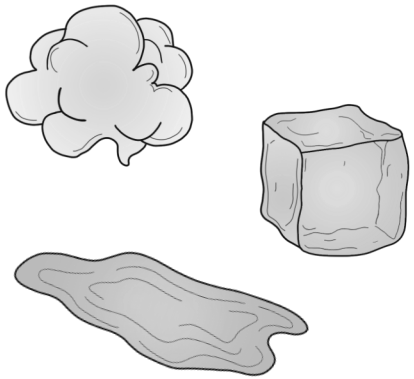
Advice:

- *Control building material*
  - Make sure that the building material is of good quality, dry and well wrapped when delivered
- *Handle the material carefully*
  - Store it in a place that is waterproof, airy and protected from solar radiation and dirt
  - Use weather protection during construction
- *Control the airtightness of the finished construction*
  - Give time to dry out building moist
  - Do moisture measurements



About DREEAM

DREEAM (Demonstration of an integrated Renovation approach for Energy Efficiency At the Multi building scale) aims to show that renovating at a larger scale opens the opportunity for better integration of renewable energy and is generally more cost-effective. The project demonstrates a multi-building and single owner renovation approach that can achieve a 75% reduction of total energy demand.

The DREEAM approach is implemented on pilot sites in the UK, Germany and Italy. These demonstration sites are to validate the DREEAM method in different climate, cultural and institutional configurations.

dreeam
scaling energy renovation

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MOISTURE

Why is moisture bad?

Moisture in a building can lead to severe structural damages and serious health risks. Thereby, it is essential to keep the construction dry during the renovation process, especially when the goal is to improve its energy efficiency.

Water damage is one of the most common mistakes to occur during construction, and as moist is easily spread these damages are one of the most expensive to repair. In energy-efficient buildings, moist takes longer time to dry out and increase the risks of long-term problems.

Sources of moisture

Moisture damages are caused by water liquid or vapour. Water vapour is slower in the process compared to liquid. The most common sources of moisture in buildings are:

Weather

All buildings experience precipitation (e.g. rain and snow). The types, amount and intensity along with temperature varies depending on location.

Ground moisture

The amount of moisture in the ground depends on the groundwater level and the properties of the soil. To reduce damage, the groundwater level can be assumed to be high and the terrain should be inclined down, away from the foundation.

Humidity

Air always carries some amount of water vapour. The amount is increased as everyday tasks are carried out e.g. taking a shower and preparing a meal, but also through breathing.

Building moisture

Moist can occur during the construction of a building. Moist can be contained within the materials, obtained from precipitation, or from processes that involve water (e.g. concrete). This kind of moisture often dries out, but as the drying process is slower in well-insulated buildings this may increase the risk of water damage.

Moisture transport

Moisture has three main ways of transport, by *moist convection*, *liquid diffusion* and *capillary flow*.

Convection

When two volumes with different air pressures are connected, higher air pressure (warmer air), moves towards lower air pressure (colder air). Since the air carries its humidity, the water vapour will condensate if the temperature is lowered to saturation conditions. This can cause decay problems if the condensed water gets trapped inside the construction. Convection occurs quickly and can create damage relatively fast.

A vapour barrier can be installed to prevent condensation in the construction. The barrier must be within the condensation limit of the wall, but not too close to the interior to avoid perforations later in the building process. Any damage to the vapour barrier will defeat the purpose.

Diffusion

Diffusion is the transfer of water from an area of high concentration to one of lower concentration. Unlike convection, diffusion is a slow process. Building material dries out by diffusion.

Capillarity

Capillary motion is the ability of a liquid to flow in narrow spaces without the external forces. Moisture transport in thus takes place when a sufficiently small porous material gets in contact with liquid water. The smaller the pores, the better the water transport.

Types of water damage

Water damage appears in different shapes and forms, e.g. mould and dry rot.

Mould growth is not always visible and can take time to discover. These problems can be avoided by keeping the material dry during construction. When fungi growth is evident, significant sanitations often is required, potentially leading to the need for reconstruction of the complete composite construction.

Unlike mould, dry rot gradually breaks down the material and reduce the density. Dry rot exists in the atmosphere as spores and germinate in the right condition, i.e. a place with about 20 % humidity and free access to air.

The drying of building moist

Water is generally removed from a construction either by heating or dehumidification. Warming in combination with ventilation will enable the moisture to evaporate. This technique is more used in colder climates. Higher temperature makes the process faster but may damage the material.

Dehumidifiers are more prevalent in warmer climates. Moisture is then transferred from the material to the air by diffusion. However, any breaks in the building fabric will significantly reduce the effectiveness of dehumidifiers.