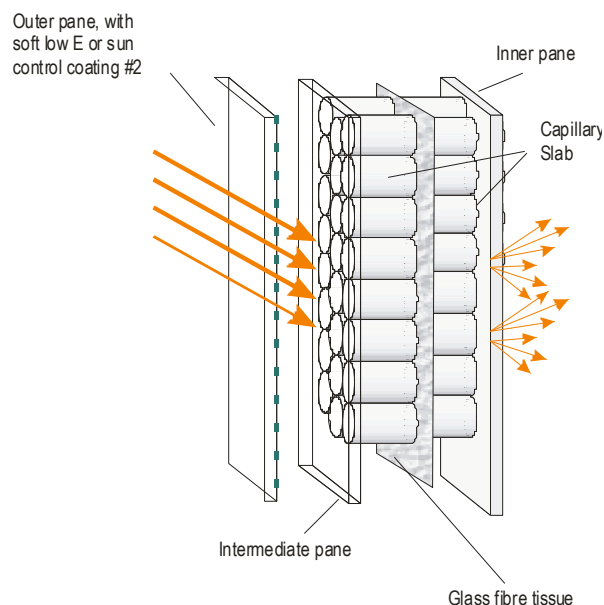


OKALUX EVO Light Diffusing Insulating Glass

The challenge for OKALUX EVO Light Diffusing Insulating Glass: to make daylight useful. With the use of a translucent light diffusing capillary slab with additional glass fibre tissues in between, OKALUX EVO achieves

- optimum, uniform light transmittance into the room, irrespective of irradiation conditions
- light transmission and total solar energy transmittance as required
- very good colour rendering index
- very good heat insulation
- UV protection as required
- sound insulation as required
- vision protection and glare protection
- attractive appearance in daylight and in artificial light
- optical effect of depth from visible capillary structure
- bird friendly glazing



Physical properties

Thermal insulation

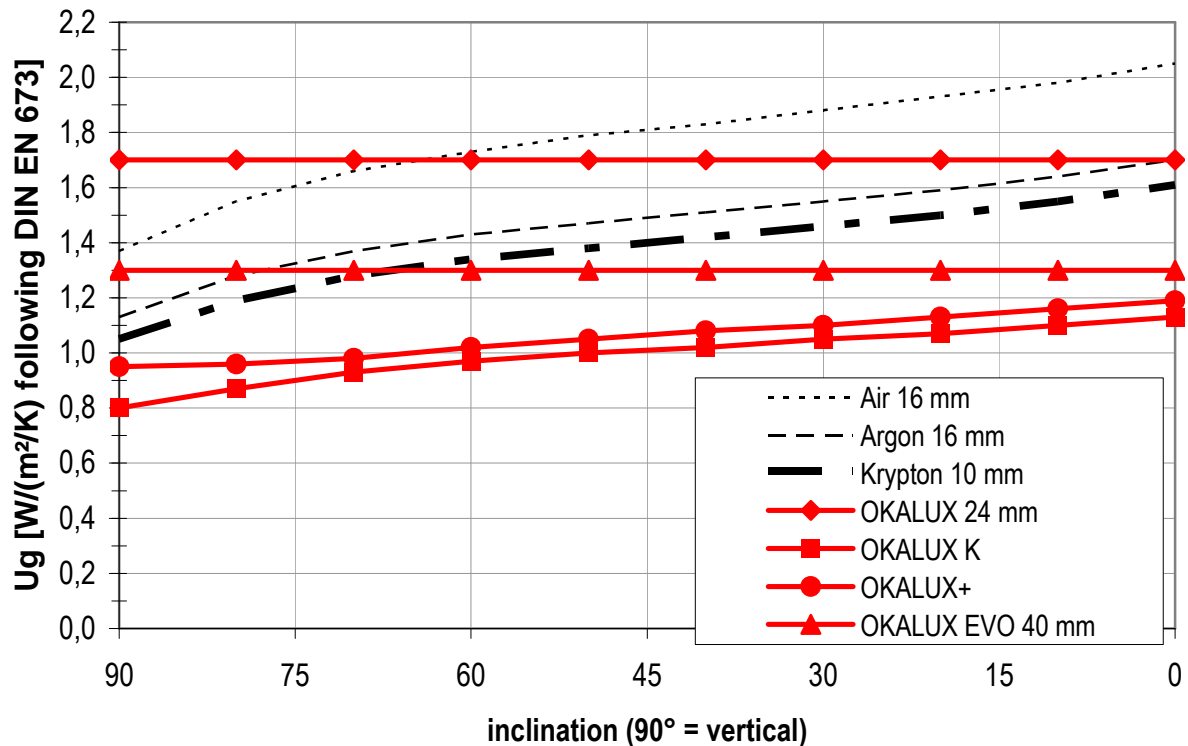
The capillaries reduce the heat transfer in the cavity between panes in terms of convection and heat radiation. OKALUX EVO therefore achieves a U_g value up to $1.3 \text{ W}/(\text{m}^2\text{K})$ as a two pane make-up and $0.8 \text{ W}/(\text{m}^2\text{K})$ with an additional gas filled cavity. The special geometry of the capillary material "KAPI-PANE" means that the improved insulation due to the greater layer thickness does not cause any noteworthy infiltration in the light transmission.

The U_g value for the various versions is dependent, among other things, on:

- the thickness of the capillary slab (2-pane make-up)
- the functional coating on surface #2 (3-pane make-up)
- the filling gas in the cavity between panes (Air/Argon/Krypton)

The U_g value of insulating glass in accordance with DIN EN 673 or DIN EN 674 always relates to vertical installation. If the insulating glass is at an angle, e.g. as in roof glazing, the U_g value increases, because the rising convection level in the cavity. Insulating glass with a standard value of $U_g = 1.1 \text{ W}/(\text{m}^2\text{K})$ has an actual value of approx. $1.7 \text{ W}/(\text{m}^2\text{K})$ if used for horizontal roof glazing.

The capillary slab in the cavity between panes prevents convection, which means that the U_g value of OKALUX EVO is nearly constant whatever the installation position.



Sound insulation

Capillary slabs decouple the panes of the insulating glazing and provide improved sound insulation.

Spectral properties

The special light diffusing properties of the KAPIPANE insert provide an optimised, uniform distribution of light in the room, regardless of irradiation conditions.

g value and light transmission depend on:

- the design of the light-scattering inserts
- the functional coating on surface #2

A low-e coating or a combined sun-control and low-e coating at position 2 changes the colour appearance when viewed from outside.

The g value and the light transmission are dependent on the make-up of the light diffusing inserts. Other g values and light transmission values can be provided on request with the use of special make-ups.

UV protection

Very low UV transmission possible on request.

Technical values of standard types

OKALUX EVO is available as a 2-pane and as a 3-pane make-up, with an additional cavity.

The following specifications apply to the 2-pane make-up with a 6 mm outer pane and an 8 mm laminated glass inner pane (0.76 PVB foil).

Table 1. U_g value

Capillary slab (mm)	16	20	24	28	32	40
U_g [W/(m ² K)]	2.0	1.8	1.6	1.5	1.4	1.3
U_g [Btu/(hr ft ² °F)]	0.35	0.32	0.28	0.26	0.25	0.23

Table 2. Spectral properties for 2 x 20 mm KAPIPANE

OKALUX EVO Type	T_v direct %	T_v diffuse %	TSET %
42/43	42	30	43
36/38	36	26	38
31/34	31	22	34
29/32	29	21	32
21/26	21	15	26

The following data refers to glass thickness of 6/4/4 mm in a 3-pane make-up and takes into consideration a functional coating at page #2, an external cavity of 8 mm and 20 mm capillary insert in the inner cavity.

OKALUX EVO Type	T_v direct %	T_v diffuse %	TSET %	U_g -value [W/(m ² K)] / U_g [Btu/(hr ft ² °F)] cavity 8 mm		
				Krypton	Argon	Air
36/22	36	24	22	0.8 / 0.14	1.0 / 0.18	1.1 / 0.19
31/20	31	21	20	0.8 / 0.14	1.0 / 0.18	1.1 / 0.19
41/33	41	27	33	0.8 / 0.14	1.0 / 0.18	1.2 / 0.21

Legend and related values:

	unit	standard	technical term
U_g	W/m ² K	DIN EN 673 DIN EN 674	Thermal transmittance
TSET	%	DIN EN 410	Total solar energy transmittance or solar heat gain coefficient
T_v	%	DIN EN 410	Light transmission (direct/hemispheric resp. diffuse/hemispheric)
R_w	dB	DIN EN 20140	Sound reduction coefficient
F_c	%	DIN 4108	Reduction factor of a solar control system, $F_c = TSET / TSET_{reference}$
SC	%	GANA Manual	Shading coefficient, $SC = TSET / 0.86$

The above data are approximate data. They are based on measurements of approved test institutes and calculations derived from these measurements. Values determined on a project-specific basis may vary from the above values.

Direct transmission relates to direct incidence of light, generally vertical (model situation for direct sunlight). Diffuse transmission applies to homogeneous, diffuse incidence of light from the outer hemisphere (model situation for an overcast sky).

The specified values may change as a result of technical developments. No guarantee is therefore given for their correctness.

Make-up

What makes OKALUX EVO light diffusing insulating glass so special is the capillary slab inserted in the cavity between the panes. The glass type and thickness vary according to static requirements and design requirements.

Standard make-up: (2-pane unit)

- Outer pane
- Visible capillary slab 6 - 20 mm
- glass fibre tissues
- Visible capillary slab 6 - 20 mm
- Inner pane

Variations in the density of the capillary slab and the diameters of the capillaries may be visible, as can joints which are necessary for production reasons. Under certain light conditions it may also be possible that fine lines, also the result of the production process, can be seen within the capillary slab. The physical characteristics of OKALUX EVO are not adversely affected by the above.

Dimensions

larger glass dimension	Up to 4000 mm	no restrictions
smaller glass dimension	Up to 2000 mm	no restrictions

Due to tolerance justification and different thermal expansions factors the inlay may be trimmed back at the edge by up to 2.0 mm. Therefore a gap may become visible between the inlay and the spacer bar. For this reason the glazing channel in the rebate must be at least 15 mm. If the edge sealant is increased, a larger cover may be necessary. In the case of a frameless glazing system, it is recommended that the edge seal is covered by a screen print.

Planning instructions

Builder-owners and architects must be able to technically assess the effect of glazing in daylight terms. Okalux offers such calculations as a voluntary extra service without obligation. The daylight-relevant properties of the room to be examined must be known; in particular, these are:

- room geometry, window dimensions
- approximate degree of reflection of the surfaces forming the room boundaries

The so-called daylight quotient (D) in accordance with DIN 5034, Part 3, is relevant for the evaluation of the ambient daylight. This gives the ratio between the horizontal luminous intensity indoors and out of doors, under a completely overcast sky. This value can be calculated for different glazing variants using the existing simulation tools. The customer can thus assess the light-directing effects of special products, in comparison with normal glazing as well. In addition to the assessment in accordance with DIN, virtual images can visualise the light distribution in the rooms.

Installation instructions

OKALUX EVO light diffusing insulating glass is used for glazing like normal insulating glass.

For instructions and recommendations for the installation of our insulating glazing, please refer to our information and instructions for customers contained in "Delivery of OKALUX Glass Products" and "General Information on Glazing".