

EKO[®] ENERGY

*Heatable glass solution
range, specially designed for
commercial refrigeration
applications.*





HIGH LIGHT TRANSMITTANCE

EKO[®]ENERGY is a heatable glass solution range, specially designed for commercial refrigeration applications. It is the first heatable TCO magnetron coated glass ever launched. It can be processed in DGU or TGU, it is developed for commercial refrigeration and available on 3.15 and 4 mm clear glass. The product is designed to avoid condensation on the external face of the cabinet glazing.

While exhibiting enhanced anti-condensation properties, refrigeration cabinet doors including **EKO[®]ENERGY**, can also exhibit high thermal insulation performances when associated with **PLANITHERM[®]ONE** Low-E coating.

EKO[®]ENERGY is manufactured by vacuum cathodic sputtering of several TCO and ceramic layers on **PLANILUX[®]** clear glass. **EKO[®]ENERGY** coated glass must be tempered in order to acquire its electrical conductivity

properties. Once connected to the electrical supply, electrical flow through the coating, applied via screen-printed busbar connectors, will heat-up **EKO[®]ENERGY** so that condensation on the door is avoided.

PERFORMANCE DATA

Performances calculations (ie: Room side glass temperature, condensation RH, Heat Flow) for the different configurations given in this brochure, were performed by Saint-Gobain Glass. For any other configuration please contact your sales representatives who will be able to calculate the performances.

Saint-Gobain Glass delivers the coated glass unprocessed, so it is not responsible for the subsequent handling of the product, which may include, but is not limited to, the processes of cutting, tempering, installation of electrical connections and installation in general. These and other post-delivery processes can directly or indirectly affect product performance.

DGU Configuration

*T ext=27°C *T int=+4°C	W/m ² .K U-Value	Room Side Glass temperature (°C)	**Condensation RH (%)	Relative Humidity Improvement	Heat Flow (W/m ²)	Power Density (W/m ²)
PLANILUX [®] / PLANILUX [®]	2.7	19	62	/	61	-
EKO [®] ENERGY 75 / PLANILUX [®]	2.2	20	67	9%	50	-
EKO [®] ENERGY 75 / PLANILUX [®]	2.2	28	100	62%	N/A	80
PLANILUX [®] / PLANITHERM [®] ONE	1.2	23	80	29%	27	-
EKO [®] ENERGY 75 / PLANITHERM [®] ONE	1.2	23	80	29%	27	-
EKO [®] ENERGY 75 / PLANITHERM [®] ONE	1.2	28	100	62%	N/A	40

*T ext=27°C *T int=-4°C	W/m ² .K U-Value	Room Side Glass temperature (°C)	**Condensation RH (%)	Relative Humidity Improvement	Heat Flow (W/m ²)	Power Density (W/m ²)
PLANILUX [®] / PLANILUX [®]	2.7	17	53	/	77	-
EKO [®] ENERGY 75 / PLANILUX [®]	2.2	18	59	12%	63	-
EKO [®] ENERGY 75 / PLANILUX [®]	2.2	26	93	76%	N/A	80
PLANILUX [®] / PLANITHERM [®] ONE	1.2	22	74	40%	36	-
EKO [®] ENERGY 75 / PLANITHERM [®] ONE	1.2	22	74	40%	36	-
EKO [®] ENERGY 75 / PLANITHERM [®] ONE	1.2	27	98	85%	N/A	40

*T ext=27°C *T int=-20°C	W/m ² .K U-Value	Room Side Glass temperature (°C)	**Condensation RH (%)	Relative Humidity Improvement	Heat Flow (W/m ²)	Power Density (W/m ²)
PLANILUX [®] / PLANILUX [®]	2.7	12	40	/	112	-
EKO [®] ENERGY 75 / PLANILUX [®]	2.2	14	46	16%	94	-
EKO [®] ENERGY 75 / PLANILUX [®]	2.2	22	72	83%	N/A	80
PLANILUX [®] / PLANITHERM [®] ONE	1.2	19	61	55%	59	-
EKO [®] ENERGY 75 / PLANITHERM [®] ONE	1.2	19	61	55%	59	-
EKO [®] ENERGY 75 / PLANITHERM [®] ONE	1.2	28	100	153%	N/A	80

TGU Configuration

*T ext=27°C *T int=-20°C	W/m ² .K U-Value	Room Side Glass temperature (°C)	**Condensation RH (%)	Relative Humidity Improvement	Heat Flow (W/m ²)	Power Density (W/m ²)
PLANILUX [®] / PLANILUX [®] / PLANILUX [®]	2.0	15	48	/	88	-
EKO [®] ENERGY 75 / PLANILUX [®] / PLANILUX [®]	1.9	16	52	8%	80	-
EKO [®] ENERGY 75 / PLANILUX [®] / PLANILUX [®]	1.9	24	84	89%	N/A	80
PLANILUX [®] / PLANILUX [®] / PLANITHERM [®] ONE	1.5	18	58	24%	66	-
EKO [®] ENERGY 75 / PLANILUX [®] / PLANITHERM [®] ONE	1.4	19	60	29%	62	-
EKO [®] ENERGY 75 / PLANILUX [®] / PLANITHERM [®] ONE	1.4	27	100	130%	N/A	80
PLANILUX [®] / PLANITHERM [®] ONE / PLANITHERM [®] ONE	1.1	20	65	41%	52	-
EKO [®] ENERGY 75 / PLANITHERM [®] ONE / PLANITHERM [®] ONE	1.1	20	65	41%	52	-
EKO [®] ENERGY 75 / PLANITHERM [®] ONE / PLANITHERM [®] ONE	1.1	29	100	130%	N/A	80

• All glass thicknesses is 3.2mm, spacer thickness is 12mm for DGU configuration filled with Ar 90% / Air 10%.

• For TGU configuration, 2 air spaces of 6mm each, Ar 90% / Air 10%.

*T ext= Room temperature

*T int = Temperature inside the cooler/freezer cabinet.

**Condensation can occur on the external glass surface if the relative humidity within the room is greater than the value in this column.

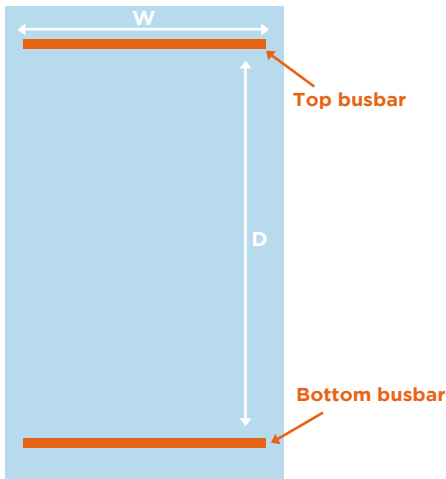
PERFORMANCES (3.15 mm)

Applicable tolerances, aspect and defect allowance comply with EN1096 standard.

Product	Light Transmittance (EN 410)	Sheet Resistance (Ω/\square)	Visual Aspect
EKO [®] ENERGY 75	83%	60-74	Neutral, no haze
EKO [®] ENERGY 255	86%	220-280	Neutral, no haze

HEATING POWER CALCULATION

It is possible to calculate the heating power expected with **EKO[®]ENERGY**. This will depend on different parameters, which are explained below.



W = Busbars width (m)

D = Distance between busbars (m)

U = Supplying voltage (ie: 110V or 220V, ...)

Rsq = **EKO[®]ENERGY** sheet resistance (ie: 70 or 250 Ω/\square)

P = Heating Power (W)

H = Surface Power Density (W/m^2)

R = Total resistance of the door (Ω)

I = current (A)

$$P = U^2 \times \frac{W}{D} \times \frac{1}{Rsq} \quad (W)$$

$$H = U^2 \times \frac{1}{Rsq \times D^2} \quad (W/m^2)$$

$$R = Rsq \times \frac{D}{W} \quad (\Omega)$$

Example:

- Busbars width $W = 0.8$ m
- Distance between busbars $D = 1.5$ m
- Supplying voltage $U = 110$ V
- **EKO[®]ENERGY 75** sheet resistance $Rsq = 70 \Omega/\square$

EXPECTED HEATING POWER

$$P = 110^2 \times \frac{0.8}{1.5} \times \frac{1}{70} = 92 \text{ W}$$

EXPECTED SURFACE POWER DENSITY

$$H = 110^2 \times \frac{1}{70 \times 1.5^2} = 77 \text{ W/m}^2$$

EXPECTED TOTAL RESISTANCE OF THE DOOR (BUSBAR TO BUSBAR)

$$R = 70 \times \frac{1.5}{0.8} = 131 \Omega$$

EXPECTED CURRENT

$$I = \frac{110}{113} = 0.8 \text{ A}$$

APPLICATIONS

EKO[®]ENERGY 75 and **EKO[®]ENERGY 255** are designed for commercial refrigeration.

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BENEFITS

In double glazing units and triple glazing units, **EKO[®]ENERGY** can offer the best visibility of displayed products, by avoiding external condensation on the door.



Excellent sheet resistance



Neutral color



High light transmittance



Low reflexion



Performances of DGU or TGU after assembling



Can be combined with PLANITHERM[®] ONE for premium Low-E performances.

HIGH Efficiency



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