



HVAC Standards and Specs

Below are our standards that are in the realm of the HVAC contractor. **Make sure your HVAC contractor has a copy of this document as well as the other standards prior to bidding.**

These standards must be met in order for us to guarantee the cooling and heating bills. Below each standard is some further explanation, where we think that might be useful to you and to the HVAC contractors in preparing bids.

If you find that the contractors you contact are unsure what some of this means, please don't hesitate to contact Krista Egger at 919-857-9000.

Heating and Cooling Efficiency:

- Energy usage must be at least 15% less than that used by a "reference house" of the same shape and size built to the 2006 International Energy Conservation Code (IECC).

We will verify this with a computer model during our plan review and let you know if any modifications will be required. Then, if the house is built to our standards, this requirement will be met, and the house will be certified as an Energy Star® Home.

- Heat pumps and air conditioners, if used, must be sized according to ACCA Manual J and be installed within a half ton of that size.

A room-by-room Manual J heat loss/heat gain calculation must be submitted by the contractor. Printouts from the computer program or copies of the manual worksheets, including what inputs were used for design temperatures, infiltration rates, insulation levels, ventilation rates, window & door U-values & Solar Heat Gain Coefficients, etc., must be submitted. If an HVAC contractor has a problem with sizing by this method, have him call us! We will not certify a house with an over-sized system.

If your contractor cannot or will not do this, let us know, and we will do it for a fee of \$0.15 per sq. foot. This is an allowable program expense.

- Heat pumps and air conditioners must have a SEER rating of at least 14 and a Heating Season Performance Factor of at least 8.2.

Air Distribution System:

- All joints in the air distribution system shall be sealed with bucket duct mastic and fiberglass mesh or an Advanced Energy-approved equivalent.
- Total duct leakage measured in cubic feet per minute at 25Pa shall be less than 3% of the conditioned floor area. (i.e. if the house has 1000 square feet of conditioned space, there shall be no more than 30 CFM of duct leakage when tested)
- Tested airflow must be within +/- 10% of the designed airflow *in each room*.

On site training is provided for the HVAC contractor at not charge. As the duct system for the first participating home is completed Advanced Energy will test the system, give immediate feedback, and answer any questions about the program that may have arisen.

Registers and diffusers must have proper throw and spread to keep rooms properly conditioned.

Mechanical Equipment Installation

- Heat pumps must include an outdoor thermostat connected to the heat strips.
- Inert gas (nitrogen) shall be used during any brazing/soldering of refrigerant lines.
- Condensation drain shall be installed to meet local codes and manufacturer's instructions.
- There must be proper airflow volume across the indoor coil and/or heat exchanger per manufacturer's instructions.
- Indoor and outdoor units must be matched according to the ARI Directory or the manufacturer's listing.
- Correct charge must be installed per manufacturer's specifications.

We require the contractor to submit a form, certifying that these requirements have been met. It would be too expensive for us to test all these items on every house, but we will check these items on a random basis.

Ventilation

- Each bathroom must have an exhaust fan that exhausts a minimum of 50 CFM directly to the outside. This is the measured flow as installed, not the rated flow.

Typically, we find that the 70 CFM models will actually move at least 50 CFM installed. Both Broan and Panasonic make excellent efficient, quiet bath fans. Four sources carrying Panasonic that we've found to be dependable are Green-R (Ron Paraseau 828-680-9615), Positive Energy (800-488-4340), Energy Federation, Inc. (www.efi.org) and Shelter Supply (www.sheltersupply.com). Broan also makes an excellent line of quiet, efficient bath fans that actually move air. We require insulated metal or flex ducts for all exhaust fans. Flexible vinyl ductwork is not acceptable. Mastic must be used to seal all connections. All exhaust fans must be ducted to the outside and attached to a proper termination.

- Each kitchen must have a range hood or exhaust fan that exhausts a minimum of 100 CFM directly to outside. This is the measured flow as installed, not the rated flow.

The kitchen exhaust must be hard-ducted to the outside with a back-draft damper installed. Recirculating range hoods are not accepted. Typically, a hood rated at 150-200 CFM will be adequate to provide 100 CFM of flow. The quieter the better, since people often don't use them if they are noisy.

- There must be a mechanical fresh air ventilation system that brings the following amount of fresh air into the home when installed:
(7.5 CFM)(number of bedrooms + 1) + (.01 CFM)(square feet of conditioned space)

In other words, a 2000 square foot 3 BR house needs mechanical ventilation of 50 CFM.

- The fresh air ventilation system must include a damper and filter. Filters must be accessible from the conditioned space.
- Fresh air intakes must be installed at least 18" above finished grade or 12" above the roof deck. They must also be at least 10' from plumbing vents, chimneys, combustion appliance vents, dryer vent terminations, and exhaust fan terminations.
- Solid metal, flexible metal, or lined, insulated flexible duct may be used.
- All ventilation ducts in unconditioned spaces must be insulated

One cost-effective approach is to use a six-inch duct with an adjustable damper to bring fresh, outside air into the return box whenever the air handler fan is running.

Pressure balancing and return air paths.

- No pressures with a magnitude greater than 3.0 Pascals with reference to the outside may exist in any zone of a house.
- Some form of pressure relief ***in addition to ¾" door undercuts*** is required between each bedroom and the main body of the house. Examples of pressure relief strategies included dedicated returns, jump-over ducts, and transfer grills.

This means that the duct design needs to be followed closely, and that pressure relief—door undercuts, relief grills, jumper ducts, etc.—is necessary.

Combustion Safety

- Any gas appliance, other than ovens, located inside the conditioned space must be direct vent or power vented.
- One hard-wired carbon monoxide (CO) detector shall be installed per 1,000 sq. feet of living space (minimum 1 per floor) in all houses with any combustion appliance or attached garage.