OKASOLAR S

Glazing with Integral Sun Control Louvres

OKASOLAR S is an insulating glass with fixed louvres in the cavity between the glass panes and is ideal for use in roofs. We recommend our products OKASOLAR W and OKASOLAR F for façade glazing.

With its three-dimensionally shaped, highly reflective profile, OKASOLAR S offers:

- Efficient directionally selective solar control
- Use of diffuse daylight
- Partial through-vision
- Can be easily recycled
- Visibility for birds

Physical properties

Thermal insulation
OKASOLAR S is available as a 2-pane make-up with a space between the panes of 24 mm, and also as a 3-pane make-up with an additional cavity between the panes. Depending on the gas filling and coating, the 2-pane make-up achieves $U_g$ values $\geq 1.1 \, W/(m^2K)$. As a 3-pane make-up, $U_g$ values $\geq 0.6 \, W/(m^2K)$ are possible.

Sound insulation
The integrated louvres have no significant effect on the sound insulation. The achievable values depend on the glass assembly.

Spectral properties
The function of OKASOLAR S depends on the current radiation conditions. Partial through-vision is always given, despite the solar protection which differs depending on the season and time of day. The flat louvre cross-section permits through-vision on a proportional area of up to 80% depending on the viewing direction. In general OKASOLAR S is installed such that direct solar radiation from the south is largely avoided, while the diffuse daylight from the northern sky can be used.
In roof applications, OKASOLAR S functions as follows:

1. Shaded range (general direction: south)
   - thermal solar protection with total solar energy transmittance values of as low as ≥ 8%, in particular secondary heat transfer without solar radiation transmission
   - glare protection

2. Penetration range (general direction: north)
   - partial transmission of the direct sunlight
   - diffused irradiation of daylight
   - partial through-vision

**Technical values of standard types**
The following information applies to 2-pane make-up consisting of one 6 mm thick external pane with a solar functional coating at face #2 and an inner pane of 8 mm thermally treated laminated safety glass.

![Diagram of sun and angle symbols]

<table>
<thead>
<tr>
<th>Type</th>
<th>Angle of louvre [°]</th>
<th>Distance of louvre [mm]</th>
<th>Maximal throughput vision %</th>
<th>Trough-vision from α [°]</th>
<th>to β [°]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OKASOLAR S</td>
<td>27</td>
<td>24.7</td>
<td>80</td>
<td>3</td>
<td>75</td>
</tr>
</tbody>
</table>

**Table 2: Technical values for the 2-pane make-up with low-e coating as well as solar control coating 70/37**

<table>
<thead>
<tr>
<th>Type</th>
<th>Functional coating</th>
<th>T&lt;sub&gt;v&lt;/sub&gt; % min.</th>
<th>T&lt;sub&gt;v&lt;/sub&gt; % max.</th>
<th>TSET % min.</th>
<th>TSET % max.</th>
<th>U&lt;sub&gt;g&lt;/sub&gt;-Wert [W/(m²K)] / U&lt;sub&gt;g&lt;/sub&gt; [Btu/(hr ft² °F)] cavity 24 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>OKASOLAR S</td>
<td>low-e</td>
<td>1</td>
<td>47</td>
<td>13</td>
<td>45</td>
<td>1.1 / 0.19</td>
</tr>
<tr>
<td>OKASOLAR S</td>
<td>solar</td>
<td>1</td>
<td>41</td>
<td>9</td>
<td>31</td>
<td>1.1 / 0.19</td>
</tr>
</tbody>
</table>
The following information applies to 3-pane make-up consisting of a 6 mm external pane functional coating at face #2, a 6 mm middle pane and an 8 mm inner pane with a thermal treated laminated safety glass with a low-e coating at face #5.

Table 3: Technical values for the 3-pane make-up with low-e coating as well as solar control coating 70/37

<table>
<thead>
<tr>
<th>Type</th>
<th>Functional coating</th>
<th>T_ν % min.</th>
<th>T_ν % max.</th>
<th>TSET % min.</th>
<th>TSET % max.</th>
<th>U_g-Wert [W/(m²K)] / U_g [Btu/(hr ft² °F)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OKASOLAR S</td>
<td>low-e</td>
<td>1</td>
<td>42</td>
<td>12</td>
<td>40</td>
<td>0.6 / 0.11 / 0.8 / 0.14 / 1.1 / 0.19</td>
</tr>
<tr>
<td>OKASOLAR S</td>
<td>solar</td>
<td>1</td>
<td>37</td>
<td>8</td>
<td>29</td>
<td>0.6 / 0.11 / 0.8 / 0.14 / 1.1 / 0.19</td>
</tr>
</tbody>
</table>

1) for angle of incidence γ = 60°
2) for angle of incidence γ = -30°

Legend and related values:

<table>
<thead>
<tr>
<th>unit</th>
<th>standard</th>
<th>technical term</th>
</tr>
</thead>
<tbody>
<tr>
<td>U_g</td>
<td>W/(m²K)</td>
<td>Thermal transmittance</td>
</tr>
<tr>
<td>TSET</td>
<td>%</td>
<td>Total solar energy transmittance or solar heat gain coefficient</td>
</tr>
<tr>
<td>T_ν</td>
<td>%</td>
<td>Light transmission (direct/hemispheric resp. diffuse/hemispheric)</td>
</tr>
<tr>
<td>R_w</td>
<td>dB</td>
<td>Sound reduction coefficient</td>
</tr>
<tr>
<td>F_C</td>
<td>%</td>
<td>Reduction factor of a solar control system, F_C=TSET/TSET_reference</td>
</tr>
<tr>
<td>SC</td>
<td>%</td>
<td>Shading coefficient, SC=TSET/0.86</td>
</tr>
</tbody>
</table>

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. The values continue to vary if other coatings are used.

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 solar and low-e coating at face #2 changes the colour 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

The special feature of OKASOLAR S is that the louvres for solar protection and use of daylight are integrated in the cavity between the glass and therefore pose no special requirements concerning the installation, maintenance and cleaning. In fact, the OKASOLAR element can be treated like conventional insulating glass. The glass thickness and type are based on the structural needs and constructional requirements.
Standard make-up:

2-pane make-up
External pane made of thermally treated glass, low-e/solar protection coating face #2
Cavity: 24 mm with integrated louvres and gas filling
Inner pane made of thermally treated laminated safety glass

3-pane make-up
External pane made of thermally treated glass, low-e/solar protection coating face #2
Cavity 1: 24 mm with integrated louvres and gas filling
Middle pane made of thermally treated glass
Cavity 2: 8 to 12 mm with gas filling
Inner pane made of thermally treated laminated safety glass, low-e coating face #5

Dimensions
The table and drawing below show maximum dimensions and visible widths.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>max. 3000 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>glass dimension parallel to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>louvre direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>glass dimension perpendicular</td>
<td>B</td>
<td>max. 4500 mm</td>
</tr>
<tr>
<td>to louvre direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>without supporting profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with supporting profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>louvre length</td>
<td>C</td>
<td>max. 1500 mm</td>
</tr>
<tr>
<td>unsupported span of louvres</td>
<td>D</td>
<td>max. 500 mm</td>
</tr>
<tr>
<td>visible width edge profile</td>
<td>E</td>
<td>15.0 mm</td>
</tr>
<tr>
<td>visible width supporting profile</td>
<td>F</td>
<td>7.2 mm</td>
</tr>
<tr>
<td>visible width of punched out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>area of louvre at supporting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>profile</td>
<td>G</td>
<td>30.6 mm</td>
</tr>
</tbody>
</table>

The maximum area is 7 m². Special shapes are possible. 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. In the case of over sized units, joints could occur at the edge, tooth and joint profiles. OKALUX will specify the location of the joints.
For visual reasons, we may finish the louvre insert by placing an edge profile all round it. Pressure on the surface of the pane can permanently damage the louvre insert. It is only permitted to walk on the panes, even when sized appropriately, in consultation with the manufacturer. When affixing boards, the load must be applied over the edge of the pane.

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.

Depending on the insulating glass formats, tooth and junction profiles may be required to support the louvres. If we do not receive any specifications, we will provide a symmetrical division of the louvres for each individual insulating glass unit. Please consult us in good time if a different division is required.

Edge and joint profiles have a matt, eloxal finish colourless C-0 (EV1). Profiles can be powder-coated in RAL colours upon request.

Example 1:
regular division with 1 joint profile and 2 tooth profiles

Example 2:
symmetrical division with 2 tooth profiles

Example 3:
regular division Example 1:

Planning instructions
On the basis of the planning data, in particular

• geographical latitude of the project
• roof orientation
• roof inclination
• room utilisation

we develop a project-specific OKASOLAR assessment. The shading times of the respective OKASOLAR type are evident in the OKASOLAR assessment.
OKASOLAR does not totally block out the sun which can at times shine through the louvres and be partially redirected to the inside. A part of the retro-reflected light is reflected once more by the outer glass surfaces to the inside. These circumstances may make it advisable to put in additional internal glare protection to satisfy especially demanding applications (e.g. computer workstations).

The louvres have a highly reflective coating, which contributes to an effective redirection of solar radiation. For this reason, certain lighting conditions and viewing angles may already make slight deviations in the positions of some of the louvres visible. These deviations are unavoidable and do not affect the function of the insulating glass.

If the OKASOLAR insulating glazing is being installed at temperatures <0°C in an unheated building (winter construction site), we must be notified of this in writing beforehand.

**Installation instructions**

OKASOLAR 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 OKAWOOD tolerances
- Cleaning instructions for OKALUX gen.
- Cleaning instructions OKACOLOR
- Guideline for visual quality