

Are your gas appliances backdrafting?

The energy crisis of the 1970's is often remembered for gasoline reaching the unthinkable price of \$1.00 a gallon and restrictions on filling your car to odd or even days. For the building industry the energy crisis marked a change in the way we thought about construction – a change exemplified by the transition from non-tight construction to tight construction. The mission became one of insulating and sealing the building envelope as much as possible to save energy. But as we soon discovered, there were some unforeseen caveats with tight construction. Among these, the availability of fresh air inside the home could become problematic as could sufficient air for gas fueled appliances. It is this latter concern which bears discussion here.

Consider the typical gas furnace and water heater in the garage of a newer home. Each will require a certain amount of air for combustion. If the garage is too tight and lacks sufficient air supply, the fuel will not burn completely and carbon monoxide will be produced. The appliances may not properly vent the byproducts of combustion to the exterior. This condition, called backdrafting or spillage, refers to the phenomena where combustion gasses spill into the habitable space – a serious and potentially deadly health hazard.

During a home inspection it is critical the inspector evaluate for possible backdrafting from gas appliances. The most common test utilizes a mirror as the byproducts of combustion contain water vapor which will cause the mirror to fog. Some inspectors use a smoke pen to actually see if the smoke is going up the vent pipe or being blown back out. In conjunction with these tools, one of the best methods to test for backdrafting is to check the appliances under what is called, “worst case conditions”.

To create worst case conditions, the inspector will close all exterior doors and windows and then activate all the exhaust fans in the house. If possible, clothes dryers and gas fireplaces will be turned on. The deliberate and cumulative effect of these actions is to lower the atmospheric pressure inside the house to determine if that depressurization has an adverse effect on the venting of the gas appliances. If so, backdrafting may occur from the effects of this negative pressure. The good news is that the fix is generally as easy as providing a source of combustion air. Go back to the example of the gas furnace and water heater in the garage. If worst case conditions caused depressurization in the garage and the appliances began backdrafting, the repair would likely be as simple as creating a properly sized opening from the garage to the exterior. Depending on the location of the appliances, the repair may be more challenging, but the principle remains the same.

It is important to note that combustion safety testing carried out by a Certified Building Analyst following Building Performance Institute (BPI) standards will be much more comprehensive, typically utilizing carbon monoxide meters, specialized pressure testing equipment and possibly blower door technology. The spillage tests performed by a home inspector who is a generalist are certainly rudimentary by comparison. Regardless, they are an essential first step to determine if further professional evaluation is needed and a critical step to ensure your safety.

Larry Stamp

Cameo Home Inspection Services

Larry taught HVAC at the Kaplan Technical College home inspector program and will be teaching HVAC at the new American Society of Home Inspectors Washington School. He can be reached at 459-1632.