responsiblenergy

windows

energy-efficient choices

taking responsibility

As an individual, your efficient use of energy brings benefits such as lower bills, improved comfort levels in your home and a reduced personal impact on the environment.

Acting together, our individual choices add up—for the benefit of our community, our environment and our energy future. That's the power of working together.

As your community energy company, we are committed to sharing our experience and energy expertise. You can always contact us for:

- Answers to your energy questions.
- Energy efficiency information and advice.
- Help in evaluating energy-saving options.
- Assistance in finding energy-efficient products.

Windows of opportunity

With new energy-efficiency ratings and features such as glass coatings and gas fills between panes, today's windows offer more options in efficiency than ever before. Along with the range of shapes, sizes and frame materials to choose from, the decision of what window to buy can be a difficult one. This booklet gives you a great start toward all the information you need. For more advice, please visit mge.com or call us at 252-7117.

Table of contents

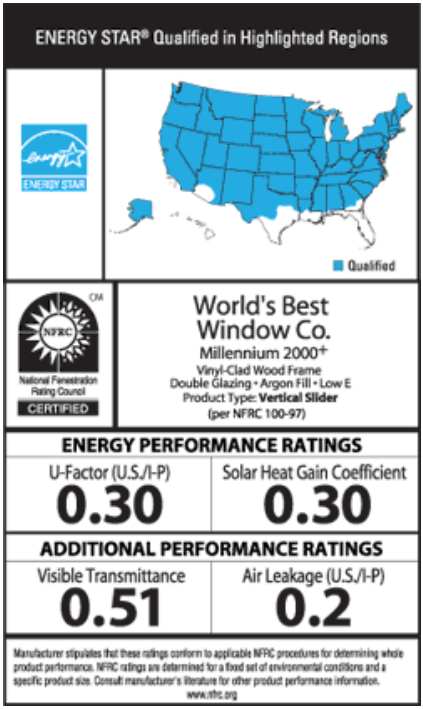
Look for the ENERGY STAR® label when you shop

The ENERGY STAR symbol certifies that a window is energy efficient. In the northern zone, an ENERGY STAR window must achieve a specified National Fenestration Rating Council (NFRC) U-factor. (See page 11 for explanation of U-factor.)

LEARN MORE AT energystar.gov

If comparing two or more ENERGY STAR windows, compare the NFRC labels.

The NFRC has developed a uniform energy rating system for windows, skylights and doors. It's similar to the mileage sticker on cars except that the lower the NFRC-rated U-factor, the better the energy performance. This rating is the only way to accurately compare the energy efficiency of windows.



Look for this label instead of "center of glass" ratings.

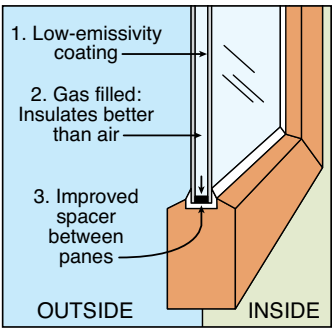
What makes ENERGY STAR windows more efficient?

1. Low-E coating (low-emissivity coating).

Low-E coatings allow light to pass through but reflect heat. This improves energy efficiency year round. A double-pane window with low-E coating can insulate as well as a triple-pane window without low-E coating. Some low-E coatings perform better than others, so check the NFRC rating.

2. Gas filled.

Window manufacturers can replace the air between panes of glass with gases that are better insulators. Argon is the most commonly used gas. These gases are harmless. There's no need to worry about them if the window gets broken.



3. Improved spacers.

An aluminum or steel spacer between the layers of glass is a weak spot for heat loss. Improved spacers (also known as warm edge spacers, insulating spacers, thermally improved spacers) enhance the overall insulating ability of windows. Less condensation forms where the glass meets the window frame in windows with improved spacers.

Proper installation

Even the best windows won't work well if they're improperly installed.

- **Stick to manufacturer instructions.** Some manufacturers will void your warranty if you do not follow manufacturer installation instructions.

- **Seek out trained professionals.** Ask about certification from InstallationMasters, the American Window & Door Institute, or equivalent manufacturer's certification program. Some warranties require that you use an installer certified by the manufacturer.

Protect your family from lead. If your house was built before 1978, it probably contains lead-based paint. You should have it inspected by a lead professional to know for certain where the lead-based paint is. Lead dust from lead-based paint is the leading cause of lead poisoning in children. Under new EPA rules, any contractor or landlord replacing a window must use lead-safe work practices to prevent lead dust hazards. All landlords and contractors must provide a brochure to homeowners before beginning a window, door, or skylight replacement.

Common window questions

Q. Should I keep my old storm windows on after I replace my primary windows?

Yes, if they don't interfere with installation of the new windows or void the warranty on vinyl windows. Keeping the storms on reduces condensation and protects your new windows from the weather.

Q. I need new storm windows. What should I look for?

Look for the low-E storm windows. Field studies have found that low-E storm windows perform much better than plain glass.

Q. I want to reduce my energy bill. Should I buy new windows?

Buying energy-efficient windows can reduce energy costs. But, it takes at least 20 years to recover the cost of the new windows in energy savings. Beware of inflated claims of "up to" 40% or more energy savings. Replacing all the windows in a house rarely saves more than 10% to 15% of the home's heating bill.

There are other reasons for replacing windows: comfort, easier maintenance, windows that are beyond repair, or resale value. Considerations that might tilt the decision in favor of new windows are (1) you plan to live in the house for a long time or (2) you are buying new heating or air-conditioning equipment. Energy-efficient windows may allow you to buy smaller-capacity equipment that costs less.

Q. Is it worth putting shrink-film plastic window insulator kits on my windows?

These temporary kits will usually pay for themselves over the course of a winter. Properly applied, these kits not only stop drafts but provide another layer between you and the outdoors. The kits are a way to simulate the effect of installing new windows. Think of them as temporary storm windows that you have to buy every year.

Q. What about rope caulk?

Rope caulk is a cheap alternative to window insulator kits. Simply press the caulk in place wherever you feel drafts and peel it off come summer. Any residue can be cleaned off with rubbing alcohol. Rope caulk doesn't furnish the extra layer of plastic that window kits do, so savings and comfort are not as great as with window kits. But the price is right, and rope caulk is easier to apply.

Q. What can I do about condensation on my windows?

- Reduce the winter humidity in your home by running exhaust fans.

- Warm up the window glass. Cold outdoor temperatures often require indoor humidity lower than 40% to prevent condensation. MGE recommends using digital humidity gauges rather than dial-type gauges to check the humidity.

Window frame materials

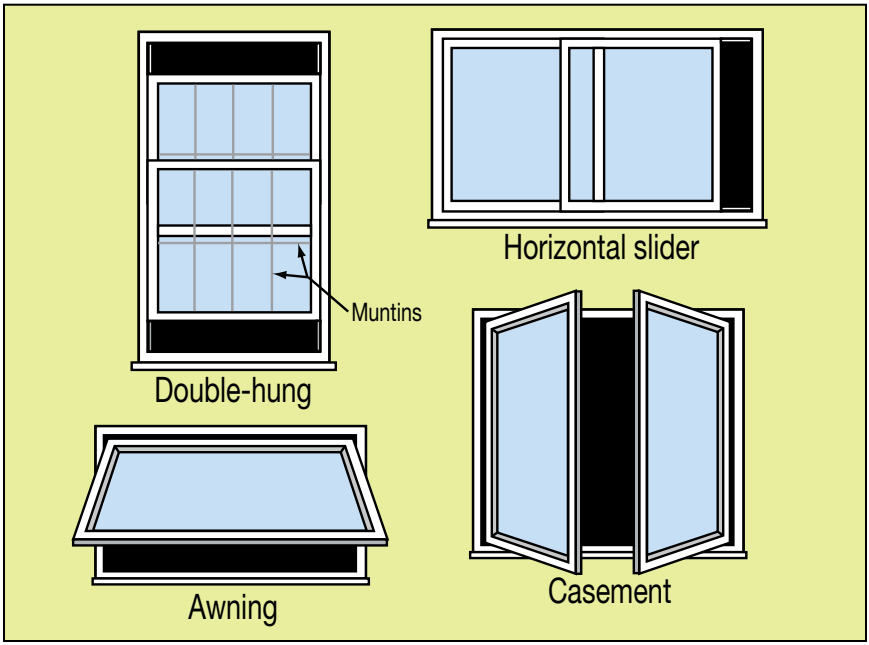
- **Wood** - Most residential windows are made from wood. Look for certification by WDMA (Window and Door Manufacturers Association). For low maintenance, choose wood windows with vinyl or aluminum cladding on the outer surface. They don't need painting.

- **Vinyl windows** are low maintenance but can't be painted. Frames that are fusion-welded are better than frames held together with screws or fasteners. Multiple small chambers in the frames are better than a few large chambers. Sunlight and extreme temperatures used to degrade the vinyl. The better grades of vinyl windows now degrade much less than they used to. Look for certification by AAMA (American Architectural Manufacturer's Association).

- **Fiberglass** - An advantage of fiberglass windows is that their frames expand and contract at the same rate the glass does. The edge seals on fiberglass windows should be less prone to failure.

- **Wood composite** - As good lumber becomes more expensive, manufacturers have developed composites. Sawdust or scrap wood fibers are combined with polymers, resulting in a rigid product with good resistance to rotting and warping.

Common types of windows



Window types

- **Sliding windows** (includes double-hung, single-hung and horizontal sliders) may leak more air, but check the ratings. Well-made double-hung windows can be tighter than some casement windows. Double-hung windows provide a traditional look.

- **Hinged windows** (includes casement and awning windows) generally have lower air leakage than sliding windows.

  - **Casement windows** offer the best ventilation. If left open in the rain, water can damage them.

  - **Awning windows** give good ventilation and can remain open during rain. Most don't open wide enough to qualify as emergency exits.

- **Stationary windows** (includes picture windows) have the least air leakage. Since they can't be opened for ventilation, they are often teamed with operable windows.

Points to consider

- **Air Leakage (AL)** measures the rate at which air passes through joints in the window. AL is measured in cubic feet of air passing through one square foot of window area per minute. The lower the AL value, the less air leakage. Most industry standards and building codes require an AL of 0.3cfm/sq.ft.

- **Construction quality** - Look for frame construction, weather stripping, hardware and edge seals that are durable.

- **Warranty** - Compare warranties carefully. Some are transferable to new owners. Window components may be covered for varying lengths of time, or the warranty may be prorated. Glass seals should have at least a 10-year warranty.

- **Location** - Safety glass may be required if a window is near a door or has a lower-than-normal sill. Check building codes.

- **Emergency egress** - Some windows serve as emergency exits and may have minimum size requirements. Bedroom windows are subject to this requirement.

- **Condensation Resistance** measures how well the window resists water build-up. Condensation Resistance is scored on a scale from 0 to 100. The Higher the condensation resistance factor, the less build-up the window allows.

- **Comfort** - Efficient windows reduce drafts in the winter, and their warmer glass temperatures reduce the chill people feel from cold surfaces.

• **Shading** - Exterior shading works better than interior shading. West-facing windows in particular need good shading. Broad-leafed trees, vine-covered trellises, awnings or overhanging eaves all work well. Interior shades, drapes or blinds must be closed by hand and let in more heat than exterior shading.

• **Noise** - Tight, well-insulated windows keep out noise.

• **Ventilation** - Casement or awning windows are best. Plan for cross ventilation if possible.

• **View** - Windows can provide attractive views, allow you to see who's approaching your house or help you keep an eye on the kids.

• **Cleaning** - Windows that tilt or turn for convenient washing may be draftier. Check air leakage ratings.

• **UV light protection (fading)** - Low-E glass and other window coatings can reduce fading of furnishings. Reducing ultraviolet (UV) light is not the whole story. Visible light fades many materials as well.

• **Storm panels (energy panels)** - If the window you're buying offers a storm panel option, it's usually worth getting. Storm panels with low-E glass are even better.

• **Orientation** - Solar heating is desirable in the winter but not in the summer. It's now possible to "tune" windows to their orientation by choosing different energy-performance characteristics for different sides of the house. North-facing windows benefit the most from the improved insulation offered by low U-factors (the lower the NFRC U-factor, the better).

New construction

Plan your windows right and save money by buying smaller cooling and heating equipment. A good design considers window type, orientation, overhangs and cross ventilation. The result is better comfort, attractive natural light, and reduced heating, cooling and lighting costs.

MGE's *New Home Planner* is available to MGE customers by calling (608) 252-7117 or can be downloaded at mge.com.

Skylights and roof windows

Energy efficiency and good installation are especially critical in these nonvertical windows. Look for ENERGY STAR certification. Shades or covers can reduce unwanted heat gain and glare from direct sunlight. Moveable insulated coverings can provide both summer shading and winter insulating, but some warranties won't cover damage due to improper use of insulated covers. Condensation can be a problem with skylights and roof windows, especially in high-humidity areas like bathrooms or kitchens.

Avoid dome-shaped skylights that can't be manufactured with low-E coatings or gas fills.

State-of-the-art windows

The most efficient windows combine a triple-pane window with two low-E-coated surfaces to achieve U-factors lower than .25. Sometimes the middle pane is a suspended clear plastic film.

Superior windows come with a higher price tag. But they can improve comfort and prevent condensation problems.

Replacement window kits

Some manufacturers sell kits for replacing just the sashes on double-hung windows. Designed for the do-it-yourself market, these kits include jamb liners (side channels) and full weather stripping. Be sure the frame is not rotted or leaky before buying one of these kits.

Definition of terms

Divided light. A window with many smaller panes separated by muntins. In windows with insulated glass, divided lights reduce energy efficiency because the glass insulates better than the muntins and spacers. Manufacturers have developed a variety of ways of simulating divided lights. Check the NFRC rating to make sure you're getting the overall insulating performance you expect.

Glazing. Layer of glass or plastic. Triple glazed = three layers of glass = triple pane.

Insulated glass. Double- or triple-pane glass.

Muntins (see page 7 for illustration). The dividing strips that hold panes in place in a divided light window. Old windows used many panes of small glass because the technology did not exist to make large panes.

R-value. A measure of insulating ability. Higher R-values mean better insulating ability. Beware of "center of glass" R-values—they don't measure overall performance.

Sash. The glass and its surrounding frame make up a sash. A double-hung window has an upper sash and a lower sash.

U-factor (also known as U-value). A measure of how well a material conducts heat. Lower U-factors mean better insulating ability. Whole window U-factors as rated by the NFRC are the best way to compare "apples to apples."

Resources and references

Window links

mge.com/windowlinks

- **Efficient Windows Collaborative**
  Easy to understand window information. Excellent section about choosing efficient windows.
- **ENERGY STAR®**
  Features ENERGY STAR products and programs, including ENERGY STAR-rated windows and purchasing tips.
- ***Residential Windows*** by Selkowitz, Carmody and Heschong is an excellent book on window design and energy efficiency. The energy comparison graphs use Madison, Wis., as an example. Copies are available through public libraries.
- **Other resources**
  efficientwindowcoverings.org
  greenbuildingadvisor.com

Focus on Energy
www.focusonenergy.com

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Partnering with Wisconsin utilities

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listening. learning.

MGE takes responsibility to provide information and education to serve our customers and stakeholders. We educate customers today to help inform their decision making. We educate tomorrow's stakeholders so they can help plan our energy future.

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When replacing windows, look for the ENERGY STAR® label.

Working together we can make a difference.

Contact us for information about:

- Heating/Air-conditioning.
- Insulating/Weatherizing.
- Lighting.
- Windows/Doors.
- Appliances.
- Water heating.

Get more home energy information at:

- *mge.com/saving-energy/*.
- Home Energy Line 608-252-7117.
- 800-245-1125.

Questions about billing? Call:

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