



**MIKE CAUSEY**  
INSURANCE COMMISSIONER

**BRIAN TAYLOR**  
STATE FIRE MARSHAL

January 25, 2024

Donald M. Nicholson, Ph.D.  
Nicholson and SUN, LLC  
26 Courtland Avenue  
Asheville, NC 28801

**RE: 2018 NC Residential Code Section N1102.2.14 Framed cavity walls, Section R702.7 Vapor retarders.**

Mr. Nicholson:

This letter is in response to your request for formal interpretation to the Office of State Fire Marshal ("OSFM") dated March 20, 2023, which NC OSFM received by email on March 22, 2023.

Your letter states in relevant part:

"N1102.2.14(R402.2.14): For framed walls, the cavity insulation shall be enclosed on all sides with solid rigid material or and air barrier material. Polyethylene shall not be allowed. R702.7: Class I or II are required on the interior sides of framed walls in Climate Zones 5,6,7,8, and Marine 4. R702.7.2: "Class I: Sheet Polyethylene, unperferated aluminum. R702.7 together with R702.7.2 imply that Polyethylene is allowed in walls for Climate zone 5. This contradicts an interpretation of N1102.2.14 that would disallow any use of polyethylene in a wall. The phrase "not be allowed" needs an interpretation that relates it to the context of enclosing wall insulation on all sides, for example, polyethelene shall not be used to satisfy the requirement that insulation shall be enclosed on all sides with solid rigid material or an air barrier material."

**Remarks:**

Attachment A is comprised of the request for formal interpretation as well as all supporting information submitted with the request.

**Code Analysis:** The air barrier material shall not be polyethylene in framed cavity walls.

**N1102.2.14 (R402.2.14) Framed cavity walls.** The exterior thermal envelope wall insulation shall be installed in contact and continuous alignment with the building envelope air barrier. Insulation shall be free from installation gaps, voids, or compression. For framed walls, the cavity insulation shall be enclosed on all sides with solid rigid material or an air barrier material. Polyethylene shall not be allowed. Rim joists are not required to be enclosed on all sides. Wall insulation shall be enclosed at the following locations when installed on exterior walls prior to being covered by subsequent construction, consistent with Appendix E-2.3 of this code:

1. Tubs
2. Showers

OFFICE OF STATE FIRE MARSHAL

---

1202 MAIL SERVICE CENTER I RALEIGH NC 27699-1202 I TEL 919.647.0500 I Fax

866.851.6508

3. Stairs
4. Fireplace units (Enclose with rigid material only)

....

**Code Analysis:** Class I: Sheet polyethylene, unperforated aluminum foil is permitted to be used to meet the requirement of vapor retarders in the Climate Zones noted in 2018 NCRC R702.7 Vapor retarders.

**R702.7 Vapor retarders.** Class I or II vapor retarders are required on the interior side of frame walls in Climate Zones 5, 6, 7, 8 and Marine 4.

**Exceptions:**

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

....

**R702.7.2 Material vapor retarder class.** The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly.

The following shall be deemed to meet the class specified:

Class I: Sheet polyethylene, unperforated aluminum foil.

Class II: Kraft-faced fiberglass batts.

Class III: Latex or enamel paint.

....

**Conclusions:** Air and vapor barriers both stop moisture transport by vapor diffusion through a home's building envelope. However, only an air barrier prevents airflow (and the moisture attached to it) into the envelope. The prohibition of polyethylene material in 2018 NCRC N1102.2.14 Framed cavity walls, is only intended for air barriers and does not apply to vapor retarders in NCRC R702.7 Vapor retarders, unless the air barrier and vapor retarder are designated one and the same by the permit holder.

Sincerely,



David B. Rittlinger, PE, LEED AP  
Deputy Commissioner of Engineering and Chief Code Consultant  
NC OSFM Engineering & Codes Division

cc: Bridget Herring, Chair – BCC  
Mark Matheny, Vice-Chair – BCC  
Rob Howard, Chair, Residential Super Committee - BCC  
Nathan Childs, Esq., NCDOJ, counsel for NC Building Code Council, [nchilds@ncdoj.gov](mailto:nchilds@ncdoj.gov)

ATTACHMENT A



APPENDIX E
APPEALS
NORTH CAROLINA
BUILDING CODE COUNCIL
325 North Salisbury Street, Room 5\_44
Raleigh, North Carolina 27603
(919) 647-0095

APPEAL TO NCDOI/NCBCC Hearing Date \_\_\_/\_\_\_/\_\_\_
GS 153A-374, GS 160A-434 GS 143-140, GS 143-141
Formal Interpretation by NCDOI \_\_\_ X \_\_\_ Appeal of Local Decision to NCBCC \_\_\_
Appeal of Local Decision to NCDOI \_\_\_ Appeal of NCDOI Decision to NCBCC \_\_\_

APPELLANT Donald M. Nicholson, Ph.D. PHONE ( 865 ) 253 - 6922 x \_\_\_
REPRESENTING Nicholson and SUN LLC
ADDRESS 26 Courtland Ave
CITY Asheville STATE NC ZIP 28801
E-MAIL don@nicholsonandsun.com FAX ( ) -

North Carolina State Building Code, Volume Residential Code - Section N1102.2.214

REQUEST ONE: [X] Formal Interpretation by NCDOI [ ] Appeal of Local Decision to NCBCC
[ ] Appeal of Local Decision to NCDOI [ ] Appeal of NCDOI Decision to NCBCC

Type or print. Include all background information as required by the referenced General Statutes and the attached policies. Attach additional supporting information.

N1102.2.14(R402.2.14):

"For framed walls, the cavity insulation shall be enclosed on all sides with solid rigid material or and air barrier material. Polyethylene shall not be allowed".

R702.7: "Class I or II are required on the interior sides of framed walls in Climate Zones 5,6,7,8, and Marine 4.

R702.7.2: "Class I: Sheet Polyethylene, unperferated aluminum

REASON:

R702.7 together with R702.7.2 imply that Polyethylene is allowed in walls for Climate zone 5. This contradicts an interpretation of N1102.2.14 that would disallow any use of polyethylene in a wall. The phrase "not be allowed" needs an interpretation that relates it to the context of enclosing wall insulation on all sides, for example, polyethelene shall not be used to satisfy the requirement that insulation " shall be enclosed on all sides with solid rigid material or an air barrier material".

APPEAL TO NCDOI/NCBCC

Signature Dan Nicholson

DATE: 3/20/2023

FORM 3/14/17