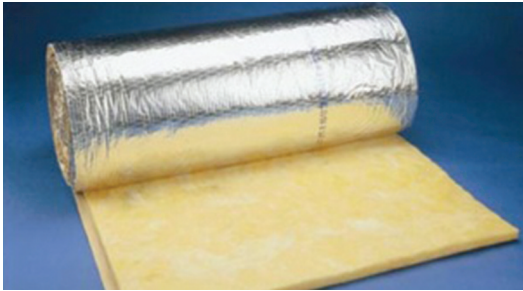


MECHANICAL CODE DISCUSSION

Duct Insulation



IN THE LAST PIPELINE EDITION, the code discussion addressed the incorrect application of bubble foil for duct insulation. In this issue, we'll focus on where and when ducts must be insulated. Recent changes to the code provide clarity, to an often confusing subject. First, considering the commercial requirements from the International Energy Conservation Code (IECC) Chapter 4, commercial section:

C403.2.7 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of R-6 insulation *where located in unconditioned spaces* and a minimum of R-8 insulation *where located outside the building. Where located within a building envelope assembly*, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation.

Considering each underlined condition requiring insulation:

- **Where located in unconditioned spaces:** Since the definition of conditioned or unconditioned space has been a source of confusion, I worked with code officials from Colorado during the development of the recently printed 2015 Codes, to modify the definition. Rather than wait for the adoption of the 2015 Codes, we successfully added the new definition to the State Amendments with the adoption of the 2012 IECC. A typical uncondi-

tioned space might be a crawl space or a basement with an insulated floor above.

CONDITIONED SPACE. An area, room or space that is enclosed within the building thermal envelope and is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

- **Where located outside the building:**

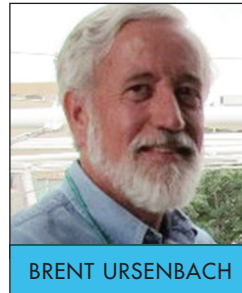
This one is easy; if exposed to outside conditions, insulate to R-8.

- **Where located within a building envelope assembly:**

This one can be a little confusing. This might be a mechanical chase up against an outside wall or other unvented spaces. The key here is identifying the building envelope versus the thermal envelope. The thermal envelope is the continuous line of insulation creating an envelope, separating conditioned space from unconditioned or outside spaces. Is the duct exposed to temperatures similar to outside; if so, insulate to R-8.

Summarizing:

- If a duct is in a crawlspace or a ceiling or wall cavity, isolated from the conditioned space with an insulated floor, wall or ceiling, insulate duct to R-6. This might be a ceiling cavity, with duct located between an insulated ceiling and an insulated roof deck. It is not directly or indirectly conditioned.



BRENT URSENBACH

BRENT URSENBACH

SALT LAKE COUNTY PLANNING AND DEVELOPMENT

bursenbach@slco.org
385-468-6694

- A space may be indirectly conditioned if inside the building thermal envelope, and not isolated from the conditioned space by insulation. As wall and roof insulation requirements have increased, the ceiling space above a grid ceiling on the top floor of a building see a reduced gain or loss, through the well-insulated roof above; therefore duct insulation is no longer required.
- Of course, the code does not override an engineer's specification. If the construction documents call for insulation for condensation, noise or other intended purpose, the code official will enforce the design specifications.

For residential projects, the requirement is the same, expressed in simpler terms:

R403.2.1 Insulation (Prescriptive).

Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

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

Real easy; if it's inside the thermal envelope, the duct does not require insulation. Ducts in a basement with insulated walls, insulated doors into cold storage rooms and no insulation in the floor joists above; do not require duct insulation.

As we are approaching the 40th Pipeline Code Discussion, I want to thank each of you who have asked questions! Don't apologize for calling or emailing, I need the ideas for my next Discussion. Thank You! —Brent