Florida Building Code
Energy Conservation

Time for CHANGE

CALCS-PLUS
Code Change

Out with the Old – In with the New

Ends June 30th 2015

Begins June 30th 2015

Raises the Bar on the “Standard Reference Design” Home by 10% or Maybe More
Moved to the 2012 IECC

+ Florida Amendments =

CALCS-PLUS
Florida Building Code - On Line

Florida Building Code - Book Shelf
# Table Of Contents


<table>
<thead>
<tr>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Conservation Code Cover</td>
</tr>
<tr>
<td>Copyright</td>
</tr>
<tr>
<td>Preface</td>
</tr>
<tr>
<td><strong>Commercial Provisions</strong></td>
</tr>
<tr>
<td>Chapter 1 [CE] Scope and Administration</td>
</tr>
<tr>
<td>Chapter 2 [CE] Definitions</td>
</tr>
<tr>
<td>Chapter 3 [CE] General Requirements</td>
</tr>
<tr>
<td>Chapter 4 [CE] Commercial Energy Efficiency</td>
</tr>
<tr>
<td>Chapter 5 [CE] Referenced Standards</td>
</tr>
<tr>
<td>Appendix A Reserved</td>
</tr>
<tr>
<td>Appendix B [CE] Reserved</td>
</tr>
<tr>
<td>Appendix C [CE] Forms</td>
</tr>
<tr>
<td><strong>Residential Provisions</strong></td>
</tr>
<tr>
<td>Chapter 1 [RE] Scope and Administration</td>
</tr>
<tr>
<td>Chapter 2 [RE] Definitions</td>
</tr>
<tr>
<td>Chapter 3 [RE] General Requirements</td>
</tr>
<tr>
<td>Chapter 4 [RE] Residential Energy Efficiency</td>
</tr>
<tr>
<td>Chapter 5 [RE] Referenced Standards</td>
</tr>
<tr>
<td>Appendix A Reserved</td>
</tr>
</tbody>
</table>
Major Changes

Climate Zones
Indoor Design Conditions
10%+ More Efficient Than 2010
Blower Door (Residential)
Ventilation (Residential)
Air Barriers Not Required (Commercial)
Commissioning Required (Commercial)
Thank You

Questions?
Climate Zone Change
R302.1 Interior design conditions.
The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.
### Prescriptive

#### 2010 Energy Code

<table>
<thead>
<tr>
<th>% Glazing</th>
<th>FENESTRATION U-FACTOR</th>
<th>SKYLIGHT U-FACTOR</th>
<th>GLAZED FENESTRATION SHGC</th>
<th>CEILING R-VALUE</th>
<th>WOOD FRAME WALL R-VALUE</th>
<th>MASS WALL R-VALUE</th>
<th>WOOD WALL R-VALUE</th>
<th>FLOOR R-VALUE</th>
<th>DOOR R-VALUE</th>
<th>DUCTS R-VALUE/LOCATION</th>
<th>AIR HANDLER LOCATION</th>
<th>AIR LEAKAGE TESTED PER SECTION 403.2.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>0.66</td>
<td>0.75</td>
<td>0.26</td>
<td>0.25</td>
<td>12</td>
<td>2.25</td>
<td>9.25</td>
<td>1.10</td>
<td>0.65</td>
<td>Conditioned</td>
<td>Conditioned</td>
<td>0.80</td>
</tr>
</tbody>
</table>

#### 2014 Energy Code

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>FENESTRATION U-FACTOR</th>
<th>SKYLIGHT U-FACTOR</th>
<th>GLAZED FENESTRATION SHGC</th>
<th>CEILING R-VALUE</th>
<th>WOOD FRAME WALL R-VALUE</th>
<th>MASS WALL R-VALUE</th>
<th>WOOD WALL R-VALUE</th>
<th>FLOOR R-VALUE</th>
<th>BASEMENT WALL R-VALUE</th>
<th>SLAB R-VALUE &amp; DEPTH</th>
<th>CRAWL SPACE WALL R-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.65</td>
<td>0.75</td>
<td>0.25</td>
<td>30</td>
<td>13</td>
<td>3/4</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0.40</td>
<td>0.65</td>
<td>0.25</td>
<td>36</td>
<td>13</td>
<td>4/6</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

CALCS-PLUS
Prescriptive

New Construction
Additions
Renovations

Must Meet Sections R402.1.1 thru R402.4

Must Meet

Table R402.1.1 Insulation and Fenestration Requirements by Component

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Fenestration U-Factor</th>
<th>Skylight U-Factor</th>
<th>Glazed Fenestration SHGC</th>
<th>Ceiling R-Value</th>
<th>Wood Frame Wall R-Value</th>
<th>Mass Wall R-Value</th>
<th>Floor R-Value</th>
<th>Basement Wall R-Value</th>
<th>Slab R-Value &amp; Depth</th>
<th>Crawl Space Wall R-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.65</td>
<td>0.75</td>
<td>0.25</td>
<td>30</td>
<td>13</td>
<td>3/4</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0.40</td>
<td>0.65</td>
<td>0.25</td>
<td>38</td>
<td>13</td>
<td>4/6</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Building Infiltration Testing: R402.4.1.2
Programmable Thermostat Required: R403.1.2
Supply ducts in attic insulated to R-8: R403.2.1
Duct testing required: R403.2.2
Air Handlers not allowed in attics: R403.2.4
R-3 insulation on (most) all piping: R403.4.2
75% high efficiency lighting: R404.1

No GFA Limit
R402.1.4 Total UA alternative.

If the total building thermal envelope UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from using the U-factors in Table R402.1.3 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table R402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance.
Residential Energy Efficiency

Total UA Alternative

Proposed Building sum of U-factor times assembly area
Less than or equal to
Prescriptive Building sum of (Table 402.1.3) U-Factor times assembly area

Building shall be considered in compliance with Table R402.1.1.

UA calculation consistent with the ASHRAE Handbook of Fundamentals
Include the thermal bridging effects of framing materials.
The SHGC requirements shall be met in addition to UA compliance.

Software works well

Table R402.1.3

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>FENESTRATION U-FACTOR</th>
<th>SKYLIGHT U-FACTOR</th>
<th>CEILING U-FACTOR</th>
<th>FRAME WALL U-FACTOR</th>
<th>MASS WALL U-FACTOR</th>
<th>FLOOR U-FACTOR</th>
<th>BASEMENT WALL U-FACTOR</th>
<th>CRAWL SPACE WALL U-FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.50</td>
<td>0.75</td>
<td>0.035</td>
<td>0.082</td>
<td>0.197</td>
<td>0.064</td>
<td>0.360</td>
<td>0.477</td>
</tr>
<tr>
<td>2</td>
<td>0.40</td>
<td>0.65</td>
<td>0.030</td>
<td>0.082</td>
<td>0.165</td>
<td>0.064</td>
<td>0.360</td>
<td>0.477</td>
</tr>
</tbody>
</table>

CALCS-PLUS
Residential Energy Efficiency

Performance Path

R405.3 Performance-based compliance.

Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have annual total normalized modified loads that are less than or equal to the annual total loads of the standard reference design.

Proposed Is \leq\text{ Energy Than}\ Reference
## Standard Reference Design

### 2010 Change 2014

<table>
<thead>
<tr>
<th>Component</th>
<th>2010 Reference</th>
<th>2014 Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window Area</td>
<td>18% GFA</td>
<td>As proposed if &lt;15% &gt; 15% - Reference</td>
</tr>
<tr>
<td>Window U-Factor / SHGC</td>
<td>.75 / .40</td>
<td>(1), 0.65 / .25 (2), 0.40 / 0.25</td>
</tr>
<tr>
<td>Ceiling U Factor</td>
<td>0.035</td>
<td>(1), 0.035 (2), 0.030</td>
</tr>
<tr>
<td>HVAC</td>
<td>SEER 13 / HSPF 7.7</td>
<td>SEER 14 / HSPF 8.2</td>
</tr>
<tr>
<td>Indoor Temp (F)</td>
<td>78/68</td>
<td>75/72</td>
</tr>
</tbody>
</table>

About 10% More Energy Efficient
Testing the Air Barrier

Building Air leakage

R402.4 Air leakage (Mandatory).

The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.4.
Residential Energy Efficiency

Blower Door Testing

R402.4.1.2 Testing.
The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals)
Could Still Go Away

About R402.4.1.2 Testing.

You may not know but we are still battling parts of this new code, like the Blower Door Test and the new requirement for Ventilation in residential construction. If given the opportunity once the legislature reconvenes in June, our lobbying group through the FHBA will be asking for a stay of 90 days or more from the effective date of July 1, 2015.
Commercial

C402.4 Air leakage (Mandatory).

The thermal envelope of buildings shall comply with Sections C402.4.1 through C402.4.9.

C402.4.1 Air barriers.

A continuous air barrier shall be provided throughout the building thermal envelope. The air barriers shall be permitted to be located on the inside or outside of the building envelope, located within the assemblies composing the envelope, or any combination thereof. The air barrier shall comply with Sections C402.4.1.1 and C402.4.1.2.

Exception: Air barriers are not required in buildings located in Climate Zones 1, 2 and 3.
No Need to Comply

not required in buildings located in Climate Zones 1, 2 and 3

C402.4.1.1 and C402.4.1.2

C402.4.1.1 Air barrier construction.

C402.4.1.2 Air barrier compliance options.

C402.4.1.2.1 Materials.

C402.4.1.2.2 Assemblies.

C402.4.1.2.3 Building test.
Florida Amendments

C402.4.9.1 Vented dropped ceiling cavities.

Where vented dropped ceiling cavities occur over conditioned spaces, the ceiling shall be considered to be both the upper thermal envelope and pressure envelope of the building and shall contain a continuous air barrier between the conditioned space and the vented unconditioned space that is also sealed to the air barrier of the walls. See the definition of air barrier in Section C202.

C402.4.9.2 Unvented dropped ceiling cavities.

Where unvented dropped ceiling cavities occur over conditioned spaces that do not have an air barrier between the conditioned and unconditioned space (such as T-bar ceilings), they shall be completely sealed from the exterior environment (at the roof plane) and adjacent spaces by a continuous air barrier that is also sealed to the air barrier of the walls. In that case, the roof assembly shall constitute both the upper thermal envelope and pressure envelope of the building.
Commissioning

C403.2.9 Mechanical systems commissioning and completion requirements.
Mechanical systems shall be commissioned and completed in accordance with Section C408.2.

C408.2 Mechanical systems commissioning and completion requirements.
Prior to passing the final mechanical inspection, the registered design professional shall provide evidence of mechanical systems commissioning and completion in accordance the provisions of this section.

Construction document notes shall clearly indicate provisions for commissioning and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documentation shall be given to the owner and made available to the code official upon request in accordance with Sections C408.2.4 and C408.2.5.
Exception

C403.2.9 Mechanical systems commissioning and completion requirements.

Exception: The following systems are exempt from the commissioning requirements:

1. Mechanical systems in buildings where the total mechanical equipment capacity is less than 480,000 Btu/h (140,690 W) cooling capacity and 600,000 Btu/h (175,860 W) heating capacity.

2. Systems included in Section C403.3 that serve dwelling units and sleeping units in hotels, motels, boarding houses or similar units.
Residential Energy Efficiency

R403.2.2 Sealing (Mandatory).

Duct tightness shall be verified by testing to Section 803 of the RESNET Standards by either an energy rater certified in accordance with Section 553.990, Florida Statutes, or as authorized by Florida Statutes, to be “substantially leak free” by either a Post-Construction Test or Rough-In Test:

Exceptions:

1. The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.
2. Duct testing is not mandatory for buildings complying by Section 405 of this code.
Residential Energy Efficiency

R403.2.4 Air-handling units.

Air handling units shall not be installed in the attic when a home is brought into code compliance by Section R402 (Prescriptive). Air-handling units shall be allowed in attics for compliance by Section R405 (Performance) only if the following conditions are met:

1. The service panel of the equipment is located within 6 feet (1829 mm) of an attic access.
2. A device is installed to alert the owner or shut the unit down when the condensation drain is not working properly.
3. The attic access opening is of sufficient size to replace the air handler.
4. A notice is posted on the electric service panel indicating to the homeowner that the air handler is located in the attic. Said notice shall be in all capitals, in 16 point type, with the title and first paragraph in bold:

CALCS-PLUS
Notice to Homeowner

NOTICE TO HOMEOWNER
A PART OF YOUR AIR CONDITIONING SYSTEM, THE AIR HANDLER, IS LOCATED IN THE ATTIC. FOR PROPER, EFFICIENT, AND ECONOMIC OPERATION OF THE AIR CONDITIONING SYSTEM, YOU MUST ENSURE THAT REGULAR MAINTENANCE IS PERFORMED. YOUR AIR CONDITIONING SYSTEM IS EQUIPPED WITH ONE OR BOTH OF THE FOLLOWING:

(1) A DEVICE THAT WILL ALERT YOU WHEN THE CONDENSATION DRAIN IS NOT WORKING PROPERLY OR
(2) A DEVICE THAT WILL SHUT THE SYSTEM DOWN WHEN THE CONDENSATION DRAIN IS NOT WORKING.

TO LIMIT POTENTIAL DAMAGE TO YOUR HOME, AND TO AVOID DISRUPTION OF SERVICE, IT IS RECOMMENDED THAT YOU ENSURE PROPER WORKING ORDER OF THESE DEVICES BEFORE EACH SEASON OF PEAK OPERATION.
Spot Ventilation - Local Exhaust

R403.5 Mechanical ventilation (Mandatory).

The building shall be provided with ventilation that meets the requirements of the Florida Building Code, Residential or Florida Building Code, Mechanical, as applicable, or with other approved means of ventilation.

Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.
Residential Energy Efficiency

R403.5.1 Whole-house mechanical ventilation system fan efficacy.
Mechanical ventilation system fans shall meet the efficacy requirements of Table R403.5.1.

**Exception:**
Where mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.

<table>
<thead>
<tr>
<th>FAN LOCATION</th>
<th>AIR FLOW RATE MINIMUM (CFM)</th>
<th>MINIMUM Efficacy (CFM/WATT)</th>
<th>AIR FLOW RATE MAXIMUM (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range hoods</td>
<td>Any</td>
<td>2.8 cfm/watt</td>
<td>Any</td>
</tr>
<tr>
<td>In-line fan</td>
<td>Any</td>
<td>2.8 cfm/watt</td>
<td>Any</td>
</tr>
<tr>
<td>Bathroom, utility room</td>
<td>10</td>
<td>1.4 cfm/watt</td>
<td>&lt; 90</td>
</tr>
<tr>
<td>Bathroom, utility room</td>
<td>90</td>
<td>2.8 cfm/watt</td>
<td>Any</td>
</tr>
</tbody>
</table>

For SI: 1 cfm = 28.3 L/min.

CALCS-PLUS
### 2014 Mechanical Code

#### Chapter 4, Table 403.3 Minimum Ventilation Rates

**TABLE 403.3—continued MINIMUM VENTILATION RATES**

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>OCCUPANT DENSITY #/1000 FT²</th>
<th>PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, Rₚ</th>
<th>AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, Rₑ</th>
<th>EXHAUST AIRFLOW RATE CFM/FT²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conference rooms</td>
<td>50</td>
<td>5</td>
<td>0.06</td>
<td>—</td>
</tr>
<tr>
<td>Office spaces</td>
<td>5</td>
<td>5</td>
<td>0.06</td>
<td>—</td>
</tr>
<tr>
<td>Reception areas</td>
<td>30</td>
<td>5</td>
<td>0.06</td>
<td>—</td>
</tr>
<tr>
<td>Telephone/data entry</td>
<td>60</td>
<td>5</td>
<td>0.06</td>
<td>—</td>
</tr>
<tr>
<td>Main entry lobbies</td>
<td>10</td>
<td>5</td>
<td>0.06</td>
<td>—</td>
</tr>
<tr>
<td>Specialty shops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automotive motor-fuel dispensing stations</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1.5</td>
</tr>
<tr>
<td>Barber</td>
<td>25</td>
<td>7.5</td>
<td>0.06</td>
<td>0.5</td>
</tr>
<tr>
<td>Beauty salons</td>
<td>25</td>
<td>20</td>
<td>0.12</td>
<td>0.6</td>
</tr>
<tr>
<td>Nail salons</td>
<td>25</td>
<td>20</td>
<td>0.12</td>
<td>0.6</td>
</tr>
<tr>
<td>Private dwellings, single and multiple</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garages, common for multiple units</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.75</td>
</tr>
<tr>
<td>Garages, separate for each dwelling</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>100 cfm per car</td>
</tr>
<tr>
<td>Kitchens</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>25/100</td>
</tr>
<tr>
<td>Living areas</td>
<td>Based upon number of bedrooms. First bedroom, 2; each additional bedroom, 1</td>
<td>0.35 ACH but not less than 15 cfm/person</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Toilet rooms and bathrooms</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>20/50</td>
</tr>
</tbody>
</table>

**CALCS-PLUS**
R403.5.2 Ventilation air.

Residential buildings designed to be operated at a positive indoor pressure or for mechanical ventilation shall meet the following criteria:

1. The design air change per hour minimums for residential buildings in ASHRAE 62, Ventilation for Acceptable Indoor Air Quality, shall be the maximum rates allowed for residential applications.
2. No ventilation or air-conditioning system make-up air shall be provided to conditioned space from attics, crawlspaces, attached enclosed garages or outdoor spaces adjacent to swimming pools or spas.
3. If ventilation air is drawn from enclosed space(s), then the walls of the space(s) from which air is drawn shall be insulated to a minimum of R-11 and the ceiling shall be insulated to a minimum of R-19, space permitting, or R-10 otherwise.
Ventilation Air
Its Here to Stay

Scope and Administration
R102.1.1 Above code programs.

The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as “mandatory” in Chapter 4 shall be met.
ASHRAE 62 Minimums

**TABLE 4.1a (I-P)**
Ventilation Air Requirements, cfm

<table>
<thead>
<tr>
<th>Floor Area (ft²)</th>
<th>0–1</th>
<th>2–3</th>
<th>4–5</th>
<th>6–7</th>
<th>&gt;7</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1500</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>1501–3000</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
</tr>
<tr>
<td>3001–4500</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
</tr>
<tr>
<td>4501–6000</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
</tr>
<tr>
<td>6001–7500</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
</tr>
<tr>
<td>&gt;7500</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
<td>165</td>
</tr>
</tbody>
</table>

**OR**

**ASHRAE 62.2-2010, Formula 4.1a**

\[ Q_{\text{fan}} = 0.01 x A_{\text{floor}} + 7.5 (N_{\text{br}} + 1) \]

Where:
- \( Q_{\text{fan}} \) = Fan Flow Rate, CFM
- \( A_{\text{floor}} \) = Floor Area in square feet
- \( N_{\text{br}} \) = Number of Bedrooms, Not to be less than 1
2014 Mechanical Code

CHAPTER 4 VENTILATION

401.2 Ventilation required.
Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section 402.4.1.2 of the Florida Building Code, Energy Conservation, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.

403.3 Outdoor airflow rate.
Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with this section. Occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3.
b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

g. Mechanical exhaust is required and recirculation is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air re-circulated from these spaces (see Section 403.2.1, Items 2 and 4).
How Much Ventilation?

Section 403.5.2 of the Florida Building Code – Energy Conservation says:

The design air change per hour minimums for residential buildings in ASHRAE 62, Ventilation for Acceptable Indoor Air Quality, shall be the maximum rates allowed for residential applications.

**ASHRAE 62.2-2010 Minimum** 7.5 CFM per person + (.01 CFM x SQ FT)

Table 403.3 of the Florida Building Code – Mechanical, Chapter 4, Ventilation says:

PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, $R_p$

| CFM/PERSON | 0.35 ACH but not less than 15 cfm/person |

CALCS-PLUS
SECTION R106 REFERENCED STANDARDS

R106.1 Referenced codes and standards.
The codes and standards referenced in this code shall be those listed in Chapter 5, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R106.1.1 and R106.1.2.

R106.1.1 Conflicts. Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

R106.1.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

R106.2 Conflicting requirements.
Where the provisions of this code and the referenced standards conflict, the provisions of this code shall take precedence.
Ventilation

Let's look at a 3 bedroom home, 2,000 SQ FT
The quantity of people is equal to the number of bedrooms + 1

**ASHRAE 62.2-2010 Minimum**
7.5 CFM per person + .01 CFM / SQ FT

\[(7.5 \times 4) + (.01 \times 2,000) = 30 + 20 = 50 \text{ CFM}\]

Table 403.3 of the Florida Building Code – Mechanical, Chapter 4, Ventilation

0.35 ACH but not less than 15 cfm/person

\[4 \times 15 = 60\]
However

Lets look at a 3 bedroom home, 8,000 SQ FT

**ASHRAE 62.2-2010 Minimum**

7.5 CFM per person + .01 CFM / SQ FT

\[(7.5 \times 4) + (.01 \times 8,000) =\]

\[30 + 80 = 110 \text{ CFM}\]

Table 403.3 of the Florida Building Code – Mechanical, Chapter 4, Ventilation

0.35 ACH but not less than 15 cfm/person

\[4 \times 15 = 60 \text{ CFM}\]
Ventilation Air

Three methods of supplying ventilation air

Exhaust

Air is exhausted from a known location and replacement air enters the building from an unknown location

Balanced

Air is exhausted from a known location and replacement air enters the building from known location

Supply

Air enters the building from a known location and exhaust air leaves the building from an unknown location
505.2 Makeup air required.

Exhaust hood systems capable of exhausting in excess of 400 cfm (0.19 m³/s) shall be provided with *makeup air* at a rate approximately equal to the exhaust air rate. Such *makeup air* systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

**Exception:** In a single-family dwelling, make-up air is not required for range hood exhaust systems capable of exhausting:

(a) Four hundred cubic feet per minute or less; or

(b) More than 400 cubic feet per minute but no more than 800 cubic feet per minute if there are no gravity vent appliances within the conditioned living space of the structure.
**FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION**

**Table 402.4.1.1**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Walls**
- Insulation on any exposed envelope, exterior thermal envelope contains a continuous barrier. Exterior or interior walls shall be covered with a permeable insulation not used as a sealing material.
- Insulation on any exposed envelope, exterior thermal envelope contains a continuous barrier. Exterior or interior walls shall be covered with a permeable insulation not used as a sealing material.

**Windows, skylights, and doors**
- The space between the window and frame is sealed.
- The space between the window and frame is sealed.

**Roof areas**
- The roof is sealed.
- The roof is sealed.

**Ducts**
- Ducts shall be insulated or covered with a continuous barrier.
- Ducts shall be insulated or covered with a continuous barrier.

**Energy Performance Level (EPL)**

**Estimated Energy Performance Index**

- EPL = 55

**Duct Leakage Test Results**

<table>
<thead>
<tr>
<th>Duct Leakage Test Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 1</td>
</tr>
<tr>
<td>Value 1</td>
</tr>
</tbody>
</table>

**Florida Building Code**

**Florida Energy Efficiency Code**

**Building Official**

- Name: [Provided]
- Address: [Provided]

**Pass**

- [Provided]
- [Provided]

**CALCS-PLUS**

- [Provided]
6/15/2015

Form R405-2014

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

Energy Performance Level (EPL) Display Card

Estimated Energy Performance Index* = 95

The lower the Energy Performance Index, the more efficient the home.

Dradon, FL

If the pass on this form is not within the compliance range on the Energy Performance Index (EPL) Display Card, then the homeowner must correct the problem in accordance with the Florida Building Code. If the problem cannot be corrected, then a new EPL Display Card must be completed based on installed Code compliant features.

Under Signature:

If the EPL Display Card is not completed, then the new owner will not be able to receive the full benefit of the Florida Energy Efficiency Code.

Note: This is not a Building Energy Rating. If your index is below 75, your home may qualify for energy efficient mortgages. If you obtain a Florida Energy/Residential Mortgage, contact the Florida Energy/Residential Mortgage at (904) 434-5255 or see the Energy/Residential Mortgage website at energycares.com for information and a list of certified Raters. For information about the Florida Building Code, Energy Conservation, contact the Florida Building Commission's support staff.

*Label required by Section R303.1.3 of the Florida Building Code, Energy Conservation, if not DEFAULT.

6/15/2015 3:21 PM

CALCS-PLUS

Form R405 Duct Leakage Test Report (usually one page)
Form R405-2014

RESIDENTIAL ENERGY CONSERVATION CODE DOCUMENTATION CHECKLIST

Florida Department of Business and Professional Regulation
Simulated Performance Alternative (Performance) Method

Applications for compliance with the 2014 Florida Building Code, Energy Conservation via the residential Simulated Performance method shall include

☐ This checklist

☐ A Form R405 report that documents that the Proposed Design complies with Section R405.3 of the Florida Energy Code. This form shall include a summary page indicating home address, e-ratio and the pass or fail status along with summary areas and types of components, whether the home was simulated as a worst-case orientation, name and version of the compliance software tool, name of individual completing the compliance report (1 page) and an input summary checklist that can be used for field verification (usually 4 pages/may be greater).

☐ Mandatory Requirements (three pages)

Required prior to CO for the Performance Method:

☐ Air Barrier and Insulation Inspection Component Criteria checklist (Table R402.4.1.1 - one page)

☐ A completed Envelope Leakage Test Report (usually one page)

☐ If Form R405 duct leakage type indicates anything other than "default leakage", then a completed Form R405 Duct Leakage Test Report (usually one page)
Mandatory Requirements

Mandatory Requirements

6/15/2015
### Air Barrier Checklist

**Residential Energy Compliance**

**Florida Department Simulated Performance**

Applications for compliance with the 2015 Florida Building Code Simulated Performance and
decision to be made prior to CO for the Performance.

- Air Barrier and Insulation Inspection (one page)

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CRITERIA</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air barrier and thermal barrier</td>
<td>A continuous air barrier shall be installed in the building envelope.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exterior thermal envelope contains a continuous barrier.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breaks or joints in the air barrier shall be sealed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air-permeable insulation shall not be used as a sealing material.</td>
<td></td>
</tr>
<tr>
<td>Ceiling/attic</td>
<td>The air barrier in any dropped ceiling/soffit shall be aligned with the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>insulation and any gaps in the air barrier shall be sealed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access openings, drop down stairs or knee wall doors to unconditioned</td>
<td></td>
</tr>
<tr>
<td></td>
<td>attic spaces shall be sealed.</td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Corners and headers shall be insulated and the junction of the foundation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and sill plate shall be sealed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The junction of the top plate and the top or exterior walls shall be</td>
<td></td>
</tr>
<tr>
<td></td>
<td>sealed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exterior thermal envelope insulation for framed walls shall be installed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in contact with continuous alignment with the air barrier.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knee walls shall be sealed.</td>
<td></td>
</tr>
<tr>
<td>Windows, skylights and doors</td>
<td>The space between window/door jams and framing and skylights and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>framing shall be sealed.</td>
<td></td>
</tr>
<tr>
<td>Recessed lighting</td>
<td>Recessed light fixtures shall be installed in the building thermal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>envelope shall be air tight, IC rated, and sealed to the drywall.</td>
<td></td>
</tr>
<tr>
<td>Plumbing and wiring</td>
<td>Bat insulation shall be cut neatly to fit around wiring and plumbing in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>exterior walls, or insulation that is installed is rated to conform to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>available space shall extend behind piping and wiring.</td>
<td></td>
</tr>
<tr>
<td>Shower/tub on exterior wall</td>
<td>Exterior walls adjacent to showers and tubs shall be insulated and the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>air barrier installed separating them from the showers and tubs.</td>
<td></td>
</tr>
<tr>
<td>Electrical/phone box on</td>
<td>The air barrier shall be installed behind electrical or communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>boxes or air sealed boxes shall be installed.</td>
<td></td>
</tr>
<tr>
<td>HVAC register boots</td>
<td>HVAC register boots that penetrate building thermal envelope shall be</td>
<td></td>
</tr>
<tr>
<td></td>
<td>sealed to the sub-floor or drywall.</td>
<td></td>
</tr>
<tr>
<td>Fireplace</td>
<td>An air barrier shall be installed on fireplace walls. Fireplaces shall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>have gasketed doors.</td>
<td></td>
</tr>
</tbody>
</table>

*EnergyGauge - USA - FluRes2014 Section R405-4.1 Compliant Software*
Blower Door Inputs

FLORIDA ENERGY EFFICIENCY CODE
FOR BUILDING CONSTRUCTION
Envelope Leakage Test Report
Proactive and Performance Method

Envelope Leakage Test Results

<table>
<thead>
<tr>
<th>Regression Data</th>
<th>Leakage Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single or Multi Point Test Data</td>
<td></td>
</tr>
<tr>
<td>HOUSE PRESSURE</td>
<td>FLOW</td>
</tr>
<tr>
<td>1</td>
<td>Pa</td>
</tr>
<tr>
<td>2</td>
<td>Pa</td>
</tr>
<tr>
<td>4</td>
<td>Pa</td>
</tr>
<tr>
<td>6</td>
<td>Pa</td>
</tr>
</tbody>
</table>

RM9.4.1.2 Testing: The building air sealing details shall be verified and verified on a daily basis on a daily basis in climate Zones 1 and 2, as shown in Table 1 in climate Zones 1 through 6. Testing shall be conducted at least every 30 days. If required by the code official, testing shall be conducted by an independent third party. The testing shall be conducted by the party conducting the test and provided to the code official. Testing shall be performed under the air pressure of the building thermal envelope.

During testing:
1. Exterior windows and doors, window and door units shall be closed, but not sealed. This will ensure the accuracy of the test.
2. Ventilation systems, including exhaust, intakes, makeup air, backdraft, and auxiliary control measures, shall be turned off and not used during the test.
3. Interior doors, windows, and ventilation systems shall be open and not sealed.
4. Heating and cooling systems shall be turned off and not used.
5. Supply and return registers, if installed, shall be open during the test.
6. The building shall be pressurized to the design pressure of the building thermal envelope.

I hereby certify that the above envelope leakage performance data demonstrate compliance with Florida Energy Code requirements in accordance with Section 901.4.1.2.

SIGNATURE:
PRINTED NAME:
DATE:

Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the third party conducting the test and provided to the code official.

BUILDING OFFICIAL:
DATE:

EnergyGauge® USA - Florida 2014 - Section RM9.4.1.2 Compliant Software
Page 1 of 1
CALCS-PLUS
### Duct Test

**FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION**

Form R405 Duct Leakage Test Report

**Performance Method**

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project Number</th>
<th>Performance Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grierson-SM4-205</td>
<td>G4000</td>
<td>Performance Method</td>
</tr>
</tbody>
</table>

**Duct Leakage Test Results**

<table>
<thead>
<tr>
<th>Line</th>
<th>System</th>
<th>Outside Duct Leakage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total House Duct System Leakage**

\[
\text{Total Leakage} = \left( \sum \text{Line Leakage} \right) \times \text{Floor Area}
\]

- **Total Leakage**
- **Floor Area**

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**Residential Energy Conservation Code Documentation Checklist**

- Florida Department of Business and Professional Regulation
- Simulated Performance Alternative (Performance) Method

Applications for compliance with the 2014 Florida Building Code, Energy Conservation via the residential Simulated Performance method shall include:

- This checklist
- A Form R405 report that documents that the Proposed Design complies with Section R405.3 of the Florida Energy Code. This form shall include a summary page indicating home address, model and the pass or fail status along with summary areas and types of components, whether the home was simulated as a worst-case orientation, name and version of the compliance software tool, name of individual completing the compliance report (1 page) and an input summary checklist that can be used for field verification (usually 4 pages may be greater)
- Energy Performance Level (EPL) Display Card (1 page)

**If Form R405 duct leakage type indicates anything other than “default leakage”, then a completed Form R405 Duct Leakage Test Report (usually one page)**

- A completed Envelope Leakage Test Report (usually one page)
- If Form R405 duct leakage type indicates anything other than “default leakage”, then a completed

- Compliance with a proposed duct leakage Qn requires a Duct Leakage Test Report confirming duct leakage to outdoors, tested in accordance with Section 803 of RESNET Standards, is not greater than 0.030 Qn for whole house.
Residential Energy Efficiency

R403.8 Snow melt system controls (Mandatory).
Thank You

Questions?