

# Condensation

Ecoease secondary glazing was originally designed to save on energy costs, but 60% of customers now purchase in order to eliminate condensation on their windows.

To better understand the process of window insulation and condensation reduction, the following thermodynamic principles are relevant:

1. Convection is the movement of air circulation caused when warm air rises and cool, denser air falls.
2. The convection process is reduced when a narrow airspace is put between the two air movements. The narrow airspace increases the drag between the rising and falling air. The net result is that the air falling down the window is not cooled to the same extent as it would be if it came into direct contact with the cold external glass.
3. Conduction is the process by which heat is directly transmitted through a material when there is a difference of temperature. Glass is a very good conductor of heat and therefore it can become very cold.
4. Warm air can 'hold' more moisture (as water vapour) than cold air can.
5. Dew point is the temperature at which a given parcel of air must be cooled down (at constant pressure) for water vapour to condense into water droplets, often referred to as condensation or dew.

## Convection and conduction

When we heat the air in our homes, the warm air rises straight to the ceiling. This rising air displaces other warm air near the ceiling, which then slowly sinks as it cools, travelling down the walls. When the air travelling down the wall passes a cold window, conduction occurs causing the warm air to be cooled as it passes the cold pane of glass.

This cooled air can then fall even faster and often causes a draught effect at the bottom of the windowsill which results in cold spots being felt within the room. This cycle will continue to pull warm air against the window establishing a convection current that will cool your room throughout the day and night.

## How Ecoease secondary glazing can help

Ecoease secondary glazing significantly reduces the rate of heat loss because the insulating airspace between the two surfaces is less prone to convection and conduction. An Ecoglaze window will still cool the internal falling air, but the conduction process is greatly reduced.

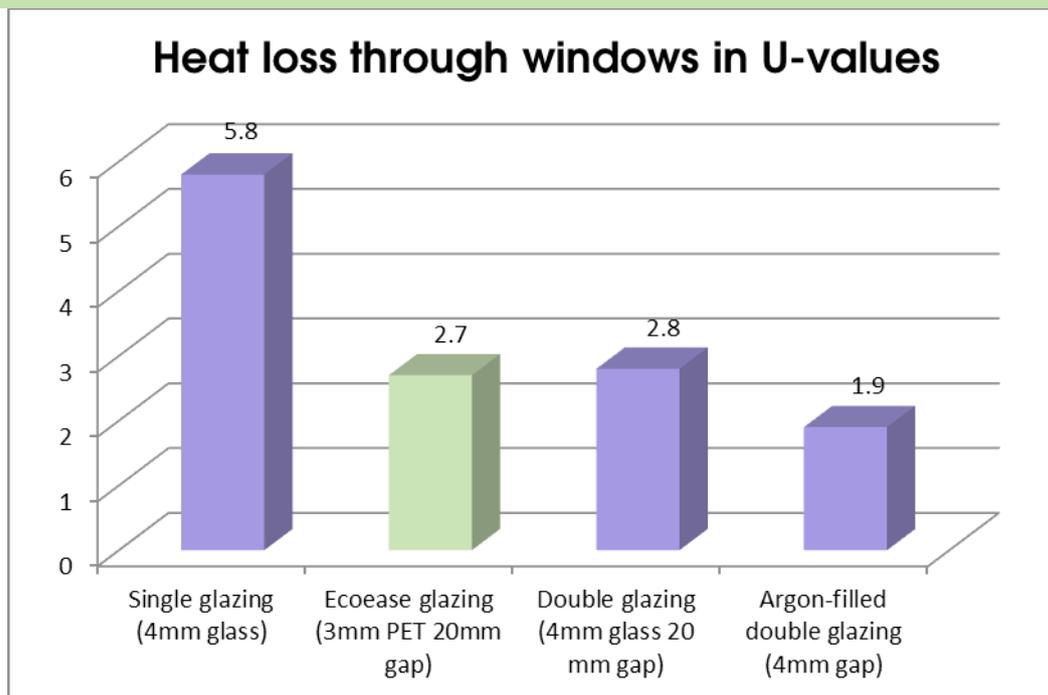
Ecoease uses PET and not glass because of its superior insulating properties. PET can prevent the transfer of heat five times better than glass. This is why, under similar conditions on a cold day, glass will be a lot colder to the touch than PET.

# What are U and R-values?

They are values used to indicate the energy efficiency of materials with regards to heat loss.

A U-value is the amount of heat transferred or conducted through a material and an R-value is the resistance of heat flow through a material. They are essentially two sides of a coin; one is the inverse of the other. Windows are best measured through U-values because they can rate the energy efficiency of the combined materials in a building component or the entire assembly, including the airspace.

The lower the U-value, the better the insulating performance will be.



Single glazing typically has a U-value of approximately 5.8, double glazing starts at 3.14 and decreases depending on the specifications. Ecoease PET has been calculated to have a U-value of 2.7 when used with a 20mm gap on single glazing, lower than some types of double glazing. This means that Ecoease can achieve up to 54% less heat loss through your windows if applied to single glazing.

Thanks to the thermal properties of the PET glazing panels, Ecoease greatly reduces the amount of condensation occurring, enabling your current glazing to last longer, as well as creating a drier and healthier home in which to live.