

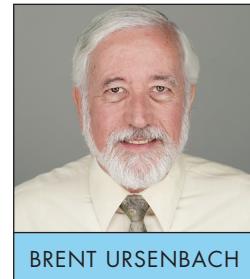
MECHANICAL CODE DISCUSSION

2021 IRC: Duct Sealing

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.



BRENT URSENBACH

**HVAC EDUCATOR/
EXPERT WITNESS**
bursenbach@gmail.com
801-381-1449

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*. ➔*



► The energy portion of the code (IRC and IECC) further requires leakage testing of all duct systems inside or outside the thermal envelope; however, a new amendment effective July 1, 2024, only requires leakage testing when the furnace/air handler, or any

portion of the duct system is located outside the thermal envelope. Watch for additional discussion on this in the future, including at our upcoming RMGA Education Summit, Wednesday, September 11, 2024.

How often is the basement cold in the summertime, due to excessive supply leakage into the basement, where the cooling load is minimal? Would comfort improve if the cool air was delivered to the areas it was needed? ■

I need to extend a thank you to many of you who wrote letters of support in the past year, as I moved through the process of renewing a state contract to continue to provide energy/mechanical training and other resources supporting building energy efficiency. As of last month, I have a contract in place to continue assisting you with code interpretations and questions. Please continue to share your thoughts and ask questions, as I use each in the development of class curriculum. Success to each of you!

—Brent

FEDERATED INSURANCE 
It's Our Business to Protect Yours

Who is Counting on You to Secure the Future of Your Business?

Your business provides employees with a career, customers with quality services, and your family with financial security. Protect your life's work with the help of Federated's network of independent estate planning attorneys.

AN ASSOCIATION MEMBER BENEFIT FOR 119 YEARS
DIRECT, LOCAL MARKETING REPRESENTATIVES AUTO
PROPERTY AND CASUALTY SELF-INSURED RETENTION
POLICYHOLDER SURPLUS LIVE VOICE CUSTOMER SERVICE
MYSHIELD® TAILORED, INDUSTRY-SPECIFIC COVERAGE
BUSINESS SUCCESSION AND ESTATE PLANNING STABLE
FACE-TO-FACE RELATIONSHIPS FINANCIAL STRENGTH
MUTUAL COMPANY DIRECT CLAIMS REPRESENTATIVES
500+ EXCLUSIVE ASSOCIATION RECOMMENDATIONS
ESTATE PLANNING ATTORNEY NETWORK ANNUITIES

IT'S OUR BUSINESS TO PROTECT
RMGA MEMBERS

WE'RE BETTER TOGETHER LIFE AND DISABILITY INCOME
PRIVATE BONUS PLANS KEY PERSON COVERAGE
WORKERS COMPENSATION HIRING PRACTICES
FEDERATED DRIVSAFE™ TELEMATICS SOLUTION
RISK MANAGEMENT RESOURCE CENTER
EMPLOYMENT RELATED PRACTICES LIABILITY
EMPLOYMENT LAW ATTORNEY NETWORK
BONDING EMPLOYEE SAFETY TRAINING
RISK MANAGEMENT ACADEMY
CLIENT SUPPORT CENTER
FIELD RISK CONSULTANTS
CERTIFICATE CENTER
SURETY SPECIALISTS
MANAGED CARE
CYBER

Scan to learn more
about **BUSINESS
SUCCESSION AND
ESTATE PLANNING**
support.



Commercial Insurance | Property & Casualty | Life & Disability Income | Workers Compensation | Business Succession and Estate Planning | Bonding

Federated Mutual Insurance Company and its subsidiaries* | federatedinsurance.com

23.04 Ed. 12/22 *View A.M. Best Rating Guide information at www.ambest.com. **Not licensed in all states. © 2022 Federated Mutual Insurance Company

