

Condensation

The Problem

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

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 rooms. In many homes traditional open fires have been replaced by sophisticated heating systems. Ill fitting door and window frames have been provided with draught excluders, floors have been completely covered by fitted carpets, while ceiling heights have been lowered and the space between loft joists filled with insulating materials.

These modern aids to comfort have created rooms which are warmer but have less ventilation and therefore fewer air changes. The result is that air vapour produced by normal living conditions is no longer able to escape up the chimney or through the 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.

How then do we reduce condensation without sacrificing the benefit of increased comfort ?

When Double glazing is used in conjunction with heating and controlled ventilation it helps solve this problem , and its effectiveness will be even greater if the elementary precautions referred to in this leaflet are adopted.

What is Condensation

Condensation is the water which results from the conversion of water vapour in the atmosphere. The air which surrounds us in our homes always contains water vapour, which is usually invisible. A typical example is the steam cloud from a boiling kettle, which rapidly becomes invisible - it has in fact been absorbed into the atmosphere.

The warmer the air - the more water vapour it can hold, but there is a limit 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 colder than itself, the air is chilled at the point of contact and sheds its surplus water vapour onto that surface.

Initially this is in the form of a mist, and if excessive eventually becomes droplets of water. An example of this is when a person breathes onto a mirror, condensation occurs because the exhaled air is saturated and its temperature is higher than that of the mirror (which is at room temperature).

Vapour comes from Where ?

Breathing : Two adults produce 1.5 pints of moisture in 8 hours, absorbed as water vapour into the atmosphere.

Cooking : Steam clouds can be seen near saucepans and kettles, and then seem to disappear. They have been

absorbed into the atmosphere. The cooker itself may be a source of water vapour. e.g. an average gas cooker could produce up to 1/5th gallon of moisture per hour.

Washing : The vapour clouds given off by hot water are quickly absorbed into the atmosphere.

Bathing, Laundry & Wet Clothing : Often the major sources of water vapour in the home.

Heaters : A flueless gas heater can produce up to 2/3rds pint of moisture per hour. Paraffin heaters produce NINE pints of moisture for every EIGHT pints of fuel burned.

Indoor Plants : A frequently unrecognised but nevertheless significant source of water vapour.

New Property : The bricks, timber, concrete and other building materials in an average 3- bedroomed house retain about 1500 gallons of water during construction. Much of this is dissipated into the indoor atmosphere during the drying out years.

Factors behind Condensation

1.. Water Vapour in 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.

2.. Inside Room Temperature

This can be improved by replacing single glazing with double glazing, thereby maintaining a higher surface temperature on the inside pane, and by increasing the air temperature to enable it to hold more water vapour without condensing.

3.. Outside Temperature

This cannot be controlled, but it can be countered when it falls by increasing the indoor heating level.

How Double Glazing Helps

Double Glazing is an insulator, designed to reduce the loss of heat by conduction from the inside to the outside of a building. Under average exposure conditions, and provided the room is heated, the room side surface temperature of the inner glass will be higher than would be the case with single glazing. The likelihood of condensation occurring when warm moist air in the room comes into contact with the surface of the glass is thereby reduced. It must be remembered however, that double glazing is an insulator and not a source of heat, nor does it control the amount of water vapour in the air. When rooms are inadequately heated and there is little heat to retain, double glazing cannot fulfil the purpose for which it was installed.

For example, one reason why condensation forms in, say, a bedroom not normally occupied, is that many householders for reasons of economy do not heat such rooms. Consequently the surface temperature of the inner glass gets close to that of the outer glass pane. In addition, the windows in such rooms are generally kept closed, but water vapour generated elsewhere in the house, will find its way in and then cannot escape. Thus the two conditions necessary to produce condensation - a low glass surface temperature, and a high water vapour content in the atmosphere - are present.

Reducing Condensation

- Provide natural ventilation through an open section of the window, or through a proprietary ventilating unit, or through an air brick.
- Where there is no open fire, or where existing Flues have been permanently closed, ensure that wall vents are fitted and kept clear.
- Install double glazing and open at least one vent in each room for some part of the day to allow a change of air.
- Ensure ventilation of all rooms where gas or oil heaters are used.
- Fix hoods over cookers and other steam producing appliances, and ventilate them to the outside air.
- Draughtproof internal doors and keep them closed, to prevent transfer of air with a high moisture content from the main moisture producing rooms (kitchens, bathrooms, drying rooms. It should be borne in mind that water vapour does not remain in the room where it was first generated, but tends to migrate all over the house because :
 - a) the water vapour pressure in the original room will be higher than elsewhere and so the moist air will be forced out into rooms with a lower pressure.
 - b) convection currents will carry it through the house.
- increase slightly the air temperature in the house.
- In cold weather keep the house heated permanently by some means.
- Wherever practicable fix radiators under 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 air to the glass, position curtains 15cm. to 20cm. away from the window, and ensure there are sufficient gaps at the top and bottom to permit continuous air circulation. Holes should be drilled along the top of any box pelmet fitted.