INTRODUCTION TO CONDENSATION AND MOULD GROWTH CONTROL MEASURES

Mould growth and condensation in your home are the visible signs that the air in your home is too wet.

Air always contains a certain amount of water vapour and this varies with air temperature. The warmer air is the more water vapour it can hold. The cooler air is the less it can hold. This is expressed as Relative Humidity [RH].

Condensation occurs when the RH is too high for the air temperature – the excess water is dumped on to the nearest surface that is at or below the dew point temperature, for those conditions.

For example, if we have an air temperature of 16C and a RH of 70%, lowering the air temperature to just 11C, would produce a RH of 100% (saturation) and water droplets (condensation) will appear on walls, windows, furniture and water- tight surfaces such as your telly, leather coat and trainers, which are at or below that temperature. Condensation can even occur inside tightly packed clothes in the wardrobe and chests of drawers!

Mould requires the RH to exceed 70% for some time before it will start growing. Scientists have shown that for people to feel comfortable and stay healthy, RH should be in the range 30-60% in the temperature range 18 to 25 Celsius.

Why is it important?

House dust mites live in your carpets, mattresses, pillows and soft furnishings. They are invisible to the naked eye. The mites themselves are not the problem - they won't cause you any direct harm. The problem is their droppings. They are so small that they are easily breathed in and are potent allergy causing agents (allergens). **High RH encourages them to breed – rapidly!**

Mould spores are the "seeds" of mould growth and are released into the atmosphere from mould growth. The spores are microscopic easily breathed in and are potent allergens too. They are always in the air and just require a source of moisture (condensation) and food (dust) to start growing.

Exposure to either or both at high concentrations over a long period can cause increased sensitivity to them. Once a person is sensitised, relatively low

concentrations of these allergens can trigger allergic reactions such as sneezing, runny nose, eye infections and irritation, eczema, cough and wheeze.

For some sensitised people, long term exposure can lead to asthma. *Research has shown that the severity of asthma increases with increasing levels of humidity, house dust mite and mould levels.* About 1/3 of all children, whether asthmatic or not, show an allergy to house dust mites, even if there is no evidence of mould growth.

The spores of many moulds and fungi are known to cause allergy reactions. Some species are *suspected* to be involved with cancers and others are thought to be involved in nausea, vomiting, diarrhoea, infections and suppression of the immune system. Although *extremely* uncommon, these are serious if they occur.

Whilst mould and dust mites are the most important parts of the problem, there are other things you need to know about high humidity levels.

“Wet” air is a very efficient conductor of heat. You will use more energy keeping yourself and your house warm if the relative humidity in your home is too high and your clothes and your walls are damp as a result.

Elderly people, young children and the chronically ill have difficulty in regulating their body temperature. It is particularly important that these groups live in homes that are warm and dry.

High humidity and condensation present threats to the physical fabric of your home, it can cause wallpaper and paint to peel, timbers to rot, floorboards and other timbers to warp and swell, and metal components to corrode. There is also a danger of electric shock if switches are used whilst they are wet from condensation.

If you are a tenant, you may face losing part or all of your deposit to pay for the damage caused.

The information is provided for **you** to use in controlling **your** condensation and mould growth problem. The mould won’t go away by itself. **You** have to take the steps needed to prevent or control it.

Please read it carefully.

CONDENSATION AND MOULD GROWTH – CAUSES AND CURES

Condensation occurs when **water vapour** in the air inside the house condenses on a cold surface. **It can occur at any time of the year** and is seen as misting or water droplets on windows, walls, tiled areas, concrete floors and toilet cisterns.

The appearance of condensation and mould growth is a sign that the building or room in question is not being adequately heated and ventilated.

A wall may be cold and attract condensation for several reasons:

Walls of rear extensions in older houses are more exposed and so may be colder.

It may only be a 4 inch thick brick wall, especially where an old external toilet or coal house has been incorporated into the main house

It may be facing north or the room may be inadequately heated or not heated at all.

Trees, shrubs, alleyways or an adjacent building may shade the room or walls, preventing the sun from heating it up.

A leak from a gutter or pipe may make part of a wall colder. Locate the leak and repair it.

If the house is new, it may still be drying out.

Mould Growth. Mould spores are always in the air and growth occurs when mould spores germinate on contact with surfaces that are damp through condensation or rain water penetration.

The mould takes the appearance of small black (most common), grey or green spots on the wall or other surfaces. Mould is most commonly seen around window reveals, on external walls and at high level in external corners. If you have mould growth at low level, it is not rising damp. It is just that that bit of the wall is at or below dew point!

WATER VAPOUR is created by normal, everyday living in your house such as breathing, perspiration, washing, cooking, bathing, drying clothes, and burning fuel, such as gas or paraffin.

The average family produces 20 pints (5 gallons or approximately 12L) of moisture every day. Think of it as two and a half builders buckets full of water and you will see the scale of the problem that the house has to cope with.

You can reduce this by:

• Keeping lids on pans when cooking, keeping the kitchen door closed and leaving the window open/extract fan on.

• Drying clothes outside or piping the tumble dryer's moist exhaust air to the outside.

• Not drying your clothes indoors on airers or over radiators.

• Running the cold water for a bath before the hot water. Leave the bathroom door closed whilst the bath is filling to reduce the spread of steam. When you have finished, open the window wide for an hour or so, or until the last beads of moisture have disappeared from the windows and walls. If there is an extract fan in this room, leave the window closed and leave the fan running for an hour or so. If you have a heater in the bathroom, turn it on at least one hour before you go in to the bathroom. If you have central heating, make sure that the air temperature in this room is not less than 21C. This is particularly important for people under 5 and over 60, or who have a long-standing illness.

• Not using liquid paraffin or bottled gas room heaters. These produce 8 pints (5L) of water vapour for every gallon of fuel burned. The water will end up condensing on your walls and windows.

PREVENTION OF CONDENSATION AND MOULD GROWTH

In 99.99% of cases, the cure for condensation and mould growth is heating and ventilating properly.

VENTILATION:

This is the normal escape route for moist air. As the air in your house circulates, it draws moist air to the outside through open windows, doors, trickle vents, extractor fans, airbricks and chimneys and is replaced by fresh

air. *Outside air is always drier than the air inside your house*. If this exchange of air is poor or prevented, the air in the house becomes saturated and water vapour will condense on the nearest surface at or below dew point temperature. To allow fresh air to circulate you should consider some of these:

Fit extractor fans to shower rooms, bathrooms and kitchens. Bathrooms require an extract rate of not less than 80 litres per second and kitchens 60 litres per second. There are extract fan systems available that can remove most of the heat from the extracted air and blow it back into the room (Mechanical Ventilation with Heat Recovery).

A cooker hood is not an extractor fan. *If there is an open flued appliance in the premises do not use an extract fan with an extract rate of more than 15 litres per second.*

Open all windows wide until the condensation disappears and then close them, leaving a 1/4inch (5mm) gap between the sash and the frame in each room.

Ensure that trickle vents are open in double glazed windows.

Keep bathroom and kitchen doors shut to help prevent moist air circulating to the rest of the home.

Avoid still air pockets - areas between furniture and external walls and behind heavy curtains will encourage condensation to form, because there is no circulation of warm air to warm the wall and furniture. If it is not possible to put the furniture against an inside wall, leave a gap of at least 3” to 4” (75mm to 100mm). Do not over fill wardrobes, cupboards and chests of drawers.

Do not put your mattress directly on the floor.

Provide heating in the affected rooms. In damp affected cupboards, an electric green house heater can provide sufficient warmth to prevent or reduce mould growth. Similarly, if there is a light fitting within the cupboard, leaving the light on can do the same. (Make sure that there is a large gap between the bulb and any flammables). Cut a ventilation hole in to the foot and head of the cupboard door to encourage a through flow of air.

If you have a hot water storage tank in a cupboard with a feed and expansion tank above it, make sure the feed and expansion tank has a tight fitting (but not air tight) lid.
If you have nowhere to dry your clothes, ***take them to the launderette and dry them there***. Failing this put them in the bathroom, turn on the heating, open the window or turn on the extract fan and close the door.

Open windows when ironing.

HEATING

Warm air can hold more moisture than cold air so if your house is **heated adequately** you are less likely to suffer from condensation. Warm air cooling in the night *will still result in condensation, especially on or around windows during cold weather.* Most of this will evaporate as **heating is turned on** again in the morning and ***windows are opened*****.**

If you suffer from condensation and mould growth during the winter**, it is important to understand why, and what you can do to prevent, or at least, reduce it.**

Your walls store heat. The amount of heat stored will depend upon the density of the material, the insulation standards and the period for which it has been heated.

As the external air cools down, heat is lost from the structure to the outside atmosphere. *If the heat is not replaced quickly enough by the heating system*, your walls will continue to cool until they fall below the “Dew Point Temperature”

At this stage, you will notice that condensation will begin to occur.
The formation of condensation cools the wall even more, resulting in even more condensation occurring. This will continue happening until **you** do something about it.

You will notice that:

• Your house, clothing and bedding will feel cold and damp. There will be a musty, damp smell. You may see mould growth on furniture, external walls, in cupboards, drawers, on or around windows and on your clothing or bedding. Wallpaper may peel off around windows or other areas.

• It takes a long time before your heating begins to take effect, your walls stay cold to the touch and you will not feel properly warm as a result.

• Your fuel bills will increase substantially.

• You will find it more difficult to keep yourself warm, especially if you are elderly, ill, or spend a great part of your day in the house

The cure to this problem is to put more heat in until the wall is warmed to a temperature above dew point (Don't forget ventilation.) **Yes, it will cost more initially to get the walls warmed up but when they are properly dry your heating bills will reduce.**

WHAT MORE CAN I DO?

Do not wait until it starts to turn cold before putting your heating system on. Leaving the heating off until the weather turns cold will result in the walls losing all their stored heat. It will then take a lot longer (and a lot more money) for the heating system to warm them up sufficiently for you to feel comfortable

Do turn your heating on at the end of September (or earlier if the weather cools), and set the main thermostat to a temperature of *not less than* **21*C.*** If you have thermostatic radiator valves in your bedrooms, bathrooms etc, adjust these to achieve a temperature of *not less than* ***18C (aim for 21-22C in living rooms).*** The heating system will then automatically provide enough heat to maintain the structure above dew-point.

Economy 7 or Night Storage Heaters, it is important to listen to the weather forecasts at night and adjust the input control to take account of the temperatures for the **next day**.

On most E7 or Night Storage Heaters there will be 2 knobs. Generally, the right hand one will control the heat input and the left hand one will control the heat output.

The left hand knob (the output control) controls a flap within the heater. To keep the room at a reasonable temperature you will need to adjust it to allow heat to escape gradually through out the day.

The control knobs are often marked with the numbers 1 to 10 around the outside. As a rough guide in mild weather, (outside air temperatures between 10 to 17 Celsius), the **input control** should be somewhere between 4 and 8. In cold weather (10 Celsius and below), turn it to 8 or above.

These types of heaters **will provide a minimum temperature of 18 Celsius,** but however, this is not a comfortable temperature and you will find that it will probably be necessary to supplement the heating with a convector heater during periods of very cold weather.

Do not **over-ventilate** by leaving your windows wide open all day in cold weather – y*our walls will lose all of the heat stored in them.*

Do **open the windows wide for a short period of time** in the morning say 30-60 minutes and then close them up, leaving a small gap between the sash and the frame of ¼ of an inch (5mm), or at any time that you see condensation forming on the glass.

Do mop up any water that accumulates on the window glass or window cills. Wring the cloth out in the toilet or washbasin, don't leave it wet on the cills. This will provide a moisture reservoir for future condensation.

Do not **put your heating on for short periods of time (one hour or less)** – ***this will actually ensure that the problem becomes worse.*** The air absorbs water vapour more quickly than the walls can warm up. When the heating is turned off, the air cools very quickly and condensation rapidly occurs, cooling the walls further.

Do **put the heating on for at least 3 hours at a time.** Set your timer to come on at 4 or 5 a.m (when the air is coldest) and to go off an hour *after* you leave for work. During the day, set it to come on at least an hour before you come home from work and to go off at least an hour *after* you go to bed. If you are at home all day, put the heating on for not less than 3 hours at a time or leave the heating on full time, but at a lower temperature. In extremely cold weather, it is a good idea to leave your heating on at a low level whether you are at home or not.

Do **insulate your home.** Loft insulation, wall insulation and double glazing will help you to keep the heat in your house longer, walls are warmer and the chances of damaging condensation are greatly reduced. **However, these measures will not cure condensation and mould growth by themselves.**

It is essential that you ensure that you heat and ventilate your home properly. Mould growth is a symptom of high relative humidity, inadequate heating and ventilation. If you do not tackle the causes of condensation first, the mould growth will come back.

REMOVING MOULD GROWTH

The steps to take are:

Wash the affected area thoroughly. Use non-ammonia soap or detergent, or a commercial cleaner, in hot water, and scrub the entire area affected by the mould. Use a stiff brush or cleaning pad on cement-block walls or other uneven surfaces. Wet the surface first with detergent solution before scrubbing.

Rinse and Dry. Use a damp cloth to rinse any residual detergent off the treated surface. A wet/dry vacuum cleaner can be helpful for removing water and cleaning items.

Disinfection. Disinfectants are intended to be applied to thoroughly cleaned materials and are used to ensure that most micro-organisms have been killed. Therefore, do not use disinfectants instead of, or before, cleaning materials with soap or detergent. After thoroughly cleaning and rinsing contaminated materials, a solution of 10% household bleach (200ml bleach per 2 litres of water) should be used as a disinfectant.

Using bleach straight from the bottle is less effective than diluted bleach. Keep the disinfectant on the treated material for the prescribed time before rinsing or drying; typically 10 minutes is recommended for a bleach solution.

WARNING: Bleach and disinfectant should be handled with caution. Bleach should never be added to ammonia or other chemicals; toxic gas will be produced. Wear gloves, mask and eye protection when using disinfectants. Bleach fumes can irritate the eyes, nose, and throat, and damage clothing and shoes. Make sure working areas are well ventilated.

Clean Up. Discard any loose porous materials where mould growth cannot be removed or has become ingrained into the material (e.g, ceiling tiles, plasterboard, carpeting, and wood products). Bag and discard mouldy items; if properly wrapped, items can be disposed with household rubbish. Ensure humidity levels are kept down and place a fan heater near the affected area to dry out the treated materials. **Dry the affected areas for 2 or 3 days.**