

Guideline to daylight simulations in IES-VE with MicroShade®

This is a guideline to building simulations with MicroShade® in IES-VE. IES-VE is a building simulation software for analyzing buildings and installations developed by IES in United Kingdom. IES-VE is used for designing and simulating buildings and calculates, among other things, the annual energy consumption and daylight conditions for a given building. IES-VE contains several applications, one of them is RadianceIES. RadianceIES uses the daylight calculation tool Radiance as a calculation core and can calculate several daylight parameters for one or multiple rooms.

This guideline is intended for daylight simulations with MicroShade® in the RadianceIES application for IES-VE. For further questions regarding RadianceIES or IES-VE simulations, please contact IES on their support page <http://www.iesve.com/support/contact>. For questions regarding MicroShade®, please contact us on support@microshade.com.

For building simulations in IES-VE with MicroShade® please see our [guideline](#) to building simulations in IES-VE.

Simulation of MicroShade® in RadianceIES

About MicroShade®

MicroShade® is a highly effective shading product consisting of an almost invisible film combining UV and IR coatings with a structured micro-lamella. The shading efficiency depends on the incidence angle of the sun on the lamellas. When the sun is high in the sky during the summer, MicroShade® provides the strongest shading and during winter when the sun is low more heat is allowed into the building. Similarly, the shading efficiency also varies during the course of the day due to the different positions of the sun morning, noon and evening.

Daylight metrics

It is recommended to use either spatial Daylight Autonomy (sDA) or Useful Daylight Illuminance (UDI) as the evaluation metric when simulating daylight conditions in a room or building. The RadianceIES application for IES-VE can calculate these daylight metrics under the "Advanced" tab in "Simulate". In Europe it is recommended to use the spatial daylight autonomy (sDA) as described in EN 17037.

sDA describes the percentage of floor area that receives daylight above a limit, usually 300 lux, for at least 50% of the annual daylight hours.

UDI describes how many hours, workhours or percentage of the year where the daylight levels are within the desired interval (usually 100-3000 lux). Lower illuminance levels requires artificial light and higher illuminance levels causes a risk of overheating and glare.

Usage

In RadianceIES a MicroShade® glazing can be simulated with a BSDF file for the glazing containing MicroShade®. BSDF files for standard 2- and 3-layer glazings with MicroShade® can be downloaded from this guideline and imported into RadianceIES in the "Surface Properties" tab for the window.

In case you need a special glazing configuration, it is possible to create a special glazing containing MicroShade® following our general guideline on [daylight simulations with MicroShade®](#).

MicroShade® BSDF files

BSDF (Bi-directional-Scattering-Distribution-Function) files of MicroShade® used in common window constructions are available for download below, these are to be used in RadianceIES-VE.

- 2-layer MS-F 60/14 for facade
- 3-layer MS-F 60/14 for facade
- 2-layer MS-F 60/14 for roof
- 3-layer MS-F 60/14 for roof

In case you cannot find the variation you are looking for, a custom BSDF can be made following the [Guideline to daylight simulations with MicroShade®](#), otherwise feel free to contact us at support@microshade.com

Setting up a simulation in RadianceIES with MicroShade®

Getting started

1. In IES-VE, create your model in ModelIT, add windows and open the lighting application RadianceIES
2. Select the "Surface properties" tab. This is where you will add the MicroShade® glazing BSDF file.
3. Press "Add BSDF" in the "Surface properties" tab.

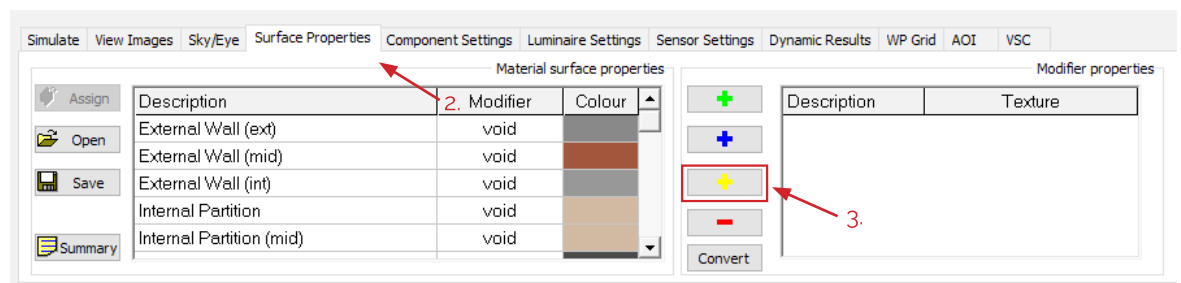


Fig. 1: Add a BSDF file under "Surface Properties"

4. In the "Description" list under the "Surface properties" tab, navigate to "External glazings", and select the MicroShade® modifier instead of "void". This will now be the BSDF modifier for all the external glazings in the model.

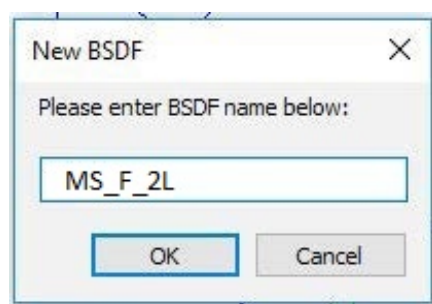


Fig. 2: Give the BSDF file a name

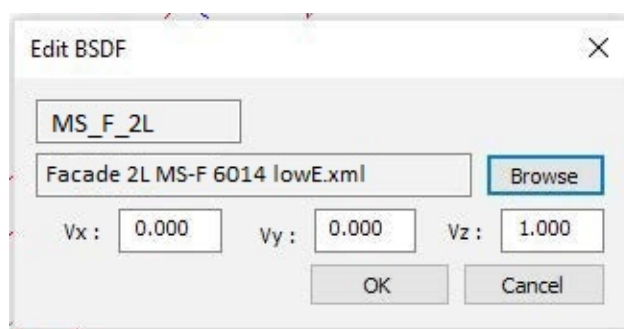


Fig. 3: Navigate to the directory of the BSDF file and select it

5. In the "Description" list under the "Surface properties" tab, navigate to "External glazings", and select the MicroShade® modifier instead of "void". This will now be the BSDF modifier for all the external glazings in the model.

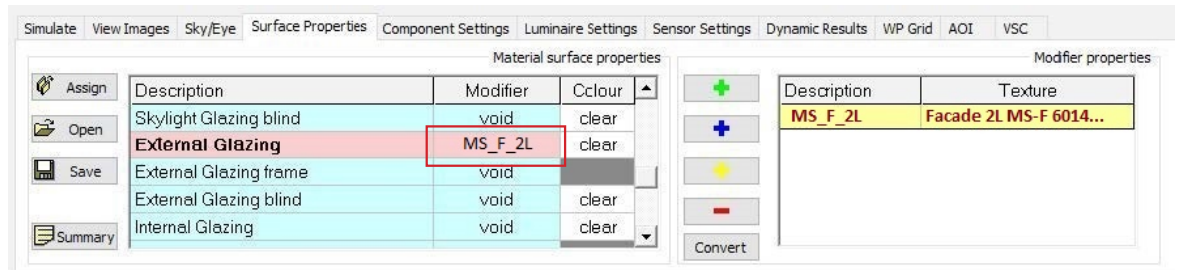


Fig. 4: In this example a MS-F BSDF file has been selected as a modifier for the external glazings of the model

More than one type of MicroShade®

If the model includes different kinds of MicroShade® types or external glazings, complete these steps:

1. Select the façade with the glazings you want to edit and click on "Assign".

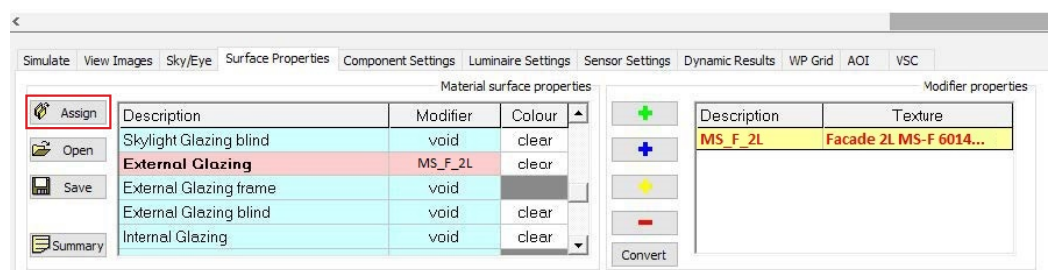
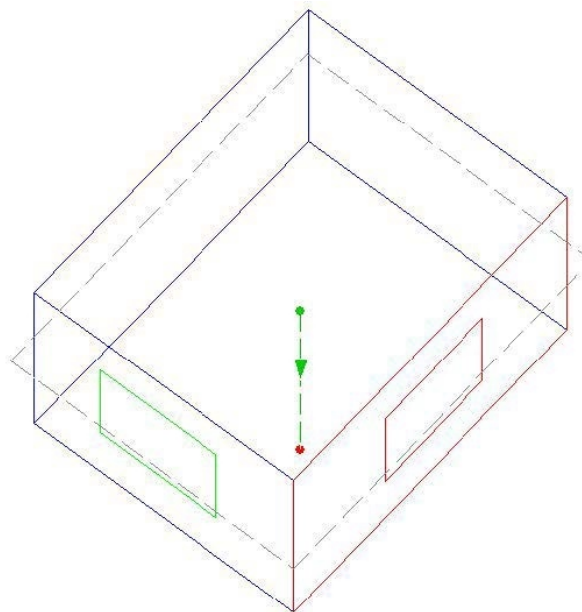


Fig. 5: In this scenario, a MS-F 60/14 2-layer BSDF file has been added to one window, and a MS-F 16/14 3-layer BSDF file must be added in the other window. Select the facade where the other BSDF should be inserted and click on "Assign"

2. Select the appropriate glazing surfaces from the list in "Model surface(s) of the following type". Click on "New" and create a new surface type. Select the surface you just created in "Possible replacement surface type" and click on "Replace". The windows on this wall now have their own surface type. Press "Close".

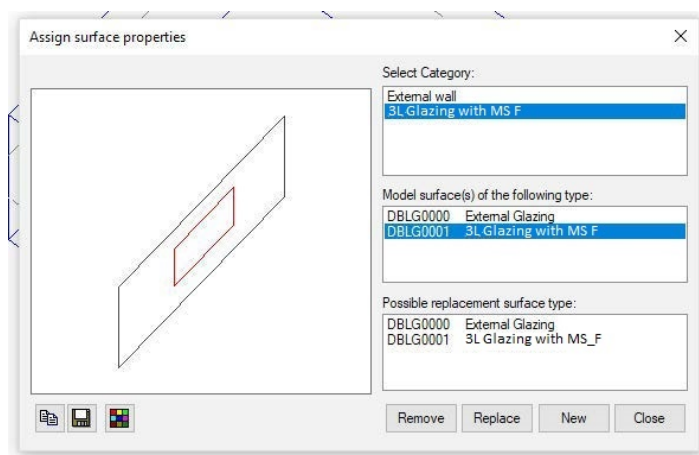


Fig. 6: Replace an existing surface type with a new surface type

3. A new material has now been created in "Material surface properties". Assign a new BSDF file as a modifier, by following the procedure for adding BSDF-files, as mentioned earlier.

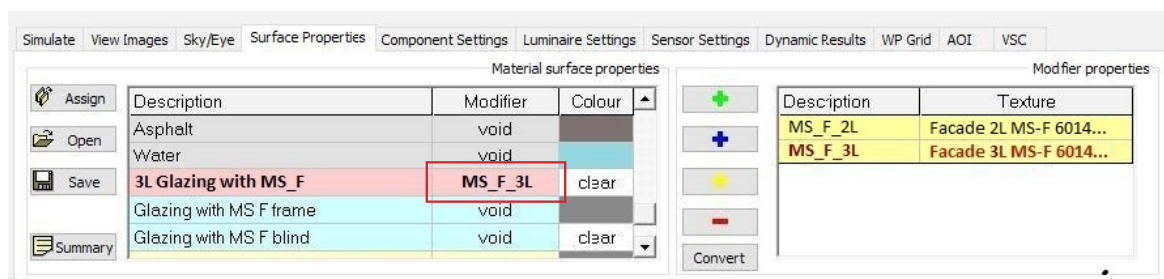


Fig. 7: In this example, a MS-F 60/14 BSDF file has been used as the modifier for the newly created surface material

If the simulation includes different kinds of MicroShade® types or glazings in the same façade, follow the same procedure as mentioned above, but instead of initially selecting a wall and clicking on "Assign", select the individual window in the 3D view and then click "Assign".