

KEY CHANGES TO 2012 NC RESIDENTIAL CODE CHAPTER 11 ENERGY EFFICIENCY

1. CHAPTER 2 DEFINITIONS - ADDED DEFINITIONS

2. CHAPTER 2 DEFINITIONS - MODIFIED SOME EXISTING DEFINITIONS

3. INSULATION CHANGES – TABLE N1102.1.1

TABLE N1102.1.1

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT ^a

CLIMATE ZONE	FENESTRATION U-FACTOR/ SOLAR HEAT GAIN COEFFICIENT	CEILING R-VALUE ^k	WOOD FRAME WALL R-VALUE ^e	MASS WALL R-VALUE ⁱ	FLOOR R-VALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^c WALL R-VALUE
3	U-0.35/ SHGC-0.30	30	13	5/10	19	10/13^f	0	5/13
4	U-0.35/ SHGC-0.30	38 or 30 cont. ^j	15, 13+2.5^h	5/10	19	10/13	10	10/13
5	U-0.35/ NR	38 or 30 cont. ^j	19, 13+5, or 15+3 ^{eh}	13/17	30 ^g	10/13	10	10/13

- a. R-values are minimums. U-factors and SHGC are maximums.
- b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- c. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall or crawl space wall.
- d. For monolithic slabs, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 18 inches below grade whichever is less. For floating slabs, insulation shall extend to the bottom of the foundation wall or 24 inches, whichever is less. (See Appendix O) R-5 shall be added to the required slab edge R-values for heated slabs.
- e.- R-19 fiberglass batts compressed and installed in a nominal 2 x 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2x4 wall is not deemed to comply.
- f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.2 (1 and 2) and Table N1101.2.
- g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
- h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. 15+3 means R-15 cavity insulation plus R-3 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2. 13+2.5 means R-13 cavity insulation plus R-2.5 sheathing.
- i. For Mass Walls, the second R-value applies when more than half the insulation is on the interior of the mass wall.
- j. R-30 shall be deemed to satisfy the ceiling insulation requirement wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Otherwise R-38 insulation is required where adequate clearance exists or insulation must extend to either the insulation baffle or within 1" of the attic roof deck.
- k. Table value required except for roof edge where the space is limited by the pitch of the roof, there the insulation must fill the space up to the air baffle.

4. N1101.9 CERTIFICATE – Added required fields

ENERGY EFFICIENCY CERTIFICATE N1101.9	
Builder, Permit Holder or Registered Design Professional Print Name: Signature:	
Property Address:	
Date:	
Insulation Rating - List the value covering largest area to all that apply	R-Value
Ceiling/roof:	R-
Wall:	R-
Floor:	R-
Closed Crawl Space Wall:	R-
Closed Crawl Space Floor:	R-
Slab:	R-
Basement Wall:	R-
Fenestration:	
U-Factor	
Solar Heat Gain Coefficient(SHGC)	
Building Air Leakage	
<input type="checkbox"/> Visually inspected according to N1102.4.2.1 OR	
<input type="checkbox"/> Building Air Leakage Test Results (Sec. N1102.4.2.2) ACH50 [Target: 5.0] or CFM50/SFSA [Target: 0.30]	
Name of Tester / Company:	
Date:	Phone:
Ducts:	
Insulation	R-
Total Duct Leakage Test Result (Sect. N1103.2.2) (CFM25 Total/100SF) [Target: 6]	
Name of Tester or Company:	
Date:	Phone:
Certificate to be displayed permanently	



5. N1102.2.3 Access hatches and doors

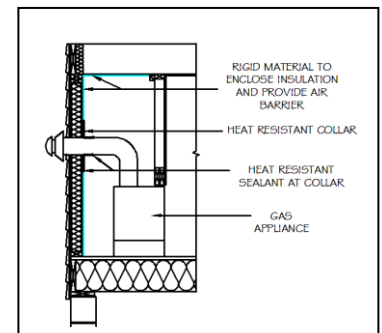
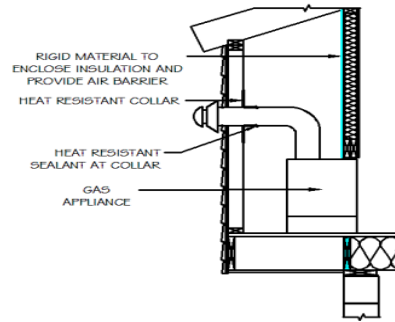
Exceptions:

1. Pull down stair systems shall be weatherstripped and insulated to with a minimum of an R-5 insulation. value such that t The insulation does shall not interfere with proper operation of the stair. Non-rigid insulation materials are not allowed. Additional insulation systems that enclose the stair system from above are allowed.

Exposed foam plastic must meet the provisions of the *North Carolina Residential Code*.

6. 1102.2.12 Framed cavity walls: Behind framed in fireplaces or wood stoves

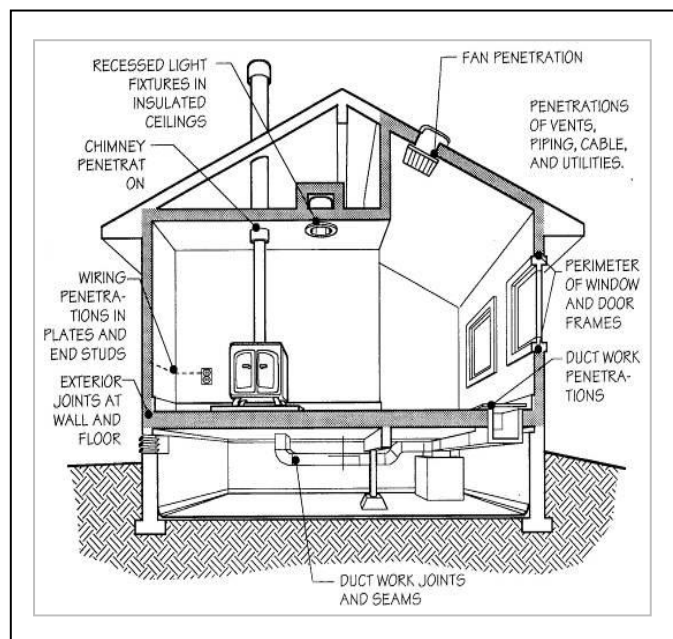
1102.2.12 Framed cavity walls. The exterior thermal envelope wall insulation shall be installed in substantial contact and continuous alignment with the building envelope air barrier. Insulation shall be substantially free from installation gaps, voids, or compression. **For framed walls, the cavity insulation shall be enclosed on all sides with rigid material or**



7. N1102.4 AIR LEAKAGE CONTROL

AREAS FOR AIR LEAKAGE

- **Windows/doors**
- **Between sole plate**
- **Floors and exterior wall panels**
- **Plumbing**
- **Electrical**
- **Service access**
- **Recessed lighting**
- **Rim Joist junction**



8. 1102.4.2 Air Sealing: Builder may use:

1102.4.2.1 Visual inspection option. Building envelope tightness shall be considered acceptable when items providing insulation enclosure in 1102.2.12 and air sealing in 1102.4.1 are addressed and when the items listed in Table 1102.4.2, applicable to the method of construction, are certified by the builder, permit holder or registered design professional via the certificate in Appendix 1.1

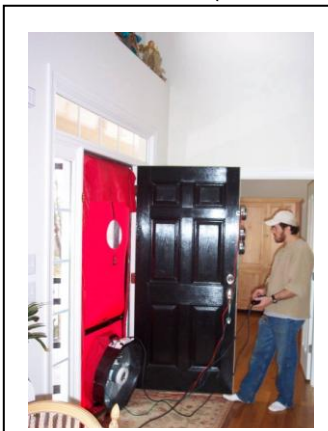
**TABLE 1102.4.2
AIR BARRIER INSPECTION**

COMPONENT	CRITERIA
Ceiling/attic	Sealants or gaskets provide a continuous air barrier system joining the top plate of framed walls with either the ceiling drywall or the top edge of wall drywall to prevent air leakage. Top plate penetrations are sealed. For ceiling finishes that are not air barrier systems such as tongue-and-groove planks, air barrier systems,(for example, taped house wrap), shall be used above the finish Note: It is acceptable that sealants or gaskets applied as part of the application of the drywall will not be observable by the code official.
Walls	Sill plate is gasketed or sealed to subfloor or slab.
Windows and doors	Space between window and exterior door jambs and framing is sealed.
Floors (including above-garage and cantilevered floors)	Air barrier system is installed at any exposed edge of insulation.
Penetrations	Utility penetrations through the building thermal envelope, including those for plumbing, electrical wiring, ductwork, security and fire alarm wiring, and control wiring, shall be sealed.
Garage separation	Air sealing is provided between the garage and conditioned spaces. An air barrier system shall be installed between the ceiling system above the garage and the ceiling system of interior spaces.
Duct boots	Sealing HVAC register boots and return boxes to subfloor or drywall.
Recessed lighting	Recessed light fixtures are air tight, IC rated, and sealed to drywall. Exception—fixtures not penetrating the building envelope.



Or

Blower Door Test (1102.4.2.2)



1102.4.2.2 Testing option. Building envelope tightness shall be considered acceptable when items providing insulation enclosure in 1102.2.12 and air sealing in 1102.4.1 are addressed and when tested air leakage is less than or equal to one of the two following performance measurements:

1. 0.24 CFM50/Square Foot of Surface Area (SFSA) or
2. Four (4) air changes per hour (ACH50)



9. Mechanical – Duct testing

1103.2.2 Sealing (Mandatory Requirements). All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Part V – Mechanical, Section 603.9 of the North Carolina Residential Code.

Duct tightness shall be verified as follows:

Total duct leakage less than or equal to 6 CFM (12 L/min) per 100 ft² (9.29 m²) of conditioned floor area served by that system when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure.



During testing:

1. Block, if present, the ventilation air duct connected to the conditioning system.
2. The duct air leakage testing equipment shall be attached to the largest return in the system or to the air handler.
3. The filter shall be removed and the air handler power shall be turned off.
3. Supply boots or registers and return boxes or grilles shall be taped, plugged, or otherwise sealed air tight.
4. The hose for measuring the 25 Pascals of pressure differential shall be inserted into the boot of the supply that is nominally closest to the air handler.
5. Specific instructions from the duct testing equipment manufacturer shall be followed to reach duct test pressure and measure duct air leakage.

10. N1104.1 Lighting Equipment (Residential Code). High efficiency lighting requirement –

A minimum of 75 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.

