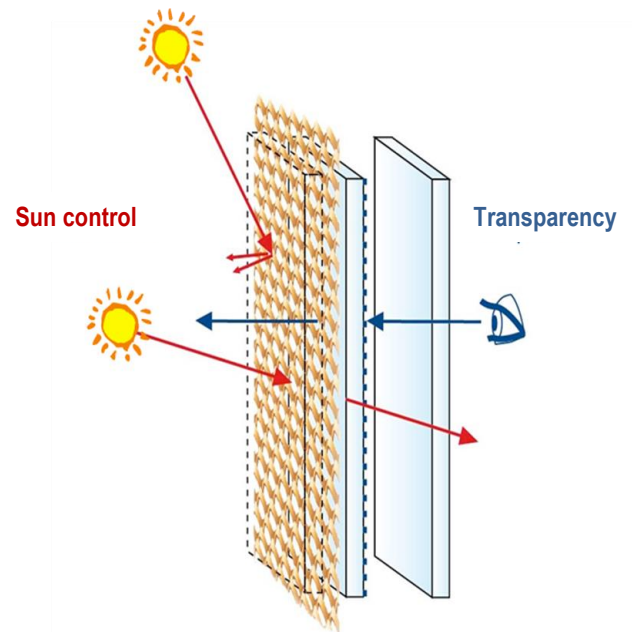


## OKATECH – Insulating Glass with Metal Interlayer

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<sup>2</sup>K) (0.18 - 0.21 - 0.27 Btu/hr/ft<sup>2</sup>/°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 a 6 mm outer pane, a 6 mm middle pane with a coating on surface #4 and a 6 mm inner pane.

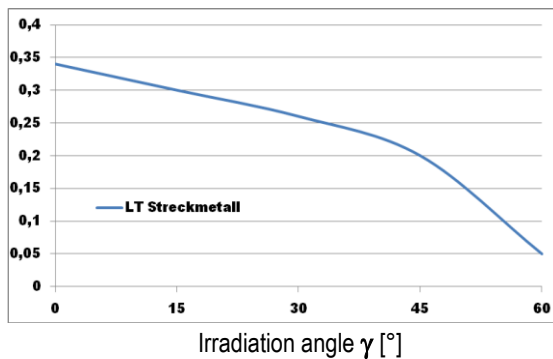
Light transmission and total solar energy transmittance depend on the angle of incidence.

**Table 1:** Technical values for standard make-up with low-e coating as well as solar control coating 70/35 T

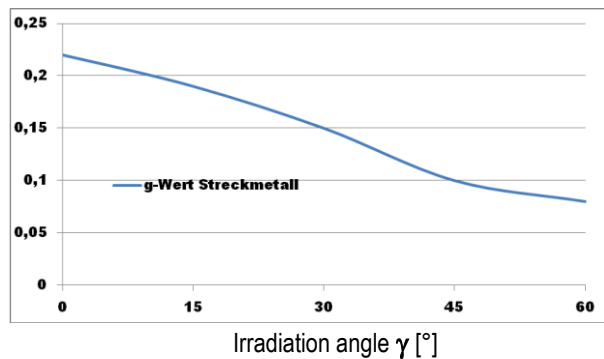
Type OKATECH	Functional coating	T <sub>v</sub> % min. <sup>1)</sup>	T <sub>v</sub> % max. <sup>2)</sup>	TSET % min. <sup>1)</sup>	TSET % max. <sup>2)</sup>	U <sub>g</sub> -value [W/(m <sup>2</sup> K)] / U <sub>g</sub> [Btu/(hr ft <sup>2</sup> °F)]		
						cavity 12 mm		
						Krypton	Argon	Luft
Lamelle	low-e	13	36	15	31	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Lamelle	solar	9	31	12	21	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Sambesi 450	low-e	11	33	14	28	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Sambesi 450	solar	10	29	12	20	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Omega 1520	low-e	20	39	20	33	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Omega 1520	solar	17	34	15	22	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Kiwi	low-e	20	31	22	27	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Kiwi	solar	17	27	14	19	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Mandarin	low-e	20	31	22	27	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Mandarin	solar	17	27	14	19	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Expanded Metal Alu 10x5,8x1,55x1	low-e	8	39	9	31	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Expanded Metal Alu 10x5,8x1,55x1	solar	6	34	8	21	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Expanded Metal Alu 20x10x2,5x1	low-e	11	46	-	36	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Expanded Metal Alu 20x10x2,5x1	solar	8	41	-	24	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Expanded Metal Alu 28x9x2,5x1,5	low-e	4	44	11	35	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Expanded Metal Alu 28x9x2,5x1,5	solar	4	38	11	24	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Expanded Metal Alu 90x42x10x2	low-e	13	53	-	42	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Expanded Metal Alu 90x42x10x2	solar	11	46	-	28	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25
Expanded Metal Cu 20x10x2,5x0,8	low-e	9	45	15	36	1.0 / 0.18	1.2 / 0.21	1.5 / 0.26
Expanded Metal Cu 20x10x2,5x0,8	solar	8	39	13	24	0.9 / 1.6	1.1 / 0.19	1.4 / 0.25

<sup>1)</sup> for angle of incidence  $g = 60^\circ$     <sup>2)</sup> for angle of incidence  $\gamma = 0^\circ$  (vertical to the glass surface)

Data for other metal interlayer or 3-pane build up on request.



**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

Legend and related values:

	unit	standard	technical term
$U_g$	W/(m <sup>2</sup> 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 or estimations 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 on surface #4 changes the colour appearance.

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.

## Standard make-up

Outer pane made of thermally treated glass

Cavity 1: depending on metal inlay

Middle pane made of thermally treated glass, coating on surface #4

Cavity 2: up to 12 mm with gas filling

Inner pane made of thermally treated glass

## Dimensions

OKATECH Type	Max. width (IGU)	Max. height (IGU)	Max. width (IGU)	Max. height (IGU)	Max. width (IGU)	Max. height (IGU)
	natural		anodised <sup>1)</sup>		RAL <sup>2)</sup>	
Lamelle	2000 mm	4000 mm	-	-	-	-
Sambesi 450	2000 mm	4000 mm	-	-	-	-
Omega 1520	2000 mm	4000 mm	-	-	-	-
Kiwi	2000 mm	4000 mm	-	-	-	-
Mandarin	1570 mm	3500 mm	-	-	-	-
Expanded Metal Alu 10x5,8x1,55x1	2500 mm	3500 mm	2800 mm	4000 mm	1500 mm	4000 mm
Expanded Metal Alu 20x10x2,5x1	1250 mm	3500 mm	1400 mm	4000 mm	1500 mm	4000 mm
Expanded Metal Alu 28x9x2,5x1,5	1250 mm	3500 mm	1900 mm	4000 mm	1900 mm	4000 mm
Expanded Metal Alu 90x42x10x2	2000 mm	3500 mm	1400 mm	4000 mm	2000 mm	4000 mm
Expanded Metal Cu 20x10x2,5x0,8	1250 mm	3500 mm	-	-	-	-
Expanded Metal Cu 28x9x2,5x1,5	1250 mm	3500 mm	-	-	-	-
Expanded Metal Cu 90x42x10x2	1250 mm	3500 mm	-	-	-	-

<sup>1)</sup> Possible anodised colours: EV1, C31, C32

<sup>2)</sup> Possible RAL colours: Colours that are brighter than RAL 8004 copper brown

The maximum area is 7 m<sup>2</sup>. 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 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 12 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.

OKATECH insulating glass with metal mesh inserts can be differences in colour between and also within individual element. Optical changes may result on some surfaces from the effects to temperature and UV rays. 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.

Small deformations i.e. in the form of waves may become visible when the soft, flexible, textile-like OKATECH insert is exposed to temperature fluctuations. This is inherent to the material and does not constitute 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](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®  
Cleaning instructions for OKALUX gen.  
Guideline for visual quality