

GREEN REPORT

Looking into Green Windows

By Jim Hackler

In spite of the housing industry coming to an economic standstill, interest in green continues to grow. The McGraw-Hill Construction, Green Outlook 2009 estimates the green building market will more than double in the next five years to nearly \$100 billion. Building material dealers who know what it means to be green are in the best position to profit from what may be one of the economy's few bright spots.

"We're actively in it," says Mike Moore, vice president of materials management with TW Perry. "Others aren't there yet, but with most state and local governments mandating that anything built with state or federal funds has to have some sort of green certification—it's going to hit everywhere at some point." Moore says TW Perry made a strategic



decision in 2008 to position itself as a leader in providing green construction materials for the Mid-Atlantic States. "I had to do a sales job on my fellow owners to put the resources behind this entire initiative, and I think now, a little over a year later, we're seeing the benefits of that."

Green Building 101

One of the first steps Moore's company took was to educate itself on green. He says *LBM Journal's* Certified Green Dealer™ Program is a good start, and green building conferences staged by the National Association of Home Builders and U.S. Green Building

Council are excellent places to hear some of the industry's top experts. Another valuable resource are some of the local and regional programs such as EarthCraft House™, Earth Advantage®, Green Built® and Built Green® which often hold trainings and education seminars (mostly geared towards homebuilders, but it's good information for anyone in the industry).

The primary tool of these national and local green building programs is a rating system that requires builders to meet a minimum number of points for certification of a project, and in most cases, submit to third-party verification. The two national rating systems are NAHB's National Green Building Standard™ (that's recently been approved by ANSI) and the USGBC's LEED for Homes. You can pull up detailed information online on how these and other rating systems categorize different products toward earning enough points for certification (knowing this is a big help to your customers).

Having headed up two green building programs (EarthCraft House and LEED for Homes), I'm often asked which is the best. The answer I give is whichever one you choose. I emphasize that rating systems are just tools that serve as a guide for home builders and renovators to be greener—it's still up to them to choose what makes the most sense. The truth is the building science behind the programs is essentially the same—what varies is what each considers "green enough" and what level of third-party verification or accountability is required.

There's so much information on green, it can be overwhelming. You also have to watch out for "green washing" where manufacturers make unjustified claims that their products are environmentally-friendly. "The difficulty is that you can take almost any product these days and you slap some sort of label on it that tells you it's green for one reason or another," says Moore.

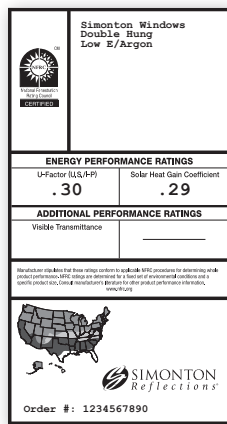
The 25 million residential vinyl windows installed in 2002 have already saved their homeowners the expense and time of using 6.25 million gallons of paint (the amount of paint needed to maintain wood windows in a 7 year time period)—that's enough to annually paint San Francisco's Golden Gate Bridge until the year 2634.

The Case for Windows

While many products have a long list of green (or not so green) attributes, it's a good idea to focus on just one or two. In the case of windows, it's simple. "It's strictly about energy efficiency," says Moore. "What's important for us is to stress the energy savings and what it adds to a building envelope." And if you're talking about energy efficiency, you're talking about what's central to every green building program in the country—and consumers understand it as well. In a survey by Schulman, Ronca and Bucavalas, Inc. (SRBI) on America's attitudes toward environmental and energy issues, it found the public making a strong link between energy and the environment. Ninety percent agreed they were very concerned about the

environment and 94 percent strongly agreed that "saving energy helps the environment."

Figuring out which windows are the most energy-efficient is also simple thanks to the energy performance label developed by the National Fenestration Rating Council® (NFRC). Only windows that have been submitted by their manufacturers to the NFRC for testing can feature its energy



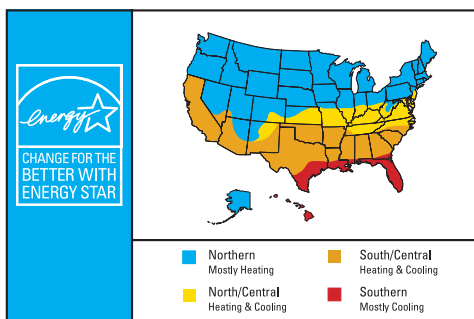
performance label. The tests figure out how well a window will help warm a house in the winter, keep it cool in the summer, keep out the wind and resist condensation. It's a test of the overall performance of a window (glass and frame) that is presented as the U-factor and Solar Heat Gain Coefficient (SHGC).

The U-factor (or you may know it as U-value) measures how well a window and its frame prevents heat from escaping—it's especially important for colder, northern climates.

While there are some new, super energy-efficient windows that have a U-factor as low as 0.1,

you'll generally see ratings for windows from 0.2 to 0.5. The rule with U-factors is the lower the number, the more energy-efficient the window.

The Solar Heat Gain Coefficient measures how well a window blocks the heat created from sunlight. The SHGC is a fraction from 0 to 1 of how much heat



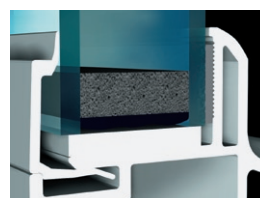
from the sun (both directly transmitted and absorbed) enters through a window. Just like the U-factor, the lower the window's solar heat gain coefficient, the less solar heat gets into the house which is a good thing for hotter climates, but a higher SHGC may be more appropriate in colder parts of the country.

If coefficients and fractions give you a headache, just look for the ENERGY STAR logo on the NFRC label. Windows constructed to meet ENERGY STAR® standards are 40 percent more efficient than the average window built to code. Another selling point is ENERGY STAR has the most brand recognition of any energy program in the country. The government-backed initiative tailors its criteria for windows depending on which part of the country you're in (it breaks it down into four climate zones).

Clearly Better Glass

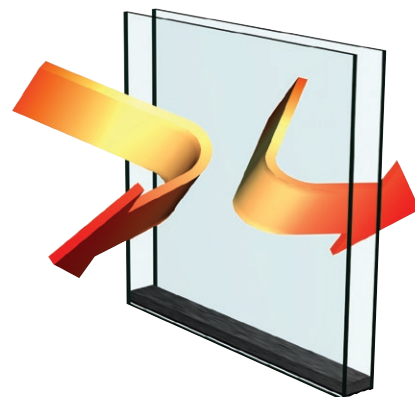
Navigating a builder or renovator through a NFRC label is a good start (you can purchase NFRC label brochures from its website to have on hand for your customers) – but you'll likely get questions on what makes one window more energy-efficient than another. Special

coatings on today's glass have dramatically improved a window's performance. You'll see what's called low emissivity (Low E) glass that has a transparent coating made of metal or metallic oxide. According to the American Council for an Energy-Efficient Economy (ACEEE), the invention and commercial development of low-emissivity coatings in the 1980s is the single most important improvement to the energy-efficiency



of windows. The benefit of Low E glass is that it reflects infrared light—keeping heat inside in the winter and outside in summer. Another important feature is it reflects damaging ultraviolet light that helps keep furniture, curtains and rugs from fading. One of the newest energy-efficient coatings is LoE³-366® Glass made by Cardinal Glass Industries that's a triple layer of a transparent silver coating that can drop a window's U-factor to as low as .24 and a SHGC to .27. A few manufacturers such as Simonton Windows are now offering this high-performance glass in their products.

The number of panes of glass also increases a window's energy efficiency. You may find a few triple





This 32-foot high open design features interior windows from Simonton.

pane windows, but double glazing is more common. A neat trick to increase a window's energy savings is filling the space between the glass with an inert, odorless gas such as argon or krypton that insulates better than regular air because it's denser. It also works as an additional barrier to keep UV rays from entering the house.

Even spacers for the glass can impact its energy efficiency. An edge spacer holds the panes of glass apart and provides an airtight seal in an insulated glass window. The Intercept® Spacer System and Super Spacer® System are two of the better approaches on the market that use flexible materials that reduce heat flow, prevent condensation and are better at keeping the insulating gas in the window. PPG Industries, maker of the Intercept Spacer, says its field data shows the failure rate of windows using its product is less than a quarter of one percent.

Framing a Discussion on Green

The window's frame is also important to making it energy efficient. Vinyl and wood are far better insulators than metals frames such as aluminum—but it's not just about the materials. The quality of the construction of the frame is important too. In addition to the U-factor and SHGC on the NFRC label is a

rating for air leakage (this rating is not always listed because it's optional for a manufacturer to include it or not). The air leakage rating (AL) is expressed as the equivalent cubic feet of air passing through a square foot of window area. Here again, the lower the number the better.

While everything that makes a window more energy-efficient is certainly a strong selling point, other important features make it green including how durable it is, what's its recycled content, how much energy did it take to make and transport it, and is it safe to manufacture, install and discard. The 2009 report *The Remodeling Market in Transition* by The Joint Center of Housing Studies of Harvard University shows there's growing interest in sustainable remodeling projects that are addressing more than just energy-efficiency—and a survey of full-service remodeling contractors found 40 percent already are regularly or occasionally installing products that are "greener."

If 100,000 homes with single pane windows switched to Energy Star vinyl windows that met the new energy tax credit requirements—they'd save enough electricity to run the refrigerators of every house in Austin, Texas—and they'd pocket \$1,500 in tax credits.

As far as maintenance and durability, most of your customers already know vinyl is easier to care for and lasts much longer (some with lifetime warranties which you won't find with wood). The big environmental question that's likely to come up is what it's made from. The U.S. Green Building Council took a hard look at vinyl used in flooring, siding, piping and windows, and weighed its environmental merits against other products. The approach it took is called "Life Cycle Assessment" which examines the impacts on human health and the environment throughout the "life" of a product. The conclusion of the 2007 report is that when comparing vinyl with other common building materials, it didn't emerge as a clear winner or loser (nearly every building material has its environmental pros and cons). The report goes on to say, "The proper conclusion to be drawn from this

The energy saved in the manufacturing process of vinyl windows compared to metal or aluminum saves nearly 2 trillion BTUs of energy annually – that's enough energy to heat 40,000 single family homes a year or to keep 900 railroad cars of coal out of a power plant.

analysis is that from a life cycle human health perspective, the key issue is window energy efficiency rather than frame material."

Even columnists from TreeHugger,[™] an environmental blog that gets more than 1.4 million visitors a month, see vinyl windows as a practical

choice. "Millions of people with low incomes live with inefficient, uncomfortable windows," wrote John Laumer in a post titled Look Out Any Window. "Vinyl replacement windows are the most common and easily installed technology for upgrading energy performance affordably." However, Laumer and his fellow columnist Lloyd Alter don't sugarcoat their concerns about the manufacturing and disposal of vinyl. "The single issue here is windows, which people do not tend to eat, and for which the alternatives are far more expensive," writes Alter. "An analysis of pro versus con on the significant hazards is best done if vinyl products are put into two categories: those with a long design life such as a window or drain pipe and those made to be used briefly and tossed in the trash such as a plastic wrap or a child's toy. My defense of vinyl is on the former category only."

The Bottom Line

Jeff Hunt, a sales manager with Reeb Millwork, agrees that vinyl has advantages over wood. "Vinyl as a material is a whole lot less, uses a whole lot less energy to produce than the alternative," he says. "Where Simonton and other window manufacturers present the best opportunity for green is in the area of energy savings. I think that the market has spoken,

that a vinyl window meets the requirements." And helping make some of the most energy-efficient windows even more affordable is the American Recovery and Reinvestment Act. It increased the previous tax credit for home improvements from 10 percent to 30 percent of the cost, and increased the maximum amount of the credit from \$500 to \$1,500 for projects completed this year or next. Dealers should note that not all ENERGY STAR windows qualify for the tax break (requirements are U-factor ≤ 0.30 and SHGC ≤ 0.30).

For those building material suppliers who still think vinyl windows may be a tough sale for their greenest customers should talk to John Kosmer whose 4,000 square foot solar house in upstate New York is costing only \$2.50 a day to heat and cool. "One of our most important decisions was which windows to install," says Kosmer. "I specified ENERGY STAR compliant windows from Simonton Windows. Choosing vinyl windows with an upgraded glass package is one of the best investments any homeowner can make to save on energy bills."

Green Resources

- The Vinyl Institute—www.vinylinfo.org
- The Green Building Resource Center—www.globalgreen.org
- Vinyl by Design—www.vinylbydesign.com
- LBM Journal's Certified Green Dealer Program—www.certifiedgreendealer.com
- NAHB's National Green Building Program—www.nahbgreen.org
- U.S. Green Building Council's LEED for Homes—www.usgbc.org
- TreeHugger—www.treehugger.com
- AAMA—www.aamanet.org
- ENERGY STAR—www.energystar.gov
- Environmental Building News—www.buildinggreen.com
- Whole Building Design Guide—www.wbdg.org

If a million older homes upgraded to Energy Star vinyl windows, the combined annual savings would be more than \$130 million - that's how much the U.S. Department of Energy just targeted for the development and use of fuel cells to power our cars, homes, and businesses.



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