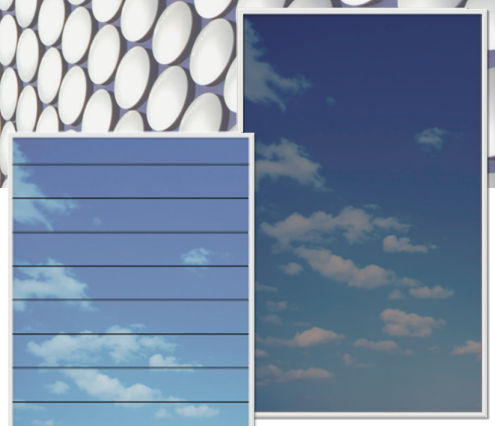
Comparison Electrochromic glass and MicroShade®



Electrochromic glass

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 electrochromic glass 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.

Thermal indoor climate	g-value*	√	√
	Beam Shading	√	(X)
Daylight and view out	Daylight*	√	(√)
	Colour Rendering	√	X
	View out*	√	(X)
Predictability	Wind Stability	√	√
	Control	**No control**	**Automatic w. override**
	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. For electrochromic glass, the light transmission varies with the degree of activation and can be as low as 1 %, with a minimum g-value of 0.09. MicroShade® can provide a g-value as low as 0.10, while still letting more than 40 % diffuse light through, and blocking the direct light almost entirely. Electrochromic glass reduces both diffuse and direct light. The ability to see through is the same for both solutions when glare is not considered, but the electrochromic glass has a much lower colour rendering index when activated, which means that the visual indoor climate will be distorted to a high degree. None of the solutions are sensitive to wind, but the overall predictability will be less with electrochromic glass, because it depends on electric equipment and power supply, and also has a certain activation time.

Assumptions

Types of glazing

2-layer low energy glazing both for MicroShade® and electrochromic glass

Electrochromic glass

For calculation purpose, the electrochromic glass is either fully activated or switched off.
Activation threshold of 150 W/m² g_o = 0.41 (deactivated) and 0.09 (activated)
LT_o = 0.61 (deactivated) and 0.01 (activated)
Reference:
www.sageglass.com

Orientation

South façade

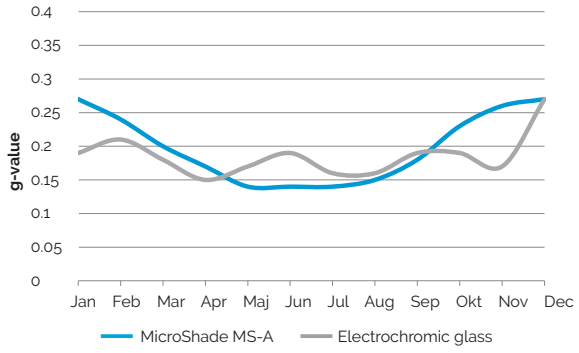
Weatherdata

Copenhagen,
Meteonorm ver. 7.1.1.122

Effevtive g-value

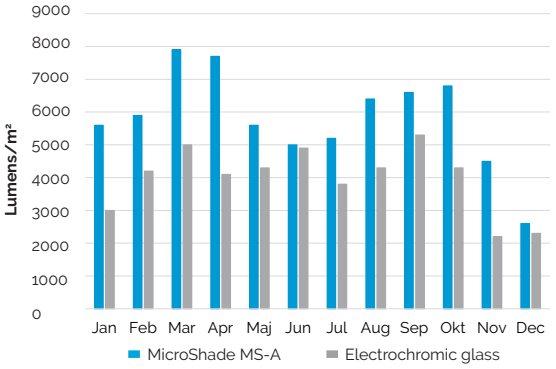
The effective g-value varies over the year for both MicroShade® and electrochromic glass.

For MicroShade®, the g-value decreases when the irradiation angle increases, while for electrochromic glass it varies with activation time. 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 more solar irradiation is transmitted.



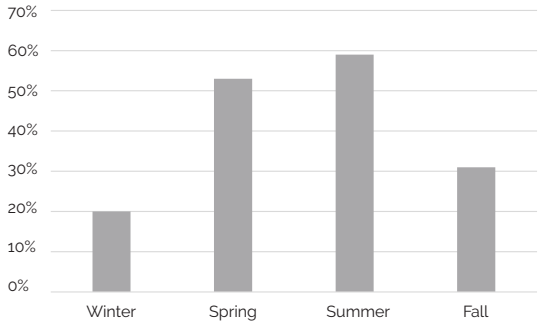
Daylight trough facade

The amount of daylight through the façade is measured in lumens/m². As seen on the graph the electrochromic glass allows more direct light to pass than with MicroShade®. The light is strongly coloured by the electrochromic glass.



Activated shading hours

In order to avoid high solar gain in the room, the electrochromic glass will be activated up to 60 % of the working hours during summer.



Daylight through facade, summer day

For electrochromic glass, the daylight is determined by the degree of activation during the day. For the MicroShade®, less direct light will enter as the sun goes higher, but the amount of diffuse light will not be reduced. When the electrochromic glass activates, much less light comes through the façade, compared to MicroShade®.