

MECHANICAL CODE DISCUSSION

2021 IRC: Duct Sealing



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True or False: *Duct sealing is not important when the duct is inside the thermal envelope, as there is no leakage to outside.*

Hopefully your response is False. Over the past several years, Mitch Richardson with Building Science West and I have tested duct systems in six problem homes where the duct system leakage rate was excessive to the point that we could not attain the 25-pascal test pressure. In most cases, the system was moving design airflow through the air handler/furnace; however, the design airflow was not measured at the supply outlets or return inlets. The comfort level in the homes was unacceptable, often varying 8-10 degrees throughout the home, simply because the heated or cooled air was not reaching the areas it was needed.

The attached are my photos from two of those homes. The leakage in the panned return chase, installed to pull return from several inlets located at the main floor ceiling resulted in an airflow of 5% of the design CFM. In the other photo, the installer applied sealer only where he expected the inspector would see it.

IRC M1601.1 Duct design.

Duct systems serving heating, cooling and ventilation equipment shall be installed in accordance with the provisions of this section and ACCA Manual D, the appliance manufacturer's installation instructions or other approved methods.

IRC M1601.4.1 Joints, seams and connections.

Longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA HVAC Duct Construction Standards—Metal and Flexible and NAIMA Fibrous Glass Duct Construction Standards. Joints, longitudinal and transverse seams, and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes.



Please note the code specifies all ducts servicing heating cooling and ventilation equipment, which includes supply, return, exhaust, combustion, and make-up air; any air we move into, out off, or within a building.

IRC N1103.3.4 (R403.3.4) Sealing (energy).

Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section M1601.4.1. N1103.3.4.1 (R403.3.4.1) Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of not greater than 2 percent of the design airflow rate when tested in accordance with ASHRAE 193. ➡

