SYRACUSE GLASS COMPANY

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TECH TIPS

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#15 – GLASS AND ENERGY – WHOLE SYSTEM SHGC VALUES

This document provides an example of the use of the simplest, but most stringent method of compliance with SHGC requirements under the Energy Conservation Construction Code of New York – 2007. This method is allowed for commercial buildings with less than 50% window and door glazed area.

First, go to chapter 2 and select the commercial climate zone for the County the project is located in.

Second, calculate the percentage of wall area that is glazed by dividing the area of the windows and doors by the area of the above grade walls.

Third, go to chapter eight and select one of the four charts for the project climate zone depending on the window and door glazing percentage. The SHGC value listed there is the requirement, a "whole system" SHGC value, not just center-of-glass. The SHGC's get more stringent as the percent of glass windows and doors increases, as the location of the project moves to the warmer areas of the State, and as the glazing is less shaded by roof eaves, sun shades, or overhangs. Shading is quantified by calculating the "projection factor" as defined in section 802.2.3.

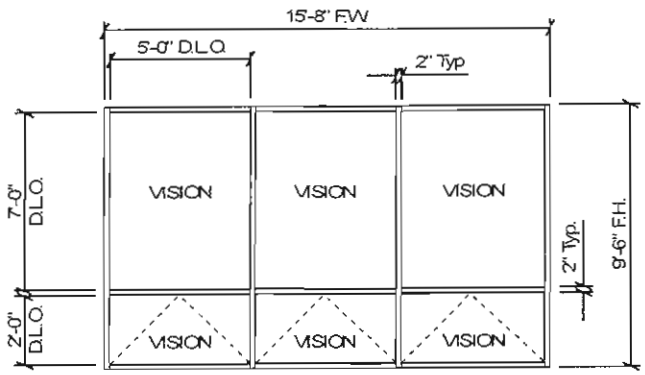
Fourth, calculate the percent of vision glass by dividing the area of the glass using the daylight opening dimensions by the total area of the glazing, using the frame width and height dimensions.

Fifth, select framing material and glass and determine whole system SHGC value using the AAMA 507 Standard or a chart supplied by the framing manufacturer.

Here's an example, using a commercial building in Albany County, with 30% glazing area, with no exterior shading. The required SHGC is .40. The percent of vision glass is 91%. To comply with the .40 requirement, I select glass with a center-of-glass SHGC value of .45 or lower. In bulletin 13, I selected a 1" clear insulating unit with Pilkington Low e to meet the U value requirement. But that make-up won't meet the SHGC requirement, since it has a center-of-glass SHGC of .66. As a "passive solar "low e product, it's designed to allow and capture solar energy. There are several options to meet the .40 "whole system" SHGC:

- You can include a tinted outboard lite - a bronze/low e combination yields a center-of-glass SHGC of .45, for a "whole system" SHGC near .40 (see chart next page).
- If more light transmission is desired, you can use a clear solar control low e product like Guardian SN-68, with a remarkable center-of-glass SHGC of .37.
- You can employ a permanent shading device - eaves, overhangs or sun shades. You evaluate the contribution of the shading device using the projection factor formula in Section 802.2.3. A greater than .50 projection factor changes the code SHGC requirement from .40 to .60, allowing for glazing materials with lesser solar control properties.

Example Calculation
(Based on entire elevation)



Vision Area	= 3(5' x 7') + 3(5' x 2') = 135.0 ft^2
Total Area	=15'-8" x 9'-6" = 148.8 ft^2
Percent of Vision Glass	= (Vision Area ÷ Total Area)100 = (135.0 ÷ 148.8)100 = 91%

14000 Center Glazed Wall System

System SHGC vs. Percentage of Vision Area