Why wool insulation

Exclusive Hydroscopic Advantage

WOOL BREATHES

- Wool fibre is hygroscopic ~ it can absorb and release moisture from the air. This phenomenon is known as 'breathing'
- Within specially designed **Foreverbreathe™** wall systems, Terra Lana will absorb moisture vapor, reducing condensation and creating warmer healthier environments
- A drier home is easier to heat, healthier and less prone to condensation, mould and mildew.
- **For every litre of water absorbed into and evaporated out of Terra Lana 0.628 kWh of energy is released or absorbed.**

Water Vapour absorbed

Water Vapour released

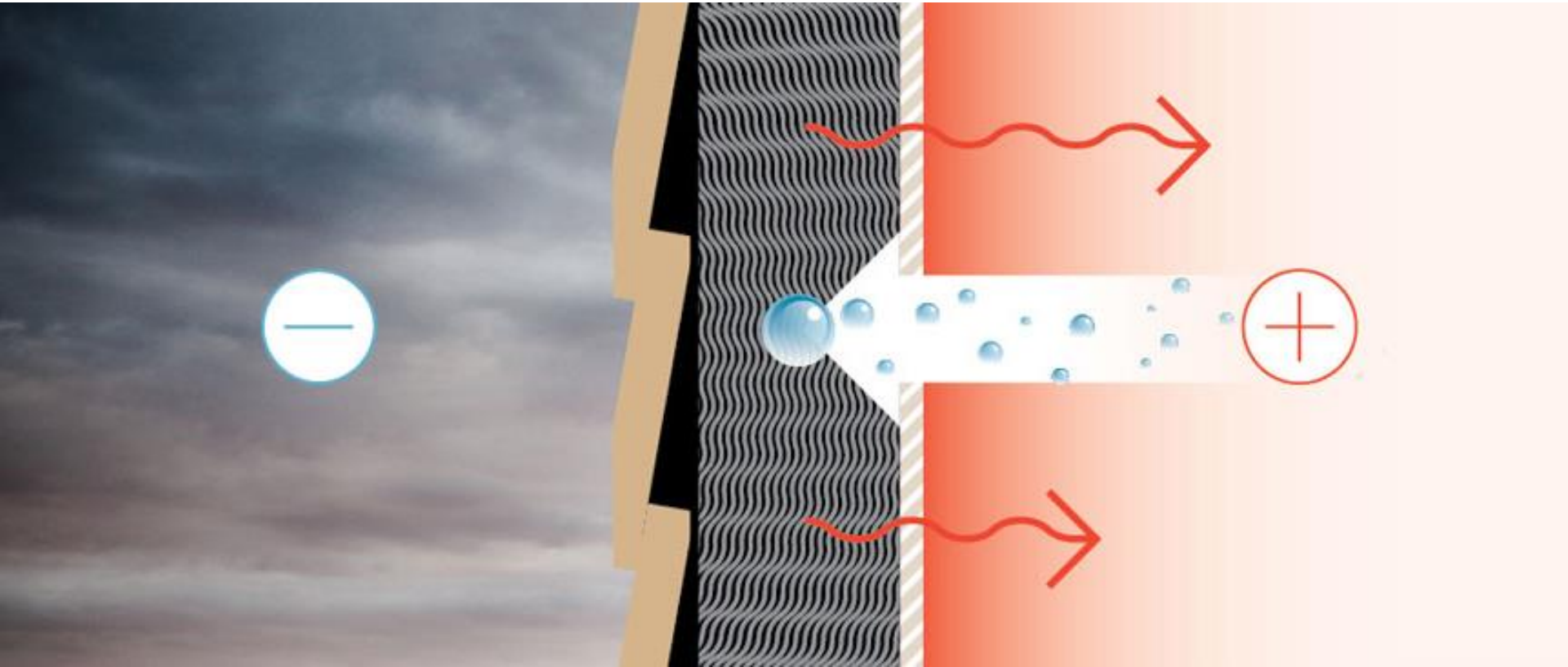
Water liquid repelled

TERRA LANA

Relative Humidity Night Cycle

Terra Lana in Foreverbreathe™ wall systems – Night Cycle

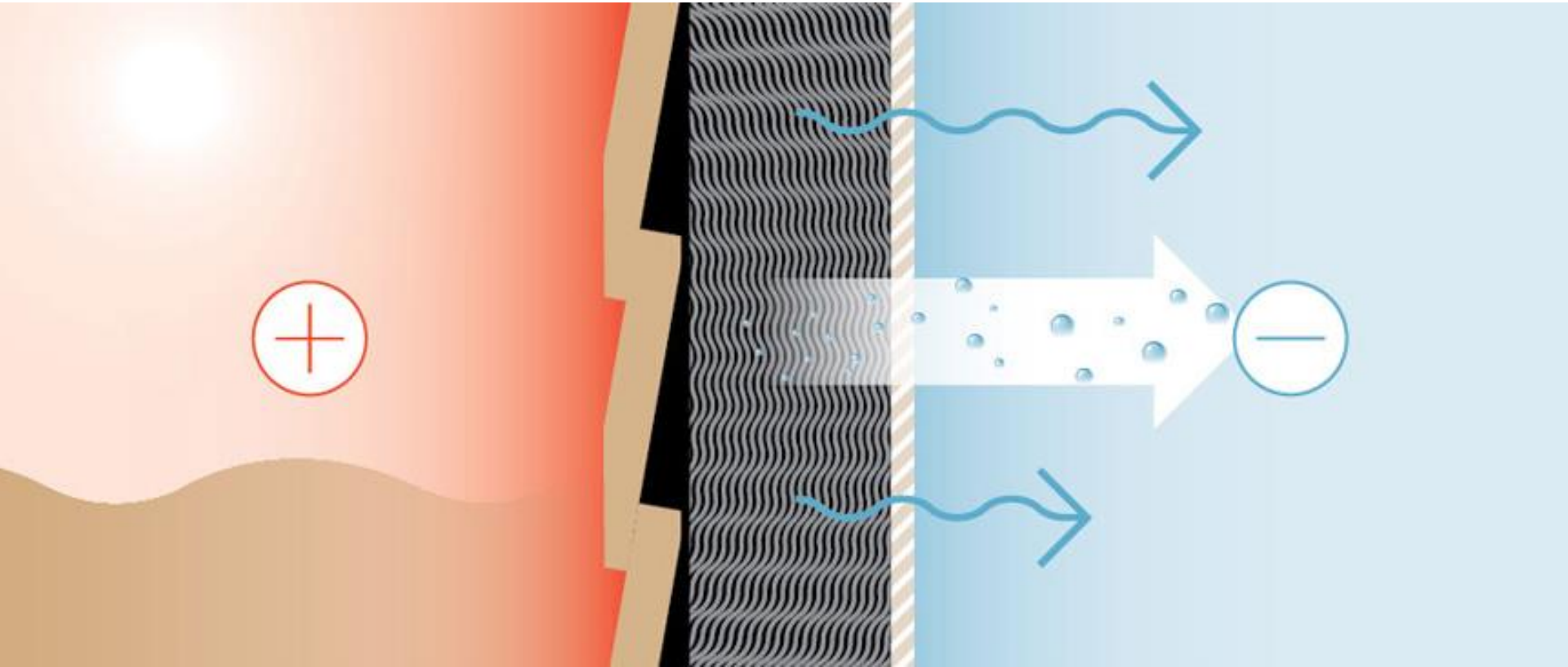
- Air temperature decreases,
- Relative humidity increases,
- Moisture is absorbed into wool fibre,
- Energy is released



Diurnal Relative Humidity Cycle

Terra Lana in Foreverbreathe™ wall systems – Day Cycle

- Air temperature increases,
- Relative humidity decreases,
- Moisture is evaporated out of the wool fibre,
- Energy is absorbed.



Diurnal Cycle Conclusion

Terra Lana in Foreverbreathe™ wall systems can

- Act like a very considerable thermal mass,
- Resist the change in temperature,
- Flatten out the peak highs and lows of temperature,
- Improve the comfort of homes,
- Reduce the energy required to heat and cool a home

The "breathing" phenomena is part of the reason why sheep can survive in climates of extreme heat and extreme cold.

Whole House Case (potential)

Insulation	Meters	GSM	Mass
Ceiling	R3.6 x 150m²	2600	390 kg
Wall	R2.4 x 100m²	2500	250 kg
Underfloor	R1.8 x 150m²	1350	202.5 kg
Total			842.5 kg

So as temperature is decreasing, Terra Lana could absorb up to 33.7 litres of water (4%*) releasing **21.2 kWh of energy**

* AgResearch Client Report CLR 14-28 September 2014

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Breatheability – moisture egress

The vapour permeable materials used within the Foreverbreathe™ wall system allow moisture to travel through the wall.

Moisture will flow from high to low concentration much the same way heat does. Typically the air inside a home has more moisture than air outside a home.

The build up of moisture inside a home leads to condensation, mould and higher energy costs. Opening windows removes moist air but heat is also lost. Mechanical ventilators use energy and have ongoing maintenance costs.

Foreverbreathe™ wall systems are a new solution that use a clever combination of trusted high quality materials to deal to a range of moisture related issues while delivering significant performance benefits over many traditional construction systems

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Moisture created by common household activities

Activity	Litres	5 person home
Cooking	3.0 per day	**3**
Clothes washing	0.5 per day	**.5**
Showers and baths	1.5 per day (per person)	**7.5**
Dishes	1.0 per day	**1**
Breathing, active	0.2 per hour (per person)	**5 (5 hours)**
Breathing, asleep	0.02 per hour (per person)	**0.8 (8 hours)**
Perspiration	0.03 per hour	**2**
Total Moisture Loading		**20 ltrs**

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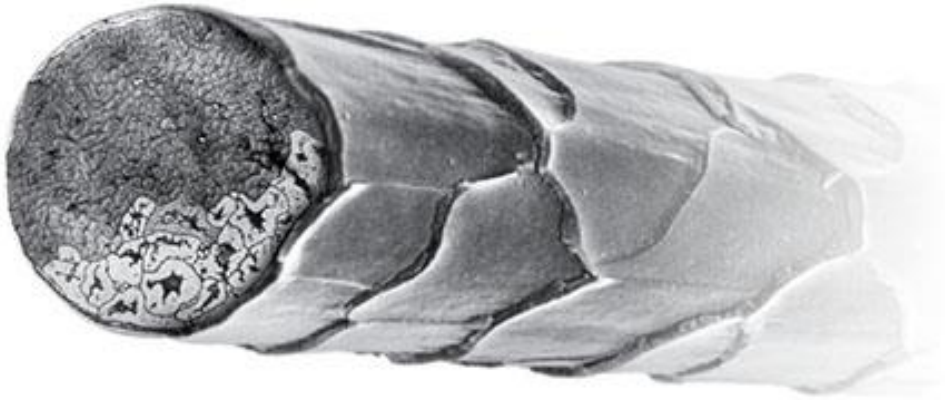
DURABLE

- Wool will last the life of a home without breaking down.
- To remain effective, insulation fibres must trap air and form pockets of still air. Tiny scales on the fiber surfaces hook them together so the wool stays fluffed up.
- The result – longer lasting insulating performance that doesn't slump over time.



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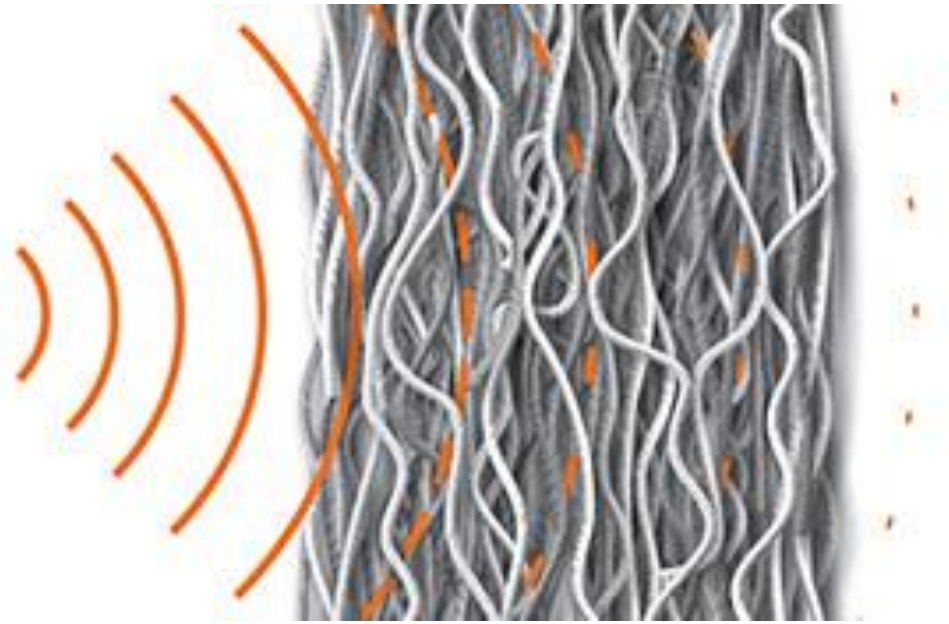
Quieter

Wool has excellent acoustic insulating properties too, so it helps keeps the noise down through walls, floors and ceiling.



EASY & SAFE TO INSTALL

- Non-toxic,
- Non-irritating
- Protective clothing or mask not required
- Rips to length and can be cut to size at factory

NON TOXIC

The wool fibre in Terra Lana actually absorbs toxins such as formaldehyde out of the air around it. Wool molecules bind with formaldehyde molecules in such a way that the result is irreversible and reemission does not occur.

RECYCLED

The wool in Terra Lana is predominantly sourced as short length and odd colour fibre from carpet manufacturing that is uneconomic for the carpet manufacturers to reuse themselves

We recycle all our off cuts and Terra Lana can be recycle at the end of a homes life

NEW ZEALAND MADE

A New Zealand product through and through, developed, owned an operated by entrepreneurial New Zealanders

Foreverbreathe™ wall systems – here today

Superior natural technology is the innovative, sustainable way of today and the future.

Start building healthy, energy efficient, high quality, sustainable homes today. Specify, build and live in the revolutionary Foreverbreathe construction system.