

Briefing Bulletin: 'Condensation' January 06

So what exactly is it? – Air borne moisture forming into a liquid state when in contact with cold surfaces e.g. single pane windows, cold water pipes, north facing walls.

Why does it occur? Water vapour is easily held within the air at normal room temperatures but converts to water droplets when the temperature falls below what is called the saturation or 'dew point'.

The key to understanding this subject is based on 'relative humidity'. This relates to the principle that the higher the internal house temperature the lower the relative humidity, because warm air holds or is able to 'carry' more moisture. Conversely, the lower the temperature, the higher the relative humidity, as the air is less able to hold or carry moisture in a vapour form. In other words it becomes closer to the saturation point i.e. 100% relative humidity.

In colder months, (October to March) when central heating shuts down at night, building fabrics become cooler; such surfaces often provide a surface for condensation to settle upon.

Since many building materials are hygroscopic (water absorbent) this is when problems can occur.

Is it damp or condensation? - In diagnosing such matters, it is important to distinguish between damp in the masonry substrate i.e. rising or penetrating damp and internally created moisture i.e. condensation. To do this, results from resistance type moisture meters should be interpreted with care, as they read only the surface of a wall for moisture with a scale that invariably has not been calibrated for masonry i.e. wood moisture equivalent (WME). Therefore what often can pass as rising or penetrating damp in a wall is often condensation which will invariably require a very different remedial (possibly less costly) solution.

Essentially, rising and or penetrating damp is an issue of external moisture moving through the capillaries within masonry substrate, whereas condensation is primarily the result of internally created moisture. The latter is often but not exclusively a consequence of normal lifestyle activities.

It is possible, but not always easy, to determine one form from the other and should therefore be assessed along with other key indicators, particularly what is occurring on the relevant sections of corresponding wall. Likewise, condensation problems often come with other tell-tale signs, such as mould on cold wall corners or behind pieces of furniture.

Ultimately a correct diagnosis is essential to provide the right solution so that remedial works (if needed) are effective and not simply an unnecessary expense.

So what causes it? – Primarily condensation is a complex interrelationship between the following four factors:

- i. insufficient ventilation within the property
- ii. Fluctuating room temperatures (heating regime)
- iii. Lack of or insufficient insulation
- iv. Normal lifestyle e.g. washing, cooking etc

For example, consider a property with a cementitious render covering over the 9" (lime mortar) solid walls, replacement double glazing and central heating are in place and the original cold fire places have been blocked off with no ventilation. A large family plus pets occupy the house, clothes are being dried on radiators, and there are no air extraction devices in the kitchen and bathroom. Condensation/mould growth is almost inevitable, due to the inability of excess (internally created) moisture to vent out sufficiently. The property is unable to 'breathe' as it was originally designed to do.

Why is it a problem? – Condensation leads to mould growth, e.g. Black Mould (*Aspergillus Niger*) which often grows on corners of cold walls. In addition to being unsightly, there are possible health risks associated with such an environment, particularly as the Dust mite population also increases significantly in such conditions.

Mould can be partially removed with a mild bleach solution. However unless the high humidity problem is dealt with, the mould will often return. This is because the root structure of the mould fungus often remains, being left dormant until a sufficient level of humidity returns causing the fungus to re-colonise. Condensation can also develop in sub floor voids and loft spaces causing joists and other timbers to rot, especially if floor/ roof vents are inadequate and timber becomes subject to moisture levels of 20% and above.

Where properties have single glazed wooden windows, over the long term the wood is liable to rot if not kept dry and well maintained. Gypsum plaster may show up as damp patches e.g. salt damp patches on a chimney breast in winter months. N.B. Beware the effects of humidity often manifest in numerous ways.

Control strategies – Venting humidity at source when cooking and washing i.e. opening windows wide once a day for a short period e.g. purge ventilation is often very effective. Ensure clothes dryers are vented to the outside and trickle vents are open.

Being aware of these dynamics and altering one's lifestyle can also make a significant impact. Best results are often obtained where both a Landlord as well as the tenant agrees on a joint strategy, incorporating e.g. mechanical devices together with lifestyle changes.

E.g. where serious levels persist, fitting a positive air unit to help reduce levels of humidity/still air can also be useful in some situations. Kitchens and bathrooms, (being points of most moisture production) should ideally be fitted with air extractors (with humidistat sensors) that activate at predetermined levels of humidity e.g. 65%.

Ensure that insulation is adequate not only in the loft space but also in cavity walls etc and seek to maintain a more even or consistent heating regime in the winter months as opposed to an on off regime. Remember that condensation and mould growth are (secondary) symptoms and that each situation/property is different. Therefore, deal with the root causes as well as the manifestations. Use the correct masonry biocides for effective mould control.

Conclusion - Building Research Establishment (BRE) studies have shown 1 in 6 properties to of suffered with condensation. It is however, a symptomatic problem, primarily due to insufficient ventilation together with irregular heating patterns, inadequate insulation and the occupant's lifestyle. As each property is unique with

many variables, a basic audit with monitoring equipment may be required to define the key contributing factors, so that appropriate i.e. bespoke advice can be provided. For more information: Please contact Mark Duckworth on 01353 – 661222 or MJD@martinandmortimer.co.uk.