

**4101:8-11-01 Energy efficiency.**

*[Comment: When a reference is made within this rule to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in rule 4101:8-43-01.2 of the Administrative Code. The application of the referenced standards shall be limited and as prescribed in section 102.4 of rule 4101:8-1-02 of the Administrative Code.]*

**SECTION 1101  
GENERAL**

**1101.1 Scope.** This chapter regulates the energy efficiency for the design and construction of buildings comprised of detached one-, two-, and three- family dwellings regulated by this code. Buildings comprised of R-3 occupancies shall comply with Chapter 13 of the Ohio Building Code for energy efficiency.

**Exception:** Portions of the building envelope that do not enclose conditioned space.

**1101.2 Compliance.** Compliance shall be demonstrated by ~~either~~ meeting the requirements of the *International Energy Conservation Code (if adopted by the local jurisdiction, above code programs identified in section 103.1.1 of the "IECC" shall be adopted in accordance with "RCO" section 101.3(3))* ~~or~~, meeting the requirements of sections 1101 through 1103 of this chapter, or meeting the requirements of section 1104 – Ohio Residential One-, Two-, and Three-Family Dwelling Prescriptive Energy Requirements. Climate zones from Figure 1101.2 or Table 1101.2 shall be used in determining the applicable requirements from sections 1101 through 1103 of this chapter.

**1101.3 Identification.** Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this chapter.

**1101.4 Building thermal envelope insulation.** An *R*-value identification mark shall be applied by the manufacturer to each piece of building thermal envelope insulation 12 inches (305 mm) or more wide. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the building thermal envelope. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be listed on the certification. For sprayed polyurethane foam

(SPF) insulation, the installed thickness of the area covered and  $R$ -value of installed thickness shall be listed on the certificate. The insulation installer shall sign, date and post the certificate in a conspicuous location on the job site.

**1101.4.1 Blown or sprayed roof/ceiling insulation.** The thickness of blown in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least one for every 300 ft<sup>2</sup> (28 m<sup>2</sup>) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers a minimum of 1 inch (25 mm) high. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed  $R$ -value shall be listed on the certificate provided by the insulation installer.

**1101.4.2 Insulation mark installation.** Insulating materials shall be installed such that the manufacturer's  $R$ -value mark is readily observable upon inspection.

**1101.5 Fenestration product rating.**  $U$ -factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled  $U$ -factor shall be assigned a default  $U$ -factor from Tables 1101.5(1) and 1101.5(2). The solar heat gain coefficient (SHGC) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC shall be assigned a default SHOC from Table 1101.5(3).

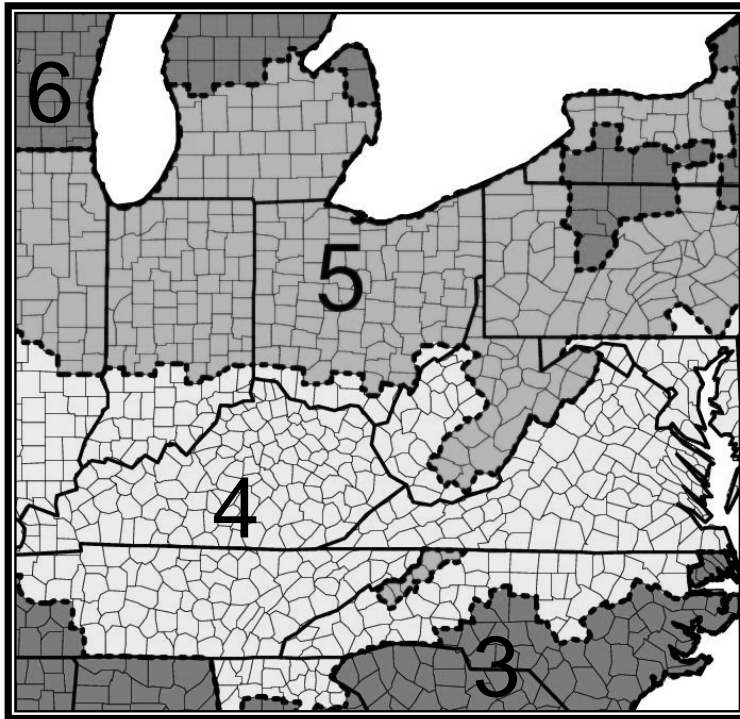
**1101.6 Installation.** All materials, systems and equipment shall be installed in accordance with the manufacturer's installation instructions and the provisions of this code.

**1101.6.1 Protection of exposed foundation insulation.** Insulation applied to the exterior of basement walls, crawl space walls, and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend a minimum of 6 inches (152 mm) below grade.

**1101.7 Above code programs.** *If adopted by the local jurisdiction, above code programs that exceed the energy efficiency requirements of this chapter shall be adopted in accordance with "RCO" section 101.3(3).*

**1101.8 Certificate.** A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration; and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the type and efficiency of heating, cooling and service water heating equipment.

**FIGURE 1101.2  
CLIMATE ZONES**



**TABLE 1101.2  
CLIMATE ZONES BY STATE AND COUNTIES**

<b>OHIO</b>
<b>Zone 5 except</b>
<b>Zone 4</b>
Adams
Brown
Clermont
Gallia
Hamilton

Lawrence
Pike
Scioto
Washington

**TABLE 1101.5(1)**  
**DEFAULT GLAZED FENESTRATION U-FACTORS**

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			Single	Double
Metal	1.2	0.8	2	1.3
Metal with thermal break	1.1	0.65	1.9	1.1
Nonmetal or metal clad	0.95	0.55	1.75	1.05
Glazed block	0.6			

**TABLE 1101.5(2)**  
**DEFAULT DOOR U-FACTORS**

DOOR TYPE	U-FACTOR
Uninsulated metal	1.2
Insulated metal	0.6
Wood	0.5
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

**TABLE 1101.5(3)**  
**DEFAULT GLAZED FENESTRATION SHGC**

SINGLE GLAZED		DOUBLE GLAZED		Glazed Block
Clear	Tinted	Clear	Tinted	
0.8	0.7	0.7	0.6	0.6

## SECTION 1102

### BUILDING THERMAL ENVELOPE

**1102.1 Insulation and fenestration criteria.** The building thermal envelope shall meet the requirements of Table 1102.1 based on the climate zone specified in Table 1101.2.

**1102.1.1 R-value computation.** Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component *R*-value. The manufacturer's settled *R*-value shall be used for blown insulation. Computed *R*-values shall not include an *R*-value for other building materials or air films,

**1102.1.2 U-factor alternative.** An assembly with a *U*-factor equal to or less than that specified in Table 1102.1.2 shall be permitted as an alternative to the *R*-value in Table 1102.1.

**Exception:** For mass walls not meeting the criterion for insulation location in Section 1102.2.3, the *U*-factor shall be permitted to be:

1. *U*-factor of 0.17 in Climate Zone 1
2. *U*-factor of 0.14 in Climate Zone 2
3. *U*-factor of 0.12 in Climate Zone 3
4. *U*-factor of 0.10 in Climate Zone 4 except Marine
5. *U*-factor of 0.082 in Climate Zone 5 and Marine 4

**1102.1.3 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 1102.1.2, (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table 1102.1. 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.

## 1102.2 Specific insulation requirements.

**1102.2.1 Ceilings with attic spaces.** When Section 1102.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly R-38 shall be deemed to satisfy the requirement for R-49 wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves.

**1102.2.2 Ceilings without attic spaces.** Where Section 1102.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 1102.1 shall be limited to 500 ft<sup>2</sup> (46 m<sup>2</sup>) of ceiling area.

**TABLE 1102.1  
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>a</sup>**

CLIMATE ZONE	FENESTRATION <i>U</i> -FACTOR	SKYUGH <sup>b</sup> <i>U</i> -FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE	FLOOR R-VALUE	BASEMENT <sup>c</sup> WALL R-VALUE	SLAB <sup>d</sup> R-VALUE AND DEPTH	CRAWL SPACE WALL R-VALUE
1	1.2	0.75	0.40	30	13	3	13	0	0	0
2	0.75	0.75	0.40	30	13	4	13	0	0	0
3	0.65	0.65	0.400	30	13	5	19	0	0	5/13

4 except Marine	0.40	0.60	NR	38	13	5	19	10/13	10, 2ft	10/13
5 and Marine 4	0.35	0.60	NR	38	19 or 13+5 <sup>g</sup>	13	30 <sup>f</sup>	10/13	10, 2ft	10/13
6	0.35	0.60	NR	49	19 or 13+5 <sup>g</sup>	15	30 <sup>f</sup>	10/13	10, 4ft	10/13
7 and 8	0.33	0.60	NR	49	21	19	30 <sup>f</sup>	10/13	10, 4ft	10/13

- a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 insulation shall be permitted to be compressed into a 2 X 6 cavity.
- b. The fenestration *U*-factor column excludes skylights. The solar heat gain coefficient (SHGC) column applies to all glazed fenestration.
- c. The first *R*-value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.
- d. R-5 shall be added to the required slab edge *R*-values for heated slabs.
- e. There are no solar heat gain coefficient (SHGC) requirements in the Marine Zone.
- f. Or insulation sufficient to fill the framing cavity, R-19 minimum.
- g. "13+5" means R- 13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25% or less of the exterior, R-5 sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25% of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

**TABLE 1102.1.2**  
**EQUIVALENT *U*-FACTORS<sup>a</sup>**

CLIMATE ZONE	FENESTRATION <i>U</i> -FACTOR	SKYLIGHT <i>U</i> -FACTOR	CEILING <i>U</i> -FACTOR	FRAME WALL <i>U</i> -FACTOR	MASS WALL <i>U</i> -FACTOR	FLOOR <i>U</i> -FACTOR	BASEMENT WALL <i>U</i> -FACTOR	CRAWL SPACE WALL <i>U</i> -FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360	0.136
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.060	0.06	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

- a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.

**1102.2.3 Mass walls.** Mass walls, for the purposes of this chapter, shall be considered walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs. The provisions of Section 1102.1 for mass walls shall be applicable when at least 50 percent of the required insulation R-value is on the exterior of, or integral to, the wall. Walls that do not meet this criterion for insulation placement shall meet the wood frame wall insulation requirements of Section 1102.1.

**Exception:** For walls that do not meet this criterion for insulation placement, the minimum added insulation *R*-value shall be permitted to be:

1. *R*-value of 4 in Climate Zone 1
2. *R*-value of 6 in Climate Zone 2
3. *R*-value of 8 in Climate Zone 3
4. *R*-value of 10 in Climate Zone 4 except Marine
5. *R*-value of 13 in climate Zone 5 and Marine 4

**1102.2.4 Steel-frame ceilings, walls and floors.** Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table 1102.2.4 or shall meet the *U*-factor requirements in Table 1102.1.2. The calculation of the *U*-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.

**TABLE 1102.2.4  
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (*R*-VALUE)**

WOOD FRAME <i>R</i> -VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT <i>R</i> -VALUE
<b>Steel Truss Ceilings<sup>a</sup></b>	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38+3
R-49	R-38+5
<b>Steel Joist Ceilings<sup>b</sup></b>	
R30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
<b>Steel Framed Wall</b>	
R-13	R-13 + 5 or R-15 + 4 or R-21 + 3
R-19	R-13 + 9 or R-19 + 8 or R-25 + 7
R-21	R-13 + 10 or R-19 + 9 or R-25 + 8
<b>Steel Joist Floor</b>	
R-13	R-19 in 2x6 R-19 + R-6 in 2 x 8 or 2 x 10
R-19	R-19 + R-6 in 2 x 6 R-19 + R-12 in 2 x 8 or 2 x 10

For SI: 1 inch = 25.4 mm.

- a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
- b. Insulation exceeding the height of the framing shall cover the framing.

**1102.2.5 Floors.** Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking.

**1102.2.6 Basement walls.** Exterior walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls

associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections 1102.1 and 1102.2.5.

**1102.2.7 Slab-on-grade floors.** Slab-on-grade floors with a floor surface less than 12 inches below grade shall be insulated in accordance with Table 1102.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table 1102.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation.

**1102.2.8 Crawl space walls.** As an alternative to insulating floors over crawl spaces, insulation of crawl space walls when the crawl space is not vented to the outside is permitted.

Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous vapor retarder. All joints of the vapor retarder shall overlap by 6 inches (152 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached to the stem wall.

**1102.2.9 Masonry veneer.** Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer.

**1102.2.10 Thermally isolated sunroom insulation.** The minimum ceiling insulation *R*-values shall be R-19 in zones 1 through 4 and R-24 in zones 5 through 8. The minimum wall *R*-value shall be R-13 in all zones. New wall(s) separating the sunroom from conditioned space shall meet the building thermal envelope requirements.

### **1102.3 Fenestration.**

**1102.3.1 U-factor.** An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements.

**1102.3.2 Glazed fenestration SHGC.** An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the solar heat gain coefficient (SHGC) requirements.

**1102.3.3 Glazed fenestration exemption.** Up to 15 square feet (1.4 m<sup>2</sup>) of glazed fenestration per dwelling unit shall be permitted to be exempt from *U*-factor and solar heat gain coefficient (SHGC) requirements in Section 1102.1.

**1102.3.4 Opaque door exemption.** One opaque door assembly is exempted from the *U*-factor requirement in Section 1102.1.

**1102.3.5 Thermally isolated sunroom *U*-factor.** For zones 4 through 8 the maximum fenestration *U*-factor shall be 0.50 and the maximum skylight *U*-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements.

**1102.3.6 Replacement fenestration.** Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for *U*-factor and solar heat gain coefficient (SHGC) in Table 1102.1.

#### **1102.4 Air leakage.**

**1102.4.1 Building thermal envelope.** The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating the garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Other sources of infiltration.

**1102.4.2 Fenestration air leakage.** Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cubic foot per

minute per square foot [ $1.5(\text{L/s})/\text{m}^2$ ], and swinging doors no more than 0.5 cubic foot per minute per square foot [ $2.5(\text{L/s})/\text{m}^2$ ], when tested according to NFRC 400 or AAMA/WDMA/CSA 101/IS.2/A440 by an accredited, independent laboratory, and listed and labeled by the manufacturer.

**Exception:** Site-built windows, skylights and doors.

**1102.4.3 Recessed lighting.** Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces by being:

1. IC-rated and labeled with enclosures that are sealed or gasketed to prevent air leakage to the ceiling cavity or unconditioned space; or
2. IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 pounds per square foot (75 Pa) pressure differential with no more than 2.0 cubic feet per minute (0.944 L/s) of air movement from the conditioned space to the ceiling cavity; or
3. Located inside an airtight sealed box with clearances of at least 0.5 inch (13 mm) from combustible material and 3 inches (76 mm) from insulation.

**1102.5 Moisture control.** The building design shall not create conditions of accelerated deterioration from moisture condensation. Above-grade frame walls, floors and ceilings not ventilated to allow moisture to escape shall be provided with an approved vapor retarder. The vapor retarder shall be installed on the warm-in-winter side of the thermal insulation.

**Exceptions:**

1. In construction where moisture or its freezing will not damage the materials.
2. Frame walls, floors and ceilings in jurisdictions in Zones 1, 2, 3, 4A, and 4B. (Crawl space floor vapor retarders are not exempted.)
3. Where other approved means to avoid condensation are provided.

**1102.5.1 Maximum fenestration *U*-factor.** The area weighted average maximum fenestration *U*-factor permitted using tradeoffs from Section 1102.1.3 in Zones 6 through 8 shall be 0.55.

To comply with this section, the maximum *U*-factor for skylights shall be 0.75 in zones 6 through 8.

## SECTION 1103 SYSTEMS

**1103.1 Controls.** At least one thermostat shall be installed for each separate heating and cooling system.

**1103.1.1 Heat pump supplementary heat.** Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

### **1103.2 Ducts.**

**1103.2.1 Insulation.** Supply and return ducts shall be insulated to a minimum of R-8. Ducts in floor trusses shall be insulated to a minimum of R-6.

**Exception:** Ducts or portions thereof located completely inside the building thermal envelope.

**1103.2.2 Sealing.** Ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.3.1.

**1103.2.3 Building cavities.** Building framing cavities shall not be used as supply ducts.

**1103.3 Mechanical system piping insulation.** Mechanical system piping capable of carrying fluids above 105°F (40°C) or below 55°F (13°C) shall be insulated to a minimum of R-2.

**1103.4 Circulating hot water systems.** All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

**1103.5 Mechanical ventilation.** Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

**1103.6 Equipment sizing.** Heating and cooling equipment shall be sized as specified in Section M1401.3.

## **SECTION 1104** **OHIO RESIDENTIAL ONE-, TWO-, AND THREE-FAMILY DWELLING** **PRESCRIPTIVE ENERGY REQUIREMENTS**

**1104.1 Energy compliance:** *Energy efficiency for the design and construction of buildings regulated by this code shall be demonstrated by complying with the*



prescriptive requirements listed Table 1, Table 2, and Table 3 of this section. By complying with the prescriptive requirements of these tables, those buildings shall be deemed to satisfy the requirements of this chapter.

**TABLE 1**

<b>Ohio Residential Prescriptive Energy Requirements Table<sup>a</sup></b>			
<b>Thermal Envelope</b>		<b>Zone A<sup>b</sup></b>	<b>Zone B<sup>b</sup></b>
1.	<u>Attic Insulation</u>	<u>R-30</u>	<u>R-38</u>
2.	<u>Walls</u>	<u>R-13</u>	<u>R-13</u>
3.	<u>Floors</u>	<u>R-19</u>	<u>R-19</u>
4.	<u>Band board/Band joist/Rim joist<sup>c</sup></u>	<u>R-19</u>	<u>R-19</u>
5.	<u>Conditioned Basement - Walls<sup>d</sup>, Conditioned Crawl Space – Walls<sup>f</sup></u>	<u>R-5 (R13<sup>e</sup>)</u>	<u>R-5 (R13<sup>e</sup>)</u>
6.	<u>Slab Perimeter (When above Frost Line)<sup>g</sup></u>	<u>R-10</u>	<u>R-10</u>
7.	<u>Glazing<sup>h</sup></u>	<u>U-0.35</u>	<u>U-0.35</u>
8.	<u>Exterior Doors</u>	<u>U-0.57</u>	<u>U-0.57</u>
9.	<u>Ductwork<sup>i</sup></u>	<u>R-6</u>	<u>R-6</u>
10.	<u>Maximum window to wall area ratio</u>	<u>21%</u>	<u>21%</u>
<b>HVAC Efficiencies</b>			
1.	<u>Furnace<sup>j</sup></u>	<u>90%</u>	<u>90%</u>
2.	<u>Air Conditioning<sup>k</sup></u>	<u>13</u>	<u>13</u>
<b>Air Infiltration Requirements</b>			
1.	<u>Refer to infiltration requirements in Table 3</u>		

- a. R-values represent the insulation only (i.e. not the entire wall, floor, or ceiling assembly).
- b. Zones A and B are as indicated in Table 2.
- c. Includes sill sealer, compressible gasketing, or caulking for air infiltration sealing.
- d. Insulated from the top of the plate to frost line.
- e. Walls that are more than fifty percent above grade shall be insulated as a wall – R-13.
- f. The crawl space wall R-value requirements are for walls of conditioned crawl spaces (i.e., not directly vented to the outside). The crawl space wall insulation must extend from the top of the plate to top of footing or crawlspace slab.
- g. Insulation depth/length - 24 inches.
- h. Skylights shall have a U-factor of 0.60
- i. Duct sealing as required by code; Recommend burying attic ducts in ceiling insulation.
- j. AFUE rating; heat pumps shall have an HSPF efficiency rating of 7.7.
- k. SEER rating.

**TABLE 2**

<b>Zone A</b>		<b>Zone B</b>	
<p><u>Adams, Athens, Belmont, Brown, Butler, Clermont, Clinton, Coshocton, Fairfield, Fayette, Franklin, Gallia, Greene, Guernsey, Hamilton, Highland, Hocking, Jackson, Lawrence, Licking, Madison, Meigs, Monroe, Montgomery, Morgan, Muskingum, Noble, Perry, Pickaway, Pike, Preble, Ross, Scioto, Vinton, Warren, or Washington County</u></p>		<p><u>Allen, Ashland, Ashtabula, Auglaize, Carroll, Champaign, Clark, Columbiana, Crawford, Cuyahoga, Darke, Defiance, Delaware, Erie, Fulton, Geauga, Hancock, Hardin, Harrison, Henry, Holmes, Huron, Jefferson, Knox, Lake, Logan, Lorain, Lucas, Mahoning, Marion, Medina, Mercer, Miami, Morrow, Ottawa, Paulding, Portage, Putnam, Richland, Sandusky, Seneca, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Van Wert, Wayne, Williams, Wood, or Wyandot County</u></p>	

**TABLE 3**

<b><u>AIR INFILTRATION REQUIREMENTS</u></b>	
<b><i>These items are required when using the Ohio Residential Prescriptive Energy Requirements</i></b>	
<b><u>1. Overall Air and Thermal Barrier Alignment</u></b>	<ul style="list-style-type: none"> <li>• <u>Insulation shall be installed in full contact with sealed interior and exterior air barrier.</u></li> <li><u>A - Overall alignment throughout dwelling without gaps or compression</u></li> <li><u>B - Garage band joist air barrier adjoining conditioned space</u></li> <li><u>C - Attic eave baffles</u></li> <li><u>D - Slab-edge insulation</u></li> </ul>
<b><u>2. Walls Adjoining Exterior Walls or Unconditioned Space</u></b>	<ul style="list-style-type: none"> <li>• <u>Fully insulated walls align with air barrier at interior and exterior; Continuous top and bottom plates or sealed blocking.</u></li> <li><u>A - Wall behind shower/tub</u></li> <li><u>B - Wall behind furnace</u></li> <li><u>C - Insulated attic slopes for unvented attic spaces</u></li> <li><u>D - Attic knee walls</u></li> <li><u>E - Skylight shaft walls</u></li> <li><u>F - Walls adjoining porch roofs</u></li> <li><u>G - Staircase walls</u></li> <li><u>H - Double walls</u></li> </ul>
<b><u>3. Floors Between Conditioned and Unconditioned Spaces</u></b>	<ul style="list-style-type: none"> <li>• <u>Air barrier installed at any exposed insulation edges; Insulation installed to maintain permanent contact with sub-floor above and air barrier below.</u></li> <li><u>A - Insulated floor above garage</u></li> <li><u>B - Insulated cantilevered floor</u></li> </ul>
<b><u>4. Shafts</u></b>	<ul style="list-style-type: none"> <li>• <u>Openings to unconditioned space fully sealed with solid blocking or flashing and gaps are fully sealed with caulking or foam (fire-rated collars and caulking where required)</u></li> <li><u>A - Duct shafts and penetrations</u></li> <li><u>B - Piping shafts and penetrations</u></li> <li><u>C - Flue shafts</u></li> </ul>
<b><u>5. Attic/Ceiling interface</u></b>	<ul style="list-style-type: none"> <li>• <u>All attic penetrations and dropped ceilings include full interior air barrier aligned with insulation; gaps fully sealed with caulking or foam; Moveable insulation fits snugly in opening and air barriers fully gasketed</u></li> <li><u>A - Attic access panel fully gasketed and insulated</u></li> <li><u>B - Attic drop-down stairs fully gasketed and insulated</u></li> <li><u>C - Dropped ceiling/soffit - air barrier aligned with insulation</u></li> <li><u>D - Recessed lighting fixtures IC-AT (Insulation Contact- Air Tight) labeled &amp; sealed to drywall</u></li> <li><u>E - Whole-house fan insulated cover gasketed to the opening</u></li> </ul>
<b><u>6. Common Walls Between Dwelling Units</u></b>	<ul style="list-style-type: none"> <li>• <u>Gaps between drywall shaft wall (common wall) and structural framing between units sealed at all exterior boundary conditions</u></li> <li><u>A - Common walls between dwelling units</u></li> </ul>

Effective: 01/01/2009

R.C. 119.032 review dates: 05/27/2011

CERTIFIED ELECTRONICALLY

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Certification

12/22/2008

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Date

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