MicroShade® datasheet

Type: MS-D

MicroShade® is a highly effective shading product containing microscopic shading lamellas. 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.

The micro lamellas are constructed in a strip of steel and the MicroShade® strip is mounted in the cavity of two- or three-layer low-E glazing. The standard width of the strip is 140 mm. The MicroShade® strip can be mounted in any position.

Application

The lamellas of MicroShade® MS-D have a tilt of 23˚ and have been developed for application in facades, where it provides the most effective shading. MS-D can also be applied in roofs with a shading effect that is only slightly reduced compared to the facades. MS-D can be applied at all orientations but is sensitive to direction of mounting.

MicroShade® MS-D is applied when stronger shading is needed than the MS-A can achieve. MS-D is color neutral.

For information on other types of MicroShade® shading see www.microshade.net

Technical data for MicroShade® glazing

Construction

MicroShade® glazing is dimensioned in accordance with current standards. MicroShade® glazing can be supplied in standard two- or three-layer glazing constructions.

External: Tempered

Internal glass: Normally supplied with low-E float glass. Tempered or laminated low-E glass can be delivered if specified.

Spacer: Warm edge, stainless steel or similar.

Gas filling: Argon

U- value

Type	U-value (W/m²K)
2-layer MS-D, (4-16-4)	1,1
3-layer MS-D, (4-12-4-12-4)	0,7

Light- & solar energy transmittance

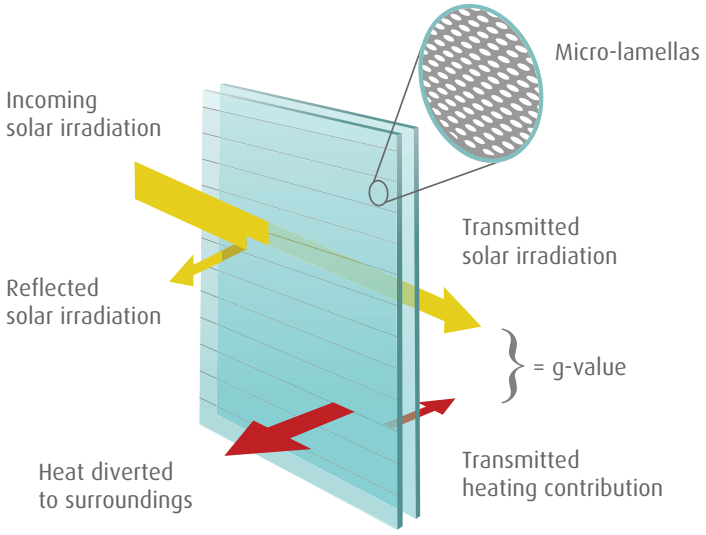
The light transmittance indicates that ratio between the volume of transmitted daylight through the window and the amount of incident daylight on the window. The daylight is defined by the radiation distribution of illuminant D65 (EN410:2011).

The direct solar energy transmittance through a window is defined as the ratio between the transmitted and incident solar energy on the window.

The total solar energy transmittance or g-value (solar factor) is calculated as the sum of the transmitted solar radiation and the transmitted heat contribution divided by the incident solar energy on the window.

A low g-values indicates strong solar shading and a high g-value indicates weaker shading.

For MicroShade® the light transmittance and the g-value of the glazing change with the incident angle of the solar radiation: At low radiation angles MicroShade® allows a high transmittance while the transmittance is low a higher angles.



Optical properties – Two-layer MicroShade® glazing

The tables show the g-value, the direct solar energy transmittance and the daylight transmittance for MicroShade® glazing at selected angles of incidence. The data shown is valid for two-layer glazing with MicroShade® type MS-D.

The construction of the glazing

4 mm Planiclear + MicroShade® MS-D+ 4 mm Planitherm XN with argon filling from Saint Gobain (Calumen II).
All optical data is calculated according to EN 410:2011.

Table 1: g-values

		Solar height (degrees)					
		0	15	30	45	60	75
Azimuth (degrees)	0	0,37	0,33	0,27	0,20	0,09	0,03
	15	0,37	0,32	0,27	0,19	0,08	0,03
	30	0,34	0,30	0,25	0,18	0,07	0,02
	45	0,30	0,26	0,21	0,14	0,05	0,02
	60	0,20	0,18	0,13	0,07	0,03	0,02
	75	0,04	0,03	0,02	0,02	0,02	0,01

Table 2: Solar direct transmittance

		Solar height (degrees)					
		0	15	30	45	60	75
Azimuth (degrees)	0	0,32	0,27	0,22	0,15	0,05	0
	15	0,31	0,27	0,22	0,15	0,04	0
	30	0,29	0,25	0,20	0,13	0,03	0
	45	0,25	0,21	0,16	0,10	0,02	0
	60	0,16	0,13	0,09	0,04	0	0
	75	0,01	0	0	0	0	0

Table 3: Light transmittance

		Solar height (degrees)					
		0	15	30	45	60	75
Azimuth (degrees)	0	0,44	0,38	0,30	0,21	0,07	0
	15	0,43	0,37	0,30	0,20	0,06	0
	30	0,39	0,34	0,27	0,18	0,05	0
	45	0,34	0,29	0,22	0,13	0,02	0
	60	0,21	0,18	0,12	0,05	0	0
	75	0,02	0	0	0	0	0

Optical properties – Three-layer MicroShade® glazing

The tables show the g-value, the direct solar energy transmittance and the daylight transmittance for MicroShade® glazing at selected angles of incidence.

The construction of the glazing

4 mm Planiclear + MicroShade® MS-D + 4 mm Planitherm XN + 4 mm Planitherm XN with argon filling from Saint Gobain (Calumen II). All optical data is calculated according to EN 410:2011.

Table 4: g-values

		Solar height (degrees)					
		0	15	30	45	60	75
Azimuth (degrees)	0	0,32	0,27	0,23	0,16	0,07	0,02
	15	0,31	0,27	0,22	0,16	0,06	0,02
	30	0,29	0,25	0,21	0,14	0,05	0,02
	45	0,25	0,22	0,17	0,11	0,04	0,01
	60	0,16	0,14	0,10	0,05	0,02	0,01
	75	0,03	0,02	0,02	0,01	0,01	0,01

Table 5: Solar direct transmittance

		Solar height (degrees)					
		0	15	30	45	60	75
Azimuth (degrees)	0	0,26	0,22	0,18	0,12	0,04	0
	15	0,25	0,21	0,17	0,11	0,03	0
	30	0,23	0,20	0,16	0,10	0,02	0
	45	0,19	0,17	0,13	0,07	0,01	0
	60	0,12	0,10	0,07	0,03	0	0
	75	0,01	0	0	0	0	0

Table 6: Light transmittance

		Solar height (degrees)					
		0	15	30	45	60	75
Azimuth (degrees)	0	0,40	0,34	0,27	0,18	0,06	0
	15	0,39	0,33	0,27	0,18	0,05	0
	30	0,35	0,31	0,24	0,15	0,04	0
	45	0,30	0,26	0,20	0,11	0,02	0
	60	0,18	0,15	0,10	0,04	0	0
	75	0,01	0	0	0	0	0

Color rendering index

The color rendering of transmitted light through the MicroShade® MS-D is neutral.

The color rendering index is calculated according to EN 410:2011 by assessing the color rendering of eight different color standards illuminated with a standard light source through the window.

The color rendering is measured on a scale from 0 to 100, with 100 as the best (neutral) and the overall index is the average of the eight. According to EN 410:2011 a color rendering index above 90 indicates high color neutrality

Color rendering index for MicroShade® by normal incident light:								
Color	1	2	3	4	5	6	7	8
Ra	99,8	99,7	99,5	99,6	99,5	99,2	99,5	99,7