Effective Ventilation Systems

By Ron Pariseau

The movement towards building energy efficient homes in the Western North Carolina area is growing and with it the understanding that ventilation is an important factor in the Indoor Air Quality of these homes. There are different ventilation strategies that a builder can incorporate in the design and construction of a house but there are a few basic steps that need to be taken in the design, installation and maintenance of any ventilation strategy to insure it is effective.

1. **Calculating how much fresh air is required to insure a healthy environment for the occupants**. Too much fresh air will lead to higher heating and cooling costs and too little may lead to Indoor Air Quality problems. I recommend using the guidelines set forth by ASHREA, The American Society of Heating, Refrigerating and Air-Conditioning Engineers, in the 62.2 2007 publication Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. In summation they recommend the following:

1 cfm per 100 sq ft of floor area
+
(The number of bedrooms + 1) 7.5

2. **Decide where to place the fresh air intake**. You want to put some thought into where the fresh air intake is placed so you're not introducing any fowl or potentially harmful fumes into you house. Too many times I see the placement based aesthetics and not the quality of the surrounding air. Don't place the intake near any parking areas, grills, pet areas, underneath a deck, on a shingle roof, or near the ground. Also take into consideration the surrounding foliage when choosing a location.

3. **Filter the air before it is introduced into the house or HVAC system**. Most equipment have filters built into them but when introducing fresh air into the HVAC return plenum through a duct to the outside make sure the air is filtered before it enters the return plenum. Most of the systems I see incorporating this design do not have a filter before connecting to the HVAC ductwork. They rely on the filter at the airhandler but don't realize that they are introducing insect matter into the return plenum which will lead to a dirty duct and potential mold problems down the road.

4. **Install the equipment in accordance to the manufactures instructions.** Sounds simple but sometimes the installer doesn't make time to review the instructions and equipment that is installed incorrectly could pose a hazarded to the homeowners.

5. **Test the system to make sure it is operating properly**. The HVAC contractor or HERS rater should test the system to make sure it is operating properly and bring in the designed volume of fresh air.

6. **Educate the homeowner on the operation and maintenance of the system**. Every homeowner needs to be educated on the importance of introducing fresh air, the operation of the equipment as well as the maintenance of the equipment. Homeowners that are not informed of the importance of fresh air introduction are more likely to shut the system off thinking they are saving even more energy when in effect they may be creating an unhealthy environment in the house. It is important that the filters and the screen on the intake are cleaned or replaced periodically. The mechanical parts also need to be inspected periodically for proper operation.

It doesn't matter how you provide fresh air exchange for the house if the system is not properly installed and maintained it will not deliver its desired result, a healthier environment for the homeowner.