The Elephant in the Room

Someone Needs to Say It: Consumers Are Buying the Wrong Windows

By Serge Martin, Vice President of Marketing, AGC Flat Glass North America

The glass industry has achieved amazing technical advances in recent years, which enable us to provide customized products that meet the changing seasonal needs of every region of North America. Depending on annualized regional energy needs, we can help to provide superior thermal insulation, as well as control the amount of passive solar heat that is blocked or gained through the window. Our products, specified and installed properly, can deliver significant energy savings over the life of the window.

Despite these impressive advances, all of us are aware of an unfortunate shortcoming in our approach to the marketplace.

At AGC Flat Glass North America, we think it's time to finally say it: Consumers often buy the wrong windows, featuring a glass that does not maximize their energy efficiency — because the glass was not designed and specified with their true regional energy needs in mind.

For Northern regions, the existing standards focus too much attention on a single measure, U-Factor, while ignoring the importance of passive solar heat gain, an important source of free heat in cooler climates.

The real losers are the consumers, especially those in Northern regions, who have been purchasing and installing windows that are advertised as "high-performance" when, in fact, these products do not perform better on an annual basis than generic clear glass.

ENERGY COST REDUCTION:
The Positive Effect of a High SHGC Coated Glass, Compared to Generic Clear Glass

ENERGY STAR Region	Glass Type	Center-of-Glass SHGC	Energy Costs (per house, annual)
Northern	Low SHGC	< 0.30	+$24
	Medium SHGC	< 0.40	-$3
	High SHGC	**> 0.60**	**-$55**
North/Central	Low SHGC	< 0.30	+$14
	Medium SHGC	< 0.40	-$6
	High SHGC	**> 0.60**	**-$42**

Typical 2129 ft² house, with 319.4 ft² of window area

Source: Enermodal Engineering

In the Northern and North/Central ENERGY STAR zones, the use of low SHGC coatings results in higher annual energy bills than clear glazing. In both regions, high SHGC coatings are the best year-round performers.

Common Sense Should Prevail in Every Region

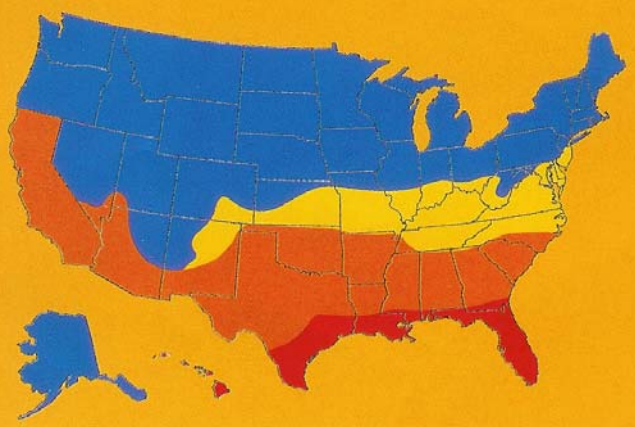
The current ENERGY STAR® program is well-intentioned, based on the prevailing data and constraints of its time. But, the challenge we face today is that a number of manufacturers advocate a "one size fits all" product approach that is made possible by the current rating systems. For example, the ENERGY STAR program is extremely specific about performance requirements for U-Factor in every region of the country, and also mandates a specific solar heat gain coefficient (SHGC) for three out of four U.S. regions. However, in the Northern region, "any" solar heat gain coefficient is acceptable — in the very region where solar heat can be used most beneficially, to reduce annual heating costs. While there is no question that thermal insulation is important in every region, it cannot be logically seen as the only factor in conserving energy in the Northern region.

A recent report by Enermodal Engineering confirms what many of us would agree is a logical conclusion: the double- and triple-

U.S. ENERGY STAR REQUIREMENTS WINDOWS AND DOORS

Zone	U-Factor	SHGC
Northern	≤ 0.35	**ANY**
North/Central	≤ 0.40	**≤ 0.55**
South/Central	≤ 0.40	≤ 0.40
Southern	≤ 0.65	≤ 0.40

While the current ENERGY STAR program makes specific recommendations for window performance in most areas, it ignores the passive solar heat gains that would reduce annual heating costs for Northern homeowners.



silver coated glass products that maximize annual energy performance in the South, by minimizing solar heat gain, perform abysmally in the North — where passive solar heat is a benefit during many months of the year.

Enermodal's exacting models — which study whole-house energy consumption — have proven that, in the Northern and North/Central regions of the ENERGY STAR map, generic clear glass actually performs better on an annual basis than triple-silver coated glasses. In terms of annual heating energy used, overall energy costs and greenhouse gas emissions, only those glass products designed for high solar heat gain show a significant advantage over clear glass in the heating-dominated Northern regions.

For these regions — and any location where annual heating costs outweigh annual cooling costs — glass products that capitalize on passive solar heat are proven to be much more energy-efficient than the low U-Factor sputter coatings, with their lower SHGC, that are gaining in popularity and acceptance.

The Enermodal study also looked at the cumulative 20-year impact of using various types of coated glass, as well as generic clear glass, on greenhouse gas emissions — one of the most serious environmental threats today. While the use of low SHGC glass in every U.S. region (the "one size fits all" approach) would decrease overall greenhouse gas emissions by about 165 million tonnes of CO_2, this reduction is primarily attributable to reduced annual energy consumption in the Southern and South/Central regions. However, matching glass type to annual energy consumption patterns — i.e., using high SHGC glass in the Northern and North/Central regions, medium SHGC glass in the South/Central zone, and low SHGC glass in the Southern zone — would reduce overall greenhouse gas emissions by an impressive 276 million tonnes of CO_2. That improvement corresponds to eliminating the annual emissions of 42 million cars!

TWO LOGICAL ALTERNATIVES

If double- and triple-silver coated glasses are not well suited for Northern regions, what glasses should consumers be buying and installing? Far more effective are pyrolytic low-e glasses such as **AGC's Comfort E2™**, or sputter-coated low-e glasses like **AGC's Comfort Ti-PS™**. Both products are specifically designed for the needs of Northern regions. **Comfort E2** offers a higher SHGC and many advantages in terms of processing, while **Comfort Ti-PS** allows for a lower U-factor. Both products can have an equally significant impact on annual heating usage, and associated energy costs.

USING THE WRONG GLASS:
Greater Emissions and a Serious Long-Term Impact

Cumulative 20-Year Emissions of CO_2 in Megatonnes

ENERGY STAR Region	Clear Glass	Low SHGC	Product Matched to Regional Needs
Northern	1551	1547	1467 (with AGC Comfort E2)
North/Central	649	622	611 (with AGC Comfort E2)
South/Central	915	878	863 (with AGC Comfort Ti-AC 36™)
Southern	574	475	470 (with AGC Comfort Ti-AC 23™)
TOTAL CO_2 EMISSIONS	3755	3522	3411
REDUCTION OVER CLEAR	--	165	276 megatonnes of CO_2 over 20 years

Source: Enermodal Engineering

Specifying the right glass for regional energy needs — high SHGC glass in the Northern and North/Central regions, medium SHGC glass in the South/Central zone, and low SHGC in the Southern zone — can eliminate 276 megatonnes of CO_2 emissions over the next two decades.

Let's Focus on Logic, Not Lobbying

In light of the significant benefits that can be realized by installing the most energy-efficient windows and doors, our industry needs to rethink the aggressive lobbying efforts that have helped to support "one size fits all" solutions — while overlooking not only regional energy consumption studies, but also common sense. Instead of convincing consumers to purchase less-than-optimal products in the interest of short-term sales gains, we need to focus on our long-term credibility — and recommend only those glass products that are backed by solid regional energy consumption data.

The ENERGY STAR program, and associated energy codes, will be reviewed soon — and that represents a unique opportunity for the Department of Energy and the entire industry to go a step further in ensuring more accurate window specifications for every region of the country.

Based on scientific evidence, it is our opinion that a minimum SHGC should be defined for both the Northern and North/Central ENERGY STAR zones. In today's new world of advanced glass technologies, no group of homeowners should have to settle for just "any" glass — and certainly not so-called "high-performance" coatings that actually perform worse than clear glass.

AGC Flat Glass North America offers the broadest product line of float glass, solar and patterned glass, and coating technologies in the flat-glass industry. For more information on AGC glass products and services, call 1-800-251-0441 or visit na.agc-flatglass.com.

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Want to Learn More?

For a summary of Enermodal's new report, contact AGC Flat Glass North America by calling 1-800-251-0441 or sending an e-mail to info@na.agc-flatglass.com.