

MECHANICAL CODE DISCUSSION

Duct Insulation



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PAST ISSUES HAVE DISCUSSED duct insulation, including the improper application of bubble foil materials, installed without required sealed airspaces. This issue will discuss insulation R-value requirements for both residential and commercial applications as defined in the International Energy Conservation Code (IECC).



Residential Duct Insulation

The 2015 residential code states:

R403.3.1 Insulation (Prescriptive).

Supply and return ducts in attics shall be insulated to an R-value of not less than R-8 for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Supply and return ducts in other portions of the building shall be insulated to not less than R-6 for ducts 3 inches (76 mm) in diameter and not less than R-4.2 for ducts smaller than 3 inches (76 mm) in diameter.

Exception: Ducts or portions thereof located completely inside the building thermal envelope.

Summarizing:

- 3" or larger supply and return ducts in attics must be insulated to a minimum R-8.
- Ducts smaller than 3" in attics must be insulated to R-6. (high velocity systems)
- 3" or larger supply and return ducts in crawlspaces or un-insulated basements must be insulated to a minimum R-6, with those smaller than 3" insulated to R-4.2.

R-4 insulation for return air ducts *has not* been allowed by the code since January 1, 2007, with the adoption of the 2006 IECC.

Commercial Duct Insulation

The 2018 commercial code states:

C403.11.1 Duct and plenum insulation and sealing (Mandatory).

Supply and return air ducts and plenums shall be insulated with not less than R-6 insulation where located in unconditioned spaces and where located outside the building with not less than R-8 insulation in Climate Zones 1 through 4 and not less than R-12 insulation in Climate Zones 5 through 8.

Summarizing:

- The commercial code does not give an exception for ducts smaller than 3" ducts
- In Washington County, Climate Zone 3, the requirements for ducts in attics (or on roofs) is R-8.

- In all other counties in Utah, Climate Zones 5 or 6, ducts in attic (or on roofs) require R-12 insulation.

Please be aware the 2018 residential code, which we did not adopt in Utah, recognizes the significant heat loss and heat gain reductions realized when ducts in attics are buried in the attic insulation. Every effort should be made to keep duct systems in attic low as possible allowing covering with the blown insulation, or even better, bring the duct inside the thermal envelope.



Also remember where at least 25% of a duct system or the air handler/furnace is located outside the thermal envelope, duct blaster testing is required.

Thanks again for your response to these discussions. Please continue to contact me with your comments and questions.—Brent ■