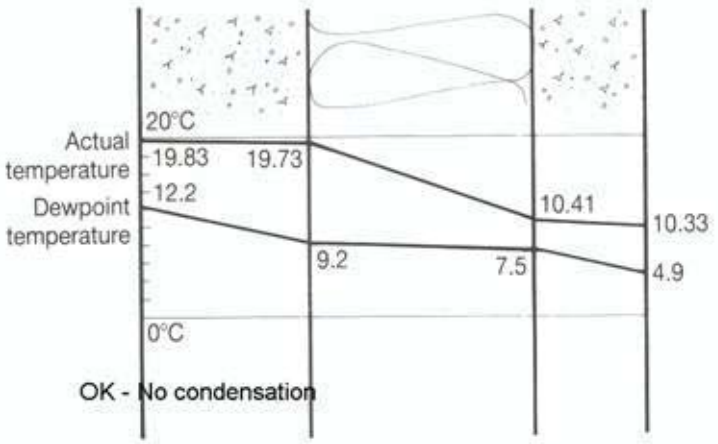
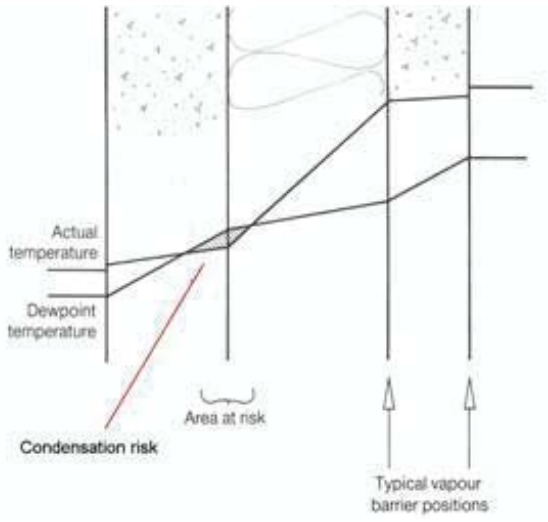
Condensation	Published Date: 09/04/2009

Condensation and its prevention is a somewhat vague subject with little information available, and the concepts involved can be complex if gone into in great depth. In the simplest of terms, condensation is the formation of a film of water on a surface. The amount of water that can be carried by air depends on the temperature. As the temperature falls, a point is reached at which the air is unable to carry the moisture as vapour, and condensation occurs. This temperature is called the dewpoint. As moist air passes outwards through a wall it will cool down, and may reach the dewpoint, when condensation occurs. There are two aspects of combating this. The first is to incorporate a vapour barrier so that the moist air cannot get in contact with the cold part of the wall, and the second is to insulate the wall so that the actual temperature at the barrier is kept above the dew point. If this is not achieved then interstitial (in a gap between two things) condensation can result, and mould, rust, staining, and even running moisture can occur.

Software is available to predict whether a given construction will, or will not, promote the formation of condensation, and it can also be checked 'longhand'. However it should be appreciated that such calculations carry an inherent risk in that the basic design data upon which it is based are difficult to define. Further, in the event of a 'failure' it is equally difficult to determine what environmental conditions actually existed. Such calculations are therefore not a guarantee that condensation will not occur.





The design method involves calculating the theoretical temperature across the wall section from the warm inside to the cooler outside. This results in a temperature gradient. A similar (but far more complicated) calculation does the same for the dewpoint temperature. These two graphs are then plotted together. If the actual temperature remains above the dewpoint temperature, then condensation should not occur. If they cross, or even touch, then condensation is predicted.

A calculation that indicates condensation is not the end of the world. The figure given is a total amount of condensation (g/m2) over a period of a year. A figure of say 20 g/m2 means that 4 teaspoons of water may occur over an area of 1m2 in a whole year. The slightest ventilation would easily disperse this amount of moisture without any visible deposits.

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The main way of avoiding condensation is to use a moisture membrane or barrier. Most rigid foam insulation has an integral foil facing which does this job. Calculations with the barrier inevitably indicate no condensation. The barrier should however be complete. It is argued by some that joints between sheets do not need taping, however, large holes in the insulation/barrier could cause problems. This is particularly true if the barrier is part of the inner lining. All effort is wasted if following trades puncture the membrane to install services etc.