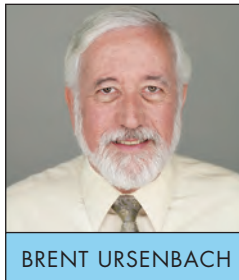


MECHANICAL CODE DISCUSSION

IRC Chapter 16 – SMACNA HVAC Duct Construction Standards – Metal & Flexible



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PREVIOUS DISCUSSIONS HAVE REVIEWED *ACCA/ANSI Manual D – Residential Duct Systems*, primarily focusing on pressure drops across devices, duct sizing, and fitting design. This discussion will concentrate on installation practices as identified in *SMACNA – HVAC Duct Construction Standard*. In a recent RMGA investigation into complaints of poor airflow in a residential installation, excessive duct leakage was identified as the primary reason airflow at return inlets and supply outlets tested at far below the design volume. With a design airflow of 1000 CFM, duct testing showed actual return CFM measured at 365 CFM and actual supply CFM at 740 CFM. With massive leakage identified at the plenum/trunk connections, the areas around the furnace room are marginally comfortable, but the living space around the perimeter of the home does not heat or cool.

The attached photos identify obvious leaks where the plenum tapped into the bottom of the main trunk. It is painfully obvious why the supply airflow at the registers is poor. Please notice the dirt on top of the coil and in the duct. This is a 6-month-old house, with



the furnace used for construction heat without a properly sized filter.

View looking down into the plenum from above (below):

View from below, facing up, from outside the plenum (right):

Referring to the currently adopted *2015 International Residential Code*

(IRC), Chapter 16 Section M1601 Duct Construction Subsection M1601.1.1 (3):

Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA HVAC Duct Construction Standards—Metal and Flexible except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A 653.

As many do not own a copy of SMACNA, the following summarizes several important rectangular duct specifications:

1. All transverse duct joints/connections shall be made with s-cleats or a combination of s and drive cleats.

☛ (Continues top of next page)



2. Where s-cleats are used on all four sides, screws are required within 2" of corners and 12" on centers.
3. Larger ducts, typically commercial, may require standing cleats.
4. Fittings and tap-ins may use clinch/hammerlock connections.
5. Provide flanges for connections to coils, air handlers and other equipment.
6. Seal all connections per SMACNA and the IECC.
7. Listed UL-181 tape is a duct sealer, not a substitute for sheet metal, cleats and fasteners. It is for use after a secure, relatively tight connection has been made. Notice in the second photo where foil tape was spanning ½" to 1" gaps, the tape has failed.
8. Flanged/butted connections such as at plenum to equipment connections should include gaskets and sealers as connections are being made.
9. Refer to the manufacturer's installation instructions for specific equipment requirements.

Watch for future discussion from SMACNA and other standards on duct reinforcement, turning vanes, round ducts, hangers and supports. Of course, your questions, comments and suggestions are always welcome. Thank You, Brent ■

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