

Public Comments
of
AGC Flat Glass North America, Inc.
to the
U.S. Department of Energy's
Energy Star Program's
Windows, Doors, and Skylights Revised Draft Criteria and Report

Introductory Comments

AGC Flat glass North America, Inc. (AGC) wishes to thank the Department of Energy (DOE) for the openness of the process employed to develop the next generation of Energy Star Windows (Energy Star) criteria¹ and for the time, work and energy they have invested in developing a proposed criteria that is essentially fair and balanced to competing stakeholders and technologies supplying the energy efficient fenestration market.

AGC strongly supports DOE's decision to break with the past failings of the International Energy Conservation Code (IECC) and the criteria established by predecessor Energy Star programs in failing to include consideration of the Solar Heat Gain Coefficient (SHGC) of fenestration in heating dominated regions of the north. DOE's historic decision to provide a simplified alternate criteria specifying SHGCs in the Northern Climate Region will lead to significant energy savings in the north. It will also lead to a significant reduction in the number of annual energy dollars spent by northern homeowners and reduce the amount those homeowners will pay for windows bearing the Energy Star label in the north.

I. In Support of a Simplified Alternate Path Criteria
Rather than Prescriptive U-factors Alone in the Northern Climate Zone.

One need only compare the insulation delivered by a northern wall (R value of 21) to a northern window (U-factor of 0.23 or an R value of 4), to realize that windows, no matter how well constructed using today's technologies, provide significantly less "insulation" than well constructed opaque walls. However, in addition to their transparency, windows offer another redeeming value to northern homes. Windows can be designed with a high SHGC to let the renewable energy of the sun reduce the amount of fossil fuels that would otherwise be burned heating homes in the north.

The proposed Energy Star criteria, for the first time, takes a quantum leap forward in supporting the use of pyrolytic low-e window technologies to save energy. This is done by using a simplified alternate path criteria in the northern climate region, rather than a prescriptive U-factor alone.

Energy Star's use of an alternate path criteria in the north has several significant

¹ The Windows, Doors, and Skylights Revised Draft Criteria and Report prepared by D & R International, Ltd. published March 11, 2009, will be referred to as the "Energy Star Report."

advantages:

1. The alternate path criteria will save more energy than a criteria based on U-factor alone; and
2. The alternate path criteria will maximize reliance on a renewable, non-polluting energy source, the Sun, to reduce the amount of fossil fuels that would otherwise be burned to satisfy northern heating loads.

II. Proposed U-factor and SHGC Additions to the Alternate Path Criteria.

As noted at p. 7 of the Energy Star Report:

[I]n the North, a 0.01 increase in U-factor produces equivalent energy performance to a 0.05 increase in SHGC. DOE used this relationship to establish the proposed revised tradeoff levels: setting the tax credit criteria of 0.30 U-factor and 0.30 SHGC as the base case, the minimum required SHGC in the revised tradeoffs rises 0.05 to balance a 0.01 rise in U-factor. The two alternative criteria specify U-factors of 0.31 and 0.32, while allowing the minimum SHGC to rise to 0.35 and 0.40 respectively. Windows with those specific U-factors and the corresponding SHGCs or higher will qualify.

AGC believes that the Energy Star criteria would be significantly improved by adding two additional U-factors to the alternate path criteria. Using the same 0.01 U-factor to 0.05 SHGC ratio expressed above to determine equivalent energy performance, the northern trade-offs should add 0.33 and 0.34 U-factors with corresponding minimum SHGCs of 0.45 and 0.50.

Windows having a U-factor of 0.33 and a minimum SHGC of 0.45 and windows having a U-factor of 0.34 and a minimum SHGCs of 0.50 both yield the same energy performance as windows having a 0.30 U-factor and a maximum 0.30 SHGC. If these two additional windows are not added to the alternate path criteria, windows will be eliminated from the Energy Star Program even though they have the same energy performance as windows in the Energy Star Program. There is no scientific or other justification for excluding these windows from the Energy Star Program.

III. Proposed Addition of a Minimum SHGC to the Criteria for the Northern Zone.

One alternative being proposed in the revised criteria is a U-factor of ≤ 0.30 with no rating for SHGC. This will allow even ultra-low SHGC glazings specially manufactured for the deep south to be Energy Star labeled in the northern climate zone. For example, glazing with a 0.30 U-factor and an ultra-low SHGC of 0.25 will be awarded an Energy Star label in 1- the Southern zone, 2- the South-Central zone, 3- the North-Central zone, and 4- the Northern zone.

A glazing with a 0.25 SHGC will permanently block 75% of the sun's free heat from entering a home in the Northern Climate Zone. This will, in turn, result in that home burning more fossil fuels to heat the home in the winter because 75% of the sun's energy is being blocked by its windows. Surely, such ultra-low SHGC windows, manufactured specifically to reduce cooling loads in the deep south, should not be awarded an Energy Star label in the Northern zone.

In order to block ultra-low SHGC products from migrating from the south, where they do save energy, to the north, where they will actually increase fossil fuel consumption in the winter, the Energy Star Windows criteria should include a minimum 0.30 SHGC in the Northern Climate Zone.

IV. No Credible Proof Exists That Increased Sales of High SHGC Windows in the Northern Climate Zone Will Increase Peak Demand

The Energy Star Reports at p. 6 that:

Stakeholders expressed the following concerns about the draft criteria for Zones ES5, ES5a, and ES4:

- The criteria, especially for Phase 2, might lead to greater sales of high-gain windows, which, if sold in large quantities, might increase peak demand in the summer.²

It is, simply, unscientific to suggest that “greater sales of high-gain windows ... might increase peak demand.” In the first place, most high solar gain windows sold with an energy star label will be replacement windows. The windows that will most likely replace will be clear glass windows. Any low-e window, whether high or low solar gain, will have an SHGC lower than virtually any clear glass window. Hence, (assuming that one could accurately measure its peak load impact) increased sales of high solar gain, low-e windows in the north is actually more likely to **reduce** peak load rather than increase it.

Moreover, reports attempting to attribute increased peak load to the use of high solar gain residential windows are notoriously subjective and unreliable. They are typically developed using a host of subjective and unrealistic assumptions that significantly exaggerate the impact of high-gain windows. In order to make hypothetical calculations of the peak load attributable to high versus low solar gain windows, these studies typically assume, for example, that every home in the climate zone under consideration has central air conditioning. They then assume that, instead of opening windows, or closing blinds, or using fans or shades, northern consumers all run their central air conditioners 24-hours a day, 7-days a week at a constant thermostat set point all summer long. While these arbitrary and subjective assumptions allow the authors of these reports to run peak load calculations, these types of assumptions are wholly unrealistic,

² This concern that Energy Star might lead to greater sales of high-gain windows was presumably expressed by a stakeholder that sells low-solar gain windows.

unreliable and provide highly exaggerated estimates of the impact of high-gain residential windows on peak load.

V. There is no Scientifically Sound Basis for a 0.40 SHGC cap in the North-Central Zone.

There is no scientific or analytical support for the imposition of a 0.40 SHGC cap in the North-Central climate zone. There is no support of any kind for this 0.40 SHGC cap in the Energy Star Report. Indeed, there is not even any discussion of it. In DOE's predecessor Energy Star report³ the **only** mention is as follows:

SHGC has been lowered from 0.55 to 0.40. IECC 2009 has no SHGC criterion for this region, because the energy savings analysis shows that solar control provides only modest benefits in this climate region.

There is, simply, no scientific or any other rational basis upon which to impose a 0.40 SHGC cap in the north-central climate zone.

The SHGC in this zone should either be ≤ 0.55 or NR (no rating.) to ensure that homeowners in this zone are not precluded from using Energy Star labeled windows capable of maximizing the renewable heat of the sun rather than increasing their reliance on burning fossil fuels in the winter.

VI. Sliding Glass Doors Should Have a Separate Criteria.

The amended criteria for Energy Star Windows applies not only to windows, but to sliding glass doors. For structural purposes, sliding glass doors require framing and construction that is typically far different from window framing and construction. Accordingly, the Energy Star Windows Program should take these structural differences into account and provide a separate standard for sliding glass doors. Grouping sliding glass doors together with windows would be much like grouping windows together with opaque walls. The differences between the two, simply, do not permit them to be grouped together for purposes of establishing energy conservation criteria.

Respectfully Submitted,

AGC Flat Glass North America, Inc.

³ Windows, Doors and Skylights Draft Criteria and Analysis prepared by D&R International, Ltd. dated August 6, 2008.