Guidance Notes on Condensation

Revised; 1st April 2021

External Condensation

External Condensation on newly installed low-emissivity units can be a common complaint, particularly around Spring and Autumn.

This is a natural phenomenon and a predictable event caused by the outer pane of the glazing being colder than the glass that it replaced. Fitting modern low-emissivity (low-e) glazing will increase the chances of external condensation but this is not a fault in the glass or the windows.

In comparison, single glazing and less thermally efficient styles of double glazing, lose a larger proportion of heat to the outside through the glass and so don't display the same level of condensation or for as long throughout the day. Modern low-e glazed windows help to keep more of the heat inside the property by allowing less heat to reach the outside glass surface by having reduced thermal conductivity.

When moisture condenses out of the air onto a cold surface, that is said to be below the dew point. The dew point varies with the air temperature and the amount of moisture it contains. In Spring and Autumn in particular, the glass temperature can fall to a low level during the night and the dew point can be comparatively high in these seasons. The glass is more likely to be below the dew point in these conditions and so moisture condenses onto the surface.

In order to comply with the latest Building Regulations we are all obliged to fit more thermally efficient windows in our homes. The trend is to use a glass product that has lower U-values and provides better thermal insulation.

The lower the U-value, the lower the outer pane temperature is likely to be, the bigger the risk of condensation is on the external surface.

In many cases the condensation does not last long and a little heat from the sun warms the outer glass enough to evaporate the moisture. A gentle breeze or small amount of wind will also do the same job.

You may notice that not all the panes are affected by early morning condensation, even in the same window. Even subtle differences in orientation and the position of objects outside the window can change the surface temperature of the glass to the point that one pane suffers, and another does not.

In short, external condensation is most often noticed as a result of improved thermal performance. Building Regulations stipulate as a requirement the use of more thermally efficient glazing, so external condensation is to be expected. There is also a ongoing

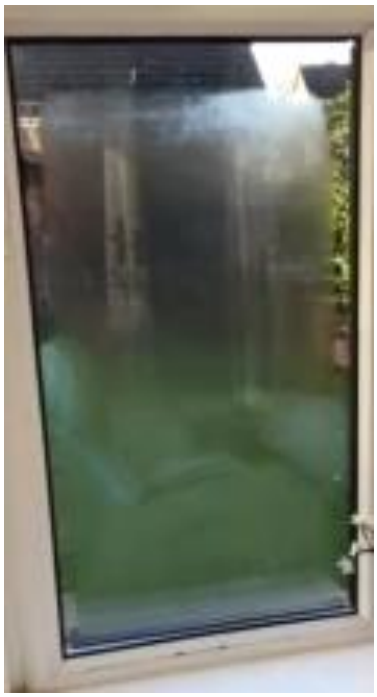

Figure 1;Example of external condensation on a modern low-e unit. Note clearing around perimeter is caused by heat transfer from inside property passing through the frame.

commitment from all glass manufactures and installers to produce and supply ever more thermally efficient products and so this natural phenomenon must be accepted as part of a more sustainable type of glazing.

Internal Condensation

Internal condensation although less common than external condensation, can sometimes be seen on the internal faces of double glazing. Much the same as external condensation, it's a natural phenomenon and predictable event caused by the surface temperature being below the dew point.

There are a number of factors, any one of which, can cause internal condensation. The use of low-emissivity glass can mean more radiant heat is reflected back into the room interior and the glass therefore absorbing less energy. This reduces the surface temperature where a dew point can be witnessed.

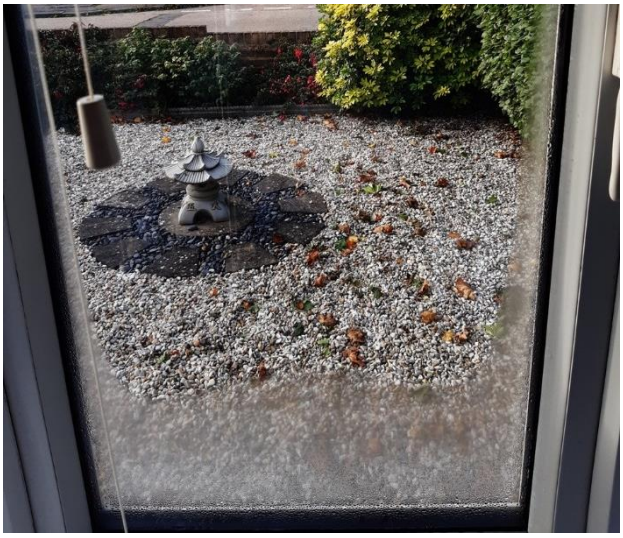

Figure 2; Example of internal condensation around lower perimeter where glass surface temperature is at it's lowest.

It is sometimes common for internal condensation to be first witnessed around all or part of the perimeter of the glass. It can often be seen where deep window cills prevent good air circulation. Dew points will vary with the air temperature and the amount of moisture it contains. The slightest differences can cause different results.

Where condensation is seen around the perimeter, or partially, it is a sign of where the glass is at it's lowest temperature. This can be as a result of the colder temperatures outside passing though the frame to the interior glass surface. This is often why aluminium and other frame types with a high density require a 'thermal-break' design to reduce this effect.

Frames with reduced or poor thermal performance will display internal condensation more readily than those with improved performance and thermal-breaks. The use of warm-edge spacer tube as opposed to aluminium spacer within sealed units also helps to reduce the thermal-bridge effect and heat-loss to the outside.

Internal condensation can also be caused by events that cause high humidity. This can be as a result of wet-trades (for example plastering) or a property being left open or vacant for a period of time. Even an increased number of people in a room can raise the level of humidity.

Internal condensation can often display the reverse effect of external condensation, where external condensation often is left with a clear perimeter band around the perimeter, internal condensation does the opposite.

Internal condensation is not caused by the glass and must be managed. This can include ensuring good air circulation, reducing the humidity and increasing ambient air temperature.