VELUX Daylight Visualizer Readme
Version 3.0.84

About

Daylight Visualizer is a free professional and validated simulation tool for the analysis of daylight conditions in buildings. It is easy-to-use and compatible with many CAD/BIM software including Revit, AutoCAD, ArchiCAD, SketchUp, 3ds Max, Rhinoceros 3D and more.

In the release notes below you will find useful information about the software and links to video tutorials to help you get started using Daylight Visualizer.

New features in version 3.0.84

- New simulation engine capable of simulating light redirection on mirror surfaces for complex products like light pipes (Sun Tunnels), light shelves and louvers with specular reflections.
- New HTML report format making it easy to evaluate and document EN 17037 requirements for daylight, as well as Active House version 3 specifications.
- New "Update project" option to update 3D model in existing projects with imported models to allow users to update the model without losing all other settings such material properties and cameras. This option is found under the file menu as "Update project".
- Added support for latest file formats for .DWG, .DXF and .SKP imported models (2020).
- Added option to choose between rendering only zones or camera output, or both. This allows to evaluate daylight performance on zones much faster.
- Added option to draw custom shape for analysis of results in output viewer for plan view simulations. This is done by holding the "Shift" key as you define the area point by point.
- Added support for sunlight in illuminance renderings.
- Updated the list of default reflectance and glass transmittance values.

Video tutorials

Video tutorials showing how to use Daylight Visualizer can be found on our YouTube channel VELUX Building Simulation Tools.

- How to import models from SketchUp:
  https://youtu.be/uv2KfmDHDos
- How to import models from REVIT:
  https://youtu.be/isMvhyvMsLM

- How to import models from AutoCAD:
  https://youtu.be/kHzT21F1Zac

- How to evaluate daylight requirements from EN 17037 and make a report with results:
  https://youtu.be/0_vva2cCygo (imported models)
  https://youtu.be/SE8A4xQxAyo

- How to use pre-defined zones for daylight calculations in imported models:
  https://youtu.be/yKqOSNFNjg8

- How to use sensor points:
  https://youtu.be/22VcQwsypEc

Create or import 3D models

The 3D modeler in Daylight Visualizer permits quick and easy generation of 3D models in which façade and roof windows are freely inserted. Most of the operations usually required to create a 3D model are automated within the modeler functionalities, such as the insertion of windows which is simply performed by dragging a window icon to a desired location in the model.

*The embedded 3D modeler does not support complex shapes (fx. curved walls) and multi-storey buildings.

The 3D Importer makes it possible to import 3D models generated by most CAD/BIM software to permit the evaluation of a wide range of building designs without limitations to the complexity of geometry or scale of the building. Supported formats are .OBJ, .DWG, .DXF, and .SKP.

*Note that Daylight Visualizer version 3.0.84 supports 3D models saved in 2020 format or prior for .SKP, .DWG and .DXF models.

Simulation output

Daylight factor (DF): Daylight factor is a daylight availability metric that expresses as a percentage the amount of daylight available inside a room (on a work plane) compared to the amount of unobstructed daylight available outside under overcast sky conditions.

Illuminance: Illuminance is the measure of the amount of light received on the surface. It is typically expressed in lux (lm/m2).

Luminance: Luminance is the measure of the amount of light reflected or emitted from a surface. It is typically expressed in cd/m^2.

*Daylight Visualizer can be used to perform single point in time simulations (specific time of day/year defined by the user) under a wide range of CIE sky conditions.

Note on window "glass" materials and BSDF support

VELUX Daylight Visualizer has 2 types of glass material: glass (surface) and glass (solid).
It is important to know the difference between those 2 materials as it can have a big influence on daylight calculation results.

Glass (surface): This material type applies the transmittance value to every polygon light travels through in the model. For example, if you have modelled a glass pane as a solid object with a thickness you will have two layers of polygon – and a transmittance value 0.8 will result in a light transmittance of 0.64 for the glass pane.

Glass (solid): This material type applies the transmittance value to a solid object where light travels through two layers of polygon. For example, if you have modelled a glass pane as a solid object with a thickness you will have two layers of polygon – and a transmittance value 0.8 will result in a light transmittance of 0.8 for the glass pane.

Light diffuser: This material type applies the transmittance value to every polygon light travels through in the model – and has an isotropic diffuse light output. We highly recommend applying this material to window panes modeled with only one layer of polygon.

BSDF: Daylight Visualizer supports the use of BSDF materials (in .xml format) which can be used to simulate complex fenestration systems. BSDF can only be used when working with imported 3D models.

Validation reports

Report 01. Simulation results have been validated by ENTPE (National School of State Public Works) against test cases dedicated to natural lighting in CIE 171:2006 Test Cases to Assess the Accuracy of Lighting Computer Programs.

Report 02. Simulation results have been validated in the investigation – Daylight Calculations in Practice SBI 2013:26 - which looked into the ability of nine daylight simulation programs to calculate daylight factor levels in five typical rooms.

Simulation engine

Daylight Visualizer simulation engine uses bi-directional Monte Carlo ray tracing with photon mapping algorithms and is developed by Luxion ApS.

Contact and support

Please contact us at daylight.visualizer@velux.com