



**10** facts about

# The influence of moisture on stone wool



# Water is central to our very existence.

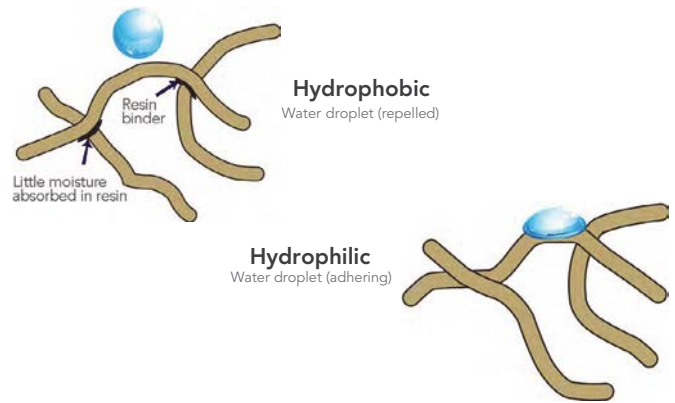
However, when it comes to buildings, it can often be the cause of major problems, including mould, rot and corrosion. In construction projects, it's essential that we select insulation materials that do not absorb moisture if they are exposed to water. Stone wool is one of these materials. Water repellency is one of the key properties of stone wool insulation.

Here are 10 factors to consider around the influence of moisture on stone wool.

## 1

### Stone wool does not absorb moisture when exposed to water

Stone wool is water repellent, meaning it resists water absorption. Stone wool is defined as a **hydrophobic** material. Water repellency is one of the key properties of stone wool insulation. If a material is defined as **hydrophilic**, it absorbs water. This is illustrated to the right:



## 2

### Stone wool does not absorb moisture from humid environments

Stone wool is a **non-hygroscopic** material, meaning it does not take up and retain moisture from the air. As a result, moisture has no influence on the product's thermal and structural performance. At the same time, there is no influence on the product's durability either, so its ability to withstand wear and pressure remains unaffected.

## 3

### Stone wool is water repellent for a reason

A water repellent agent is mixed with the fibers during stone wool's production process, making it able to repel water. The inherent water-repellent properties of these ingredients provide stone wool with an excellent ability to resist water absorption and moisture effects.

# 4

## Stone wool allows water vapour to pass through it

Stone wool is 98 percent porous material, meaning it is an open material, unlike a closed-cell structure. This is why it is defined as vapor permeable, and is practically almost as permeable as still air.

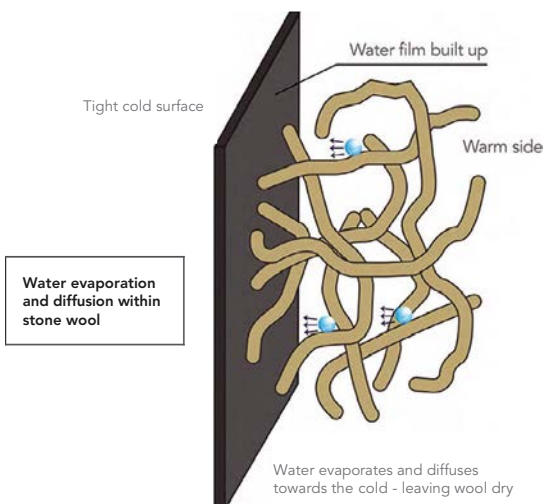
This is similar to wearing a breathable and waterproof jacket instead of a regular plastic raincoat. The difference lies in the fact that, if you sweat, the fabric will allow the vapor to pass through and dry out. With a regular plastic raincoat however, you will remain sweaty unless you take it off. Please see point 7 for further details of how moisture behaves within stone wool.



# 5

## The importance of having air tight structures

Building structures must be air tight. This is important in order to prevent air moving through a building exterior and avoid both unwanted heat losses and severe moisture damage from air moving outside the structure. Vapor retarders and wind barriers are often used to prevent this. An airtight structure assists in providing superior thermal comfort for its occupants, a little like wearing a wind jacket outdoors in windy conditions instead of just a sweater.



# 6

## Stone wool contains no moisture when installed

During the construction process, unexpected rain can lead to moisture being encapsulated into construction materials. However, when we use stone wool this moisture can pass through the product resulting in a quicker drying process (see point 4). Any moisture that may be inadvertently created during stone wool installation can easily be dried out before the assembly is completed.

# 7

## If moisture gets into stone wool, its performance will be unaffected

As part of a structure that separates the indoor and outdoor environments, stone wool is designed to act under different temperatures. Any moisture present will naturally and quickly migrate to the cold external side of the material and evaporate if the boundary is open and ventilated, as in ventilated facade systems, for example.

In general, building structures should be designed in a manner that avoids build-up of moisture, and allows the drying of excess water. If this is not the case, moisture will gather as a thin layer of water on the external surface of the insulation layer and will likely also evaporate, but at a slower rate. This means that the product will essentially be left dry and its thermal performance will remain unaffected. In all cases, care has to be taken that the other construction layers and materials are not damaged. This is depicted to the left.

# 8

## What is the value of having an essentially dry product?

The presence of water in an insulation product will significantly deteriorate its insulation properties. Since there will be almost no moisture in stone wool, its overall thermal performance will remain constant and unaffected. This is determined by the thermal resistance R-value, which is a measure of temperature difference and shows how much the material resists to a heat flow.

# 9

## How much moisture can a stone wool product contain?

Take a 100mm thick stone wool batt with a density of 30kg/m<sup>3</sup>, for example. As explained in point 7, the moisture will create a thin layer of water in the external surface of insulation. In an extreme scenario of 10 percent moisture by weight, it would lead to a practically negligible 0.3mm thick layer.

A more typical case would involve moisture content of just 1 percent by weight, resulting in a barely 0.03mm thick film of water: less than the density of a human eyelash.

**When it comes to handling moisture, stone wool offers excellent water repellent properties, keeping your home warm and dry without any reduction in thermal performance over time.**

# 10

## Can stone wool be soaked with water?

In buildings, soaked stone wool can only happen in instances where the material is subjected to flooding, or where there is a lack of draining options. This isn't due to the properties of stone wool itself, but to accidents, poor design or improper installation. Even in these circumstances, evidence shows that the material will work to the same standards after drying out.

