

Wood Fibre Insulation Boards for better & healthier buildings



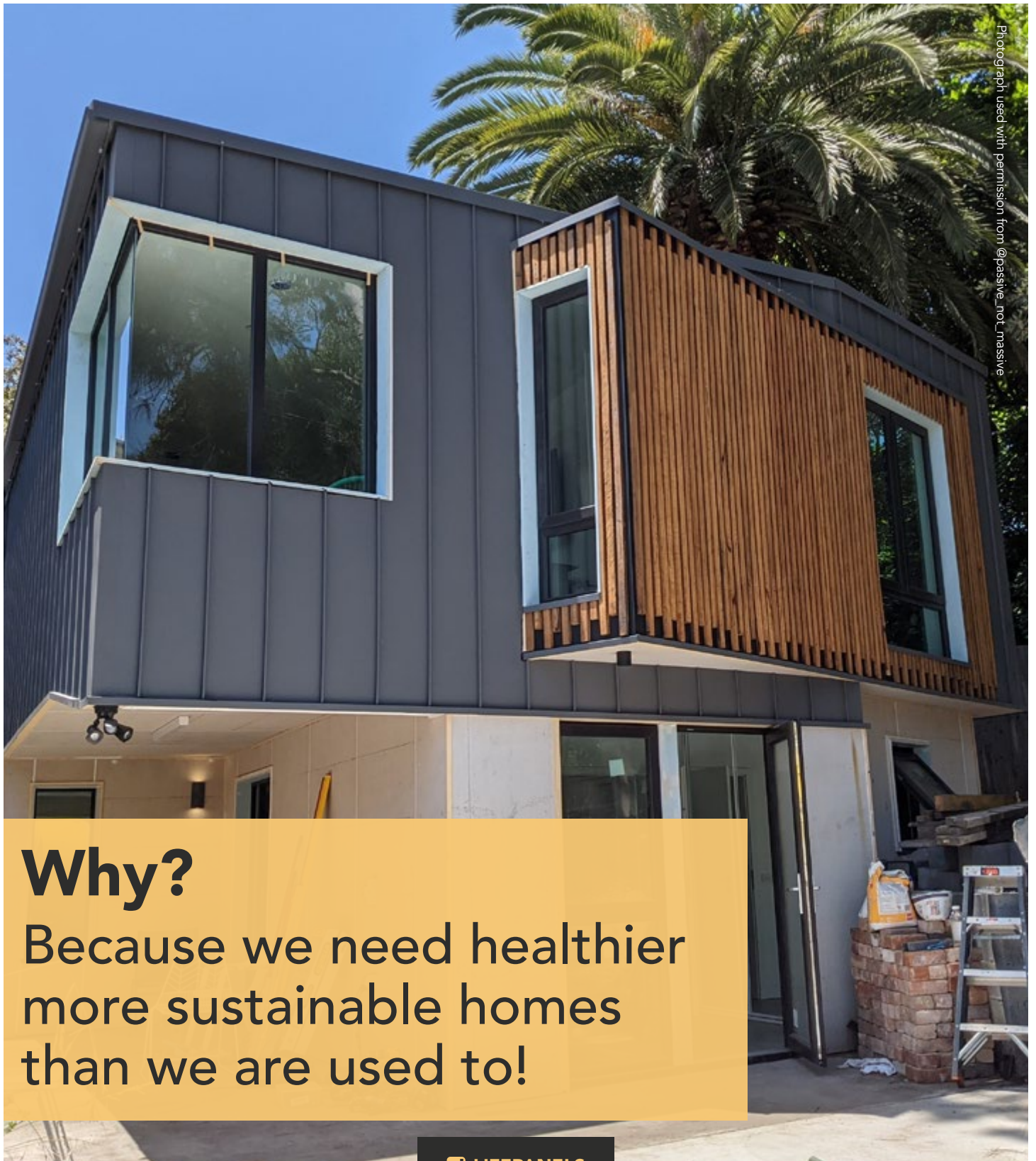
@milina_opsetica_brandphoto

BUILDING PHYSICS

Life Panels brings you premium quality eco products for walls, roofs and floors manufactured from responsibly sourced wood fibre to meet Australia's rapidly growing demand for healthier buildings.



Fabric first, we must learn how to be better at building.



Photograph used with permission from @passive_not_massive

Why?

Because we need healthier
more sustainable homes
than we are used to!

WE HAVE THE SOLUTION!

Wood Fibre Insulation



Photograph used with permission from Soprema Group.

The solution: Insulation is about thermal performance and must have the following four in abundance:

1. High Density

For sound and overheating control.

2. Low Thermal Conductivity

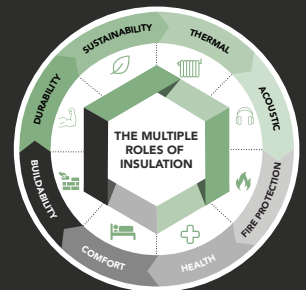
To reduce heat loss and for more comfort

3. High Heat Storage

For temperature control

4. High Vapour diffusion

To deal with moisture



Made from re-purposed wood-chips, free from harmful emissions, low level of embodied energy and vapour permeable.

An Additional benefit is high level acoustic performance.

Synthetic batts don't have the same level of performance.

Our 60mm wood fibre board has a density 145 kg/m³

Our 90mm wood fibre batt has a density of 60 kg/m³



Acoustics

Get your quote now

Email - info@lifepanels.com or Call - 0452 274 443

PASSIVE HOUSE

Build in a better way.

Passive House Fabric



Insulation



Low Thermal Bridging



Airtightness

The Big 3

Thermal Performance

- A1. Low Thermal Bridging
- A2. Airtightness

Moisture Control

- B1. Moisture Control
- B2. Breathability
- B3. Relative Humidity

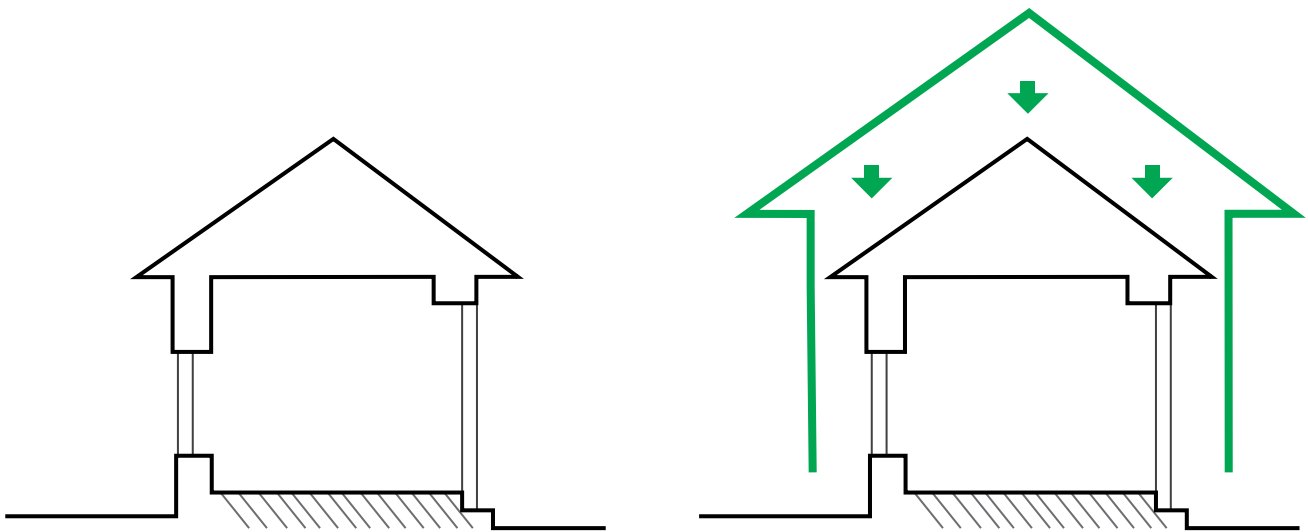
Overheating Control

- C1. Thermal Mass
- C2. Decrement Delay

THERMAL PERFORMANCE

Low Thermal Bridging

The ideal solution is to fit insulation in a continuous wrap around the building.
Think of it like dropping a tea cosy around the house!



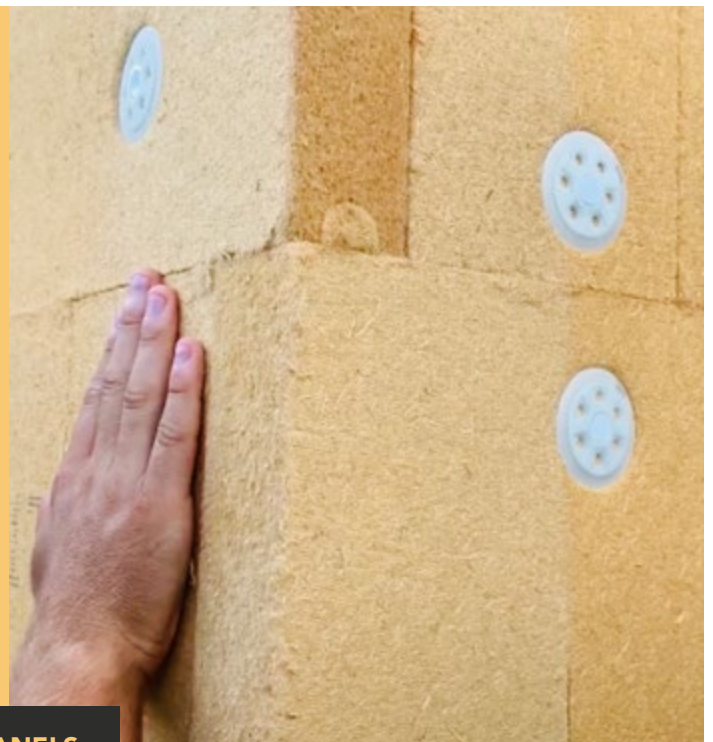
Thermal Bridging needs to be prevented by creating a 'Thermal Break' between outside and inside.

Why?

Based on current regulations you can lose as much as 1/3 of your heat through thermal bridging. Cold spots can also form on the inside which is a contributor to mould inside your home. Your insulation solution must take account of this.

How?

Wood fibre is one of the only insulation solutions that can be installed as a continuous wrap around the building, thus reducing cold bridging.



THERMAL PERFORMANCE

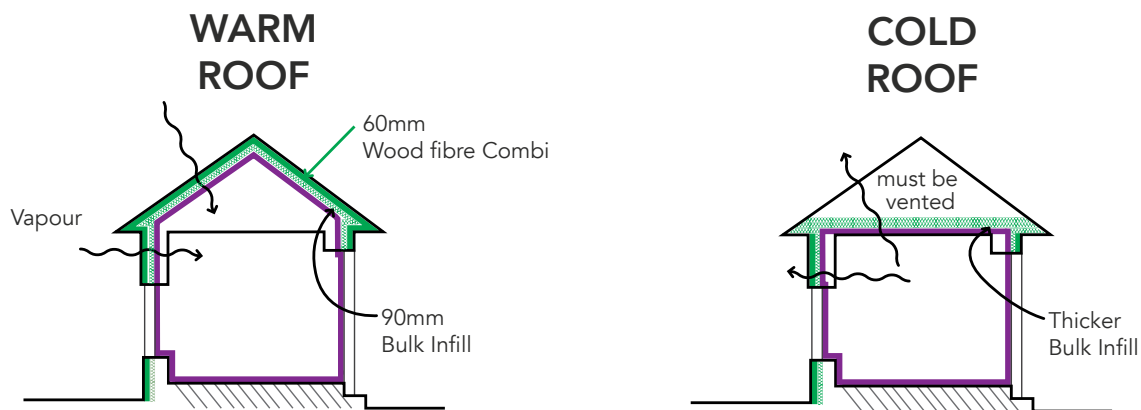
Airtightness




Reducing air leakage, limiting the fluctuations between hot and cold whilst maintaining internal temperature.

Weak points are usually:

- Windows
- Doors
- Ceilings

- Wall to Roof detail
- Floor junction details
- Any interface between joints



-  Bulk Infill
-  Wood fibre Insulations
-  Airtightness Layer

Types of material for good airtightness, but vapour open.

• Airtight Membranes

• Lime Render

• OSB 3

Why?

Heat energy is lost from a building through either **Conduction**, heat travelling through solid materials. **Convection**, heat travelling through as a gas, or by warm air moving out of the building through gaps.

We can never stop heat moving out of a building, but we can slow it down.

How?

A) Reduce the amount of gaps in our building that lets warm air out. This is called airtightness.

B) Increase the amount of material that conducts heat slowly.

The use of tapes, membranes and good detailing can provide excellent airtightness.

Call or email us for professional advice at 0452 274 443 or info@lifepanels.com.

The ideal solution is to fit insulation in a continuous wrap around the building creating a **THERMAL BREAK**.

Quick Tip!

- From a practical building viewpoint - it's easier to make the inside airtight. Attempting airtightness from the outside can be difficult to detail/access.
- Do a blower door test at rough in stage.

MOISTURE CONTROL

There are different types of moisture.

Direct



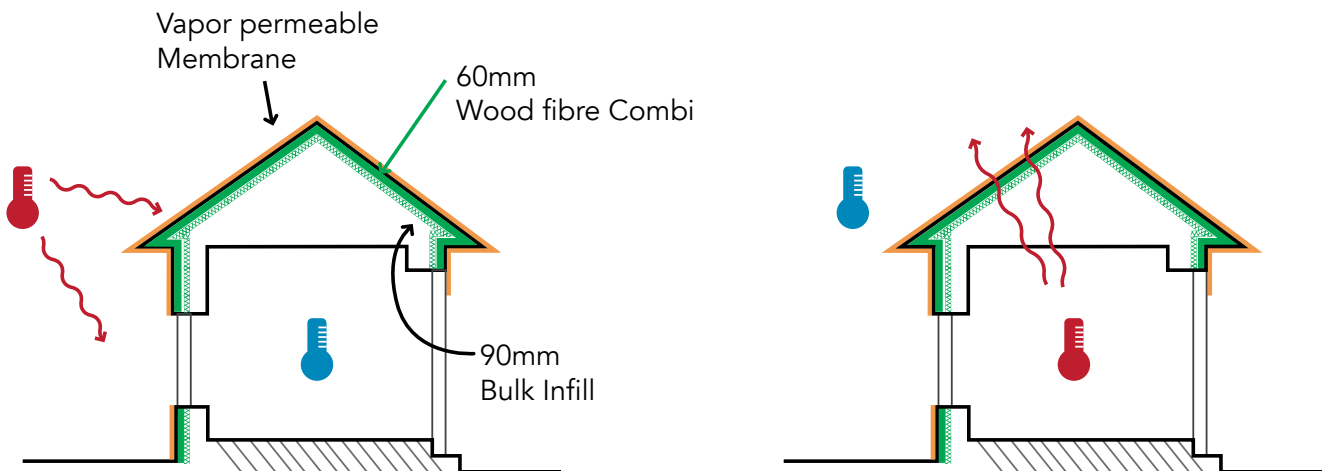
Indirect



Atmospheric



The building fabric has to allow moisture to get in and out. Materials that trap or hold moisture cause many problems.



Heat Energy + Moisture

- Heat energy is like water, It will level itself out. Moisture always gets pushed from the hot side to the cold side.

Can this cause a problem?

- If materials that are not vapour permeable are used then condensation can form inside the wall. This pushes the moisture content of timber frames above 20% and can cause mould in the wall space and in worst-case, dry rot.

How is this prevented?

- Wood fibre is perfect for managing moisture.
- Using vapour permeable membranes also protects and helps the building.
- Using vapour permeable materials also keeps the RH inside the building more stable by controlling the moisture transfer in and out without it getting trapped.

Examples of materials and details that should NOT be used:

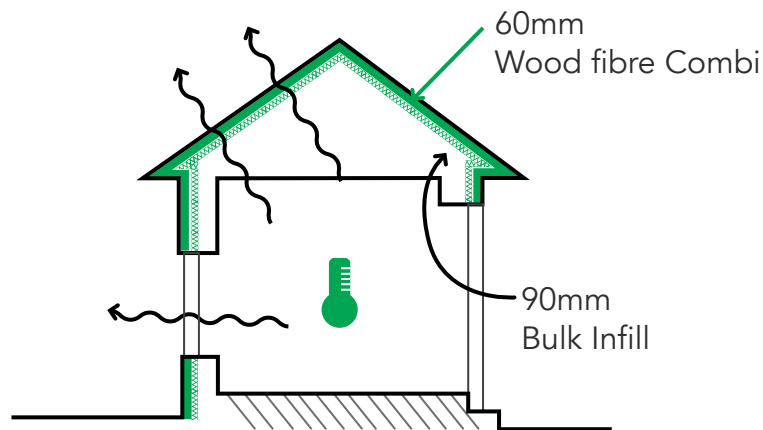
- ✗ Foils
- ✗ Polystyrene & foam
- ✗ Some types of glass wool & earth wool which sag and drop in performance over time.
- ✗ Sagging membranes.
- ✗ Air cavities in the wrong place.

MOISTURE CONTROL

Breathability

4 Lane Highway Effect

Essential when improving thermal performance.



How does moisture behave?

Moisture vapour quite literally moves through the fabric of the building, but at different rates depending on how vapour open, or closed, the materials are.

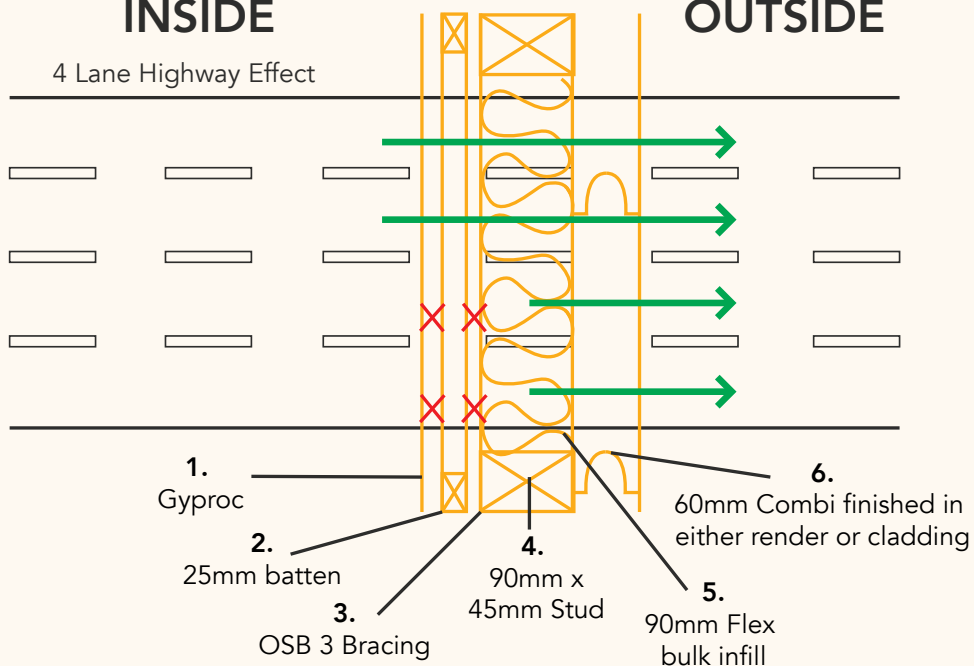
What is essential to understand is:

No material or detail will prevent the movement of moisture vapour altogether. So ensure you understand that the design works! Ask us for help!

INSIDE

4 Lane Highway Effect

OUTSIDE



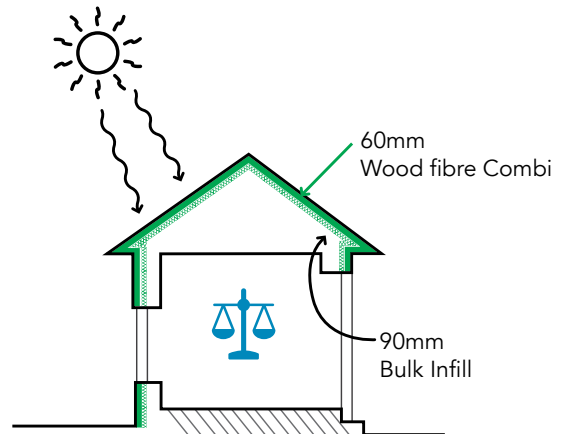
MOISTURE CONTROL

Relative Humidity

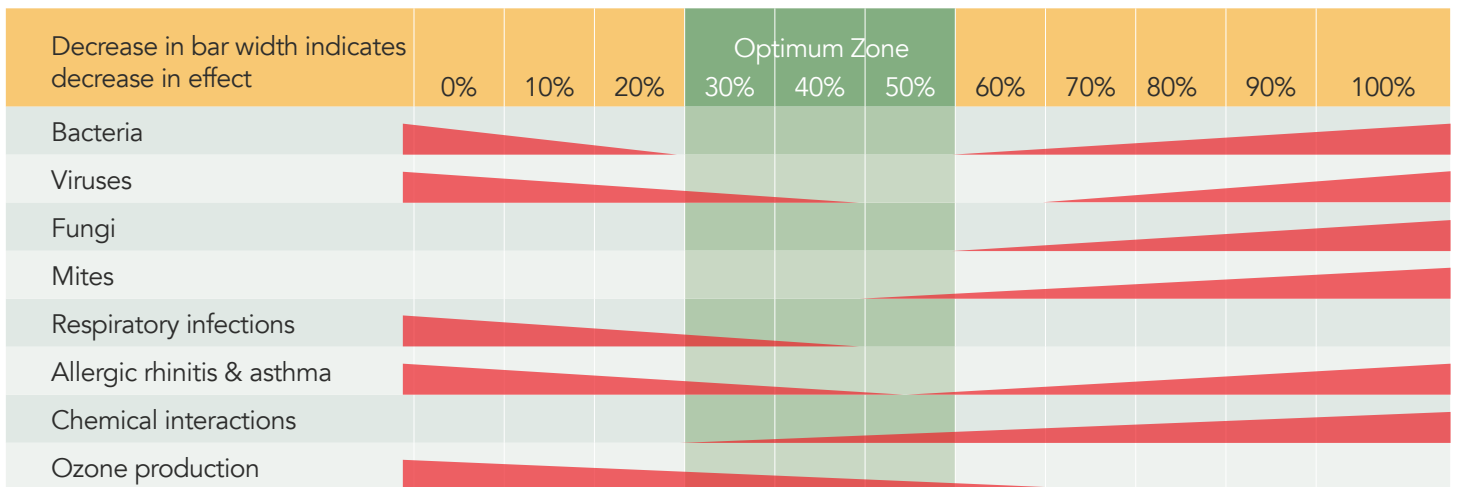
Reducing the internal Relative Humidity is key to comfortable living!

How?

By using wood fibre as a genuine solution to high thermal performance alongside, building orientation, cross ventilation/HRV will help achieve a balanced internal RH level:



RH levels and their effects on:



In relation to The Big 3 ensure:

- a) No material or detail will prevent the movement of moisture vapour altogether.
- b) Materials that are less vapour permeable should be used towards the inside of the building.

These 2 points are key because as the temperature drops, the RH increases.

Example = Temperature is 20 degree C - RH is 50% - Temperature Drops to 9 degree C - RH increases to 100% which is when vapour turns into liquid.

The issue:

- Materials that are too vapour closed slow the movement of moisture vapour down which means it builds up in the fabric of the building. At lower temperatures this will condense into a liquid, which can cause wet rot.
- At higher temperatures, this can drive the excessive moisture in timber above 20% and can cause dry rot.

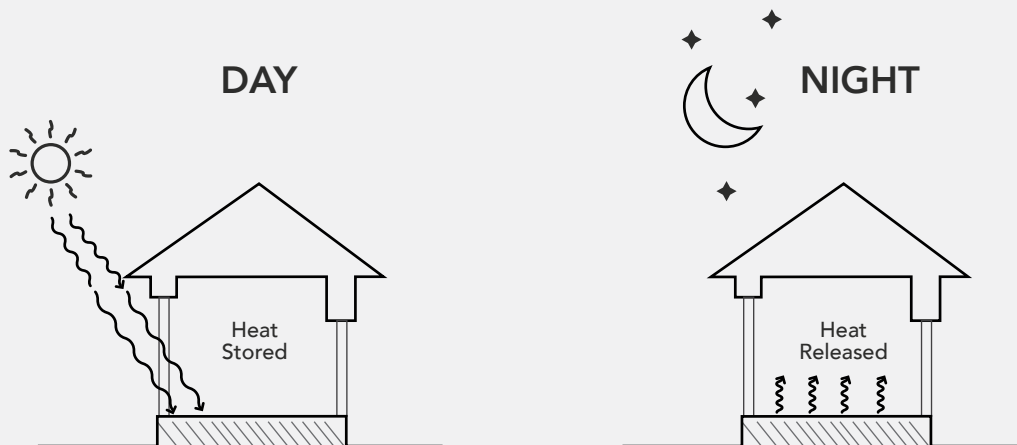
The solution:

- The key focus is to allow any moisture that gets in to the build up to get out as fast, or faster than it got in.

OVERHEATING CONTROL

Thermal Mass

Heat energy is very similar to water, it will try to level itself out.



A common basic way to think of thermal mass is to use concrete...

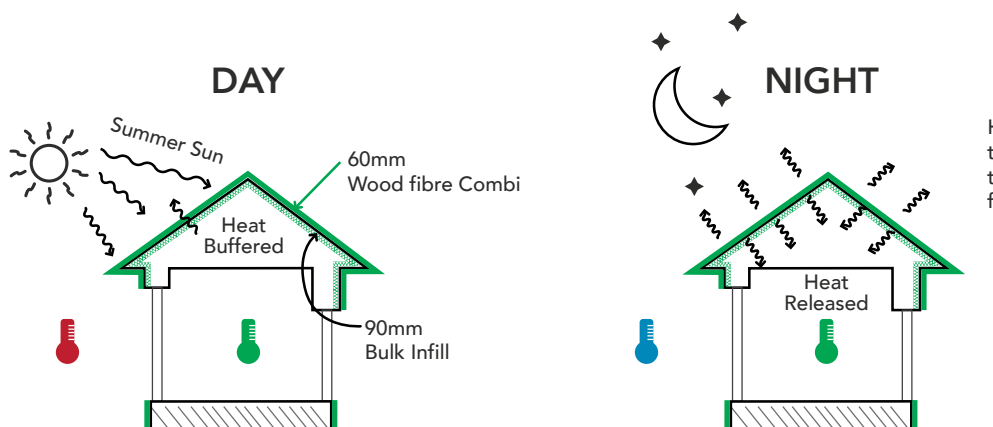
Thermal mass is needed to 'soak up' the heat into the external building fabric during the day and release it during the cooler night. Insulations that have the combination of low conductivity and high thermal mass are key to achieving this.

Thermal mass can benefit your building:

1. Heat Storage to help keep warm in winter
2. To buffer the heat in summer, to keep it cool

For these 2 points to work properly materials have to have the following:

1. High Thermal Mass - Heat Storage
2. Low Thermal Conductivity



Heat storage capacity

- Wood fibre has a high thermal mass as the heat storage capacity is 2100 j/kg
- Concrete is only 960 j/kg

Thermal conductivity

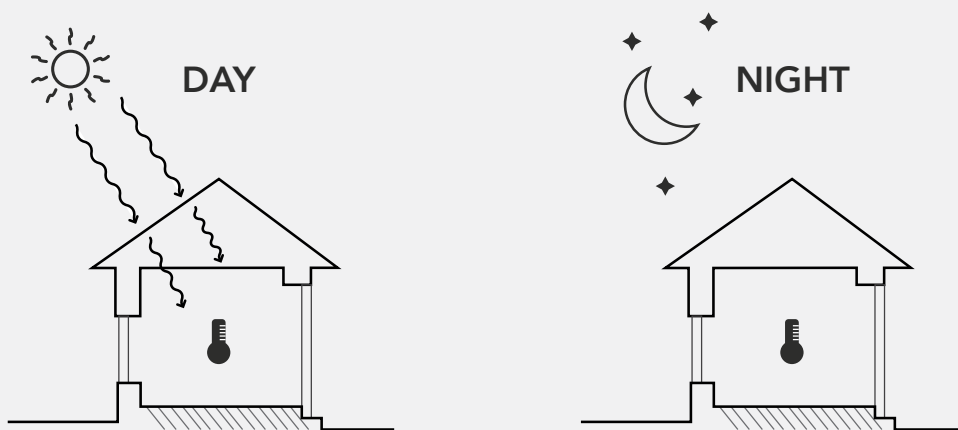
- Our rigid wood fibre board has a low thermal conductivity of 0.041 W/mk
- Our flex wood fibre bulk infill is 0.036 W/mk
- Concrete is higher at an average 1.5 W/mk

Combining our wood fibre products gives energy efficient, steady and stable temperature all year round.

OVERHEATING CONTROL

Decrement Delay

How long it takes for the sun's heat to pass through the surface of a building.



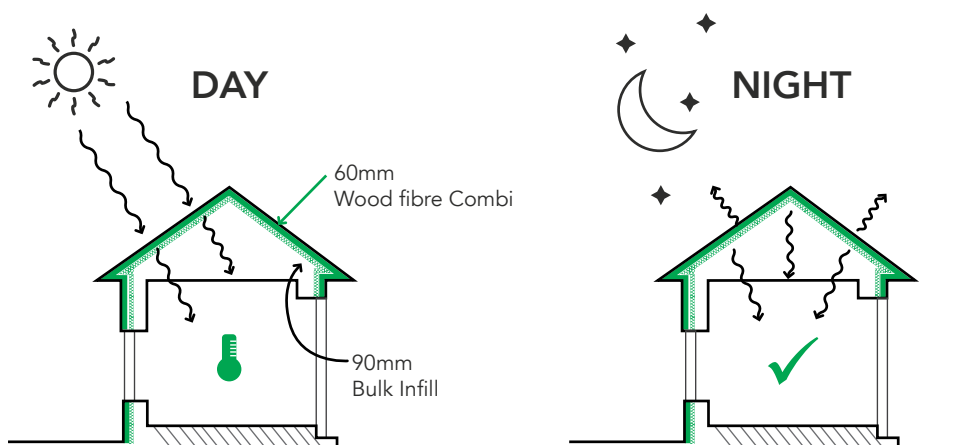
The issues:

Standard Materials such as roof tin heat up really quickly and the radiant heat enters the fabric (roof & walls) and warms everything else up too.

This overheating occurs within 2-3 hours and increases the relative humidity internally, which is not good.

A building will gain heat during warmer months due to the effect of the sun's energy. Insulation and airtightness will keep this low level heat in the building.

The sun produces high level heat which cannot be kept out by many conventional insulation materials.



The solution!

Combining our products will delay the time for the heat to pass through the roof and the walls. Inside stays cooler and the Relative Humidity remains more constant. This keeps it comfortable + SAVES energy = cheaper power bills!

- The overall wall performance using the 60mm and the 90mm will be R4.05.
- To increase the performance you simply put thicker Combi sheets on the outside and thicker bulk infill into thicker frames. This will increase the R value too!

IN SUMMARY

The most cost effective way to use as little energy as possible is a fabric first approach.

To slow heat loss in the winter we use materials with low conductivity as a building wrap.

To slow heat gain in the summer we use materials with high thermal mass and low conductivity.

To ensure that there are no unintended consequences as a direct result of high thermal performance measures, use vapour permeable materials.

Our wood fibre insulation does all this while locking up CO_2 and using renewable materials. It's fast and simple to install and long lasting.

Life Panels.



LIFEPANELS.COM



James Cornell
Director of Life Panels

**This document is just the start.
We want to educate and share the knowledge.
If you would like the Director of Life Panels to speak at
an event or consult on a project please contact us now.**

**Book in your training with us today!
Email - info@lifepanels.com or Call - 0452 274 443**

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