



High Performance Housing — Information Sheet 15

for Greensburg, Kansas

Duct Sealing

Last updated on March 3, 2008

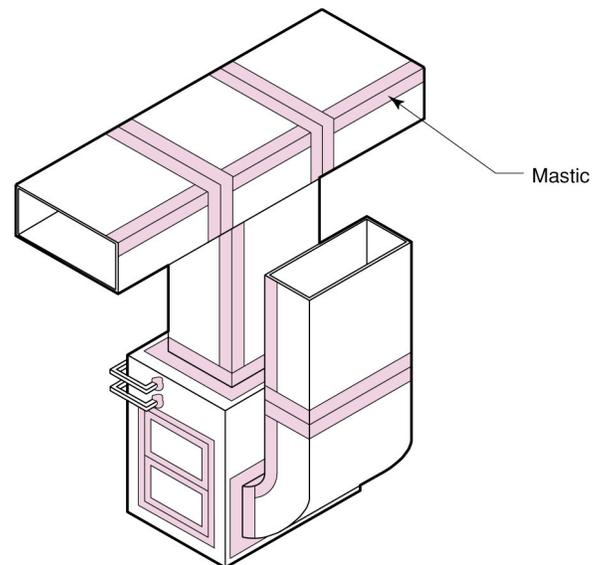
Ductwork, furnaces and air handlers should be sealed against air leakage. The only place air should be able to leave the supply duct system and the furnace or air handling unit is at the supply registers. The only place air should be able to enter the return duct system and the furnace or air handling unit is at the return grilles. A forced air system should be able to be pressure tested the way a plumber pressure tests a plumbing system for leaks. Builders don't accept leaky plumbing systems, so they should not accept leaky duct systems.

Supply systems should be sealed with mastic in order to be airtight. All openings (except supply registers), penetrations, holes and cracks should be sealed with mastic or fiberglass mesh and mastic. Tape, especially duct tape, does not work and should not be used. Sealing of the supply system includes sealing the supply plenum, its attachment to the air handler or furnace, and the air handler or furnace itself. Joints, seams and openings on the air handler, furnace or ductwork near the air handler or furnace should be sealed with both fiberglass mesh and mastic due to greater local vibration and flexure.

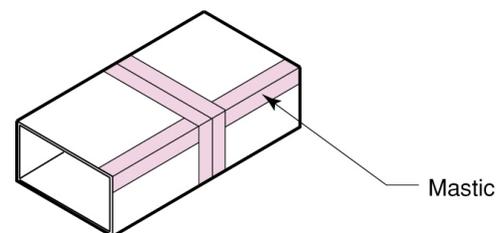
Return systems should be "hard" ducted and sealed with mastic in order to be airtight. Building cavities should never be used as return ducts. Stud bays or cavities should not be used for returns. Panned floor joists should not be used. Panning floor joists and using stud cavities as returns leads to leaky returns and the creation of negative pressure fields within interstitial spaces. Carpet dustmarking at baseboards, odor problems, mold problems and pollutant transport problems typically occur when building cavities are used as return ducts.

The longitudinal seams and transverse joints in sheet metal ducts should be sealed. The inner liner or insulated plastic flex duct should be sealed where flex ducts are connected to other ducts, plenums, junction boxes and boots/registers.

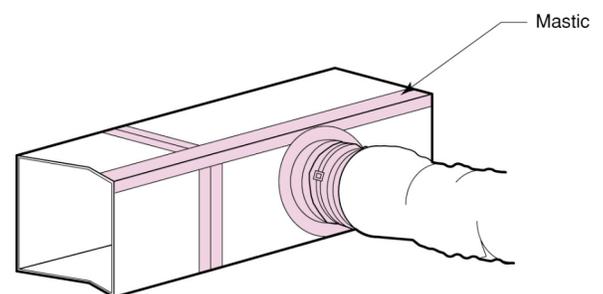
Air Handler Air Sealing



Rigid Duct Air Sealing



Flex Take-off from Rigid Air Sealing



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For more information about Building America go to www.buildingamerica.gov

For more information about the Greensburg, Kansas project go to buildingamerica-greensburg.com

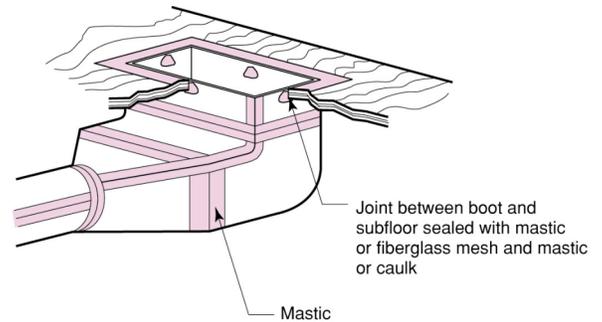


In flex duct installation, the outer liner and insulation should be pulled back and the inner liner attached to the collar with a tie. Fiberglass mesh tape (fabric) should be installed over the inner liner and collar such that at least 1 inch of fiberglass mesh tape covers the exposed collar. Mastic is then applied over the fiberglass mesh tape. The insulation and the outer liner is then pulled back over the connection and sealed with a second tie. When flex ducts are used, care must be taken to prevent restricting air flow by "pinching" ducts.

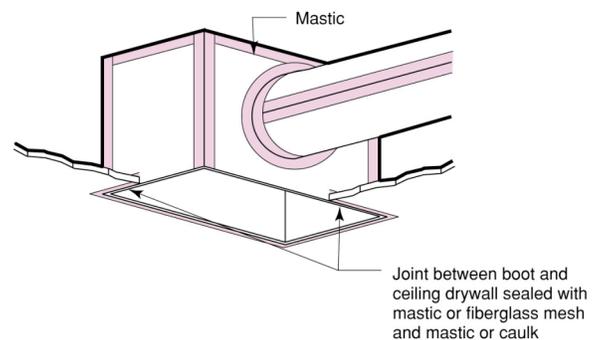
Connections between grilles, registers and ducts at ceilings, floors or knee walls typically leak where the boot does not seal tightly to the grille or gypsum board. Air from the attic, basement, or crawlspace can leak in or out where the ducts connect to the boot.

If the gap between boots and gypsum board opening or subfloor openings is kept to less than $\frac{3}{8}$ -inch, a bead of sealant or mastic may be used to seal the gap. Where gaps are larger than $\frac{3}{8}$ -inch, fabric and mastic should both be used. The optimum approach is to keep the gaps to less than $\frac{3}{8}$ -inch and use a bead of sealant. This requires careful coordination with the drywall contractor to make sure that the rough openings for the boots are cut no more than $\frac{3}{8}$ -inch bigger than the actual boot size on all sides.

Floor Boot Air Sealing



Ceiling Boot Air Sealing



Rigid to Flex Air Sealing

