

FLORIDA BUILDING CODE

Mechanical / Energy Technical Core Summary

Participant Guide

June 2004

Version 1.0 (1 hour)



**Florida Building Commission
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100
(850) 487-1824**

Preface

This document supports the **2004 Florida Building Code, Mechanical** and **Florida Building Code, Building, Chapter 13: Energy**. These instructional materials are not intended to provide basic code training but rather to highlight differences from the 2001 *Florida Building Code, Mechanical* and 2001 *Florida Building Code, Chapter 13: Energy* to the 2004 *Florida Building Code, Mechanical* and the 2004 *Florida Building Code, Building, Chapter 13: Energy*. The *Florida Building Code, Mechanical* is based on the *International Mechanical Code*®, and there are significant changes between the 2000 and 2003 *International Mechanical Codes*®. This module is the result of the work of a number of professionals and is intended for a 1-hour continuing education program.

The Florida Building Commission Mechanical and Energy Technical Advisory Committee members have been provided copies of these materials for solicitation of their feedback.

A special thank-you is extended to Ms. Ann Stanton, Department of Community Affairs, Codes and Standards, for her input, review and feedback.

Products referenced in this course are for illustration only and are not an endorsement, warrant, or representation by the author or instructor that the product meets the requirements of the 2004 *Florida Building Code, Mechanical* or the 2004 *Florida Building Code, Building, Chapter 13: Energy*. Use of all products requires the approval of the local jurisdictional authority.

For more information regarding the Florida Building Code contact:

Florida Building Commission, Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 487-1824

To obtain a complete copy of the 2004 Florida Building Code contact The Florida Department of Community Affairs Building Code Information System web site:

<http://www.floridabuilding.org>

The Florida Energy Extension Service worked with Building A Safer Florida, Inc. under contract to the Florida Building Commission through the Florida Department of Community Affairs to develop version 1.0 of this program. Mr. Craig Miller coordinated development of the program and Ms. Barbara Haldeman provided layout and design services.

Table of Contents

2004 Florida Building Code, Mechanical	2
2004 Florida Building Code, Residential: Chapter 11, Energy Efficiency	21
2004 Florida Building Code, Building: Chapter 13, Energy Efficiency	22
2004 Florida Building Code, Residential	48
Course evaluation	51



2004 Florida Building Code, Mechanical/Energy

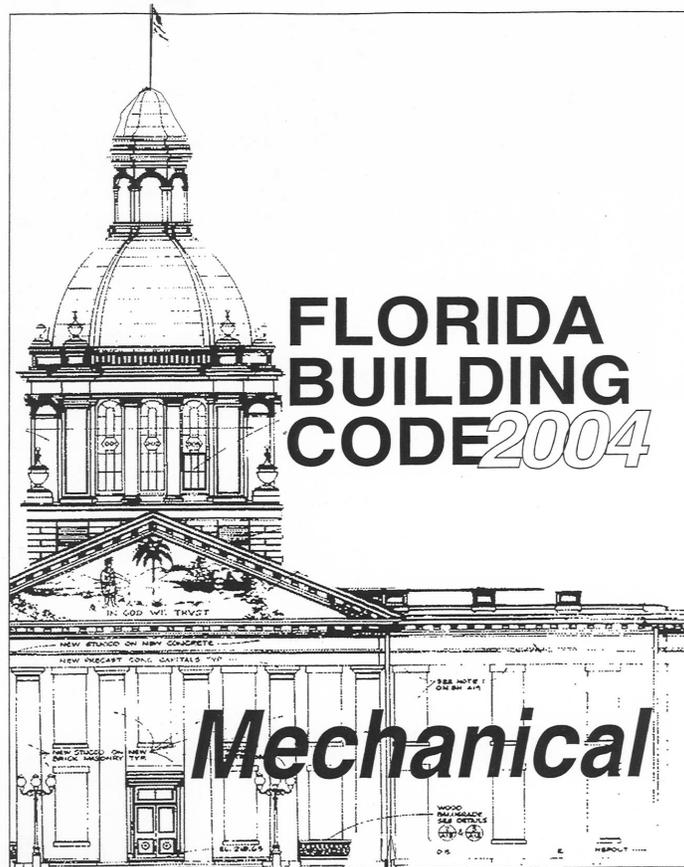
Technical Core Summary

(1 hour)
June 2004

The following Technical Core "summary" of the 2004 Florida Building Code, Mechanical/Energy is intended to provide an overview of those changes from the 2001 versions of the Florida Building Code. The changes highlighted in this presentation are by no means a complete review of all the changes in the 2004 Florida Building Code, Mechanical or Chapter 13: Energy Efficiency in the Florida Building Code, Building. It is advised that each participants review the 2004 Florida Building Code in its entirety.

2004 Florida Building Code

Mechanical



Florida Building Code, Mechanical Chapter 3: General Regulations

302 PROTECTION OF STRUCTURE

- 302.3 Cutting, notching and boring in wood framing.
 - 302.3.4 Engineered wood products.
 - Notches, cuts and holes are generally prohibited.
- 302.4 Alterations to trusses.

304 INSTALLATION

- 304.4 Hydrogen generating and refueling operations. (Hydrogen appliances/refueling)

CHAPTER 3 GENERAL REGULATIONS

SECTION 302 PROTECTION OF STRUCTURE

302.3 Cutting, notching and boring in wood framing.

302.3.4 Engineered wood products. Cuts, notches and holes bored in trusses, laminated veneer lumber, glue-laminated members and I-joists are prohibited except where the effects of such alterations are specifically considered in the design of the member.

[B] 302.4 Alterations to trusses. Truss members and components shall not be cut, drilled, notched, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g., HVAC equipment, water heaters) shall not be permitted without verification that the truss is capable of supporting such additional loading.

SECTION 304 INSTALLATION

304.4 Hydrogen generating and refueling operations. Ventilation shall be required in accordance with Section 304.4.1, 304.4.2 or 304.4.3 in public garages, private garages, repair garages, automotive motor-fuel-dispensing facilities and parking garages which contain hydrogen generating appliances or refueling systems. Such spaces shall be used for the storage of not more than three hydrogen-fueled passenger motor vehicles and have a floor area not exceeding 850 square feet. The maximum rated output capacity of hydrogen generating appliances shall not exceed 4SCFM of hydrogen for each 250 square feet of floor area in such spaces. Such equipment and appliances shall not be installed in Group H occupancies except where the occupancy is specifically designed for hydrogen use, or in control areas where open-use, handling or dispensing of combustible, flammable or explosive materials occurs. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Florida Building Code, Mechanical Chapter 3: General Regulations

- 306.5 Equipment and appliances on roofs or elevated structures.
 - Permanent ladders installed to provide the required access has been added.
 - Ladders shall comply with the 7 minimum design criteria.

CHAPTER 3 GENERAL REGULATIONS

SECTION 306 ACCESS AND SERVICE SPACE

306.5 Equipment and appliances on roofs or elevated structures. Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches.
2. Ladders shall have rung spacing not to exceed 14 inches on center.
3. Ladders shall have a toe spacing not less than 6 inches deep.
4. There shall be a minimum of 18 inches between rails.
5. Rungs shall have a minimum 0.75-inch diameter and be capable of withstanding a 300-pound load.
6. Ladders over 30 feet in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot.
7. Ladders shall be protected against corrosion by approved means.

Catwalks installed to provide the required access shall be not less than 24 inches wide and shall have railings as required for service platforms.

Florida Building Code, Mechanical Chapter 3: General Regulations

307 CONDENSATION DISPOSAL

- 307.2.2 Drain pipe materials and sizes.
 - Added Exception:

Exception: On wall mounted ductless split units less than 36,001 Btu/h where the drain line is less than 10 feet in length the factory drain outlet size shall be acceptable from the equipment to the place of disposal.

CHAPTER 3 GENERAL REGULATIONS

SECTION 307 CONDENSATION DISPOSAL

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC or PVC pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Condensate waste and drain line size shall be not less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method. All horizontal sections of drain piping shall be installed in uniform alignment at a uniform slope.

Exception: On wall mounted ductless split units less than 36,001 Btu/h where the drain line is less than 10 feet in length the factory drain outlet size shall be acceptable from the equipment to the place of disposal.

Florida Building Code, Mechanical Chapter 3: General Regulations

312 HEATING AND COOLING LOAD CALCULATIONS

- 312.1 Load calculations.
 - Heating and cooling system design loads for the purpose of sizing systems, appliances and equipment shall be determined in accordance with the requirements of Chapter 13 of the *Florida Building Code, Building*:
 - Commercial: Section 13-407.1.ABC.1
 - Residential: Section 13-607.1.ABC.1

CHAPTER 3 GENERAL REGULATIONS

SECTION 312 HEATING AND COOLING LOAD CALCULATIONS

312.1 Load calculations. Heating and cooling system design loads for the purpose of sizing systems, appliances and equipment shall be determined in accordance with the requirements of Chapter 13 of the *Florida Building Code, Building*:
Commercial: Section 13-407.1.ABC.1 Residential: Section 13-607.1.ABC.1.

Florida Building Code, Mechanical Chapter 4: Ventilation

402 NATURAL VENTILATION

- 402.3 Adjoining spaces.
 - 402.3.1 Bath rooms.
 - Rooms containing bath tubs, showers, spas and similar bathing fixtures shall be mechanically ventilated in accordance with Section 403.
 - **Exception:** Residential bathrooms with windows having no less than 3 square feet of open space.
- 402.4 Openings below grade.
 - Added measurement criteria

CHAPTER 4 VENTILATION

SECTION 402 NATURAL VENTILATION

402.1 Natural ventilation. Natural ventilation of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants.

402.2 Ventilation area required. The minimum open area to the outdoors shall be 4 percent of the floor area being ventilated

402.3 Adjoining spaces. Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining rooms shall be unobstructed and shall have an area not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.3 m²). The minimum operable area to the outdoors shall be based on the total floor area being ventilated.

402.3.1 Bath rooms. Rooms containing bath tubs, showers, spas and similar bathing fixtures shall be mechanically ventilated in accordance with Section 403. Exception: Residential bathrooms with windows having no less than 3 square feet (.28 m²) of open space.

402.4 Openings below grade. Where openings below grade provide required natural ventilation, the outside horizontal clear space measured perpendicular to the opening shall be one and one-half times the depth of the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.

Florida Building Code, Mechanical Chapter 4: Ventilation

403 MECHANICAL VENTILATION

- 403.3 Ventilation rate.
 - Other than Group R-3 (one- and two-family dwellings), ventilation systems shall comply with Table 403.3, "Required Outdoor Ventilation Air"
 - 403.6 Smoke Control Provisions have been moved to Section 513 Smoke Control Systems

CHAPTER 4 VENTILATION

SECTION 403 MECHANICAL VENTILATION

403.3 Ventilation rate. Ventilation systems for other than Group R-3 (one- and two-family dwellings), shall be designed to have the capacity to supply the minimum outdoor air flow rate determined in accordance with Table 403.3 based on the occupancy of the space and the occupant load or other parameter as stated therein.

Florida Building Code, Mechanical

Chapter 5: Exhaust Systems

501 General

- 501.3 Pressure equalization.
 - See Section 601.4 of this code and Section 13-409 of the *Florida Building Code, Building*

502 REQUIRED PROTECTION

- 502.5 Valve-regulated lead-acid batteries.
 - Added requirements/limits
 - See notes

CHAPTER 5 EXHAUST SYSTEMS

SECTION 501 GENERAL

501.3 Pressure equalization. See Section 601.4 of this code and Section 13-409 of the *Florida Building Code, Building*

SECTION 502 REQUIRED SYSTEMS

502.5 Valve-regulated lead-acid batteries. Valve-regulated lead-acid battery systems as regulated by Section 609 of the International Fire Code, shall be provided with ventilation in accordance with Section 502.5.1 or 502.5.2 for rooms and in accordance with Section 502.5.3 or 502.5.4 for cabinets.

[F] 502.5.1 Hydrogen limit in rooms. The ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the room during the worst-case event of simultaneous boost charging of all batteries in the room.

[F] 502.5.2 Ventilation rate in rooms. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot [$0.00508 \text{ m}^3/(\text{s}\cdot\text{m}^2)$] of floor area of the room.

[F] 502.5.3 Hydrogen limit in cabinets. The ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the cabinet during the worst-case event of simultaneous boost charging of all batteries in the cabinet.

[F] 502.5.4 Ventilation rate in cabinets. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot [$0.00508 \text{ m}^3/(\text{s}\cdot\text{m}^2)$] of the floor area covered by the cabinet. The room in which the cabinet is installed shall also be ventilated as required by Section 502.5.1 or 502.5.2.

Florida Building Code, Mechanical Chapter 5: Exhaust Systems

- 504.6 Domestic clothes dryer ducts.
 - Added Exception:
 - Booster fan in accordance with manufacturer's installation instructions
 - Exception also found in *Florida Building Code, Residential* Chapter 15 Exhaust Systems.

CHAPTER 5 EXHAUST SYSTEMS

SECTION 504 CLOTHES DRYER EXHAUST

504.6 Domestic clothes dryer ducts. Exhaust ducts for domestic clothes dryers shall have a smooth interior finish and the maximum developed length shall not exceed 25 feet from the dryer location to the outlet terminal. The maximum length of the duct shall be reduced 2 ½ feet for each 45-degree bend and 5 feet for each 90-degree bend. The exhaust duct shall be a minimum nominal size of 4 inches in diameter. The entire exhaust system shall be supported and secured in place. The male end of the duct at overlapped duct joints shall extend in the direction of airflow. Clothes dryer transition ducts used to connect the appliance to the exhaust duct system shall be limited to single lengths not to exceed 8 feet in length and shall be listed and labeled for the application. Transition ducts shall not be concealed within construction. Developed duct lengths longer than 25 feet shall be allowed for specific dryer installations where the dryer manufacturer's installation instructions specify the allowable developed length of an engineered system.

Exception: Where a clothes dryer booster fan is installed and listed and labeled for the application, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the booster fan manufacturer's installation instructions. Where a clothes dryer booster fan is installed and not readily accessible from the room in which the dryer is located, a permanent identifying label shall be placed adjacent to where the exhaust duct enters the wall. The label shall bear the words "This dryer exhaust system is equipped with a remotely located booster fan."

Florida Building Code, Mechanical Chapter 5: Exhaust Systems

505 DOMESTIC KITCHEN EXHAUST EQUIPMENT

- Added Exception:
 - 2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that the installation complies with all of the following: (see notes)

CHAPTER 5 EXHAUST SYSTEMS

SECTION 505 DOMESTIC KITCHEN EXHAUST EQUIPMENT

505.1 Domestic Systems.

Exceptions:

2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that the installation complies with all of the following:
 - 2.1. The duct shall be installed under a concrete slab poured on grade.
 - 2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.
 - 2.3. The PVC duct shall extend not greater than 1 inch above the indoor concrete floor surface.
 - 2.4. The PVC duct shall extend not greater than 1 inch above grade outside of the building.
 - 2.5. The PVC ducts shall be solvent cemented.

Florida Building Code, Mechanical Chapter 5: Exhaust Systems

506 COMMERCIAL KITCHEN HOOD VENTILATION SYSTEM DUCTS AND EXHAUST EQUIPMENT

- 506.3 Ducts serving Type I hoods.
 - 506.3.1.2 Makeup air ducts.
 - Make up air ducts connecting to or within 18 inches of a Type I hood shall be constructed and installed in accordance with Sections 603.1, 603.3, 603.4, 603.9, 603.10 and 603.12. Duct insulation installed within 18 inches of a Type I hood shall be noncombustible or shall be listed for the application.

CHAPTER 5 EXHAUST SYSTEMS

SECTION 506 COMMERCIAL KITCHEN HOOD VENTILATION SYSTEM DUCTS AND EXHAUST EQUIPMENT

506.3 Ducts serving Type I hoods

506.3.1.2 Makeup air ducts. Make up air ducts connecting to or within 18 inches of a Type I hood shall be constructed and installed in accordance with Sections 603.1, 603.3, 603.4, 603.9, 603.10 and 603.12. Duct insulation installed within 18 inches of a Type I hood shall be noncombustible or shall be listed for the application

Florida Building Code, Mechanical Chapter 5: Exhaust Systems

- 506.3.14.3 Termination location Exception 2 (see notes). Removed
- 506.5 Exhaust equipment. (Added)
 - Fan discharge
 - Fan mounting
 - Clearances – factory-built Exceptions

CHAPTER 5 EXHAUST SYSTEMS

SECTION 506 COMMERCIAL KITCHEN HOOD VENTILATION SYSTEM DUCTS AND EXHAUST EQUIPMENT

506.3.12 Exhaust outlets serving Type I hoods

506.3.12.3 Termination location. Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from parts of the same or contiguous buildings, adjacent property lines and air intake openings into any building and shall be located not less than 10 feet (3048 mm) above the adjoining grade level.

Exception: Exhaust outlets shall terminate not less than 5 feet (1524 mm) from an adjacent building, adjacent property line and air intake openings into a building where air from the exhaust outlet discharges away from such locations.

Removed - The minimum horizontal distance between vertical discharge fans and parapet-type building structures shall be 2' provided that such structures are not higher than the top of the fan discharge opening.

506.5 Exhaust equipment. Exhaust equipment, including fans and grease reservoirs, shall comply with Section 506.5.1 through 506.5.5 and shall be of an approved design or shall be listed for the application.

506.5.2 Exhaust fan discharge. Exhaust fans shall be positioned so that the discharge will not impinge on the roof, other equipment or appliances or parts of the structure. A vertical discharge fan shall be manufactured with an approved drain outlet at the lowest point of the housing to permit drainage of grease to an approved grease reservoir.

506.5.3 Exhaust fan mounting. An upblast fan shall be hinged and supplied with a flexible weatherproof electrical cable to permit inspection and cleaning. The ductwork shall extend a minimum of 18 inches above the roof surface.

506.5.4 Clearances. Exhaust equipment serving a Type I hood shall have a clearance to combustible construction of not less than 18 inches.

Exception: Factory-built exhaust equipment installed in accordance with Section 304.1 and listed for a lesser clearance.

Florida Building Code, Mechanical

Chapter 5: Exhaust Systems

- 506.5.5 Termination location.
 - In accordance with Section 506.3.12.3
 - **Exception:** 2' provided not higher than the top of fan discharge opening

507 COMMERCIAL KITCHEN HOODS

- 507.1 General.
 - Adds Exception 2 and 3.
 - Factory-built recirculating systems
 - Automatic operation where engineered or multi-speed controls

CHAPTER 5 EXHAUST SYSTEMS

SECTION 506 COMMERCIAL KITCHEN HOOD VENTILATION SYSTEM DUCTS AND EXHAUST EQUIPMENT

506.5 Exhaust equipment

506.5.5 Termination location. The outlet of exhaust equipment serving Type I hoods, shall be in accordance with Section 506.3.12.3

Exception: The minimum horizontal distance between vertical discharge fans and parapet-type building structures shall be 2 feet provided that such structures are not higher than the top of the fan discharge opening.

SECTION 507 COMMERCIAL KITCHEN HOODS

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or Type II and shall be designed to capture and confine cooking vapors and residues.

Exceptions:

1. Factory-built commercial exhaust hoods which are tested in accordance with UL 710, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.7, 507.11, 507.12, 507.13, 507.14 and 507.15.
2. Factory-built commercial cooking recirculating systems which are tested in accordance with UL 197, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.12, 507.13, 507.14 and 507.15.
3. Net exhaust volumes for hoods shall be permitted to be reduced during no-load cooking conditions, where engineered or listed multi-speed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section.

Florida Building Code, Mechanical Chapter 6: Duct Systems

601 GENERAL

- 601.4 Balanced return air.
 - Three Exceptions.

CHAPTER 6 DUCT SYSTEMS

SECTION 601 GENERAL

601.4 Balanced Return Air. Restricted return air occurs in buildings when returns are located in central zones and closed interior doors impede air flow to the return grill or when ceiling spaces are used as return plenums and fire walls restrict air movement from one portion of the return plenum to another. Provisions shall be made in both residential and commercial buildings to avoid unbalanced air flows and pressure differentials caused by restricted return air. Pressure differentials across closed doors where returns are centrally located shall be limited to 0.01 inch WC (2.5 pascals) or less. Pressure differentials across fire walls in ceiling space plenums shall be limited to 0.01 inch WC (2.5 pascals) by providing air duct pathways or air transfer pathways from the high pressure zone to the low zone.

Exceptions:

1. Transfer ducts may achieve this by increasing the return transfer 1 1/2 times the cross sectional area (square inches) of the supply duct entering the room or space it's serving and the door having at least an unrestricted 1 inch undercut to achieve proper return air balance.
2. Transfer grilles shall use 50 square inches (of grille area) to 100 cfm (of supply air) for sizing through-the-wall transfer grilles and using an unrestricted 1 inch undercutting of doors to achieve proper return air balance.
3. Habitable rooms only shall be required to meet these requirements for proper balanced return air excluding bathrooms, closets, storage rooms and laundry rooms, except that all supply air into the master suite shall be included.

Florida Building Code, Mechanical Chapter 6: Duct Systems

602 PLENUMS

- 602.2.1 Materials exposed within plenums.
 - Added **Exception #5: Combustible materials enclosed in approved gypsum board assemblies or enclosed in materials listed and labeled for such application.**

CHAPTER 6 DUCT SYSTEMS

SECTION 602 PLENUMS

International Code Council adds Exception 5.

602.2.1 Materials exposed within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.5, materials exposed within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one-and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials enclosed in approved gypsum board assemblies or enclosed in materials listed and labeled for such application.
6. Condensate Pump Units with a total volume not exceeding 2 cubic feet.
7. Loudspeakers, loudspeaker assemblies, and their accessories exposed within a plenum shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a peak heat release rate not greater than 100 kW when tested in accordance with UL 2043.

Florida Building Code, Mechanical Chapter 6: Duct Systems

- 603.4.2 Fibrous Glass Duct, Rigid.
 - 603.4.2.2 Mechanical fastening.
 - Attachments of ductwork to air-handling equipment shall be by mechanical fasteners. Where access is limited, two fasteners on one side shall be acceptable when installed in accordance with Section M603.1.6

CHAPTER 6 DUCT SYSTEMS

SECTION 603 DUCT CONSTRUCTION AND INSTALLATION

Removes words “100 % closure” from 603.4.2 Fibrous glass duct, rigid. All joints, seams and duct wall penetrations including, but not limited to, the joints between sections of duct and the joints between duct and other distribution system components shall be mechanically attached and sealed using approved closure systems as specified in §M603.1.

603.4.2.2 Mechanical fastening. Attachments of ductwork to air-handling equipment shall be by mechanical fasteners. Where access is limited, two fasteners on one side shall be acceptable when installed in accordance with Section M603.1.6.

Florida Building Code, Mechanical Chapter 7: Combustion Air

- *Sections 701 thru 708 of the 2001 Florida Building Code, Mechanical have been replaced with Sections 304.1 – 304.12 of 2003 International Fuel Gas Code (IFGC).*

CHAPTER 7 COMBUSTION AIR

The Florida Building Commission voted to replace Sections 701 thru 708 of Chapter 7 with Sections 304.1-304.12 of the 2003 International Fuel Gas Code. The provisions that are now in Chapter 7 Combustion Air are new. A complete review of these sections are included in the 2003 Florida Building Code, Plumbing/Fuel Gas Technical Core, Chapter 3: General Regulations.

You are advised to review these sections of the code and/or the Plumbing/Fuel Gas Technical Core.

Changes between the 2001 Florida Building Code, Fuel Gas and the 2004 Florida Building Code, Fuel Gas

- **Significant changes:**

Allows serving gas supplier to convert gas equipment to a different gas.

Many additions in Section 304 (IFGS) Combustion, Ventilation and Dilution Air

The section requiring all air for combustion to be provided from outside on building of unusually tight construction was deleted and replaced with calculated volumes using air infiltration rates (304.5)

*New installation requirements for installing outdoor gas appliances consistent with the **National Fuel Gas Code.***

Florida Building Code, Mechanical
Chapter 9: Specific Appliances, Fireplaces and
Solid Fuel-Burning Equipment

916 POOL AND SPA HEATERS

- 916.1 General.
 - Electric pool and spa heaters shall be tested in accordance with UL 1261

CHAPTER 9 SPECIFIC APPLIANCES, FIREPLACES AND SOLID FUEL-BURNING EQUIPMENT

SECTION 916 POOL AND SPA HEATERS

916.1 General. Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired pool and spa heaters shall be tested in accordance with UL 726. Electric pool and spa heaters shall be tested in accordance with UL 1261.

Florida Building Code, Mechanical

Chapter 11: Refrigeration

1101 GENERAL

Added:

- 1101.7 Maintenance.
- 1101.8 Change in refrigerant type.
 - Refrigerant circuit containing more than 220 pounds of Group A1 or 30 pounds of any other group refrigerant shall not be changed without prior notification to the code official
- Table 1103.1, "Refrigerant Classification, Amount and TLV-YWA" completely redone

CHAPTER 11 REFRIGERATION

SECTION 1101 GENERAL

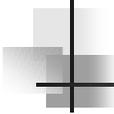
Added:

1101.7 Maintenance. Mechanical refrigeration systems shall be maintained in proper operating condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris and leaks.

1101.8 Change in refrigerant type. The type of refrigerant in refrigeration systems having a refrigerant circuit containing more than 220 pounds of Group A1 or 30 pounds of any other group refrigerant shall not be changed without prior notification to the code official and compliance with the applicable code provisions for the new refrigerant type.

[F] 1101.9 Refrigerant discharge. Notification of refrigerant discharge shall be provided in accordance with the Florida Fire Prevention Code

Table 1103.1 Refrigerant Classification, Amount and TLV-YWA has been replaced and expanded in the 2003 International Mechanical Code. Revised table reflected in *Florida Building Code, Mechanical*.



FLORIDA BUILDING CODE, RESIDENTIAL
CHAPTER 11: ENERGY EFFICIENCY

SECTION 1101 GENERAL

- N1101 Energy Efficiency.
 - The provisions of Chapter 13, *Florida Building Code, Building* shall govern the energy efficiency of residential construction.

Florida Building Code, Residential

CHAPTER 11 ENERGY EFFICIENCY

SECTION 1101 GENERAL

N1101 Energy Efficiency. The provisions of Chapter 13, *Florida Building Code, Building* shall govern the energy efficiency of residential construction.

SUB-CHAPTER 1, ADMINISTRATION & ENFORCEMENT
SECTION 101: SCOPE

- 101.1.1 New Construction
 - Commercial Building Compliance Methods
 - *Changes Method titles*
 - Method B: Building Envelope Tradeoff Method
 - Method C: Buildings Prescriptive Envelope Method
 - *Removes Method D Renovations and Systems Prescriptive Method*

SUB CHAPTER 1 ADMINISTRATION AND ENFORCEMENT
SECTION 101 SCOPE

101.1 Commercial Buildings.

101.1.1 New Construction.

Sub-chapter 4, Commercial Building Compliance Methods.

Commercial buildings of any size and multifamily residential buildings greater than three stories shall comply with Sub-chapter 4 of the code. This chapter contains three compliance methods:

Method A: Whole Building Performance Method

Method B: Building Envelope Tradeoff Method

Method C: Buildings Prescriptive Envelope Method

SUB-CHAPTER 1, ADMINISTRATION & ENFORCEMENT
SECTION 104: INSPECTIONS

- 104.4.5 Fenestration Energy Rating Labels
 - *Changes references*
 - Tables B-6, B-7 and B-8 of Appendix B for U-factor and SHGC shall be used to determine code compliance for commercial applications and in
 - Section 601.1.ABC.1 for residential applications

SUB CHAPTER 1 ADMINISTRATION AND ENFORCEMENT
SECTION 104 INSPECTIONS

104.4.5 Fenestration Energy Rating Labels. Energy performance values (i.e. U-factor, Solar Heat Gain Coefficient) of fenestration products (i.e. windows, doors and skylights) shall be determined by an accredited, independent laboratory and labeled and certified by the manufacturer. Such certified and labeled fenestration energy ratings shall be accepted for the purposes of determining compliance with the building envelope requirements of this code.

Where the specified energy performance (U-factor or Solar Heat Gain Coefficient) of the fenestration product is not labeled nor readily apparent, the default procedures outlined in Tables B-6, B-7 and B-8 of Appendix B for U-factor and SHGC shall be used to determine code compliance for commercial applications and in Section 601.1.ABC.1 for residential applications.

Product features must be verifiable for the product to qualify for the default value associated with those features. Where the existence of a particular feature cannot be determined with reasonable certainty, the product shall not receive credit for that feature. Where a composite of materials from two different product types are used, the product shall be assigned the worst value.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

- 400.0.A Method A, the Whole Building Performance Method.
 - Design energy cost does not exceed the energy cost budget
 - Energy efficiency level of components specified in the building design meet or exceed the efficiency levels used to calculate the design energy cost.
- *Review "Informative Note"*

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

400.0.ABC Compliance Criteria.

400.0.A Method A, the Whole Building Performance Method. This is a computer-based energy code budget method which may be used for determining the compliance of all proposed designs, except designs with no mechanical system. Under this method, cost performance is calculated for the entire building based on the envelope and major energy-consuming systems specified in the design and simultaneously for a Baseline building of the same configuration, but with baseline systems. Compliance is met if the design energy cost does not exceed the energy cost budget when calculated in accordance with this section; and the energy efficiency level of components specified in the building design meet or exceed the efficiency levels used to calculate the design energy cost.

Compliance calculations are those utilized in the EnergyGauge FLA/COM 2004 computer program and are as described in the sections called Performance Calculation Procedures. Basic prescriptive requirements described in the sections called Prescriptive Requirements shall also be met.

Informative Note: The energy cost budget and the design energy cost calculations are applicable only for determining compliance with this standard. They are not predictions of actual energy consumption or costs of the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this standard, changes in energy rates between design of the building and occupancy, and precision of the calculation tool.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

- **400.0.B Method B, the Building Envelope Tradeoff Method.**
 - Meets basic prescriptive requirements
 - Proposed envelope performance factor is less than or equal to the envelope performance factor of budget building
 - Envelope performance factor shall be calculated using the EnergyGauge FLA/COM 2004 computer program
 - Procedures for envelope components met under compliance Method B

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS**SECTION 400 ADMINISTRATION****400.0.ABC Compliance Criteria.**

400.0.B Method B, the Building Envelope Tradeoff Method. This is a computer-based calculation methodology. The building envelope complies with the standard if the proposed building meets the Basic Prescriptive Requirements (.ABC) and the envelope performance factor of the proposed building is less than or equal to the envelope performance factor of the budget building. The envelope performance factor considers only the building envelope components. Schedules of operation, lighting power, equipment power, occupant density, and mechanical systems shall be the same for both the proposed building and the budget building. Envelope performance factor shall be calculated using the EnergyGauge FLA/COM 2004 computer program and the procedures specified for each envelope component under compliance Method B (.2.B).

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

- **400.0.C Method C, the Buildings Prescriptive Envelope Method.**
 - Listed on Form 400C for the appropriate climate zone
 - Either nonresidential or residential
 - Conditioned space or unconditioned space requirements

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

400.0.ABC Compliance Criteria.

400.0.C Method C, the Buildings Prescriptive Envelope Method. This method requires that prescriptive requirements listed on Form 400C for the appropriate climate zone for a given building type be met or exceeded to comply with this code. For, the exterior building envelope shall comply with either the “nonresidential” or “residential” requirements on Form 400C, as applicable. If a building contains any semiheated space or unconditioned space, (see Section 400.0.C.1), then the semi-exterior building envelope shall comply with the requirements for semiheated space on Form 400C.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

- **400.0.C.1 Scope.**
 - Used provided that:
 - a. The vertical fenestration area does not exceed 50% of the gross wall area for each space-conditioning category and
 - b. The skylight fenestration area does not exceed 5% of the gross roof area for each space-conditioning category. Requirements are specified for the exterior building envelope, which separates conditioned space from the exterior.

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

400.0.ABC Compliance Criteria.

400.0.C Method C, the Buildings Prescriptive Envelope Method.

400.0.C.1 Scope. Method C may be used provided that:

- a) the vertical fenestration area does not exceed 50% of the gross wall area for each space-conditioning category and
- b) the skylight fenestration area does not exceed 5% of the gross roof area for each space-conditioning category Requirements are specified for the exterior building envelope, which separates conditioned space from the exterior.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

- **Exceptions:** For buildings that contain spaces that will be only semi-heated or unconditioned, and if compliance Method A is used for such spaces, then Method C also specifies requirements for the semi-exterior building envelope, which separates
 - a. conditioned space from either semiheated space or unconditioned space,
 - b. semiheated space from either unconditioned space or from the exterior
- **Note:** Method C does not address moisture control

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS**SECTION 400 ADMINISTRATION****400.0.ABC Compliance Criteria.****400.0.C Method C, the Buildings Prescriptive Envelope Method.**

Exceptions: For buildings that contain spaces that will be only semi-heated or unconditioned, and if compliance Method A is used for such spaces, then Method C also specifies requirements for the semi-exterior building envelope, which separates

- a) conditioned space from either semiheated space or unconditioned space,
- b) semiheated space from either unconditioned space or from the exterior.

NOTE: Method C does not address moisture control or provide design guidelines to prevent moisture migration that leads to condensation, mold and mildew, or deterioration to insulation or equipment performance.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 400 ADMINISTRATION

- 400.2 Performance Calculation Procedures.
 - Method B allows performance tradeoffs for envelope features only
 - Buildings complying by Method C have only prescriptive minimum requirements for envelope and equipment
 - Calculation procedures for Methods A and B are contained in the FLA/COM computer program
 - Method A allows tradeoffs among all building systems

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS**SECTION 400 ADMINISTRATION**

400.2 Performance Calculation Procedures. The calculation procedures contained in the personal computer-based program entitled EnergyGauge FLA/COM and those described in Sections marked either “.2.A”, “.2.B”, or “.2.C”, respectively, shall be used to demonstrate code compliance of the design for commercial buildings complying by Method A, Method B or Method C of this chapter. The building components’ efficiency levels specified in the Method A performance compliance calculation (or amended copy submitted to the building department) are the minimum efficiencies allowed to be installed in the building. Buildings complying by Method B are allowed performance tradeoffs for envelope features only. Buildings complying by Method C have only prescriptive minimum requirements for envelope and equipment.

TABLE 13-400.3.ABC.3
INDEX TO COMMERCIAL CODE COMPLIANCE FORMS

METHOD	FORM NUMBER
Method A: Whole Building Performance	Form 400A-04 (FLA/COM computer printout)
Method B: Building Envelope Tradeoff	Form 400B-04 (FLA/COM computer printout)
Method C: Buildings Prescriptive Envelope	Form 400C-04 (separate forms for North, Central, and South Florida)

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 401 FENESTRATIONS

- 401.1.C Prescriptive Requirements Specific to Method C.
 - Compliance with U-factors and solar heat gain coefficient (SHGC) shall be demonstrated
 - Gross wall areas and gross roof areas shall be calculated separately for each space-conditioning category
 - **Exception:** ...It is not acceptable to do an area-weighted average across multiple classes of construction or multiple space-conditioning categories.

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS**SECTION 401 FENESTRATION (GLAZING)****401.1.AB Calculations.**

401.1.C Prescriptive Requirements Specific to Method C. Fenestration areas of buildings complying by Method C shall be no higher than that specified on Form 400C for that occupancy type. Compliance with U-factors and solar heat gain coefficient (SHGC) shall be demonstrated for the overall fenestration product, including glass, sash, and frame, as shall be determined from manufacturer's product specification sheets in accordance with applicable test procedures. Gross wall areas and gross roof areas shall be calculated separately for each space-conditioning category for the purposes of determining compliance.

Exception: Alternatively, if there are multiple assemblies within a single class of construction for a single space-conditioning category, compliance shall be based on an area-weighted average U-factor or SHGC. It is not acceptable to do an area-weighted average across multiple classes of construction or multiple space-conditioning categories.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 401 FENESTRATIONS

- 401.1.C.3. Fenestration Solar Heat Gain Coefficient.
 - **Exceptions:**
 1. Latitudes greater than 10 degrees, north-oriented vertical fenestration shall be calculated separately and not exceed Form 400C
 2. Multipliers in Table 401.2.C.3 for each fenestration product shaded by permanent projections

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS**SECTION 401 FENESTRATION (GLAZING)****401.1.C.3 Fenestration Solar Heat Gain Coefficient (SHGC).****Exceptions:**

1. Alternatively, in latitudes greater than 10 degrees, the SHGC for north-oriented vertical fenestration shall be calculated separately and shall not be greater than that specified in Form 400C for north-oriented fenestration. When this Exception is used, the fenestration area used in selecting the criteria shall be calculated separately for north-oriented and all other-oriented fenestration.
2. For demonstrating compliance for vertical fenestration only, the SHGC in the proposed building shall be reduced by using the multipliers in Table 401.2.C.3 for each fenestration product shaded by permanent projections that will last as long as the building itself.
3. Vertical fenestration that is located on the street side of the street-level story only, provided that
 - 1) the street side of the street-level story does not exceed 20 ft in height,
 - 2) the fenestration has a continuous overhang with a weighted average projection factor greater than 0.5, and
 - 3) the fenestration area for the street side of the street-level story is less than 75% of the gross wall area for the street side of the street-level story. When this Exception is utilized, separate calculations shall be performed for these sections of the building envelope, and these values shall not be averaged with any others for compliance purposes. No credit shall be given here or elsewhere in the building for not fully utilizing the fenestration area allowed.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 406 AIR INFILTRATION

- 406.1.ABC.1.2 Exterior Joints in the Envelope.
 - Shall be sealed, caulked, gasketed, or weather-stripped
 - a) Fenestration and door frames
 - b) Walls and foundations, building corners, floors, roofs, wall panels
 - c) Utility services through roofs, walls, and floors
 - d) Site-built fenestration and doors
 - e) Building assemblies used as ducts or plenums
 - f) Penetrations of vapor retarders
 - g) All other openings

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS**SECTION 406 AIR INFILTRATION**

406.1.ABC.1.2 Exterior Joints in the Envelope. The following areas of the building envelope shall be sealed, caulked, gasketed, or weather-stripped to minimize air leakage:

- a. joints around fenestration and door frames
- b. junctions between walls and foundations, between walls at building corners, between walls and structural floors or roofs, and between walls and roof or wall panels
- c. openings at penetrations of utility services through roofs, walls, and floors
- d. site-built fenestration and doors
- e. building assemblies used as ducts or plenums
- f. joints, seams, and penetrations of vapor retarders
- g. all other openings in the building envelope. Outside air intakes, exhaust outlets, relief outlets, stair shaft, elevator shaft smoke relief openings, and other similar elements shall also comply with Sections 407.1.ABC.2.4.3 and 409.1.ABC.3.3.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS
SECTION 407 SPACE COOLING SYSTEMS

- 407.1.ABC.3.5 Exhaust Air Energy Recovery for Cooling Systems.
 - Individual fan systems that have both a design supply air capacity of 5000 cfm or greater and have a minimum outside air supply of 70% or greater of the design supply air quantity shall have an energy recovery system with at least 50% recovery effectiveness
 - Exceptions provided

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 407 SPACE COOLING SYSTEMS

407.1.ABC.3.5 Exhaust Air Energy Recovery for Cooling Systems. Individual fan systems that have both a design supply air capacity of 5000 cfm or greater and have a minimum outside air supply of 70% or greater of the design supply air quantity shall have an energy recovery system with at least 50% recovery effectiveness. Fifty percent energy recovery effectiveness shall mean a change in the enthalpy of the outdoor air supply equal to 50% of the difference between the outdoor air and return air at design conditions.

Exceptions:

1. Laboratory systems meeting Section 409.1.ABC.3.6.2.
2. Systems serving spaces that are not cooled and that are heated to less than 60°F.
3. Systems exhausting toxic, flammable, paint or corrosive fumes or dust.
4. Commercial kitchen hoods (grease) classified as Type 1 by NFPA 96.
5. Where the largest exhaust source is less than 75% of the design outdoor airflow.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS
SECTION 408 SPACE HEATING EQUIPMENT

- 408.1.ABC.3.1.1 Equipment Efficiency Verification.
 - Certification programs from Tables 408.1.ABC.3.2E – 408.1.ABC.3.2G
 - Furnished by manufacturers
 - Florida-registered engineer

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 408 SPACE HEATING EQUIPMENT

408.1.ABC.3.1.1 Equipment Efficiency Verification. If a certification program exists for a product covered in Tables 408.1.ABC.3.2E through 408.1.ABC.3.2G, and it includes provisions for verification and challenge of equipment efficiency ratings, then the product shall be either listed in the certification program or, alternatively, the ratings shall be verified by an independent laboratory test report. If no certification program exists for a product covered in Tables 408.1.ABC.3.2E through 408.1.ABC.3.2G, the equipment efficiency ratings shall be supported by data furnished by the manufacturer.

Where equipment is not rated, a Florida-registered engineer shall specify component efficiencies whose combined efficiency meets the minimum equipment efficiency requirements in 408.1.ABC.3.2.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 409 VENTILATION

- 409.1.ABC.3.5 Ventilation Controls for High-Occupancy Areas.
 - Outside air capacities greater than 3000 cfm serving areas having an average design occupancy density exceeding 100 people per 1000 ft² shall include means to automatically reduce outside air intake below design rates when spaces are partially occupied

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS**SECTION 409 VENTILATION**

409.1.ABC.3.5 Ventilation Controls for High-Occupancy Areas. Systems with design outside air capacities greater than 3000 cfm serving areas having an average design occupancy density exceeding 100 people per 1000 ft² shall include means to automatically reduce outside air intake below design rates when spaces are partially occupied. Ventilation controls shall be in compliance with ASHRAE Standard 62 and local standards.

Exception: Systems with heat recovery complying with Section 407.1.ABC.3.5.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS
SECTION 410 AIR DISTRIBUTION SYSTEMS

- 410.1.ABC.3.2.2 Mechanical fastening.
 - Attachments of ductwork to air handling equipment shall be by mechanical fasteners. Where access is limited, two fasteners on one side shall be acceptable when installed in accordance with Section 410.1.ABC.3.0.6.

Note: (Same for Residential)

**SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE
METHODS**

SECTION 410 AIR DISTRIBUTION SYSTEMS

410.1.ABC.3.2.2 Mechanical Fastening. Attachments of ductwork to air handling equipment shall be by mechanical fasteners.

Where access is limited, two fasteners on one side shall be acceptable when installed in accordance with Section 410.1.ABC.3.0.6

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS
SECTION 410 AIR DISTRIBUTION SYSTEMS

- 410.1.ABC.4.1 Duct Leakage Tests.
 - Air distribution systems shall be tested, adjusted, and balanced by an engineer licensed in this state or a company or individual holding a current certification from a recognized testing and balancing agency organization.
 - **Exceptions:**
 - Less than 15 tons, mechanical contractor
 - Capacities less than 65,000 Btu/h per system are exempt from requirements of this section

**SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE
METHODS**

SECTION 410 AIR DISTRIBUTION SYSTEMS

410.1.ABC.4 Air Distribution System Testing, Adjusting, and Balancing.

410.1.ABC.4.1 Duct Leakage Tests. Air distribution systems shall be tested, adjusted, and balanced by an engineer licensed in this state or a company or individual holding a current certification from a recognized testing and balancing agency organization.

Exceptions:

1. Buildings with cooling or heating system capacities of 15 tons or less per system may be tested and balanced by a mechanical contractor licensed to design and install such system(s).
2. Buildings with cooling or heating system capacities of 65,000 Btu/h or less per system are exempt from the requirements of this section.

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS
SECTION 410 AIR DISTRIBUTION SYSTEMS

- **410.1.ABC.4.2 General.**
 - Construction documents shall require that a written balance report be provided to the owner or the designated representative of the building owner for HVAC systems serving zones with a total conditioned area exceeding 5000 ft².

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS

SECTION 410 AIR DISTRIBUTION SYSTEMS

410.1.ABC.4.2 General. Construction documents shall require that all HVAC systems be balanced in accordance with generally accepted engineering standards (see Appendix E of this chapter). Construction documents shall require that a written balance report be provided to the owner or the designated representative of the building owner for HVAC systems serving zones with a total conditioned area exceeding 5000 ft².

SUB-CHAPTER 4, COMMERCIAL BUILDING COMPLIANCE METHODS
SECTION 412 WATER HEATING SYSTEMS

- 412.1.ABC.3.4.1 Space Heating and Water Heating.
 - Gas-fired or oil-fired space heating boiler system must either:
 - Meets standby loss requirement
 - Satisfies building official that the system will consume less energy than separate units
 - Energy input is less than 150K Btu/h

SUB-CHAPTER 4 COMMERCIAL BUILDING COMPLIANCE METHODS
SECTION 412 WATER HEATING SYSTEMS

412.1.ABC.3.4.1 Space Heating and Water Heating. The use of a gas-fired or oil-fired space heating boiler system otherwise complying with Section 408.1.ABC.3 to provide the total space heating and water heating for a building is allowed when one of the following conditions is met:

1. The single space heating boiler, or the component of a modular or multiple boiler system that is heating the service water, has a standby loss in Btu/h not exceeding $(13.3 \times pmd + 400) / n$ where *pmd* is the probable maximum demand in gal/h, determined in accordance with the procedures described in generally accepted engineering standards and handbooks, and *n* is the fraction of the year when the outdoor daily mean temperature is greater than 64.9° F. The standby loss is to be determined for a test period of 24 hours duration while maintaining a boiler water temperature of at least 90° F above ambient, with an ambient temperature between 60° F and 90° F. For a boiler with a modulating burner, this test shall be conducted at the lowest input.
2. It is demonstrated to the satisfaction of the Building Official that the use of a single heat source will consume less energy than separate units.
3. The energy input of the combined boiler and water heater system is less than 150,000 Btu/h.

SUB-CHAPTER 6, RESIDENTIAL BUILDING COMPLIANCE METHODS

- *All references in this sub-chapter have been changed to reflect 2004 versions of Compliance Forms (04) and FLA/RES-04.*
- *References for online access to compliance forms have been added www.floridabuilding.org*

SUB-CHAPTER 6 RESIDENTIAL BUILDING COMPLIANCE METHODS

SUB-CHAPTER 6, RESIDENTIAL BUILDING COMPLIANCE METHODS

SECTION 601 FENESTRATIONS

- **601.1.ABC.1 Glazing Types.**
 - Windows shall contain at least the minimum efficiency glazing type certified by the owner to be in compliance with the code.
 - Default U-factor and Solar Heat Gain Coefficient (SHGC) shall be assumed per Table 601.1.ABC.1 if windows are not labeled.

**SUB-CHAPTER 6 RESIDENTIAL BUILDING COMPLIANCE METHODS
SECTION 601 FENESTRATIONS (GLAZING)**

601.1.ABC.1 Glazing Types. Windows shall contain at least the minimum efficiency glazing type certified to be in compliance with the code.

U-factors (thermal transmittances) or Solar Heat Gain Coefficient (SHGC) for glazed fenestration products shall be determined in accordance with National Fenestration Rating Council 100, Procedure for Determining Fenestration Product U-factors or National Fenestration Rating Council 200: Procedures for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence by an accredited, independent laboratory and labeled and certified by the manufacturer.

When a manufacturer has not determined U-factor or SHGC in accordance with NFRC 100 or 200 for a particular product line, compliance with the building envelope requirements of this code shall be determined by assigning such products default U-factor or SHGC in accordance with Table 601.1.ABC.1. Product features must be verifiable for the product to qualify for the default value associated with those features. Where the existence of a particular feature cannot be determined with reasonable certainty, the product shall not receive credit for that feature. Where a composite of materials from two different product types are used, the product shall be assigned the higher U-factor or SHGC.

Glazing in doors shall be considered fenestrations.

TABLE 13-601.1.ABC.1
DEFAULT WINDOW ENERGY VALUES FOR RESIDENTIAL APPLICATIONS

TYPE	U-FACTOR	SOLAR HEAT GAIN COEFFICIENT (SHGC)
Single pane, clear	1.30	0.75
Single pane, tint	1.30	0.64
Double pane, clear	0.87	0.66
Double pane, tint	0.87	0.55

SUB-CHAPTER 6, RESIDENTIAL BUILDING COMPLIANCE METHODS
SECTION 607 SPACE COOLING SYSTEMS

- **607.1.ABC.1.1 Cooling Equipment Capacity.**
 - Added Exceptions:
 - Cooling capacity is less than the calculated total sensible load but not less than 80% of that load
 - Florida-registered engineer in accordance with good design practice.

SUB-CHAPTER 6 RESIDENTIAL BUILDING COMPLIANCE METHODS

SECTION 607 SPACE COOLING SYSTEMS

607.1.ABC.1.1 Cooling Equipment Capacity. Cooling only equipment shall be selected so that its sensible capacity is not less than the calculated total sensible load but not more than 120% of the design sensible load calculated according to the procedure selected in Section 607.1.ABC.1., or the closest available size provided by the manufacturer's product lines.

The corresponding latent capacity of the equipment shall not be less than the calculated latent load.

Exceptions:

1. Attached single family and multifamily residential equipment sizing may be selected so that its cooling capacity is less than the calculated total sensible load but not less than 80% of that load.
2. When signed and sealed by a Florida-registered engineer, in attached single family and multifamily units, the capacity of equipment may be sized in accordance with good design practice.

SUB-CHAPTER 6, RESIDENTIAL BUILDING COMPLIANCE METHODS
SECTION 607 SPACE COOLING SYSTEMS

- **607.1.ABC.3.2.1 Mandatory Provisions.**
 - Tables 607.1.ABC.3.2A through 607.1.ABC.3.2D contain the minimum efficiency requirements for equipment covered by this section of the code. The tables are organized to cover the following types of equipment:
 - Table 607.1.ABC.3.2A Air Conditioners and Condensing Units
 - Table 607.1.ABC.3.2B Heat Pumps
 - Table 607.1.ABC.3.2D Packaged Terminal and Room Air Conditioners and Heat Pumps

SUB-CHAPTER 6 RESIDENTIAL BUILDING COMPLIANCE METHODS
SECTION 607 SPACE COOLING SYSTEMS

607.1.ABC.3.2.1 Mandatory Provisions. Equipment shown in Tables 607.1.ABC.3.2A through 607.1.ABC.3.2D shall meet the minimum performance for that equipment at the specified rating conditions when tested in accordance with the specified test procedure. Omission of minimum performance requirements for equipment not listed in Tables 607.1.ABC.3.2A through 607.1.ABC.3.2D does not preclude use of such equipment. Equipment not listed in Tables 607.1.ABC.3.2A through 607.1.ABC.3.2D has no minimum performance requirements. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements, unless otherwise exempted by footnotes in the table. However, equipment covered under the Federal Energy Policy Act of 1992 (EPACT) shall have no minimum efficiency requirements for operation at minimum capacity or other than standard rating conditions. Equipment used to provide water heating functions as part of a combination system shall satisfy all stated requirements for the appropriate space heating or cooling category.

Tables 607.1.ABC.3.2A through 607.1.ABC.3.2D contain the minimum efficiency requirements for equipment covered by this section of the code. The tables are organized to cover the following types of equipment:

Table 607.1.ABC.3.2A Air Conditioners and Condensing Units

Table 607.1.ABC.3.2B Heat Pumps

Table 607.1.ABC.3.2D Packaged Terminal and Room Air Conditioners and Heat Pumps

SUB-CHAPTER 6, RESIDENTIAL BUILDING COMPLIANCE METHODS
SECTION 610 AIR DISTRIBUTION SYSTEMS

- 610.1.ABC.3.0.3 Space Provided.
 - **Exception:** Retrofit or replacement units not part of a renovation are exempt from the minimum clearance requirement.

**SUB-CHAPTER 6 RESIDENTIAL BUILDING COMPLIANCE
METHODS**

SECTION 610 AIR DISTRIBUTION SYSTEMS

610.1.ABC.3.0.3 Space Provided. Sufficient space shall be provided adjacent to all mechanical components located in or forming a part of the air distribution system to assure adequate access for

- 1) construction and sealing in accordance with the requirements of Section 610.1.ABC.3 of this Code
- 2) inspection and
- 3) cleaning and maintenance. A minimum of 4" is considered sufficient space around air handling units.

Exception: Retrofit or replacement units not part of a renovation are exempt from the minimum clearance requirement.

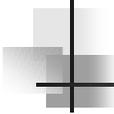
SUB-CHAPTER 6, RESIDENTIAL BUILDING COMPLIANCE METHODS
SECTION 610 AIR DISTRIBUTION SYSTEMS

- **610.1.ABC.3.2.2 Mechanical fastening.**
 - Attachments of ductwork to air handling equipment shall be by mechanical fasteners. Where access is limited, two fasteners on one side shall be acceptable when installed in accordance with Section 610.1 ABC.3.0.6.

**SUB-CHAPTER 6 RESIDENTIAL BUILDING COMPLIANCE
METHODS**

SECTION 610 AIR DISTRIBUTION SYSTEMS

610.1.ABC.3.2.2 Mechanical fastening. Attachments of ductwork to air handling equipment shall be by mechanical fasteners. Where access is limited, two fasteners on one side shall be acceptable when installed in accordance with Section 610.1 ABC.3.0.6.



2004 Florida Building Code, Residential

- The following chapters have provisions for residential construction and should be review (detailed overview provided in the *Florida Building Code, Residential Core and Summary*)
- **Chapter 13: General Mechanical System Requirements**
 - Attics
 - Installation—wind requirements
 - Hydrogen
 - Clearance requirements

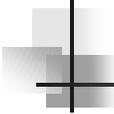
2004 Florida Building Code, Residential

- **Chapter 14: Heating & Cooling Requirements**

- Drain pipe materials and size

- **Chapter 15: Exhaust**

- 1501 Clothes Dryers
- 1502 Range Hoods
 - Kitchen exhaust rates
- 1503 Microwave Ovens
- 1504 Overload Exhaust
- 1506 Mechanical Ventilation
 - Table of minimums



2004 Florida Building Code, Residential

■ **Chapter 16: Duct Systems**

- 1601 Duct Construction—similar to *Florida Building Code, Mechanical*, Chapter 6
- 1602 Return Air—Balanced return

■ **Chapter 17: Combustion Air**

- 1701 General
 - *Florida Building Code, Mechanical* 703
- 1702 All Air From Inside the Building
- 1703 All Air From Outdoors

Course Evaluation

Course Title: **Mechanical / Energy Technical Core Summary**

Course #: _____

Date: _____

Location: _____

Please circle your response:	Strongly Disagree  Strongly Agree				
Question 1: The course objectives were accomplished.	1	2	3	4	5
Question 2: The course started and finished on time.	1	2	3	4	5
Question 3: The instructor(s) was well-versed in their topic and well-prepared.	1	2	3	4	5
Question 4: The materials presented were effective.	1	2	3	4	5
What did you like most about the course?					
What did you like least about the course?					
Please list other comments about this course, including ways to improve the course or suggestions for other courses.					

