

DAYLIGHT MODELING

WOOLPERT WHITE PAPER

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Daylight modeling is a technique used to predict the luminance levels in a space that will be directly or indirectly affected by sunlight. It is a powerful tool for understanding the design decisions that impact a building's visual comfort.

Daylight modeling takes the mystery out of predicting the impact of daylight on a space by allowing architects and designers to see the impact of variations in daylighting strategies before a space is constructed.

Daylight Modeling has several benefits for designers, including:

- Improving the environment of a space
- Developing optional daylighting designs
- Capturing LEED points
- Avoiding daylighting disasters caused by glare
- Managing related heat loss/gain and energy usage

However, to successfully design with daylight, there are some things to consider:

- Impacts of the time of day and season of the year
- Building position
- Surrounding buildings and terrain
- Glazing
- Glare control
- Color, finish and materials



Color, finish and materials affect how light is reflected; unfortunately, they are rarely decided on at the time of the daylight modeling process. However, some assumptions can be made. A good rule of thumb is to assume 80% of light will be reflected by ceilings, 50% of light will be reflected by walls and 20% of light will be reflected by floors.

Windows also play an important role in accurate daylight modeling. Just as important as it is to know the size of a window or skylight that's going to be incorporated into the model, so is the type of glass. Will it be tinted or clear? Is the glass diffused? Are the windows single or double pane and how does the projection factor contribute to the overall model?

While there are many considerations that contribute to daylight modeling, it's undoubtedly a powerful tool that should be used during the design development phase of a project. If designed with daylighting in mind, a space can avoid the use of electric lights for most of the day, saving tenants a significant amount on their electricity bills each year.