

OKALUX Light Diffusing Insulating Glass

The challenge for OKALUX Light Diffusing Insulating Glass: to make daylight useful. With the use of a translucent light diffusing capillary insert (OKAPANE) both sides covered with additional glass fibre tissues in the cavity, OKALUX 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
- good heat insulation
- UV protection as required
- sound insulation as required
- vision protection and glare protection
- attractive appearance in daylight and in artificial light
- visibility for birds



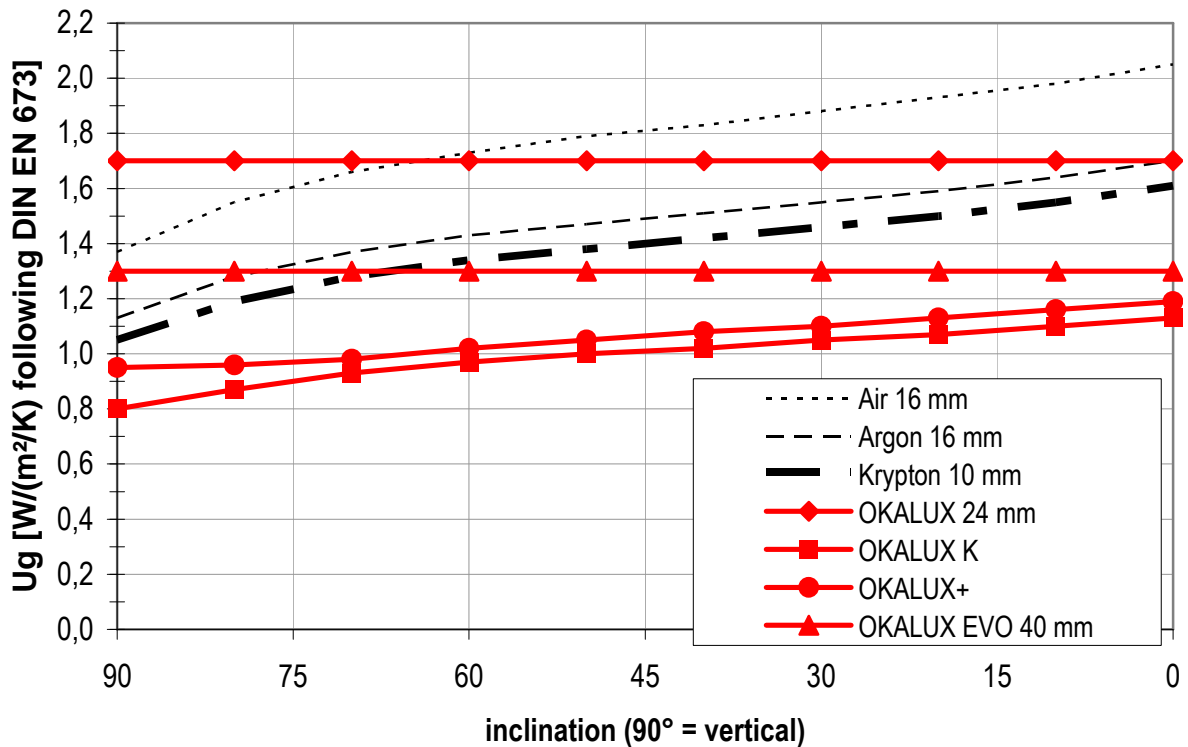
Physical properties

Thermal insulation

The OKAPANE insert reduce the heat transfer in the cavity between panes in terms of convection and heat radiation. The thicker the OKAPANE, therefore, the better the U_g value. For OKAPANE thicknesses of 24 mm and over, we recommend the use of our OKALUX EVO product, which enables U_g values of $\geq 1.3 \text{ W}/(\text{m}^2\text{K})$ to be achieved. With the triple pane make (OKALUX K product variant) it is possible to achieve U_g values of $\geq 0.8 \text{ W}/(\text{m}^2\text{K})$.

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.

OKAPANE in the cavity between panes prevents convection, which means that the U_g value of OKALUX is constant whatever the installation position. For roof glazing, OKALUX glass with a 24 mm capillary slab achieves the same U_g value as insulating glass with a U_g of $1.1 \text{ W}/(\text{m}^2\text{K})$.



Sound insulation

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

Spectral properties

The special light diffusing properties of the OKAPANE insert provide an optimized, uniform distribution of light in the room, regardless of irradiation conditions. The special geometry of the OKAPANE capillary material results in improved heat insulation with an increased thickness, but without any notable reduction in light transmission.

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

The following details apply to glass make-ups with a 6 mm outer pane and a 8 mm laminated safety glass as inner glass pane (0.76 PVB foil).

Table 1. Spectral properties

OKALUX Type	T_v direct %	T_v diffuse %	TSET direct %	SC %
45/47	45	34	47	55
38/40	38	29	40	47
32/36	32	25	36	42
28/32	28	22	32	37
25/28	25	19	28	33
22/26	22	17	26	30

Table 2. U_g value and R_w value

Capillary slab [mm]	8	12	16	20	24	32	40
U _g [W/(m ² K)]	2.7	2.5	2.2	1.9	1.7	1.5	1.3
U _g [Btu/(hr ft ² °F)]	0.48	0.44	0.39	0.34	0.30	0.26	0.23
R _w [dB]	38	40	41	42	43	44	45

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 light diffusing insulating glass so special is the OKAPANE with a diameter of capillary about 1 mm to 1.5 mm inserted in the cavity between the panes. The glass type and thickness vary according to static requirements and design requirements.

Standard make-up:

- Outer pane
- additional glass fibre tissues
- OKAPANE 8 - 24 mm (Special make-up > 24 mm capillary slab size on application)
- additional glass fibre tissues
- Inner pane

Variations in the density of the capillary slab and the diameters of the OKAPANE 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 and wrinkling of the tissues, also the result of the production process, can be seen within the OKAPANE. The physical characteristics of OKALUX are not adversely affected by the above.

Dimensions

larger glass dimension	up to 4500 mm	no restrictions
smaller glass dimension	smaller than 1500 mm	no restrictions
	1500 mm to 2000 mm	light transmission not more than 32 %
	Larger than 2000 mm	subdivision by joint with aluminium profile

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 coefficient (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 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