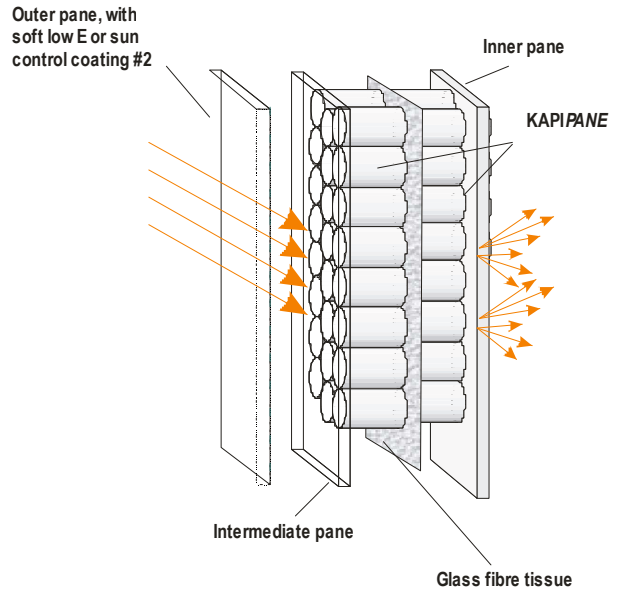


OKALUX EVO Light Diffusing Insulating Glass

The challenge for OKALUX EVO Light Diffusing Insulating Glass: to make daylight useful. With the use of a translucent light diffusing capillary insert (KAPIPANE) 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
- visibility for birds



Physical properties

Thermal insulation

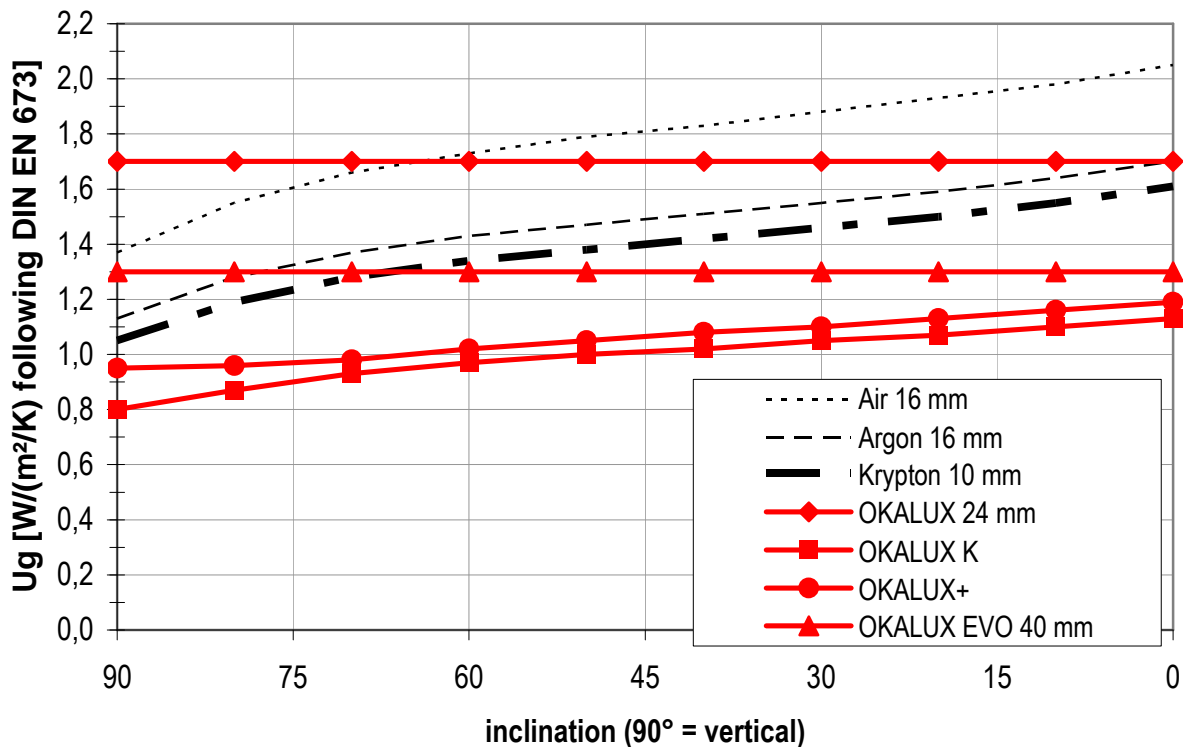
The KAPIPANE insert reduce the heat transfer in the cavity between panes in terms of convection and heat radiation. OKALUX EVO therefore achieves a U_g value $\geq 1.3 \text{ W}/(\text{m}^2\text{K})$ as a two pane make-up and $0.8 \text{ W}/(\text{m}^2\text{K})$ with an additional gas filled cavity. The special geometry of the capillary material "KAPIPANE" 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 KAPIPANE insert (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. Duplex 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.

KAPIPANE 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

KAPIPANE 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 optimized, 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

KAPIPANE (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 %
43/45	43	31	45
36/40	36	26	40
32/35	32	23	35
29/33	29	21	33
21/27	21	15	27

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/(m²K)] / U_g [Btu/(hr ft² °F)] cavity 8 mm		
				Krypton	Argon	Air
42/36	42	28	36	0.8 / 0.14	1.0 / 0.18	1.2 / 0.21
37/22	37	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

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). All values were measured hemispherically.

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

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 KAPIPANE inserted in the cavity between the panes with a capillary diameter of about 2.5 mm to 3 mm. The glass type and thickness vary according to static requirements and design requirements.

Standard make-up: (2-pane unit)

- Outer pane
- KAPIPANE 8 - 20 mm
- glass fibre tissues
- KAPIPANE 8 - 20 mm
- Inner pane

Variations in the density of the KAPIPANE and the diameters of the capillaries may be visible, as can joints which are necessary for production reasons. These "variations" in appearance give the product a lively appearance. 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

max. width without joint	up to 1.4 m
max. width with joint	up to 2.0 m
max. height without joint	up to 4.0 m
max. height with joint	up to 6.0 m

For tolerance reasons and due to differing temperature expansion, the insert may exhibit an expansion gap of up to 2.0 mm on each side. This can lead to a visible gap between the insert and the spacer bar. For this reason, the edge cover must amount to at least the required overall seal width plus 5 mm or be covered using an edge screen print (spacer bar + secondary bar).

In the case of a polysulphide as secondary seal, it may be necessary to use an exceed cover in order to provide sufficient UV protection. In the case of a frameless glazing system, it is generally recommended that the edge areas are covered using a screen print. Depending on loading, the required sealant width can be considerably greater than that of "conventional" insulating glazing.

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".

Other printed matter

If you do not have the following printer matter, please request it directly from OKALUX or download it from the Internet at www.okalux.com:

General terms and conditions of business
Product-specific information texts

As well as these, there are the following customer notes:

Customer notes on offers
Customer notes on delivery
Customer notes alarm glass
Customer notes screen printing
Customer notes Structural Glazing / Edge deletion
Customer notes on heat-soak test
Customer notes on glazing
Customer notes SIGNAPUR®
Customer notes installation of OKAPANE
Customer notes OKAWOOD tolerances
Cleaning instructions for OKALUX gen.
Cleaning instructions OKACOLOR
Guideline for visual quality