

MECHANICAL CODE DISCUSSION

Insulating Ducts with Building Insulation



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IN PAST ISSUES WE HAVE discussed duct insulation several times. Over the past months, several new questions on the subject have been submitted, regarding insulating ducts with the building insulation. In this issue the focus will be on ducts serving conditioned spaces located above garage ceilings, with the ducts installed at the garage ceiling.

The question: is it acceptable to simply insulate around the ducts with the building insulation?

Referring to the IECC:

R403.3.1 Insulation (Prescriptive).

Supply and return ducts in attics shall be insulated to a minimum of R-8 where 3 inches (76 mm) in diameter and greater and R-6 where less than 3 inches (76 mm)

in diameter. Supply and return ducts in other portions of the building shall be insulated to a minimum of R-6 where 3 inches (76 mm) in diameter or greater and R-4.2 where less than 3 inches (76 mm) in diameter.

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

Summarizing:

- Both return and supply ducts in attics must be insulated to a minimum R-8, with an exception for ducts smaller than 3" require a reduced level of R-6, basically for high velocity systems.
- Ducts in other areas require R-6, with an R-4.2 exception for less than 3" ducts.

Considering another important concept when using typical loose fill insulation products, which includes fiberglass insulation. For these types of insulation to be effective, an air barrier is mandatory, just as a thick sweater or down-fill coat is not effective without an air barrier covering. Insulation around ducts must be void of airspaces and include an air barrier surrounding the insulation.



Referring back to the first photo, if batt insulation is applied around the underside and sides of the duct, it will not enclose the entire duct, there will be large airspaces allowing convective flows of air around through the insulation, and there will be areas with no insulation, such as the face of the drop ceiling, at framing members and all around the sides of round branch ducts. Batt insulation installed as the building thermal insulation is simply not acceptable.

Let us consider another method. Where the floor system and dropped ceiling are blown full of fiberglass insulation (see above, next page).

Please note the blown insulation fills all cavities and smaller spaces, and after drywall is complete, includes an air

barrier on all sides of the insulation. (Drywall and OSB are considered an air barrier.) Also note, the duct installation and ceiling furring must allow for a minimum 1-1/2 to 2" of space on the bottom and sides of the duct to allow for a minimum R-6. Certainly, a little more space is better.

Please understand the code does not specifically address this application, and that this will not work in climates with extremely high humidity, where a vapor barrier is required. This should not be used in attics; we discussed attics last issue and will revisit again in a future issue.



Please also note, as with other discussions, this is my interpretation of the code. If you have differing opinions or wish to discuss further, your questions and comments are always welcome. Stay healthy, be safe.—Brent ■

Meet and Get to Know: SCOTT CARPENTER

Q. Tell us about your company?

A. Legends Mechanical was formed in 2013 with four partners. We specialize in residential new construction, service and retro fit replacement. We have 60+ employees with two branches located in Bluffdale, UT and Nampa, ID.

Q. What is your position within the company?

A. Administrative & Design Partner.

Q. If you weren't an HVACR Contractor, what would you like to be?

A. A football coach.

Q. What was your most unusual work experience?

A. Getting an opportunity to teach local building officials in the application of new energy designs within the HVAC industry.

Q. What are your favorite aspects of your job?

A. Learning new and different design and energy options. I also enjoy networking with others in our industry.

Q. What is a motto that you live by?

A. Why Not?

Q. If you could travel anywhere in the world, where would you go?

A. Moorea, Tahiti. I have been there before and I loved it.

Q. What is your favorite hobby and when did you last do it?

A. I have two hobbies I love. #1 Steelhead fishing on

the Clearwater River. #2 Driving my race car. I do them as often as possible.

Q. What is your hidden talent?

A. I can fix just about anything.

Q. Do you have a favorite movie?

A. Right now, Ford Vs. Ferrari.

Q. If you could invite any three people to dinner (dead or alive), whom would you invite and why?

A. My grandfather, great grandfather and great great grandfather. I would love to hear about their lives firsthand.

Q. If you won a \$50,000,000 lottery, what would you do?

A. Build a race car team and travel.

Q. People would be surprised to know...

A. I play the drums.



SCOTT CARPENTER
& FAMILY

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