

Interpretation Variables and Common Areas of Confusion
Of the 2009 IECC

1. (Mandatory) provisions vs. (Prescriptive) provisions: The IECC contains flexibility by allowing different approaches to achieve compliance. In offering this flexibility however, it can become confusing on when a particular requirement applies. There are prescriptive requirements that only apply if you are using the prescriptive path, such as specific insulation requirements found in Sections 402.2 and 403.2.1 or the fenestration requirements found under Section 402.3. There are mandatory requirements that apply to all projects, no matter which compliance approach (Prescriptive, Trade-off, or Performance) is used. Mandatory items are things like duct sealing, thermostat controls, automatic or gravity dampers on outside intake or exhaust openings, etc. You will easily find these items by looking for the words (Mandatory) or (Prescriptive) in parenthesis within chapters 4 and 5.

2. Default Glazed Fenestration and Default Door U-Factors: No matter which compliance path you are using there will always be a requirement for a specific U-Value for the fenestration and doors. In a perfect world these U-Values would always be shown on the window and door stickers. Sometimes the stickers are removed before we can witness them or the windows are constructed in the field so they never had a sticker or it's possible that the windows were purchased used and do not have stickers any longer. In these cases it may become necessary to assign the windows or doors a default U-Value or SHGC from the default tables located in Chapter 3. These default values are not too code friendly. In other words, it becomes very hard for the project to comply with code requirements. There are other options available through NFRC to get the windows tested or reviewed under their CMA program but until someone can prove what the U-Value actually is, it is necessary to use the default values from the tables.

3. Fireplaces: There is a common misconception that fireplaces are no longer allowed unless they contain gasketed doors or full inoperable glass. Section 402.4.3 Fireplaces, only applies to new wood-burning fireplaces. There is no mention to gas fireplaces. Do not be overly restrictive by mistakenly applying the gasketed door rule to everything.

4. Recessed Lighting: It is true that recessed lighting is one area where you can see a tremendous amount of air leakage when doing leakage or infrared testing. The requirement in Section 402.4.5 and 502.4.8 specifically apply to those recessed luminaires installed in the building thermal envelope where the ceiling that they are installed in is separating conditioned from unconditioned space. In these locations the luminaires must be sealed to limit leakage and must be IC-rated (rated for insulation contact) because it is in these locations where the air sealing is important to keep unconditioned air from entering the conditioned area and vice versa. Also, it is usually only in these areas where there would be insulation to worry about. Insulation can be in conditioned areas and if so, the recessed can lights in these areas must still be IC-rated but there is no requirement for the gasketed or sealed cans.

5. Maximum Fenestration U-Factor/SHGC: In the UA Trade-off and the Performance paths it is possible to trade some U-Value for some R-Factor and vice versa. If you have a window that has a higher U-Value then the prescriptive code would allow then you could trade it off by putting in a higher insulation

then is required by code and as long as the total UA for the entire area is equal to or less than that of the prescriptive tabular values then you could use that worse window. What this section of the code, found in 402.5, says though is that no matter which path you choose you can only trade off the U-Value so far. In climate zones 4 and 5, the maximum U-Value allowed even with trade-offs is .48 (area weighted average) and in climate zones 6-8 the maximum value is .40 (area weighted average).

6. Equipment sizing – Residential: Section 403.6 states that heating and cooling equipment for residential occupancies shall be sized per Section 1401.3 of the IRC. This is fine if you are sizing equipment for homes that are built under the IRC, such as one and two family dwellings, 3 stories or less. The confusion comes in because the IECC also looks at R-2 and R-4 occupancies under 4 stories as residential that must comply with Chapter 4 but these particular occupancies are constructed under the IBC so why would we have to go to the IRC for equipment sizing? Because the International Mechanical Code calls for load calculations according to ASHRAE 183, Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings. So what do we do for low rise residential? We go to the IRC and size the equipment per ACCA Manual S and J.

7. Pool Covers: Sections 403.9 and 504.7 both say that Pools shall be provided with energy conserving measures... Nowhere does it say that only outdoor pools have to comply. These pool provisions apply to both indoor and outdoor pools the same. There are both condensation and evaporation problems with heated pools causing not only increased energy usage but additional possible structural issues for indoor pools. Be sure to apply these pool sections to both indoor and outdoor pools.

8. UA Trade-off compliance path vs. Simulated Performance Alternative- Residential: The UA tradeoff path allows you to trade U-Value for R-Factor, a better window for a lower insulation or a better ceiling insulation for a lower basement or slab insulation, etc. The simulated performance path allows you to trade the U-Value, the R-Factor and some additional items such as certain amounts of air leakage, internal and structural mass, etc. Each compliance path comes with its own set of requirements as to the calculations and/or software used.

The UA trade off path states that calculations are done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. DOE's ResCheck software is set up to do these calculations and works quite well. If someone is proposing to use the UA tradeoff approach for residential it is quite popular to require them to turn in a ResCheck. The ResCheck software can be downloaded for free from DOE's website at www.energycodes.gov.

The performance path requires a proposed design be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. It also states that the compliance software tools shall generate a report that documents that the proposed design complies with Section 405.3. As of the publishing of this toolkit, the DOE's ResCheck does not quite comply with the requirements of this section. There are software tools out there that do print out the energy cost analysis as well as the assumptions that went into the standard reference design as well as the proposed design. A popular tool is RemRate or RemDesign, which calculates a HERS rating for each project. There are other tools to show compliance. You can find a list of different software tools and what they will comply with at DOE's website by using this link: www.eere.energy.gov/buildings/tools_directory/

9. ICC Committee Interpretations related to the IECC.

**CHAPTER 1
ADMINISTRATION**

**SECTION 102.1.3
2006 Edition
IECC Interpretation No. 18-08
Issued 11-19-2008
EC_06_18_08**

102.1.3 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 Table 102.1.3(1) or 102.1.3(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 SHGC from Table 102.1.3(3).



Q: Does Section 102.1.3 of the *2006 International Energy Conservation Code* intend that fenestration products with *U*-factors determined in accordance with NFRC 100 or SHGC ratings determined in accordance with NFRC 200 be subject to labeling by an approved third-party agency?

A: No. The manufacturers have their products rated by an accredited and independent testing laboratory. The manufacturer then labels their products demonstrating their commitment to provide accurate energy and energy-related performance information. The code does not require that the labeling be done by an approved third party agency.

**CHAPTER 5
RESIDENTIAL BUILDING DESIGN BY COMPONENT
PERFORMANCE APPROACH**

**SECTION 502.1.1
IECC Interpretation No. 02-05
2003 Edition
Issued: 06-06-05**

502.1.1 Moisture control. The design shall not create conditions of accelerated deterioration from moisture condensation. Frame walls, floors and ceilings not ventilated to allow moisture to escape shall be provided with an approved vapor retarder having a permeance rating of 1 perm ($5.7 \times 10^{-11} \text{ kg/Pa} \cdot \text{s} \cdot \text{m}^2$) or less, when tested in accordance with the desiccant method using Procedure A of ASTM E 96. 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. Where the county in which the building is being constructed is considered a hot and humid climate area and identified as such in Figures 902.1(1) through 902.1(51) in Chapter 9 of this code.
3. Where other approved means to avoid condensation in unventilated framed wall, floor, roof and ceiling cavities are provided.



Q: The requirements in Section 502.1.1 stipulates that a vapor retarder must be installed on the warm-in-winter side of the thermal insulation. Is the installation of the vapor retarder required continuously across the face of the wall studs?

A: No. The word continuous is not used in the referenced code section. Therefore, a vapor retarder is not required to be installed in a manner that will provide a continuous barrier on the warm-in-winter side of the exterior wall. The performance criteria of a vapor retarder establishes that material must have a permeance rating not exceeding 1 perm in order to limit the amount of moisture vapor that passes through a material.

Staff Note: Also see *International Residential Code*, Committee Interpretation 01-05, Section R318.1 Moisture Control.

CHAPTER 5
COMMERCIAL ENERGY EFFICIENCY

SECTION 504.7.3
IECC Interpretation No. 01-08
2006 Edition
Issued: 05-20-2008
EC_06_01_08

504.7.3 Pool covers. Heated pools shall be equipped with a vapor retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.

Exception: Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source.



Q: Do the provisions of Section 504.7.3 of the *International Energy Conservation Code* apply to both indoor and outdoor heated swimming pools, hot tubs, and spas?

A: Yes. The purpose of the vapor retardant pool cover is to minimize energy losses caused by the loss of heat from the water itself, as well the loss of energy caused by the evaporation of the heated water in the pool. The loss of energy will occur in both indoor pools and outdoor pools. Although the loss of energy would likely be greater for outdoor pools, the goal is to minimize any loss of energy. There are no provisions to establish a specific loss of energy to be achieved or maintained.

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