



Why Double Glazed Windows can help save the world

Heat flows through a window in three ways: **conduction, convection and radiation**. When these basic mechanisms of heat transfer are applied to the performance of windows, they interact in complex ways.

Conduction:

Can be described as transfer between two surfaces in direct contact with each other.

Convection:

Through movement between a solid surface and a gas heat is transferred through circulation.

Radiation:

Linked to heat emission, describing the capability of heat transfer of a surface. A lower emission will cause weaker heat transfer. Thus the higher the emission, the more heat will be radiated.

A surface will exchange heat with the air it comes into contact with through conduction as well as convection and will also radiate heat to the surrounding space. These three mechanisms together combine to form the window's U-value.

U-value measures how much heat is lost through a given thickness of a particular material.

The environmental temperatures inside and outside a structure play an important role when calculating the U-value of an element. A good heat insulating material will have a low U-value.

The external exchanges are indicated by "he" and internal heat exchanges are indicated by "hi".

Due to the rise in energy costs, double glazed windows (insulated glass), with better thermal insulation is becoming more popular. Two or three panes of glass are separated by a spacer and the space in between is filled with either a layer of air or gas.

Heat transfer coefficient indicates the temperature difference between a solid surface and fluid/gas flowing over and surrounding the solid surface. It is measured in watts per square meter kelvin and the lower the U-value of a surface the lower the heat transfer coefficient will be.

Unfortunately, it is not possible to change the “he” and “hi” heat exchanges. But with double glazed windows a reduction in the heat exchange between the two or three panes will reduce heat loss in the winter. In the summer the reverse will occur with the double glazed glass preventing unwanted heat from penetrating the interior space.

Other advantages of double glazed windows include a reduction in condensation that can lead to unhealthy mould formation. Double glazed windows offer better security and can even be toughened or laminated for this purpose. Acoustic control can also be a motivating factor in choosing double glazed windows, although the spacing required between the panes for effective acoustic control will reduce the insulating properties.

It is important to note that when considering double glazed windows, the window must be seen as a whole unit. This includes the frame, which can contribute to heat transfer. An example of this would be standard aluminium frames, not enhanced thermally. Also take into account how well the cavity between the spacers are sealed, as this will most definitely have an impact. If there is condensation between the panes, it can be an indication that air is circulating.

If correctly installed, double glazed windows assist with:

- Energy & Cost Savings
- Improved Comfort
- Less Condensation
- Increased Light & View
- Reduced Fading
- Lower Heating, Ventilation and Air Conditioning Costs

Source:

<http://www.build.com.au/what-are-double-glazed-windows>