ASK THE

INSPECTOR

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I live in an older home. My heating bills have been high and I notice cold, uncomfortable drafts at several locations in my home. How can I reduce my heating bills and create a more comfortable climate in my home?

The cause for high heating bills and uncomfortable drafts are uniquely caused by specific conditions in each home, however, the following common causes for high heating bills and uncomfortable drafts are summarized as follows.

High heating bills are commonly caused by:

1. Older, inefficient heating equipment. An older, conventional natural gas or oil fired furnace commonly operates at efficiencies on the order of 65 to 70%. In general, this means that for every dollar you are spending on heating, approximately 30-35 cents are going up your chimney to unnecessarily heat the great outdoors. Newer, high efficiency systems are often 90% (or more) efficient, which results in less than 10 cents of each dollar being wasted. On this basis, an upgrade from a conventional furnace to a high efficiency furnace could reduce heating fuel usage and costs by 20% - 30%.
2. Low insulation levels in the walls and ceilings. Heat flows from the inside of your home to the outside during colder months. The barrier between the interior heated portion of your home and the outside or unheated portions of your home (i.e. most attics and garages) is called a "thermal envelope". The more insulation you have in your walls and ceilings (thermal envelope), the slower the rate of heat loss from the house. Insulation levels within the thermal envelope are often measured by R-value. An R-value is simply a measure of thermal resistance. The higher the R-value, the greater the resistance to heat transfer. Current R-values required by building codes in Canada are on the order of R-32 for ceilings and R-19 for walls, although this varies significantly with the location in which the home is located. A typical house built 30 years ago often had an R-15 ceiling insulation level and R-10 wall insulation level. Houses built before 1940 often had very little or no insulation installed in the ceilings or walls. Depending on the current insulation levels in your home, retrofitting your ceilings/walls with more insulation may be an option to reduce heat loss from your home and heating bills.
3. Air leakage through gaps in the building's thermal envelope. A building that has a poorly sealed thermal envelope (i.e. inadequately trimmed or caulked/sealed windows, doors, attic hatches, plumb vents, foundation sills, etc.) can rapidly leak warm air out of and

cold air into the building, dropping the house temperature quickly in winter months and therefore requiring the heating system to run longer and more often. By properly sealing the thermal envelope of leaky buildings, significant energy cost reductions can often be achieved.

Cold, uncomfortable drafts are often caused by:

1. Continuous furnace blower fan operation. If the house is heated by a forced air central heating system, the drafty conditions may be caused by continuous furnace blower operation. The blower is a large fan located in the base of the furnace that circulates air in a home. You can check if continuous blower operation is the source of the drafty conditions by feeling for an intermittent cool breeze at heat registers in your home. If a cool breeze is noted, attempt to adjust the fan setting on your thermostat from "manual" to "automatic" mode. If your thermostat is older and not equipped with these settings, a similar switch may be located at the main panel of your furnace. If neither of these switches are present, consider consulting a heating contractor to discuss possible options to reduce the drafty conditions and improve comfort in your home.
2. Excessive leakage through the buildings thermal envelope. In an older house, sealing the thermal envelope of a building (described in point 3 on the previous page) was often ignored because minimizing "drafts" or "excessive air leakage" simply wasn't a significant consideration at the time of construction. In the past 20-25 years, the issue of home comfort has gained relevance among the public and construction techniques have been improved to minimize excessive air leakage. The newer construction techniques used to minimize excessive air leakage include using improved building materials and tightening or sealing the buildings thermal envelope more effectively during original construction.

   Many leaky, older houses naturally achieve 1.0 air change per hour on cold winter days. In other words, the house has a complete change of fresh air from the exterior to the interior of the home every hour. In recent years, the residential building industry has established that an appropriate amount of air change to maintain good air quality in a home is on the order of 0.3 air changes per hour, or a total air change approximately every 3 hours. In order to assess the air change rate (or how leaky) a specific house is, a blower door test can be performed to calculate air leakage characteristics for the home. The blower door test depressurizes the house, which makes high air leakage areas easy to find. During the blower door test, a smoke pencil is used to easily and very effectively visually demonstrate the areas of leakage, which often are at the same locations that homeowners complain of drafty conditions. Based on the results of a blower door test, recommendations for air leakage control solutions such as caulking and weather stripping leaky components of the buildings thermal envelope or more invasive techniques such as foam/plastic vapour barrier installation can be developed. By implementing these recommendations, the cold, uncomfortable drafts can often be reduced, making your house more comfortable.

Many of the items described above can be reviewed/assessed as part of the EnerGuide For Homes energy efficiency assessment program.

For further information about this program see our website at www.amerispec.ca

Did you know?

Have you ever heard of or been confused by the term "RSI-value" when on the topic of insulation? An RSI-value is simply the metric equivalent of an R-value; to obtain an RSI value, divide the R-value by 5.6.

Contact Us: