



Word On Windows

a publication of the Efficient Windows Collaborative and the Alliance to Save Energy > Summer 2006

NFRC to Implement Labeling for Dynamic Glazing Systems

As another move forward in standardized fenestration evaluation, the National Fenestration Rating Council's board of directors recently approved the use of a rating and labeling system for dynamic-glazing products. The labels, which will become mandatory after January 1, 2008 or 12 months after implementation, will provide a system for comparison among retailers and consumers alike.

Technologically advanced dynamic glazing systems are already beginning to transform the market and are making a big hit. These products range from coatings with switchable properties, such as in electrochromic glazing, to mechanical shading systems fabricated into the air gap of an insulating glass unit or thermo-chromic glazing that changes transparency in response to temperature changes.

Windows with dynamic glazing properties can provide features completely new to the fenestration world. Electrochromic glass, for example, can change transparency based on light, privacy, or safety needs. They can be remotely operated by computer, occupant signal, by thermostat, or be set to change according to occupant habits and local conditions.

No fundamental change in testing procedure is being proposed, so the familiar ratings will allow users to easily compare the performance of a dynamic glazing product to that of other fenestration products. Labels already in place for U-factor, Solar Heat Gain Coefficient, and Visible Transmittance fluctuate according to the variability of the dynamic glazing; the greater the range of these values, the better the window can adapt to changing climatic conditions.

See page 3 for a story on dynamic glazing in use.

EWC Educates Building Code Professionals about Florida Code Change Implications

As reported in the spring issue of Word on Windows, changes in the National Appliance Energy Conservation Act (NAECA) will affect builder choices for energy compliance in states where trade-offs between HVAC equipment performance and building envelope performance are allowed for compliance with building energy codes. NAECA sets standards for appliances like heating, cooling and ventilation (HVAC) equipment that are regularly updated and form the minimum tier for state-specific standards nationwide. In the latest update, the Seasonal Energy Efficiency Ratio (SEER) for air conditioners was increased from 10 to 13. In states where SEER 13 had not been the standard before this change makes it harder to trade envelope energy efficiency for above-standard HVAC efficiency.

Florida is a case in point. In the state with the most housing starts nationwide, a majority of builders currently base their

I N S I D E

NFRC Rating in Place for Window Film Attachments.....	2
California Requests NFRC Component Rating System.....	2
Statements of Infrared Rejection May Misinform Consumers.....	3
Minnesota School Improves Energy Performance with Dynamic Glazing 3	
Commercial Windows Website Wins Crystal Achievement Award.....	4
Efficient Windows Collaborative Starts New Project Phase.....	4

energy code compliance strategy on using HVAC equipment with above-NEACA minimum performance while downgrading thermal envelope measures. This practice will become significantly less cost effective once the NEACA update is reflected in the Florida energy code, which is expected to happen in December 2006. In turn it will become more attractive to avoid these trade-offs and meet the code requirements through building envelope measures such as energy-efficient windows instead.



Arlene Stewart presents to building code professionals on June 7 at the Florida Windows Workshop.

In order to explain how the NAECA change might affect builder choices and increase demand for efficient windows,...

Continued on page 5

	<p>World's Best Window Co.</p> <p>Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Dynamic Glazing • Argon Fill • Low E Product Type: Vertical Slider</p>
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S./I-P) 0.30 ↔ 0.40 <small>Off/Closed On/Open</small>	Solar Heat Gain Coefficient 0.10 ↔ 0.50 <small>Off/Closed On/Open</small>
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance 0.03 ↔ 0.65 <small>Off/Closed On/Open</small>	Air Leakage (U.S./I-P) 0.2
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>	

NFRC Ratings in Place for Window Films and Attachments

The National Fenestration Rating Council (NFRC) has approved a rating procedure and labeling system to add fair, accurate, and credible ratings for window attachments such as window films, screens, and shades. NFRC is expecting to be ready to accept the first attachment product data by August 2006.

NFRC, which has been successful in evaluating and labeling windows of all sorts since 1992, will be the first fenestration-related organization to analyze the Solar Heat Gain Coefficient (SHGC) and Visible Transmittance (VT) of window attachments.

NFRC ATTACHMENT RATINGS			
XYZ Applied Film Company • Deluxe Green Film			
CPD#000-x-000 (Interior)			
This rating uses reference product energy performance - actual product performance may vary.			
ENERGY PERFORMANCE RATINGS - Solar Heat Gain Coefficient & Visible Transmittance Only			
Reference Product		Solar Heat Gain Coefficient	Visible Transmittance
Type	Glazing	With Film	With Film
Residential	Single Glazed Clear	0.64	0.67
	Double Glazed Clear	0.56	0.60
Non-Residential	Single Glazed Clear	0.68	0.69
	Single Glazed Grey	0.46	0.33
	Double Glazed Clear	0.58	0.64
	Double Glazed Grey	0.35	0.29

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

Seeing the need for a nationally recognized rating methodology for window attachments, NFRC conducted research evaluating the needs of those using the new fenestration attachment ratings – consumers, code officials, and utility energy efficiency representatives. Based on these needs, NFRC developed a technical procedure for rating window attachments and a methodology for calculating the effects of combining these attachments with referenced fenestration products. NFRC will use the tested or simulated data for an attachment product and establish SHGC and VT values that indicate how the attachment performs in

conjunction with different default glazing types.

NFRC has furthermore developed criteria and labeling requirements in order to provide fair and uniform third-party certification of the energy performance of tested window attachment products. NFRC anticipates that the testing procedures and labels will enable window buyers to make informed purchasing decisions by assessing the energy consumption and potential costs savings of alternative window products and by comparing energy performance of various attachment types.

To have their products certified, manufacturers will have to:

1. Enter a license agreement with NFRC;
2. Choose an NFRC-licensed testing or simulation laboratory;
3. Choose an NFRC-licensed certification and inspection agency;
4. Have the products rated and the data uploaded in the NFRC Certified Products Database;
5. Have the certification authorized and the manufacturing facility inspected by the inspection agency;
6. Label the certified products (certification is for four years).

For more information about the window film certification and rating process, contact Jessica Ferris at NFRC: 301-589-1776 ext. 204 or jferris@nfrc.org.

For more information on window films, see www.iwfa.com.

California Requests NFRC Component Labeling

The California Energy Commission (CEC) requests that the National Fenestration Rating Council (NFRC) establish its planned Component Modeling Program by 2008. The reasons for this appeal are to encourage increased use of certified and energy-efficient site-built glazing systems in non-residential buildings, rather than fall back on default values for U-factor and solar heat gain. The Energy Commission is well underway with its next energy code update, tentatively set to take effect November 1, 2008. All related software and manuals must be ready at least six months in advance of the effective date.

NFRC's Component Modeling Program is envisaged to work such that individual components of a fenestration system (frame, glazing, and spacer) are combined via computer model to determine the energy performance of the entire system. NFRC has been developing this program for three years and has now set it on a fast track to meet the Energy Commission's schedule for the 2008 energy code update.



WORD ON WINDOWS is produced with funding from the Windows and Glazings Program at the U.S. Department of Energy in support of the Efficient Windows Collaborative. For more information on the Collaborative, contact:

Nils Petermann
Alliance to Save Energy
1850 M Street, NW, Suite 600
Washington, DC 20036
phone: 202-530-2234
email: npetermann@ase.org
www.efficientwindows.org

Statements of Infrared Rejection May Misinform Consumers

In countries without established testing and reporting procedures for thermal properties of fenestration, several manufacturers list an infrared (IR) rejection percentage to describe the solar heat control of their products. In the U.S. market, however, where the solar heat gain coefficient (SHGC) exists as a far more comprehensive and well-defined denominator of solar control, the use of IR rejection values is not necessary and can be misleading to consumers.

While infrared rejection is an important property of fenestration products it is not the only factor of solar heat control. Moreover, the effect of infrared rejection depends on which wavelengths are rejected, and there is no set standard determining which wavelengths are meant by an IR rejection percentage. Accordingly, IR rejection ratings do not offer a complete picture of solar heat control. Therefore, it is preferable that manufacturers refer to the SHGC instead of IR rejection values.

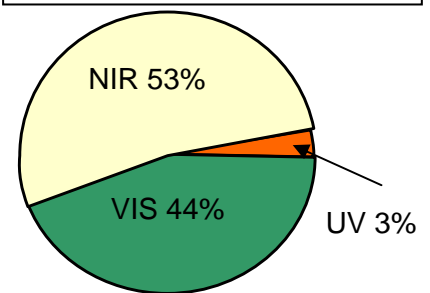
The SHGC predicts the heat gain of the total contribution of *all three* spectral

regions of solar light - UV, visible light and near-infrared radiation (see the figure for relative contribution to solar energy by the three spectral regions). Thus, the SHGC provides the only valid evaluation of total solar heat gain of a fenestration product. The National Fenestration Rating Council sets the methodology for determining the SHGC of different products and includes this information on all of their fenestration labels.

The practice of using IR rejection ratings is particularly prevalent in parts of Asia where, without a commonly acknowledged body such as the NFRC, manufacturers are free to rate their products in ways that may not provide complete information about thermal performance. In the U.S., with its established thermal performance rating system, however, it is in the best interest of the fenestration market to provide optimum consumer information through the SHGC. The use of the Solar Heat Gain Coefficient has become common in the windows market with the introduction of standard rating procedures by the

National Fenestration Rating Council. Now that the NFRC also has developed SHGC rating procedures for window attachments such as window films, informed consumer decisions will be further facilitated.

Solar Energy Distribution
from 300 nm to 2500nm



The EWC would like to thank Darrell Smith, Executive Director of the International Window Film Association, for his help on this article.

Minnesota School Improves Energy Performance and Education with Dynamic Glazing

Twin Lakes Elementary School in Elk River, Minnesota, has selected electronically tintable SageGlass® windows to install in the school's building science center. The school, which will open in 2007, hopes to feature these high-tech windows along with other sustainable design strategies that will allow the school district to reach the U.S. Green Building Council's Gold Certification under the LEED Rating System.

Primarily, the windows will help the school save energy. At the push of a button, the glass can switch from clear to different grades of tinting, thus controlling daylight, heat gain, and the outside view. The windows are highly functional, providing necessary daylighting for

learning, while allowing teachers to control the light intensity. Also, as these windows will be in the science center and around computers, glare control is a particularly practical feature for Twin Lakes.

According to SAGE's vice president of customer solutions, Helen Sanders, it takes less electricity to power and control 1,500 square feet of SageGlass products per day than it does to power a 60-watt incandescent light bulb. These windows reduce energy use throughout the whole system and, according to Department of Energy Estimates, provide up to 40% savings on energy bills, 20% savings on operating costs, 24% reduction in peak demand, and a 25% decrease in the

necessary size of HVAC systems. Besides using these efficient windows to improve the classroom environment and conserve energy, the school district also plans to use them as part of an innovative curriculum. The windows will be the focus of a "learning lab" for elementary school science classes in which students will compare the SageGlass product to conventional windows and shading.

For more information about SAGE Electrochromics Inc. and electronically tintable glass products, visit www.sage-ec.com or call (877)-724-3321.

Collaborative NEWS

Commercial Windows Website Wins Crystal Achievements Award

The Center for Sustainable Building Research (CSBR), based in the College of Design at the University of Minnesota, has been announced a winner in the first annual Crystal Achievement Awards for its *Commercial Windows* web site.

Glass Magazine, which administered the contest, selected the web site as the most innovative internet media application or site in the large-company category. Its development was a coordinated effort between the Center for Sustainable Building Research (CSBR) at the University of Minnesota and Lawrence Berkeley National Laboratory (LBNL). LBNL was responsible for providing the technical information. CSBR was responsible for the design of the site, including the design and

functionality of the Facade Design Tool. The web site as well as the companion book, *Window Systems for High-Performance Buildings* were developed with support from the U.S. Department of Energy's Windows and Glazings Research Program within the Office of Building Technology, Community and State Programs.

The website, www.commercialwindows.umn.edu, features information regarding the impor-

tance of windows, issues in window selection, window materials and technologies, a façade design tool, case studies about cutting-edge design, and other tools and resources. The purpose of this web site is to provide designers with more complete information on the energy, interior environment, technical, and life cycle cost impacts of window design decisions in commercial buildings. It provides such critical information and performance data so that designers may begin to understand the implications of design choices on building performance.

CSBR will be honored, along with other outstanding innovators in the architectural glass industry, in the September issue of Glass Magazine and in the Crystal Achievement Awards Pavilion at GlassBuild America: the Glass, Window, and Door Expo, September 19-21, 2006 in Las Vegas, Nevada.

Visit the CSBR's web site at www.csbr.umn.edu and LBNL's web site at windows.lbl.gov.



Efficient Windows Collaborative Starts New Project Phase (2006-2009)

At the 2006 NFRC Summer Meeting, which was held in Minneapolis from July 24 through 27, the Efficient Windows Collaborative announced the start of its new 2006 to 2009 project phase to the assembled fenestration industry representatives.

With funding from the U.S. Department of Energy, the EWC will continue its efforts to advance energy efficiency in the residential fenestration market, but is also starting to promote energy-efficient fenestration for commercial buildings. The EWC's tasks for the next three years can be summarized as:

1. Promoting design and rating tools to manufacturers;
2. Promoting ENERGY STAR compliant and even more efficient products;
3. Promoting research tools to suppliers, contractors and architects; and
4. Promoting market transformation programs, such as utility rebate programs.

All of these tasks include work in the residential as well as the commercial sectors. The EWC will develop several toolkits designed to help manufacturers, suppliers, architects and other actors bring to bear the full energy-efficiency potential of modern fenestration.

The new project efforts of the Collaborative will be planned and organized by the Alliance to Save Energy, the technical

research activities will be lead by the University of Minnesota, while AZS Consulting will provide deployment support to outreach and training efforts. Lawrence Berkeley National Laboratory will continue to assist the EWC project team with its technical expertise.

In order to allow more industry participation in its activities, the EWC will also rely on feedback and input from a newly formed advisory board, consisting of experts from the fenestration industry, consulting groups, and industry associations. Over the second half of 2006, the Collaborative will establish the exact composition of this advisory board and form a residential and a commercial advisory council from its members.



EWC Educates Building Code Professionals about Florida Code Change Implications

continued from page 1

Arlene Stewart of the EWC team spoke about these issues at the Florida Windows Workshop on June 7 in conjunction with the Building Officials Association of Florida. Over 200 building code professionals and window industry representatives participated in this special event and learned how new federal requirements would affect energy code compliance. Based on an analysis commissioned by the Florida Home Builders Association (FHBA), Stewart found that over 60% of housing starts in Florida would be significantly affected by NAECA. Once the change is implemented, these builders may face significant cost increases of \$1,000 - \$3,000 if they continue to use the same energy

configurations, due to a limited availability of premium equipment (SEER 15-17) with adequate moisture removal capacity.

Stewart pointed out to the workshop participants that a more cost-effective option may be to increase the efficiency of thermal envelope components like wall insulation and windows.

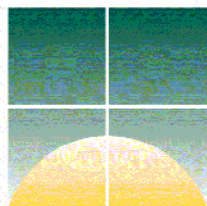
In addition, while code enforcement officials are already familiar with labeling requirements for insulation, the FHBA analysis showed that during 2004-2005, advanced window performance based on National Fenestration Rating Council (NFRC) testing was not entered into compliance forms. With almost one million products available, builders using NFRC-tested windows can increase calculated energy performance at no cost simply by entering the information from the window label into the calculation.

Stewart concluded the session by educating plan reviewers about what to look for in compliance forms and NFRC labels and about what information to convey to their field personnel for verification of efficient windows.



Workshop participants listen attentively, learning about new federal requirements and energy code compliance.

Efficient Windows



Collaborative

Efficient Windows Collaborative
Alliance to Save Energy
1850 M Street, NW, Suite 600
Washington, DC 20036

www.efficientwindows.org

Do You Have News You'd Like to Share?

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