Thermal Enclosure System

ENERGY STAR® Qualified Homes

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST
### Rater Checklist: Sections 1 thru 4

#### Home Address
- **City**:  
- **Zip Code**:  

#### High-Performance Penetration
<table>
<thead>
<tr>
<th>Item</th>
<th>High-Performance Penetration</th>
<th>High-Penetration Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.</td>
<td>Descriptive Path Penetration</td>
<td>Descriptive Penetration</td>
</tr>
<tr>
<td>1.2.</td>
<td>Performance Path Penetration</td>
<td>Performance Penetration</td>
</tr>
</tbody>
</table>

#### Insulation

1. **Quality Insulation**
   - Quality Insulation:
     - All exterior walls:
       - **R-value**:  
     - All exterior walls:
       - **R-value**:  
     - All exterior walls:
       - **R-value**:  

2. **Polyurethane Air Barrier**
   - Polyurethane Air Barrier:
     - All exterior walls:
       - **R-value**:  
     - All exterior walls:
       - **R-value**:  

#### Exterior Insulation

1. **Walls**
   - **Walls**:
     - **Walls**:
       - **Walls**:
     - **Walls**:
     - **Walls**:
     - **Walls**:

2. **Roof**
   - **Roof**:
     - **Roof**:
     - **Roof**:

3. **Ceiling**
   - **Ceiling**:
     - **Ceiling**:
     - **Ceiling**:

4. **Advanced Heating, Insulation of the Items Below**
   - **Advanced Heating, Insulation of the Items Below**
     - **Advanced Heating, Insulation of the Items Below**

**Effective for homes occupied starting 06/01/2013**
**Revised 06/01/2013**
**Page 3 of 16**
1. High-Performance Fenestration

- Prescriptive Path
  - Meet or exceed Energy STAR requirements

- Performance Path
  - Meet or exceed 2009 IECC requirements
Prescriptive Path

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST
1 HIGH-PERFORMANCE FENESTRATION
1 PRESCRIPTIVE PATH

ENERGY STAR WINDOW SPECIFICATIONS

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>U-Factor¹</th>
<th>SHGC²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern</td>
<td>≤0.30</td>
<td>ANY</td>
</tr>
<tr>
<td>Prescriptive</td>
<td>≤0.31</td>
<td>≤0.35</td>
</tr>
<tr>
<td>North-Central</td>
<td>≤0.32</td>
<td>≥0.40</td>
</tr>
<tr>
<td>South-Central</td>
<td>≤0.35</td>
<td>≥0.30</td>
</tr>
<tr>
<td>Southern</td>
<td>≤0.60</td>
<td>≤0.27</td>
</tr>
</tbody>
</table>

ENERGY STAR SKYLIGHT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>U-Factor¹</th>
<th>SHGC²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern</td>
<td>≤0.65</td>
<td>ANY</td>
</tr>
<tr>
<td>North-Central</td>
<td>≤0.55</td>
<td>≤0.40</td>
</tr>
<tr>
<td>South-Central</td>
<td>≤0.57</td>
<td>≤0.30</td>
</tr>
<tr>
<td>Southern</td>
<td>≤0.70</td>
<td>≤0.30</td>
</tr>
</tbody>
</table>

ENERGY STAR DOOR SPECIFICATIONS

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>U-Factor¹</th>
<th>SHGC²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opaque</td>
<td>≤0.55</td>
<td>ANY</td>
</tr>
<tr>
<td>≤ 1/2 Lite</td>
<td>≤0.67</td>
<td>≤0.30</td>
</tr>
<tr>
<td>&gt; 1/2 Lite</td>
<td>≤0.70</td>
<td>≤0.30</td>
</tr>
</tbody>
</table>

¹ Btu/ft²·°F
² Fraction of incident solar radiation

A. Window does not meet ENERGY STAR requirements.

B. Window meets ENERGY STAR requirements.

Map of the United States showing regions:
- Northern
- North-Central
- South-Central
- Southern

Legend:
- Blue: Northern
- Yellow: North-Central
- Orange: South-Central
- Red: Southern
Performance Path

**THERMAL ENCLOSURE SYSTEM RATER CHECKLIST**

1. HIGH-PERFORMANCE FENESTRATION
2. PERFORMANCE PATH

---

**2009 IECC WINDOW REQUIREMENTS**

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>U-FACTOR*</th>
<th>SHGC**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>1.2</td>
<td>0.30</td>
</tr>
<tr>
<td>Zone 2</td>
<td>0.65†</td>
<td>0.30</td>
</tr>
<tr>
<td>Zone 3</td>
<td>0.50</td>
<td>0.30</td>
</tr>
<tr>
<td>Zone 4</td>
<td>0.35</td>
<td>NR</td>
</tr>
<tr>
<td>Zone 5</td>
<td>0.35</td>
<td>NR</td>
</tr>
<tr>
<td>Zone 6</td>
<td>0.35</td>
<td>NR</td>
</tr>
<tr>
<td>Zone 7</td>
<td>0.35</td>
<td>NR</td>
</tr>
</tbody>
</table>

**2009 IECC SKYLIGHT REQUIREMENTS**

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>U-FACTOR*</th>
<th>SHGC**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>0.75</td>
<td>0.30</td>
</tr>
<tr>
<td>Zone 2</td>
<td>0.75</td>
<td>0.30</td>
</tr>
<tr>
<td>Zone 3</td>
<td>0.65</td>
<td>0.30</td>
</tr>
<tr>
<td>Zone 4</td>
<td>0.60</td>
<td>NR</td>
</tr>
<tr>
<td>Zone 5</td>
<td>0.60</td>
<td>NR</td>
</tr>
<tr>
<td>Zone 6</td>
<td>0.60</td>
<td>NR</td>
</tr>
<tr>
<td>Zone 7</td>
<td>0.60</td>
<td>NR</td>
</tr>
</tbody>
</table>

a. U-factors and SHGC are maximum.

b. For impact-rated fenestration complying with Section R301.2.1.2 of the International Residential Code or Section 1606.1.2 of the International Building Code, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

c. There are no SHGC requirements in the Marine Zone.


---

A. Window does not meet 2009 IECC requirements.

B. Window meets 2009 IECC requirements.
2. Quality Insulated Insulation

**THERMAL ENCLOSURE SYSTEM RATER CHECKLIST**

**2. QUALITY-INSTALLED INSULATION**

**1. INSULATION LEVELS: MEET OR EXCEED 2009 IECC LEVELS**

**DETAIL 2.1 3, 4, 5, 7**

Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.

Install insulation in a home to meet or exceed the levels specified in the 2009 IECC and located on the back of this page.

A. Verify insulation meets standards by utilizing the guide below, looking at printed R-values on the insulation product or consulting the insulator.

* Footnotes located on page 49.

**COMMON INSULATION MATERIALS**

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>APPROX. R-VALUE PER INCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulose</td>
<td>R-3.5</td>
</tr>
<tr>
<td>Fiberglass (Batts)</td>
<td>R-3.5</td>
</tr>
<tr>
<td>Fiberglass (Blown)</td>
<td>R-3</td>
</tr>
<tr>
<td>Polyurethane Rigid Board</td>
<td>R-6.8</td>
</tr>
<tr>
<td>EPS Insulated Concrete Forms (ICF)</td>
<td>R-4.25</td>
</tr>
<tr>
<td>XPS Insulated Concrete Forms (ICF)</td>
<td>R-5.0</td>
</tr>
<tr>
<td>EPS Structurally Insulated Panels (SIP)</td>
<td>R-3.1</td>
</tr>
<tr>
<td>XPS Structurally Insulated Panels (SIP)</td>
<td>R-4.3</td>
</tr>
<tr>
<td>Spray Foam (Closed Cell)</td>
<td>R-6</td>
</tr>
<tr>
<td>Spray Foam (Open Cell)</td>
<td>R-3.6</td>
</tr>
</tbody>
</table>

Knowing the exterior boundary of the house is critical for everyone involved in aligning air barriers with insulation. The Rater should first gather all plans, elevations and sections of the house. By drawing a boundary around the exterior barrier, the Rater can see the difficult areas to insulate and better communicate the required actions in those areas with the insulator and subcontractors.
Quality-Installed Insulation

- Ceiling, wall, floor and slab
  - Meet or exceed 2009 IECC levels
  - Achieve ≤ 133%

- All ceiling, wall, floor and slab insulation shall achieve RESNET
  - Grade I installation or alternatively
  - Grade II for surfaces that contain layers of continuous air impermeable insulation
    - ≥ R-3 in Climate Zones 1 to 4
    - ≥ R-5 in Climate Zones 5 to 8
# Quality Insulated Insulation

*Meet or Exceed 2009 IECC Levels*

## 2009 IECC Insulation Requirements

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Ceiling</th>
<th>Frame Wall</th>
<th>Mass Wall</th>
<th>Floor</th>
<th>Basement Wall*</th>
<th>Crawl Space Wall*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>R-30</td>
<td>R-13</td>
<td>R-4</td>
<td>R-13</td>
<td>R-0</td>
<td>R-0</td>
</tr>
<tr>
<td>Zone 2</td>
<td>R-30</td>
<td>R-13</td>
<td>R-4</td>
<td>R-13</td>
<td>R-0</td>
<td>R-0</td>
</tr>
<tr>
<td>Zone 3</td>
<td>R-38</td>
<td>R-13</td>
<td>R-5</td>
<td>R-13</td>
<td>R-0</td>
<td>R-0</td>
</tr>
<tr>
<td>Zone 4</td>
<td>R-38</td>
<td>R-20 or R-13+R-5°</td>
<td>R-13</td>
<td>R-30°</td>
<td>R-10/13</td>
<td>R-10/13</td>
</tr>
<tr>
<td>Zone 5</td>
<td>R-49</td>
<td>R-20 or R-13+R-5°</td>
<td>R-13</td>
<td>R-30°</td>
<td>R-10/13</td>
<td>R-10/13</td>
</tr>
<tr>
<td>Zone 6</td>
<td>R-49</td>
<td>R-21</td>
<td>R-19</td>
<td>R-15/19</td>
<td>R-10/13</td>
<td>R-10/13</td>
</tr>
<tr>
<td>Zone 7</td>
<td>R-49</td>
<td>R-21</td>
<td>R-19</td>
<td>R-15/19</td>
<td>R-10/13</td>
<td>R-10/13</td>
</tr>
</tbody>
</table>

- a. R-Values are minimums.
- b. “R-13 4x4” means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulated sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of the exterior, structural sheathing shall be supplemented with insulation sheathing of at least R-2.
- c. The second R-value applies when more than half of the insulation is on the interior of the mass wall.
- d. Sufficient insulation to fill the cavity, R-19 minimum.
- e. “R-15/19” means R-15 continuous insulation sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. “R-10/13” means R-10 continuous insulated sheathing or R-10 cavity insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
- f. Basement wall insulation is not required in warm-humid locations defined by Figure 301.1 and Table 301.1 of the IECC.

**Interactive Map:**
Quality Insulated Insulation

RESNET Grade I or Grade II Installation

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST

2 QUALITY-INSTALLED INSULATION

2 INSULATION: RESNET GRADE I OR GRADE II INSTALLATION

A. Insulation has misalignment, compression, and gaps.

RESNET Grade I installation of batt insulation.

A. Compression and misalignment because insulation is not split around wires.

Batt was properly split around wires to achieve RESNET Grade I.

A. Compression and misalignment because insulation is not split around plumbing.

RESNET Grade I installation of blown insulation.

A. Spray foam installed with voids.

RESNET Grade I installation of spray foam insulation.
3. Fully-Aligned Air Barriers

- Complete air barrier shall be provided that is fully aligned with insulation
  - Interior or exterior surface ceilings in Climate 1-3
  - Interior surface ceilings in Climate Zones 4-8
  - Barrier at interior edge of attic eave in all climate zones
    - Wind baffle that extend to the full height of insulation
  - Baffle in every bay or a tabbed baffle in each bay with soffit vent
    - Prevent wind washing of insulation in adjacent bays
  - Exterior surface of walls in all climate zones
  - Interior surface of walls in Climate Zones 4-8
  - Exterior surface of floor in all climate zones
    - Include supports to ensure permanent contact and blocking at exposed edge
Fully-Aligned Air Barriers (cont.)

- **Walls**
  - Walls behind showers and tubs
  - Walls behind fireplaces
  - Attic knee walls
  - Skylight shaft walls
  - Wall adjoining porch roof
  - Staircase walls
  - Double walls
  - Garage rim / band joist adjoining conditioned space
  - All other exterior walls
Walls

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST

3
FULLY-ALIGNED AIR BARRIERS
1 Walls

DETAIL 3.1.1 6,7,10

Walls behind showers and tubs
A. Install insulation without misalignments, compressions, gaps, or voids in all exterior wall cavities behind all tubs and showers.
B. Back with a rigid air barrier or other supporting material to prevent insulation from sagging and create a continuous thermal barrier.*
C. Seal all seams, gaps, and holes of the air barrier with caulk or foam before tub/shower installation.

* EPA recommends using a rigid air barrier, but it is not a requirement.

FOOTNOTES
6. For purposes of this checklist, an air barrier is defined as any durable solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams and adequate support to resist positive and negative pressures without displacement or damage. EPA recommends, but does not require, rigid air barriers. Open-cell or closed-cell foam shall have a finished thickness ≥ 5.5" or 1.5", respectively, to qualify as an air barrier unless the manufacturer indicates otherwise. If flexible air barriers such as house wrap are used, they shall be fully sealed at all seams and edges and supported using fasteners with caps or heads ≥ 1" diameter unless otherwise indicated by the manufacturer. Flexible air barriers shall not be made of Kraft paper, paper-based products, or other materials that are easily torn. If polyethylene is used, its thickness shall be ≥ 6 mil.
7. EPA highly recommends, but does not require, inclusion of an interior air barrier at band joists in Climate Zone 4 through 6.
10. All insulated vertical surfaces are considered walls (e.g., exterior walls, knee walls) and must meet the air barrier requirements for walls. All insulated ceiling surfaces, regardless of slope (e.g., cathedral ceilings, tray ceilings, conditioned attic roof decks, flat ceilings, sloped ceilings), must meet the requirements for ceilings.
**Walls**

**THERMAL ENCLOSURE SYSTEM RATER CHECKLIST**

**3 FULLY-ALIGNED AIR BARRIERS**

**1 WALLS**

**DETAILED 3.1.4 6.7.10**

**Skylight shaft walls**

A. If non-rigid insulation is used, install a rigid air barrier to prevent insulation from sagging and create a continuous thermal barrier.

B. Seal all seams, gaps, and holes of the air barrier with caulk or foam.

C. Install the insulation without any misalignments, compressions, gaps, or voids so that it acts as both the air barrier and thermal boundary. Examples include foam board, spray foam or dense pack insulation.

* EPA highly recommends using a rigid air barrier, but it is not a requirement.

**FOOTNOTES**

6. For purposes of this checklist, an air barrier is defined as any durable solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams and adequate support to resist positive and negative pressures without displacement or damage. EPA recommends, but does not require, rigid air barriers. Open-cell or closed-cell foam shall have a finished thickness ≥ 5.5” or 1.5”, respectively, to qualify as an air barrier unless the manufacturer indicates otherwise. If flexible air barriers such as house wrap are used, they shall be fully sealed at all seams and edges and supported using fasteners with caps or heads ≥ 1” diameter unless otherwise indicated by the manufacturer. Flexible air barriers shall not be made of Kraft paper, paper-based products, or other materials that are easily torn. If polyethylene is used, its thickness shall be ≥ 6 mil.

7. EPA highly recommends, but does not require, inclusion of an interior air barrier at band joists in Climate Zone 4 through 8.

10. All insulated vertical surfaces are considered walls (e.g., exterior walls, knee walls) and must meet the air barrier requirements for walls. All insulated ceiling surfaces, regardless of slope (e.g., cathedral ceilings, tray ceilings, conditioned attic roof decks, flat ceilings, sloped ceilings), must meet the requirements for ceilings.
Walls

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST

3 FULLY-ALIGNED AIR BARRIERS

1 WALLS

DETAIL 3.1.8 8.7.16
Garage rim/band joist adjoining conditioned space
A. Install a continuous rigid air barrier or other supporting material to separate the garage from the conditioned space.*
B. Seal all seams, gaps, and holes of the air barrier with caulk or foam and completely before installing the insulation.
C. Install insulation without misalignments, compressions, gaps, or voids in all band joist cavities.
* EPA highly recommends using a rigid air barrier, but it is not a requirement.

FOOTNOTES
6. For purposes of this checklist, an air barrier is defined as any durable solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams and adequate support to resist positive and negative pressures without displacement or damage. EPA recommends, but does not require, rigid air barriers. Open-cell or closed-cell foam shall have a finished thickness ≥ 5.5" or 1.5", respectively, to qualify as an air barrier unless the manufacturer indicates otherwise. If flexible air barriers such as house wrap are used, they shall be fully sealed at all seams and edges and supported using fasteners with caps or heads ≥ 1" diameter unless otherwise indicated by the manufacturer. Flexible air barriers shall not be made of Kraft paper, paper-based products, or other materials that are easily torn. If polyethylene is used, its thickness shall be ≥ 6 mil.
7. EPA highly recommends, but does not require, inclusion of an interior air barrier at band joists in Climate Zone 4 through 6.
10. All insulated vertical surfaces are considered walls (e.g., exterior walls, knee walls) and must meet the air barrier requirements for walls. All insulated ceiling surfaces, regardless of slope (e.g., cathedral ceilings, tray ceilings, conditioned attic roof decks, flat ceilings, sloped ceilings), must meet the requirements for ceilings.
Walls

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST

3 FULLY-ALIGNED AIR BARRIERS
1 WALLS

A. Air barrier is not continuous.
B. Electrical box not air sealed.
C. Insulation is misaligned.

Continuous air barrier
Wiring penetrations properly air sealed.
Insulation is properly installed.

A. Air barrier is air sealed.
B. Air barrier is air sealed.
C. Insulation is misaligned.

Left Updated: 12/06/11
Fully-Aligned Air Barrier (cont.)

- Floors
  - Floor above garage
  - Cantilevered floor
  - Floor above unconditioned basement or unconditioned crawlspace

- Ceilings
  - Dropped ceiling / soffit below unconditioned attic
  - All other ceilings
Floors

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST

3 FULLY-ALIGNED AIR BARRIERS

2 FLOORS

A. No air barrier is present between the floor system and unconditioned space.

B. Penetration through the floor is not air sealed.

C. Sub-floor insulation has gaps, compression, and misalignment.

D. Sub-floor insulation is improperly installed and supported.

GOOD PICT OF SUB- FLOOR INSULATION PROPERLY SUPPORTED NEEDED.
Ceilings

**THERMAL ENCLOSURE SYSTEM RATER CHECKLIST**

3 FULLY-ALIGNED AIR BARRIERS

3 CEILINGS

**A.** Wind baffle installation will not allow insulation over the top plate.

**B.** Wind baffle installation will allow proper insulation depth over the top plate.

**BAD PIC OF WIND BAFFLE WITHOUT CLEARANCE FROM ROOF DECK NEEDED**

**Wind baffle installation maintains necessary code clearance between baffle and roof deck.**

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**2009 IECC INSULATION REQUIREMENTS**

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>CEILING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>R-30</td>
</tr>
<tr>
<td>Zone 2</td>
<td>R-30</td>
</tr>
<tr>
<td>Zone 3</td>
<td>R-30</td>
</tr>
<tr>
<td>Zone 4</td>
<td>R-38</td>
</tr>
<tr>
<td>Zone 5</td>
<td>R-49</td>
</tr>
<tr>
<td>Zone 6</td>
<td>R-49</td>
</tr>
<tr>
<td>Zone 7</td>
<td>R-49</td>
</tr>
</tbody>
</table>

a. R-values are minimums.

Interactive Map:

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*Image credit:* [Energy Star](http://energycode.pnl.gov/EnergyCodeReqs/)
4. Reduced Thermal Bridging

- Insulated ceiling with attic space above
- For slabs on grade in Climate Zone 4 and higher
- Insulation beneath attic platforms
- Reduce Thermal bridging at above-grade walls separating conditioned from unconditioned space
  - Choice in bridging
    - Rigid insulation
    - Structural Insulated Panels (SIPs)
    - Insulated Concrete Forms (ICFs)
    - Double-wall framing
    - Advanced framing
Minimum Required Levels

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST

4 REDUCED THERMAL BRIDGING
1 PERIMETER OF INSULATED CEILING MEETS REQUIRED LEVEL

DETAIL 4.1
For insulated ceilings with attic space above (i.e., non-cathedralized ceilings), uncompressed insulation extends to the inside face of the exterior wall below at the following levels: CZ 1 to 5: ≥ R-21; CZ 6 to 8: ≥ R-30

A. Install raised-heel trusses or equivalent framing method to allow the specified attic insulation R-value to be installed at the inside face of the exterior wall below (extending over the top plate).

FOOTNOTES
11. The minimum designated R-values must be achieved regardless of the trade-offs determined using an equivalent U-factor or UA alternative calculation. Note that if the minimum designated values are used, they must be compensated with higher values elsewhere using an equivalent U-factor or UA alternative calculation in order to meet the overall insulation requirements of the 2009 IECC. Also, note that these requirements can be met by using any available strategy, such as a raised-heel truss, alternate framing that provides adequate space, and/or high-density insulation. In Climate Zones 1 through 3, one option that will work for most homes is to use 2x6 framing, an R-21 high-density batt, and a wind baffle that only requires 0.5" of clearance.
**DETAIL 4.2**

For slabs on grade in CZ 4 and higher, 100% of slab edge insulated to ≥ R-5 at the depth specified by the 2009 IECC and aligned with thermal boundary of the walls.

A. Install slab edge insulation to extend to the top of the slab so it provides a complete thermal break.

**FOOTNOTES**

4. Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall.

5. Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the house, slab insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab. Where specific details cannot meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the homes qualification. EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program. A list of currently exempted details is available at: www.energystar.gov/slabedge.
Slab Edge Insulation

**THERMAL ENCLOSURE SYSTEM RATER CHECKLIST**

4. **REDUCED THERMAL BRIDGING**

2. **SLAB EDGE INSULATION**

**SLABS**

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>DEPTH</th>
<th>R-VALUE$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Zone 2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Zone 3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Zone 4</td>
<td>10, 2 ft.</td>
<td>0</td>
</tr>
<tr>
<td>Zone 5</td>
<td>10, 2 ft.</td>
<td>0</td>
</tr>
<tr>
<td>Zone 6</td>
<td>10, 4 ft.</td>
<td>0</td>
</tr>
<tr>
<td>Zone 7</td>
<td>10, 4 ft.</td>
<td>0</td>
</tr>
</tbody>
</table>

a. R-values are minimums.
b. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or two feet, whichever is less in Climate Zones 1-3 for heated slabs.

Interactive Map:
Walls: Continuous Rigid Insulation

THERMAL ENCLOSURE SYSTEM RATER CHECKLIST
4 REDUCED THERMAL BRIDGING
4 WALLS: CONTINUOUS RIGID INSULATION

DETAIL 4.4.1
Continuous rigid insulation, insulated siding, or i.e., 1 to 4 combination of the two; ≥ R-3 in Climate Zones 1 to 4, ≥ R-5 in Climate Zones 5 to 8

A. If utilizing insulated siding that is not water-resistant barrier, install a water-resistant barrier before installing siding.
B. If using steel studs, install continuous rigid insulation of ≥ R-3 in CZ 1 to 4 or ≥ R-5 in CZ 5 to 8.
C. Tape and seal all seams of continuous rigid insulation if it is being utilized as a water-resistant barrier.

* Only one item of 4.4.1-4.4.5 must be installed to comply with ENERGY STAR. If the building utilizes steel framing, this requirement must be met.
† Footnotes located on page 95.
Walls: Structural Insulated Panels (SIPs)
Walls: Insulated Concrete Forms (ICFs)
Walls: Double-Wall Framing
Walls: Advanced Framing
Resources

Important Websites:
- www.ruralhome.org
- www.energystar.gov
- http://www.epa.gov/watersense
- www.usgbc.com
- http://greenhomeguide.com/program/leed-for-homes

YouTube Videos:
- [http://youtu.be/SvuXT1NQGis](http://youtu.be/SvuXT1NQGis)
  - Attic Air-Sealing: Part 1, Evaluation (GreenHomes America)
- [http://youtu.be/cJViiGzGmn7I](http://youtu.be/cJViiGzGmn7I)
  - Swiftsure Energy Duct Testing
GENE GONZALES
Southwest Regional Director
Housing Assistance Council
7510 Montgomery NE, Suite 205
Albuquerque, NM 87109

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Wrap Up

Materials from today’s webinar and the recording will be available on HAC’s website.

www.ruralhome.org