

## 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 T) 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



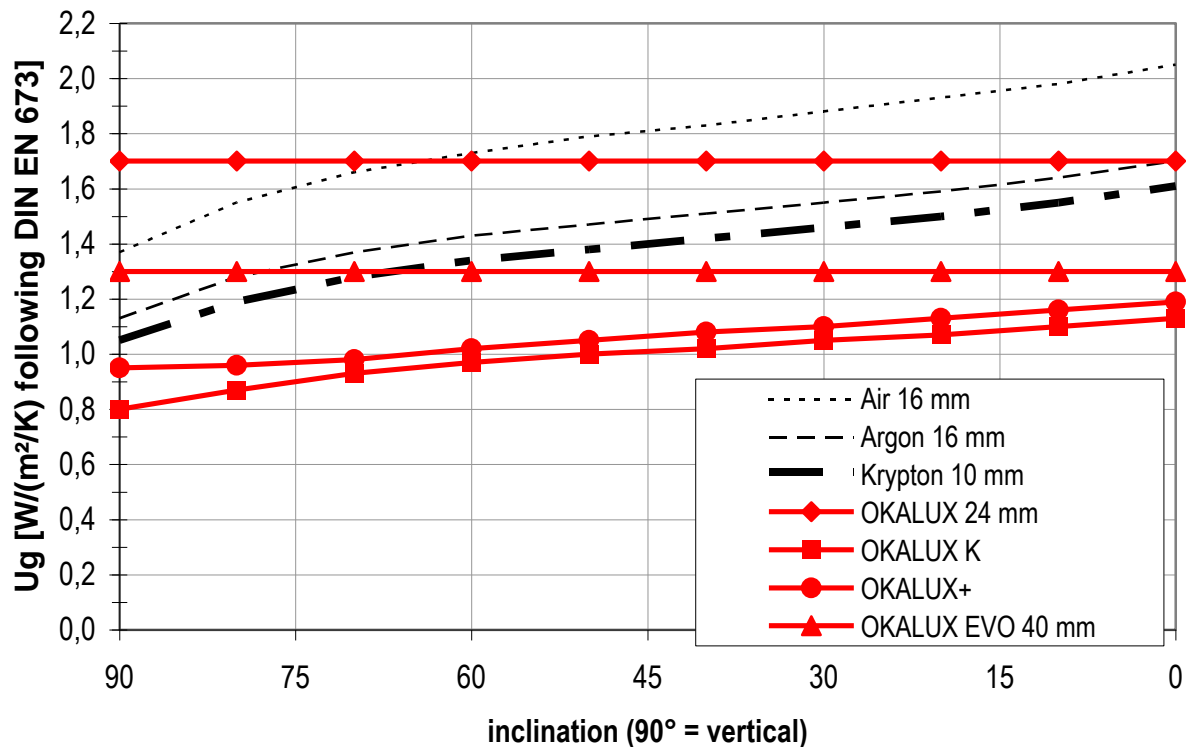
### Physical properties

#### 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

| <b>OKALUX<br/>Type</b> | <b>T<sub>v</sub><br/>direct<br/>%</b> | <b>T<sub>v</sub><br/>diffuse<br/>%</b> | <b>TSET<br/>direct<br/>%</b> | <b>SC<br/>%</b> |
|------------------------|---------------------------------------|--|------------------------------|-----------------|
| 45/43                  | 45                                    | 35                                     | 43                           | 50              |
| 38/38                  | 38                                    | 29                                     | 38                           | 44              |
| 32/34                  | 32                                    | 25                                     | 34                           | 40              |
| 28/30                  | 28                                    | 21                                     | 30                           | 35              |
| 24/27                  | 24                                    | 19                                     | 27                           | 32              |
| 21/25                  | 21                                    | 16                                     | 25                           | 29              |

**Table 2.** U<sub>g</sub> value and R<sub>w</sub> value

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

Legend and related values:

|                      | <b>unit</b>          | <b>standard</b>          | <b>technical term</b>  |
|----------------------|----------------------|--------------------------|--|
| <b>U<sub>g</sub></b> | W/(m <sup>2</sup> K) | DIN EN 673<br>DIN EN 674 | Thermal transmittance  |
| <b>TSET</b>          | %                    | DIN EN 410               | Total solar energy transmittance or solar heat gain coefficient                            |
| <b>T<sub>v</sub></b> | %                    | DIN EN 410               | Light transmission (direct/hemispheric resp. diffuse/<br>hemispheric)                      |
| <b>R<sub>w</sub></b> | dB                   | DIN EN 20140             | Sound reduction coefficient  |
| <b>F<sub>c</sub></b> | %                    | DIN 4108                 | Reduction factor of a solar control system, F <sub>c</sub> =TSET/TSET <sub>reference</sub> |
| <b>SC</b>            | %                    | 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 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 T 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 4000 mm       | no restrictions                             |
| smaller glass dimension | up to 1400 mm       | no restrictions                             |
|                         | 1401 mm to 2000 mm  | light transmission not more than 32 %       |
|                         | larger than 2000 mm | subdivision by joint with aluminium profile |

For tolerance reason and due to different thermal expansions, the insert may exhibit a visible light gap between the insert and the spacer bar. For this reason, the overall sealant (spacer bar + secondary seal) plus additional 5 mm have to be covered by a profile or by an appropriate edge screen printing.

In the case of a polysulphide as secondary seal, it may be necessary to use a 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 UV-impenetrable edge enamelling. 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](http://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 OKAWOOD tolerances

Cleaning instructions for OKALUX gen.

Cleaning instructions OKACOLOR

Guideline for visual quality