

Solector® Sun Shading Estimator User Instructions

There are two sections that require user inputs: **general information** and **façade configuration**.

GENERAL INFORMATION

In the **general information section**, enter basic information about unit selection (US or SI), building location (state/province and city), space dimensions (façade width, room depth and height) and façade orientation, along with basic glazing properties (U-value/U-factor, visible transmittance and SHGC – provided by all glass manufacturers).

FAÇADE CONFIGURATION

This section provides several flexible options for **façade configuration**, framing system type, glazing-framing fraction, and type and details of sun control products (blades, outriggers and power shades). Two scenarios are presented for comparison, each providing a graphical representation of a façade section with selected options. Enter the following details:

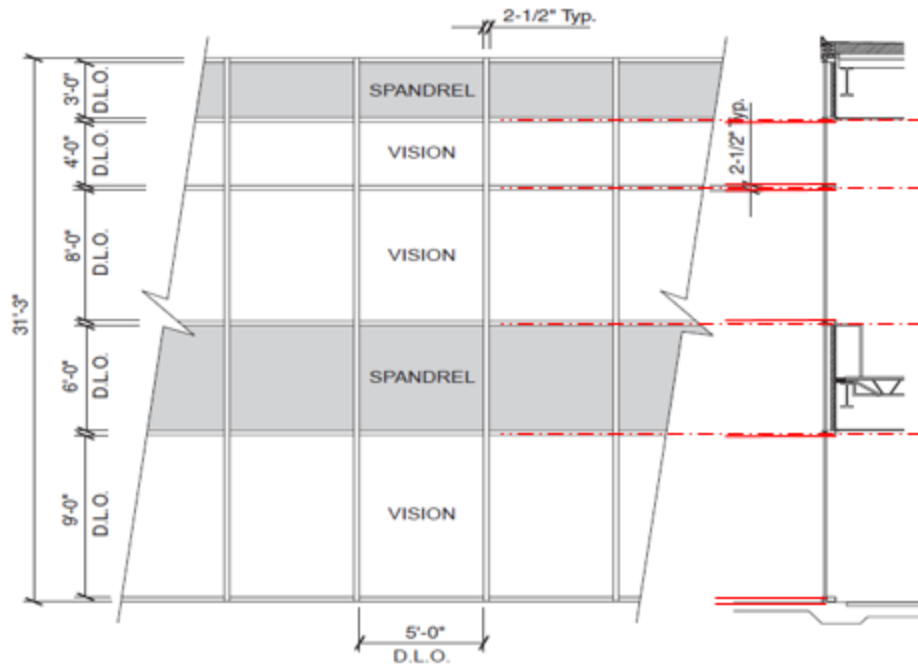
Façade configuration, top inputs:

Select from the drop-down menus:

- **Shading type:** Select one of the options: “Outrigger,” “Single Blades” or “Power Shade.” *(Once selected, the image will change to the respective sun control product design with required inputs.)*
- **Façade framing:** Select “Curtain Wall” or “Storefront” depending on the application. This automatically configures the framing options for the construction type.
- **Frame type:** Select the framing type you want to compare. For more information, contact Kawneer or visit the product section of Kawneer.com at www.kawneer.com/kawneer/north_america/en/product_browse.asp.
- **Glass percentage:** The glass percentage is the ratio of vision glass area to the total opening area (excluding any spandrel glass area). If spandrel glass is within the elevation, the opening area is taken to the centerline of the framing members that retain the spandrel. If the spacing between verticals is consistent, a single bay can be used to calculate the glass percentage as shown in the example (see Figure 1). Use the drop-down menu to select a glass percentage between 70% and 95%.

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Figure 1: Sample Glass Percentage Calculation



$$\text{Vision Area (Glass)} = 5'(9' + 8' + 4') = 105.0\text{ft}^2$$

Vision Daylight Openings (D.L.O.)

$$\text{Total Area (Vision)} = (5' + 2.5'') * ((9' + 3.75'') + (8' + 2.5'') + (4' + 2.5'')) = 113.20\text{ft}^2$$

Vision Daylight Openings (D.L.O.) and Metal Members

$$\text{Percentage of Vision Glass} = 100 \left(\frac{\text{Vision Area}}{\text{Total Area (Vision)}} \right)$$

$$\text{Percentage of Vision Glass} = 100 \left(\frac{105.0\text{ft}^2}{113.20\text{ft}^2} \right) = 93\%$$

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Façade configuration, figure inputs:

For all designs, enter the window height, which can be different from (but not greater than) the room height previously defined, to account for the window-to-wall ratio. The portion of the façade that is not a window is automatically assigned as a spandrel section with a U-value recommended by ASHRAE Standard 90.1 for your location.

- **For outriggers:** Select the outrigger position (distance from the top of the window), length, type and blade type. When you select the outrigger type and blade type, a side view appears on the bottom right. These options affect solar heat gain and are required for calculations.
- **For single blades:** Select horizontal or vertical blades. For horizontal blades, enter the position of the top blade, number of blades (in rows; enter 1 for single blade) and distance between rows (spacing) when applicable. On the bottom right, select the angle from horizontal and the length of the blade. For vertical blades, enter the blade spacing, blade length and angle from the window normal. (*Note: the image next to the number of rows is for illustration purposes and therefore only two blades will be shown regardless of the blade quantity selected.*)
- **For power blades:** No input is required except for window height. The power blade is fixed to cover the top part of the window and is rotated to an angle that maximizes electricity production for the selected location.

CALCULATE RESULTS

After you've entered all data, click "Calculate Results." Calculations for the two scenarios run simultaneously in about 10 to 15 seconds to account for all the parameters entered.

Outputs include:

- A chart with the percentage of annual cooling energy savings for each scenario (compared to no shading)
- A table with average window shading fractions for every hour of each month for your selected design
- Power production if using power blades
- A graph showing daylight sufficiency as a function of distance into the room if using light shelf

If one or more required fields are blank or an incorrect number has been entered (e.g., window height exceeds room height), an error message will appear at the top in the general information section explaining what needs to be changed. (*Note: If a required field is left blank, the field will be highlighted.*) Adjust any of the inputs and click "Calculate Results" again.