MicroShade® datasheet

Type: 3-layer MS-F 60/14

MicroShade® is a highly eff ective shading product containing microscopic shading lamellas. The shading effi ciency 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 diff erent positions of the sun morning, noon and evening.

MicroShade® is an almost invisible fi lm combining UV and IR coatings with a structured micro-lamella. MicroShade® is placed inside the low-E glazing.

Application

MicroShade® MS-F 60/14 has been developed for application in facades, where it provides the most eff ective shading. MS-F 60/14 can also be applied in roofs with a shading eff ect that is only slightly reduced compared to the facades. MS-F 60/14 can be applied at all orientations, but is sensitive to direction of mounting.

MicroShade® MS-F 60/14 is a good compromise between an eff ective shading and satisfactory daylight conditions while visibility is maintained.

For more information on MicroShade® shading see www.microshade.com. To calculate data for other glazing build-ups go to www.simshade.microshade.com

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 and Ra-value

Type	U-value (W/m²K)	Ra-value (-)
3-layer MS-F 60/14 with 2 Planitherm XN coatings (6-14-6 PXN-14-6 PXN)	0,64	93
3-layer MS-F 60/14 with Planitherm One and XN coatings (6-14-6 PO-14-6 PXN)	0,61	94
3-layer MS-F 60/14 with 2 Planitherm One coatings (6-14-6 PO-14-6 PO)	0,59	94

Light- & solar energy transmittance

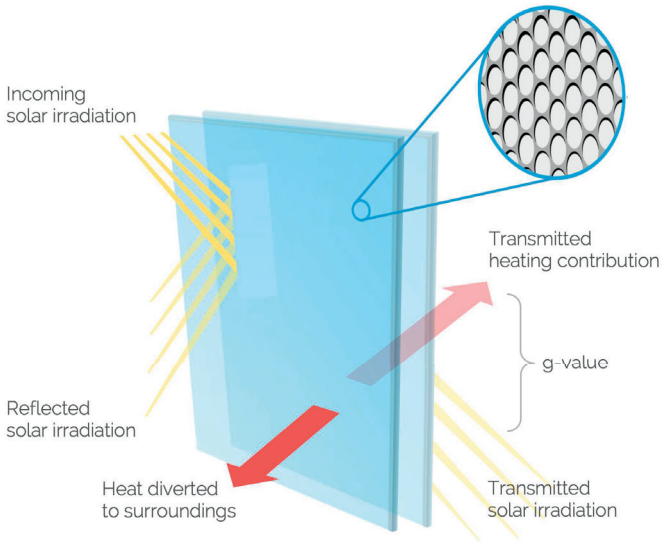
The light transmittance indicates that ratio between the volume of transmitted daylight through the window and the amount of incident daylight on the window. The daylight is defined by the radiation distribution of illuminant D65 (EN410:2011)

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.

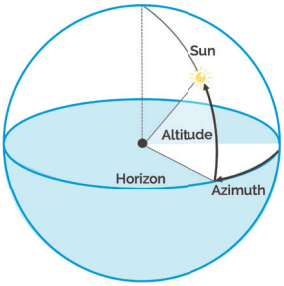
A low g-values indicates strong solar shading and a high g-value indicates weaker shading.

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 – MicroShade® glazing with two low-e coatings

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 three-layer glazing with MicroShade® type MS-F 60/14 with 2 Planitherm XN coatings



The construction of the glazing

6 mm Planiclear + MicroShade® MS-F 60/14 + 6 mm Planitherm XN + 6 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
75	0,02	0,02	0,02	0,01	0,01	0,01
60	0,08	0,07	0,06	0,04	0,02	0,01
45	0,17	0,17	0,15	0,12	0,06	0,01
30	0,23	0,23	0,22	0,18	0,11	0,02
15	0,28	0,28	0,25	0,22	0,14	0,03
0	0,32	0,30	0,27	0,23	0,16	0,03

Azimuth (degrees)

Table 2: Solar direct transmittance

Solar height (degrees)	0	15	30	45	60	75
75	0	0	0	0	0	0
60	0,05	0,04	0,03	0,02	0	0
45	0,13	0,12	0,11	0,08	0,03	0
30	0,18	0,18	0,17	0,13	0,07	0
15	0,23	0,22	0,20	0,17	0,10	0,01
0	0,27	0,25	0,22	0,18	0,11	0,01

Azimuth (degrees)

Table 3: Light transmittance

Solar height (degrees)	0	15	30	45	60	75
75	0	0	0	0	0	0
60	0,09	0,08	0,06	0,03	0	0
45	0,24	0,23	0,21	0,15	0,06	0
30	0,35	0,34	0,32	0,25	0,14	0,01
15	0,44	0,42	0,38	0,32	0,19	0,02
0	0,50	0,47	0,42	0,35	0,21	0,02

Azimuth (degrees)

Optical properties – MicroShade® glazing with two extra low-e coatings

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 three-layer glazing with MicroShade® type MS-F 60/14 with Planitherm One.

The construction of the glazing

6 mm Planiclear + MicroShade® MS-F 60/14 + 6 mm Planitherm One + 6 mm Planitherm One 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
75	0,02	0,02	0,01	0,01	0,01	0,01
60	0,06	0,06	0,05	0,03	0,02	0,01
45	0,13	0,13	0,12	0,09	0,05	0,01
30	0,18	0,18	0,17	0,14	0,09	0,02
15	0,22	0,22	0,20	0,17	0,11	0,02
0	0,25	0,24	0,21	0,18	0,12	0,03
	0	15	30	45	60	75
	Azimuth (degrees)					

Table 5: Solar direct transmittance

Solar height (degrees)	0	15	30	45	60	75
75	0	0	0	0	0	0
60	0,03	0,03	0,02	0,01	0	0
45	0,09	0,08	0,07	0,05	0,02	0
30	0,13	0,13	0,12	0,09	0,05	0
15	0,17	0,16	0,14	0,12	0,06	0
0	0,20	0,18	0,16	0,13	0,07	0,01
	0	15	30	45	60	75
	Azimuth (degrees)					

Table 6: Light transmittance

Solar height (degrees)	0	15	30	45	60	75
75	0	0	0	0	0	0
60	0,06	0,05	0,04	0,02	0	0
45	0,18	0,17	0,15	0,11	0,04	0
30	0,27	0,26	0,25	0,19	0,09	0
15	0,35	0,34	0,30	0,24	0,13	0,01
0	0,41	0,38	0,33	0,26	0,15	0,01
	0	15	30	45	60	75
	Azimuth (degrees)					

Optical properties

– MicroShade® glazing with an extra low-e coating and a low-e coating

Thetables show the g-value, the direct solar energy transmittance and the daylight transmittance for MicroShade® glazing at selected angles of incidence. TThe data shown is valid for two-layer glazing with MicroShade® type MS-F 60/14 with Planitherm XN and Planitherm One.

The construction of the glazing

6 mm Planiclear + MicroShade® MS-F 60/14 + 6 mm Planitherm One + 6 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)	75	0,02	0,02	0,01	0,01	0,01	0,01
	60	0,06	0,06	0,05	0,03	0,02	0,01
	45	0,13	0,13	0,12	0,09	0,05	0,01
	30	0,18	0,18	0,17	0,14	0,09	0,02
	15	0,22	0,21	0,19	0,16	0,11	0,03
	0	0,25	0,23	0,21	0,18	0,12	0,03
		0	15	30	45	60	75
		Azimuth (degrees)					

Table 5: Solar direct transmittance

Solar height (degrees)	75	0	0	0	0	0	0
	60	0,03	0,03	0,02	0,01	0	0
	45	0,09	0,08	0,07	0,05	0,02	0
	30	0,13	0,13	0,12	0,09	0,05	0
	15	0,17	0,16	0,14	0,11	0,06	0,01
	0	0,20	0,18	0,15	0,13	0,07	0,01
		0	15	30	45	60	75
		Azimuth (degrees)					

Table 6: Light transmittance

Solar height (degrees)	75	0	0	0	0	0	0
	60	0,06	0,06	0,04	0,02	0	0
	45	0,18	0,17	0,15	0,11	0,04	0
	30	0,27	0,26	0,24	0,19	0,09	0
	15	0,35	0,33	0,29	0,23	0,13	0,01
	0	0,40	0,37	0,32	0,26	0,15	0,01
		0	15	30	45	60	75
		Azimuth (degrees)					

Color rendering index

The color rendering of transmitted light through the MicroShade® MS-F 60/14 is slightly affected.

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® MS-F 60/14 by normal incident light:								
Color	1	2	3	4	5	6	7	8
Ra	96,5	98,8	97,0	95,5	96,6	98,3	97,9	94,7