Energy
2012 IECC, 2012 IRC & 2012 USBC

- IECC C303.1.3(3) Dynamic Glazing
- IECC C401.2 Application
- IECC C401.2.1 Existing Buildings
- IECC C402.2 R-Values
- IECC C402.3 U-Factor
- IECC C402.3.1 Fenestration Max Area
- IECC C402.3.3.1 SHGC Adjustment
- IECC C402.4.1 Air Barriers
- IECC C402.1.2.3 Building Test
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- IECC C402.4.7 Vestibules
- IECC C403.2.3 HVAC Equipment Performance (Efficiency Tables)
- IECC C403.2.4.3.3 Automatic Start Capabilities
- IECC C403.2.5.1 Demand Control Ventilation
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- IECC C403.3.1 Economizers
- IECC C404.7 Pools and In-Ground Permanently Installed Spas
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- IECC C406.3 Efficient Lighting System (Option #2)
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- IRC R403.1.1/IRC N1103.1.1 Programmable Thermostat
- IECC R403.2.2/IRC 1103.2.2 Sealing
- IECC R403.2.2.1/IRC N1103.2.2.1 Testing Option
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- IECC R403.3.1/IRC N1103.3.1
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- IECC R403.6/IRC N1103.6
- IECC R404.1/IRC N1104.1
- IECC R404.1.1/IRC N1104.1.1
- IECC R405.5.2(1)/IRC Table N1105.5.2(1)
2012 IECC and 2012 IRC Chapter 11

New for 2012:
- Residential Energy provisions are located in IRC Chapter 11 and IECC Chapter 4 [RE]
- Sections in IRC Chapter 11 are subsequently numbered with the corresponding IECC section
- Commercial Energy provisions are only located in IECC Chapter 4 [CE]

IECC C303

- C303.1.3(3) Dynamic Glazing

IECC C401

- C401.2 Application
IECC C401

- C401.2.1 Existing Buildings

IECC C402

- Table C402.2 R-Values

IECC C402

- Table C402.3 U-Factor

IECC C402

- C402.3.1 Fenestration Max Area

IECC C402

- Table C402.3.3.1 SHGC Adjustment

<table>
<thead>
<tr>
<th>PROJECTION FACTOR</th>
<th>ORIENTED WITHIN 45 DEGREES OF TRUE NORTH</th>
<th>ALL OTHER ORIENTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 ≤ PF ≤ 0.5</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td>PF ≤ 0.5</td>
<td>1.2</td>
<td>1.6</td>
</tr>
</tbody>
</table>
IECC C402

- C402.4.1.2.3 Building Test

IECC C402

- C402.4.4 Doors and Access Openings

IECC C402

- C402.4.7 Vestibules

IECC C403

- C403.2.3 HVAC Equipment Performance (Efficiency Tables)
IECC C403

- C403.2.4.3.3 Automatic Start Capabilities

IECC C403

- C403.2.5.1 Demand Control Ventilation

IECC C403

- C403.2.6 Energy Recovery Ventilation

IECC C403

- C403.2.8, 403.2.8.1 Piping Insulation

IECC C403

- Content/slide text
**IECC C404**
- C 404.7 Pools and In-Ground Permanently Installed Spas

**IECC C405**
- C405.1 Lighting in Commercial Dwelling Units 75% of all Fixtures fitted with High Efficacy Lamps

**IECC C405**
- C405.2.2 Additional Lighting Controls

**IECC C405**
- C405.2.2.1 & .2 Automatic Lighting Controls, Timed Switched Devices or Occupancy Sensors

**IECC C405**
- C405.2.2.3 Daylight Zone Controls
IECC C405

- C405.2.3 Specific Application Controls

IECC C405

- C405.5.2 (2) Interior Lighting

<table>
<thead>
<tr>
<th>Common Space-By-Space Types</th>
<th>LPO (w/in2)</th>
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</thead>
<tbody>
<tr>
<td>Auditorium - First 40 ft in Height</td>
<td>0.03 per ft. 14</td>
</tr>
<tr>
<td>Auditorium - Above 40 ft in Height</td>
<td>0.02 per ft. 14</td>
</tr>
<tr>
<td>Audiovisual/entertainment area - permanent</td>
<td></td>
</tr>
<tr>
<td>For auditorium</td>
<td>0.5</td>
</tr>
<tr>
<td>For performing arts theater</td>
<td>2.5</td>
</tr>
<tr>
<td>For motion picture theater</td>
<td>1.2</td>
</tr>
<tr>
<td>Classroom/lecture training</td>
<td>1.3</td>
</tr>
<tr>
<td>Conference/meeting/ multipurpose</td>
<td>1.2</td>
</tr>
<tr>
<td>Corridor/transition</td>
<td>0.7</td>
</tr>
<tr>
<td>Dining area</td>
<td></td>
</tr>
<tr>
<td>Banquet/measure dining</td>
<td>1.4</td>
</tr>
<tr>
<td>Family dining area</td>
<td>1.4</td>
</tr>
</tbody>
</table>

IECC C406

- C406.1 Additional Efficiency Package Options

<table>
<thead>
<tr>
<th>Pick One:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C406.2 - Eff. HVAC Performance</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>C406.3 - Eff. Lighting Systems</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>C406.4 - On-site Renewable Energy</td>
</tr>
</tbody>
</table>

IECC C406

C406.2 Efficient HVAC Performance (Option #1)

- Tables C406.2(1) through C406.2(7)
- Greater efficiencies than those in C403.2.3

IECC C406

C406.3 Efficient Lighting System (Option #2)

- Reduced lighting power density per Table C406.3
- Applies to the whole building (not space by space)
### IECC C406

C406.4 On-Site Renewable Energy (Option #3)
- Provide ≥ 1.75 Btu or not less than 0.50 watts per square foot of conditioned floor area OR
- Provide ≥ 3% of energy used for mechanical and service water heating equipment and lighting

### IECC C407

- C407.3 Performance Based Compliance

### Building energy cost to be ≤ 85% of standard reference design building

### 2012 IECC and 2012 IRC Chapter 11

New for 2012:
- **Residential** Energy provisions are located in IRC Chapter 11 and IECC Chapter 4 [RE]
- Sections in IRC Chapter 11 are subsequently numbered with the corresponding IECC section
- **Commercial** Energy provisions are only located in IECC Chapter 4 [CE]

### IRC N1102/IECC R402

Table N1102.1.1 (R402.1.1) and Table N1102.1.3 (R402.1.3) R-Value changes Climate Zone 4
- Wood-framed walls – R 15 or 13 + 1
- Ceilings – R 38
- Mass Walls – 8/13
- Ceiling U-factor – 0.030
- Frame Wall U-factor – 0.079
**IRC N1102/IECC R402**

Table N1102.1.1 (R402.1.1) USBC Amendment
- Climate Zone 4 Skylight U Factor – 0.55
- Solar Heat Gain Coefficient (SHGC) – 0.40

**IRC N1102/IECC R402**

N1102.2.1 (R402.2.1) Ceilings with attic spaces -
- This section allows for reduced R values of ceiling insulation when a raised-heel (energy) truss is used.
- USBC amended ceiling R-values to require R-38 and R-30 with Energy Truss

**IRC N1102/IECC R402**

- N1102.2.3 (R402.2.3) Eave Baffle – Required in attics when air-permeable insulation is used.

**IRC N1102/IECC R402**

N1102.2.4 (R402.2.4) Access hatches and doors – Virginia amended entire section
- In addition to weather-stripping, certain doors and hatches, such as hinged vertical doors, pull down, and hatches and scuttle covers must be insulated per this section

**IRC N1102/IECC R402**

- Table N1102.2.6 (R402.2.6) Changes to insulation R-Value requirements for steel framed walls
IRC N1102/IECC R402
N1102.2.12 (R402.2.12) Sunrooms -
- Energy Code requires all walls separating sunrooms from conditioned space to meet current R – Value requirements for insulation.

IRC N1102/IECC R402
N1102.3.5 (R 402.3.5) Sunroom U-Factor – New U-Factor requirements for sunrooms
- Maximum fenestration U-Factor of .45 and maximum skylight U-Factor of .70
- Exceptions for thermally isolated sunrooms

IRC N1104/IECC R402
N1102.4 (R402.4) Air leakage – Virginia has amended the following criteria in Table N1102.1.1.1 (402.1.1.1)
- Walls-corners and headers shall be completely filled with R 3
- Shower/Tub on exterior wall-air barrier installed on interior side of wall
- Fireplace-gasketed doors or tight-fitting flue dampers required
  Two notes added to table

IRC N1102/IECC R402
- N1102.4.1.2.2 /R402.4.1.2.2 Testing – Virginia amended this section to add Visual Option back in.
- Envelope tightness acceptable when all items in Table N1102.4.1.1 (R402.4.1.1) are field verified.

IRC N1102/IECC R402
- N1102.4.1.3 (R402.4.1.3) Leakage Rate – The building or dwelling shall not have a leakage rate exceeding 5 Air Changes per hour (ACH)
- Note: new section in IRC, R303.4 Mechanical Ventilation
- Requires whole-house mechanical ventilation when less than 5 ACH is obtained as verified by Blower Door Testing
IRC N1103/IECC R403

- N1103.1.1 (R403.1.1) Programmable Thermostat – Amended by Virginia
- The thermostat controlling the primary heating and cooling system must meet the requirements of this section

IRC N1103/IECC R403

- N1103.2.2 (R403.2.2) Sealing - All ducts, air handlers and filter boxes shall be sealed IAW IMC to minimize leakage.

Three new exceptions:
- Air impermeable spray foam permitted
- Partially inaccessible duct connections shall have 3 screws equally spaced used on exposed portion of joint
- Continuously welded or locking-type longitudinal joints and seams for systems of 2 inches of wc or less

IRC N1103/IECC R403

N1103.2.2.1 (R403.2.2.1) Testing option
- Post Construction testing – Total leakage shall be less than or equal to 6 cfm/100 sq. ft. of conditioned floor area
- Rough-in testing – Total leakage shall be less than or equal to 5 cfm/100 sq. ft. of conditioned floor area
- USBC amendment Visual Option allowed

IRC N1103/IECC R403

- N1103.2.2.1 (R403.2.2.1) Air handlers shall include manufacturer’s designation for an air leakage of no more than 2 percent of the design air flow rate IAW ASHRAE 193.

IRC N1103/IECC R403

- N1103.3.1 (R403.3.1) Piping insulation shall be protected from damage when exposed to weather, including sunlight, moisture, equipment maintenance, wind, and solar radiation.
- Tape cannot be used.
**IRC N1103/IECC R403**

- N1103.4.2 (R403.4.2) Piping for service water heating shall be insulated to R-3. Va. USBC Amendment.

  Deleted Table N1103.4.2 (R403.4.2) and added the following criteria:
  - 1. Larger than ¾” nominal diameter
  - 2. Piping serving for than one dwelling unit
  - 3. Located outside the conditioned space
  - 4. From the water heater to a distribution manifold
  - 5. Located under floor slab or Buried piping
  - 6. All Piping in recirculating systems

**IRC N1103/IECC R403**

- N1103.6 (R403.6) Mechanical equipment shall be sized IAW ACCA Manual S and building loads calculated IAW ACCA Manual J or other approved heating and cooling calculation methods.

**IRC N1104/IECC R404**

- N1104.1 (R404.1) A minimum of 50% of the lamps in permanently installed lighting fixtures shall be high-efficacy.

  Amended by Virginia to remain at 50% vs. 75%.

**IRC N1104/IECC R404**

- N1104.1.1 (R404.1.1) Fuel gas lighting systems shall not have continuously burning pilots.

**IRC N1105/IECC R405**

- Table N1105.5.2(1) (R405.5.2(1)) Changes to table for Air Exchange Rate, Heating Systems, Cooling Systems and Thermal Distribution Systems so Standard Reference Design Table is compatible with Virginia changes.

  Standard Reference Design only to be used as a baseline for comparing Performance-Based Design.