STATE OF NORTH CAROLINA
OFFICE OF ADMINISTRATIVE HEARINGS

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1711 New Hope Church Rd
Raleigh, NC 27609-6285

November 21, 2019

Carrie Hollis
Office of State Budget and Management
Sent via email to Carrie.Hollis@osbm.nc.gov

Re: Residential Code, N1106.2 (R406.2);
Energy Conservation Code, R202; and
Energy Conservation Code R406.2.

Ms. Hollis:

At its meeting this morning, the Rules Review Commission voted pursuant to G.S. 150B-21.9 to ask the Office of State Budget and Management to determine if the above-referenced Rules have a substantial economic impact and therefore require a fiscal note. A response to this request pursuant to G.S. 150B-21.9 will assist the Commission in determining whether the agency adopted the Rules in accordance with the Administrative Procedure Act.

These Rules will remain under the Commission's review until after review by OSBM and subsequent action by the agency pursuant to G.S. 150B-21.12. The Commission is aware that there are multiple demands on your time, and respectfully requests a response as soon as you are able to do so.

Thank you for your assistance in this matter. Please let me know if I can be of any assistance or if you desire further information regarding the Commission's decision.

Sincerely,

Amanda J. Reeder
Commission Counsel

cc: Carl Martin, Rulemaking Coordinator

Enclosures Residential Code, N1106.2 (R406.2);
Energy Conservation Code, R202; and
Energy Conservation Code R406.2.

N1106.2 (R406.2) Mandatory requirements.

Compliance with this section requires that the provisions identified in Sections N1101.14 through N1104 labeled as "mandatory" be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table N1106.2.1 or Table N1106.2.2. ~~Table 402.1.1 or 402.1.3 of the 2012 North Carolina Energy Conservation Code.~~ Minimum standards associated with compliance shall be the ANSI RESNET ICC 301-2014: "Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index." A North Carolina *registered design professional* or certified *HERS rater* is required to perform the analysis if required by North Carolina licensure laws.

Exception: Supply and return ducts in unconditioned space and outdoors shall be insulated to a minimum R-8. Supply ducts inside semi-conditioned space shall be insulated to a minimum R-4; return ducts inside conditioned and semi-conditioned space are not required to be insulated. Ducts located inside conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior of cooling ducts.

TABLE N1106.2.1
MINIMUM INSULATION AND FENESTRATION REQUIREMENTS FOR ENERGY RATING INDEX COMPLIANCE[a]

	FENESTRATION VALUES			R-VALUES FOR								
CLIMATE ZONE	FENESTRA-TION U-FACTOR[b,j]	SKYLIGHT U-FACYTOR[b]	GLAZED FENESTRA-TION SHGC[b,k]	CEILING[m]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[p]	UNVENTED ENCLOSED RAF-TER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[p]	WOOD FRAME WALL	MASS WALL[i]	FLOOR	BASE-MENT WALL[c,o]	SLAB[d]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.3	30	20	20+5[q]	13	5/10	19	10/13[f]	0	5/13
4	0.35	0.6	0.3	38 or 30ci[l]	20	20+15[q]	15, 13+2.5[h]	5/10	19	10/13	10	10/13
5	0.35	0.6	NR	38 or 30ci[l]	25	15+20[q]	19[n], 13+5[h], or 15+3[h]	13/17	30[g]	10/13	10	10/13

For SI: 1 foot = 304.8 mm.

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. Deleted.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. The first value is cavity insulation, the second value is continuous insulation so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. 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 the exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.
j. In addition to the exemption in N1102.3.3, a maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.

k. In addition to the exemption in N1102.3.3, a maximum of two glazed fenestration product assemblies having a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
l. 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 either to the insulation baffle or within 1" of the attic roof deck.
m. 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.
n. R-19 fiberglass batts compressed and installed in a normal 2 x 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2 x 4 wall are not deemed to comply.
o. Basement wall meeting the minimum mass wall specific heat content requirement may use the mass wall R-value as the minimum requirement.
p. The *air-impermeable insulation* shall meet the requirements of the definition in section R202. *Air-impermeable insulation* shall be installed in direct contact with the underside of the structural roof sheathing.The insulation installation shall meet the requirements of R806.5.
q. The value for *air-permeable insulation* is shown first and that for *air-impermeable insulation* second. Thus R-20 + R-5 indicates that the minimum value for air-permeable insulation is R-20, and the minimum value for *air-impermeable insulation* is R-5. *Air-impermeable insulation* shall be installed in direct contact with the underside of the structural roof sheathing. The air-permeable insulation shall be installed directly under the *air-impermeable insulation*.

TABLE N1106.2.2
EQUIVALENT U-FACTORS FOR TABLE RN1106.2.1[a]

CLIMATE ZONE	FENESTRATION[d]	SKYLIGHT	CEILING	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[e]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[e]	FRAME WALL	MASS WALL[b]	FLOOR	BASEMENT WALL[c]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.0350	0.05	0.04[f]	0.082	0.141	0.047	0.059	0.136
4	0.35	0.60	0.0300	0.05	0.029[f]	0.077	0.141	0.047	0.059	0.065
5	0.35	0.60	0.0300	0.04	0.029[f]	0.061	0.082	0.033	0.059	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation, or *approved* source.
b. When more than half the insulation is on the interior the mass wall *U*-factors shall be a maximum of 0.07 in Climate Zone 3, 0.07 in Climate Zone 4, and 0.054 in Climate Zone 5.
c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
d. A maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 and a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty. When applying this note and using the RESCheck "UA Trade-off" compliance method to allow continued use of the software, the applicable fenestration products shall be modeled as meeting the U-factor of 0.35 and the SHGC of 0.30, as applicable, but the fenestration products' actual U-factor and actual SHGC shall be noted in the comments section of the software for documentation of application of this note to the applicable products. Compliance for these substitute products shall be verified compared to the allowed substitute maximum U-value requirement and maximum SHGC requirement, as applicable.
e. The *air-impermeable insulation* shall meet the requirements of the definition in section R202. *Air-impermeable insulation* shall be installed in direct contact with the underside of the structural roof sheathing. The insulation installation shall meet the requirements of R806.5.
f. For air-permeable/impermeable applications, Table N1106.2.1 shall be followed for minimum insulation values.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

2018 NC Energy Conservation Code
R202 Definitions. (190312 Item B-9)

AIR-IMPERMEABLE INSULATION. An insulation having an air permanence equal to or less than 0.02 L/s-m^2 at 75 Pa pressure differential tested according to ASTM E2178 or E 283.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

R406.2 Mandatory requirements.

Compliance with this section requires that the provisions identified in Sections R401 through R404 labeled as "mandatory" be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table R406.2.1 or Table R406.2.2. ~~Table 402.1.1 or 402.1.3 of the 2012 North Carolina Energy Conservation Code.~~ Minimum standards associated with compliance shall be the ANSI RESNET ICC Standard 301-2014: "Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index." A North Carolina *registered design professional* or certified *HERS rater* is required to perform the analysis if required by North Carolina Licensure laws.

Exception: Supply and return ducts in unconditioned space and outdoors shall be insulated to a minimum R-8. Supply ducts inside semi-conditioned space shall be insulated to a minimum R-4; return ducts inside conditioned and semi-conditioned space are not required to be insulated. Ducts located inside conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior of cooling ducts.

TABLE R406.2.1
MINIMUM INSULATION AND FENESTRATION REQUIREMENTS FOR ENERGY RATING INDEX COMPLIANCE[a]

	FENESTRATION VALUES			R-VALUES FOR								
CLIMATE ZONE	FENESTRATION U-FACTOR[b,j]	SKYLIGHT U-FACYTOR[b]	GLAZED FENESTRATION SHGC[b,k]	CEILING[m]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[p]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[p]	WOOD FRAME WALL	MASS WALL[i]	FLOOR	BASEMENT WALL[c,o]	SLAB[d]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.3	30	20	20+5[q]	13	5/10	19	10/13[f]	0	5/13
4	0.35	0.6	0.3	38 or 30ci[g]	20	20+15[q]	15, 13+2.5[h]	5/10	19	10/13	10	10/13
5	0.35	0.6	NR	38 or 30ci[g]	25	15+20[q]	19[n], 13+5[h], or 15+3[h]	13/17	30[g]	10/13	10	10/13

For SI: 1 foot = 304.8 mm.

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 R2) R-5 shall be added to the required slab edge *R*-values for heated slabs.
e. Deleted.
f. Basement wall insulation is not required in warm humid locations as defined by Figure R301.1 and Table R301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. The first value is cavity insulation, the second value is continuous insulation so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. 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.
i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.
j. In addition to the exemption in R402.3.3, a maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
k. In addition to the exemption in R402.3.3, a maximum of two glazed fenestration product assemblies having a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.

l. 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 either to the insulation baffle or within 1" of the attic roof deck.
m. 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.
n. R-19 fiberglass batts compressed and installed in a normal 2 x 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2 x 4 wall are not deemed to comply.
o. Basement wall meeting the minimum mass wall specific heat content requirement may use the mass wall R-value as the minimum requirement.
p. The *air-impermeable insulation* shall meet the requirements of the definition in section R202. *Air-impermeable insulation* shall be installed in direct contact with the underside of the structural roof sheathing. For one- and two-family dwellings and townhouses, the insulation installation shall meet the requirements of R806.5 of the North Carolina Residential Code. For residential buildings other than one- and two-family dwellings and townhouses, the insulation installation shall meet the installation requirements of 1203.3 of the North Carolina Building Code.
q. The value for air-permeable insulation is shown first and that for *air-impermeable insulation* second. Thus R-20 + R-5 indicates that the minimum value for air-permeable insulation is R-20, and the minimum value for *air-impermeable insulation* is R-5. *Air-impermeable insu*lation shall be installed in direct contact with the underside of the structural roof sheathing. The air-permeable insulation shall be installed directly under the *air-impermeable insulation.*

TABLE R406.2.2
EQUIVALENT U-FACTORS FOR TABLE R406.2.1[a]

CLIMATE ZONE	FENESTRA-TION[d]	SKYLIGHT	CEILING	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[e]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[e]	FRAME WALL	MASS WALL[b]	FLOOR	BASE-MENT WALL[c]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.0350	0.05	0.04[f]	0.082	0.141	0.047	0.059	0.136
4	0.35	0.60	0.0300	0.05	0.029[f]	0.077	0.141	0.047	0.059	0.065
5	0.35	0.60	0.0300	0.04	0.029[f]	0.061	0.082	0.033	0.059	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an *approved* source.
b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.07 in Climate Zone 3, 0.07 in Climate Zone 4, and 0.054 in Climate Zone 5.
c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure R303.1 and Table R301.1.
d. A maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 and a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty. When applying this note and using the RESCheck "UA Trade-off" compliance method to allow continued use of the software, the applicable fenestration products shall be modeled as meeting the U-factor of 0.35 and the SHGC of 0.30, as applicable, but the fenestration products' actual U-factor and actual SHGC shall be noted in the comments section of the software for documentation of application of this note to the applicable products. Compliance for these substitute products shall be verified compared to the allowed substitute maximum U-value requirement and maximum SHGC requirement, as applicable.
e. The *air-impermeable insulation* shall meet the requirements of the definition in section R202. *Air-impermeable insulation* shall be installed in direct contact with the underside of the structural roof sheathing. For one- and two-family dwellings and townhouses, the insulation installation shall meet the requirements of R806.5 of the North Carolina Residential Code.
f. For air-permeable/impermeable applications, Table R406.2.1 shall be followed for minimum insulation values.

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Residential Code, N1106.2

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

Table N1106.2.1: Why do you need Footnote e? As this is all new language, what are you deleting?

In Footnotes i and n, I do not see where these are within the Table. Where are these used? Should the footnote for the Mass Wall column be i instead of l, like it is in Table R406.2.1 in the Energy Conservation Code?

In Footnote l, what is "adequate clearance"? Who will determine this, and based upon what?

In Footnotes p and q, since "air-impermeable insulation" is defined in the Code, should the phrase be italicized?

Table N1106.2.2: In Footnote a, what is an "approved source"? Approved by whom? Are you relying in part upon the definition of "approved" in the Code?

And please insert a comma after "calculation"

In Footnote b, consider inserting a comma after "4"

In Footnote e, since "air-impermeable insulation" is defined in the Code, should the phrase be italicized?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Energy Conservation Code, R406.2

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

Table 406.2.1: Why do you need Footnote e? As this is all new language, what are you deleting?

In Footnote n, I do not see where these are within the Table. Where is it used?

In Footnote l, what is "adequate clearance"? Who will determine this, and based upon what?

In Footnotes p and q, since "air-impermeable insulation" is defined in the Code, should the phrase be italicized?

Table R406.2.2: In Footnote a, what is an "approved source"? Approved by whom? Are you relying in part upon the definition of "approved" in the Code?

In Footnote b, consider inserting a comma after "4"

In Footnote e, since "air-impermeable insulation" is defined in the Code, should the phrase be italicized?

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

N1106.2 (R406.2) Mandatory requirements.

Compliance with this section requires that the provisions identified in Sections N1101.14 through N1104 labeled as "mandatory" be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table N1106.2.1 or Table N1106.2.2. ~~Table 402.1.1 or 402.1.3 of the 2012 North Carolina Energy Conservation Code.~~ Minimum standards associated with compliance shall be the ANSI RESNET ICC 301-2014: "Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index." A North Carolina *registered design professional* or certified *HERS rater* is required to perform the analysis if required by North Carolina licensure laws.

Exception: Supply and return ducts in unconditioned space and outdoors shall be insulated to a minimum R-8. Supply ducts inside semi-conditioned space shall be insulated to a minimum R-4; return ducts inside conditioned and semi-conditioned space are not required to be insulated. Ducts located inside conditioned space are not required to be insulated other than as may be necessary for preventing the formation of condensation on the exterior of cooling ducts.

TABLE N1106.2.1
MINIMUM INSULATION AND FENESTRATION REQUIREMENTS FOR ENERGY RATING INDEX COMPLIANCE[a]

	FENESTRATION VALUES			R-VALUES FOR								
CLIMATE ZONE	FENESTRATION U-FACTOR[b,j]	SKYLIGHT U-FACYTOR[b]	GLAZED FENESTRATION SHGC[b,k]	CEILING[m]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[p]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[p]	WOOD FRAME WALL	MASS WALL[i]	FLOOR	BASEMENT WALL[c,o]	SLAB[d]	CRAWL SPACE WALL[c]
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4	0.35	0.6	0.3	38 or 30ci[l]	20	20+15[q]	15, 13+2.5[h]	5/10	19	10/13	10	10/13
5	0.35	0.6	NR	38 or 30ci[l]	25	15+20[q]	19[n], 13+5[h], or 15+3[h]	13/17	30[g]	10/13	10	10/13

For SI: 1 foot = 304.8 mm.

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. Deleted.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. The first value is cavity insulation, the second value is continuous insulation so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. 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 the exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.
j. In addition to the exemption in N1102.3.3, a maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.

k. In addition to the exemption in N1102.3.3, a maximum of two glazed fenestration product assemblies having a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
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m. 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.
n. R-19 fiberglass batts compressed and installed in a normal 2 x 6 framing cavity is deemed to comply. Fiberglass batts rated R-19 or higher compressed and installed in a 2 x 4 wall are not deemed to comply.
o. Basement wall meeting the minimum mass wall specific heat content requirement may use the mass wall R-value as the minimum requirement.
p. The air-impermeable insulation shall meet the requirements of the definition in section R202. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing.The insulation installation shall meet the requirements of R806.5.
q. The value for air-permeable insulation is shown first and that for air-impermeable insulation second. Thus R-20 + R-5 indicates that the minimum value for air-permeable insulation is R-20, and the minimum value for air-impermeable insulation is R-5. Air-impermeable insulation shall be installed in direct contact with the underside of the structural roof sheathing. The air-permeable insulation shall be installed directly under the air-impermeable insulation.

TABLE N1106.2.2
EQUIVALENT U-FACTORS FOR TABLE RN1106.2.1[a]

CLIMATE ZONE	FENESTRA-TION[d]	SKYLIGHT	CEILING	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-IMPERMIABLE[e]	UNVENTED ENCLOSED RAFTER ASSEMBLIES AIR-PERMIABLE/ IMPERMIABLE[e]	FRAME WALL	MASS WALL[b]	FLOOR	BASE-MENT WALL[c]	CRAWL SPACE WALL[c]
3	0.35	0.65	0.0350	0.05	0.04[f]	0.082	0.141	0.047	0.059	0.136
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a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or approved source.
b. When more than half the insulation is on the interior the mass wall *U*-factors shall be a maximum of 0.07 in Climate Zone 3, 0.07 in Climate Zone 4 and 0.054 in Climate Zone 5.
c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
d. A maximum of two glazed fenestration product assemblies having a U-factor no greater than 0.55 and a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty. When applying this note and using the RESCheck "UA Trade-off" compliance method to allow continued use of the software, the applicable fenestration products shall be modeled as meeting the U-factor of 0.35 and the SHGC of 0.30, as applicable, but the fenestration products' actual U-factor and actual SHGC shall be noted in the comments section of the software for documentation of application of this note to the applicable products. Compliance for these substitute products shall be verified compared to the allowed substitute maximum U-value requirement and maximum SHGC requirement, as applicable.
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The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

2018 NC Energy Conservation Code
R202 Definitions. (190312 Item B-9)

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Chapter 6 – Reference Standards
ASTM
E2178-13 Standard Test Method for Air Permeance of Building Materials …..Table R406.2.1, Table R406.2.2

2018 NC Residential Code
Chapter 44 – Reference Standards

ASTM
E283-04 Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
……..Table N1106.2.1, Table N1106.2.2

The delayed effective date of this Rule is January 1, 2021.
The Statutory authority for Rule-making is G. S. 143-136; 143-138.

REQUEST FOR TECHNICAL CHANGE

AGENCY: Building Code Council

RULE CITATION: NC Energy Conservation Code, R202

DEADLINE FOR RECEIPT: Thursday, November 7, 2019

The Rules Review Commission staff has completed its review of this Rule prior to the Commission's next meeting. The Commission has not yet reviewed this Rule and therefore there has not been a determination as to whether the Rule will be approved. You may call our office to inquire concerning the staff recommendation.

In reviewing this Rule, the staff recommends the following technical changes be made:

What ASTM standards do you want to use here? I ask because you published ASTM E217 and E283 in the Register. But you are now proposing to add E2178. I note that while ASTM E283 is included in Chapter 6 of this Code, there is no inclusion of either E217 nor E2178. But there is a E1827, which addresses airtightness.

Please retype the rule accordingly and resubmit it to our office at 1711 New Hope Church Road, Raleigh, North Carolina 27609.

Amanda J. Reeder
Commission Counsel
Date submitted to agency: October 24, 2019

2018 NC Energy Conservation Code
R202 Definitions. (190312 Item B-9)

AIR-IMPERMEABLE INSULATION. An insulation having an air permanence equal to or less than 0.02 L/s-m^2 at 75 Pa pressure differential tested according to ASTM E2178 or E 283.

Chapter 6 – Reference Standards
ASTM
E2178-13 Standard Test Method for Air Permeance of Building Materials …..Table R406.2.1, Table R406.2.2

2018 NC Residential Code
Chapter 44 – Reference Standards

ASTM
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