

B r e a t h a b i l i t y

There are basically 3 types of building concepts (*in medium and cold climate regions*).

1st complete closed system as:

timber frame with glue-bounded boards as OSB, MDF, plywood /
houses with concrete (block) walls, glass-walls and similar

2nd diffusion open as:

“poroton/thermopor” bricks (clay stone),
loam blocks, etc.

3rd breath-able systems:

old timber frame/post & beam as old continental timber farmhouses
log cabins, etc.

Let’s have a look to breath-able systems

First some basics:

- Warm air is always trying to go to the top
- Warm air can include more moisture than cool air
- In houses we need enough oxygen
- To avoid MOULD, the moisture has to go out of the house

A breathable shell of an house is similar with our skin.

- Our skin is airtight (we cannot blow through)
- Our skin is rain tight (no water is going through the skin in our body)
- Fluids of body can go out (as sweat and so on)
- Needful substances can go in the body through the skin (based on crèmes, oils, etc.)
- Our skin takes oxygen (if we would cover our skin completely with non-breathable material, we would die in short time)

These abilities we can find in nearly all skins of world, skins of animals but skin of plants also. So we see the idea of breathability is as old as life on earth. The skin is protection but also most important for correspondence between inside and outside.

To realize this concept in houses, we need a special wall and roof construction (*preferably out of organic materials*), which fulfils **ALL** following points.

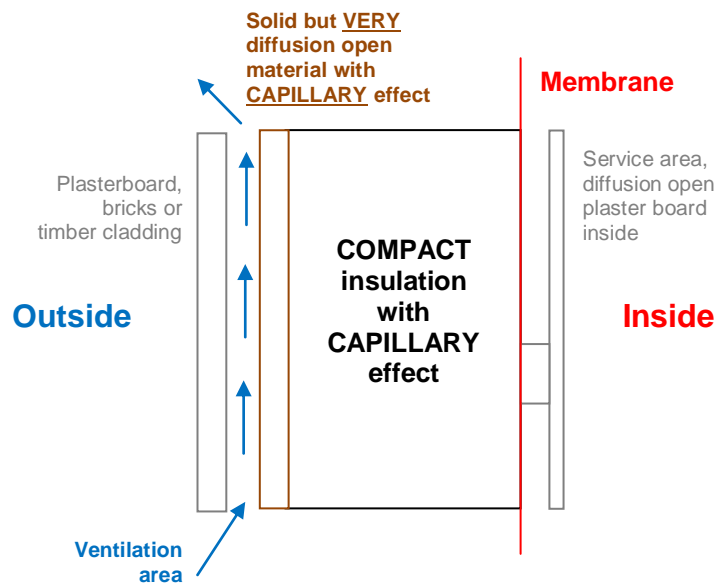
- It need to be **from INside to OUTside** more and more diffusion open
- The insulation need to be able to **ABSORBE** moisture
- The insulation need to be **compact** enough to realize a very good **CAPILLARY** effect
- The “board” outside has to realize a very good **CAPILLARY** effect as well (*and preferably it should be raintight as well*).
- We need a “active” power to realize a movement of moisture from dew-point inside the insulation to outside.

S o l u t i o n i n s t e a d o f c o n f u s i o n !

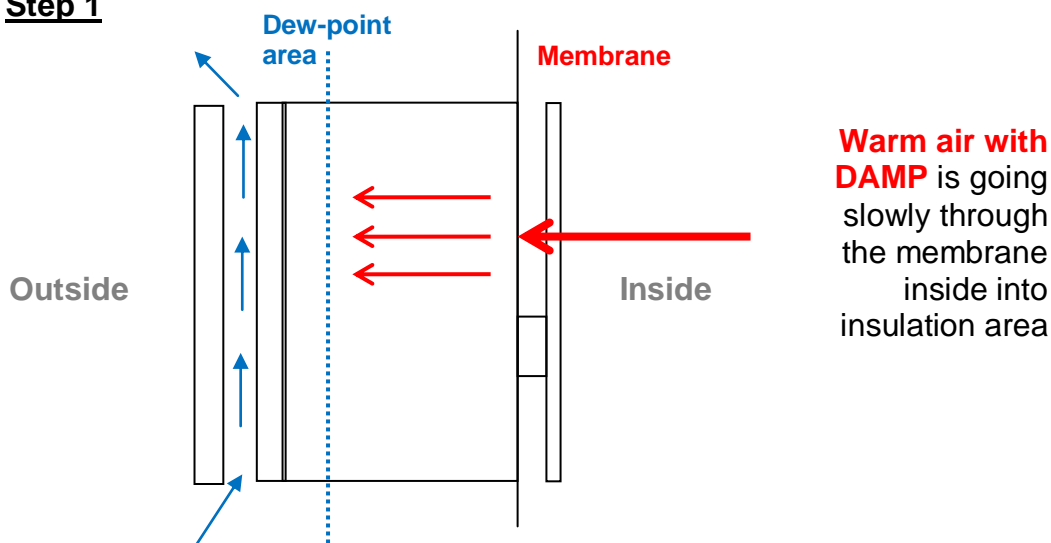
Example of a breathable timber construction:

Building materials which fulfil all specifications:

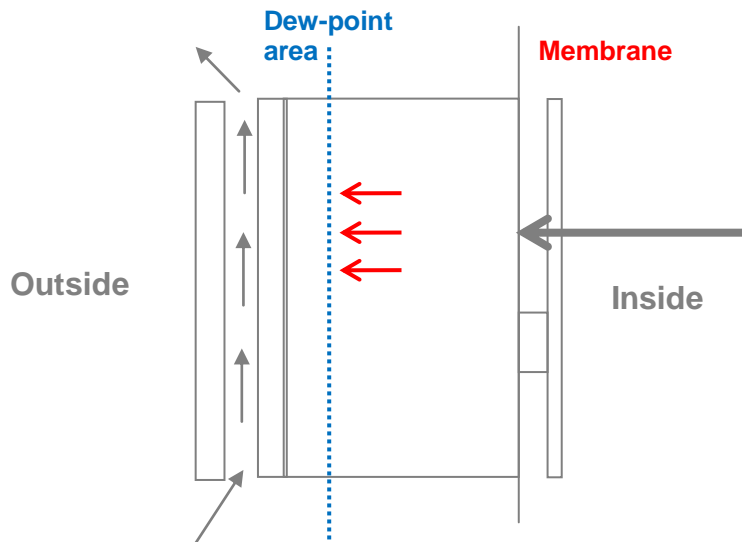
- PROCLIMA DB+ **membrane** (out of acid free paper = good for centuries)
- **Blow-In cellulose insulation** with minimum compression: 60kg/m²
- **Soft wood-fibre boards** without any glue and rain-tight surface



Step 1



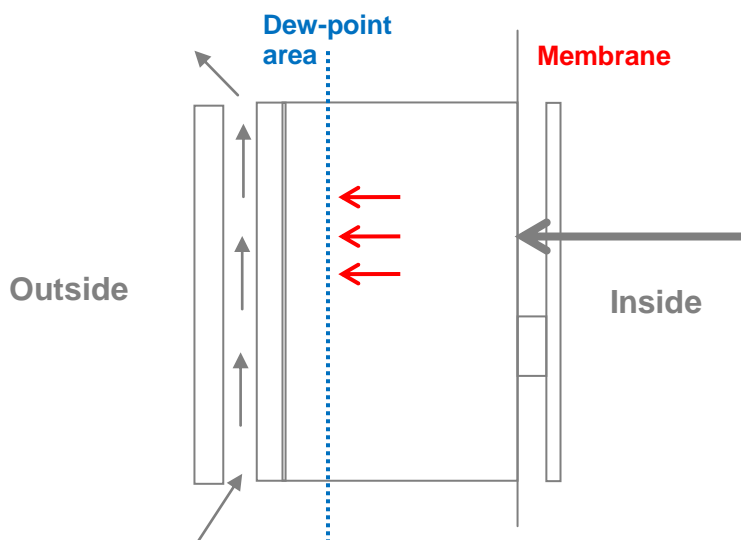
Step 2



At the **dew-point** area, the movement of damp is stopping and the moisture is absorbed from insulation.

Without an additional power, the moisture would **stay** inside the insulation and it would **cause construction damages** and **MOULD**

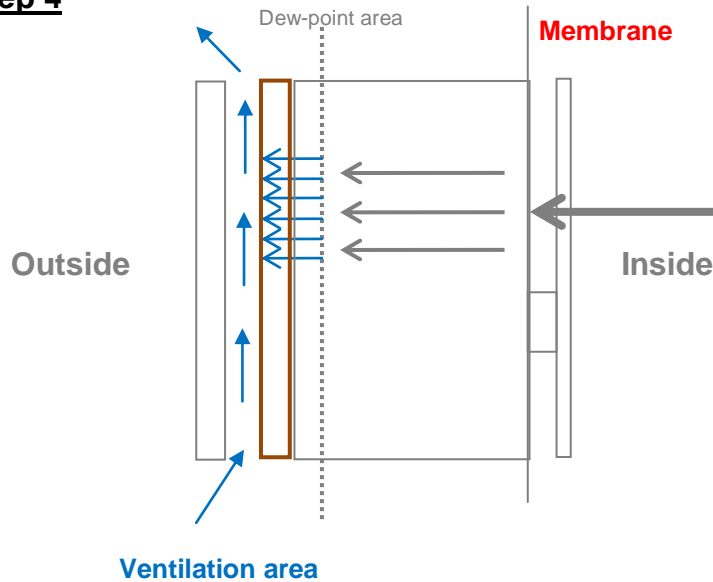
Step 3



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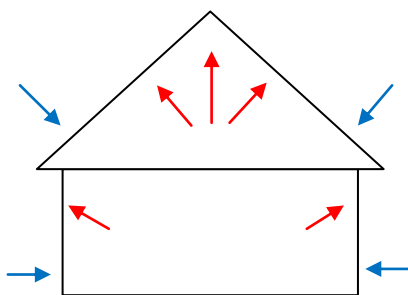
Step 4



And now the “trick”:

In **ventilation area** we have **always** a movement of air from bottom to top (without wind also/by difference of temperature between bottom and top).
 If the air goes along the **surface of the outside board**, it is causing a small **under-pressure!**
 This **under-pressure** together with **capillary-effect** of insulation and outside board is “pulling/sucking” out the **moisture** always.

This is NOT magic! – This effect is based on one of most important functions of life (= osmotic pressure / osmotic pump).
In the same way, the roof construction need to be done!
 This effect happened in cells of organic life, is the reason that water reach the leaves of trees, water wells in mountains happened and so on.
 This concept is practiced millions of years by nature. If we open our eyes we can see solution all around!



Situation in a house:

Red arrows: Here most of warm air with damp is going **out**.

Blue arrows: in these regions fresh air is coming **in**.

The need of a ventilation system in houses with **breathable shell** depends to:

- Total volume of air inside
- Amount of people who lives inside
- And total surface of breathable shell

Basically, as long we have a volume of minimum 80m3 and at least 40m2 **breathable** shell per person we do **NOT** need a ventilation system to take moisture out and enough oxygen in!

In case of big buildings with many apartments inside, a ventilation system can make sense.

FACT you can see & feel:

In more than 99.8% of all Irish houses the moisture level is too high and the exterior walls are too tight for breathability. So there is a big need to take the moisture out and to vent the house.

Good ventilation system should have a heat recovery system and there should be no PVC inside. But these (good) systems are very **expensive**, they need **electricity always**, high movement of **fine-dust** and the **danger of airborne germs/mould** in the pipes are very high (*don't look to a ventilation pipe after 5 or 10 years, because after this you are not hungry anymore or you have to clean the system with chemicals periodically*).

In a **good breathable** timber construction house, the **moisture** level is rather **too LOW** (*too dry*) but never too high.

This you can see and feel in our **Project Oecotop Home of Health** in Malahide. Visitors are welcome.

More information you find at: www.project-oecotop.com/home.htm

As very helpful information we recommend to study our brochure **Notes, Guide & Checklist**, you can download from our Download area.

Make a research by your self (internet, medical studies, etc.):

- Microorganism in ventilation system
- Diseases caused by chemicals / microorganism in ventilation system
- Mould & health
- PVC & health

Did you know?

68% of ALL allergies are caused by **MOULD** in houses!

BY EUROPEAN LAW:

If a builder, architect, etc. is building a house and later on, the people inside are getting sick by bad construction, mould and/or toxic materials inside, the **builder, architect, etc.** has to take **FULL responsibility!** = People can make legal action.

If a **government** is making building regulation which will **damage** peoples **life** and **health**, the **government** has to take **responsibility** for this.