2021 International Energy Conservation Code

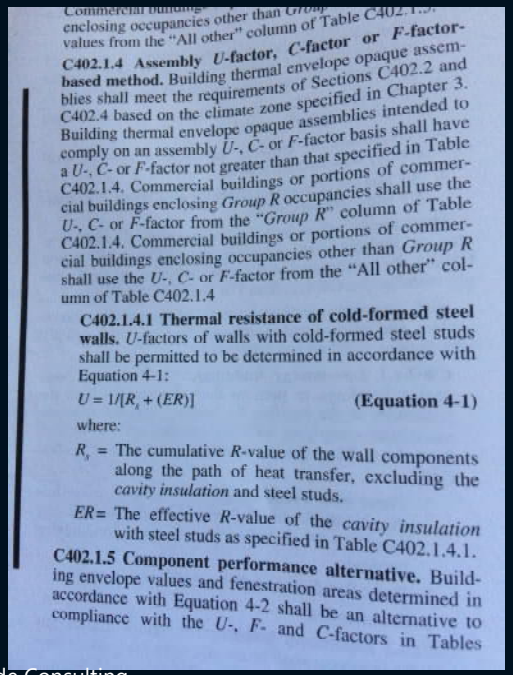
Commercial Provisions

What does the future have in store?

COLORADO CODE CONSULTING LLC

LOOKS ARE DECEIVING

FORMAT CHANGES



enclosing occupancies other than Group R shall use the U-, C- or F-factor values from the "All other" column of Table C402.1.4.

C402.1.4 Assembly *U*-factor, *C*-factor or *F*-factor-based method. Building thermal envelope opaque assemblies shall meet the requirements of Sections C402.2 and C402.4 based on the climate zone specified in Chapter 3. Building thermal envelope opaque assemblies intended to comply on an assembly *U*-, *C*- or *F*-factor basis shall have a *U*-, *C*- or *F*-factor not greater than that specified in Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing *Group R* occupancies shall use the *U*-, *C*- or *F*-factor from the "*Group R*" column of Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing occupancies other than *Group R* shall use the *U*-, *C*- or *F*-factor from the "All other" column of Table C402.1.4

C402.1.4.1 Thermal resistance of cold-formed steel walls. *U*-factors of walls with cold-formed steel studs shall be permitted to be determined in accordance with Equation 4-1:

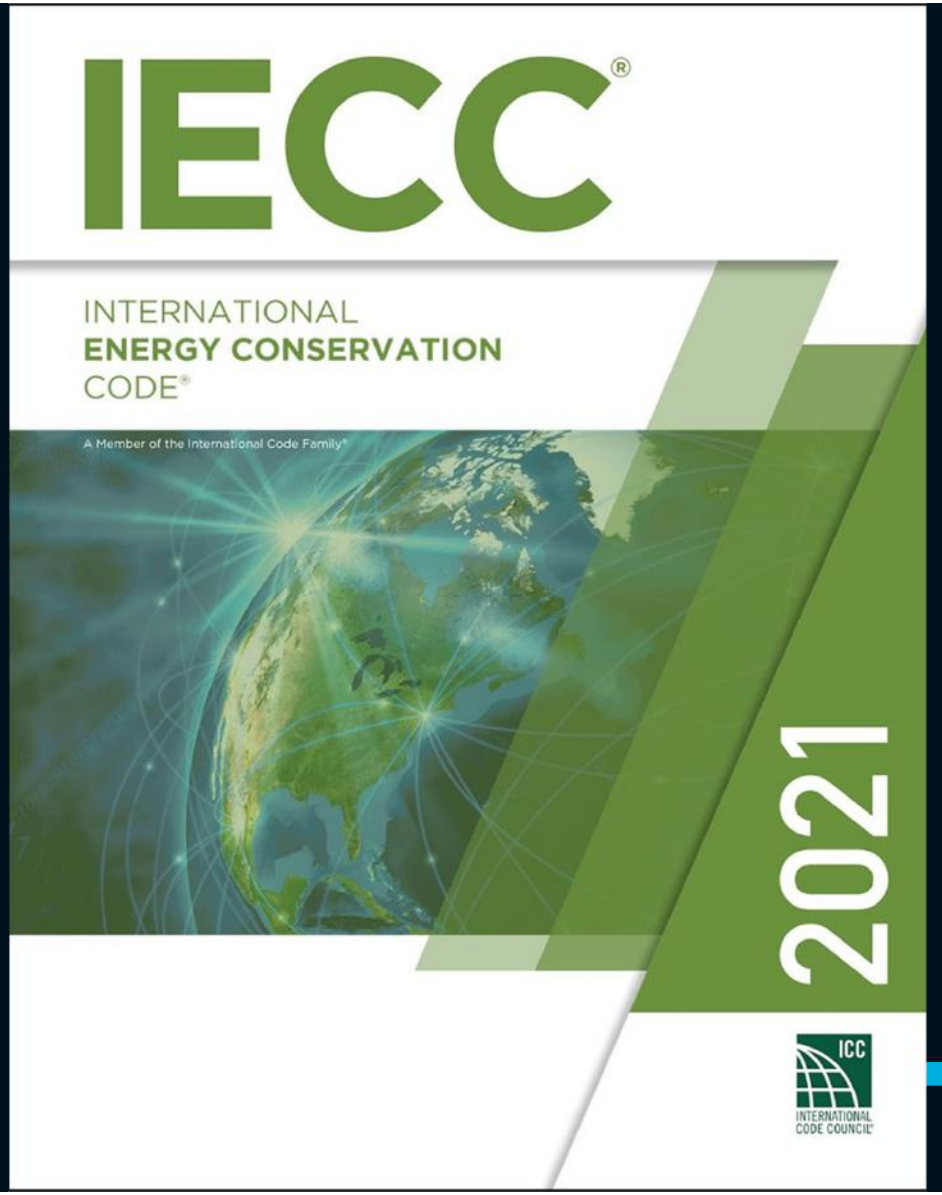
$$U = 1/[R_s + (ER)] \qquad \textbf{(Equation 4-1)}$$

where:

R_s = The cumulative *R*-value of the wall components along the path of heat transfer, excluding the *cavity insulation* and steel studs.

ER = The effective *R*-value of the *cavity insulation* with steel studs as specified in Table C402.1.4.1.

C402.1.5 Component performance alternative. Building envelope values and fenestration areas determined in accordance with Equation 4-2 shall be an alternative to compliance with the *U*-, *F*- and *C*-factors in Tables



2021 IECC – CONSENT AGENDA

CE-42 - MANDATORY

Table C407.2
Requirements for Total Building Performance

Section[a]	Title
Envelope	
C402.5	Air Leakage-Thermal Envelope
Mechanical	
C403.2	System Design
C403.3, except sections C403.3.3 and C403.3.4	Heating and Cooling Equipment Efficiencies
C403.4, except sections C403.4.3 C403.4.4, and C403.4.5	Heating and Cooling System Controls
C403.5.5	Economizer Fault Detection and Diagnoistics (FDD)
C403.7	Ventilation and Exhaust Systems
C403.8, except sections C403.8.5 and C403.8.5.1	Fan and Fan Conrols
C403.10, except section C403.10.4	Walk-in coolers, Walk-in Freezers, Refrigerated Warehouse Coolers and Refrigerated Warehouse Freezers
C403.11	Construction of HVAC system elements
C403.12	Mechanical systems located outside of the building thermal envelope
C404	Service Water Heating
C405, except section C405.3	Electrical Power and Lighting Systems
C408	System Commissioning

- **REMOVES THE NOTATION OF MANDATORY AND PRESCRIPTIVE FROM THE SECTIONS.**
- **CREATES A TABLE FOR EACH COMPLIANCE PATH TO SHOW WHAT SECTIONS ARE MANDATORY ITEMS.**
- **CLARIFIES IF SECTIONS WERE MANDATORY BUT NOT LISTED**

2021 IECC – CONSENT AGENDA

CE-36 – CLIMATE ZONES

Chapter 3

INDIANA
4A~~5A~~ Bartholomew
4A~~5A~~ Clay
4A~~5A~~ Decatur
4A~~5A~~ Fayette
4A~~5A~~ Franklin
4A~~5A~~ Hendricks
4A~~5A~~ Johnson
4A~~5A~~ Marion
4A~~5A~~ Morgan
4A~~5A~~ Owen
4A~~5A~~ Putnam
4A~~5A~~ Rush
4A~~5A~~ Shelby
4A~~5A~~ Union
4A~~5A~~ Vigo

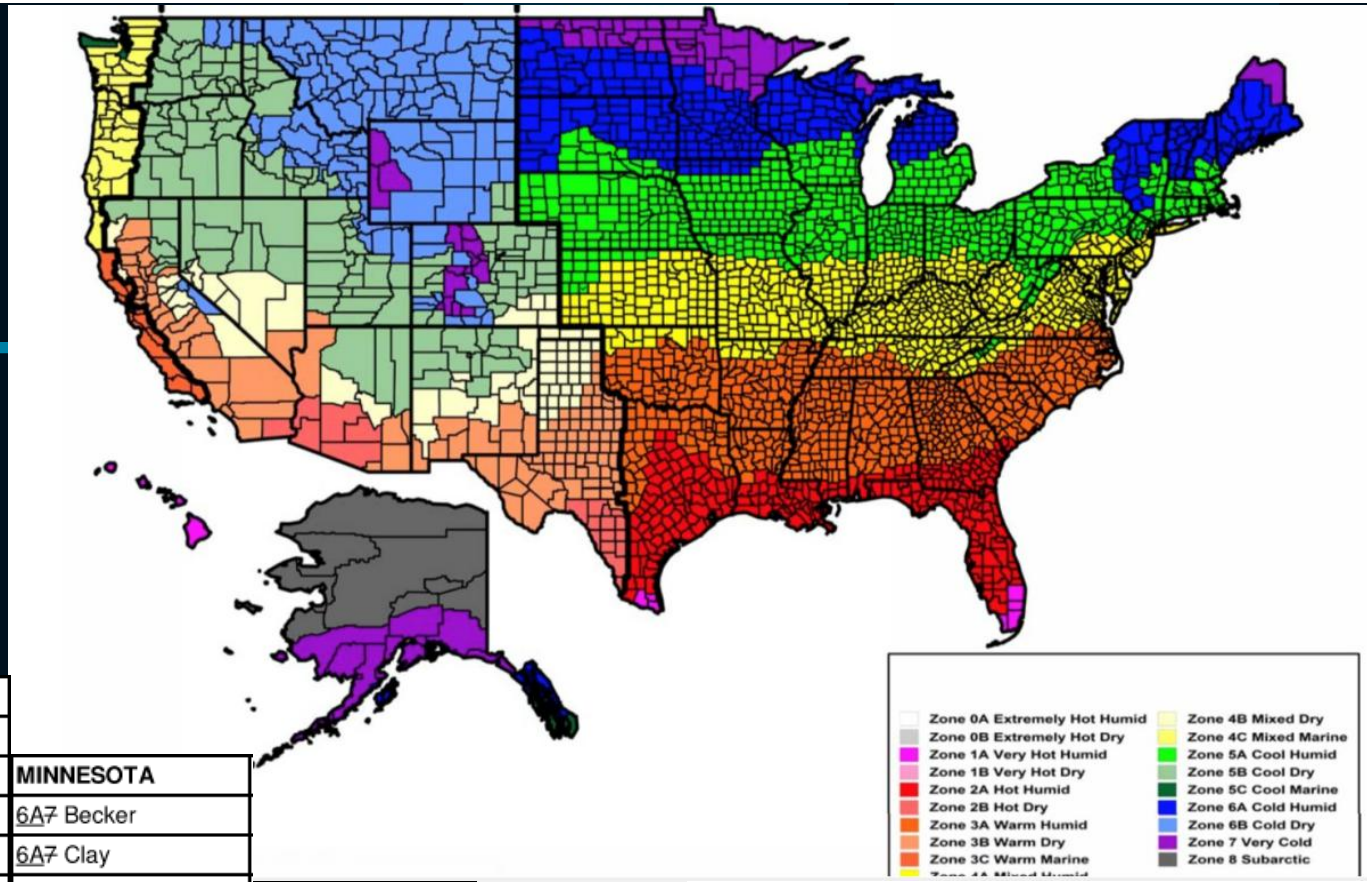
OHIO
4A~~5A~~ Athens
4A~~5A~~ Butler
4A~~5A~~ Clinton
4A~~5A~~ Fayette
4A~~5A~~ Franklin
4A~~5A~~ Greene
4A~~5A~~ Highland
4A~~5A~~ Hocking
4A~~5A~~ Jackson
4A~~5A~~ Madison
4A~~5A~~ Meigs
4A~~5A~~ Pickaway
4A~~5A~~ Ross
4A~~5A~~ Vinton
4A~~5A~~ Warren

MICHIGAN
6A~~7~~ Baraga
6A~~7~~ Chippewa
6A~~7~~ Gogebic
6A~~7~~ Houghton
5A~~6A~~ Huron
6A~~7~~ Iron
6A~~7~~ Luce
6A~~7~~ Mackinac
76~~A~~ Marquette
6A~~7~~ Ontonagon
5A~~6A~~ Sanilac
6A~~7~~ Schoolcraft

MINNESOTA
6A~~7~~ Becker
6A~~7~~ Clay
5A~~6A~~ Fillmore
6A~~7~~ Grant
5A~~6A~~ Houston
6A~~7~~ Kanabec
6A~~7~~ Mille Lacs
6A~~7~~ Otter Tail
6A~~7~~ Wilkin
5A~~6A~~ Winona

ILLINOIS
4A~~5A~~ Calhoun
4A~~5A~~ Clark
4A~~5A~~ Coles
4A~~5A~~ Cumberland
4A~~5A~~ Greene
4A~~5A~~ Jersey

IOWA
5A~~6A~~ Allamakee
5A~~6A~~ Bremer
5A~~6A~~ Buchanan



- **ADDED CLIMATE ZONE 0**
- **ADJUSTED SOME OF THE CLIMATE ZONES FOR COUNTIES IN MOST STATES**
- **CONSISTENT WITH ASHRAE'S ESTABLISHED CLIMATE ZONES**

2021 IECC – CONSENT AGENDA

CE70- REMOVED DOORS FROM THE R-VALUE TABLE AND PLACED THEM IN U-FACTOR TABLE

C402 –Building Envelope

TABLE C402.1.3
OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, R-VALUE METHOD[a, f]

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Opaque doors																
Nonswinging	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~	~~R-4.75~~

Opaque doors															
NonSwinging door	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31
Swinging door	~~U-0.61~~ U-0.37	~~U-0.61~~ U-0.37	~~U-0.61~~ U-0.37	~~U-0.61~~ U-0.37	~~U-0.61~~ U-0.37	~~U-0.61~~ U-0.37	~~U-0.61~~ U-0.37	~~U-0.61~~ U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37
Garage door <14% glazing	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31

C402.5.1 Opaque swinging doors Opaque nonswinging doors shall comply with Table C402.1.4.

C402.4.5.2 Nonswinging Doors. Opaque nonswinging doors that are horizontally hinged sectional doors with a single row of fenestration shall have an assembly U-factor less than or equal to 0.440 in Climate Zones 0 through 6 and less than or equal to 0.360 in Climate Zones 7 and 8, provided the fenestration area is at least 14 percent and not more than 25 percent of the total door area.

Exception: Other doors shall comply with the provisions of Section C402.4.3 for vertical fenestration.

2021 IECC – CONSENT AGENDA

CE113- HVAC EFFICIENCY TABLES

C403- Building Mechanical Systems

C40C403.3.2 HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables 6.8.1-1 through 6.8.1-19 of ASHRAE Standard 90.1 when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of 6.8.1-8 of ASHRAE Standard 90.1. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units - Minimum Efficiency Requirements

Table 6.8.1-2 Electrically Operated Air Cooled Unitary and Heat Pumps - Minimum Efficiency Requirements

Table 6.8.1-3 Water Chilling Packages - Minimum Efficiency Requirements

Table 6.8.1-4 Electrically Operated Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Single-Package Vertical Air Conditioners, Single-Package Vertical Heat Pumps, Room Air Conditioners, and Room Air Conditioner Heat Pumps—Minimum Efficiency Requirements

Table 6.8.1-5 Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters—Minimum Efficiency Requirements

Table 6.8.1-6 Gas- and Oil-Fired Boilers—Minimum Efficiency Requirements

Table 6.8.1-7 Performance Requirements for Heat Rejection Equipment—Minimum Efficiency Requirements

Table 6.8.1-8 Heat Transfer Equipment—Minimum Efficiency Requirements

Table 6.8.1-9 Electrically Operated Variable-Refrigerant-Flow Air Conditioners—Minimum Efficiency Requirements

Table 6.8.1-10 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps— Minimum Efficiency Requirements

Table 6.8.1-11 Floor Mounted Air Conditioners and Condensing Units Serving Computer Rooms—Minimum Efficiency Requirements

Table 6.8.1-13 Commercial Refrigerators, Freezers and Refrigeration—Minimum Efficiency Requirements

Table 6.8.1-14 Vapor Compression Based Indoor Pool Dehumidifiers—Minimum Efficiency Requirements

Table 6.8.1-15 Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, without Energy Recovery—Minimum Efficiency Requirements

Table 6.8.1-16 Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, with Energy Recovery—Minimum Efficiency Requirements

Table 6.8.1-17 Electrically Operated Water Source Heat Pumps—Minimum Efficiency Requirements

Table 6.8.1-18 Heat Pump and Heat Reclaim Chiller Packages – Minimum Efficiency Requirements

Table 6.8.1-19 Ceiling Mounted Computer Room Air Conditioners—Minimum Efficiency Requirements

TECHNICAL CHANGES

What am doing now?

2021 IECC – CONSENT AGENDA

CE-13 – COMPLIANCE PATH

MUST BE LISTED ON THE PLANS

CE-99 – INCLUDING AIR BARRIER AND AIR SEALING DETAILS WITH LOCATION

C103.2 Information on construction documents. Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Energy compliance path

2. Insulation materials and their R-values.

3. Fenestration U-factors and solar heat gain coefficients (SHGCs).

4. Area-weighted U-factor and solar heat gain coefficient (SHGC) calculations.

5. Mechanical system design criteria.

6. Mechanical and service water heating systems and equipment types, sizes and efficiencies.

7. Economizer description.

8. Equipment and system controls.9. Fan motor horsepower (hp) and controls.

10. Duct sealing, duct and pipe insulation and location.

11. Lighting fixture schedule with wattage and control narrative.

12. Location of daylight zones on floor plans.

13. Air barrier and air sealing details, including the location of the air barrier.

CE-49 – PERFORMANCE PATH (In Review)

C402 –Building Envelope
C407- Total Building Performance

C401.2 Application. Commercial buildings shall comply with one of the following:

1. The requirements of ANSI/ASHRAE/IESNA 90.1.
2. The requirements of Sections C402 through C405 and C408. In addition, commercial buildings shall comply with Section C406 and tenant spaces shall comply with Section C406.1.1.
3. The requirements of Sections C402.5, C403.2, C403.3 through C403.3.2, C403.4 through C403.4.2.3, C403.5.5, C403.7, C403.8.1 through C403.8.4, C403.10.1 through C403.10.3, C403.11, C403.12, C404, C405, C407 and C408. The building energy cost shall be equal to or less than **80** percent of the standard reference design building.

C407.3 Performance-based compliance. Compliance based on total building performance requires that a proposed building (proposed design) be shown to have an annual energy cost that is less than or equal to **80** percent of the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations. The reduction in energy cost of the proposed design associated with on-site renewable energy shall be not more than 5 percent of the total energy cost. The amount of renewable energy purchased from off-site sources shall be the same in the standard reference design and the proposed design.

Exception: Jurisdictions that require site energy (1 kWh = 3413 Btu) rather than energy cost as the metric of comparison

CE-55 –THERMAL ENVELOPE CERTIFICATE

C401.3 Thermal envelope certificate (Mandatory). A permanent thermal envelope certificate shall be completed by an approved party. Such certificate shall be posted on a wall in the space where the space conditioning equipment is located, a utility room or other approved location. If located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. A copy of the certificate shall also be included in the construction files for the project. The certificate shall include:

1. R-values of insulation installed in or on ceilings, roofs, walls, foundations and slabs, basement walls, crawl space walls and floors and ducts outside conditioned spaces;

2. U-factors and solar heat gain coefficients (SHGC) of fenestration;

3. Results from any building envelope air leakage testing performed on the building

Where there is more than one value for any component of the building envelope, the certificate shall indicate the area-weighted average value where available. If the area-weighted average is not available, the certificate shall list each value that applies to 10% or more of the total com

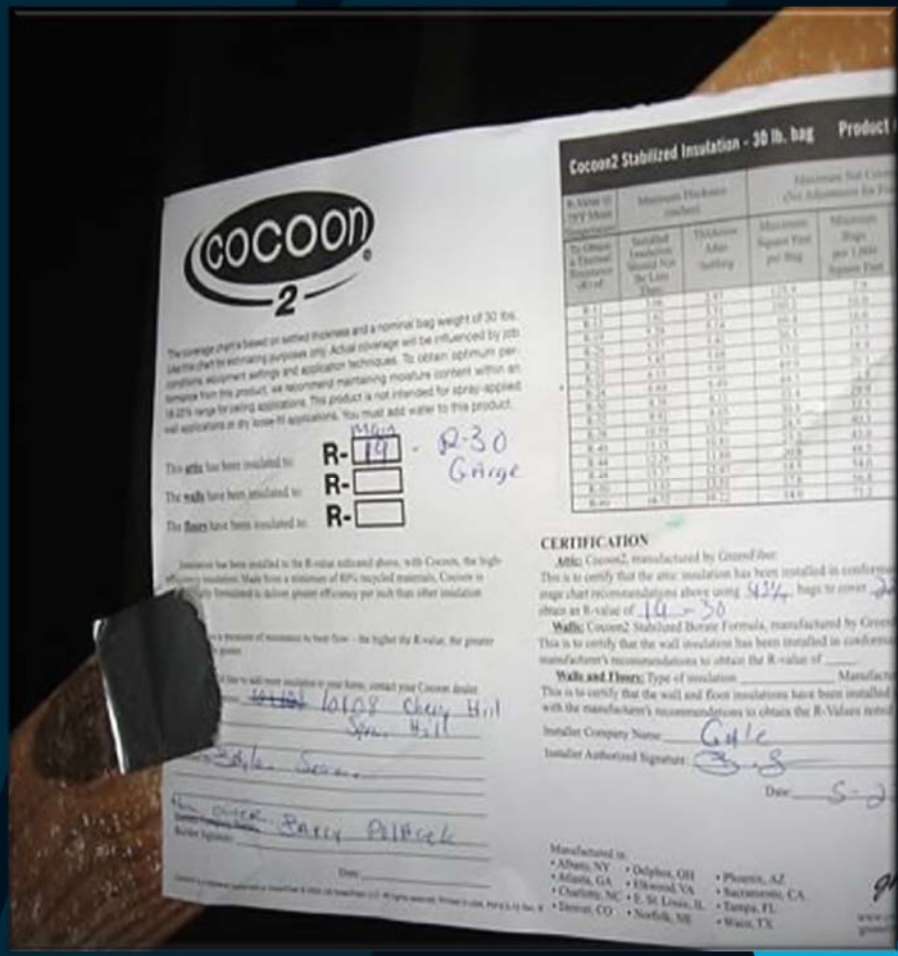


TABLE C402.1.3

MULTIPLE CHANGES APPROVED THAT ALTER VALUES IN THIS TABLE

TABLE C402.1.3
OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, R-VALUE METHOD[a, i]

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	R-20ci	R-25ci	R-25ci	R-25ci	R-25ci	R-25ci	R-30ci	R-30ci	R-30ci	R-30ci	R-30ci	R-30ci	R-35ci	R-35ci	R-35ci	R-35ci
Metal buildings[b]	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-25 + R-11 LS	R-25 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS
Attic and other	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-49	R-49	R-49	R-49	R-49	R-49	R-49
Walls, above grade																
Mass[g]	R-5.7ci[c]	R-5.7ci[c]	R-5.7ci[c]	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci	R-11.4ci	R-11.4ci	R-13.3ci	R-13.3ci	R-15.2ci	R-15.2ci	R-15.2ci	R-25ci	R-25ci
Metal building	R-13+ R-6.5ci	R-13 + R-6.5ci	R13 + R-6.5ci	R-13 + R-13ci	R-13 + R-6.5ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13+ R-19.5ci	R-13 + R-13ci	R-13+ R-19.5ci
Metal framed	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-15.6ci	R-13 + R-7.5ci	R-13+ R17.5ci
Wood framed and other	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R13 + R-15.6ci or R-20 + R-10ci	R13 + R-15.6ci or R-20 + R-10ci
Walls, below grade																
Below-grade wall[d]	NR	NR	NR	NR	NR	NR	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-10ci	R-10ci	R-10ci	R-12.5ci
Floors																
Mass[e]	NR	NR	R-6.3ci	R-8.3ci	R-10ci	R-10ci	R-10ci	R-10.4ci	R-10ci	R-12.5ci	R-12.5ci	R-12.5ci	R-15ci	R-16.7ci	R-15ci	R-16.7ci
Joist/framing	NR	NR	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-30[f]	R-30[f]	R-30[f]	R-30[f]	R-30[f]
Slab-on-grade floors																
Unheated slabs	NR	NR	NR	NR	NR	NR	R-10 for 24" below	R-10 for 24" below	R-10 for 24" below	R-10 for 24" below	R-10 for 24" below	R-15 for 24" below	R-15 for 24" below	R-15 for 24" below	R-15 for 24" below	R-20 for 24" below
Heated slabs[h]	R-7.5 for 12" below + R-5 full slab	R-7.5 for 12" below + R-5 full slab	R-7.5 for 12" below + R-5 full slab	R-7.5 for 12" below + R-5 full slab	R-10 for 24" below + R-5 full slab	R-10 for 24" below + R-5 full slab	R-15 for 24" below + R-5 full slab	R-15 for 24" below + R-5 full slab	R-15 for 36" below + R-5 full slab	R-15 for 36" below + R-5 full slab	R-15 for 36" below + R-5 full slab	R-20 for 48" below + R-5 full slab	R-20 for 48" below + R-5 full slab	R-20 for 48" below + R-5 full slab	R-20 for 48" below + R-5 full slab	R-20 for 48" below + R-5 full slab

TABLE C402.1.4

MULTIPLE CHANGES APPROVED THAT ALTER VALUES IN THIS TABLE

REMEMBER NON-SWINGING DOORS ADDED TO THIS TABLE

TABLE C402.1.4
OPAQUE THERMAL ENVELOPE ASSEMBLY MAXIMUM REQUIREMENTS, U-FACTOR METHOD[a, b]

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	U-0.048	U-0.039	U-0.039	U-0.039	U-0.039	U-0.039	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.028	U-0.028	U-0.028	U-0.028
Metal buildings	U-0.044	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.031	U-0.031	U-0.029	U-0.029	U-0.029	U-0.029
Attic and other	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021
Walls, above grade																
Mass[g]	U-0.151	U-0.151	U-0.151	U-0.123	U-0.123	U-0.104	U-0.104	U-0.090	U-0.090	U-0.080	U-0.080	U-0.071	U-0.071	U-0.071	U-0.061	U-0.061
Metal building	U-0.079	U-0.079	U-0.079	U-0.079	U-0.079	U-0.052	U-0.052	U-0.052	U-0.052	U-0.052	U-0.052	U-0.052	U-0.052	U-0.039	U-0.052	U-0.039
Metal framed	U-0.077	U-0.077	U-0.077	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.052	U-0.064	U-0.045
Wood framed and other[c]	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.051	U-0.051	U-0.051	U-0.051	U-0.036	U-0.036
Walls, below grade																
Below-grade wall[c]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-0.119	C-0.119	C-0.119	C-0.119	C-0.119	C-0.119	C-0.092	C-0.092	C-0.092	C-0.092
Floors																
Mass[d]	U-0.322[e]	U-0.322[e]	U-0.107	U-0.087	U-0.076	U-0.076	U-0.076	U-0.074	U-0.074	U-0.064	U-0.064	U-0.064	U-0.055	U-0.051	U-0.055	U-0.051
Joist/framing	U-0.066[e]	U-0.066[e]	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033
Slab-on-grade floors																
Unheated slabs	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.54	F-0.54	F-0.54	F-0.54	F-0.54	F-0.52	F-0.40	F-0.40	F-0.40	F-0.40
Heated slabs[f]	F-1.02 0.74	F-1.02 0.74	F-1.02 0.74	F-1.02 0.74	F-0.90 0.74	F-0.90 0.74	F-0.86 0.64	F-0.86 0.64	F-0.79 0.64	F-0.79 0.64	F-0.79 0.55	F-0.69 0.55	F-0.69 0.55	F-0.69 0.55	F-0.69 0.55	F-0.69 0.55
Opaque doors																
Swinging door	U-0.61	U-0.61	U-0.61	U-0.61	U-0.61	U-0.61	U-0.61	U-0.61	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37
Garage door <14% glazing	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31

2021 IECC – CONSENT AGENDA

CE92 – TABLE C402.4 VALUES REDUCTION

TABLE C402.4
BUILDING ENVELOPE FENESTRATION MAXIMUM *U*-FACTOR AND SHGC REQUIREMENTS

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
Vertical fenestration																
U-factor																
Fixed fenestration	0.50		~~0.50~~ 0.45		~~0.46~~ 0.42		~~0.38~~ 0.36		~~0.38~~ 0.36		~~0.36~~ 0.34		0.29		~~0.29~~ 0.26	
Operable fenestration	~~0.65~~ 0.62		~~0.65~~ 0.60		~~0.60~~ 0.54		0.45		0.45		~~0.43~~ 0.42		~~0.37~~ 0.36		~~0.37~~ 0.32	
Entrance doors	~~1.10~~ 0.83		~~0.83~~ 0.77		~~0.77~~ 0.68		~~0.77~~ 0.63		~~0.77~~ 0.63		~~0.77~~ 0.63		~~0.77~~ 0.63		~~0.77~~ 0.63	
SHGC																
Orientation[a]	SEW	N	SEW	N	SEW	N	SEW	N	SEW	N	SEW	N	SEW	N	SEW	N
PF < 0.2	~~0.25~~ 0.23	~~0.33~~ 0.31	0.25	0.33	0.25	0.33	0.36	0.48	0.38	0.51	~~0.40~~ 0.38	~~0.53~~ 0.51	~~0.45~~ 0.40	~~NR~~ 0.53	~~0.45~~ 0.40	~~N~~ 0.53
0.2 ≤ PF < 0.5	~~0.30~~ 0.28	~~0.37~~ 0.34	0.30	0.37	0.30	0.37	0.43	0.53	0.46	0.56	~~0.48~~ 0.46	~~0.58~~ 0.56	~~NR~~ 0.48	~~NR~~ 0.58	~~NR~~ 0.48	~~NR~~ 0.58
PF ≥ 0.5	~~0.40~~ 0.37	~~0.40~~ 0.37	0.40	0.40	0.40	0.40	0.58	0.58	0.61	0.61	~~0.64~~ 0.61	~~0.64~~ 0.61	~~NR~~ 0.64	~~NR~~ 0.64	~~NR~~ 0.64	~~NR~~ 0.64
Skylights																
U-factor	~~0.75~~ 0.70		0.65		0.55		0.50		0.50		0.50		~~0.50~~ 0.44		~~0.50~~ 0.41	
SHGC	~~0.35~~ 0.30		~~0.35~~ 0.30		~~0.35~~ 0.30		0.40		0.40		0.40		NR		NR	

CE-99 – ENVELOPE PERFORMANCE VERIFICATION

C402 –Building Envelope

C402.5.1 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 C402.5.1.1, C402.5.1.2 and C402.5.1.3.

Exception: Air barriers are not required in buildings located in Climate Zone 2B.

C402.5.1.3 **Building envelope performance verification**. The installation of the continuous air barrier shall be verified by a registered design professional or approved agency in accordance with the following:

1. A review of the construction documents and other supporting data shall be conducted to assess compliance with the requirements in Sections C402.5.1.

2. Inspection of continuous air barrier components and assemblies shall be conducted during construction while the air barrier is still accessible for inspection and repair to verify compliance with the requirements of Sections C402.5.1.1 and C402.5.1.

3. A final commissioning report shall be completed by the registered design professional or approved agency and provided to the building owner or owner's authorized agent and the code official. The report shall identify deficiencies found during the review of the construction documents and inspection and details of corrective measures use.

AIR BARRIER TESTING CE-97

C402.5 Air leakage—thermal envelope (Mandatory). The building thermal envelope shall comply with Sections C402.5.1 through C402.5.8, or the building thermal envelope shall be tested in accordance with Section C402.5.1.2.3. Where compliance is based on such testing, the building shall also comply with Sections C402.5.5, C402.5.6 and C402.5.7.

C402.5.1 Air barriers. A continuous air barrier shall be provided throughout the building thermal envelope. The air barriers shall be located on the inside or outside of the building thermal envelope, located within the assemblies composing the building thermal envelope, or any combination thereof. The air barrier shall comply with Sections C402.5.1.1 and C402.5.1.2.

Exception: Air barriers are not required in buildings located in Climate Zone 2B.

C402.5.1.2 Air barrier compliance. A continuous air barrier for the opaque building envelope shall comply with the following:

1. Buildings or portions of buildings including group R and group I occupancy shall meet the provisions of Section C402.5.1.2.1 or C402.5.1.2.2.
2. Buildings or portions of buildings of other than group R and group I occupancy shall meet the provisions of Section C402.5.1.2.3.

Exceptions:

1. Buildings in Climate Zones 2B, 3B, 3C, and 5C.
2. Buildings larger than 5000 square feet floor area in Climate Zones 0B, 1, 2A, 4B, and 4C.
3. Buildings between 5000 and 50,000 square feet floor area in Climate Zones 0A, 3A and 5B.

3. Buildings or portions of buildings other than group R and group 1 occupancy that do not complete air barrier testing shall

AIR BARRIER TESTING CE97

C402.5.1.2.3 Building thermal envelope testing. The building thermal envelope shall be tested in accordance with ASTM E 779 or an equivalent method approved by the code official. The measured air leakage shall not exceed 0.40 cfm/ft (2.0 L/s · m) of the building thermal envelope area at a pressure differential of 0.3 inch water gauge (75 Pa). Alternatively, portions of the building shall be tested and the measured air leakages shall be area-weighted by the surface areas of the building envelope in each portion. The weighted average test results shall not exceed the whole building leakage limit. In the alternative approach, the following portions of the building shall be tested:

1. The entire envelope area of all stories that have any spaces directly under a roof,
2. The entire envelope area of all stories that have a building entrance, exposed floor, or loading dock, or are below grade, and
3. Representative above-grade sections of the building totaling at least 25 percent of the wall area enclosing the remaining conditioned space.

Exception: Where the measured air leakage rate exceeds 0.40 cfm/ft (2.0 L/s•m) but does not exceed 0.60 cfm/ft (3.0 L/s•m2), a diagnostic evaluation using smoke tracer or infra-red imaging shall be conducted while the building is pressurized along with a visual inspection of the air barrier. Any leaks noted shall be sealed where such sealing can be made without destruction of existing building components. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner, and shall be deemed to comply with satisfy the requirements of this section.

AIR BARRIER TESTING CE-96

TESTING UNIT ENCLOSURE AREA. The area sum of all the boundary surfaces that define the dwelling unit, sleeping unit, or occupiable conditioned space including top/ceiling, bottom/floor, and all side walls. This does not include interior partition walls within the dwelling unit, sleeping unit, or occupiable conditioned space. Wall height shall be measured from the finished floor of the conditioned space to the finished floor or roof/ceiling air barrier above.

C402.5.1 Air barriers. A continuous air barrier shall be provided throughout the building thermal envelope. The continuous air barriers shall be located on the inside or outside of the building thermal envelope, located within the assemblies composing the building thermal envelope, or any combination thereof. The air barrier shall comply with Sections C402.5.1.1 and C402.5.1.2.

Exception: Air barriers are not required in buildings located in Climate Zone 2B.

C402.5.1.2 Air barrier compliance. A continuous air barrier for the opaque building envelope shall comply with the following:

1. Buildings or portions of buildings including Group R and Group I occupancy shall meet the provisions of Section C402.5.1.2.3.

Exception: Buildings in Climate Zones 2B, 3C, and 5C.

2. Buildings or portions of buildings including Group R and Group I occupancy in Climate Zones 3C and 5C shall meet the provisions of Section C402.5.1.2.1 or C402.5.1.2.2.

3. Buildings or portions of buildings other than Group R and Group I occupancy shall meet the provisions of Section C402.5.1.2.1 or C402.5.1.2.2.