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The Revised Window Guidelines—and Their Role in Smart Energy Management

## ***A Look at the New ENERGY STAR® Window Standards***

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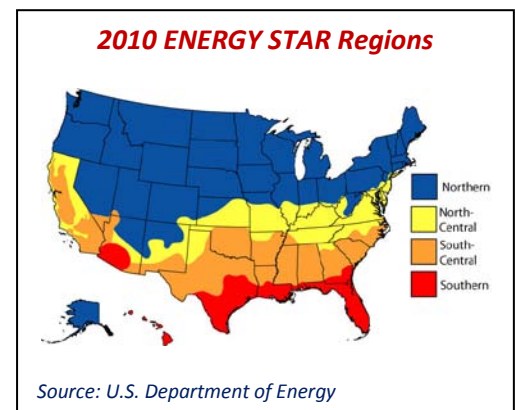
Following a lengthy comment period, the U.S. Department of Energy has just released the 2010 window criteria for its ENERGY STAR® program, created in 1992 to recognize energy-efficient products and help consumers make more appropriate choices. The purpose of this communication is to help you understand the key implications of the new ENERGY STAR criteria for residential windows.

With a broad range of soft- and hard-coat product options, AGC can help you make the most appropriate glass choices for each region of America—and offer your customers residential window systems that are ENERGY STAR approved. We can partner with you to choose an appropriate window configuration, matched with specific AGC low-e glass products, that meets or exceeds the new 2010 guidelines.

### **An Overview: 2010 ENERGY STAR Standards**

The 2010 ENERGY STAR window standards are based on meeting the annual heating and cooling needs of four different geographic areas (see map at right):

- Northern: mostly heating
- North-Central: heating and cooling
- South-Central: cooling and heating
- Southern: mostly cooling



For every region, ENERGY STAR defines two main criteria for window performance: U factor, which measures the rate of heat transfer—with a lower number indicating better insulation—and Solar Heat Gain Coefficient (SHGC), which measures the fraction of solar energy admitted into the home. The lower the SHGC, the higher the window's performance in blocking the penetration of solar heat.

**In each region, ENERGY STAR's U-factor requirement has been tightened for 2010** to increase insulation value, which provides year-round benefits for every region of the U.S.

The revised ENERGY STAR criteria include new Solar Heat Gain Coefficient guidelines. In the South, the SHGC rating is higher in the 2010 criteria, while the two Central regions require a lower SHGC. A low SHGC makes sense for warmer regions, dominated by air conditioning costs—but Northern homes can actually benefit from passive solar heat gain, in order to cut heating costs.

<b>2010 ENERGY STAR Ratings for Windows</b>			
<i>Climate Zone</i>	<i>U Factor</i>	<i>SHGC</i>	
<b>Northern</b>	≤ .30	ANY	Prescriptive Rating
	= .31	≥ .35	Equivalent Energy
	= .32	≥ .40	Performance
<b>North-Central</b>	≤ .32	≤ .40	
<b>South-Central</b>	≤ .35	≤ .30	
<b>Southern</b>	≤ .60	≤ .27	

*Source: U.S. Department of Energy*

The 2010 guidelines also include alternate-path criteria that recognize the positive contributions of passive solar heat in the North. These alternate-path criteria increase the range of glass options available to consumers, including higher SHGC products.

However, the “any” prescriptive rating for SHGC in the Northern region also allows the use of specialized low-SHGC glasses with double and triple silver coatings. Designed to effectively block solar heat gain in hot climates, these high-cost, high-performance glass products fail to leverage passive solar energy to reduce annual heating costs.

As shown below, the use of a high solar gain glass such as AGC’s Comfort E2™ (SHGC .603) results in significant annual heating savings, when compared with a triple-silver, low solar gain glass (SHGC .233) in 10 Northern cities. Yet both these windows are ENERGY STAR approved.

<b>Annual Heating Cost Comparison for Northern ENERGY STAR Region</b>			
<i>2000 existing sq. ft. house with 300 sq. ft. of window area</i>			
	<b>Clear/Argon/Comfort E2™</b> <i>U factor = .315, SHGC = .603</i>	<b>Triple-Silver/Argon/Clear</b> <i>U factor = .265, SHGC = .233</i>	<b>Annual Heating Savings</b> <i>Due to Passive Solar Effect</i>
Portland, ME	1114.98	1317.18	<b>202.20</b>
Boston, MA	981.63	1151.88	<b>170.25</b>
Buffalo, NY	1164.61	1296.99	<b>132.38</b>
Newark, NJ	716.35	844.02	<b>127.67</b>
Dayton, OH	814.87	930.78	<b>115.91</b>
Boise, ID	516.24	624.40	<b>108.16</b>
Minneapolis, MN	911.09	1019.04	<b>107.95</b>
Fargo, ND	1011.03	1115.54	<b>104.51</b>
Denver, CO	363.18	464.69	<b>101.51</b>
Grand Rapids, MI	815.37	916.34	<b>100.97</b>
<b>Average Annual Heating Savings Across 10 Northern Cities</b>			<b>\$127</b>

*Based on 2008 local costs for electricity and natural gas compiled by the DOE Energy Information Administration. Calculations performed using RESFEN, a computer program for calculating the annual cooling and heating energy use and costs due to window selection. RESFEN is available for free download from Lawrence Berkeley National Laboratory: <http://windows.lbl.gov/software/resfen/resfen.html>. For additional questions about heating costs, cooling costs, or whole-house energy consumption as described in this table, please contact AGC Technical Services at our glass hotline, 423-229-7200 or 800-251-0441.*

By choosing hard-coat Comfort E2 instead of triple-silver glass, homeowners in these 10 cities can save as much as \$200 in annual heating costs—with an average savings of \$127 across the Northern region. Not only do hard-coat products such as Comfort E2 capture solar heat gain to reduce heating costs, but they also provide a more controlled glass temperature, reducing the “draft” sensation caused by cold interior glass surfaces in winter months.

While the 2010 alternative-path recommendations acknowledge the value of passive solar heat gain, AGC believes that the ENERGY STAR criteria would be improved by recognizing the significant difference between low and high solar gain glass in the Northern region.

## The AGC Advantage: Meeting Your ENERGY STAR Needs in All Regions

With a comprehensive line of both soft- and hard-coat glass solutions that deliver customized U factor and SHGC performance, AGC can help you meet the new ENERGY STAR standards.

### AGC Product Fit With 2010 ENERGY STAR Guidelines

Climate Zone	AGC Low-E Solutions
Northern	Comfort E2™* Comfort Ti-PS™* Comfort Ti-AC 40™ Comfort Ti-AC 36™ Comfort Ti-AC 23™
North-Central	Comfort Ti-AC 40™ Comfort Ti-AC 36™ Comfort Ti-AC 23™
South-Central	Comfort Ti-AC 36™ Comfort Ti-AC 23™
Southern	Comfort Ti-AC 23™

*\*Recommended by AGC for the Northern region, due to passive solar benefits*

**In the heating-dominated Northern region, hard-coat Comfort E2™ and soft-coat Comfort Ti-PS™ can help homeowners meet ENERGY STAR standards and minimize their annual heating costs.** (Due to the “any” SHGC rating created for 2010, Comfort Ti-AC products also meet ENERGY STAR requirements, although they will not capture passive solar benefits during winter months.)

**North-Central and South-Central homes can benefit from the balanced year-round performance of soft-coat Comfort Ti-AC 40™, Comfort Ti-AC 36™, and Comfort Ti-AC 23™ to meet ENERGY STAR standards for this part of the country.**

Dominated by air conditioning, the Southern region requires exceptional year-round solar-blocking performance. Designed specifically for Southern homes,

**AGC’s Comfort Ti-AC 23™ minimizes air conditioning costs and meets ENERGY STAR goals for the Southern region.** In fact, Comfort Ti-AC 23 leads the industry in solar-blocking performance, with the lowest SHGC rating for a Clear substrate.

Keeping in mind that whole-window performance also depends upon selecting energy-efficient framing and spacer systems—where the options are steadily growing—AGC can support you in making appropriate window configuration choices that maximize the contributions of our innovative glass products.

## Beyond Glass™: AGC's Partnership Approach

In addition to ENERGY STAR, there are many window efficiency standards and ratings published today—including the new stimulus bill and local utility programs.

### **Capitalizing on Utility Incentives**

*In addition to ENERGY STAR ratings and the stimulus bill, many other programs have been created to reward energy-efficient window purchases. For a list of utility incentives and rebates across the United States, visit: [www.efficientwindows.org/UtilityIncentivesWindows.pdf](http://www.efficientwindows.org/UtilityIncentivesWindows.pdf)*

With so many different performance standards targeting the residential window market, window makers may feel backed into a corner—and challenged to meet a sometimes conflicting set of demands.

Backed by years of expertise in both glass technology and overall window design, AGC's Technical Services team can help you make glass choices that satisfy ENERGY STAR requirements and other window performance standards—while also supporting smart year-round energy management that will deliver long-term savings for your customers.

One-on-one energy management consulting is just one way that AGC can support your business.

To help you leverage our investments in new products and emerging glass technologies—and maximize the energy performance of your windows—today AGC is moving *Beyond Glass*, with a spectrum of value-added solutions and services designed to meet the real-world needs of your business.

**No matter what changes may occur in window requirements in the future, AGC will be there to support you** with the next-generation glass solutions and complementary services you need to succeed.

### **Beyond Glass™: Outstanding Support From AGC**

- ***A highly collaborative field sales team***
- ***A knowledgeable customer support team***
- ***Marketing support and Web-based tools***
- ***Superior supply chain capabilities***
- ***A Technical Services hotline, 423-229-7200 or 800-251-0441***

*To learn more about how AGC's broad range of soft- and hard-coat products meet ENERGY STAR standards and other window criteria, **call the AGC Technical Services team at our glass hotline, 423-229-7200 or 800-251-0441.** You can also send an e-mail to [info@na.agc-flatglass.com](mailto:info@na.agc-flatglass.com), or visit us online at [www.na.agc-flatglass.com](http://www.na.agc-flatglass.com).*