

# Sealing ductwork in an attic

Last Updated: Friday, May 20th, 2011, Created: Monday, January 15th, 2001

Often furnace heating and air conditioning duct work is run through an attic and then back down into the house. Personally I think that this is a really bad idea unless there is absolutely no alternative route. Why? First, most duct work is not sealed where it goes through the ceiling, so a lot of heat and moisture escape into the attic through this opening. Second, most ductwork is poorly sealed at its joints, and studies show that up to 40% of the heat in the heating system escapes through the joints, never getting to the heating grill in the rooms. If the ductwork is inside the heated part of the house, this is poor distribution, but not a heat loss. In an attic it is both poor distribution and a total energy loss -- for both heating and air conditioning. Third, running heating ducts through freezing cold attics, and air conditioning ducts through roasting hot attics just doesn't make any sense. Ok, you put some insulation on the duct. How much? Probably about R-5. Look at the floor of the attic. It has R-30 to R-60 to keep the heat in the house, and you blow your heat through a duct protected to only R-5? It is also very often the cause of ice dams on the roof, because the warmth melts the bottom of the snow peak on the roof, which then refreezes into ice.

If you must have ducts in an attic, seal the hole through the ceiling air tight. Then putty and tape up all joints on all the ductwork. Do not use cloth duct tape -- it will not last more than a year or two. Leave that stuff to Red Green. Use aluminum duct tape, and do try to get to the hard to reach parts of the duct joints. Then carefully cover all sides of the duct with at least R-30 of insulation.

One alternative to all of this is to have a professional spray polyurethane insulating foam over, under and around the entire duct, joints and all. This will do a very good job of sealing the air leaks and about three inches of this stuff will give you a little over R-20 of insulation (R-7.5 per inch). But it is expensive and is rarely applied at anything near an R-30 thickness. Some worry about off-gassing but that is not a problem at the temperatures that will be in the ductwork (could be a problem of melting or shrinkage if applied very close to the furnace itself). The real problem is that although this is very successfully done on a regular basis -- it is not allowed by the part of the National Building Code that deals with spray foam insulation. This is a contested part of the code, apparently in place for fire considerations, but for many professionals the benefits outweigh the worries.

**Keywords:**

Air Conditioning, Air Sealing, Aluminum, Attic, Codes, Duct, Environmental, Fire, Foam, Furnace, Heat Loss, Heating, Ice, Ice Dams, Insulation, Polyurethane, Problems, Roof, Sealing, System, Tape, Temperature