



U-values: how low can you go?

Everybody is talking about the environment, there is a United Nations Climate Change Conference in Copenhagen this summer and many companies wish to show a greener image. In our line of business we are getting use to terms like passive house, low energy buildings or improvement of inner climate, but one word in particular is now used every day: U-values!

The requirements for better insulation of buildings keep changing. Good insulation of buildings is a high focus area, as the energy for heating and lightning in these represent 40 % of the total energy consumption in the EU. Façades, windows and doors are at the top of the list of building parts for improving the U-value of buildings, and it is natural for **HansenGroup** to stay ahead of the demands and legislation, by improving existing systems as well as developing new ones. So is there a limit to how low we can go with these U-values?

U-values

U-values indicate how much energy (in Watt) goes through 1 m² of the building part per degree in temperature difference between inside and outside. U-values are thus measured in W/m²K, and the aim is to get it as low a value as possible.

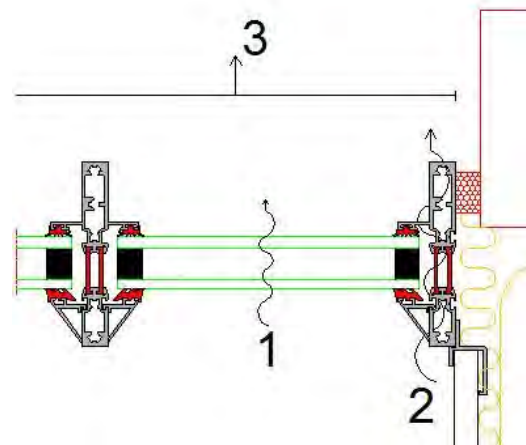
It is important to know what U-values are being discussed. There are several different values, which often cause confusion when comparing products!

The graphics to the right shows a typical section of a **Hansen Millennium®** window:

- 1 represents the U_g value (g for glass)
- 2 U_f value (f for frame)
- 3 U_w value (w for window)

U_w is the interesting value when calculating the energy consumption of a building.

The markets in Northern Europe have their own demands in the national building regulations, where Norway takes the lead demanding an average U_w value of no more than 1.2 W/m²K.



(click the graphics to enlarge it)

Three ways to achieve low U-values:

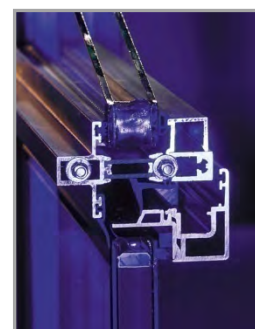
- slim profiles
- effective and better thermal break
- better glass pane constructions

Hansen profile systems focus on all three ways.

With slim profile systems, integrated thermal break and three-layer glass panes it is possible to get below U_w values of 0.8 W/m²K, the magic limit for the passive house concept:

Hansen Millennium®
 CEN, 1230 x 1480 mm:
 Uw = 0,7 W/m²K

Hansen Millennium®
 CEN, 1230 x 1480 mm:
 Uw = 0,8 W/m²K





Two examples of **Hansen Millennium®** windows are shown on the previous page, a fixed field and a vent, both 1230 x 1480 mm, a reference size (CEN) which makes it possible to compare different products from different manufacturers.

Well-built and heavy frames may have a good (low) U_f value, but reduce the view considerably, and diminishes the reason why we install windows in our buildings: light and view.

For doors the term is U_D and when calculating curtain walls the final U-value is U_{CW} .

Composites?

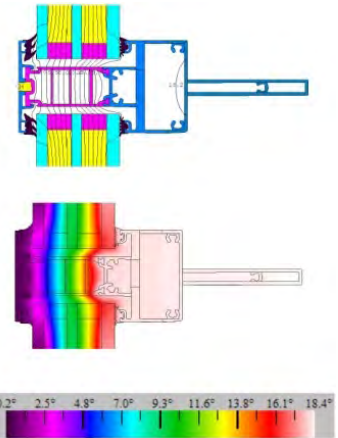
Choosing the right materials is also important. Lately composite windows have been mentioned as the product to help us meet the demands for lower U-values.

A typical composite window, however, has a U_f value of 1.2 W/m²K, where we have examples of aluminium systems with good thermal break and a U_f value of only 0.95 W/m²K!

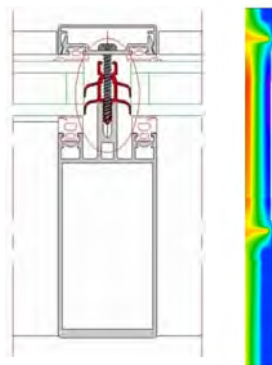
The **Hansen** profile systems use a combination of materials to take advantage of the strength of each material: Aluminium is easy to shape, has good strength, is reasonable cheap in new extrusions/dies and has very good surface treatment. Composites are good for insulation, but expensive in new profiles, and are more limited in shaping. Together they make a good match.

Composites are merely two or more materials put together, e.g. glass fibre or fibreglass.

Hansen profile systems use an integrated system of composites, securing a 100 % thermal break; this is important. Whereas other systems may be put together in a correct way, but penetrated when fixing is needed or the accessories are inserted as a result of poor design!

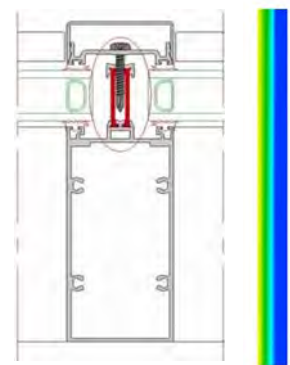


Hansen UnitAl: example with a U_f of only 0.95 W/m²K



The section to the left shows a different curtain wall system. The thermograph picture clearly shows how the screws “puncture” the system.

The right picture shows **Hansen Fasad®** with integrated insulation and a 100 % thermal break.



$U_{cw} \leq 0.5$

It is not unusual to see demands for a curtain wall construction below 0.8 W/m²K and this is quite possible with **Hansen** systems, three-layer glass panes and insulated fields.

It is also possible to go much lower than 0.8 W/m²K by using 3rd generation window products, such as **Hansen 3G** which is an air-supply window. **Hansen 3G** pushes the limit below 0.5 with a combination of the right products and solutions – improving the inner climate in general at no extra costs, but this is a whole new story ...

For more information on U-values please contact nearest **Hansen** curtain wall company.

HansenGroup curtain wall companies:

- Danish Vision (UK)
- DFE (DK)
- Glasalu (DK)
- HansenMetallbau (D)
- HSHansen (DK)
- HubroHansen (N)
- MagHansen (UK)
- PreconalHansen (S)



QUALITY SYSTEM
DS/EN
ISO 9001