

Condensation

Condensations on windows, and the damage it does to paintwork, curtains, wall coverings and window fittings, are problems frequently encountered in all types of buildings.

The increased incidence of condensation in today's buildings is the direct result of changes in modern living conditions, which have led to warmer and more comfortable homes.

In many homes, traditional open fires have been replaced by sophisticated heating systems, ill-fitting doors and window frames have been sealed up, floors have been completely covered by fitted carpets, while ceiling heights have been lowered and the space between wall and ceilings have been filled with insulating material.

These modern aids to home comfort have created rooms which are warmer but which often have less ventilation and fewer air changes. The result is that the water vapor produced by normal living activities no longer escapes up the chimney or through door jambs, window joints and other outlets. In certain circumstances, all these aids to comfort combine to create ideal conditions for the formation of condensation.

Condensation is the water which results from the conversion of water vapor in the atmosphere.

The air which surrounds us in our homes always contains water vapor, which is usually invisible. A typical example is the steam cloud from a kettle, which rapidly becomes invisible - it has in fact been absorbed into the atmosphere. The warmer the air, the more water vapor it can hold - but there is a limit to the amount it can hold for a given temperature. When that limit is reached, the air is said to be "saturated". When saturated air comes into contact with a surface which is at a lower temperature than itself, the air is chilled at the point of contact and sheds its surplus water vapor on that surface - initially in the form of a mist and, if excessive, eventually in the form of droplets of moisture. An example of this is when a person breathes onto a mirror: condensation occurs because the exhaled air is water saturated and its temperature is higher than that of the mirror (which is at room temperature).

Some examples of where the water vapor comes from

Breathing: Two sleeping adults produce 1 ½ pints of moisture in 8 hours, which is absorbed as water vapor into the atmosphere.

Cooking: Steam clouds can be seen near saucepans and kettles, and then seem to disappear. The clouds have been absorbed into the atmosphere. The average gas stove will produce approximately 1 ½ pints of moisture per hour.

Washing up: The steam given off by the hot water is rapidly absorbed into the atmosphere.

Bathing, laundry, and wet outer clothing: These are often the major sources of water vapor in the home.

Indoor Plants: Are a frequently unrecognized but nevertheless significant source of water vapor.

New Property: The timber, concrete and other materials in an average 3bed roomed house absorb about 1500 gallons of water during construction. Much of this is dissipated into the indoor atmosphere during the drying out period.

The three main factors governing condensation are:

- The water vapor content of the air. This is produced by normal living activities such as washing, cooking, bathing, etc., and can be controlled by the use of extractor fans, cowlings, and ventilation at appropriate places.
- Inside room temperature. This can be controlled by replacing single glazing with double glazing, thereby maintaining a higher surface temperature of the glass on the room side, and by increasing the air temperature to enable it to hold more water vapor without condensing.
- Outside temperature. This cannot be controlled, but it can be countered when it falls by increasing the indoor heating.

How to reduce condensation when it forms on the room side surface of the inner glass

- Provide natural ventilation through an opening section of the window.
- Open at least one window in each room for some part of the day to permit a change of air.
- Install hoods over stoves and other equipment producing steam, and ventilate them to the outside air.
- Ensure that bathrooms and kitchens are ventilated in accordance with National Standards.
- Keep internal doors closed, to prevent transfer of air with high water vapor content from the main moisture producing rooms – kitchens, bathrooms, and drying rooms. It should be borne in mind that water vapor does not remain in the room where it is first generated, but tends to migrate all over the house
- Increase slightly the air temperature within the house.
- In cold weather, keep some form of heating on permanently in the house.
- Wherever practicable, fix radiators under windows to maintain the temperature of the inner glass at a reasonable level.
- Condensation can be caused by isolating the inner glass from the warm room air with heavy curtains when drawn. To allow free passage of warm air to the glass, position curtains 6 to 8 inches away from the window, and ensure there are sufficient gaps at the top and bottom to permit continuous circulation.