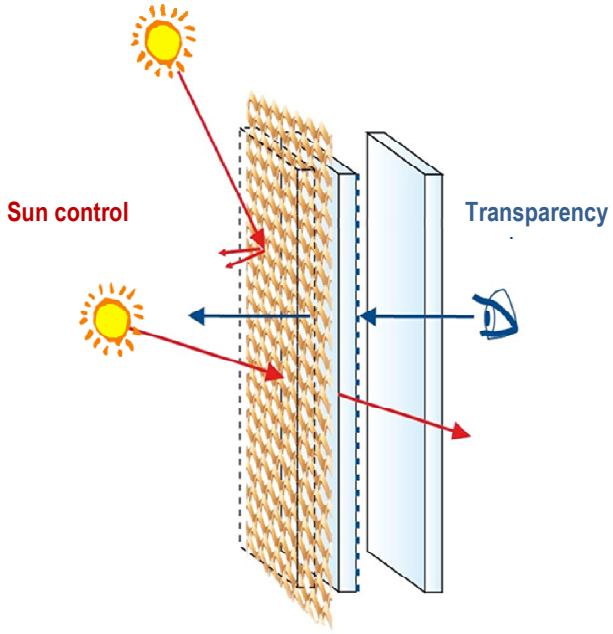
OKA*TECH* – Insulating Glass with Metal Interlayer

OKA*TECH* 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/(m²K) (0.18-0.21-0.27 Btu/hr/ft²/°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

OKA*TECH* has directionally-selective properties, depending on the type of insert.
The function of OKA*TECH* 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, OKA*TECH* 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 external pane with a thickness of 6 mm, a middle pane with a thickness of 6 mm with a coating at #4 and a inner pane with a thickness of 6 mm.
Light transmission and total solar energy transmittance depend on the angle of incidence.

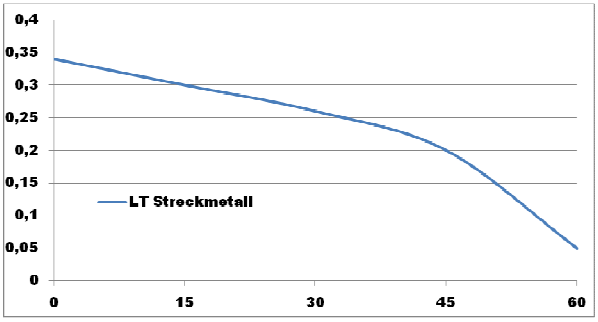


Figure 1:
Angle-selectve light transmission T_v according to DIN EN 410 from OKA*TECH* with solar control coating

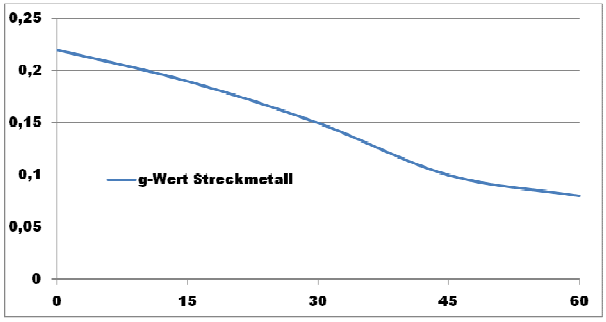


Figure 2:
TSET according to DIN EN 410 from OKA*TECH* with solar control coating

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

Type OKA*TECH*	**Functio-nal coating**	**T_v % min.[1)]**	**T_v % max.[2)]**	**g-value % min.[1)]**	**g value % max.[2)]**	**U_g-value [W/(m²K)] / U_g [Btu/(hr ft²F)] cavity 12 mm**		
						Krypton	Argon	Air
Kiwi	low-e	22	30	22	27	**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	30	22	27	**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	39	9	31	**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	30	**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

[1)] for angle of incidence γ = 60°

[2)] for angle of incidence γ = 0° (vertical to the glass surface)

Data for other metal interlayer on request.

Legend and related values:

	unit	**standard**	**technical term**
U_g	W/(m²K)	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.

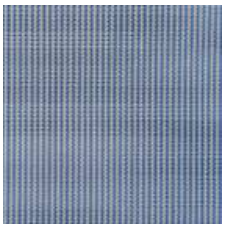
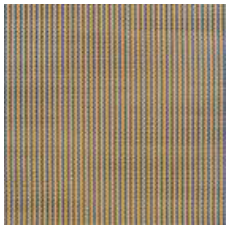
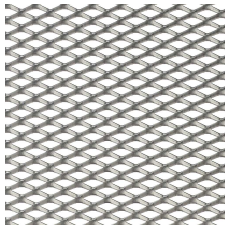
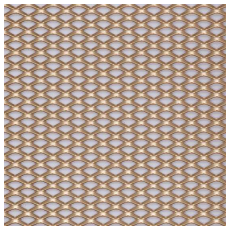
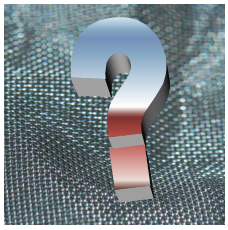
Direct transmission relates to direct incidence of light, generally vertical (model situation for direct sunlight). Diffuse transmission applies to homogeneous, diffuse incidence of light from the outer hemisphere (model situation for an overcast sky). All values were measured hemispherically.

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 OKA*TECH* 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 OKA*TECH* element can be treated like conventional insulating glass. The glass thickness and type are based on the structural needs and constructional requirements.

Kiwi	Mandarin	Expanded Metal Alu	Expanded Metal Copper	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

OKA*TECH* Type	Max. width of the insert	Max. height of the insert
Kiwi	2000 mm	4000 mm
Mandarin	1600 mm	3500 mm
Expanded Metal Alu	1250 mm	4000 mm
Expanded Metal Copper	1250 mm	4000 mm

The maximum area is 7 m^2. 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 OKA*TECH* element is based on the maximum width of the respective inserts.
For tolerance reasons and due to differing temperature expansion, the insert may be 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 sealant (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. 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 OKA*TECH* 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

OKA*TECH* 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 OKA*LUX* 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

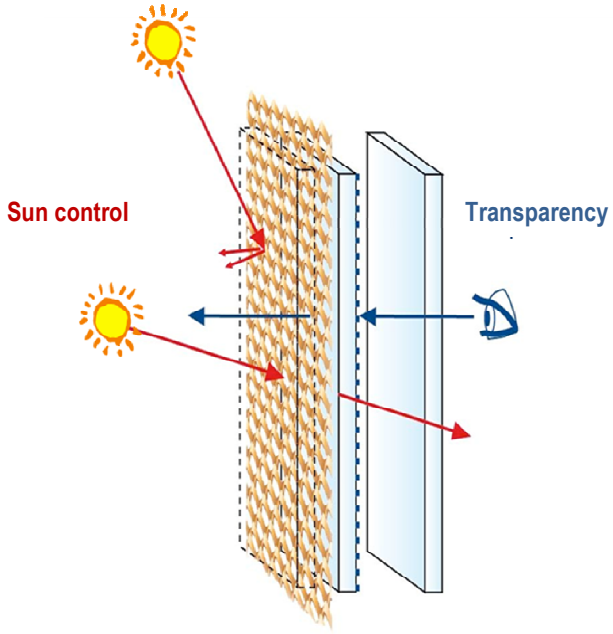
As well as these, there are the following customer notes:

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 OKA*WOOD* tolerances
Cleaning instructions for OKA*LUX* gen.
Cleaning instructions OKA*COLOR*
Guideline for visual quality

OKA*TECH* – Insulating Glass with Metal Interlayer

OKA*TECH* 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/(m²K) (0.18-0.21-0.27 Btu/hr/ft²/°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

OKA*TECH* has directionally-selective properties, depending on the type of insert.
The function of OKA*TECH* 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, OKA*TECH* 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 external pane with a thickness of 6 mm, a middle pane with a thickness of 6 mm with a coating at #4 and a inner pane with a thickness of 6 mm.
Light transmission and total solar energy transmittance depend on the angle of incidence.

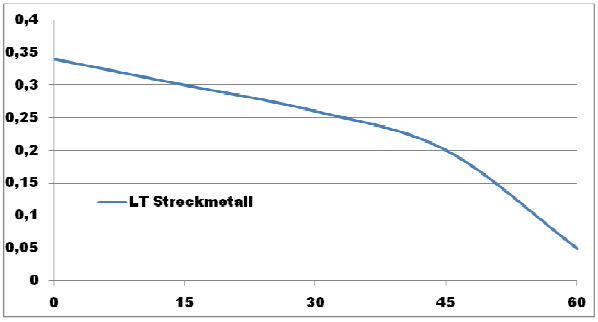


Figure 1:
Angle-selectve light transmission T_v according to DIN EN 410 from OKA*TECH* with solar control coating

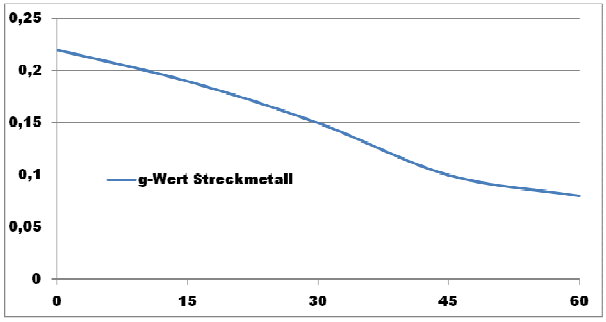


Figure 2:
TSET according to DIN EN 410 from OKA*TECH* with solar control coating

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

Type OKA*TECH*	**Functio-nal coating**	**T_v % min.[1)]**	**T_v % max.[2)]**	**g-value % min.[1)]**	**g value % max.[2)]**	**U_g-value [W/(m²K)] / U_g [Btu/(hr ft²F)] cavity 12 mm**		
						Krypton	Argon	Air
Kiwi	low-e	22	30	22	27	**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	30	22	27	**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	39	9	31	**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	30	**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

[1)] for angle of incidence γ = 60°

[2)] for angle of incidence γ = 0° (vertical to the glass surface)

Data for other metal interlayer on request.

Legend and related values:

	unit	**standard**	**technical term**
U_g	W/(m²K)	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.

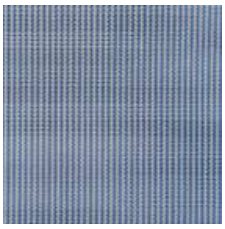
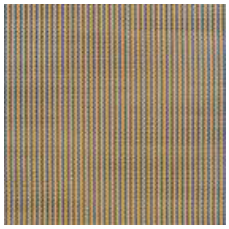
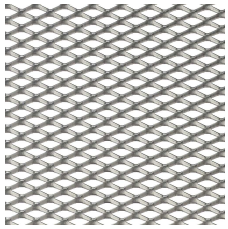
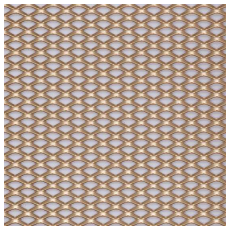
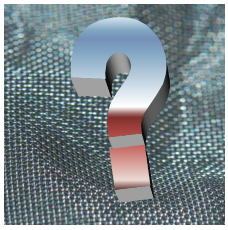
Direct transmission relates to direct incidence of light, generally vertical (model situation for direct sunlight). Diffuse transmission applies to homogeneous, diffuse incidence of light from the outer hemisphere (model situation for an overcast sky). All values were measured hemispherically.

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 OKA*TECH* 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 OKA*TECH* element can be treated like conventional insulating glass. The glass thickness and type are based on the structural needs and constructional requirements.

Kiwi	Mandarin	Expanded Metal Alu	Expanded Metal Copper	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

OKA*TECH* Type	Max. width of the insert	Max. height of the insert
Kiwi	2000 mm	4000 mm
Mandarin	1600 mm	3500 mm
Expanded Metal Alu	1250 mm	4000 mm
Expanded Metal Copper	1250 mm	4000 mm

The maximum area is 7 m^2. 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 OKA*TECH* element is based on the maximum width of the respective inserts.
For tolerance reasons and due to differing temperature expansion, the insert may be 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 sealant (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. 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 OKA*TECH* 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

OKA*TECH* 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 OKA*LUX* 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 OKA*WOOD* tolerances
Cleaning instructions for OKA*LUX* gen.
Cleaning instructions OKA*COLOR*
Guideline for visual quality