

**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 Commercial Buildings**

Code: 2018 North Carolina Energy Code

Date: July 20, 2022
Expires March 17, 2024ⁱ

Section: C403.2.9

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

Notice:

North Carolina General Assembly advanced House Bill 243ⁱⁱⁱ to Governor Roy Cooper and the Governor signed this legislation March 17, 2022, and a subsequent update with technical changes July 7, 2022^{iv}. This new law temporarily changes the Commercial^v and Residential insulation R-value for ducts installed in ventilated and non-ventilated unconditioned spaces. This law will allow for reduced duct insulation values for a period of two years.

Question 1:

How does this affect the present code requirements of C403.2.9 for ventilated or non-ventilated unconditioned **attic** spaces?

Opinion:

Supply and return air ducts located in ventilated or non-ventilated unconditioned attic spaces shall be insulated to a minimum R-6.0.

Examples of which include:

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

Ductwork located outside, such as the supply and return ductwork to a pad-mounted HVAC or rooftop HVAC unit would be unchanged, R-8 in Zones 3,4 and R-12 in Zone 5.

The ductwork insulation levels located **within** the building envelope assemblies, such as within a wall, ceiling, or floor assembly, can also be reduced per the statute, but any reduction made in the ductwork insulation must be made up with building insulation to meet the requirements of C403.2.9 which are:

Zone 3 and 4:	R-8
Zone 5:	R-12

Question 2:

How does this affect the present code requirements of C403.2.9 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 to R-4 for climate zones 3 and 4, and R-6 for climate Zone 5.

Examples of which include:

- naturally ventilated crawl spaces, (insulation is in the floor of building above)
- unconditioned closed crawl spaces
- uninsulated mechanical penthouses
- uninsulated mechanical rooms either adjacent to the building or located in the footprint of the building but outside the thermal envelope

Ductwork located outside, such as the supply and return ductwork to a pad-mounted HVAC or rooftop HVAC unit would be unchanged, R-8 in Zones 3,4 and R-12 in Zone 5.

The ductwork insulation levels located **within** the building envelope assemblies, such as within a wall, ceiling, or floor assembly, can also be reduced per the statute, but any reduction made in the ductwork insulation must be made up with building insulation to meet the requirements of C403.2.9 which are:

Zone 3 and 4:	R-8
Zone 5:	R-12

Question 3:

How does this affect the compliance path of Section C401.2 Item 1, ASHRAE 90.1-2013?

Opinion:

The statute refers to commercial spaces subject to C403.2.9. Since the ASHRAE 90.1-2013 compliance path does not refer to this code section, but instead has its own duct insulation requirements that are more detailed, and sometimes lower, sometimes higher than the prescriptive path of C403.2.9, this compliance path is unaffected by the statute. Follow the ductwork insulation requirements contained in ASHRAE 90.1-2013 Table 6.8.2-1 or Table 6.8.2-2 as applicable to the building using this compliance path.

Question 4:

How does this affect the Total Building Performance compliance path of Section C407?

Opinion:

Section C407 requires the modeler meet the Mandatory requirements of C402.5, C403.2, C404 and C405, of which C403.2.9 is a sub-section of C403.2, therefore the statutory reduction allowance can be applied. The modeler should use the required minimum R-value of C403.2.9 even though the R-value allowed by SL 2022-6 is installed, and note the statute allowances in the design notes.

Question 5:

How does this affect the COMCheck compliance path of C401.2?

Opinion:

In the commercial requirements, there are two allowed paths for COMCheck – ASHRAE 90.1-2013 or IECC 2015 or later versions.

If using the COMCheck ASHRAE 90.1 option, the inputs actually interface with a modeling platform, and the rules follow the ASHRAE 90.1 requirements, so this path is unaffected by the statute. As with Question 2, follow the allowances in the ASHRAE 90.1-2013 standard. As always, if you follow the ASHRAE 90.1 path for the building envelope, it is required to follow the same ASHRAE path for the mechanical, electrical, and plumbing.

If using the IECC 2015 or later option, the envelope requirements are not traded off with the mechanical systems, so they are independent, and it is not prohibited to use the thermal envelope portion of the COMCheck with the prescriptive portions of the 2018 NCECC. Therefore, the ductwork insulation levels could be used as outlined in Question 1.

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', and this guidance paper with all permits issued during the effective dates prescribed in SL 2022-6 and updated by SL 2022-46 or as modified later by law.

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)

ii **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.

iii 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, and SECTION 20.10A.(b) addresses commercial spaces.

iv 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>

^vSECTION 20.10A.(a) Definitions. – As used in this section, "Council" means the North Carolina Building Code Council, "Code" means the North Carolina Energy Conservation Code and amendments to the Code as adopted by the Council, and "Commercial Spaces Insulation Rule" means C403.2.9 of the 2018 North Carolina Energy Conservation Code.

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 shall be insulated with a minimum of R-4 insulation in Climate Zones 3 and 4 and a minimum of R-6 insulation in Climate Zone 5.



**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