

LUXURY

HOME DESIGN

183
Beautiful
DESIGNS

**From Small Luxury
to Estates**



The Sustainable Lifestyle Issue

- ◆ Choosing windows and doors for beauty and efficiency
- ◆ Building and living in an eco-friendly home
- ◆ Our favorite green luxury products

WINTER 2011/2012



windows and doors

Window of Opportunity

Now is your best chance to choose the windows and doors that will keep your home comfortable and energy efficient for years to come

By Paige Lozier

IMAGE COURTESY OF ANDERSEN WINDOWS, INC.

Andersen's 400 Series windows offer unlimited versatility. Available in an almost endless array of combinations to match your home's style, the 400 series also offers Andersen's trademark Low-E4 glass, with or without Sun Glass or SmartSun Glass for additional protection from solar heat gain. All of the options above are available with Stormwatch Protection for coastal areas. www.andersenwindows.com

BUILDING A LUXURY HOME MAY seem counterproductive to the concept of sustainability. The current popularity of the "not so big" house (a term you may have heard from Susan Susanka's series of books by the same name) and the even smaller subculture of the "tiny house" undoubtedly illustrate a greener way to build, with less material needed and smaller

spaces to heat and cool. But these homes are often impractical for a family of more than...one. You can rid yourself of half your possessions, but it's likely you'll still want a room of your own, a bit of space to stretch out in, and the luxuries that create a beautiful and comfortable home for family and guests. There are indeed ways to build a spacious luxury home in tune

with sustainable design. One of the most effective is to choose windows and doors that incorporate energy-saving materials and technology.

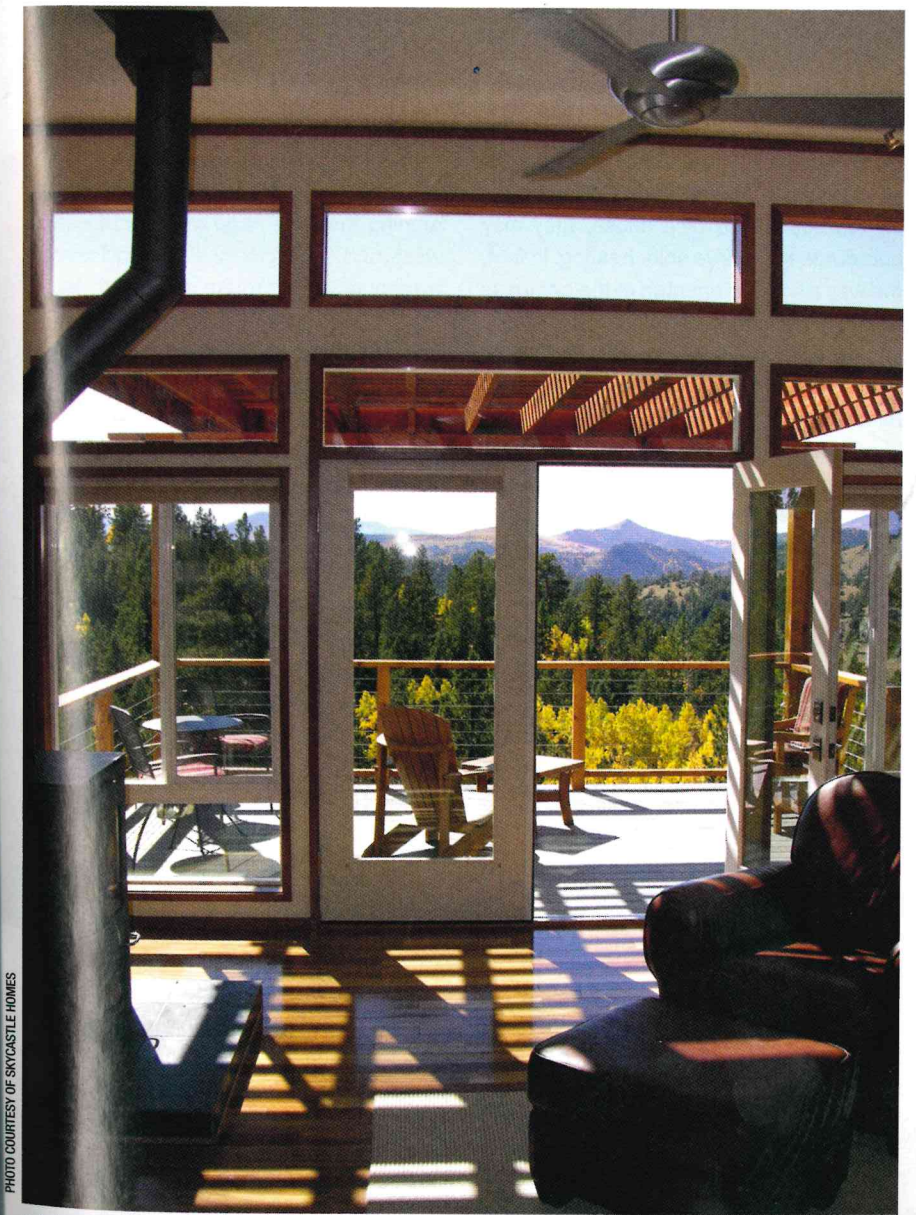
Windows and doors are the major culprit of energy loss in a home, with most U.S. homes losing approximately 20% of their energy through openings. Doors are a little less critical as they typically

PHOTO COURTESY OF SKYCASTLE HOMES

account for a much smaller percentage of the exterior wall than windows and generally contain less glass, which is the weak link. To illustrate, an Energy Star compliant window with a U-value of .3 has an equivalent R-value of 3.3. Not bad for a window...but it sits in a wall that is R-19 or better. Dave Jenkins, designer of the Energy Saver Plus plans (featured in this magazine on pages 69 and 132, or see the whole collection online at www.eplans.com/energysaver), says,

"Installing low-performing windows and doors in one of our cutting-edge designs is just like leaving one open 24-7."

While windows and doors may be inefficient from a heating and cooling perspective, they provide natural light and reduce the amount of energy required to light the home. The past decade's advances in window technology have helped to mitigate and balance the drawbacks of window glass by making it more efficient while preserving



Window construction, glazing, shading, and placement combine for both maximum comfort and view in this Colorado home by Rodwin Architecture. To see more photos and the floor plans, visit eplans.com and enter plan code HWEP69531.

The Alphabet Soup of Industry Language

Before we go any further, let's review the basics needed to understand a window's efficiency.

U-Value: Measures the window assembly's ability to resist thermal transfer and is the defining measure of a window's thermal performance. The lower the U-value the better, with .35 being an average new window and .27 being very good.

R-value: The measure of a product's resistance to heat loss; the higher the R-value, the greater the insulating power. This number is typically used for other building materials such as insulation, but does not accurately reflect a window's interaction with sunlight and airflow, which is why the U-value was developed specifically for windows.

Low-E: Stands for Low-Emissivity coatings, a critical factor in blocking radiant heat transfer. In most climates, a double-paned window with Low-E films is the bare minimum. For the highest performance, look to triple-paned windows that have multiple layers of Low-E films combined with thermally broken fiberglass frames. Today's Low-E coatings are nearly invisible. They vary in quality from brand to brand, and some manufacturers use multiple Low-E layers to create super-efficient windows.

SHGC: The Solar Heat Gain Coefficient is another important concept that measures solar heat transfer. Together, the U-value and the SHGC make up a window's Energy Performance Rating.

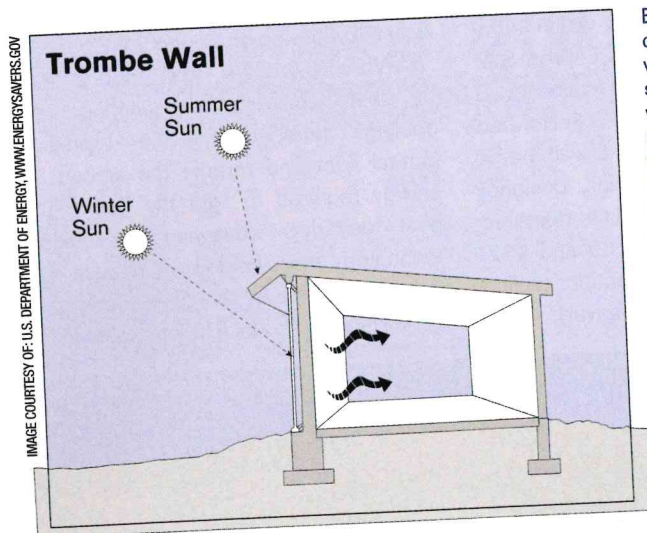
IECC: The International Energy Conservation Code. Find their interactive climate zone chart at energycode.pnl.gov/EnergyCodeReqs to see minimum R-values for walls, ceilings, windows, and more in your county.

windows and doors

the benefits of natural light and expansive views.

To accurately place, protect, and select windows, work with an energy modeler who will provide a HERS rating. The Home Energy Rating System (HERS) equates to a miles-per-gallon rating that can be used during the design/build process to compare various strategies and products. According to Scott Rodwin, principal at Rodwin Architecture in Boulder, Colo., "The IECC climate zone chart is also a good place to start planning, as it lists the performance requirements necessary for windows to meet code in different parts of the country. For example, in cloudier cooler climates, you generally want to maximize the SHGC on the south face and decrease your overhangs to increase passive solar gain. In sunny hot locations, you would want to do the reverse. Overall, the total ratio of window to floor area should be below 18%, with the majority of windows on the south. The southern exposure is the easiest side on which to control solar gain by blocking it in the summer and allowing it in the winter."

Windows can become an asset from a heating perspective. Properly arrayed



Even a small overhang can protect south-facing windows from the high summer sun. In the winter, when the sun is low in the sky, sun can enter through those same windows and help to heat the home. For eastern and western exposures, where the sun's angle changes throughout the day, deciduous shade trees can help to keep your home cool in the summer, while allowing the sun's rays to penetrate in the winter.

on the south side of a house, they may contribute to passive solar heating. In fact, the way a home is oriented to the compass points can have an even more significant impact on energy efficiency than the types of windows chosen. Overhangs, insulating blinds, and specific window types can be used in conjunction with the orientation of the home to minimize energy loss. Rodwin Architecture always begins a design by orienting the home to optimize passive solar benefits. That generally means

running the main ridge of the roof east to west, and strategically sizing and placing overhangs that protect the south-facing windows from summer sun yet allow the sun's rays to penetrate in the winter when it is low on the horizon. To frame critical views on the east or west, they simply use deep overhangs and individual picture windows instead of large banks of unprotected glass.

Designers take all of these factors into consideration when specifying windows, and they are continually seeking the optimal intersection of price, energy performance, and overall design. There are a wide variety of windows and doors that meet these needs, with several manufacturers standing out in the crowd. Rodwin typically uses metal clad wood windows on high-end projects, as their solid quality and exterior durability can stand up to the strong Colorado sun and freeze/thaw cycle. For metal clad wood windows, he prefers Pella, Hurd, Jeld-Wen, Sierra Pacific, Weather Shield, or Andersen. When the budget allows and for his most energy-efficient homes, which are considered "near net zero" for energy consumption, he specifies fiberglass windows for optimal energy performance and durability. For entry doors, Therma-Tru fiberglass insulated doors beat the competition as a durable, energy-efficient, and cost-effective product.



Entry doors in the Classic-Craft Canvas Collection are made with smooth fiberglass and are shipped ready to paint. The Energy Star-certified doors come in five styles—two-panel square top, two-panel plank soft arch, four-panel arch top, five-panel, and one-panel plank Craftsman—and with a range of glass options, including 11 low-E models. www.thermatru.com

Jenkins also prefers Andersen windows, and typically specifies the Andersen A-Series and 400 Series for custom clients. Andersen has an extensive variety of options for exterior color, interior wood species, finishes, and hardware, and Jenkins is convinced that their High-Performance, Low-E4 glass is the best in the business. For the Energy Saver Plus designs, Jenkins specifies Andersen's new 100 Series. The Fibrex composite window frames and sashes are made with 40% pre-consumer reclaimed wood fiber and are more resistant to expansion and contraction. "They're made to compete

with vinyl windows, but are twice as stable. Even the glass in the 100 Series is 12% reclaimed. They are great looking windows and patio doors, with five exterior colors to choose from," says Jenkins. The 100 Series is even available in hard-to-find dark colors.

One of the best ways to choose a window manufacturer is to match the specific design needs to what the company offers. Rodwin says, "If designing a large bank of windows and doors combining to form a view wall, we will pick a company that provides an integrated line of windows and matching doors so that headers and

finishes all match. We also 'tune' the glass of all our windows in order to create the best passive solar envelope for the house; some manufacturers are more adept and cost-effective for the varied glazing options that make tuning possible." Tuning means selecting the best glazing option for each wall's windows depending on which direction they face. Glazing choices are not cut-and-dry even within a given climate zone. Certain combinations of U-value, emissivity, and SHGC work best on the south side, while others work best on the north, east, and west. When choosing your window supplier, make



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From this interior laundry room, the Sun Tunnel skylight from Velux looks just like a regular light fixture, but the light is coming from the sky more than one story above. The SunTunnel skylight is available with rigid or flexible tunnel in three roof profiles (pitched, low profile, and flat). An optional light kit installs within the tunnel to provide nighttime lighting. www.suntunnelskylights.veluxusa.com

sure the glazing combinations you require are offered in the style you prefer.

People building luxury homes often desire large expanses of glass such as sliding doors or window walls. These types of doors can be particularly challenging because in an effort to create clean thresholds and easy operation, the gaskets that prevent air infiltration may be sacrificed. Rodwin prefers products such as the Liftslide series from Weiland. This system allows door panels to be lifted above a 3/16" flush track to roll easily when opening or closing the door. When lowered, a special gasketing system works with the weight of the door to provide excellent weather resistance.

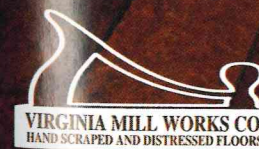
To maximize daylight with minimal sacrifice from a heating and cooling perspective, consider installing sun tubes. Like skylights, sun tubes open to the roof, but the light travels down through

a reflective tube in the ceiling and into almost any room in the house. Sun tubes have far less surface area than windows or regular skylights, so there is less heat transfer, no glare, and unlike regular light fixtures, they don't generate heat of their own. Sun tubes require no structural reframing and can be installed in just about any room, including rooms without direct roof access and interior spaces like bathrooms or closets where daylighting is usually not an option.

Despite the advances of the past decade, Rodwin says, "Even the best window is still far less efficient than the worst wall." Given the rising cost of energy, homeowners should consider how their windows' efficiency affects the true cost of home ownership. An up-front investment in high-performance windows will result in real savings for years to come, as well as greater comfort and enjoyment of your home. ■

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