

## **Appliance Makeovers to Die For**

It is probably fair to say that most significant home improvement projects usually encounter challenges along the way; be they surprises inside the walls, unexpected construction related problems, or unplanned cost overruns. However, appliance makeovers in particular also have the potential to create unintended consequences, some of which can be a matter of life and death.

### **Let's Talk Upgrades**

Consider an all too familiar scenario where the electric appliances, furnace and water heater, are both in a small area such as the utility room. For years this arrangement has worked well, but when the homeowner learns natural gas will soon become available, plans are made to change out these appliances to more efficient gas models. Soon after the appliances have been upgraded, energy bills start to drop and it is beginning to look like the upgrade decision was a good one. But then the homeowner takes notice of subtle health issues they never experienced before like the occasional dull headache, some dizziness and weakness and even some twinges of nausea.

### **It's All About Combustion**

So what could possibly be going on? It is quite possible those symptoms may be related to carbon monoxide poisoning. But why? The answer becomes clear when one understands some very basic principles: Every gas appliance requires oxygen to burn the fuel properly, a process referred to as combustion. As part of this combustion process, a properly functioning gas appliance will produce a variety of byproducts. Among them is carbon dioxide, derived from the oxygen used by the appliance to burn the fuel. Should a gas appliance have insufficient oxygen to burn the fuel, then combustion will be incomplete and instead of producing carbon dioxide, (CO<sub>2</sub>), it may produce deadly carbon monoxide, (CO).

### **Location, Location, Location**

The problem created in the scenario above is that the small utility room simply could not provide enough combustion air for the new gas appliances when the door was closed. Turning on the utility exhaust fan pulled even more air out of the room. Of course all that loss of air paled in comparison to how much oxygen was pulled from the space when the clothes dryer was turned on. This utility room example may be extreme, but it is by no means unusual, nor is it the only situation where sufficient combustion air may be an issue.

### **Let it Breathe**

Clearly, the situation at hand can be a significant health and safety concern, but at the same time the fix can be simple and inexpensive - let it breathe. In other words, bring combustion air into the space. Depending on the location and structure, the air may come

from inside or outside through vent openings into the attic and/or crawl space. It would be up to a heating technician to determine the most efficacious method and the size of vent openings needed.

### **Lessons Learned**

In the end, the most valuable lesson is to make sure such upgrade projects are performed with a building permit where the inspector will be able to identify potential installation concerns before they become an issue. In particular, they will look to ensure the space for the gas appliances will have sufficient combustion air. And of course with any gas appliance upgrade, installing carbon monoxide detectors in the home should be a matter of course to protect you and your loved ones.

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