ASK THE
INSPECTOR

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Why does condensation form on my windows in the winter?

This depends on the types of windows installed and the relative humidity levels in the home. The following is a summary of two typical scenarios:

1. The condensation is forming on the room side of the glass. This is caused by a combination of high interior air humidity and a large temperature difference between the window and the indoor air. When warm interior air hits the cold window, it decreases in temperature. Cold air cannot hold as much moisture as warm air, which is why the condensation forms. If condensation forms in large quantities and runs down the glass, the windowsill or underlying wall materials may become mouldy or moisture damaged and require repair. Remedies for reducing the formation of condensation include:
   - Lowering the humidity (removing plants, hanging laundry/storing wood outside to dry, installing an exhaust fan, etc.),
   - Installing heat sources below windows to reduce the formation of condensation by flowing warm air across the glass, and
   - Installing storm windows on single pane windows and keeping blinds/curtains slightly away from the window to allow airflow in front of the window.
2. The window installed is double-glazed (two panes of glass separated by a sealed spacer) or triple-glazed (three panes of glass separated by sealed spacers), aka Thermopanes. The seals between the panes have deteriorated, allowing condensation to form between the panes of glass, which cannot be cleaned. This diminishes the insulating capacity of the window only slightly, however, is often considered inconvenient to look through. Correction of the problem typically involves having the window replaced.

I've got older wood windows in my home that are in need of some maintenance/repair. What are my options?

1. If the windows are wood and have weathered/flaking paint or are slightly soft, completing scraping and painting of the windows is an option. Alternatively, the window frames can often be professionally cladded with aluminum to reduce future painting requirements.
2. If the windows are rotted, moisture damage to the windowsills and interior walls may occur, which could be costly to repair. Rotted windows often need to be repaired or replaced by a qualified window contractor.
3. If the windows are older or loose fitting and consist of a pane of glass in a track or sash, the energy savings may make it worth your while to upgrade to more energy efficient windows.

I'm thinking of upgrading my old windows with a more energy efficient type. What are some of the main features that are available in new windows and what are the costs for these features?

The following is a summary of several key features available in new windows:

- **Double or triple glazed glass** (i.e. thermopanes). These are two or three panes of glass manufactured as one window with a very thin separation between the panes. This separation width provides less convective heat loss than the typical separation width of 2-4 inches that is often observed on standard thermo pane windows or single pane windows equipped with a storm window.
- **Low-E coatings.** A low-E (emissivity) coating is merely a thin, invisible metallic layer – only several atoms thick, that is applied directly to a window's surface. Standard window glass easily allows solar heat and radiant heat (heat from objects such as furniture and trees), to pass through it, however, a low-E coating actually reflects radiant heat. This means heat loss through a low-E window at night will be heavily reduced. In the winter, heat from room objects will be reflected back into the home rather than being wasted through window to the exterior. In the summer, heat from objects on the exterior will be reflected back to the exterior, thus reducing night-time air conditioning requirements. Low-E coatings also allow fewer ultraviolet rays through, which can mean less fading of carpets and fabrics.
- **Inert Gas Fills.** Another big advance in window technology has been the introduction of inert gas fills into the space between the glazings. Argon and krypton are the usual choice with argon being the most common. Filling the space between the glazing with these heavier gases reduces heat loss due to convection and conduction.
- **Low-conductivity spacers.** The spacer between the glazing at the perimeter of the window have historically been made out of aluminium, which is light weight and durable, but also provides considerable heat loss. Newer non-metallic spacers are now available to reduce heat loss at this location.

The cost for inclusion of the energy efficiency features described above varies, but can be 10-15 percent more than standard double-glazed units. However, many window manufacturers are converting their production lines to produce only high-performance units. Some super high performance windows that are using cutting edge technology for even more energy savings than those described above are available, but at considerably higher costs.

Proper installation is especially important with high-performance windows because poor installation techniques can negate their performance. Installation should be completed in accordance with manufacturers recommendations and should reflect current industry standards such as CSA-A440.4 "Window and Door Installation Standard". In addition, other installer certification programs such as "Window Wise" or those developed by the Siding and Window Dealers Association of Canada (SAWDAC) are available. Be sure to check out your contractor's qualifications to ensure proper installation.

Completion of an energy efficiency assessment such as the EnerGuide for Houses Program is recommended prior to upgrading to determine the feasibility of upgrading windows.

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