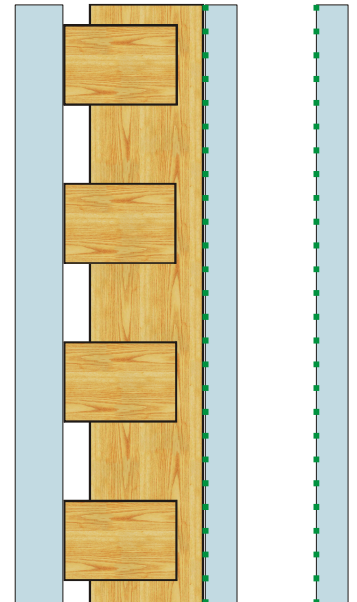


OKAWOOD - Insulating Glass with Wooden Grid

OKAWOOD is a successful synthesis between the classical and the modern construction material, between wood and glass. OKAWOOD is made up of a filigree wooden grid which is integrated in the cavity between the glass panes of insulated glazing. Therefore the natural wooden material is protected against the effects of the weather.

OKAWOOD offers:

- efficient directionally selective sun protection
- very good heat insulation
- natural vibrant appearance of the façade
- partial though-vision
- privacy screening from outside to inside
- can be easily recycled
- visibility for birds



Physical properties

Thermal insulation

OKAWOOD is available as a 2-pane make-up with a cavity of 18 mm, and also as a 3-pane make-up with an additional cavity between the glass panes.

Depending on the gas filling and coating, the 2-pane make-up achieves U_g values $\geq 1.3 \text{ W/(m}^2\text{K)}$. As a 3-pane make-up, U_g values $\geq 0.6 \text{ W/(m}^2\text{K)}$ are possible.

Sound insulation

The integrated wooden grid has no significant effect on the sound insulation. The achievable values depend on the glass assembly.

Spectral properties

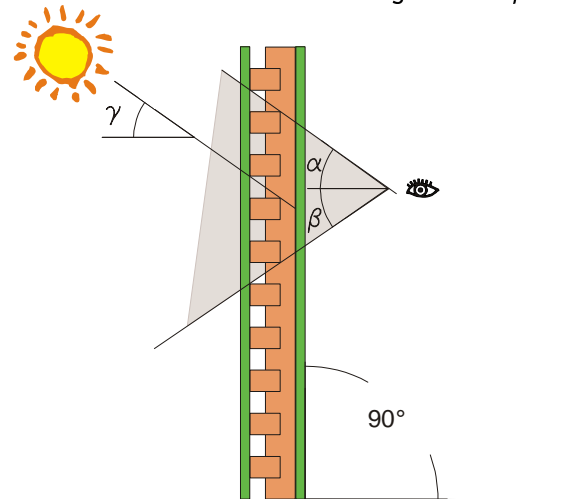
The wooden grid acts as a solar protection device and allows a warm tint of daylight to enter between the bars.

The compact cross-section of the louvres enables horizontal through-vision of approx. 50% of the surface area.

The function of OKAWOOD depends on the prevailing sunlight conditions. Partial through-vision is always given, despite the sun protection which differs depending on the season and time of day.

Integrated in a vertical façade, OKAWOOD functions as follows:

1. direct irradiation from high and medium solar altitude
 - thermal solar protection with total solar energy transmittance values of as low as $\geq 7\%$, in particular secondary heat transfer with low solar radiation transmission
 - glare protection
2. direct irradiation from low solar altitude
 - partial transmission of the direct sunlight



Technical values of standard types

Table 1: Geometry of the OKAWOOD grid

| Type | Distance of louver [mm] | Horizontal trough-vision % | Trough-vision to above α [°] | Trough-vision to lower β [°] | Lock out angle γ [°] |
|---------|-------------------------|----------------------------|-------------------------------------|------------------------------------|-----------------------------|
| OKAWOOD | 10 | 50 | 35 | 35 | 35 |

The following information applies to 2-pane make-up consisting of an external pane with a thickness of 6 mm with a functional low-e coating at face #3 and an inner pane with a thickness of 6 mm.

Table 2: Technical values for the 2-pane make-up with low-e coating (vertical glazing)

| Type | Make-up | T_v % min. ¹⁾ | T_v % max. ²⁾ | g -value % min. ¹⁾ | g -value % max. ²⁾ | U_g value [W/(m²K)] U_g [Btu/(hfr ft²F)] cavity 18 mm | | |
|---------|---------|----------------------------|----------------------------|---------------------------------|---------------------------------|---|------------|------------|
| | | | | | | Krypton | Argon | Air |
| OKAWOOD | 2-pane | 2 | 29 | 11 | 29 | 1.3 (0.23) | 1.6 (0.28) | 1.9 (0.33) |

The following information applies to 3-pane make-up consisting of an external pane with a thickness of 6 mm, a middle pane with a thickness of 6 mm with a low-e coating at face #3 and an inner pane with a thickness of 6 mm with a low-e coating at face #5.

Table 3: Technical values for the 3-pane make-up with low-e coating at face #3 and face #5 (vertical glazing)

| Type | Make-up | T_v % min. ¹⁾ | T_v % max. ²⁾ | g -value % min. ¹⁾ | g -value % max. ²⁾ | U_g -value [W/(m²K)] U_g [Btu/(hfr ft²F)] cavity 18 mm + 10/12 mm | | |
|---------|---------|----------------------------|----------------------------|---------------------------------|---------------------------------|---|----------------|--------------|
| | | | | | | Krypton 10 mm | Argon 12 mm | Air 12 mm |
| OKAWOOD | 3-pane | 2 | 22 | 7 | 21 | 0.6 (0.11) | 0.8 (0.14) | 1.0 (0.18) |

¹⁾ for angle of incidence $\gamma = 60^\circ$

²⁾ for angle of incidence $\gamma = 0^\circ$ (vertical to the glass surface)

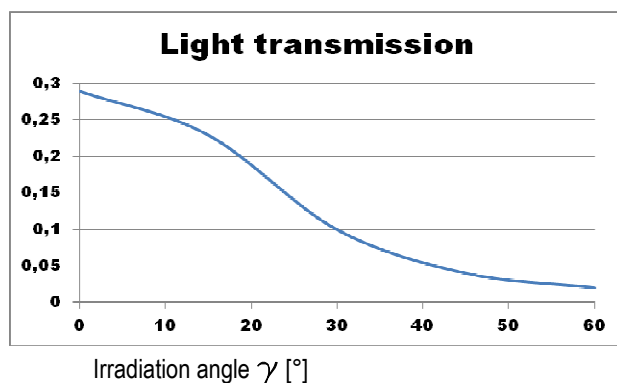


Figure 1: Angle-selective light transmission T_v according to DIN EN 410 of OKAWOOD in the 2-pane make up with low-e coating

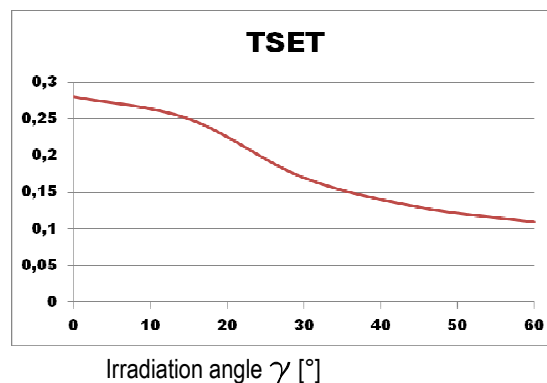


Figure 2: TSET according to DIN EN 410 in the 2-pane make up with low-e coating

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) |
| 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 sun-light). Diffuse transmission applies to homogeneous, diffuse incidence of light from the outer hemisphere (model situation for an overcast sky).

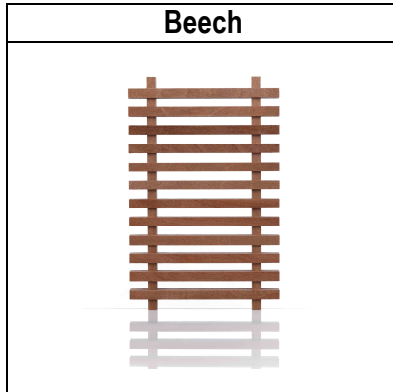
The specified values may change as a result of technical developments. No guarantee is therefore given for their correctness.

Make-up

The special feature of OKAWOOD is that the wooden grid for solar control is integrated in the cavity between the glass panes of insulated glazing and so require no special attention in terms of installation, maintenance and cleaning. In fact, the OKAWOOD element can be treated like conventional insulating glass. The glass thickness and type are based on the structural needs and constructional requirements.

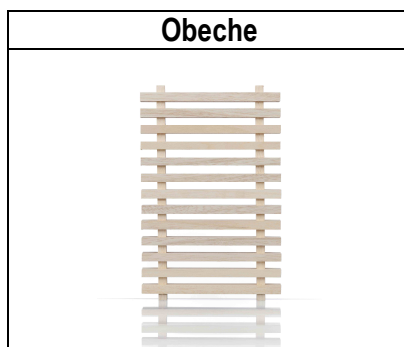
The natural wood grid insert is made of high-quality laminated wood cut from locally cultivated indigenous beech.

Table 4: Domestic wood



The precious wood grid insert is made of solid wood. All the wood used in our products originates from sustainably managed forests. Other types of wood are available upon request.

Table 5: Exotic wood



Standard make-up

Vertical glazing:

2-pane make-up

External pane made of thermally treated glass

Cavity: 18 mm with wooden grid, rough-sawn surface

Inner pane made of thermally treated glass, low-e coating face #3

3-pane make-up

External pane made of thermally treated glass

Cavity 1: 18 mm with wooden grid, rough-sawn surface

Intermediate pane made of thermally treated glass, low-e coating #3

Cavity 2: 8 to 12 mm with gas filling

Inner pane made of thermally treated glass, low-e coating face #5

Standard make-up

Horizontal glazing:

2-pane make-up

External pane made of thermally treated glass, functional coating face #2

Cavity: 18 mm with wooden grid, rough-sawn surface

Inner pane made of laminated glass from heat strengthened glass thermally treated glass

3-pane make-up

External pane made of thermally treated glass, functional coating face #2

Cavity 1: 18 mm with wooden grid, rough-sawn surface

Intermediate pane made of thermally treated glass

Cavity 2: 8 to 12 mm with gas filling

Inner pane made of laminated glass from heat strengthened glass thermally treated glass, low-e coating face #5

Dimensions

The table below show maximum dimensions and visible widths.

| | |
|---|--------------|
| Glass dimension parallel to louvre direction | max. 3500 mm |
| Glass dimension perpendicular to louvre direction | max. 3500 mm |
| Louvre length Domestic wood | max. 1500 mm |
| Exotic wood | max. 1700 mm |
| Length of support elements Domestic wood | max. 2000 mm |
| Exotic wood | max. 3500 mm |
| Visible width of louvres | 10 mm |
| Distance between louvres | 10 mm |
| Visible width of support elements | 10 mm |
| Distance between support elements | max. 600 mm |
| Freely cantilever of louvres | 50 mm |
| End strip for shaped units | 10 mm |

Widths / heights in excess of the maximum lengths specified in the table above require a joint. At this joint it may be possible to see a gap or even an offset between the neighbouring louvres.

The material used as interlayer is a natural product. For this reason, deviations in colour, brightness and alignment of the wooden louvres may occur. Also spots of natural resin may appear at the surface of the wood. This phenomenon is not a product fault.

The maximum area is 7 m². Special shapes are possible. For shaped units with inclined edges an end strip of 10 mm width is required. The feasibility and divisions must be discussed with OKALUX beforehand. It may be necessary to use an increased secondary sealant in the case of smaller dimensions and/or greater thickness of glass. The required edge seal width must be discussed with OKALUX beforehand. OKALUX will specify the location of the joints.

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 depths of the glazing rebate must amount to at least the required overall sealant (spacer bar + secondary seal) plus 5 mm. Otherwise the edge area has to be covered by a screen print.

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.

More detailed information you can find in our General Customer Notes "OKAWOOD tolerances".

Installation instructions

OKAWOOD insulating glass is glazed as per normal insulating glass. During transportation, the insert may slide to the side, creating a greater visible slit between the spacer and the insert or the support profiles could become inclined. We must be notified in writing beforehand of any special loads which may occur during transportation (vibrations/shaking).

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 printed 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 OKAFLEX

Customer notes installation of OKAPANE

Customer notes OKAWOOD tolerances

Customer notes OKACELL product specification

Cleaning instructions for OKALUX gen.

Cleaning instructions OKACOLOR

Guideline for visual quality