The applicable building energy code that determines the minimum insulation requirements for commercial roofs with insulation entirely above the deck in North Carolina is the [2018 North Carolina State Building Code: Energy Conservation Code](https://www.ncbizenergy.org/) (based on the 2015 International Energy Conservation Code with state-specific amendments). This code is effective January 1, 2019. The minimum insulation requirements apply to new construction only.

The State's energy code requires roof replacement projects to maintain existing insulation levels (Section C503.1, Exception 2(e)). However, the replacement of a roof system on an existing building provides a cost-effective opportunity to add insulation, improve building energy efficiency, and reduce operating costs. Building owners should consider meeting the minimum requirements for new construction when replacing an existing roof system.

**Minimum R-value Requirements for Insulation Entirely Above the Roof Deck**

![Map of North Carolina showing minimum R-values for different climate zones.](image)

- **Climate Zone 5:** R-30ci
- **Climate Zone 4:** R-30ci
- **Climate Zone 3:** R-25ci

**Notes**

- **About R-value:** R-value is a measurement of a material's ability to resist heat flow. The higher the R-value, the greater the insulating power. Installers should consult data sheets provided by polyiso manufacturers for information on product-specific R-values.

- **Code Compliance:** The International Energy Conservation Code recognizes ASHRAE 90.1 as an alternate compliance option for both new construction and existing buildings.

**Resources**

- [Polyisocyanurate Insulation Manufacturers Association](https://www.polyiso.org/)
- [U.S. Department of Energy](https://www.energy.gov/)
Option #1 - R-25ci Roof Assembly

- Roof Membrane
- 2.2” Polyiso Boards
- Structural Roof Deck

Two layers of 2.2” polyiso  R-25.2

Option #2 - R-25ci Roof Assembly

- Roof Membrane
- 0.5” HD Polyiso Cover Board
- 2.0” Polyiso Boards
- Structural Roof Deck

Two layers of 2.0” polyiso  R-22.8
0.5” HD polyiso cover board  R-2.5
Total  R-25.3

Option #1 - R-30ci Roof Assembly

- Roof Membrane
- 2.6” Polyiso Boards
- Structural Roof Deck

Two layers of 2.6” polyiso  R-30

Option #2 - R-30ci Roof Assembly

- Roof Membrane
- 0.5” HD Polyiso Cover Board
- 2.4” Polyiso Boards
- Structural Roof Deck

Two layers of 2.4” polyiso  R-27.6
0.5” HD polyiso cover board  R-2.5
Total  R-30.1
About PIMA

Since 1987, PIMA has served as the voice of the North American rigid polyiso insulation industry. PIMA is a leading advocate for safe, cost-effective, sustainable, and energy-efficient construction. The Association is comprised of polyiso manufacturers and industry suppliers, and represents the public policy interests of its membership at the local, national, and international levels to advance high-performance building practices.

About Polyiso Insulation

Polyiso is a rigid foam insulation used in more than 70% of commercial roof construction and offers a continuous insulation solution for commercial and residential wall assemblies. As one of North America’s most widely used and readily available building products, polyiso is a cost-effective insulation option for reducing building energy use and improving the overall service-life of roofs and walls.

For more information on polyisocyanurate insulation, visit www.polyiso.org