



The Tax Credit for Installing Energy-Efficient Windows, Doors and Skylights

Thanks to the federal Energy Policy Act of 2005, homeowners can now claim tax credits if they upgrade their homes (meaning their existing primary residence) with energy-efficient building envelope components. These include **exterior windows, doors and skylights**. Ten percent of the purchase price (not including installation costs) of qualified components installed in 2006 or 2007 can be deducted from the homeowner's income tax. While a total of up to \$500 can be claimed during these years, the maximum total credit for windows (including storm windows and skylights) is \$200. Doors (whether glazed or opaque, including storm doors) are subject only to the \$500 cap.

Tax Credit for Efficient Windows (including skylights and storm windows)

- For windows installed in 2006 and 2007
- 10% of purchase price
- Maximum credit of \$200
- ENERGY STAR® windows and skylights qualify if installed in the regions for which they are certified

Replacing old windows and doors with ENERGY STAR® windows and doors can save homeowners hundreds of dollars in heating and cooling costs each year. But now the tax credit allows homeowners to save money even before the energy-cost-savings kick in. And, of course, more efficient windows and doors also substantially enhance comfort, reduce condensation, and help to protect the environment and conserve limited resources.

GAINING THE TAX CREDIT WITH ENERGY STAR® WINDOWS



On February 21, 2006 the Internal Revenue Service published a guideline on how to claim the tax credit. This guideline clarified that all ENERGY STAR windows and skylights qualify for the credit – if they are installed in the regions they are certified for. These regions are highlighted on the map that is printed on each ENERGY STAR label. The simplest way to get the tax credit is to purchase windows that qualify as ENERGY STAR in all 50 states. These windows meet the requirements for both cooling and heating climates and therefore qualify for the tax credit wherever they are installed.

The tax credit can be claimed on the federal income tax form at the end of the year. Homeowners should keep the ENERGY STAR certification with their records but are not required to attach it to their tax form.

WINDOWS THAT ARE NOT ENERGY STAR® CERTIFIED

Windows without ENERGY STAR® labels only qualify for the tax credit if the manufacturer can issue a manufacturer's certification statement, confirming that the window meets the standards set in either:

- the 2001 Supplement to the 2000 International Energy Conservation Code® (IECC), or
- the 2004 Supplement to the 2003 International Energy Conservation Code®.

The manufacturer's certification statement must include:

- a) Name and address of the manufacturer
- b) Identification of the product type, model number, etc.
- c) A statement that the component is an Eligible Building Envelope Component that qualifies for the credit allowed under §25C (meaning that it meets the IECC® standards)
- d) Indication of the climate zones for which the window qualifies in terms of the tax credit
- e) A special, signed declaration by an authorized person stating the correctness of the certification statement

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STORM WINDOWS AND EXTERIOR DOORS

In order to qualify for the credit, storm windows and any exterior doors (opaque or glazed) must have a similar manufacturer's certification statement as mentioned above. For storm windows, this statement must also specify over what class of

window (e.g. double pane, low-e coating, etc.) the storm window must be installed so that the requirements of the code are met.

This article is not intended to constitute legal or tax advice. More comprehensive information can be obtained from IRS Notice 2006-26, which is available

on the IRS website. Individuals should consult their own independent tax advisers.

For more information on the tax credit for energy-efficient windows, view the web sites of the Internal Revenue Service: <http://www.irs.gov/newsroom/article/0,,id=154657,00.html>.

ENERGY STAR® Windows Make Federal Tax Credits Easy!

The Internal Revenue Service published their Guidance Notices for tax credits for existing residences, new homes and manufactured housing on February 21. For existing residences, the IRS has provided a "special rule" (on page 7 of the IRS notice 2006-26) for claiming the \$200 residential efficient window tax credit with ENERGY STAR® windows. The new special rule reads as follows:

.03 Special Rule for ENERGY STAR Windows and Skylights. A taxpayer may treat an exterior window or skylight that bears an ENERGY STAR label and is installed in the region identified on the label as an Eligible Building Envelope Component and may rely on such ENERGY STAR label, rather than on a manufacturer's certification statement, in claiming the § 25C credit.

This rule is expected to make compliance with the IRS tax credit requirements easier for consumers, contractors and window manufacturers. Rather than wading through the technical requirements in the 2001 and 2004 International Energy Conservation Code® (IECC) and obtaining a special manufacturer's certification statement, all parties can rely on the established regional ENERGY STAR

window rating label. The ENERGY STAR web site has further information on the regional windows labels and performance criteria:

- For regional maps and technical criteria for windows, see:

http://www.energystar.gov/index.cfm?c=windows_doors.pr_crit_windows

- For more information on the ENERGY STAR regional labels, see:

http://www.energystar.gov/ia/partners/manuf_res/windows/Label_Finder_30Sep05.pdf

Use of the regional ENERGY STAR window labels for the tax credits will simplify compliance, minimize confusion in the marketplace and reduce transaction and recordkeeping burdens to consumers and manufacturers alike.

The new IRS special rule for efficient windows is based on an Alliance to Save Energy and Efficient Windows Collaborative (EWC) report, "The Tax Credit for the Installation of Energy Efficient Windows: Does the ENERGY STAR Help Consumers Find Products that Qualify?". In a detailed analysis of 3,111 US counties and jurisdictions, the Alliance and the EWC demonstrated to the IRS and the US

Department of Energy that the ENERGY STAR label met or exceeded the IECC code criteria in all but a small number of counties. They recommended that regional ENERGY STAR window labels be the qualifying criteria for the window tax credits because of: 1) the large existing public awareness of the ENERGY STAR labeling program, 2) the significant investment taxpayers have made in promoting the ENERGY STAR brand and 3) their value as a simple and effective messaging tool in Congressional efforts to promote greater energy efficiency. The Alliance report is publicly available for downloading at the Tax Incentives Assistance Project (TIAP) web site at: <http://www.energytaxincentives.org/tiap-recommendationsimplementation.html>

Do You Have News You'd Like to Share?

We're always interested in reporting on new technology and research in residential windows. If you have something you would like to share with us please contact Nils Petermann at: npetermann@ase.org.

Hurricane-Impact Resistant Windows

GROWING DEMAND

After the devastating hurricanes of 2004 and 2005, it is obvious why demand is rising for windows that can withstand the impact of hurricanes. Homeowners in affected regions are well-advised to install impact-resistant windows as a precaution against potentially devastating damage to their homes. For example, if windows are cracked by flying debris, the likelihood of structural damage to a home increases dramatically. Not only can the full force of the storm enter unhindered, but rapid depressurization can in fact blow off a building's roof. The rising demand is also due to new and stricter building safety requirements in hurricane-prone states from Texas to Connecticut, foremost of which is Florida.

AN OPPORTUNITY TO INCREASE ENERGY PERFORMANCE?

In hurricane-prone regions, demand for impact resistant windows is increasing, both by homeowners who seek stronger hurricane protection and by home builders who comply with strengthened impact resistance codes from Texas to New England. In addition, most of these states either have building energy codes in place or are considering their adoption. The window market in these regions is therefore stimulated by the growing demand for both impact-resistant and energy-efficient windows.

Is it realistic to expect that increased impact resistance in the windows sector of hurricane-prone regions is accompanied by more energy efficiency? There is a lot to gain from replacing the existing window stock, especially in the South, where windows generally tend to be single-paned and thus of relatively little insulating value. Considering this, retrofitting with impact resistant windows has good potential to improve energy efficiency. However, this requires that energy efficiency features are integrated in the windows. Monolithic (single-pane) laminated glazing and aluminum frames are very common among hurricane

The new Florida Building Code

In October 2005, the 2004 Florida Building Code came into effect. The code references the test procedures specified by the ASTM E-1886 and ASTM E-1996 missile impact test standards. In all Florida counties within the 120-mph wind zone, impact resistant windows that pass these tests must be installed. While homeowners are not required to replace their existing windows in order to fulfill the requirements of the code, any replacements, as well as all windows in new homes, need to comply with the standard.

windows. These components need to be manufactured so that they provide solar control, in order to perform well in Southern hurricane regions. In colder regions they also need to provide thermal insulation, preferably through insulating double-pane units.

LAMINATED GLAZING

Due to the already high cost of impact-resistant glazing, many impact-resistant windows have only one pane. Nevertheless, there are effective options for advancing the performance of these windows so that their energy performance meets the cooling requirements of the South.

Although impact-resistant glazing can also be created by applying shatter-resistant films to the window pane, a very common and more reliable glazing type is laminated glass. It consists of two sheets of glass sandwiched together without an air space, and held together with a transparent plastic material. This laminate, most often polyvinyl butyrate (PVB), gives the window a backbone, so to speak. The glass may still crack from heavy impacts, but the PVB holds it together and protects the building interior from the force of the storm. Because this glass is relatively heavy and expensive, many windows with laminated glazing are monolithic, which means that apart from the two sheets of glass sandwiched

together there is no second pane and thus no air space for thermal insulation.

In the cooling-dominated regions of Florida and along the Gulf coast, which form a large part of the hurricane windows market, a window's solar heat gain coefficient (SHGC) is far more important than its thermal performance. The SHGC determines how well a window can keep solar heat out and the cooling load low. Insulating glass units with multiple panes are better suited for this than monolithic products. The market for laminated glazing still sees many monolithic products, which are cheaper and lighter. But even monolithic glazing can be produced so that it controls solar gain considerably well.

Even though low-e coatings cannot block heat conduction between the glass sheets of monolithic laminates and thus do not help lower the U-factor, they can lower the SHGC. Low solar gain low-e coatings can be sandwiched between the sheets of laminated glass, where they can reject near infrared solar radiation while letting in visible sunlight. The coating is protected from both sides by the sheets of glass and can reduce a window's SHGC to well below 0.50 while leaving the visibility transmittance (VT) largely unaffected. Dr. Ross McCluney at the Florida Solar Energy Center explains how this works:

“The low solar gain coating will work inside a laminate, if the glass and laminate are transparent to solar near infrared radiation, because it reflects this radiation back through the glass to the outside, ideally without allowing any of it to be absorbed. Thus, this option is well-suited to a single pane (noninsulating) configuration.”¹

An even better choice for energy efficiency are insulated window units with

¹ This quote is taken from Arlene Z. Stewart's article *Windows – What You Should Know Before Purchasing*, available at: <http://www.westfloridabuilders.com/index.cfm?webid=40>

one pane of laminated glass and one additional pane of glass. These can have an SHGC of far below 0.40. In regions where heating is a necessity, insulated glazing is needed for real energy efficiency, since a lot of heat can be lost through monolithic glazing. In hot Southern parts of the country, however, monolithic glazing can also do the job, provided that it gives valuable control over solar heat gain.

ALUMINUM FRAMES

Window frames determine solar heat gain far less than they influence the U-factor. Aluminum frames are the pre-dominant framing type of hurricane windows due to their durability. In their conventional versions without thermal breaks, they are relatively conductive of heat. Thermal breaks, however, offer an effective remedy by interrupting this heat conduction. Equipped with thermal breaks and combined with low solar gain glazing, aluminum-clad windows offer energy efficiency and safety for Southern homes.

Due to the ENERGY STAR® Equivalent Energy Performance Amendment, which took effect in September 2005, many windows with high-performance aluminum frames and low solar gain glazing are now rated ENERGY STAR windows, and therefore qualify for the federal tax credit for energy-efficient window retrofits (see page 1).

IMPACT RESISTANCE AND ENERGY EFFICIENCY

There are some highly effective options for advancing the performance of windows so that they are both hurricane resistant and energy efficient.

Thermally broken aluminum frames provide durability combined with good thermal performance, which is crucial in colder regions. The energy performance of Southern windows, however, is mostly determined by the solar control provided in the glazing. The market for impact-resistant windows still features many single-pane products, and their lack of air space renders tints relatively ineffective, as they warm up the window and release

part of the heat directly to the interior. But there are viable solutions to provide

The ENERGY STAR® Equivalent Energy Performance Amendment

In 2005, the Energy Star criteria for the Southern and South/Central ENERGY STAR regions became more flexible. Windows with a slightly higher U-factor than previously allowed now qualify if their SHGC is particularly low. This offers aluminum-clad windows with low solar gain glazing a better chance to meet the ENERGY STAR criteria.

For details, see:

http://www.energystar.gov/index.cfm?c=windows_doors.win_elig

these monolithic windows with solar control: reflective coatings on the outer window surface or low solar gain coatings sandwiched between the sheets of laminated glass.

Finally, the most effective option for both protecting a home from hurricanes and keeping it cool is to use windows with two panes of glass, with laminated glass as the exterior pane. In addition, low-e coating for low solar gain applied between the panes is highly effective in reducing the SHGC of insulated glazing, especially if the exterior pane is tinted. This option is more expensive than monolithic windows, but guarantees considerable energy savings and is most likely to be supported by the federal tax credit for energy-efficient windows.

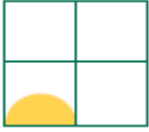
Many homeowners are deterred from replacing their windows with more energy-efficient products by the price of the retrofit. Cost is a particular problem with impact resistant windows, which are more elaborate products than most other windows. However, due to increasing damage from hurricanes, homeowners are well-advised to consider retrofitting their houses with windows that protect against storm impacts. If homeowners take this step, the extra cost for energy-efficient windows is a rather marginal investment likely to be mitigated by tax incentives, whereas the energy savings are substantial. The range of suitable

products is increasing, as are the energy prices that make it important to consider such options. At the same time, the cost of insulating hurricane windows will decrease as more products hit the market. Despite these advances the fact remains that many window vendors do not yet stock and sell the best high performance windows and that many customers are not aware of their options. The U.S. Department of Energy and the Efficient Windows Collaborative are working to encourage homeowners and window vendors to plan ahead and invest in windows that are impact resistant and energy efficient – thanks to low solar gain coatings, thermally broken frames or insulating double-pane glazing. If the growing market for impact resistant windows develops in this direction, energy savings for homeowners and market opportunities for window manufacturers will increase together with hurricane safety.



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Collaborative NEWS

Southeast Building Conference Offers Great Opportunity to Showcase Energy-Efficient Windows

This year's Southeast Building Conference (SEBC) will be held on August 3-5 in Orlando, Florida. This will be a great place for manufacturers of energy-efficient windows to showcase their products to the nation's most dynamic housing market. Not only will the SEBC be held in the state with the most housing starts, it will also draw visitors and exhibitors from all over the Southeast, which is the region where the most new construction is taking place.

The exhibitors expect more than 16,000 building industry professionals to attend the conference in the Orange County Convention Center, which offers 200,000 net square feet of exhibit space.

Companies that are interested in exhibiting their energy-efficient window products at the SEBC should contact:

- Stacy Welch, SEBC Exhibits Coordinator, at (800) 261-9447 x 23 or swelch@fhba.com
- Carol Stoutamire, SEBC Director, at (800) 261-9447 x 26 or cstoutamire@fhba.com

More information on the conference and on registration can be found at: www.sebcshow.com.



EWC Releases Builder Toolkit

On its website, the Efficient Windows Collaborative has released a "toolkit" for homebuilders who seek to provide their customers with lower energy costs and greater comfort by installing efficient windows. This toolkit includes the following features:

- Explanation of how energy-efficient windows benefit homeowners and allow HVAC systems to perform more efficiently,
- Hints on how to finance investment in better windows,
- An overview of how to make the most of energy-efficient windows.

The Builder Toolkit can be accessed at: www.efficientwindows.org/BuilderToolkit.pdf

New NAECA Regulation Strengthens Energy-Efficient Windows

The importance of energy-efficient windows has been increased due to a recent change in regulation, effected by the Department of Energy (DOE) under the National Appliance Energy Conservation Act (NAECA).

NAECA requires minimum standards for appliances like heating, cooling and ventilation (HVAC) equipment to be set and regularly updated. This does not touch windows directly, and yet the recent changes do make window standards more relevant: It is now harder to trade energy-

efficient windows for efficient HVAC equipment, a trade off which many building energy codes allow if the HVAC appliances exceed standards.

That trade-off has become far less likely now that DOE has increased the Seasonal Energy Efficiency Ratio (SEER) for air conditioners from 10 to 13, and the Heating Seasonal Performance Factor (HSPF) of heat pumps from 6.8 to 7.7. Due to these recent updates of standards under NAECA, state-of-the-art appliances are likely to meet the SEEA and HSPF

standards but won't be so likely to exceed them. According to building energy codes, HVAC equipment must exceed the DOE-accredited SEER or HSPF standards if it is to be traded for below-standard building envelope components. Therefore, the role of energy-efficient windows in building codes has been strengthened. In most cases they will now have to be as energy efficient as building energy codes prescribe – instead of being traded for air-conditioning systems that are by now of standard quality.

DOE Supports Development of Evacuated Glazing

The US Department of Energy (DOE) supports the development of a new generation of different energy-efficient window types for the American market. At a time when costs related to heat gained and lost through windows nationwide equal about \$40 billion per year, such research and development (R&D) efforts can yield tremendous benefits for our economy.

Earlier successes can serve as an example: The National Academy of Sciences has estimated that about \$10 million invested in windows R&D in the late 1970s and early 1980s brought decisive advancement in low-emissivity technology, which led to incremental net energy savings worth \$8 billion. Now that the American window market is bearing the fruits of these earlier R&D efforts, it is time to utilize the know-how that has been gained in the meantime to kick-start the production of window technologies that further lower the costs of heat transfer. Developments in other parts of the world show some of the potential.

In Europe, for instance, aerogel-filled windows are becoming more advanced

and offer superb thermal performance. However, the aerogel fillings that have been developed so far diffuse visible light and are therefore not suited for regular windows.

In Japan, on the other hand, a very promising product for general window replacements has entered the market: evacuated windows with a vacuum space between two panes of glass. This vacuum space only needs to measure less than a millimeter in order to provide more insulating value than what a half-inch gas-filled space would provide. The resulting glazing has an impressive thermal performance and is thin enough to be held by a light sash, meaning that it can be used to replace single-pane windows without replacing the frame. So far, the Japanese manufacturer Nippon Sheet Glass is the only company that produces evacuated windows, but the product has had considerable success in the Land of the Rising Sun, where the Japanese branch of Seven-Eleven has now begun to install it in their stores.

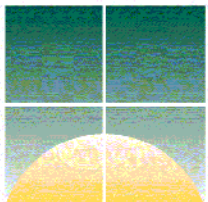
Seeing the potential of evacuated windows in the American market, the US

Department of Energy supports research and development on evacuated glazing through its R&D facilities at federal laboratories and through cost-sharing partnerships with industry.

Evacuated windows promise very good insulation within a thin structure. This makes them an especially promising product for the replacement window market. Moreover, two panes of evacuated glass could be laminated together to provide highly insulating impact resistant glazing without the need for an air space. Before such products can hit the US windows market, however, DOE and its partners will have to put further efforts into developing highly reliable edge sealants and adequate glass and spacer products for this next-generation technology.

Evacuated glazing is just one of the promising window technologies in which DOE invests its R&D efforts. Future issues of Word on Windows will report about other technologies for the American market that are currently in the development stage.

Efficient Windows



Collaborative

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