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## High Function, Low Energy: How Advanced Window Technologies Enhance Green Building Performance



Whether the goal is an ENERGY STAR® home, green building certification, or simply meeting the demands of increasingly eco-savvy consumers, the process of designing, building, and remodeling homes is more complex than ever. It takes integrated, whole-house thinking to create buildings that protect the health of people and the planet, and industry pros know that windows are a key component in that equation.

As builders, architects, and remodelers strive simultaneously to please their clients and adopt widely embraced carbon-neutral practices, there is little margin for error. Understanding window technology choices can add up to long-term cost savings for clients, establish building professionals as “thought leaders,” and avoid the reputation-damaging callbacks resulting from leakage, deterioration, and poor thermal performance.

### VALUE JUDGMENTS

The days of cheaply produced mansions are over. Today, design dollars are being focused on smaller, well-planned spaces made with quality materials. Clients are demanding simplicity, ease of use, resource efficiency, and products that are going to last a long time.” Due to general economic uncertainty, homeowners are much more likely to scrutinize every aspect of their purchase and carry particularly high expectations for products,” says Jim Howland, senior director in the real estate industries practice at J.D. Power and Associates, a global marketing information firm.

A recent survey conducted by AVID Ratings, a customer loyalty management firm specializing in the home-building industry, revealed that ultra-efficient windows are among the most important items consumers look for in new homes. So important, in fact, that they’re willing to shell out \$17,000 more for an average-costing (\$292,000) home if it contains green features such as windows, according to a study by the Royal Institution of Chartered Surveyors (RICS), an international organization that regulates property professionals and surveyors. They’re recognizing

### ABOUT THE AUTHOR



#### Cheryl Weber

Cheryl Weber is an award-winning journalist and LEED-Accredited Professional who has been addressing the information needs of the design and building industries for nearly 20 years. A former staff editor at REMODELING magazine, she is currently a senior contributing editor at *residential architect* magazine, where she writes the Practice column and cover profiles of architecture firms. She writes the AIA Architect section of *EcoHome* magazine and has also contributed many case studies to that publication. She also contributes articles to other design and construction-related magazines and websites. Her work has been recognized by the American Society of Business Press Editors and American Business Media. She lives in Lancaster, PA.



that it is not only possible, but also financially prudent to blend their aesthetic preferences with the desire to do something good for the environment.

That's true of remodeling clients, too. Even during the economic downturn, energy-efficient home renovations fared consistently better than the renovation market in general. According to SBI Energy, an industrial market research firm, from 2009 to 2013 the energy-efficient home renovations market will grow 15 percent—50 percent faster than the renovations market as a whole—to a total of \$35 billion in 2013.

### LITMUS TEST

A close look at the makeup of high-performance windows reveals just how different they are from their predecessors. For example, frames are now made of materials that maintain their shape in extreme climates and won't rot or need painting.

Because of its high tensile strength and superior insulating qualities, fiberglass is one of the best window-frame materials on the market today. It conducts very little heat and cold, so its R-value is high—a 10, compared to vinyl (6), wood (5), and aluminum (0.2), which can corrode or pit in coastal areas. For reference: <http://www.fiberglass-windows.com/save-energy.html>  
Another bonus: Its main ingredient comes from



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### MILGARD® ESSENCE™ SERIES WOOD WINDOWS

The compromise is over. Introducing the Essence Series from Milgard, wood windows that uniquely deliver durability, efficiency, performance, and style in one economical package. A new approach to window design, Essence features the beauty of rich, natural wood on the interior and the durability of fiberglass on the exterior. Plus, Essence is packed with innovation inside and out—an advanced water management system, SmartTouch® technology, 15 durable and stylish exterior finishes, and it meets ENERGY STAR® requirements without any upgrades. For more information, visit [pro.milgard.com](http://pro.milgard.com) or call 1.800.MILGARD.

an abundant resource—sand—and manufacturing is easy on the environment. Fiberglass windows have about 80 percent less embodied energy than aluminum and 39 percent less than vinyl, according to Fiberglass-Windows.com, an independent trade group in East Greenwich, CT.

Window spacers, which separate the glass lites, are another potential source of thermal transfer. Warm-edge spacers are replacing traditional aluminum spacers, which conduct heat and cold and can cause condensation. These can be material substitutions that are less conductive, such as stainless steel or insulating silicone foam, or new designs that change the spacer's cross-sectional shape.

Low-E coatings supply additional energy efficiencies. Applied to one side of the glass, these transparent metal or metallic oxide films reflect heat from its source, reducing the window's U-factor. That keeps residents cooler

in the summer and warmer in winter, and it screens harmful UV rays without sacrificing light.

Illustration: SunCoat Low-E Glass: <http://pro.milgard.com/milgard-advantages/suncoat-low-e-insulating-glass.asp>

Builders and architects don't want to spend too much time comparing product performance. To make money, they need to write specs quickly and confidently so a project can move into construction.

The ENERGY STAR program does some of that legwork by labeling windows that meet Department of Energy (DOE) criteria, and the National Fenestration Rating Council (NFRC) label certifies that ENERGY STAR windows meet local climatic guidelines for Solar Heat Gain Co-Efficient (SHGC), U-factor, visible light transmittance, and air leakage. Chart: <http://www.efficientwindows.org/energystar.cfm>

With all the emphasis on energy performance, it's easy to forget that simple issues such as operability and design versatility actually matter in terms of sustainability—and client loyalty. The Environmental Protection Agency (EPA) says North Americans spend 90 percent of their time indoors, typically in well-sealed buildings that trap toxins from molds, bacteria, and common household materials. That means cross-ventilation, and windows that are easy to open and close, are essential. So is good design.





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### IT ALL COMES TOGETHER IN MILGARD ESSENCE™ SERIES.

New Essence Series windows are beautiful on the inside and Milgard tough on the outside. They have outstanding energy-efficiency and innovative new features.

Visit [pro.milgard.com/essence](http://pro.milgard.com/essence) to watch an Essence video and sign up to receive your FREE Essence color card & brochure.



Choosing a robust product line with a wide range of attractive configurations will save on material waste when it's time to remodel or add on to a home. The new windows are more likely to blend in stylistically, while allowing the older ones to age gracefully in place.

### THE MILGARD ESSENCE SERIES DIFFERENCE

The Milgard Essence Series windows address industry demand for environmentally friendly products across a spectrum of key areas. In a competitive business environment, they offer a differentiating point for builders, architects, and remodelers, and some compelling advantages for homeowners.

**Durability.** With wood on the inside and fiberglass on the outside, Essence is a beautiful wood window with none of wood's problems, such as rotting and constant maintenance. The material of choice for surf boards and boats, fiberglass withstands the harshest environmental conditions, and it reduces heat and cold conductance. The Milgard proprietary powder coating, available in 15 colors, adds a tough, exterior surface that resists gouges, chipping, and fading. Plus, a patented weep system ensures that any moisture that might get into a window frame drains without touching the wood surfaces.

### High-performance glass and frames.

Essence Series windows meet 2010 ENERGY

STAR requirements in all zones, eliminating the need for costly energy upgrades. The standard unit is dual pane with an argon/air mixture, SunCoat® Low-E glass, and EdgeGardMAX™, a state-of-the-art, warm-edge spacer that maintains a more constant temperature and prevents seal failures. A triple-glaze option raises the bar even higher. Designed with a 1-inch insulated glass cavity, it is up to 30 percent more efficient than the base window package. Chart: SunCoatMAX Low-E Glass: <http://pro.milgard.com/milgard-advantages/suncoat-low-e-insulating-glass.asp>



**Easy to operate.** Value-conscious buyers, as well as aging boomers, appreciate small details that simplify everyday life. The Milgard SmartTouch® lock, which opens the window or closes and locks it in one smooth motion, earned the Arthritis Foundation's Ease of Use Recommendation for its universal design. Builders can expect to see more demand for such innovations in the future. A 2007 study by Hanley Wood, LLC, a construction and housing-related business-to-business publisher, showed that universal design appealed to more than 75 percent of boomers surveyed. As this population ages, architects, remodelers, and builders can extend a home's livability by incorporating design solutions that contribute to independence and quality of life. Chart: Number of Older Americans: <http://pro.milgard.com/milgard-initiatives/aging-in-place.asp>

**Produced regionally.** Milgard manufactures windows in three facilities in the Pacific Northwest, four in California, one in Phoenix, one in the Chicago area, and one in the Denver area—a geographical footprint that covers more than 25 percent of the nation. That's important because one-third of U.S. carbon emissions are transportation-related, according to the Environmental Defense Fund (EDF). Regionally produced materials reduce the amount of fuel burned in transport from manufacturing site to supplier. The USGBC's LEED certification program awards points for materials extracted and made within a 500-mile radius of a building site. Your local dealer or sales representative can provide manufacturing location information on Milgard window and door models.

**Full lifetime warranty.** The Essence Series comes with a Full Lifetime Warranty, including Glass Breakage Coverage. It promises that the company will repair or replace any defective window free of charge to the original homeowner—parts and labor included.

To find out more about the Milgard Essence Series windows, or for the downloadable Full Lifetime Warranty, performance data, and CAD files please visit [pro.milgard.com](http://pro.milgard.com).



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## MILGARD ESSENCE SERIES OF ENERGY-EFFICIENT WINDOWS OFFER THE WARMTH OF A WOOD INTERIOR AND THE DURABILITY OF A FIBERGLASS EXTERIOR

The debut of the new Milgard Essence Series of high-performance wood windows is one of those right time/right place scenarios. Recent surveys show that builders, remodelers, new-home buyers, and owners intent on improvement projects are all focused on a greener, more energy-efficient home.

In fact, a recent survey by the National Association of Home Builders (NAHB), looking ahead to 2015, reports that 68 percent of builders said their homes would be more energy efficient.

New-home buyers, as reflected in Better Homes and Gardens' annual Next Home Survey, want more energy-efficient homes with more than half saying green building practices and materials will be "more important" when purchasing their next home. Energy efficiency also promises to be a focus of future remodeling projects, with respondents placing the installation of ENERGY STAR® windows and doors above retrofitting with high-efficiency HVAC systems and ENERGY STAR appliances.

"Our Essence Series offers everything the industry's been waiting for in a wood window—breakthrough engineering,

Sponsored by Milgard Windows & Doors

## THE BEST OF BOTH WORLDS

beauty, performance," says Jim Sheehan, Product Manager for Milgard Windows & Doors, a Masco company based in Tacoma, Wash. "The Essence Series incorporates the best technologies available today and is purposely designed to accommodate energy-efficiency and performance options we can already see on the horizon. [They] meet... ENERGY STAR requirements in all zones with no upcharges."

### SUPERIOR FEATURES

The Essence Series offers the warmth and style of a wood interior with the strength and durability of a fiberglass exterior. They include such innovative features as the SmartTouch® lock as well as a new fiberglass finishing process that is not only durable but also allows for 15 different finishes to be delivered in three to four weeks (or less!). The series is covered by the Milgard Full Lifetime Warranty with Glass Breakage Coverage, including parts and labor.

Essence Series windows are available in pine, Clear Vertical Grain Douglas fir, or primed wood ready for painting. Due to unique joinery methods, there are no visible fasteners, nail holes or staple holes, which saves time and money for installation and finishing contractors. Double hung and glider windows come with a traditional spoon lock or the SmartTouch lock.

Other superior features include:

- HydroGard™, a hidden, integrated water management system
- Four exterior colors with standard lead times of three to four weeks; an additional 11 color options with slightly extended lead times
- A choice of two energy packages: 3D® and 3D MAX®
- Energy consumption and UV control through a choice of standard SunCoat®Low-E insulating glass or SunCoatMAX® option.

### HIGH QUALITY AND SHORTER LEAD TIMES

The Milgard Essence Series takes advantage of the newest advances in coating technologies with a powder-coated exterior finish that provides better color stability and resists scratches and gouges. The powder-coating process uses no solvents to eliminate VOCs and, unlike paint systems, it effectively recovers as much as 95 percent of any wasted powder-coating material for re-use.

Milgard is a vertically integrated window and door manufacturer, which allows for high quality and cost controls as well as shorter lead times. "We have a vinyl plant, an extrusion plant that makes the lineals or 'sticks,' a fiberglass pultrusion plant and even our own—make that two—glass tempering plants," says Jim Sheehan, Product Manager at Milgard. "There aren't a lot of companies like us out there."

### About Masco Corporation

Headquartered in Taylor, Mich., Masco Corporation (NYSE: MAS) is one of the world's largest manufacturers of brand-name consumer products for the home and family. Masco is also a leading provider of services that include the installation of insulation and other building products. For more information, visit [www.masco.com](http://www.masco.com) or call 313.274.7400

### About Milgard Windows & Doors

Milgard Windows & Doors, a Masco company based in Tacoma, Wash., offers a full line of wood, aluminum, vinyl, and fiberglass windows and patio doors for builders, dealers, and homeowners. The company has been recognized for manufacturing the nation's highest quality vinyl windows six times in a yearly survey sponsored by Hanley Wood, LLC, publishers of Builder magazine. Milgard employs approximately 3,500 people nationwide. For more information, visit [www.milgard.com](http://www.milgard.com) or call 1.800.MILGARD.



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