

IECC Compliance Guide to Window Selection in North Carolina

Designed to Comply with the IECC Requirements for New Single-Family Residential Buildings in North Carolina

Code: 2000 International Energy Conservation Code (IECC)

First Edition

How to Use This Guide

This guide is designed to help select windows that will meet the requirements of the IECC in North Carolina. Each county is assigned to one of five packages (A through E), which vary according to the different climate zones in North Carolina.

Step-by-Step Instructions

1. Use the color-coded map to locate the county in which construction is taking place and find the package (A through E) associated with that county.
2. Use the "Table of IECC Requirements for Window Selection in North Carolina" (on the back of this sheet) to find the prescriptive path based upon the package selected in Step 1, above.
3. Construct the home with windows that have area weighted average U-factors and SHGCs less than or equal to the values for the corresponding path and meet the code maximum air leakage requirements.

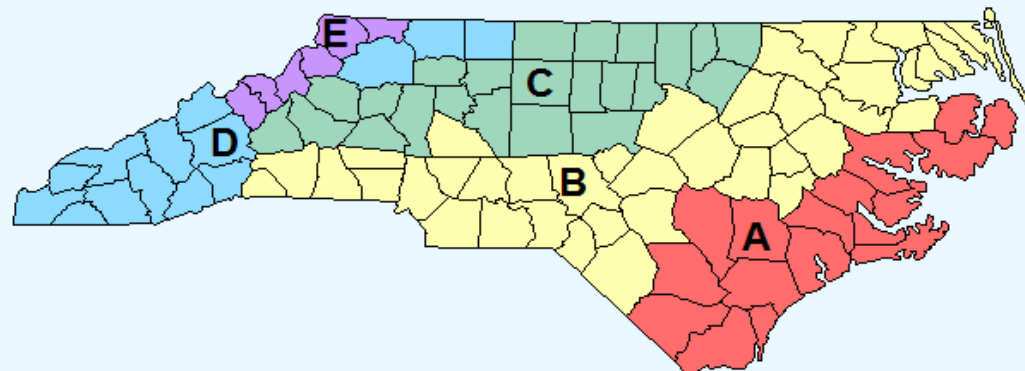
Example: If you are constructing a home with a window area of 15% in Mecklenburg County, found in Package B, you will comply with the IECC window requirements in North Carolina if your windows have an area weighted average maximum U-factor of 0.55, an SHGC of 0.40, and air leakage less than 0.3 cfm/sq.ft.

Obtaining the IECC

The IECC is published by the International Code Council (ICC). For additional details on the IECC or to purchase a copy, contact the ICC or visit its website at www.iccsafe.org.

Limitations

This guide is an energy code (IECC based) window selection compliance aid for North Carolina and does not provide a guarantee for meeting the state energy code. The guide has not been customized to reflect any state-specific amendments to the IECC that North Carolina may adopt or has adopted. The window requirements in this guide also depend upon the energy performance values of other envelope components in the home, e.g., insulation R-values in ceilings, walls, etc., not identified in this guide. For those values, refer to Tables in Chapter 5 of the IECC. For additional details on North Carolina's energy code, contact your local building code official.



North Carolina Counties by Package

| A | 2,500 - 2,999 HDD | | | C | 3,500 - 3,999 HDD | | |
|------------|-------------------|------------|-----------|-----------|-------------------|--|--|
| Beaufort | Dare | Pamlico | Alamance | Davie | Orange | | |
| Bladen | Duplin | Pender | Alexander | Durham | Person | | |
| Brunswick | Hyde | Sampson | Burke | Forsyth | Randolph | | |
| Carteret | Jones | Tyrrell | Caldwell | Franklin | Rockingham | | |
| Columbus | New Hanover | | Caswell | Granville | Vance | | |
| Craven | Onslow | | Catawba | Guilford | Warren | | |
| | | | Chatham | Iredell | Yadkin | | |
| | | | Davidson | McDowell | | | |
| B | 3,000 - 3,499 HDD | | | D | 4,000 - 4,499 HDD | | |
| Anson | Hertford | Pitt | Buncombe | Henderson | Surry | | |
| Bertie | Hoke | Polk | Cherokee | Jackson | Swain | | |
| Cabarrus | Johnston | Richmond | Clay | Macon | Transylvania | | |
| Camden | Lee | Robeson | Graham | Madison | Wilkes | | |
| Chowan | Lenoir | Rowan | Haywood | Stokes | | | |
| Cleveland | Lincoln | Rutherford | | | | | |
| Cumberland | Martin | Scotland | | | | | |
| Currituck | Mecklenburg | Stanly | | | | | |
| Edgecombe | Montgomery | Union | | | | | |
| Gaston | Moore | Wake | | | | | |
| Gates | Nash | Washington | | | | | |
| Greene | Northampton | Wayne | | | | | |
| Halifax | Pasquotank | Wilson | | | | | |
| Harnett | Perquimans | | | | | | |
| E | 5,000 - 5,499 HDD | | | | | | |
| Alleghany | Avery | Watauga | | | | | |
| Ashe | Mitchell | Yancey | | | | | |

HDD = Heating Degree Days

Table of IECC Requirements for Window Selection in North Carolina

Simplified Prescriptive Window Requirements for Compliance with the IECC for New Single-Family Residential Buildings in North Carolina

| Package ^a | Maximum Window U-factor ^b | Maximum Window SHGC ^{b,c} |
|----------------------|--------------------------------------|------------------------------------|
| A | 0.60 | 0.40 |
| B | 0.55 | 0.40 |
| C | 0.50 | NR |
| D | 0.45 | NR |
| E | 0.45 | NR |

a. This table of prescriptive requirements is applicable to homes in which the ratio of the rough opening of windows to the gross wall area, expressed as a percentage, is 15%. For homes with glazing areas that are greater than 15%, please refer to Tables 502.2.4(4) - (6) in the IECC.

b. U-factors and SHGCs may be determined by calculating an area weighted average U-factor and SHGC for all windows. For example, Area Weighted Average U-factor equals $((\text{Area}1 \times U1) + (\text{Area}2 \times U2)) / (\text{Total Area})$. The area weighted average must not exceed the maximum values in the selected path.


c. "NR" means no requirement is specified in this package.

NOTES:

1. This table of window requirements is based upon the International Energy Conservation Code (IECC) and does not reflect any state-specific amendments to the IECC. The IECC specifies additional requirements for other parts of the building envelope not listed here, such as insulation for walls and ceilings.
2. This table applies to single-family, residential construction.
3. "Window" refers to any translucent or transparent material (i.e., glazing) in exterior openings of buildings, including skylights, glass doors, the glass areas of opaque doors, and glass block, along with the accompanying sashes, frames, etc.
4. Window area % is the ratio of the area of the rough opening of windows to the gross wall area, expressed as a percentage. Up to one percent of total window area may be exempt from the U-factor requirement.
5. U-factor is a number, generally between 0.2 and 1.20, that indicates the rate of heat loss (or gain) through a window. A lower U-factor demonstrates a greater resistance to heat loss and gain, i.e., better insulating value, of the window. This number is important for winter comfort.
6. SHGC, or Solar Heat Gain Coefficient, is a number between 0 and 1 that indicates the fraction of radiation (heat) from the sun that is transmitted through the window; the lower the SHGC, the less the amount of solar radiation that is allowed to pass through the window and become unwanted additional heat in the summer. This number is critical for summer comfort.
7. Window U-factor and SHGC must be determined from a National Fenestration Rating Council (NFRC) label on the product (see sample label below), or from a limited table of product "default" values in the IECC.
8. The code requires that windows be labeled in a manner to determine that they meet the IECC's air infiltration requirements; specifically, equal to or better than 0.30 cfm per square foot of window area (swinging doors below 0.50 cfm) as determined in accordance with AAMA/WDMA 101/I.S.2 (ASTM E 283).
9. The labeled product U-factor and SHGC values should also be used in calculation procedures to properly size the home's HVAC equipment. The IECC requires the use of a computational procedure like ACCA Manual J to size equipment. Properly sized equipment will operate more efficiently and effectively and will save money up front because consumers can avoid paying extra for oversized equipment.

Look for the NFRC Label!

The 2 most important values to look for are: **U-factor and Solar Heat Gain Coefficient (SHGC)**

|  World's Best Window Co. Millennium 2000 ⁺ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: Vertical Slider CERTIFIED | |
|---|--|
| ENERGY PERFORMANCE RATINGS | |
| U-Factor (U.S./I-P) 0.35 | Solar Heat Gain Coefficient 0.32 |
| ADDITIONAL PERFORMANCE RATINGS | |
| Visible Transmittance 0.51 | Air Leakage (U.S./I-P) 0.2 |
| <small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. Consult manufacturer's literature for other product performance information. www.nfrc.org</small> | |

For more information on energy efficient windows, go to the Efficient Windows Collaborative website at: www.efficientwindows.org

