

## CHAPTER 3 [CE]

# GENERAL REQUIREMENTS

### SECTION C301 CLIMATE ZONES

**C301.1 General.** Table C301.1 shall be used in determining the applicable requirements from Chapter 4. Locations are assigned a *climate zone* based on Section C301.3.

**Figure C301.1 Climate Zone.** Reserved.

**C301.2 Warm humid counties.** Warm humid counties are identified in Table C301.1 by an asterisk.

**C301.3 International climate zones.** The *climate zone* for any location outside the United States shall be determined by applying Table C301.3(1) and then Table C301.3(2).

**C301.4 Tropical climate zone.** The tropical *climate zone* shall be defined as:

1. Hawaii, Puerto Rico, Guam, American Samoa, U.S. Virgin Islands, Commonwealth of Northern Mariana Islands; and
2. Islands in the area between the Tropic of Cancer and the Tropic of Capricorn.

### SECTION C302 DESIGN CONDITIONS

**C302.1 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.

### SECTION C303 MATERIALS, SYSTEMS AND EQUIPMENT

**C303.1 Identification.** Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

**C303.1.1 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 greater in width. 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 areas covered and *R*-value of installed thickness shall be *listed* on the certification. For insulated siding, the *R*-value shall be labeled on the product's package and shall be *listed* on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

**C303.1.1.1 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 square feet (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 not less than 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-value shall be *listed* on certification provided by the insulation installer.

**C303.1.2 Insulation mark installation.** Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.

**TABLE C301.1  
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY COUNTY**

**Key:** A – Moist  
Asterisk (\*) indicates a warm-humid location.

<b>FLORIDA</b>	2A DeSoto*	2A Highlands*	2A Marion*	2A Santa Rosa*
2A Alachua*	2A Dixie*	2A Hillsborough*	2A Martin*	2A Sarasota*
2A Baker*	2A Duval*	2A Holmes*	1A Miami-Dade*	2A Seminole*
2A Bay*	2A Escambia*	2A Indian River*	1A Monroe*	2A St. Johns*
2A Bradford*	2A Flagler*	2A Jackson*	2A Nassau*	2A St. Lucie*
2A Brevard*	2A Franklin*	2A Jefferson*	2A Okaloosa*	2A Sumter*
1A Broward*	2A Gadsden*	2A Lafayette*	2A Okeechobee*	2A Suwannee*
2A Calhoun*	2A Gilchrist*	2A Lake*	2A Orange*	2A Taylor*
2A Charlotte*	2A Glades*	1A Lee*	2A Osceola*	2A Union*
2A Citrus*	2A Gulf*	2A Leon*	1A Palm Beach*	2A Volusia*
2A Clay*	2A Hamilton*	2A Levy*	2A Pasco*	2A Wakulla*
1A Collier*	2A Hardee*	2A Liberty*	2A Pinellas*	2A Walton*
2A Columbia*	1A Hendry*	2A Madison*	2A Polk*	2A Washington*
	2A Hernando*	2A Manatee*	2A Putnam*	

**GENERAL REQUIREMENTS**

**TABLE C301.3(1)  
INTERNATIONAL CLIMATE ZONE DEFINITIONS  
MAJOR CLIMATE TYPE DEFINITIONS**

<p>Marine (C) Definition—Locations meeting all four criteria:</p> <ol style="list-style-type: none"> <li>1. Mean temperature of coldest month between -3°C (27°F) and 18°C (65°F).</li> <li>2. Warmest month mean &lt; 22°C (72°F).</li> <li>3. At least four months with mean temperatures over 10°C (50°F).</li> <li>4. Dry season in summer. The month with the heaviest precipitation in the cold season has at least three times as much precipitation as the month with the least precipitation in the rest of the year. The cold season is October through March in the Northern Hemisphere and April through September in the Southern Hemisphere.</li> </ol>
<p>Dry (B) Definition—Locations meeting the following criteria: Not marine and <math>P_{in} &lt; 0.44 \times (TF - 19.5)</math> [<math>P_{cm} &lt; 2.0 \times (TC + 7)</math> in SI units] where: <math>P_{in}</math> = Annual precipitation in inches (cm) <math>T</math> = Annual mean temperature in °F (°C)</p>
<p>Moist (A) Definition—Locations that are not marine and not dry.</p>
<p>Warm-humid Definition—Moist (A) locations where either of the following wet-bulb temperature conditions shall occur during the warmest six consecutive months of the year:</p> <ol style="list-style-type: none"> <li>1. 67°F (19.4°C) or higher for 3,000 or more hours; or</li> <li>2. 73°F (22.8°C) or higher for 1,500 or more hours.</li> </ol>

For SI: °C = [(°F) - 32]/1.8, 1 inch = 2.54 cm.

**TABLE C301.3(2)  
INTERNATIONAL CLIMATE ZONE DEFINITIONS**

ZONE NUMBER	THERMAL CRITERIA	
	IP Units	SI Units
1	9000 < CDD50°F	5000 < CDD10°C
2	6300 < CDD50°F ≤ 9000	3500 < CDD10°C ≤ 5000
3A and 3B	4500 < CDD50°F ≤ 6300 AND HDD65°F ≤ 5400	2500 < CDD10°C ≤ 3500 AND HDD18°C ≤ 3000
4A and 4B	CDD50°F ≤ 4500 AND HDD65°F ≤ 5400	CDD10°C ≤ 2500 AND HDD18°C ≤ 3000
3C	HDD65°F ≤ 3600	HDD18°C ≤ 2000
4C	3600 < HDD65°F ≤ 5400	2000 < HDD18°C ≤ 3000
5	5400 < HDD65°F ≤ 7200	3000 < HDD18°C ≤ 4000
6	7200 < HDD65°F ≤ 9000	4000 < HDD18°C ≤ 5000
7	9000 < HDD65°F ≤ 12600	5000 < HDD18°C ≤ 7000
8	12600 < HDD65°F	7000 < HDD18°C

For SI: °C = [(°F) - 32]/1.8.

**C303.1.3 Fenestration product rating.** *U*-factors of fenestration products shall be determined as follows:

1. For windows, doors and skylights, *U*-factor ratings shall be determined in accordance with NFRC 100.
2. Where required, for garage door and rolling doors, *U*-factor ratings shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

*U*-factors shall be determined 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 Table C303.1.3(1) or C303.1.3(2). The solar heat gain coefficient (SHGC) and *visible transmittance* (VT) 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 or VT shall be assigned a default SHGC or VT from Table C303.1.3(3).

**C303.1.4 Insulation product rating.** The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (CFR Title 16, Part 460) in units of  $h \cdot ft^2 \cdot ^\circ F/Btu$  at a mean temperature of 75°F (24°C).

**C303.1.4.1 Insulated siding.** The thermal resistance (*R*-value) of insulated siding shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer’s instructions.

**C303.2 Installation.** Materials, systems and equipment shall be installed in accordance with the manufacturer’s instructions and the *Florida Building Code, Building*.

**C303.2.1 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 not less than 6 inches (153 mm) below grade.

**SECTION C304**

**MATERIALS TESTING AND THERMAL PROPERTIES**

**C304.1 Building material thermal properties, general.**

**C304.1.1 Commercial and residential high rise.** *R*-values for *building materials* used to demonstrate code compliance with Chapter C4 shall be taken from ASHRAE 90.1 Normative Appendix A, from manufacturer’s product literature or from other nationally recognized engineering sources. Assembly *U*-factor calculations shall follow the procedure(s) detailed in Section C304.3 or be tested in accordance with procedure(s) described in Section C304.2.

Concrete block *R*-values shall be calculated using the isothermal planes method or a two-dimensional calculation program, thermal conductivities from ASHRAE 90.1 Normative Appendix A and dimensions from ASTM C90. The parallel path calculation method is not acceptable.

**Exception:** *R*-values for *building materials* or thermal conductivities determined from testing in accordance with Section C304.2.

**C304.2 Testing of building materials thermal properties.**

**C304.2.1 Single materials.** If *building material R*-values or thermal conductivities are determined by testing, one of the following test procedures shall be used:

- a. ASTM C177
- b. ASTM C1363
- c. ASTM C518

**TABLE C303.1.3(1)  
DEFAULT GLAZED FENESTRATION U-FACTORS**

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

**TABLE C303.1.3(2)  
DEFAULT OPAQUE DOOR U-FACTORS**

DOOR TYPE	U-FACTOR
Uninsulated Metal	1.20
Insulated Metal (Rolling)	0.90
Insulated Metal (Other)	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

**TABLE C303.1.3(3)  
DEFAULT WINDOW, GLASS DOOR AND SKYLIGHT SHGC AND VT**

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

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For concrete, the oven-dried conductivity shall be multiplied by 1.2 to reflect the moisture content as typically installed.

**C304.2.2 Assembly *U*-factors.** If assembly *U*-factors are determined by testing, ASTM C1363 shall be used. Product samples tested shall be production line material or representative of material as purchased by the consumer or contractor. If the assembly is too large to be tested at one time in its entirety, then either a representative portion shall be tested or different portions shall be tested separately and a weighted average determined. To be representative, the portion tested shall include edges of panels, joints with other panels, typical framing percentages and thermal bridges.

**C304.3 Calculation procedures and assumptions.** The following procedures and assumptions shall be used for all Chapter 4 code calculations. *R*-values for air films, insulation and *building materials* shall be taken from Section C304.3.1 or C304.3.2, respectively. In addition, the appropriate assumptions listed, including framing factors, shall be used.

**C304.3.1 Air Films.** Prescribed *R*-values for air films shall be as follows:

<b><i>R</i>-Value</b>	<b>Condition</b>
0.17	All exterior surfaces
0.46	All semi-exterior surfaces
0.61	Interior horizontal surfaces, heat flow up
0.92	Interior horizontal surfaces, heat flow down
0.68	Interior vertical surfaces

**C304.3.1.1** Exterior surfaces are areas exposed to the wind.

**C304.3.1.2** Semi-exterior surfaces are protected surfaces that face attics, crawl spaces and parking garages with natural or mechanical ventilation.

**C304.3.1.3** Interior surfaces are surfaces within enclosed spaces.

**C304.3.1.4** The *R*-value for cavity airspaces shall be taken from ASHRAE 90.1 Normative Appendix A. No

credit shall be given for airspaces in cavities that contain any insulation or less than 0.5 inch (12.7 mm). The values for 3.5 inch-cavities (84 mm) shall be used for cavities of that width and greater.

**C304.3.2 Assembly *U*-Factor, *C*-Factor and *F*-Factor Calculation.**

**C304.3.2.1 Pre-calculated assembly *U*-factors, *C*-factors, *F*-factors or heat capacities.** The *U*-factors, *C*-factors, *F*-factors, and *heat capacities* for typical construction assemblies from ASHRAE 90.1 Normative Appendix A shall be used for all calculations unless otherwise allowed by applicant-determined assembly *U*-factors, *C*-factors, *F*-factors or heat capacities. Interpolation between values for *rated R-values of insulation*, including insulated, sheathing is allowed; extrapolation beyond values in the ASHRAE 90.1 Normative Appendix A tables is not.

**C304.3.2.2 Applicant-determined assembly *U*-factors, *C*-factors, *F*-factors or heat capacities.** If the *building official* determines that the proposed construction assembly is not adequately represented in the appropriate table of ASHRAE 90.1 Normative Appendix A, the applicant shall determine appropriate values for the assembly using the assumptions in ASHRAE 90.1 Normative Appendix A. An assembly is deemed to be adequately represented if:

- the interior structure, hereafter referred to as the base assembly, for the *class of construction* is the same as described in Normative Appendix A and
- changes in exterior or interior surface *building materials* added to the base assembly do not increase or decrease the *R*-value by more than 2 from that indicated in the descriptions in ASHRAE 90.1 Normative Appendix A.

Insulation, including insulated sheathing, is not considered a *building material*.

# CHAPTER 3 [RE]

## GENERAL REQUIREMENTS

### SECTION R301 CLIMATE ZONES

**R301.1 General.** Table R301.1 shall be used in determining the applicable requirements from Chapter 4. Locations are assigned a *climate zone* based on Section R301.3.

**Figure R301.1 Climate Zones.** Reserved.

**R301.2 Warm humid counties.** Warm humid counties are identified in Table R301.1 by an asterisk.

**R301.3 International climate zones.** The *climate zone* for any location outside the United States shall be determined by applying Table R301.3(1) and then Table R301.3(2).

**R301.4 Tropical climate zone.** The tropical *climate zone* shall be defined as:

1. Hawaii, Puerto Rico, Guam, American Samoa, U.S. Virgin Islands, Commonwealth of Northern Mariana Islands; and
2. Islands in the area between the Tropic of Cancer and the Tropic of Capricorn.

### SECTION R302 DESIGN CONDITIONS

**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.

### SECTION R303 MATERIALS, SYSTEMS AND EQUIPMENT

**R303.1 Identification.** Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

#### R303.1.1 Building thermal envelope insulation.

**R303.1.1.1 Insulation product rating.** The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (CFR Title 16, Part 460) in units of  $h \cdot ft^2 \cdot ^\circ F/Btu$  at a mean temperature of 75°F (24°C).

**R303.1.1.1.1** *R*-values referenced in Chapter 4 of this code refer to the *R*-values of the added insulation only. The *R*-values of structural building materials such as framing members, concrete blocks or gypsum board shall not be included.

**Exception:** R402.1.5 Total UA Alternative.

**R303.1.1.1.2** When installing two layers of bulk or board insulation, the *R*-values of each material may be added together for a total *R*-value. When installing two separate reflective insulation products in layers, the total *R*-value of the system shall have been achieved by testing under FTC regulations, 16 CFR Part 460.

**TABLE R301.1  
CLIMATE ZONES, MOISTURE REGIMES AND  
WARM-HUMID DESIGNATIONS BY COUNTY**

**Key: A – Moist**  
**Asterisk (\*) indicates a warm-humid location.**

<b>FLORIDA</b>	2A Duval*	2A Indian River*	2A Nassau*	2A Sumter*
2A Alachua*	2A Escambia*	2A Jackson*	2A Okaloosa*	2A Suwannee*
2A Baker*	2A Flagler*	2A Jefferson*	2A Okeechobee*	2A Taylor*
2A Bay*	2A Franklin*	2A Lafayette*	2A Orange*	2A Union*
2A Bradford*	2A Gadsden*	2A Lake*	2A Osceola*	2A Volusia*
2A Brevard*	2A Gilchrist*	1A Lee*	1A Palm Beach*	2A Wakulla*
1A Broward*	2A Glades*	2A Leon*	2A Pasco*	2A Walton*
2A Calhoun*	2A Gulf*	2A Levy*	2A Pinellas*	2A Washington*
2A Charlotte*	2A Hamilton*	2A Liberty*	2A Polk*	
2A Citrus*	2A Hardee*	2A Madison*	2A Putnam*	
2A Clay*	1A Hendry*	2A Manatee*	2A Santa Rosa*	
1A Collier*	2A Hernando*	2A Marion*	2A Sarasota*	
2A Columbia*	2A Highlands*	2A Martin*	2A Seminole*	
2A DeSoto*	2A Hillsborough*	1A Miami-Dade*	2A St. Johns*	
2A Dixie*	2A Holmes*	1A Monroe*	2A St. Lucie*	

GENERAL REQUIREMENTS

TABLE R301.3(1)  
INTERNATIONAL CLIMATE ZONE DEFINITIONS  
MAJOR CLIMATE TYPE DEFINITIONS

<p>Marine (C) Definition—Locations meeting all four criteria:</p> <ol style="list-style-type: none"> <li>1. Mean temperature of coldest month between -3°C (27°F) and 18°C (65°F).</li> <li>2. Warmest month mean &lt; 22°C (72°F).</li> <li>3. At least four months with mean temperatures over 10°C (50°F).</li> <li>4. Dry season in summer. The month with the heaviest precipitation in the cold season has at least three times as much precipitation as the month with the least precipitation in the rest of the year. The cold season is October through March in the Northern Hemisphere and April through September in the Southern Hemisphere.</li> </ol>
<p>Dry (B) Definition—Locations meeting the following criteria: Not marine and <math>P_{in} &lt; 0.44 \times (TF - 19.5)</math> [<math>P_{cm} &lt; 2.0 \times (TC + 7)</math> in SI units] where: <math>P_{in}</math> = Annual precipitation in inches (cm) <math>T</math> = Annual mean temperature in °F (°C)</p>
<p>Moist (A) Definition—Locations that are not marine and not dry.</p>
<p>Warm-humid Definition—Moist (A) locations where either of the following wet-bulb temperature conditions shall occur during the warmest six consecutive months of the year:</p> <ol style="list-style-type: none"> <li>1. 67°F (19.4°C) or higher for 3,000 or more hours; or</li> <li>2. 73°F (22.8°C) or higher for 1,500 or more hours.</li> </ol>

For SI: °C = [(°F) - 32]/1.8, 1 inch = 2.54 cm.

TABLE R301.3(2)  
INTERNATIONAL CLIMATE ZONE DEFINITIONS

ZONE NUMBER	THERMAL CRITERIA	
	IP Units	SI Units
1	9000 < CDD50°F	5000 < CDD10°C
2	6300 < CDD50°F ≤ 9000	3500 < CDD10°C ≤ 5000
3A and 3B	4500 < CDD50°F ≤ 6300 AND HDD65°F ≤ 5400	2500 < CDD10°C ≤ 3500 AND HDD18°C ≤ 3000
4A and 4B	CDD50°F ≤ 4500 AND HDD65°F ≤ 5400	CDD10°C ≤ 2500 AND HDD18°C ≤ 3000
3C	HDD65°F ≤ 3600	HDD18°C ≤ 2000
4C	3600 < HDD65°F ≤ 5400	2000 < HDD18°C ≤ 3000
5	5400 < HDD65°F ≤ 7200	3000 < HDD18°C ≤ 4000
6	7200 < HDD65°F ≤ 9000	4000 < HDD18°C ≤ 5000
7	9000 < HDD65°F ≤ 12600	5000 < HDD18°C ≤ 7000
8	12600 < HDD65°F	7000 < HDD18°C

For SI: °C = [(°F) - 32]/1.8.

**R303.1.1.1.3 Insulated siding.** The thermal resistance (*R*-value) of insulated siding shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer’s instructions.

**R303.1.1.2 Building thermal envelope insulation markers.** An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. 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 areas covered and *R*-value of installed thickness shall be *listed* on the certification. For insulated siding, the *R*-value shall be labeled on the product’s package and shall be *listed* on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

**R303.1.1.2.1 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 square feet (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 not less than 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-value shall be listed on certification provided by the insulation installer.

**R303.1.1.2.2 Insulation mark installation.** Insulating materials shall be installed such that the manufacturer’s *R*-value mark is readily observable upon inspection.

**R303.1.2 Equipment efficiency ratings.** Minimum equipment efficiency rating identification for heating, cooling, hot water, swimming pool heating and filtration, and lighting shall be in accordance with industry standards and as described in Chapter 4 of the Commercial Provisions of this code, as applicable, for such equipment.

**R303.1.3 Fenestration product rating.** *U*-factors of fenestration products shall be determined as follows.

1. For windows, doors and skylights, *U*-factor ratings shall be determined in accordance with NFRC 100.
2. Where required, garage door *U*-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

*U*-factors shall be determined 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 Table R303.1.3(1) or R303.1.3(2). The solar heat gain coefficient (SHGC) and visible transmittance (VT) 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 or VT shall be assigned a default SHGC or VT from Table R303.1.3(3).

**TABLE R303.1.3(1)  
DEFAULT GLAZED FENESTRATION U-FACTORS**

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

**TABLE R303.1.3(2)  
DEFAULT OPAQUE DOOR U-FACTORS**

DOOR TYPE	U-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

**TABLE R303.1.3(3)  
DEFAULT WINDOW, GLASS DOOR  
AND SKYLIGHT SHGC AND VT**

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

**R303.2 Installation.** Materials, systems and equipment shall be installed in accordance with the manufacturer’s instructions and the *Florida Building Code, Building* or *Florida Building Code, Residential*, as applicable.

**R303.2.1 Insulation installation.** Insulation materials shall comply with the requirements of their respective ASTM standard specification and shall be installed in accordance with their respective ASTM installation practice in Table R303.2.1 in such a manner as to achieve rated *R*-value of insulation. Open-blown or poured loose-fill insulation shall not be used in attic roof spaces when the slope of the ceiling is more than 3 in 12. When eave vents are installed, baffling of the vent openings shall be provided to deflect the incoming air above the surface of the insulation.

**Exception:** Where metal building roof and metal building wall insulation is compressed between the roof or wall skin and the structure.

**R303.2.1.1 Compressed insulation.** Insulation that has been compressed to 85 percent or less of the manufacturer’s rated thickness for the product shall use the *R*-values given in Table 303.2.1.1. These values are to be used except where data developed by an independent testing laboratory are provided.

**R303.2.1.2 Substantial contact.** Insulation shall be installed in a permanent manner in substantial contact with the inside surface in accordance with manufacturer’s recommendations for the framing system used. Flexible batt insulation installed in floor cavities shall be supported in a permanent manner by supports no greater than 24 inches (610 mm) on center (o.c.).

**Exception:** Insulation materials that rely on air-spaces adjacent to reflective surfaces for their rated performance.

**GENERAL REQUIREMENTS**

**TABLE R303.2.1  
INSULATION INSTALLATION STANDARDS**

INSULATION MATERIAL	STANDARD SPECIFICATION	INSTALLATION PRACTICE
Mineral Fiber Batt/Blanket	ASTM C665	ASTM C1320
Mineral Fiber Loose Fill	ASTM C764	ASTM C1015
Cellulose Loose Fill	ASTM C739	ASTM C1015
Polystyrene Foam	ASTM C578	—
Polyisocyanurate Foam	ASTM C1289	—
Reflective	ASTM C1224	ASTM C727
Radiant Barrier	ASTM C1313	ASTM C1158
Vermiculite	ASTM C516	—
Perlite	ASTM C549	—
Spray-applied Rigid Cellular Polyurethane Foam	ASTM C1029	—
Interior Radiation Control Coating Systems	—	ASTM C1321

**TABLE R303.2.1.1  
R-VALUES OF COMPRESSED INSULATION**

% OF ORIGINAL THICKNESS	R-5	R-7	R-11	R-14	R-19	R-30	R-38
90	5	6	10	13	18	28	36
80	4	6	10	12	17	26	33
70	4	5	9	11	15	24	30
60	3	5	8	10	14	22	27
50	3	4	7	9	12	18	24
40	2	4	6	8	10	15	20
30	2	3	4	6	8	12	16
20	2	2	2	3	4	10	10

**R303.2.1.3 Insulation protection.** Exterior insulation shall be covered with a protective material to prevent damage from sunlight, moisture, landscaping operations, equipment maintenance and wind. In *attics* and mechanical rooms, a way to access equipment that prevents damaging or compressing the insulation shall be provided. Foundation vents shall not interfere with the insulation. Insulation materials in ground contact shall have a water absorption rate no greater than .3 percent when tested in accordance with ASTM C272, shall cover the exposed exterior insulation and shall extend a minimum of 6 inches (153 mm) below grade.

**R303.3 Maintenance information.** Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.