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From: Christina A. Snyder [mailto:CASnyder@ic.org]  
Sent: Wednesday, March 18, 2009 4:52 PM  
To: richard.karney@ee.doe.gov; Emily Zachery  
Subject: Criteria Revision Public

As a Certified Passive House Consultant in Michigan, I am concerned that you are getting the building science wrong in your "Energy Star for Windows, Doors and Skylights Revised Draft Criteria and Report." In any climate that has any heating loads, not just here in the North, the sun can be our friend, not our enemy, if designers plan properly sized and placed summer shading features into their projects; therefore setting a max. SHGC for south-facing windows in ANY region in the USA is getting the building science wrong. Also, the DOE should require all fenestration manufacturers (including tubular skylights) to at least label the SHGC, whole unit U-values, and EFFECTIVE AIR LEAKAGE RATES on all their products, so that designers know what they are getting and can design for their climates.

The infiltration rates through fenestration products are at least as important as SHGC and whole unit U-values in determining the thermal contribution (or liability) that fenestration products make in a building, yet such data is often very difficult to come by. Sustainable buildings are specific to climate zones and bioregions, thus attempts to propagate a one-size-fits-all prescriptive standard for a sustainable fenestration product is likely going to be counter-productive. That's why the Passive House Standard, [www.passivehouse.us](http://www.passivehouse.us), is a performance standard limiting energy use for the whole building, and providing integrated design methodologies and tools enabling designers to utilize the most climate and regionally appropriate strategies and building systems to arrive at the standardized performance goal. The Passive House Standard requires the entire building have a maximum infiltration rate of no more than .6 Air Changes per Hour at 50 pascals pressure differential, and air-tight fenestration products are essential to achieving this strict goal that accounts for much of the P.H. Std's energy savings.

Since you requested documentation, below are the windows that I specified to achieve the Passive House Standard of energy efficiency on a recent project. The P.H.Standard requires no more than 15 kwh/sq.m energy be used for space conditioning the building ANNUALLY, including the power-draw of all associated fans & motors. This translates to about 5000 BTU/sq.ft annually for space conditioning. The maximum instantaneous heating or cooling load is about 1 w/sq.ft, such that a 1200 sq.ft. dwelling can be heated by an electric element the size of that in a typical hair blowdryer. The Alpen HM88 glazing, which exceeds your max. SHGC limit by nearly double, was used for all south windows, which were fully shaded in summer with overhangs. All other exposures had the SC75 glazing which does comply with your suggested guidelines.

If I had to comply with your suggested SHGC guideline, I would have lost nearly half of the solar gain which provides about 1/3 of the building's space heating in winter. I would be unable to meet the Passive House Standard, and the back-up energy requirement would be about 150% of what it was with the non-compliant super-windows that allow me to meet the P.H.Std. It is unfair for you to penalize good designers who understand the building science by propagating a dumbed-down, one-size-fits-all

standard based on the vast majority being lazy and not building according to the scientific rules of passive solar design.

In SI (metric) units used in the Passive House software:

Alpen Glass HM88	SHGC: 0.530	U-value, w/sq.mK:
0.624		
Alpen Glass SC75	SHGC: 0.270	U-value,
w/sq.mK: 0.511		
Duxton Fiberglass Frame Frame	U-value, w/sq.mK 0.90,	
Spacer conductivity, w/mK: 0.040	Installat'n conductivity, w/mK:	
0.040		

In (american) Imperial units:

Alpen Glass HM88	SHGC: 0.530	U-value, btu/(hr sq.ft
F): 0.110		
Alpen Glass SC75	SHGC: 0.270	U-value,
btu/(hr sq.ft F): 0.090		
Duxton Fiberglass Frame Frame	U-value, btu/(hr sq.ft F): 0.159,	
Spacer & Installation conductivity,	btu in/(hr sq.ft F): 0.023	

I hope you will follow President Obama's lead, and base your policies on accurate building science physics, rather than polls relating what "green" builders do, or politics,  
Christina Snyder, architect  
Equilibrium Energy Spaces  
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Christina A. Snyder  
casnyder@ic.org  
voice: 734-428-9249