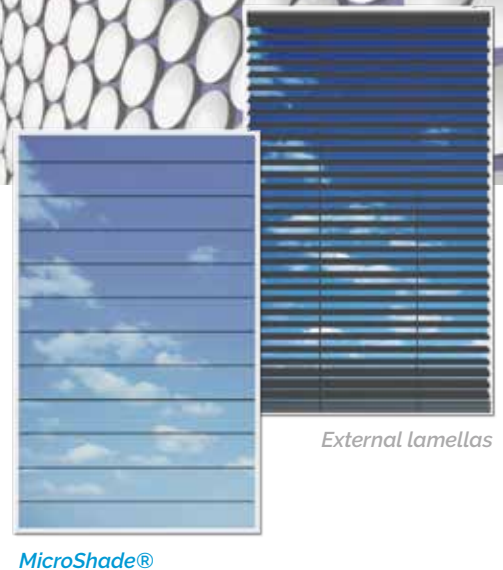


# Comparison External lamellas and MicroShade®

A good indoor climate is important for people to thrive. Employees who thrive are more productive, engaged, happy, loyal and satisfied. In order to obtain a good indoor climate the facades are critical as they will determine the indoor temperature, daylight and view out.

Below the two facade solutions MicroShade® and external lamellas are compared on the most important parameters for the experienced indoor climate; g-value, beam shading, daylight through the façade, colour rendering and view out. Furthermore the predictability of the solutions is compared.



<b>Thermal indoor climate</b>	g-value*	√	√
	Beam Shading	√	√
<b>Daylight and view out</b>	Daylight*	√	(√)
	Colour Rendering	95	95
	View out*	100%	20-70%
<b>Predictability</b>	Wind Stability	√	X
	Control	No control	Manual or automatic
	Overall Predictability	100%	50-80%

\*See graph on next page

√: Very good

(√): Good

(X): Poor

X: Very poor

The thermal performance of the two products is similar, while the performance on daylight and view out is different as described in the graphs on the next page. The external lamellas are sensitive to wind, usually they can withstand up to 10 m/s, while MicroShade is unaffected by the wind. The overall predictability is 100 % for MicroShade, while only 50-80% for the external lamellas depending on the control. Manual controlled lamellas have a predictability of app. 50%, while automatic controlled lamellas have a predictability of app. 80%.

Below is shown graphs for the two solutions of the monthly effective g-value, average monthly amount of daylight, amount of daylight on a summer day and the number of hours with a view out.

## Assumptions

### Types of glazing

3-layer low energy glazing both for MicroShade® and external lamellas

### External lamellas

Dynamic control with a threshold of 100 W/m<sup>2</sup>. Dimensions of lamellas: width of 100 mm, tilt of -45° and distance between lamellas of 100 mm

### Orientation

South façade

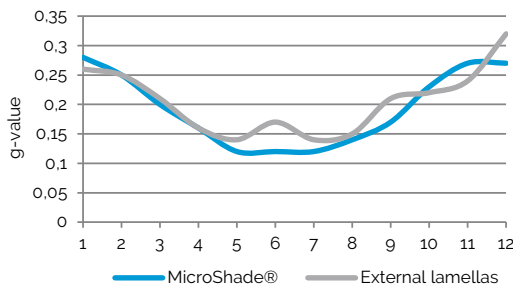
### Weatherdata

Copenhagen, Meteonorm ver. 7.1.1.122

### Effective g-value

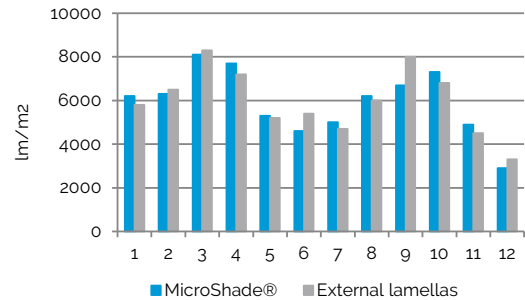
The effective g-value varies over the year for both MicroShade and External Lamellas.

During summer the g-value is lowest and hence keeping the heat out when most needed. During the winter, where the solar irradiation can be used as "free" heating the g-value is higher and hence letting in more solar irradiation.



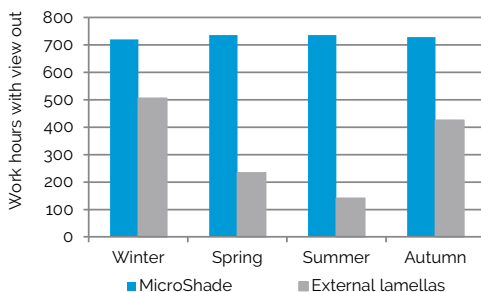
### Daylight trough facade

The amount of daylight through the façade is measured in lumens/m<sup>2</sup>. As seen on the graph the two solutions allow an equal amount of daylight to pass through the façade when looking at monthly averages.



### View out

The view out is measured by the number of work hours, where it is possible to have a view out. With MicroShade® it is possible to have a view out at all times. The external lamellas need to be closed in order to have an effect. During the summer months it is only possible to have a view out for 20% of the work hours with the External Lamellas. During the winter months it is possible to have a view out for 70% of the time.



### Daylight through facade, summer day

When looking at a single day, a cloudy summer day, it is seen that the external lamellas are in use during the working hours and hence reducing the amount of daylight. MicroShade® on the other hand allows the daylight to pass and provides a higher amount of daylight during working hours.

