CITY OF BOSTON
Thomas M. Menino
MAYOR

green your home

BOSTON GREEN BUILDING

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GREEN OPTIONS: WINDOWS

While all windows might look the same, they certainly do not perform in the same way when it comes to insulating your home. Given the climate of a cold city like Boston, installing an energy efficient window can cut your heating costs by up to 40%.

NFRC Rating System: The Standard

The National Fenestration Research Council (www.nfrc.org) has developed a rating system used by most window manufacturers. When making your window purchase, look for the NFRC label to determine how each product performs. The rating system uses five categories.

1. U-factor measures how well a product prevents heat from escaping.
2. SHGC (Solar Heat Gain Coefficient) measures how well a product blocks heat caused by sunlight.
3. Visible Transmittance (VT) measures how much light comes through the window.
4. Air Leakage (AL) represents the amount of air infiltration through the cracks in a window unit.
5. Condensation Resistance (CR) measures the ability of a product to resist the formation of condensation on its interior surface.

Go to http://www.nfrc.org/label.aspx for help reading the NFRC label.

While the NFRC label is the best source for window energy performance information, you should also look to purchase ENERGY STAR-certified windows. In Boston's climate zone, Energy Star requires a U-Factor that is less than or equal to 0.35. Energy Star windows also have low-e coatings and other energy efficient features (see below).

Features of an Energy-Efficient Window:

Double-Pane

• Single pane windows (made of one piece of glass) provide very little insulation. The temperature on the outside part of the glass will be almost the same as on the inside part.

• Double pane windows consist of two layers of glass separated by a layer of air or inert gas. They usually have multiple layers of glazing, helping them to insulate twice as well as single-glazed windows.

• Using inert gas that does not conduct heat very well (such as argon or krypton) to separate the two panes can also help improve the energy efficiency of the windows.

Low Emissivity (Low-E) Coatings

• These coatings are applied to the glass between the two panes of a double-paned window.

• By impacting the movement of solar heat waves, the low-e coatings help prevent heat from escaping during the winter and block heat from entering the home during summer.

• They do not affect the transmittance of light and are virtually unnoticeable to the eye.

• Although they may add 10-15% to the cost of the window, the coatings will usually pay for themselves in energy bill savings in just a few years.

Which direction is the window facing?

• East/West facing windows pose the biggest problem for temperature control. Minimize their size and use. Invest in higher quality windows for those facing east and west.

• Southern-facing windows are the best, allowing in the most light without direct sunlight. Northern-facing facades are the second-best choice. Large windows facing these directions are appropriate.

Comparison of Window Frame Materials

The window frame can impact energy efficiency as much as the window itself. A "green" window frame material provides low heat loss, high durability, and low environmental impact. Of these three factors, low heat loss is by far the most important. Most window frames are made from one or two of these materials:

Wood (Use only Forest Stewardship Council-Certified) Frames

• Renewable resource, biodegradable, durable (25-30 years), lowest heat loss of any material

• However, this material is only considered environmentally friendly under some circumstances. The Forest Stewardship Council (www.FSCUS.org) certifies timber that has been sourced and transported responsibly. Buying this wood helps keep the world's forests healthy by reducing the loss of old-growth trees.

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Metal (Steel and Aluminum) Frames

- Usually made from recycled content (check with manufacturer), and recyclable if coated correctly.
- All-metal frames have high heat loss. Install with a thermal break to reduce heat conductivity.
- Very durable. Aluminum-faced wood composite frames combine low conductivity with high durability

Vinyl Frames

- Durable (25 years), but not made from recycled or renewable resources.
- Made from polyvinyl chloride (PVC), an environmentally controversial material that is harmful when it ends up in a landfill.
- Wood/vinyl composite frames provide low heat loss and prevent condensation.

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