidity only
D. pH, hardness/TDS, or inhibitor treatment

106. Water distribution systems should be flushed using:

A. Bleach
B. Vinegar
C. Soap
D. Manufacturer-recommended treatment chemicals

Questions 107 thru 117 can be found in Section 3.6 - Hydronic Distribution Systems

107. Hydronic distribution systems include:

A. Refrigerant piping only
B. Electrical conduit only
C. Chimney liners
D. Supply and return piping, circulator, expansion tank, and heat emitters

108. Dividing a home into heating zones generally:

A. Reduces comfort
B. Increases fuel use
C. Eliminates thermostats
D. Improves energy efficiency

109. Radiators should be:

A. Removed
B. Ignored
C. Painted annually
D. Inspected and repaired or replaced as necessary

110. Air should be removed from:

A. Chimneys
B. Fuel lines
C. Thermostats
D. Radiators and the entire hydronic system

111. Hydronic systems should be checked for:

A. Window leaks
B. Roof damage
C. Foundation cracks
D. Distribution system leaks

112. Additional heat emitters may be required to:

A. Increase chimney draft
B. Improve blower airflow
C. Reduce thermostat settings
D. Allow lower water temperatures and rated boiler efficiency

113. Hydronic systems should include:

A. Only manual air vents
B. No air vents
C. Roof vents
D. Automatic and manual air-bleed valves

114. New piping may be extended to:

A. Garages only
B. Attics only
C. Crawl spaces only
D. Conditioned additions and finished basements

115. Thermostatically controlled radiator valves may be installed to:

A. Increase chimney draft
B. Raise gas pressure
C. Eliminate circulation
D. Improve temperature control and efficiency

116. Hot-water piping up to 1½ inches should receive:

A. ½-inch insulation
B. 1-inch insulation
C. 2-inch insulation
D. 1½-inch fiberglass insulation

117. Steam piping larger than 1½ inches should receive:

A. 1-inch insulation
B. 1½-inch insulation
C. 2-inch insulation
D. 3-inch fiberglass insulation

Questions 118 thru 135 can be found in Section 3.7 - Boiler Efficiency and Maintenance

118. Boiler efficiency decreases because of:

A. New insulation
B. Proper combustion
C. Correct draft
D. Corrosion and scale on heat exchangers

119. Modern high-efficiency boilers require maintenance:

A. Every 10 years
B. Every 5 years
C. Only after failure
D. Annually

120. One recommended maintenance item is checking for:

A. Loose siding
B. Roof leaks
C. Window condensation
D. Leaks on the boiler and connected piping

121. A magnetic filter installed on return piping helps prevent:

A. Air leakage
B. Draft loss
C. Gas leaks
D. Heat exchanger scaling

122. Replacing old circulator pumps with ECM models primarily improves:

A. Combustion
B. Chimney draft
C. Ventilation
D. Electrical efficiency

123. Dirty gauge glass on a steam boiler should be:

A. Painted
B. Ignored
C. Covered
D. Removed, cleaned, and replaced

124. Noticeable fireside dirt should be:

A. Painted
B. Left alone
C. Covered
D. Cleaned from the heat exchanger

125. Boiler doors and cleanout covers should be checked for:

A. Paint
B. Color
C. Height
D. Air leakage

126. Boiler water should be drained until:

A. Tank is empty
B. Pressure reaches zero
C. Pump stops
D. Water flows clean

127. Hot-water boilers should have what pressure-rated relief valve?

A. 10 psi
B. 15 psi
C. 20 psi
D. 30 psi

128. Typical acceptable expansion tank air pressure is:

A. 2–8 psi
B. 8–10 psi
C. 25–35 psi
D. 12–22 psi

129. Rust in the vent system may indicate:

A. Excess airflow
B. Low humidity
C. High efficiency
D. Condensation from low return-water temperatures

130. Boilers should not:

A. Have thermostats
B. Be insulated
C. Use circulators
D. Cycle repeatedly on the high limit

131. Water leaks in boiler systems should be:

A. Ignored
B. Monitored only
C. Painted
D. Repaired

132. Excess combustion air can reduce:

A. Safety
B. Water pressure
C. Chimney height
D. Boiler efficiency

133. Low-limit boiler controls should generally not be used unless:

A. Boiler is electric
B. Boiler is outdoors
C. Boiler has ECM pumps
D. The boiler also heats domestic hot water

134. Outdoor reset controllers can improve:

A. Roof drainage
B. Gas piping
C. Thermostat wiring
D. Boiler operating efficiency

135. Air trapped in hydronic systems should be removed by:

A. Opening the relief valve
B. Increasing gas pressure
C. Closing all valves
D. Bleeding radiators and piping through air vents

Questions 136 thru 142 can be found in Section 3.8.1 - Gas-Fired Heating System Installation

136. Gas-fired heating system replacements should also follow:

A. Plumbing chapter only
B. Electrical chapter only
C. Roofing standards
D. General Heating System Replacement requirements

137. Replacement gas furnaces require completion of the:

A. Boiler Inspection Checklist
B. Duct Leakage Checklist
C. Pressure Pan Checklist
D. Replacement Gas Furnace Checklist

138. Clearances between heating equipment and combustibles must comply with:

A. NEC
B. OSHA
C. IRC
D. NFPA 54

139. Clocking the gas meter is primarily used to verify:

A. Chimney height
B. Static pressure
C. Airflow
D. Actual gas input (BTU input)

140. Input gas pressure should be checked while:

A. Only the furnace is running
B. No appliances are operating
C. Windows are open
D. All gas-fired appliances are operating

141. Manifold gas pressure should remain:

A. At maximum possible pressure
B. Below manufacturer specifications
C. Above 10 IWC
D. Within the manufacturer's specified range

142. Venting systems should be installed according to:

A. Customer preference
B. Local plumbing code only
C. Manufacturer instructions only
D. Manufacturer instructions and NFPA 54

Questions 143 thru 145 can be found in Section 3.8.2 - Condensate Removal

143. Whenever practical, condensate should be removed by:

A. Condensate pump
B. Sump pump
C. Ground discharge
D. Gravity drain directly to an approved drain

144. Condensate pumps are used when:

A. Gravity drainage is possible
B. The furnace is over 90% efficient
C. Every installation requires one
D. Gravity drainage is not practical

145. Condensate should discharge into:

A. The ground
B. Storm sewer
C. Sump pump
D. The sanitary sewer system through an approved receptor with an air gap

Questions 146 thru 153 can be found in Section 3.8.3 - Testing and Servicing Gas-Fired Systems

146. Gas-fired burners generally should be cleaned and tuned:

A. Every year
B. Every 10 years
C. Only when replaced
D. Every two to four years

147. Soot, melted insulation, and rust near burners may indicate:

A. High efficiency
B. Good combustion
C. Proper draft
D. Flame rollout or combustion-gas spillage

148. Burners should be inspected for:

A. Paint color
B. Cabinet finish
C. Filter size
D. Dust, debris, misalignment, and flame impingement

149. Combustion gases should be sampled using:

A. Thermometer
B. Pressure pan
C. Smoke pencil
D. A calibrated flue-gas analyzer

150. Steady-state efficiency, oxygen, CO, and flue-gas temperature should all be:

A. Estimated
B. Ignored
C. Averaged
D. Measured and recorded

151. The natural gas meter should be clocked with:

A. All appliances operating
B. Windows open
C. Furnace off
D. Other gas appliances turned off

152. After combustion testing, technicians should:

A. Leave test holes open
B. Cover with insulation
C. Paint over them
D. Seal all test holes

153. Chimney draft should be measured:

A. At the thermostat
B. At the filter
C. At the blower
D. Downstream of the draft diverter

Questions 154 thru 157 can be found in Table 3-2

154. Typical oxygen levels for properly operating gas appliances are:

A. 0–2%
B. 2–3%
C. 10–15%
D. 4–9%

155. Carbon monoxide (air-free) should generally not exceed:

A. 50 ppm
B. 100 ppm
C. 200 ppm
D. 400 ppm

156. Typical steady-state efficiency for 90+ furnaces is:

A. 75–80%
B. 80–85%
C. 86–90%
D. 92–97%

157. Burner maintenance should be performed when:

A. CO exceeds limits
B. Soot is present
C. Burners are dirty
D. All of the above

Questions 158 thru 159 can be found in Troubleshooting CO

158. High CO in one burner chamber should first prompt adjustment of the:

A. Fan speed
B. Thermostat
C. Expansion tank
D. Primary air shutter

159. Excessive carbon buildup requires:

A. Painting the heat exchanger
B. Increasing thermostat setting
C. Replacing filters only
D. Cleaning combustion surfaces and inspecting the heat exchanger

Questions 160 thru 162 can be found in Table 3-3

160. Weak draft with CAZ depressurization may result from:

A. Oversized filters
B. High humidity
C. Proper return ducts
D. Return duct leaks and exhaust appliances

161. Weak draft without CAZ depressurization may indicate:

A. Oversized furnace
B. Dirty filter
C. Excess insulation
D. Blocked or leaking chimney

162. Stack temperatures that are too high or too low may require adjustment of:

A. Thermostat batteries
B. Water pressure
C. Chimney height
D. Fan speed or gas pressure

Questions 163 thru 164 can be found in Measuring BTU Input

163. Natural gas BTU input is determined by:

A. Reading manifold pressure only
B. Measuring airflow
C. Measuring draft
D. Timing gas meter dial revolutions

164. If measured gas input differs by more than 10% from the nameplate:

A. Replace the furnace
B. Ignore it
C. Increase airflow only
D. Adjust gas pressure within manufacturer limits

Questions 165 thru 180 can be found in Chapter 4

165. Chapter 4 primarily addresses:

A. Plumbing systems
B. Electrical systems
C. Indoor air quality
D. Structural components of buildings

166. Structural inspections are intended to identify:

A. Decorating opportunities
B. Appliance warranties
C. Landscaping needs
D. Conditions affecting safety and durability

167. Structural repairs should maintain:

A. Cosmetic appearance only
B. Lowest possible cost
C. Existing damage
D. Structural integrity of the building

168. Masonry inspections include evaluation of:

A. Paint color
B. Flooring
C. Cabinets
D. Cracks, movement, and deterioration

169. Foundation movement commonly appears as:

A. Ceiling stains
B. Window tinting
C. Carpet wear
D. Cracks and displacement

170. Chimneys should be inspected for:

A. Wallpaper
B. Cabinet hardware
C. Flooring
D. Structural stability and deterioration

171. Wood framing should be checked for:

A. Paint color
B. Wallpaper adhesion
C. Roof shingles only
D. Rot, insect damage, and structural defects

172. Steel structural members should be inspected for:

A. Moisture only
B. Paint color
C. Wallpaper damage
D. Corrosion and structural deterioration

173. Concrete components should be evaluated for:

A. Wallpaper adhesion
B. Carpet wear
C. Appliance operation
D. Cracking, spalling, and deterioration

174. Structural deficiencies should be:

A. Ignored if minor
B. Hidden with finishes
C. Painted
D. Corrected before weatherization compromises safety

175. Structural repairs should comply with:

A. Customer preference
B. Appliance manuals
C. Paint specifications
D. Applicable building codes and accepted construction practices

176. Structural members should safely support:

A. Decorations only
B. HVAC equipment only
C. Plumbing only
D. All intended design loads

177. Water damage should be addressed because it can:

A. Improve insulation
B. Increase efficiency
C. Strengthen wood
D. Lead to structural deterioration

178. Structural inspections should identify:

A. Furniture placement
B. Paint brands
C. Appliance colors
D. Conditions requiring repair before weatherization

179. Major structural defects should be:

A. Covered with insulation
B. Ignored until later
C. Painted over
D. Evaluated and repaired before proceeding

180. The primary objective of Chapter 4 structural requirements is to ensure:

A. Faster installation
B. Lower material cost
C. Better appearance only
D. A safe, durable structure capable of supporting weatherization measures