

**NC Department of Insurance
Office of the State Fire Marshal - Engineering Division
1202 Mail Service Center, Raleigh, NC 27699-1202
919-647-0000**

**Guidance Paper: Temporary Reduction in Duct Insulation Levels
for Residential Construction**

Code: 2018 North Carolina Energy Code (NCECC)
2018 North Carolina Residential Code (NCRC)

Section: NCECC R403.3.1 and NCRC N1103.3.1

Statute: SL 2022-6ⁱⁱ, updated by SL 2022-46ⁱⁱⁱ

Date: July 20, 2022

Revised: November 16, 2022

Expires March 17, 2024ⁱ

Notice:

The North Carolina General Assembly advanced House Bill 243^{iv} to Governor Roy Cooper, who signed the bill into law as Session Law 2022-6 on March 17, 2022. A subsequent update with technical changes to Session Law 2022-6 was enacted on July 7, 2022^v as Session Law 2022-46. The new law temporarily changes the Commercial and Residential insulation R-value for ducts installed in ventilated and non-ventilated unconditioned spaces. The law allows for reduced duct insulation values for a period of two years. Accordingly, this guidance paper will also expire on the date this law expires, when the law is superseded, or on March 17, 2024, whichever is later.

Between the signing of SL 2022-6 on March 17, 2022, and the enactment of SL 2022-46 on July 7, 2022, the statutory minimum in ventilated unconditioned attics was set at R-4.2. However, SL 2022-46 set the statutory minimum to R6.0 and made the effective date retroactive to March 17, 2022. The retroactive effective date ensures that the two-year period for reduced insulation values continue to run from March 17, 2022, and was not reset with the enactment of SL 2022-46 on July 7, 2022. Thus, the retroactive effective date of March 17, 2022, for SL 2022-46 should not require replacement of ductwork that was installed, inspected and approved between March 17, 2022, and July 7, 2022, in order to comply with the minimum R-values listed in SL 2022-46.

Question 1:

How does this affect the present code requirements of R403.3.1 and companion language of N1103.3.1 for ventilated or non-ventilated unconditioned **attic** spaces?

Opinion:

For attic supply and return ductwork **outside the thermal envelope** but **within the building**, the minimum level of insulation may be reduced from R-8 to R-6.

Examples of attic supply and return ductwork outside the thermal envelope but within the building include the following:

- naturally ventilated attics (insulation is in the ceiling of the living space)
- enclosed, unconditioned attics (the building thermal envelope separates the attic from the conditioned living space). This condition is rarely encountered in the NC Residential Code.

Ductwork located in *semi-conditioned spaces* is unaffected by the statute.

Question 2:

How does the new law affect the present code requirements of R403.3.1 and the companion language of N1103.3.1 for spaces **other than** ventilated or non-ventilated attics?

Opinion:

For supply and return ductwork **outside the thermal envelope**, but **within the building**, the minimum level of insulation is allowed to be reduced from R-8 to R-4.2.

Examples of supply and return ductwork outside the thermal envelope but within the building include the following:

- naturally ventilated crawl spaces, (insulation is in floor of living space)
- unconditioned closed crawl spaces
- uninsulated garages
- uninsulated mechanical rooms either adjacent to the house or located in an uninsulated garage

Ductwork located outside, such as the supply and return ductwork to a pad-mounted HVAC unit is not affected by SL 2022-6 or SL 2022-46.

Ductwork located in *semi-conditioned spaces* is unaffected by the statute.

Question 3:

How does this affect the performance code-compliance path of NCECC, Section R405 Simulated Performance Alternative?

Opinion:

Since this code path requires following the Mandatory provisions of R401 through R404, of which ductwork insulation is a Mandatory provision of R403, the ductwork insulation can be reduced in the allowed areas as referenced in Question 1 and Question 2. The modeler should use the required minimum R-value of R403.3.1 even though the R-value allowed by SL 2022-6 and SL 2022-46 is installed and make a note of the statute allowances in the design notes.

Question 4:

How does this affect the ERI path of Section R406 (N1106) Energy Rating Index (ERI) approach?

Opinion:

Section R406 (N1106) has its own code language requirements that are separate from the Statute-defined Section R403.3.1 and N1103.3.1. Therefore, the ductwork insulation levels required by the ERI method in the exception to R406.2 (N1106.2) are unaffected by these statutes.

Question 5:

How does this affect the ResCheck compliance path of R401.2, Item 4?

Opinion:

ResCheck only compares the building envelope values, and assumes the mechanical, electrical, and plumbing requirements are following the prescriptive code, therefore although not explicitly stated, it follows that the ResCheck compliance path should conform to the statutory allowances as described in Question #1 and #2.

Record Keeping:

For the benefit of record keeping, it is recommended that jurisdictions file a copy of the statute language, the letters dated March 18, 2022 and July 18, 2022 from the State Board of Examiners of Plumbing, Heating and Sprinkler Contractors', along with this guidance paper and all permits issued during the effective dates prescribed in SL 2022-6 and updated by SL 2022-46 or as modified later by law. Buildings affected by this statute may change hands several times, and each time a home inspection may generate questions for the new owner that will be directed to the building permitting jurisdiction.

Licensing Board Announcement:

For convenience, the NC Board of Examiners for Plumbing, Heating, and Fire Sprinkler Contractors letters concerning the insulation level temporary changes for ductwork is included at the end of this document.^{vi}

Keywords:

None

The guidance and opinions contained herein are not legal advice and may not necessarily reflect the most current statutory or code language.

ⁱSECTION 20.10B.(a) Rule Expiration. – Notwithstanding G.S. 150B-21.1(d), temporary rules adopted by the Council pursuant to Section 20.10 and Section 20.10A shall expire two years after the date this section becomes law. (This would be March 17th, 2024)

ⁱⁱCOMMERCIAL AND RESIDENTIAL SPACES AIR DUCT INSULATION TEMPORARY REQUIREMENTS SECTION 20.10.

(a) Definitions. – As used in this section, "Council" means the North Carolina Building Code Council, "Code" means the North Carolina Residential Code and amendments to the Code as adopted by the Council, and "Residential Spaces Insulation Rule" means Section N1103.3.1 of the 2018 North Carolina Residential Code for One- and Two-Family Dwellings, incorporating R403.3.1 of the 2018 North Carolina Energy Conservation Code. SECTION 20.10.

(b) Code Amendment. – Until the effective date of the temporary rule that the Council is required to adopt pursuant to this section, the Council, Code enforcement official, or fire code official enforcing the Code shall follow the provisions of this subsection instead of the Residential Spaces Insulation Rule with respect to minimal insulation requirements for supply and return air ducts located in ventilated or non-ventilated unconditioned spaces. Supply and return air ducts located in ventilated or non-ventilated unconditioned spaces shall be insulated to a minimum R-4.2

iii **PART XXVI. AMEND MINIMUM INSULATION REQUIREMENTS**

SECTION 26.(a) Section 20.10(b) of S.L. 2022-6 reads as rewritten:

"**SECTION 20.10.(b)** Code Amendment. – Until the effective date of the temporary rule that the Council is required to adopt pursuant to this section, the Council, Code enforcement official, or fire code official enforcing the Code shall follow the provisions of this subsection instead of the Residential Spaces Insulation Rule with respect to minimal insulation requirements for supply and return air ducts located in ventilated or non-ventilated unconditioned spaces. Supply and return air ducts located in ventilated or non-ventilated unconditioned ~~spaces~~ spaces, other than attics, shall be insulated to a minimum R-4.2. Supply and return air ducts located in ventilated or non-ventilated unconditioned attic spaces shall be insulated to a minimum R-6.0."

SECTION 26.(b) Section 20.10A(b) of S.L. 2022-6 reads as rewritten: "**SECTION 20.10A.(b)** Code Amendment. – Until the effective date of the temporary rule

that the Council is required to adopt pursuant to this section, the Council, Code enforcement official, or fire code official enforcing the Code shall follow the provisions of this subsection as it relates to the Commercial Spaces Insulation Rule with respect to the minimal insulation requirements for supply and return air ducts located in ventilated or non-ventilated unconditioned spaces in Climate Zones 3 through 5. Supply and return air ducts located in ventilated or non-ventilated unconditioned ~~spaces~~ spaces, other than attic spaces, shall be insulated with a minimum of ~~R-4~~ R-4.0 insulation in Climate Zones 3 and 4 and a minimum of ~~R-6~~ R-6.0 insulation in Climate Zone 5. Supply and return air ducts located in ventilated or non-ventilated unconditioned attic spaces shall be insulated to a minimum R-6.0."

SECTION 26.(c) This section is effective when it becomes law and applies retroactively to March 17, 2022.

^{iv} That actual language for this legislation can be viewed at the following link:

<https://www.ncleg.gov/BillLookUp/2021/h243>

Once you click on the link, you will need to click on "SL 2022-6" in the tool bar on the left side of the webpage. The duct work language is on pages 46 – 47.

^v That actual language for this amended legislation can be viewed at the following link (duct work language is on page 71).

<https://www.ncleg.gov/Sessions/2021/Bills/Senate/PDF/S496v5.pdf>



**State Board of Examiners of Plumbing,
Heating & Fire Sprinkler Contractors**

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March 18, 2022

To: North Carolina Licensed HVAC Contractors:

Greetings,

I am pleased to announce that the North Carolina General Assembly advanced House Bill 243 to Governor Roy Cooper and the Governor signed this legislation yesterday, March 17, 2022. This new law temporarily changes the Commercial and Residential insulation R-value for ducts installed in ventilated and non-ventilated non-conditioned spaces (crawlspaces and attics). This law will allow for reduced duct insulation values for a period of two years. This law is now in effect.

Based on this legislation, contractors can install ducts in Residential ventilated and non-ventilated unconditioned spaces (crawlspaces and attics) with a minimum of R-4.2 insulation. Any changes in duct insulation values are required to be included in your load calculation. Please be aware that if you install any duct work under R-6 in an attic space, you will be increasing the potential of condensation formation on the ducts and the potential for mold growth in the attic and the home.

That actual language for this legislation can be viewed at the following link:

<https://www.ncleg.gov/BillLookUp/2021/h243>

Once you click on the link, you will need to click on "SL 2022-6" in the tool bar on the left side of the webpage. The duct work language is on pages 46 – 47.

For changes to commercial projects please see the specifics in this legislation.

If you are questioned by an inspection department in reference to the duct R-values, please refer them to House Bill 243.

Sincerely,

Dale L. Dawson
Executive Director
State Board of Examiners of Plumbing,
Heating & Fire Sprinkler Contractors



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July 18, 2022

To: North Carolina Licensed HVAC Contractors:

Greetings,

I am pleased to announce that the North Carolina General Assembly passed a Bill to amend its previous legislation on duct work insulation values, and Governor Roy Cooper signed this legislation on July 7, 2022. This amended law temporarily changes the Commercial and Residential insulation R-value for ducts installed in ventilated and non-ventilated non-conditioned spaces (crawlspaces and attics). This law allows reduced duct insulation values for a period of two years from the date of the original legislation and is now in effect.

Based on this amended legislation, contractors can install ducts in residential ventilated and non-ventilated unconditioned spaces with a minimum of R-4.2 insulation (in areas other than attics) but requires that a minimum of R-6.0 shall be the minimum insulation value for supply and return ducts in attics. Any changes in duct insulation values are required to be included in your load calculation.

That actual language for this amended legislation can be viewed at the following link (duct work language is on page 71). For changes to commercial projects please see the specifics in this legislation.

<https://www.ncleg.gov/Sessions/2021/Bills/Senate/PDF/S496v5.pdf>

If you are questioned by an inspection department in reference to the duct R-values, please refer them to SL (Session Law) 2022-46.

Sincerely,

Dale L. Dawson
Executive Director
State Board of Examiners of Plumbing,
Heating & Fire Sprinkler Contractors