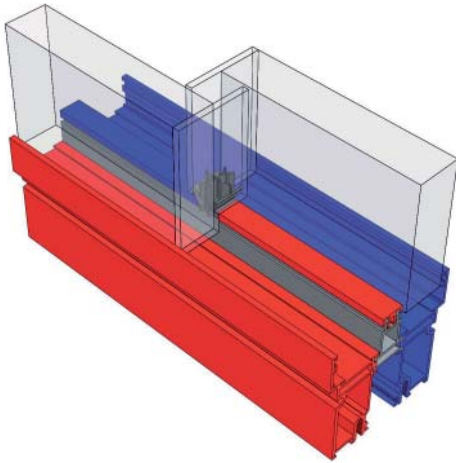


System introduction

Thermal separation

Thermal separation



The consistent thermal separation guarantees the highest thermal insulation values.

The middle bar, which essentially consists of polyamide, connects the inner and the outer aluminum shell torsion free and keeps them thermally separated at the same time.

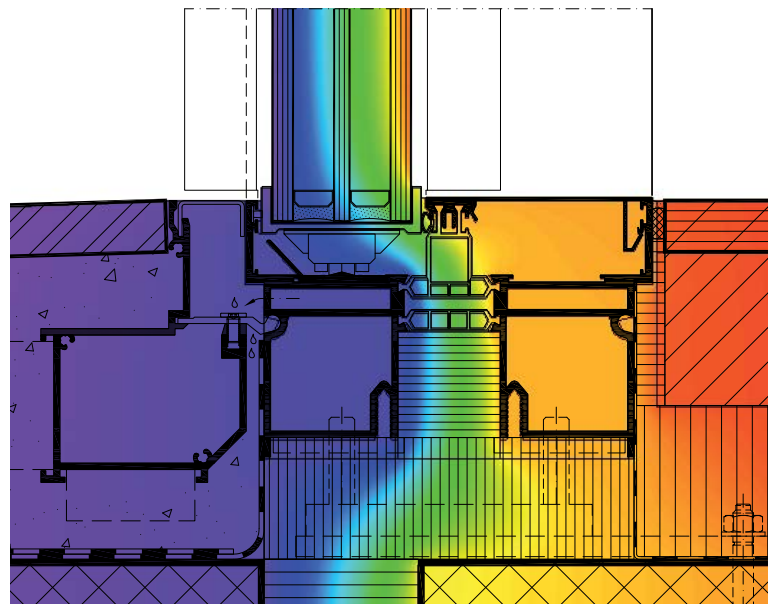
The aluminum cover of the middle bar is interrupted in the area of the mullions and is thermally separated and sealed by a special insert.

The U-profiles made from glass-fibre reinforced epoxy resin, which are attached all around the glass, optimally insulate the glass edge.

Building connections

Sky-Frame can fully utilize its advantages due to perfect building physical solutions for the integration in the construction.

A selective mounting system that does not impair the insulation, is therefore used instead of a continuous substructure in the base area. This reliably prevents the development of condensation at this point.



Properties

Thermal insulation and climate protection

Thermal insulation and climate protection



Creating comfort and providing a lasting contribution to climate protection – both must be considered in the era of climate change.

The heat loss is extremely reduced even in winter temperatures by using highly insulating glass.

An additional reduction in the heating costs is simultaneously achieved by the passive use of solar energy.

Sky-Frame therefore closes the gap between comfort and environmental awareness.

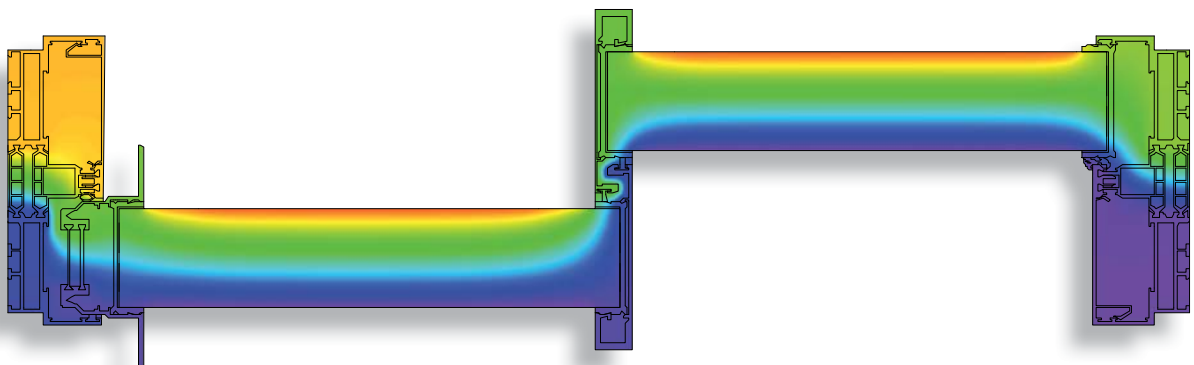


The new, highly insulated system Sky-Frame 3 meets the requirements as **MINERGIE® module window** and received the certificate as the first metal sliding window.

The excellent thermal insulation and air tightness values are thereby officially confirmed.

Energy efficient refurbishment

With the replacement of an old window front ($U_g = 3.3 \text{ W/m}^2\text{K}$) by a Sky-Frame 3 sliding window ($U_g = 0.7 \text{ W/m}^2\text{K}$), about 1'000 liters of fuel oil, or more than 3 tons of CO_2 per year are saved (reference = 40m^2).



Sky-Frame 2+3

U_w value tables Definitions

U_w value

The following tables show the calculated U_w values (thermal transmittance coefficient of the overall window) of some two-panel elements in various sizes with different glass types.

These values are calculated from the thermal transmittance coefficient of the glass (U_g) and the frame (U_f). They are related to size (see table).

In order to show that the total U_w value hardly changes in other combinations, comparison calculations are located on page 3.1.4.1.

Sky-Frame 2

Double insulating glass (2-IG), $d=30$ mm to $U_g=1.0$ W/m²K

Sky-Frame 3

Triple-glazed panes of insulating glass (3-IG), $d=54$ mm to $U_g=0.5$ W/m²K

EN 10077

U_w values calculated according to standard EN 10077 (1+2), take into account the gross surface area - that is the entire frame (see back).

This value, for example, must be consulted for **MINERGIE®** verifications and in the EU.

Isotherms

The isothermal curves illustrate the temperature characteristics of the window structure.

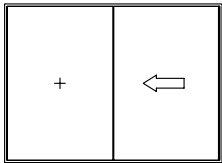
The isotherms shown in this chapter were created at the following general conditions:

Indoor temperature = 20° C

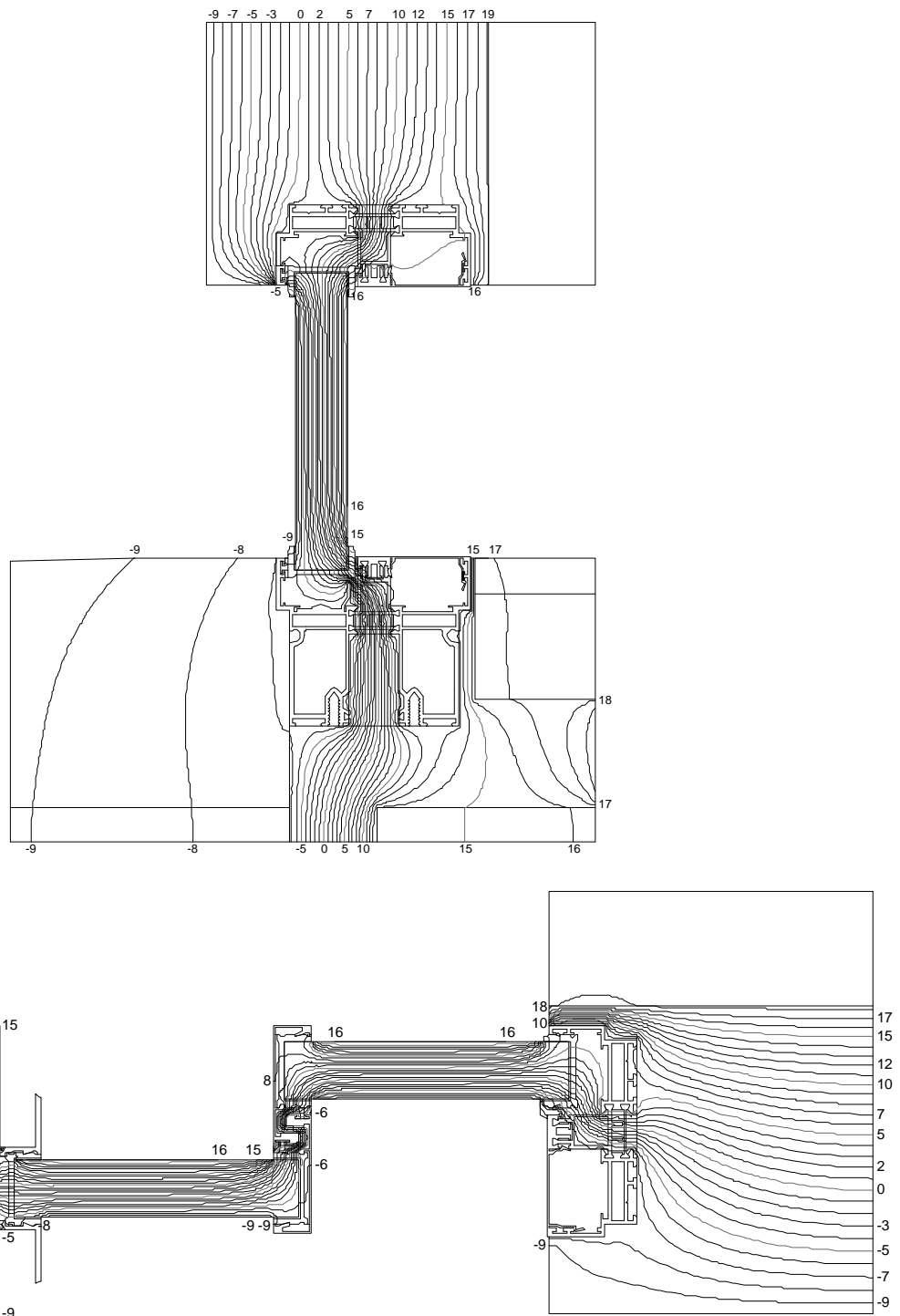
Outside temperature = -10° C

Sky-Frame 2

Illustration of isotherms



Isotherms

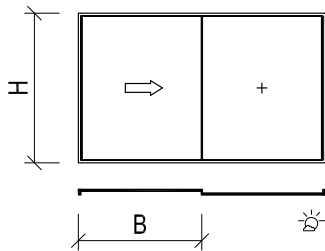


Sky-Frame 2

U_w value for entire element

Examples with U_g = 1.0 / 1.1 W/m²K (EN)

U_w value examples 2-panel element

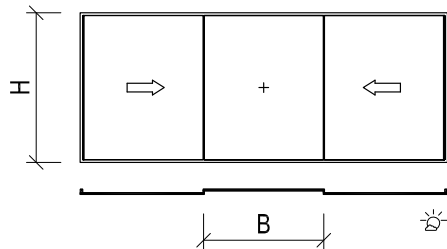


Calculation of U_w values on basis of standard: **EN 10077**
Height [m]

Height [m]	Glass U _g = 1.1 W/m ² K					[W/m ² K]
	1.25	1.5	1.75	2.0	2.25	
3.4	1.52	1.42	1.43	1.40	1.38	
3.0	1.53	1.48	1.44	1.41	1.39	
2.6	1.54	1.49	1.46	1.43	1.41	
2.2	1.57	1.52	1.48	1.45	1.43	
	Width [m]					

Height [m]	Glass U _g = 1.0 W/m ² K					[W/m ² K]
	1.25	1.5	1.75	2.0	2.25	
3.4	1.43	1.37	1.34	1.31	1.29	
3.0	1.44	1.39	1.35	1.32	1.30	
2.6	1.46	1.40	1.37	1.34	1.32	
2.2	1.48	1.43	1.39	1.36	1.34	
	Width [m]					

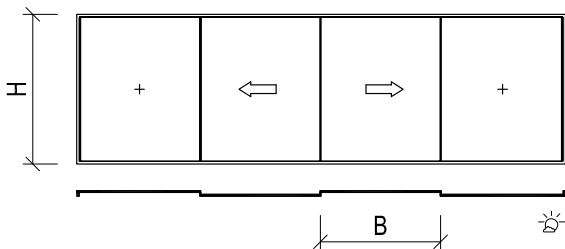
3-panel element



Height [m]	Glass U _g = 1.1 W/m ² K					[W/m ² K]
	1.25	1.5	1.75	2.0	2.25	
3.4	1.54	1.49	1.45	1.42	1.40	
3.0	1.56	1.50	1.46	1.43	1.41	
2.6	1.57	1.52	1.48	1.45	1.43	
2.2	1.59	1.54	1.50	1.47	1.45	
	Width [m]					

Height [m]	Glass U _g = 1.0 W/m ² K					[W/m ² K]
	1.25	1.5	1.75	2.0	2.25	
3.4	1.45	1.40	1.36	1.33	1.30	
3.0	1.46	1.41	1.37	1.34	1.32	
2.6	1.48	1.43	1.39	1.36	1.33	
2.2	1.50	1.45	1.41	1.38	1.36	
	Width [m]					

4-panel element



Height [m]	Glass U _g = 1.1 W/m ² K					[W/m ² K]
	1.25	1.5	1.75	2.0	2.25	
3.4	1.53	1.48	1.44	1.41	1.39	
3.0	1.54	1.49	1.45	1.43	1.40	
2.6	1.56	1.51	1.47	1.44	1.42	
2.2	1.58	1.53	1.49	1.47	1.44	
	Width [m]					

Height [m]	Glass U _g = 1.0 W/m ² K					[W/m ² K]
	1.25	1.5	1.75	2.0	2.25	
3.4	1.44	1.39	1.35	1.32	1.30	
3.0	1.45	1.40	1.36	1.33	1.31	
2.6	1.47	1.42	1.38	1.35	1.33	
2.2	1.49	1.44	1.40	1.38	1.35	
	Width [m]					

Glass edge bond
taken into consideration:
"HELIMA Nirotec 017"
PSI=0.065 W/mK (stainless steel)