CONDENSATION / DAMPNESS IN PROPERTIES

From time to time, particularly in the Winter, we experience a high volume of calls from our tenants who are seeing black mould growth on the walls and ceilings of their property.

This is usually nothing to worry about and can be easily solved but if you see this occurring in your property then please do not hesitate to contact us sooner rather than later so that we may discuss it.

Here are some frequently asked questions which may help you in deciding whether or not to contact us about any suspected damp in your property:

How can I tell if this is rising damp or simply condensation dampness?
Rising damp occurs low down in properties, never in a first floor of a building and condensation dampness is usually high up on the walls, behind wardrobes or other pieces of furniture and often occurs just in bathrooms.

What causes condensation dampness?
Condensation dampness and mould growth is caused when moist or humid air inside a property comes into contact with cold outside walls and condenses to form a damp surface to the wall which then encourages mould growth.

What causes condensation dampness in the first place?
Condensation dampness is caused by a) drying washing indoors without properly ventilating the room, b) not heating the property enough and allowing the outside walls to get cold, c) by not ventilating a shower room or bathroom after a hot bath or shower, and d) by a general lack of ventilation in rooms such as bedrooms overnight.

How can I help to prevent condensation dampness?

1. Keep a gentle heat on in the property all the time rather than turning the heating off during the day when you are out at work and then trying to heat it up in a hurry when you get home in the evening. It is more economical and better for the general atmosphere in the property to heat the property regularly for the full 24 hours in a day.
2. Avoid drying clothes indoors. If you dry clothes indoors then the moisture that comes out of those clothes goes into the air and will make condensation dampness many times worse. If you have to dry clothes on airers or over radiators then make sure that it is in a room where a window is open to let the hot moist air escape. Preferably use a tumble dryer with an external vent.

3. Ventilate a bath or shower room well after use and dry any walls which are clearly wet after a bath or shower.
4. Keep the property well ventilated. A property that is shut up all the time will not allow the moist air to escape and therefore this will encourage condensation dampness and mould growth.
5. If necessary, use an electric dehumidifier.

What do I do if I see mould growth?
Use a solution of warm water with a small amount of bleach in it to clean the mould from the walls, trying not to remove any painted surface that might exist on the wall, and also without spilling it on the carpet!! You can also use proprietary mould and stain cleaner from supermarkets or DIY stores. Please make sure you try these on a small area of wall first to ensure that they do not damage the wall. Once this has been done it is usually possible by taking the steps noted above to ensure that this does not come back. If it does start to reoccur then it maybe necessary to paint the areas with a mould killing and stain blocking paint but please do not undertake any of these kind of works without consulting us first.

Who's responsibility is it if I have condensation dampness and mould growth?
It is the Tenant's responsibility to ensure that the property remains in a good state of repair. By not properly heating and ventilating the property this will encourage condensation dampness and the onset of mould growth. It is therefore the Tenant's responsibility to make sure that this does not happen. We would much rather you report any of these problems to us so that we can consult with the landlord and come up with an easy and cost effective way of solving the problem rather than allowing mould growth to persist unchecked, so please contact us if you have any concerns or worries.

Is condensation dampness and mould growth dangerous?
No, the mould that grows as a result of condensation dampness is not dangerous as some people think. Wiping it away when dry can cause the spores to be released into the air which may aggravate some conditions such as asthma or other forms of respiratory problems, so we would ask you not to try and wipe the damp from the walls when dry. However, we have never heard of a tenant having any kind of medical problems as a result of condensation dampness and mould growth.

We hope that these notes have been useful to you but if you have any further queries then please do not hesitate to contact us.

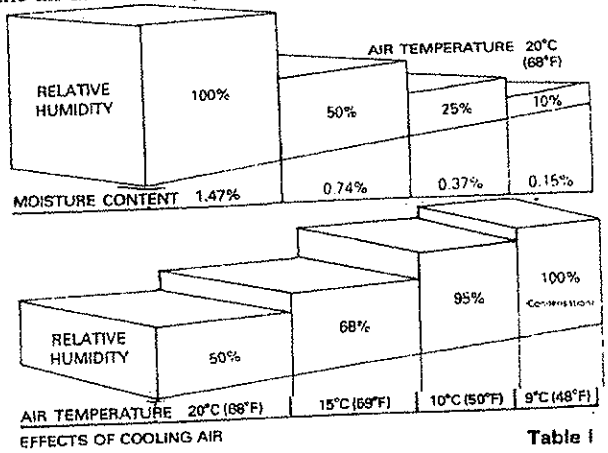
The Problem

The problem of condensation, particularly in dwelling houses, is very much a problem of today and results from a series of relatively simple, totally invariable and well understood physical factors. It will always occur given the necessary conditions, and is directly related to standards and methods of heating, ventilating and insulating buildings.

What is condensation?

Air normally contains water vapour in varying quantities and its capacity to do so is related to temperature, warm air holding more water than cold air (Table I). Air is saturated when it cannot contain any more water vapour at the existing temperature; under these conditions it is said to have a relative humidity (RH) of 100%. If the temperature of the air falls until saturation point occurs the air is at a critical temperature at which it cannot hold any more water – this temperature is known as the dew point. Any further fall in temperature will result in water vapour being forced to condense out as liquid water. The amount of water vapour condensing out will be equivalent to the amount of vapour in excess of 100% RH of the air at its new temperature. Therefore, when warm air comes into contact with either colder air or a cold surface the warm air is cooled, i.e. depressing the temperature of the air to a level at which it can no longer contain all the water vapour and some of it is discarded as condensation or liquid water.

Condensation in a building usually occurs when warm air comes into contact with a cold surface, the air is cooled below its saturation point causing its excess water vapour to change into liquid water. The condensed water usually appears as water droplets or water film on non absorbent surfaces such as windows, tiles. This form of condensation is SURFACE CONDENSATION. It is obvious and always occurs on the surfaces which are at or below the dew point of the air immediately adjacent (see fig. 1).



EFFECTS OF COOLING AIR **Table I**

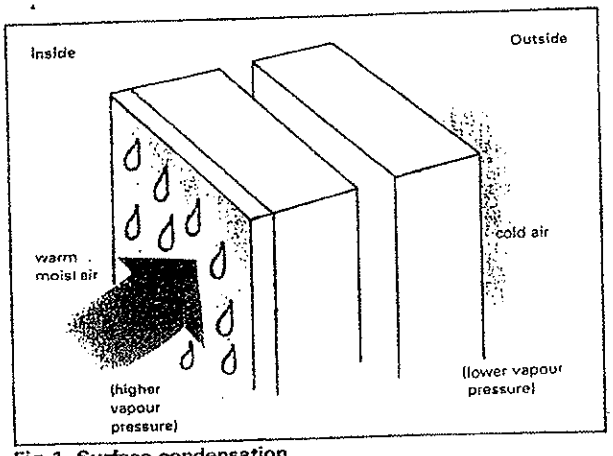


Fig 1. Surface condensation

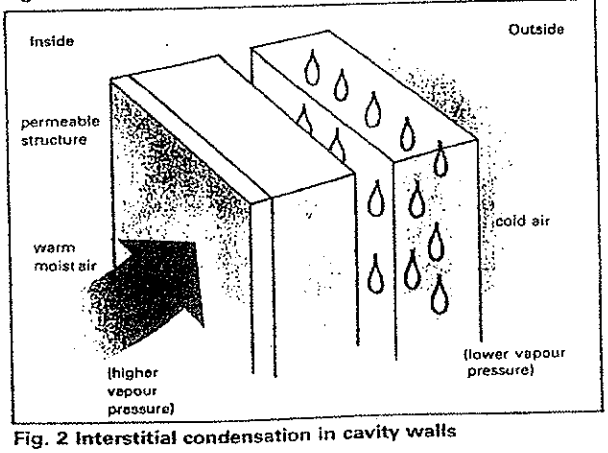


Fig. 2 Interstitial condensation in cavity walls

Condensation can also occur within the fabric of the building due to the internal air permeating through the structure because of its greater pressure. Water vapour in the air exerts a pressure which contributes to the total pressure of the air. The more moisture present in the air the greater the contribution of water vapour to the total pressure of the air, referred to as vapour pressure. Air inside a heated building usually contains more moisture than does the external air. This means it is at a higher pressure which tends to force the warm air through the structure taking the moisture with it. Most building materials, except metals, plastics and certain lined elements, are to some extent permeable and do not obstruct the movement of moist air through the structure. The warm moist air will eventually cool below its dew point within the fabric of the building resulting in condensation. This form of condensation is INTERSTITIAL CONDENSATION (see fig. 2).

Interstitial Condensation is rather more complex than the surface phenomenon and presents a greater hazard because the resulting high moisture content can often go undetected for long periods until serious structural damage has developed such as timber decay. It will also render ineffective any insulation within the component where it occurs.

Conditions for condensation

Condensation in dwelling houses is mainly a winter problem particularly where warm, moist air is generated in living areas and then penetrates to colder parts of the building.

Water vapour is produced in relatively large quantities from a number of activities (see Table II). It can also rise from damp ground under buildings and in some cases penetrate timber floors and pass freely up the cavities of brick walls into roof spaces. The severity and effects of condensation will then depend on the type and nature of building construction and the extent of the vapour barriers created in each design.

In timber frame buildings and wallings the external cladding is liable to become wet by interstitial condensation as water vapour passes through the structure. This has caused failure of the applied painted coatings in a number of ways (loss of adhesion, blistering and chemical change) with consequent disfigurement. The use of impermeable sarking to prevent water vapour reaching the cladding has redirected the condensation process as moisture will condense on the sarking and drain into the framing timbers.

The traditional design of roofs has induced the occurrence of condensation, especially in the winter. In a flat or decked roof construction the waterproof roof membrane is also a vapour barrier, the water vapour is then prevented from permeating to the external environment. Condensation is then induced to occur within the roof deck or condense under the roof sheeting and drip from it.

Condensation will also occur in low pitched roof constructions particularly when the ceiling follows the slope of the roof. The wetting of ceilings with condensation will also occur when the cold air through either convection process or percolating from the external atmosphere lowers the temperature of ceiling and condense water vapour from the underlying rooms. The effects are made apparent when little or no provision is made for ventilation of the roof space.

Condensation will often occur in brick cavity walls where moist air in the construction and external cold air circulate in a confined space. The temperature of the moist air is lowered, reaching the dew point, and moisture is deposited on the coldest nearby surface, in some cases causing water to drip from the surfaces.

Condensation will also occur under suspended floors where the temperature of humid air in the floor space is lowered by cold air moving in through ventilators and water is then condensed on the underside of floor (see 1 and 2). This will often induce timber decay of the wooden floor.

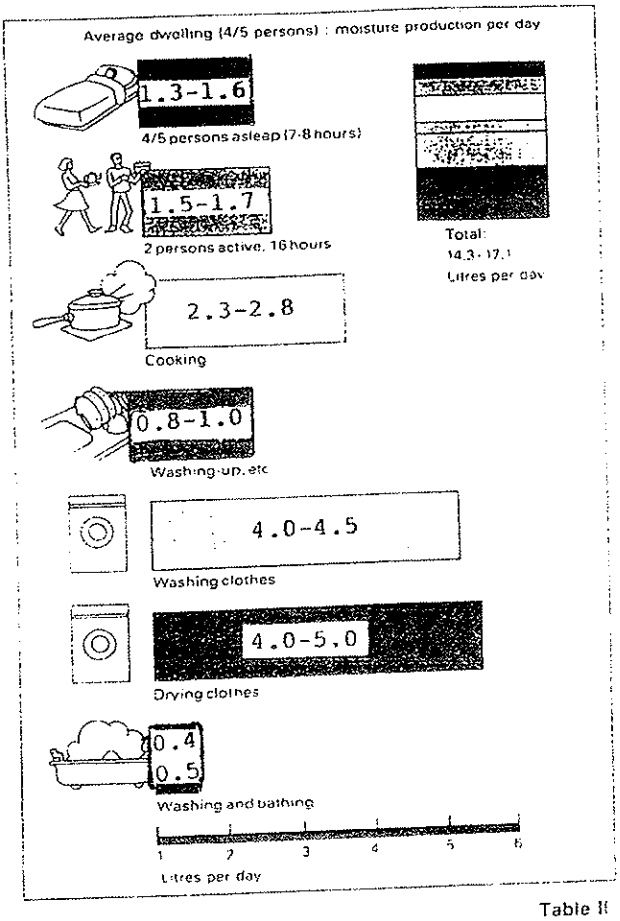
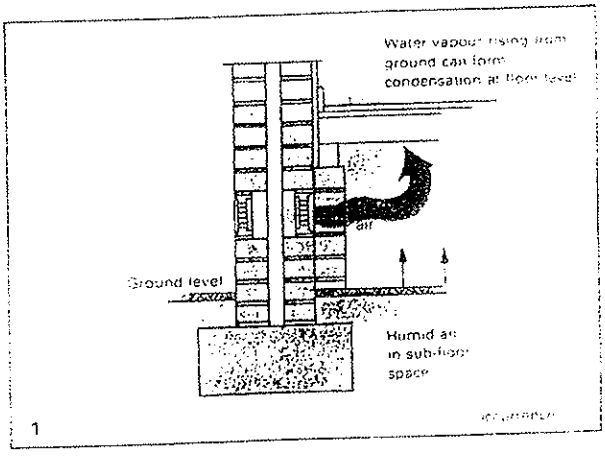


Table II



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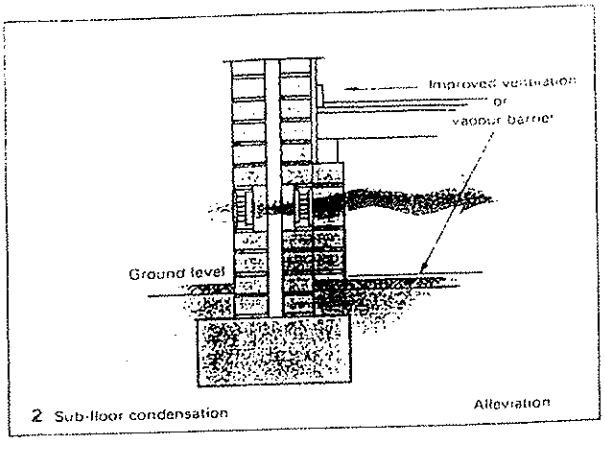


2 Sub-floor condensation

Alleviation

The causes of condensation

In dwelling houses condensation is related to modern living standards, economic pressure and change in building design.

1. The main cause of condensation is naturally the generation of moist, warm air by domestic activities. Moist air can come from cooking, bathing, washing, drying clothes as well as paraffin heaters and flueless gas heaters – up to 17 litres of water can be produced daily in some homes (see Table II), usually in certain areas such as bathrooms and kitchens where moist, warm air can then spread to cooler parts of the house to condense on cold surfaces.

The effect of moisture generation is further aggravated by the way houses are ventilated – it is theoretically possible to avoid condensation by adequate ventilation. Up to about the late 1960s there was natural ventilation in many homes because of the lack of double glazing, poorly fitting windows and doors, open fire places. Present attitudes have eliminated natural ventilation by the use of double glazing, draught excluders, fitted carpets (preventing air movement up through suspended wooden floorboards) and the removal of open fire places with introduction of central heating. To put it simply the greater ventilation the greater heat capacity required to replace heat loss in this way – buildings have been effectively sealed and provided better conditions for condensation to occur.

Ventilation is only effective if consistent throughout the whole inside of the house. Further problems are encouraged by poor ventilation where stagnant air pockets are created. There is real danger of condensation occuring where air is left undisturbed behind furniture and cupboards, often recognised by the appearance of mould growth.

Many houses remain unoccupied and unheated throughout the greater part of the day, allowing the fabric of the building to cool down. The moisture producing activities are then concentrated into a relatively short period. This sudden increase in warm air can produce condensation as the air comes into contact with the relatively cold structure which is still warming up.

2. Economic Pressure – dramatic increases in fuel prices forced many occupiers to underuse heating systems, not heat unused rooms and seal all draughts and reduce ventilation as described previously.

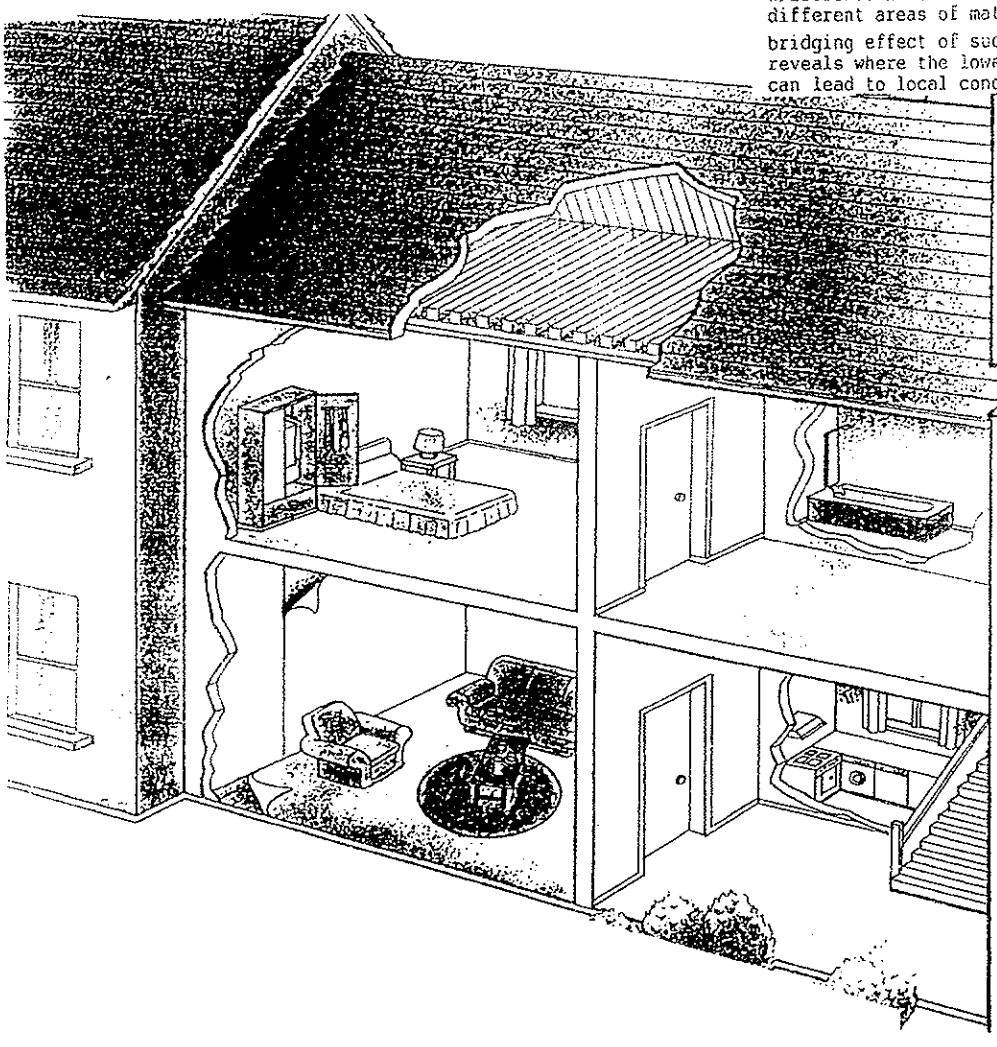
Background heating is often provided by flueless gas and paraffin heaters as a way of trying to heat and save costs. Excessive quantities of moisture are produced from such heaters. For every litre of paraffin burnt over one litre of moisture vapourises into air.

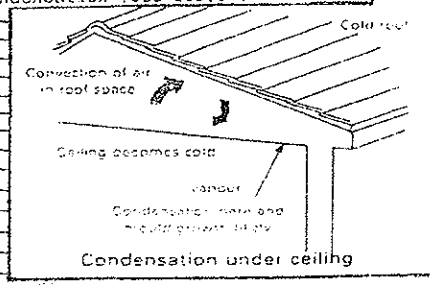
3. Changes in building design – many dwelling houses now have central heating systems where open fire places have been removed, reducing natural ventilation.

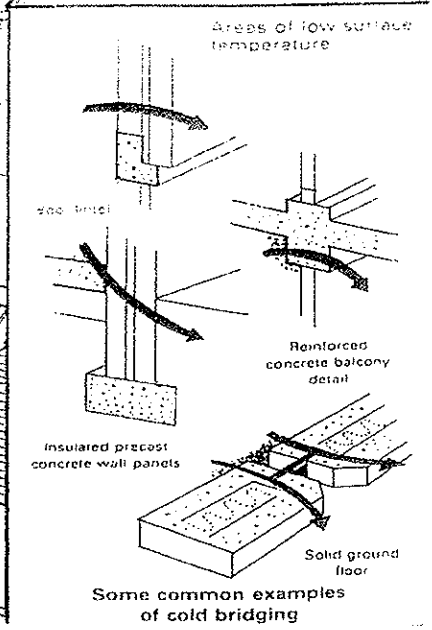
Windows without controllable ventilation became popular and permanent ventilators were not used in rooms without a flue.

Modern changes in roof design, including elemination or overhanging eaves and lowering the pitch, also reduced ventilation and increased the likelihood of condensation.

Increase in recent insulation standards increased the difference in the heat transmission rates between different areas of materials.This increased the cold bridging effect of such materials as lintels,window reveals where the lower temperatures of these surfaces can lead to local condensation (see fig.1).





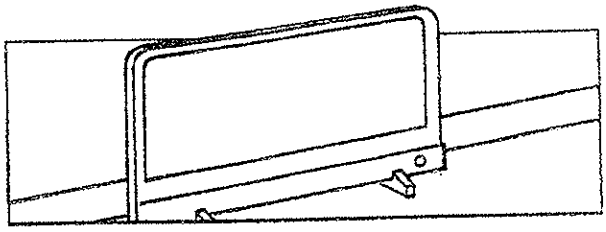


Some common examples of cold bridging

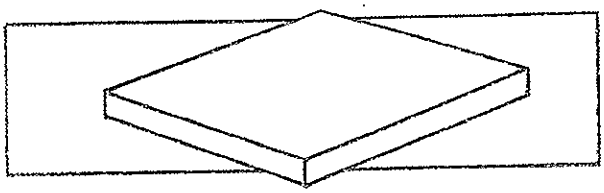
Is there a cure?

Condensation is such a common problem that a whole range of possible remedies have been suggested. In principle all condensation problems can be overcome by the use of adequate heating and ventilation.

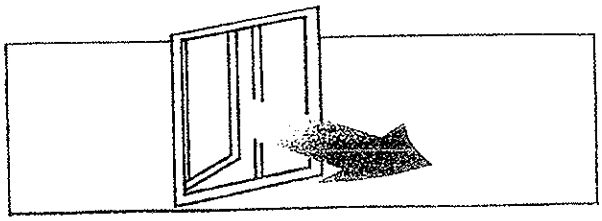
Unless cold surfaces are eliminated condensation is inevitable (at some point). Any action, must, therefore, involve a lowering of moisture levels in the air and eliminating cold surfaces within a building.



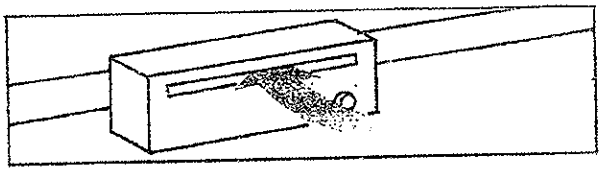
1. Improved heating and ventilation with regard to any cold spots will usually improve the conditions. A modest but constant background heat is preferable, especially in cold weather, to irregular heating since this will help maintain a higher ambient temperature in the fabric of the building.



2. Particularly cold walls can be insulated by affixing a foam lining paper or polystyrene tiles. (The provision of a vapour barrier on the warm side of the insulation may be necessary to prevent interstitial condensation behind the insulation.)



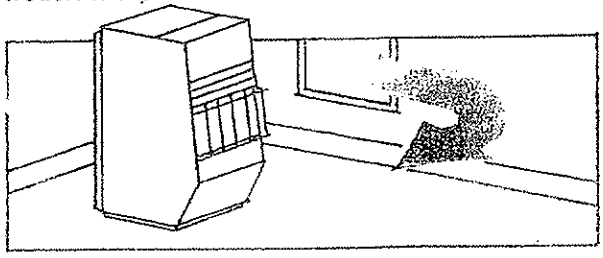
3. When cooking, bathing, washing and drying clothes keep the room door shut and the window open.



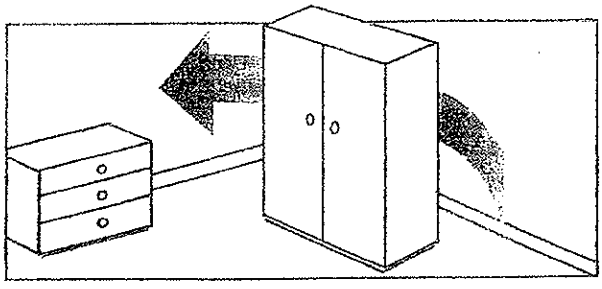
4. An alternative to heating/ventilation considerations in moisture control is the use of a dehumidifier, especially in rooms susceptible to condensation. Dehumidifiers draws air over a heat exchanger to cool it to remove moisture. Moisture is collected in a reservoir and the air reheated to an acceptable temperature before recirculating it to the room.

The installation of a small extractor fan in a kitchen or bathroom will remove moisture laden air from two areas largely responsible for condensation.

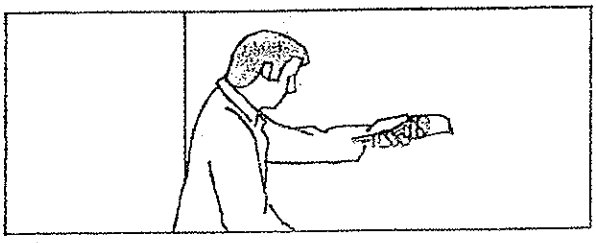
A tumble dryer and washing machine can be fitted with a direct exhaust to the outside if condensation trouble is experienced.



5. If you use a paraffin heater or flueless gas heater ensure some ventilation – open a window slightly (remember every litre of paraffin produces over one litre of water).

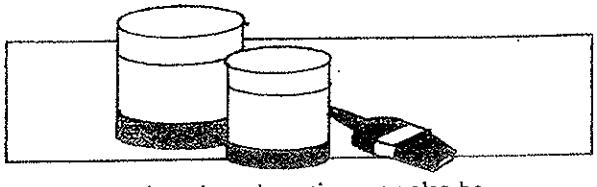


6. When there is a severe condensation problem in rooms other than bathroom/kitchen allow the warm air to circulate behind furniture and curtains – move furniture away from walls to prevent build-up of



7. External walls will often benefit from an external water repellent treatment since this will reduce loss of heat from evaporation of absorbed water.

The prevention of condensation and mould growth can, therefore, be summarised:
(i) Reduction of humidity.
(ii) Increase air circulation (air conditioning, regular airing).
(iii) Improve external wall insulation.
(iv) Improve overall background heating.



Mould growth and condensation may also be prevented to a great extent through the use of fungicidal paints and anticondensation coatings, subsequent to sterilising the surfaces to be painted. The redecoration programme should be used to complement other remedial work or used as effective