2021 International Energy Conservation Code
Amendments
And the energy provisions of the
2021 International Residential Code

2021 IECC (Energy Provisions of the 2021 IRC)

DIVISION 2. - ENERGY CODE

Sec. 5-146. - International Energy Conservation Code—Adopted.

The International Energy Conservation Code, 2021 Edition as published by the International Code Council, Inc., a copy of which is on file in office of the city secretary, as amended by section 5-147, administered and enforced by the office of the building official is hereby adopted by reference and designated as the energy code of the city as though such code were copied at length in this article.

Sec. 5-147. - Same—Deletions and amendments.

The energy code adopted in this article is hereby amended and changed in the following respects:

Section C101.1 and R101.1. amend to read as follows:

C101.1 Title. This code shall be known as the Energy Conservation Code of the City of Hurst, and shall be cited as such. It is referred to herein as “this code”.

R101.1 Title. This code shall be known as the Energy Conservation Code of the City of Hurst, and shall be cited as such. It is referred to herein as “this code”.

Section C101.1 and R101.1; add sections C101.1.1 and R101.1.1 to read as follows:

C101.1.1 Code Compliance Agency, Creation of Agency; The Building Inspections Department is hereby created and the official in charge thereof shall be known as the Building Official. The function of the agency shall be the implementation, administration, interpretation, and enforcement of the provisions of this code.

R101.1.1 Code Compliance Agency, Creation of Agency; The Building Inspections Department is hereby created and the official in charge thereof shall be known as the Building Official. The function of the agency shall be the implementation, administration, interpretation, and enforcement of the provisions of this code.

Section C102/R102 General; add Section C102.1.2 and R102.1.2 (N1101.4.1) to read as follows:

C102.1.2 Alternative compliance. A building certified by a national, state, or local accredited energy efficiency program and determined by the Energy Systems Laboratory to be in compliance with the energy efficiency requirements of this section may, at the option of the Code Official, be considered in compliance. The United States Environmental Protection Agency's Energy Star Program certification of energy code equivalency shall be considered in compliance.

R102.1.2 (N1101.4.1) Alternative compliance. A building certified by a national, state, or local accredited energy efficiency program and determined by the Energy Systems Laboratory to be in compliance with the energy efficiency requirements of this section may, at the option of the Code Official, be considered in compliance. The United States Environmental Protection Agency's Energy Star Program certification of energy code equivalency shall be considered in compliance. Regardless of the program or the path to compliance, each 1- and 2-family dwelling shall be

tested for air and duct leakage as prescribed in Section R402.4.1.2 (N1102.4.1.2) and R403.3.3 (N1103.3.3) respectively.

Section 105.2 Required Inspections; Changed numbering and to read as follows:

R105.2.1 Footing and foundation inspection.
Inspections associated with footings and foundations shall verify compliance with the code as to R-value, location, thickness, depth of burial and protection of insulation as required by the code and approved plans and specifications.

R105.2.2 Framing and Air Barrier rough-in inspection.
Inspections at framing and rough-in shall be made before application of ~~interior finish~~ insulation and shall verify compliance with the code as to: ~~types of insulation and corresponding R-values and their correct location and proper instillation; fenestration properties such as U-factor and SHGC and proper instillation;~~ air leakage controls as required by the code; and approved plans and specifications.

R105.2.3 Insulation and Fenestration rough-in inspection.
Inspections at framing and rough-in shall be made before application of interior finish and shall verify compliance with the code as to: types of insulation and corresponding R-values and their correct location and proper installation; fenestration properties such as U-factor and SHGC and proper installation.

R105.2.~~3~~4 Plumbing rough-in inspection.
Inspections at plumbing rough-in shall verify compliance as required by the code and approved plans and specifications as to types of insulation and corresponding R-values and protection and required controls.

R105.2.~~4~~5 Mechanical rough-in inspection.
Inspections at mechanical rough-in shall verify compliance as required by the code and approved plans and specifications as to installed HVAC equipment type and size, required controls, system insulation and corresponding R-value, system air leakage control, programmable thermostats, dampers, whole-house ventilation, and minimum fan efficiency.

> **Exception**: Systems serving multiple dwelling units shall be inspected in accordance with Section C105.2.4.

R105.2.~~5~~6 Final inspection. The building shall have a final inspection and shall not be occupied until approved. The final inspection shall include verification of the installation of all required building systems, equipment and controls and their proper operation and the required number of high-efficacy lamps and fixtures.

Add sections C109.5, C109.6 and C109.7 and R109.5, R109.6 and R109.7 to read as follows:

C109.5. Notice of violation. The code official is authorized to serve a notice of violation or order to the person responsible for the erection, installation, alteration, extension, repair, removal or demolition of any work regulated by this code that is in violation of the provisions of this code, or in violation of a detail statement or the approved construction documents thereunder, or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

C109.6 Prosecution of violation. Delete section

C109.7 Violation penalties. Any person who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair any work regulated by this code in violation of the approved construction documents or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be guilty of a misdemeanor and upon conviction thereof shall be fined in a sum not to exceed two thousand dollars ($2,000.00). Each day that a violation continues shall be deemed a separate offense.

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R109.6 Prosecution of violation. Delete section

R109.7 Violation penalties. Any person who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair any work regulated by this code in violation of the approved construction documents or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be guilty of a misdemeanor and upon conviction thereof shall be fined in a sum not to exceed Two thousand dollars ($2,000.00). Each day that a violation continues shall be deemed a separate offense.

Section C110 and R110; **Delete entire sections and insert the following:**

SECTION C110
MEANS OF APPEAL

C110.1 Application for appeal. Any person shall have the right to appeal a decision of the code official to the board of appeals established by ordinance. The board shall be governed by the enabling ordinance.

SECTION R110
MEANS OF APPEAL

R110.1 Application for appeal. Any person shall have the right to appeal a decision of the code official to the board of appeals established by ordinance. The board shall be governed by the enabling ordinance.

Section C202 and R202 (N1101.6); **add the following definitions:**

PROJECTION FACTOR. The ratio of the horizontal depth of the overhang, eave or permanently attached shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave or permanently attached shading device.

Section R202; add the following definition:

DYNAMIC GLAZING. Any fenestration product that has the fully reversible ability to change its performance properties, including U-factor, solar heat gain coefficient (SHGC), or visible transmittance (VT).

Section C202; add the following definitions:

RE-ROOFING. When a commercial flat roofed building, built prior to the adoption of the IECC, is re-roofed, roof deck insulation shall be installed with an R value of not less than R-19.

SHELL BUILDINGS. New buildings (shell buildings) designed to be heated or air conditioned in the future shall meet the code requirements for envelope design at the time of construction.

Section R401.2.5 Additional Energy efficiency; *deleted in its entirety.*

Table 402.1.2 Maximum Assembly/Climate Zone items: amend table as follows.

Climate Zone	*Fenestration U-Factor[f]*	*Ceiling U-Factor*
2	*.40*	*~~0.26~~ 0.29*
3	*~~0.30~~ 0.32*	*~~0.26~~ 0.29*

~~Table 402.1.3 Insulation/Climate Zone items: amend table as follows.~~

Climate Zone	*Fenestration U-Factor[b,i]*	*Ceiling R-Value*	*Wood Frame Wall R-Value*	*Slab R-Value & Depth*
2	*.40*	*~~49~~ 42*	*13 or 0 + 10*	*0*
3	*~~0.30~~ 0.32*	*~~49~~ 42*	*19 or 13+~~5~~3ci, 0+15*	*~~10ci, 2 ft~~ 0*

C402.2.1.3.1 Roof assembly. Add paragraph at end of subsection to read as follows:

Suspended or drop in ceilings shall not be considered as part of the building envelope. Insulation installed on top of the ceiling grid shall not be considered to meet envelope requirements. Pre-existing buildings may retain the insulation installed in this manner. Pre-existing buildings where 50% or more of the insulation is removed for remodeling, or any other reason, shall then meet the current code requirements.

Section C402.2.7/R402.2; Add Section C402.2.7 and R402.2.14 to read as follows:

Section C402.2.8/R402.2.13 Insulation installed in walls. To ensure that insulation remains in place, insulation installed in walls shall be totally enclosed on all sides consisting of framing lumber, gypsum, sheathing, wood structural panel sheathing, netting or other equivalent material approved by the building official.

Section R402.3.2 Glazed fenestration SHGC; amend by adding a paragraph and table following the exception to read as follows:

Where vertical fenestration is shaded by an overhang, eave, or permanently attached shading device, the SHGC required in Table R402.1.2 shall be reduced by using the multipliers in Table R402.3.2 SHGC Multipliers for Permanent Projections.

Table R402.3.2
SHGC Multipliers for Permanent Projections [a]

Projection Factor	SHGC Multiplier (all Other Orientation)	SHGC Multiplier (North Oriented)
0 - 0.10	1.00	1.00
>0.10 - 0.20	0.91	0.95
>0.20 - 0.30	0.82	0.91
>0.30 - 0.40	0.74	0.87
>0.40 - 0.50	0.67	0.84
>0.50 - 0.60	0.61	0.81
>0.60 - 0.70	0.56	0.78
>0.70 - 0.80	0.51	0.76
>0.80 - 0.90	0.47	0.75
>0.90 - 1.00	0.44	0.73

[a] North oriented means within 45 degrees of true north.

Section R402.4.1 Building thermal envelope; add section R402.4.1.4 to read as follows

R402.4.1.4 Sampling options for R2 multifamily dwelling units. For buildings with eight or more testing units that must be tested as required by R402.1.2 or R402.1.3, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional three units shall be tested, including a mixture of testing unit types and locations. Where buildings have fewer than eight testing units, each testing unit shall be tested.

Section R402.4.1.2 Testing; modify the first paragraph and add second paragraph to read as follows:

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 5 air changes per hour in Climate Zone 3. {Remainder of text unchanged}

R402.4.1.2 Testing; Add a last paragraph to read as follows:

Mandatory testing shall only be performed by individuals that are certified to perform air infiltration testing certified by national or state organizations as approved by the building official. The certified individuals must be an independent third-party entity, and may not be employed; or have any financial interest in the company that constructs the structure.

Section C402.5.2 Dwelling and sleeping unit enclosure testing. Added the underlined to read as follows

C402.5.2 Dwelling and sleeping unit enclosure testing. The building thermal envelope shall be tested in accordance with ASTM E779. ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the code official. The measured air leakage shall not exceed 0.30 cfm/ft2 (1.5 Us m2) of the testing unit enclosure area at a pressure differential of 0.2 inch water gauge (50 Pa). Where multiple dwelling units or sleeping units or other occupiable conditioned spaces are contained within one building thermal envelope, each unit shall be considered an individual testing unit, and the building air leakage shall be the weighted average of all testing unit results, weighted by each testing unit's enclosure area. Units shall be tested separately with an unguarded blower door test as follows:

1. Where buildings have fewer than eight testing units, each testing unit shall be tested.
2. For buildings with eight or more testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional two three units shall be tested, including a mixture of testing unit types and locations.

Section R403.3 Ducts; add paragraph to 403.3.5 and add section R403.3.8 to read as follows

R403.3.5 Duct Testing (Mandatory). Add a last paragraph to read as follows:
Mandatory testing shall only be performed by individuals that are certified to perform duct testing leakage testing certified by national or state organizations as approved by the building official. The certified individuals must be an independent third-party entity, and may not be employed; or have any financial interest in the company that constructs the structure.

R403.3.8 Sampling options for R2 multifamily dwelling units. For buildings with eight or more testing units that must be tested as required by R403.3.5, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and a unit with the largest testing unit floor area. For each tested unit that exceeds the maximum duct leakage rate, an additional three units shall be tested, including a mixture of testing unit types and locations. Where buildings have fewer than eight testing units, each testing unit shall be tested.

Section R403.6 Mechanical Ventilation; add section R403.6.4 to read as follows

R403.6.4 Sampling options for R2 multifamily dwelling units. For buildings with eight or more testing units that must be tested as required by R403.6.3, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and a unit with the largest testing unit floor area. For each tested unit that does not meet the minimum ventilation rate, an additional three units shall be tested, including a mixture of testing unit types and locations. Where buildings have fewer than eight testing units, each testing unit shall be tested.

R405.2 Performance-based compliance. Added to underlined to read as follows.

R405.2 Performance-based compliance. Compliance based on total building performance requires that a proposed design meets all of the following:

1. The requirements of the sections indicated within Table R405.2.
2. The building thermal envelope greater than or equal to levels of efficiency and solar heat gain coefficients in Table R402.1.1 or R402.1.3 of the 2009 International Energy Conservation Code.
3. An annual energy cost that is less than or equal to the annual energy cost of the 2021 standard reference design or 8% less than the annual energy cost of the 2018 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 Data System Prices and Expenditures reports. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.

   Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

Section R402.4.6 Electrical and Communication outlet boxes. Delete after the first sentence to read as follows.

***R402.4.6 Electrical and communication outlet boxes (air-sealed boxes). Electrical and communication outlet boxes installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. ~~Electrical and communication outlet boxes shall be tested in accordance with NEMA OS 4 , Requirements for Air-Sealed Boxes for Electrical and Communication Applications, and shall have an air leakage rate of not greater than 2.0 cubic feet per minute (0.944 L/s) at a pressure differential of 1.57 psf (75 Pa). Electrical and communication outlet boxes shall be marked "NEMA OS 4" or "OS 4" in accordance with NEMA OS 4. Electrical and communication outlet boxes shall be installed per the manufacturer's instructions and with any supplied components required to achieve compliance with NEMA OS 4.~~

Section R404.2 Interior Lighting Controls; deleted in its entirety.

Section R405.5.2; add the following sentence to the end of paragraph:

Acceptable performance software simulation tools may include, but are not limited to, REM Rate ™ , Energy Gauge and IC3. Other performance software programs accredited by RESNET BESTEST and having the ability to provide a report as outlined in R405.4.2 may also be deemed acceptable performance simulation programs and may be considered by the building official.

TABLE R406.4 (N1106.4) MAXIMUM ENERGY RATING INDEX; amend to read as follows:

TABLE R406.4 *(N1106.4)* [1]
MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX
2	~~52~~ 63
3	~~52~~ 63

[1] This table is effective until August 31, 2022.

TABLE R406.4 *(N1106.4)* [2]

MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX
2	~~52~~ 59
3	~~52~~ 59

[2] The table is effective from September 1, 2022 to August 31, 2025.

TABLE R406.4 *(N1106.4)* [3]
MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX
2	~~52~~ 57
3	~~52~~ 57

[3] The table is effective from September 1, 2025 to August 31, 2028.

TABLE R406.4 *(N1106.4)* [3]
MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX
2	~~52~~ 55
3	~~52~~ 55

[4] This table is effective on or after September 1, 2028.

Secs. 5-148—5-155. - Reserved