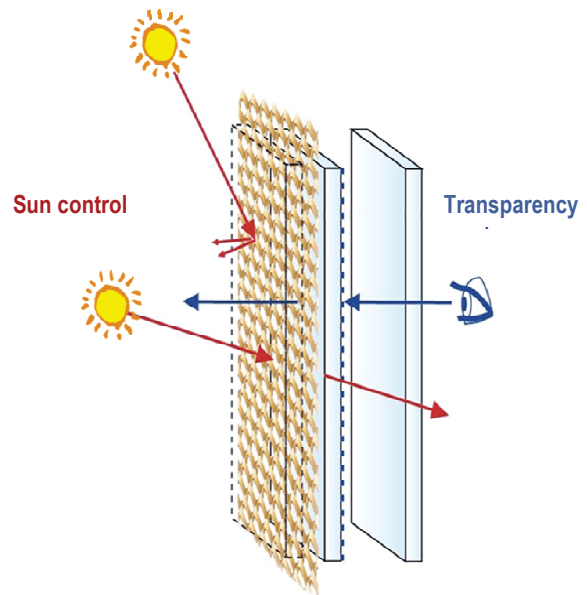


OKATECH – Insulating Glass with Metal Interlayer

OKATECH can integrate many different designs of wire mesh, expanded metal or fabric as a design element with variable functions:

- efficient solar control that can also be directionally selective, depending on the type of inlay used
- Trough-vision from inside to outside - depending on the lighting conditions
- Privacy screening from outside to inside
- Good heat insulation
- Lends the glass façade a visual structure, colour and textured shine
- Can be easily recycled
- Visibility for birds
- Individual design options



Physical construction properties

Thermal insulation

In the standard make-up, the U_g -value is 1.0-1.2-1.5 $W/(m^2K)$ (0.18-0.21-0.27 $Btu/hr/ft^2/^\circ F$) depending on gas filling and coating; the mesh improves the U-value only marginal. Lower U_g values are possible by means of an additional cavity between the panes. If this is required, please consult us in advance.

Sound insulation

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

Spectral properties

OKATECH has directionally-selective properties, depending on the type of insert. The function of OKATECH depends on the current radiation conditions. Partial through-vision is always given, despite the solar control which differs depending on the season and time of day

Integrated in a vertical façade, OKATECH functions as follows:

1. direct irradiation from high and medium solar altitude
 - thermal solar control with total solar energy transmittance values of as low, in particular secondary heat transfer without solar radiation transmission
 - glare protection
2. direct irradiation from low solar altitude
 - partial transmission of the direct sunlight
 - solar yields on south-facing façades

Technical values of standard types

The following information applies to standard make-ups consisting of an external pane with a thickness of 6 mm, a middle pane with a thickness of 6 mm with a coating at #4 and an inner pane with a thickness of 6 mm.

Light transmission and total solar energy transmittance depend on the angle of incidence.

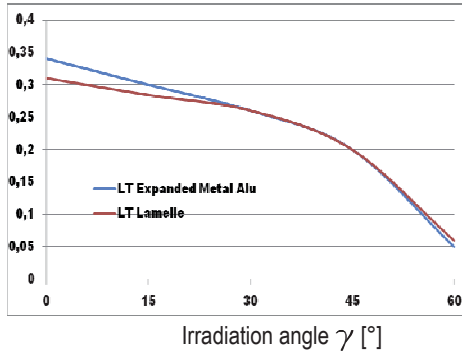


Figure 1:
Angle-selective light transmission T_v according to DIN EN 410 from OKATECH with solar control coating

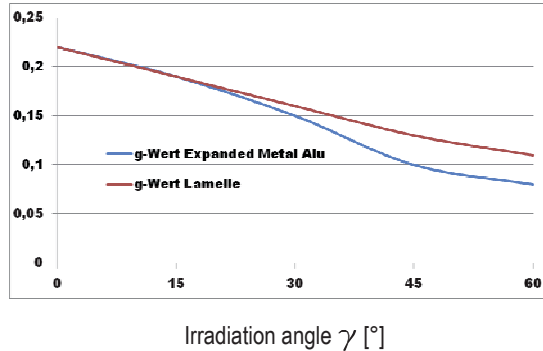


Figure 2:
TSET according to DIN EN 410 from OKATECH with solar control coating

Table 1: Technical values for standard make-up with low-e or solar control coating 69/37

Type OKATECH	Functional coating	T_v % min. ¹⁾	T_v % max. ²⁾	g-value % min. ¹⁾	g value % max. ²⁾	U _g -value [W/(m ² K)] / U _g [Btu/(hr ft ² F)] / cavity 12 mm		
						Krypton	Argon	Air
Lamelle	low-e	9	35	15	29	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Lamelle	solar	6	31	11	22	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Sambesi	low-e	8	32	14	27	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Sambesi	solar	6	29	12	21	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Omega	low-e	21	38	20	31	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Omega	solar	17	33	15	24	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Kiwi	low-e	22	30	22	26	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Kiwi	solar	17	26	14	20	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Mandarin	low-e	22	31	22	26	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Mandarin	solar	17	26	14	20	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Expanded Metal Alu	low-e	7	38	9	29	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Expanded Metal Alu	solar	5	34	8	22	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Expanded Metal Copper	low-e	5	35	9	28	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Expanded Metal Copper	solar	3	31	8	21	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Vision AL 260/25	low-e	8	19	11	15	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Vision AL 260/25	solar	7	17	9	12	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Vision AL 260/55	low-e	22	39	23	28	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Vision AL 260/55	solar	20	34	18	21	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Vision CU 260/25	low-e	8	21	13	17	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Vision CU 260/25	solar	7	19	11	14	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25
Vision CU 260/55	low-e	22	41	25	30	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Vision CU 260/55	solar	19	36	19	22	0.9 / 0.16	1.1 / 0.19	1.4 / 0.25

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

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

Data for other metal interlayer on request.

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. 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).

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 *OKATECH* is that the respective metal insert is integrated in a slim, hermetically-sealed cavity between the panes and so requires no special attention in terms of installation, maintenance and cleaning.

In fact, the *OKATECH* element can be treated like conventional insulating glass. The glass thickness and type are based on the structural needs and constructional requirements.

Lamelle	Sambesi	Omega	Kiwi	Mandarin
Expanded Metal Alu	Expanded Metal Copper	Vision AL 260/25	Vision CU 260/25	Project-specific solution

Standard make-up

- External pane made of thermally treated glass
- Cavity 1: depending on metal inlay
- Intermediate pane made of thermally treated glass, coating on #4
- Cavity 2: up to 12 mm with gas filling
- Inner pane made of thermally treated glass

Dimensions

OKATECH Type	Max. width of the insert	Max. height of the insert
Lamelle	4000 mm	4000 mm
Sambesi	4000 mm	4000 mm
Omega	4000 mm	4000 mm
Kiwi	3000 mm	4000 mm
Mandarin	3000 mm	4000 mm
Expanded Metal Alu	1250 mm	4000 mm
Expanded Metal Copper	1250 mm	4000 mm
Vision AL 260/25	2350 mm	4000 mm
Vision AL 260/55	2350 mm	4000 mm
Vision CU 260/25	1580 mm	4000 mm
Vision CU 260/55	1580 mm	4000 mm

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. Furthermore, the width of the OKATECH element is based on the maximum width of the respective inserts.

For tolerance reasons and due to differing temperature expansion, the insert may exhibit an expansion gap of up to 5.0 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 seal-

ant (spacer bar + secondary seal) plus 12 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 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 screen print. Depending on loading, the required sealant width can be considerably greater than that of "conventional" insulating glazing.

OKATECH insulating glass uses mesh inserts made of untreated metals, so there can be differences in colour between and also within individual element. Especially with neutral copper the appearance can vary visibly. This difference in surface coloration and degree of gloss are dependent on the materials used and do not represent a visual flaw or any other fault with the product. On the contrary, the natural and living appearance of the façade is considered a key product feature. Due to contact between glass surface and metal inlay vibrations can cause a sound. This is part of the design and does not represent a defect.

When viewed from inside, it is possible to see in the edge area some of the design features which are used to fasten the respective insert. To conceal these, we recommend fitting an additional edge screen print to the inside (18 mm plus secondary seal).

Installation instructions

OKATECH 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 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 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