

A Guide to Condensation

The Problem

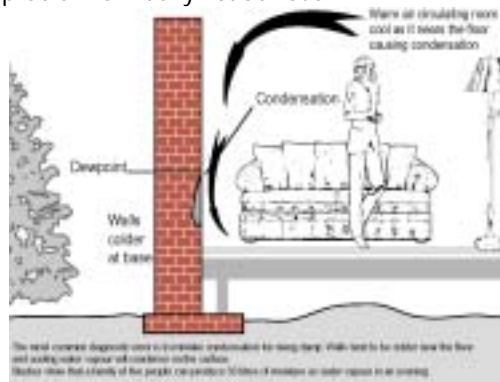
Condensation is by far the most common cause of dampness in buildings, probably accounting for most dampness problems reported. It affects both old and new properties, but it appears to be a significant problem where the building has been modernised.

Condensation is directly associated with mould growth, and it is this that the occupier first sees and gives an idea as to the potential scale of the problem. The mould is usually found on decorative surfaces, especially wallpapers, where it can cause severe and permanent spoiling. The mould and its spores ('seeds') cause the 'musty' odour frequently associated with a damp house and can sometimes give rise to health problems.

The obvious places of condensation to occur are on cold walls and floors, but sometimes it occurs in roof spaces and in subfloor areas where there is a suspended floor. Timbers in these areas will become damp and susceptible to damage by dry rot or wet rot.

The Cause

It is a fact that warm air can hold more water as vapour than cool air. So, quite simply, condensation is caused when moisture-laden air comes into contact with a cold surface – the air is cooled to a point where it can no longer hold its burden of water vapour. At this point, (DEWPOINT), water begins to drop out of the air, and it is seen as condensation on surfaces. On impervious surfaces such as glass and paint, beads or a film of water collect, but on permeable surfaces such as wallpapered and porous plaster the condensing water is absorbed into the material. Therefore, the problem is initially not obvious.



Recognising Condensation

Condensation is very much a seasonal problem, occurring during the colder months (October to April). During the summer the problem is seen to go away. During the winter, ventilation of the house is usually low (windows and doors are closed, draught proofing takes place.) This allows build up of water vapour in the house, which, in some cases, is sufficient to cause condensation. So during the colder months the following signs begin to appear:

- Water droplets form on cold impervious surfaces such as glass and paint
- Slightly damp wallpaper (often not noticed)
- Development of moulds, usually black mould (*Aspergillus niger*). This frequently forms in areas where there is little air movement such as window reveals, floor/wall and floor/ceiling junctions, behind furniture against colder walls and in the classic triangular pattern in corners. Where the problem is very severe, water will even collect and remain on double-glazing.

In some cases, condensation may be long term but intermittent, forming only at certain times of the day or night. In these cases the only sign of condensation, may be mould growth, water perhaps evaporating during the day. One should also be aware that the problem can occur well away from the site of most water vapour production. For example, water vapour produced in a kitchen may diffuse through the house into a cold bedroom where it will condense on cool walls and lead to mould growth.

Confirmation

If one wishes to confirm that there is a condensation risk, then a 'Humiditect'TM card can be affixed to the surface where condensation is expected for at least 7 days (due to the intermittent nature of the problem). Spots of colour printed on the card will

gradually 'bleed' into the card surround, depending on the severity of the problem.

Instructions for the use of Humiditect Condensation Indicators

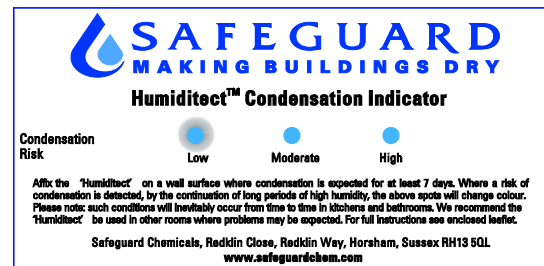
Humiditect Cards are a convenient and economic way of indicating a condensation problem.

- 1) Identify the area where you suspect moisture contamination is occurring.
- 2) Open airtight sachet and remove the Humiditect card.
- 3) Fix the card to a wall using a pin or double-sided tape.
- 4) Leave the Humiditect card in position for as long as possible to allow several potential phases of condensation to occur. We recommend seven days, but indications can occur after two days.
- 5) In severe cases of condensation, water may run down the wall. To prevent water contamination of the Humiditect surface, the card's top edge should be bent forwards to protect the indicator spots. After a period of 7 days some of the indicator spots will have started to 'bleed' or spread when a set Relative Humidity (RH) has been reached.
- 6) (Relative Humidity is the amount of water vapour in the air at a given time) – The cards can be interpreted as shown on the right:

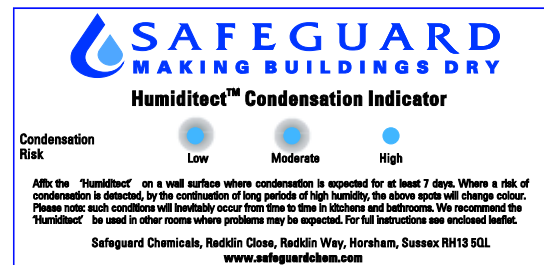
1. Levels of relative humidity encountered during the exposure period are too low to pose a condensation risk.



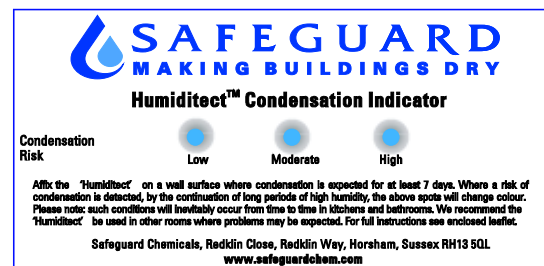
2. Slight risk of condensation, but probably not enough to cause a problem.



3. Considerable risk of condensation. It might occur on a regular basis and cause persistent dampness.



4. Serious risk of condensation occurring on a frequent basis, sufficient to saturate the wall being tested.



The Solution

The control of condensation, is based on two very simple primary measures supported by a number of secondary measures.

Primary measures

1) Improve ventilation

This will disperse the internal moisture laden air and replace it with drier air from outside (yes, external air is drier than internal air most of the year!). Ventilation is achieved by opening a few windows, installing air vents, and using extractor fans. However, it is most effective to remove the water vapour from where it is usually generated, e.g. kitchens and bathrooms. This is achieved by the installation of a powered extractor fan. Better still, rather than making the occupant responsible for operating the fan, a humidistat controlled unit can be used. These activate when moisture levels in the atmosphere reach a point at which they may begin to cause a problem.

Another approach, should condensation be widespread, is to use a 'positive pressure' system such as the PPF9 Positive Pressure System available from Safeguard. This consists of a slow speed fan set into the ceiling. It draws air into the roof space from outside through the eaves, and gently pushes it into the property. This causes a slight internal positive pressure, continually pushing out any moisture laden air as it develops. It is also important to promote free airflow around furniture, especially where it is against cold walls. This will prevent a local build up of condensation/ mould behind furniture.

2) Heating

Coupled with ventilation, heating should be set or applied to give a constant low-level background heat. This will ensure no rapid changes to the environment, and will also facilitate slight warming of wall surfaces over a period of time thus reducing the risk of condensation.

Secondary Measures

In most cases, implementing the primary measures described above will effectively control a condensation problem. However, in more severe cases it may be necessary to use one or more of the following support measures.

- 1) Remove excess water sources
This means removing systems within the house that generate excess water vapour. For example, bottled gas and paraffin heaters generate enormous amounts of water vapour. These alone may be responsible for the condensation. Further steps to eliminate water vapour include avoiding the drying of clothes on, or by radiators and never venting a hot air clothes drier into the interior of the property!
- 2) Insulate cold surfaces.
Some building materials have better thermal properties than others.
- 3) Where solid walls are encountered (or cold solid floors) these may be insulated by various dry lining techniques or, in the least expensive case, the use of thin polystyrene sheet (Cotina) applied directly to the wall. In all cases this will result in a warmer surface, thus lowering the risk of condensation. It is also prudent to provide a vapour check on the warm side of the insulation to prevent problems behind and deeper within the wall.
- 4) Prevent possible water penetration
Damp walls have poorer thermal properties than dry walls, and are therefore slightly cooler; this could increase the risk of condensation.

Water Repellents

Treating the external faces of walls with silicone water repellent can help in some cases. This prevents water penetration thus maintaining better thermal properties of external walls. Safeguard manufacture a range of Masonry Water Repellents under the brand names of 'Raincheck Plus' and 'Raindance.'

Dehumidifiers

These remove water from the atmosphere; they lower the water content of air, and therefore lower the risk of condensation. One strategically placed dehumidifier can be very effective.

Mould growth:

The greatest problem with long-term condensation is the associated mould growth, most frequently visible as black spot mould. Mould spores are present generally in the atmosphere, usually at relatively low levels. Under normal circumstances they cause no problem, surfaces being too dry for their generation and growth. However, should they land on a wet surface (condensation) under humid conditions, then they will germinate and develop into heavy mould growth, with the inevitable release of vast numbers of spores. Not only does this cause decorative spoiling, but, in some cases, health of occupants may also be affected.

Note that Black Mould can only flourish on the pure water associated with condensation – Black Mould is NOT an indication of RISING DAMP.

Anti-mould washes will kill and remove the growth, but usually their effectiveness is short lived, as the active ingredient tends to get washed out over a period of time. Anti-mould paint should remain effective for longer. Anti-mould scrubs and paints are available from Safeguard.

Anti Mould Paints

These are particularly useful where there is a high risk of mould growth, e.g. kitchens and bathrooms, and also where condensation is particularly difficult to control. They are applied like standard paints, and must not be decorated over once applied. Good quality anti-mould paints will remain effective against even the most severe mould growth conditions for over five years.

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Published by:

Safeguard Europe Ltd.,
Redkiln Close,
Redkiln Way,
Horsham,
West Sussex.
RH13 5QL

Tel: 01403 210204

Fax: 01403 217529

Email: info@safeguardeurope.com

Web: www.safeguardeurope.com