

# Moisture...

The use of Thermafleece insulation in buildings has many benefits. In addition to providing first class thermal and acoustic performance and absorbing common pollutants, the 'hygroscopic' nature of wool fibres means that the insulation can absorb and release moisture helping control internal humidity levels, contributing to a more stable and comfortable environment.

Wool can physically bind more than 30% of its own weight in moisture. This means that the moisture absorbed by the wool fibres is not present as liquid water. The result is an insulation that provides very stable thermal efficiency performance across a range of humidities.

## Moisture in Buildings

Most of the moisture inside buildings comes from the occupants through breathing and their daily activities such as washing, cleaning and drying of clothes. Indeed, the average family produces 10-30 litres of atmospheric moisture per day equivalent to a full bath of water per week.

## Movement of Moisture in Buildings

Air movement carries moisture around buildings. This moisture is capable of penetrating and diffusing through porous surfaces such as walls and floors. There is a risk of condensation if the moisture comes into contact with cool surfaces such as walls or interstitial condensation can occur within porous building materials.

## Thermafleece – Controlling Condensation

Wool reacts with water in a complex series of reversible chemical mechanisms that enables water to be absorbed and released. Wool is capable of absorbing and releasing large quantities of water very quickly whilst at the same time having the capacity to absorb and release water slowly over prolonged periods.

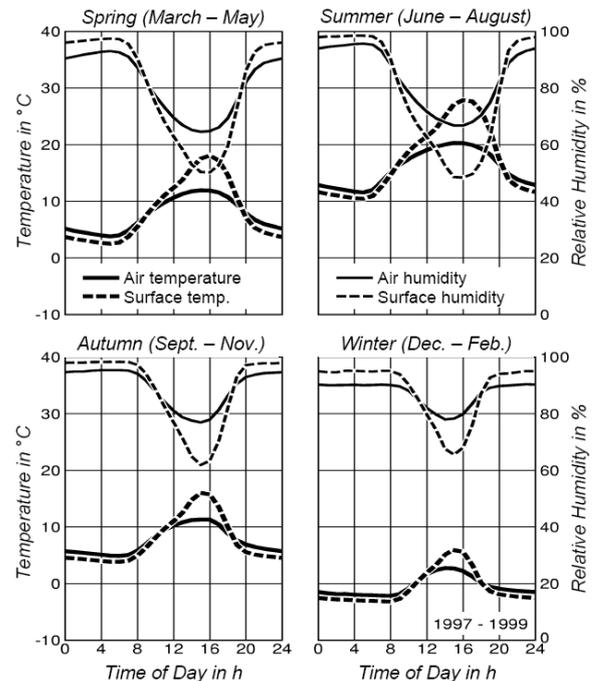
The wool in Thermafleece can absorb 38% of its own mass in water and will still feel dry. This is equivalent to more than 70kg or half a bath full of water for an average insulated property.

The use of Thermafleece can contribute to maintaining a more stable level of internal humidity. Atmospheric moisture is capable of diffusing through Thermafleece without affecting thermal performance. If conditions are drier than the wool fibre, Thermafleece will release moisture. Similarly, if the surrounding atmosphere is more humid than the wool insulation, Thermafleece will absorb moisture. The risk of condensation is therefore influenced by the ability of Thermafleece to absorb a significant proportion of moisture.

## Condensation and Temperature

Condensation can occur in warm and cold conditions. Warm weather condensation occurs when warm air which can hold a lot of moisture, enters a building and

condenses on cool surfaces. Surfaces such as walls can be cool in summer due to air conditioning or thermal inertia. Cold weather condensation occurs when cold air that doesn't hold much moisture, enters a building and rapidly picks up moisture. When this air comes into contact with cold surfaces it releases water as condensation.



Variations in air and surface temperatures and humidity for each season

## Thermafleece – Controlling Heat

When wool absorbs water, heat is created and when wool releases water through drying, cooling occurs within the wool fibre. This is one of the reasons why wool is such a comfortable material to wear. The same process can have a stabilising influence over air temperature in constructions.

If the outside temperature increases and begins to heat the wool insulation, it releases moisture, which has a cooling effect on the fibre. This in turn can reduce the flow of heat to the inside of the building by as much as 7°C when compared to buildings containing conventional insulation. Conversely, in the winter the absorption of moisture by wool insulation can increase peak temperatures by up to 4°C.

In line with good practice, Thermafleece should be considered in conjunction with the range of measures available when managing moisture levels in buildings.