



COLD CLIMATE HOUSING RESEARCH CENTER

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ENERGY FOCUS

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Weatherization and Indoor Air Quality Issues

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With the dramatic increase in heating fuel prices, we have been seeing a flurry of activity from both homeowners and contractors to improve insulation values and reduce the air loss in homes around Fairbanks. This is a good thing and something that has been long overdue, especially in some of the older houses. With this surge in home improvement activity, there are a few issues centered around indoor air quality to be aware of. It is important to keep in mind that as you attend to your home's weak spots, you are likely making the house envelope tighter. This means it may be necessary to introduce fresh air in places where previously it may not have been required. Fortunately, there are a variety of solutions available. They can be as simple as installing an air duct to an appliance and improving exhaust fans, on up to complete Heat Recovery Ventilation Systems (HRV) that can supply fresh air to the whole house while minimizing heat losses.

One challenge that may arise in a well sealed house is making sure stoves and furnaces are functioning optimally. Many of these types of combustion appliances depend on external sources of air to burn correctly and safely. Prior to weatherization, everything may have received enough combustion air from leaks in the building. This may no longer be the case. These types of appliances should be watched closely for changes in performance, and serious consideration should be given to supplying an outside air source if needed. This can typically be remedied fairly easily with a properly sized duct to the outdoors

Another concern in this regard is exhaust back draft. In a tighter house, appliances dedicated to exhausting air such as bathroom fans, oven fans, and dryers, will potentially be working a little harder to do so. This could possibly back draft carbon monoxide from an improperly supplied combustion appliance. With winter approaching, this presents a good time to get your furnace draft tested and tuned by a professional. Another prudent move would be to install a carbon monoxide detector, or if you already own one, test it periodically. One good location for a detector would be in a hallway outside the sleeping areas of the house.

Along with the lowered passive air supply that comes with tightening a home, higher humidity levels are another topic worth mentioning. A poorly sealed home may have been able to provide enough air exchanges that moisture and stale air were able to exit the house naturally. This may no longer be the case, and an external source of supply air could be necessary here. Depending on the

situation, a wall vent or bathroom style fan may suffice, or it may be beneficial to consider a whole house HRV system that can introduce and exhaust air at controlled levels.

This may hold true particularly if you are adding a layer of rigid foam board to the outside walls of the building, or sealing portions of the home with spray foam or polyethylene. As a personal example, we had the crawlspace walls in our home sprayed with foam this fall, but I didn't get around to putting the vapor barrier down on the dirt floor right away. Within two days, the wood cutting board in the kitchen upstairs had curled up a full inch on each side. The moisture, which previously had been exiting through the leaky crawlspace walls, was now staying inside the house at much higher levels. At colder temperatures, one indicator of high humidity is the buildup of excessive moisture on the windows. Poorly vented bathrooms and kitchens are classic contributors here. An inexpensive indoor humidity meter can be a handy tool when it comes to watching moisture levels.

There are steps that can be taken before and after performing retrofit work to identify changes in air movement into or out of a building. Energy audits and blower door tests are great resource when it comes to weatherization. They can provide the diagnostic tools for helping to determine a house's status, even if you are not considering one of the state sponsored weatherization programs. The results they generate can help you to make informed decisions as to where your money will best be spent, and show if additional measures will be required to maintain good, safe air quality in your home.

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