KNAUF INSULATION

A new vision of sustainability

A guide to high performance insulation for better buildings in Asia-Pacific

Build on us.

Insulation shapes a building's environmental impact

Buildings account for almost 40% of global carbon emissions[1] and reducing that requires the industry to respond quickly. Energy efficiency standards are tightening across the Asia-Pacific region and there's further change on the way.

But true sustainability is about more than carbon reduction.

The industry must deliver high performing, low-impact buildings that are also healthier for occupants and the planet. It's no small task but the benefits are considerable: a more sustainable building stock, increased property values and enhanced recognition for developers through 'green building' certifications.

It's no surprise that sustainable construction products are rising in popularity but amid so many 'green' claims, it's essential to identify which solutions will make a genuine difference.

Knauf Insulation has always been driven by sustainability. We know that insulation is critical to reducing operational carbon - that is, the carbon emitted during a building's use phase. But that's not enough. We're supporting the industry to create better buildings, by minimising embodied carbon too – the emissions associated with materials and construction processes. And it can take as little as 95 days from installation to offset the embodied carbon of our mineral wool insulation, through operational carbon savings.[2]

We're also addressing other sustainability factors such as waste reduction through our materials, manufacturing and packaging, as well as the health impacts of our products. Since 2009 we have pioneered ECOSE®, our unique plant-based binder that is low-carbon and low in Volatile Organic Compounds (VOCs), for improved installer and occupant wellbeing. And unlike traditional glasswool insulation, our binder uses no added formaldehyde, earning our products the DECLARE 'Red List Free' status. This status provides architects and specifiers a solution to avoid Red List ingredients.

Choosing the right insulation can influence sustainability at every stage of a building's lifecycle. This guide outlines four principles for sustainable specification to deliver low-carbon, efficient, less wasteful and healthier buildings for people and the planet.

Learn about our mission to lead the change in high performance building insulation solutions: **For A Better World**.

[1] World Green Building Council, Bringing Embodied Carbon Upfront, 2009
[2] Study by Knauf Insulation and Ramboll: www.knaufinsulation.com/carbon-reduction-95-days-from-installation

Contents

Sustainability is re-shaping our industry

Many countries have made climate commitments to reach net zero by 2050 and the urgency for sustainable practices has never been greater. So what steps are being taken to create that change?

Regulations and green building rating schemes to address whole-life carbon emissions, improve occupant health, and reduce waste, are on the rise. Across the Asia-Pacific region, developers face pressure from government, industry and consumers, to take action and create more sustainable buildings.

Sri Lanka

- In 2023, Sri Lanka published its Carbon Net Zero 2050 Roadmap and Strategic Plan, updating its Nationally Determined Contributions (NDCs) and committing to achieve carbon neutrality by 2050.

Thailand

- The Climate Change Act establishes a framework to reduce greenhouse gas emissions and fosters a transition towards a low-carbon economy.

Malaysia

- The Green Technology Master Plan 2017-2030 outlines the strategic plans for green technology development to create a low-carbon and resource efficient economy.

Singapore

- The Singapore Green Building Masterplan sets out Singapore's environmental sustainability ambitions for the built environment, and is part of the Singapore Green Plan 2030.

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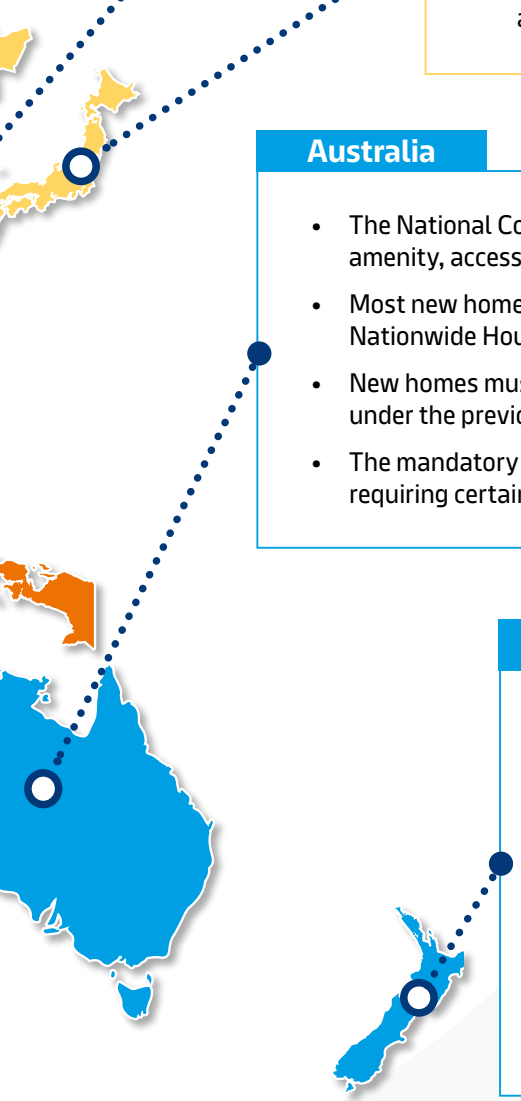
Over **400 voluntary sustainability standards** are now operating globally,[3] including LEED, WELL and Passive House in the construction industry.

See the Passive House principles in action

[3] International Institute for Sustainable Development, Market Coverage
[4] McKinsey & Company, How Japan Could Reach Carbon Neutrality by 2050, 2021



South Korea

- The Green New Deal proposes investment, promotion of clean energy, and supporting innovation for smart green cities.

Japan

- Japan's Long-Term Low Greenhouse Gas Emissions Development Strategy aims to reduce domestic greenhouse gas emissions by 46% by 2030 (compared to 2013).
- Research into Japan's potential pathways to carbon reduction showed that the buildings sector would reduce emissions by 55% by installing better insulation and switching to electric heat pumps.[4]

Australia

- The National Construction Code (NCC) sets the minimum required level for the safety, health, amenity, accessibility and sustainability of buildings.
- Most new homes must achieve a minimum 7-Stars energy efficiency rating under the Nationwide House Energy Rating Scheme or Building Sustainability Index.
- New homes must now be on average 25% more energy-efficient, compared with homes built under the previous NCC guidance.
- The mandatory climate-related financial disclosure bill 2024 passes parliament, requiring certain organisations to make mandatory climate-related financial disclosures.

New Zealand

- The New Zealand Building for Climate Change Programme was established in 2020 to guide the building and construction sector to achieve its contribution to national emissions reduction targets.
- Updates to Clause H1/AS1 of the Building Code has set tighter standards for the energy efficiency of new homes, significantly contributing to New Zealand's carbon reduction goals.
- The Carbon Neutral Government Programme aims to make various government organisations carbon neutral by 2025, requiring them to measure, verify, and report emissions annually, set reduction targets, implement phased reduction plans, and offset remaining emissions.

Legislation, voluntary schemes and consumer expectations are ***driving sustainability across the built environment.***

Better buildings requires better insulation

To meet our collective goals, the industry must create better buildings. **A safer, healthier and more sustainable building stock delivers benefits for the planet, occupants and developers.**

Better buildings are:

Safe

Building safety is fundamental, particularly when it comes to fire. Building regulations increasingly prohibit the use of combustible insulation materials, to reduce risk for occupants and promote higher standards of resilience and longevity.

Healthy

Healthy buildings prioritise the wellbeing of their occupants by maintaining optimal indoor air quality, controlling moisture, and eliminating harmful materials. Increasingly strict regulations support physical health and comfort in both residential and commercial spaces.

Sustainable

Tightening regulations and market expectations are increasing demand for sustainable buildings. These minimise energy demand, reduce operational carbon and use materials low in embodied carbon, to lessen their environmental impact.

So, your insulation must be:

Non-combustible

Our non-combustible insulation doesn't burn and won't contribute to the growth of a fire, giving building occupants valuable additional time to escape. Unlike some other insulation materials, our products are naturally non-combustible, so they don't use toxic fire retardants that can be harmful to both humans and the environment. This delivers peace of mind and safety, without compromising on occupant or environmental health.

Free from harmful ingredients

Our glasswool products are low in VOCs and contain no harmful ingredients found on the International Living Future Institute's 'Red List' of hazardous materials. Our unique plant-based binder: ECOSE® has no added formaldehyde, improving the installer and occupant experience. Our commitment to healthier materials has resulted in our glasswool insulation products achieving DECLARE 'Red List Free' status and being awarded the Eurofins Gold Certification for Indoor Air Comfort.

Low-carbon

Of the mainstream insulation materials used in Asia-Pacific, glasswool has the lowest levels of embodied carbon and glasswool by Knauf Insulation is engineered to go further, outperforming benchmarks in countries where they exist. Glasswool by Knauf Insulation achieves Global GreenTag^{CertTM} GreenRate^{TM} Level A certification, which helps buildings to achieve Green Star certification.

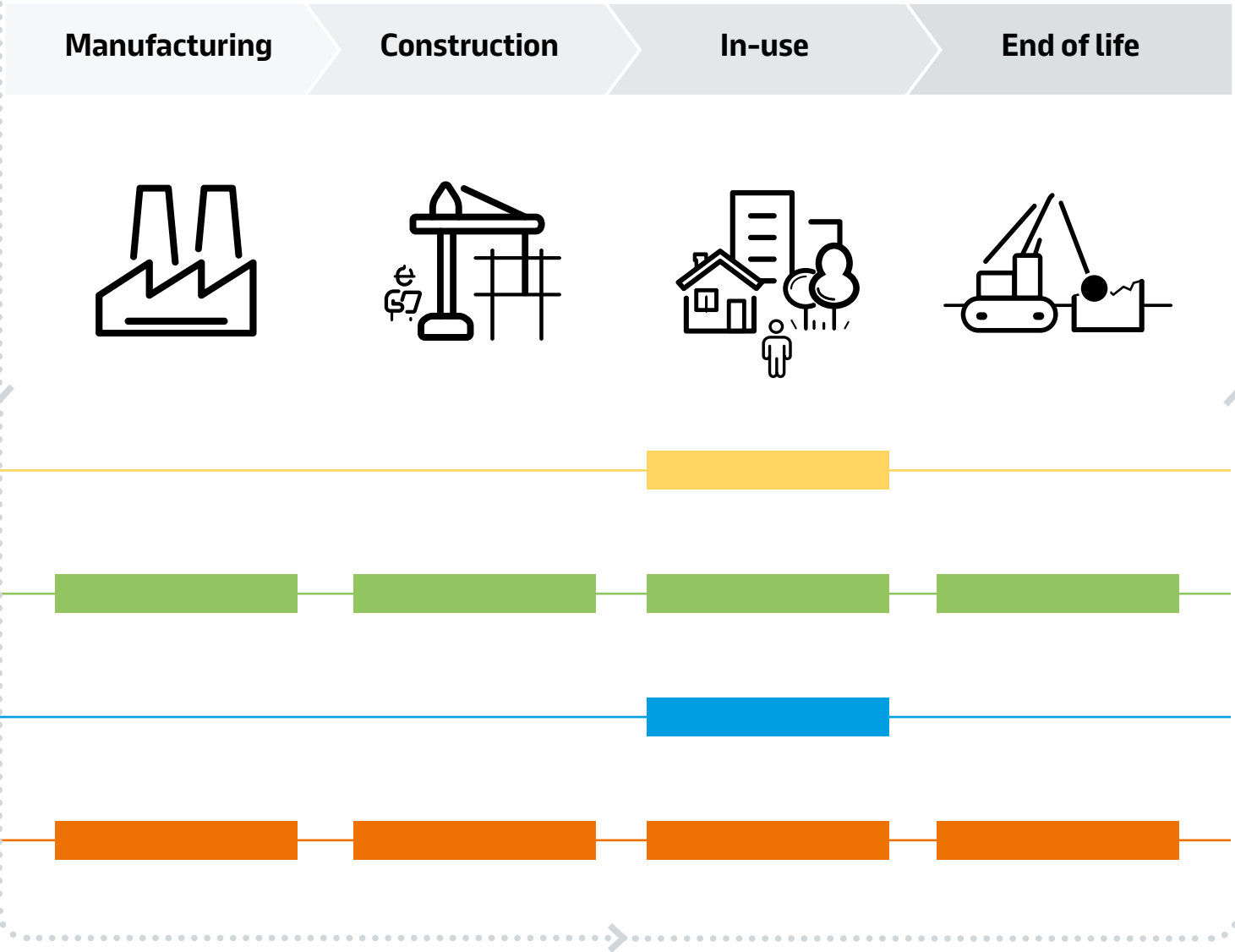
Essential principles for better buildings

Insulation is critical for reducing operational carbon emissions, but it can do so much more than that.

Ensure your insulation supports the sustainability of your building through every stage of its lifecycle, by addressing these four principles:

1. Prioritise an **efficient building envelope**
2. Choose **low-carbon materials**
3. Create **healthy spaces,** indoors and out
4. **Minimise product waste**

Your choice of materials can impact every stage of the building lifecycle:



Not all insulation is created equal, and 'green' claims vary in their credibility.

The challenge is to **identify products with reliable, transparent credentials, that meet all four sustainability principles, without compromising** on their functional performance criteria.

Principle 1:

Prioritise an efficient building envelope

Insulation is fundamental to energy efficiency because it resists the transfer of heat through the building envelope. This optimises heating and cooling systems, reduces energy bills and minimises operational carbon emissions.

Optimise your thermal efficiency

In-use stage

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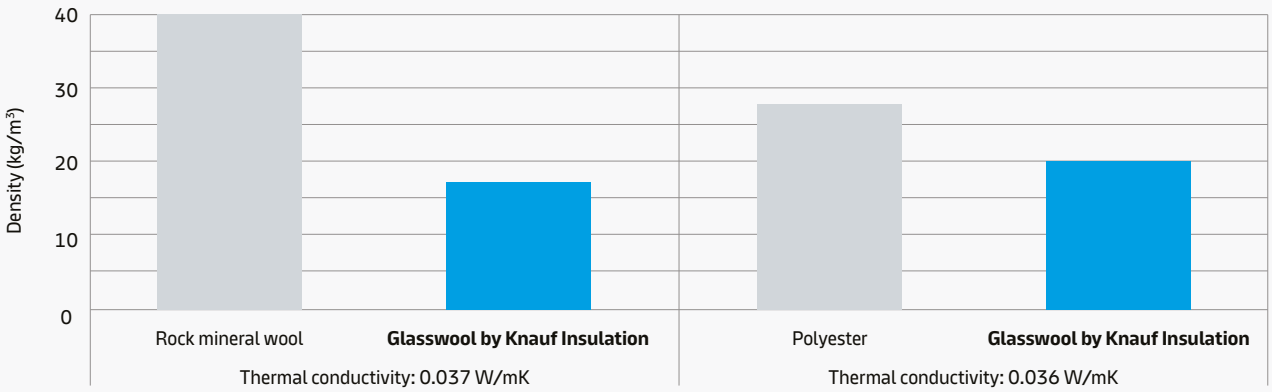
Tip: In addition to high performance insulation, there are many elements of passive design to consider for an energy-efficient build. For example, ensuring that living and sleeping spaces are positioned to either benefit from the sun and wind or be protected from it, at different times of day.

What to look for in your insulation specification:

Higher R-values

The total R-value of a building element indicates how well it will resist the transfer of heat. The higher the total R-value, the better the thermal resistance. U-value, on the other hand, measures the thermal transmittance of building elements. The lower the U-value, the better the thermal performance. In many countries, building elements must achieve minimum total R-values or maximum total U-values to comply with energy efficiency regulations.

Thermal performance with lower density
Comparing glasswool, rock mineral wool and polyester insulation



Glasswool achieves the same thermal performance as these other materials, with lower material content. Each one uses trapped air for insulation but glasswool does this more efficiently. Air also has a global warming potential of 0, unlike the blowing agents used in some foam plastic insulation. **Read more on page 15**

Ease of correct installation

Insulation can only deliver its intended thermal performance when it is installed correctly. Products that require precise cutting and taping can often lead to unintentional air gaps, whereas flexible materials such as glasswool will adapt to fill the space they are insulating and minimise gaps.

Friction fitting

Gaps between sections of insulation can lead to thermal bridging and wasted energy. But this can be minimised by choosing a material that friction fits securely between substrates, rafters or joists and connects with the neighbouring insulation.

Flexible offcuts

A flexible insulation material allows you to use offcuts to fill smaller spaces, for example around pipes or cables. This minimises thermal bridging and reduces waste.

How Knauf Insulation can help

Our glasswool insulation has been designed to meet or exceed regulatory requirements for energy efficiency. Our advanced TwinTech® technology allows us to produce thicker insulation and our current products achieve R-values as high as R8.0.

Glasswool insulation is easier to install correctly, compared with rigid foam products, because it adapts to minor surface imperfections and fully fills the space, minimising gaps and maximising thermal performance.

All our products are designed to friction fit within their building element. The mineral wool strands also 'knit' together, securely joining one section to another and ensuring a continuous layer.

Because our glasswool is flexible, offcuts can be used to fill any gap, meaning less product is wasted and thermal performance is optimised.

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A study into thermal looping in cavity walls, partially filled with insulation boards, showed that a gap of just 6mm is enough to cause an increase in heat transfer of 158%.[5] Avoid this by choosing insulation that is easier to install correctly.

[5] Lecompte, J . The Influence of Natural Convection on the Thermal Quality of Insulated Cavity Construction, 1990

Case study:

Superior thermal and acoustic performance

Architect, Josefine Watterson partnered with Knauf Insulation on her family's high-performance passive home in Featherston, New Zealand.

Insulation installed in the home's ceiling and internal and external walls provides complete protection from the cold and delivers a superior level of thermal and acoustic performance.

> *Knauf Insulation represent a safe choice when it comes to quality products and service that deliver guaranteed results.*
>
> ***Josefine Watterson,***
> *Architect*

See the full case study

Principle 2:

Choose low-carbon materials

Alongside operational carbon, it's essential to consider embodied carbon – the emissions generated from factors like **raw materials, manufacturing, transportation and construction.**

When choosing insulation, it's important to choose products low in embodied carbon throughout the whole lifecycle.

Reduce your embodied carbon

Manufacturing stage | Construction stage | In-use stage | End of life stage

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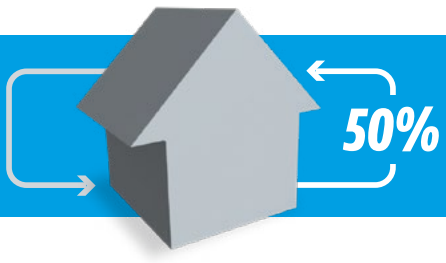
Embodied carbon of new buildings now represents **as much as 50%** of the total lifecycle emissions.[6]



[6] World Business Council for Sustainable Development and ARUP, Net-Zero Buildings Where Do We Stand?, 2023
[7] Spray foam with HFC data taken from https://pcr-epd.s3.us-east-2.amazonaws.com/450.EPD_for_SPFA_EPD_20181029_HFC.pdf

What to look for in your insulation specification:

Renewable raw materials

Some insulation is manufactured using fossil fuels such as petrochemicals. Insulation made with abundant raw materials, like sand and recycled glass, is lower in embodied carbon.

Energy-efficient manufacturing

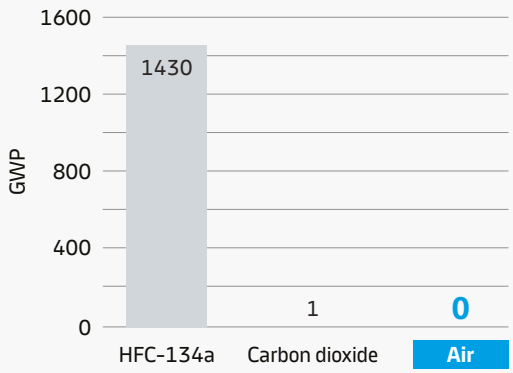
The carbon intensity of energy used to power production and manufacturing facilities adds to the embodied carbon of insulation. Some manufacturers are working to reduce their impact in this area, so look for those who have made commitments towards more energy-efficient production.

Low-impact gas or blowing agent

Some foamed plastics use blowing agents (e.g. HFC-134a) to reduce their thermal conductivity. However, these blowing agents can have extremely high global warming potentials (GWP). For instance, HFC-134a has a GWP of 1,430[7] meaning it traps 1,430 times more heat in the environment than carbon dioxide.

Glasswool products by Knauf Insulation use air as the insulating gas, which has a GWP of 0, providing effective thermal performance without compromising essential sustainability considerations.

Global Warming Potential (GWP) of example blowing agents used in insulation products



Low-carbon binder

Some glasswool and rock mineral wool insulation products use formaldehyde-based binders that increase their carbon footprint and make the insulation less comfortable to handle. A plant-based binder reduces the upfront carbon of the insulation, due to the carbon absorbed by plants as they grow, and is more comfortable for installers.

Transport efficiency

Transporting insulation by road produces emissions that contribute to a product's embodied carbon. Manufacturers who use less carbon-intensive forms of transport can reduce the carbon footprint of their products. Compression packaging also helps to reduce transport emissions by allowing for more product per delivery.

Environmental Product Declarations

The only way to be sure of a product's embodied carbon and wider environmental impact is to check its Environmental Product Declaration (EPD). Product-specific EPDs provide a clear breakdown of details like raw materials, manufacturing, packaging and waste, that contribute to a product's sustainability.

Learn more about environmental product claims on page 28

Principle 2: ***Choose low-carbon materials***

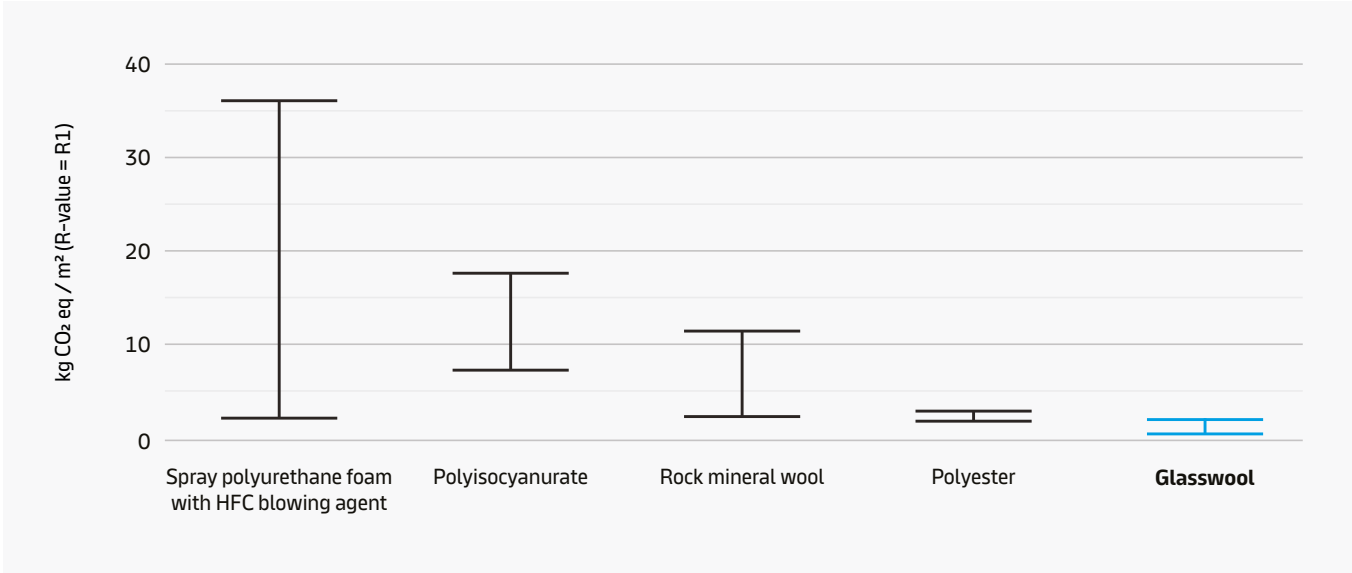
How Knauf Insulation can help

- Of the mainstream insulation materials used in Asia-Pacific, glasswool has the lowest levels of embodied carbon, as shown on the graph on the following page.
- Our glasswool insulation is made using up to 80% recycled glass.
- Our state-of-the-art manufacturing plant only uses electricity that is 100% renewable.
- All our glasswool batt and roll products use our unique plant-based binder: ECOSE®, which is up to 70% lower in upfront carbon than traditional formaldehyde-based binders.
- Our products use trapped air, Earth's best natural insulator, which has a Global Warming Potential (GWP) of zero, instead of other common blowing agents that are harmful to the environment.
- We prioritise sea freight, which is lower in carbon intensity than road transport, shipping to nearby ports to minimise emissions and deliver our insulation with the smallest possible carbon footprint.
- Our insulation is compression-packed, allowing for more product per shipment and reducing transport related carbon emissions.
- We publish product-specific EPDs, produced to the latest EN15804 +A2 standard, for greater accuracy and transparency. This illustrates the low environmental impacts of our products.

Lower than other materials. Lower than industry benchmarks.

Our products are lower in embodied carbon compared to other commonly used insulation materials and lower than industry benchmarks for glasswool, in countries where they exist.

Embodied carbon emissions from different insulation materials



Graph shows embodied carbon content of a range of products, taken from published Environmental Product Declarations.

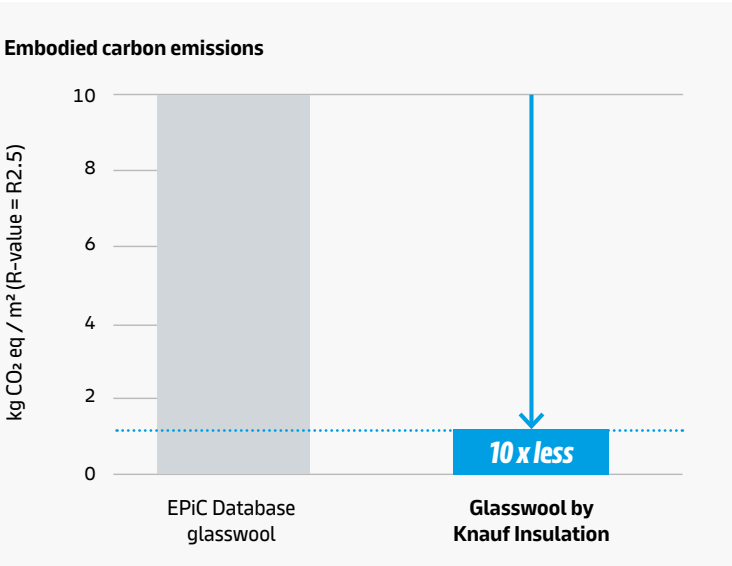
Benchmarks for glasswool in the APAC region

The EPiC Database includes embodied environmental effects of a variety of construction products in Australia.

It details embodied carbon coefficients for different insulation materials, including glasswool insulation. When compared with the average glasswool insulation from the database, **glasswool by Knauf Insulation is ten times lower in embodied carbon.***

*There are currently no benchmarks for glasswool in New Zealand.

Source: Crawford, Robert. EPiC Database. The University of Melbourne. Collection, 2019



View our EPDs

Principle 3:

Create healthy spaces, indoors and out

Your choice of insulation material impacts the health of those inside the building and the outdoor, natural environment. Choose products that don't contain harmful ingredients and that optimise indoor air quality and enhance the wellbeing of occupants and the environment.

Create healthy spaces and improve wellbeing

In-use stage

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As of August 2021, there were **over 960 WELL and Fitwel certified projects worldwide**. Another 1,431 projects were pre-certified or in progress for certification.[8]

[8] The Number of Wellness-Certified Buildings Explodes, Global Wellness Institute, 2021
[9] Embodied Carbon and Material Health in Insulation, Healthy Building Network, Perkins & Will, 2023, https://perkinswill.com/area-of-expertise/embodied-carbon-and-material-health-in-insulation/

What to look for in your insulation specification:

Low-VOCs

Volatile Organic Compounds (VOCs) are chemicals that can evaporate from solid materials into the air at room temperature, causing discomfort and health issues. Insulation that is low-VOC is healthier for both installers and building occupants.

No harmful chemicals

Some insulation contains harmful chemicals, such as toxic fire retardants or formaldehyde, that can pose a risk to people's health. When leaked, these chemicals can also pollute the air and water supplies, negatively impacting local plants and wildlife. Look for products with third-party certification that shows they are free from harmful chemicals.

Robust acoustic testing

Noise pollution, from both indoors and out, can reduce productivity, prevent sleep and impair learning. Insulation that absorbs sound and provides acoustic performance, as well as thermal performance, will improve the day-to-day wellbeing of occupants.

Non-combustibility

If combustible materials are used in the construction of a building, fire can spread more quickly. Non-combustible insulation can help prevent the rapid spread of flames, reducing the potential impact of a fire, and providing occupants with additional time to evacuate in the event of a fire. It is also essential to avoid insulation materials that have toxic fire retardants which pose a health risk to occupants.

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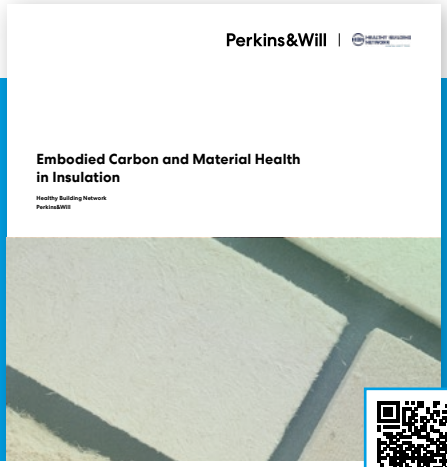
The Healthy Building Network recommends fiberglass (glasswool) insulation because it is typically optimised for both embodied carbon and material health. They also advise choosing insulation without a formaldehyde-based binder.[9]

Learn about ECOSE®, our plant-based binder with no added formaldehyde, on page 22



View the report

Principle 3: ***Create healthy spaces, indoors and out***

How Knauf Insulation can help

All our glasswool batt and roll products use our unique plant-based binder: ECOSE®, which is low-VOC.
Our products were also the first to be awarded the Eurofins Indoor Air Comfort Gold Standard certificate in 2010.

Unlike traditional glasswool insulation, our binder uses no added formaldehyde, enabling our products to achieve the DECLARE 'Red List Free' status.

All our glasswool insulation is EUCEB certified as bio-soluble and safe to use.

All our glasswool products are sound absorbent and have high Noise Reduction Coefficient (NRC) ratings.

Our unfaced glasswool products are non-combustible, as tested to local standards, helping to mitigate fire risk. And because glass is naturally non-combustible, our products do not use fire retardants, which can be harmful to the environment and building occupants.

Focus on quality for installers, comfort for occupants, and health for all.

The health impacts of insulation start long before a building is occupied – installers spend extended periods of time handling it during construction. Occupants are then exposed to it during the life of the building. Unfortunately, the chemicals found in some products, along with the dust they produce, can be detrimental to both installers' and occupants' health and comfort.

ECOSE® improves the installer and occupant experience. Our products made with ECOSE® are low-VOC, DECLARE 'Red List Free' and contain no added formaldehyde. They also generate low levels of dust and our customers tell us they are less irritating on the skin than those made with traditional binders.

Learn more about the ECOSE® Difference on the next page.

THE ECOSE® DIFFERENCE

Declare. Red List Free

> *We found that the insulation was really soft and wasn't as itchy as we expected.*
>
> **Alexander Roberts and Imogen Gilchrist,**
> *DIY enthusiasts*

Learn more about ECOSE®

ECOSE®: Our unique plant-based binder

ECOSE® is **up to 70% lower in upfront carbon emissions than traditional binders. It is also low-VOC and contains no added formaldehyde or phenol,** so it can be used to create better buildings for occupiers, for installers and for the planet.

That's the 'ECOSE® Difference'.

Make the ECOSE® Difference

Predominantly plant-based

ECOSE® is made from rapidly renewable sources and is manufactured using biogenic sources of carbon, giving it a lower carbon footprint than traditional binders.

Lower embodied carbon

Reducing the embodied carbon of our binder significantly reduces the embodied carbon of our insulation products as a whole.

Breathe the ECOSE® Difference

Superior indoor air quality

Products made with ECOSE® were the first to be awarded the Eurofins Indoor Air Comfort Gold certification, the highest possible standard.

Green building credits

ECOSE® helps designers earn additional points under green building rating schemes, such as LEED, Green Building Index (GBI) and the Green Mark Certification Scheme.

Feel the ECOSE® Difference

Comfortable handling

ECOSE® creates a more pleasant installer experience. Glasswool with ECOSE® creates low levels of dust and customers tell us it is less itchy or irritating than products made with traditional binders.

No harmful chemicals

Products made with ECOSE® are low-VOC, include no added formaldehyde and are DECLARE 'Red List Free', meaning they do not contain chemicals on the 'Red List', known to pose serious risks to human health.

Declare. Red List Free

Feel the ECOSE® Difference

Making a long-term difference

We first launched ECOSE® in 2009 and it has been helping the industry to create better buildings ever since.

Extensively tested and certified

We publish detailed EPDs for our products made with ECOSE®, produced to the latest EN15804 +A2 standard. Products made with ECOSE® also meet some of the most stringent international standards, including Eurofins Indoor Air Comfort Gold, and DECLARE 'Red List Free'.

Principle 4:

Minimise product waste

Product waste can occur at every stage of the building lifecycle, but some manufacturers have processes in place to mitigate the impact. Sustainable specification means choosing products that contribute to a circular economy.

Reduce your product waste

Manufacturing stage | Construction stage | In-use stage | End of life stage

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The construction industry makes up 40-50% of the total waste generated in New Zealand.[10]

[10] BRANZ, Material Use - Minimising Waste, 2024
[11] BBC, Glass or Plastic: Which is Better for the Environment?, 2023

What to look for in your insulation specification:

Recyclable content

Products made using recycled materials ultimately divert those materials from landfill. When extracted from insulation at the end of its life, glass (unlike some other raw materials) can be recycled indefinitely without impacting its quality.[11]

Reduced packaging

Packaging is an unavoidable source of on-site waste, but this can be minimised by using products that have been compression-packed. This means more product fits per pack and less packaging is used.

Flexible installation

Cutting insulation to size can lead to more offcuts and wasted material. This can be minimised by using products that are pre-cut. Choosing a more flexible material also means offcuts can be re-purposed to fill gaps.

Recyclable packaging

Using recyclable packaging means that more site waste can be re-purposed, if the local market has the infrastructure in place, instead of going to landfill. Look for packaging made from recycled materials and consider the recyclability of packaging at the construction stage.

Natural non-combustibility

Some insulation uses chemical-based fire retardants which can prevent it from being recycled. Insulation made from naturally non-combustible materials mitigates fire risk without compromising on sustainability.

Principle 4: ***Minimise product waste***

How Knauf Insulation can help

Our glasswool insulation is made with up to 80% recycled glass, which is obtained from local sources, including our glass recycling facility in Townsville, Queensland, Australia. This helps to re-direct more glass from landfill.

Our glasswool insulation is pre-cut to standard joist widths and its flexible nature means offcuts can always be used to fill gaps, minimising wasted material.

Our industry leading compression packaging technology enables us to compress our insulation with a 10:1 ratio in terms of volume of space which can be insulated compared to the volume of the packaged product. Which means less handling, less storage space and less packaging.

We have set a goal to achieve zero waste to disposal as of 2032.

Our plastic packaging is 100% recyclable (subject to local infrastructure).

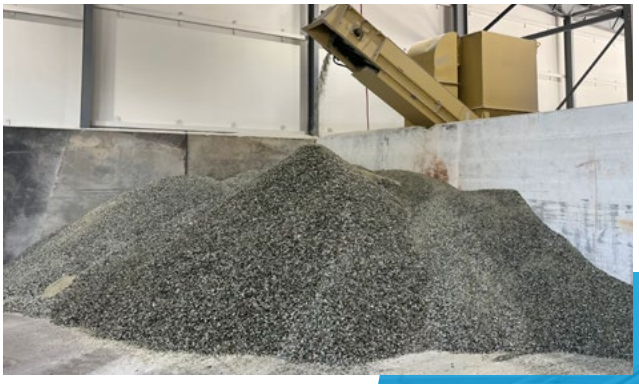
Because glass is naturally non-combustible, our unfaced glasswool products do not require any fire retardants to achieve non-combustibility to local test standards. This means they are easier to recycle than products containing fire retardants.

How we turn bottles into building materials.

We source recycled glass from suppliers across the region, helping to reduce the amount of waste going to landfill. We also have our own purpose-built glass recycling facility in Townsville, Queensland, Australia, which has an annual capacity of up to 20,000 tonnes of cullet, **derived from Australian recycled glass.**

1. Glass bottles are sourced from the Containers for Change Scheme.
2. The glass is crushed into cullet and any unwanted materials are removed.
3. Our glass cullet is then taken to our state-of-the-art manufacturing facility, where it is turned into high performance glasswool insulation.

We repurpose approximately 40 million used bottles across Australia, contributing to a circular economy.*



Once broken down to glass cullet, one beer bottle can be transformed into 5,600km of glasswool fibre *(almost the same distance as from Japan to Malaysia).*

Learn more about our sustainable practices

*The calculations are based on an average wine bottle with a weight of 500g.

Green claims:
Find the information you need

With more than 400 voluntary sustainability standards operating worldwide,[12] it's essential to know which information is reliable and where to find the details you need to make a sustainable choice.

There are three main types of environmental product claims, as per the ISO 14020 standard. These are:

Eco-labelling schemes

Self-declared environmental claims

Environmental Product Declarations (EPDs)

Knauf Insulation's products have all three types of environmental claim. However, **EPDs are the most valuable** as they provide full transparency on raw ingredients and manufacturing. EPDs are the only way to understand the true environmental impact of a product.

What to look for in an EPD:

- **Produced to the latest EN15804 +A2 standard, for a more complete analysis**
- **Product-specific data, rather than generic material EPDs**

i **View our EPDs**

i Reveal some common misconceptions with our **sustainability myth buster**

[12] International Institute for Sustainable Development, Market Coverage

1 Eco-labelling schemes

- Operated by third parties in line with ISO 14024
- Voluntary
- Multiple criteria
- Provision of labels

Example: Glasswool by Knauf Insulation has the best possible Global GreenTag^{CertTM} GreenRate™ Level A certification

2 Self-declared environmental claims

- Claims made by manufacturers
- Manufacturer evaluates and provides data in line with ISO 14021
- Not verified by third parties

Example: Glasswool by Knauf Insulation is made from up to 80% recycled materials

3 Environmental Product Declarations (EPDs)

- Quantified environmental information on the lifecycle of a product
- Verified by third parties in line with ISO 14025
- Created in accordance with LCA Standards

View our EPDs on our website

Optimised manufacturing

We continually optimise our manufacturing process, for carbon reduction and greater efficiency.

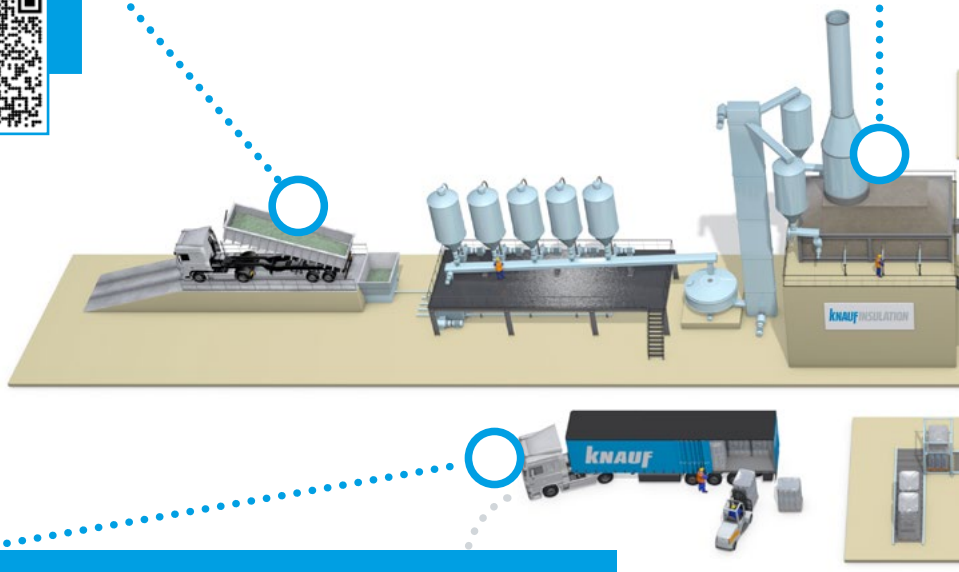
Carefully selected ingredients

Our unique batch recipe incorporates up to 80% recycled glass alongside naturally abundant resources such as sand.

For a full list of ingredients, **see our Declare label**

Innovative melting technology

Our state-of-the-art melter allows us to use a wider range of recycled glass, supporting waste reduction and resource flexibility.



Carbon-efficient transport

We use sea freight, which has a lower carbon intensity than road transport, and deliver our products to strategic ports closest to where our insulation is used to reduce road transport.

Travelling from Melbourne to Brisbane **via road** produces approx. **4,998 kg CO_2e**.
Travelling from Johor Bahru to Brisbane **via sea and road** only produces approx. **2,122 kg CO_2e**, even though the distance is greater.

Sourcing recycled materials

We operate our own recycled glass facility in Townsville, which contributes to our overall supply and allows us to maintain strict quality control and consistency throughout our production.

Modern and efficient manufacturing

Our Asia-Pacific manufacturing facility uses advanced German technology, achieving operational efficiencies that allow us to produce more insulation with less energy.

* Diagram is for illustrative purpose only to demonstrate manufacturing process.

Plant-based ECOSE® binder

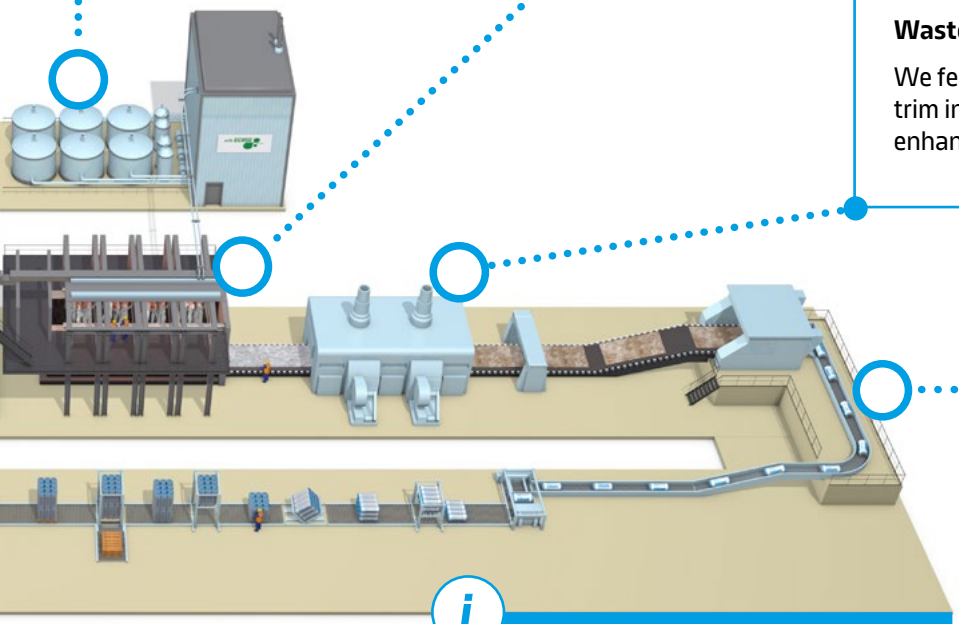
ECOSE® is made from rapidly renewable sources and is up to 70% lower in upfront carbon emissions than traditional binders. Reducing the embodied carbon of our binder reduces the embodied carbon of our insulation products as a whole.

TwinTech® forming

Our TwinTech® dual forming technology allows us to create double-thickness products, ready for evolving building regulations, while reducing costs and embodied carbon.

Waste reduction

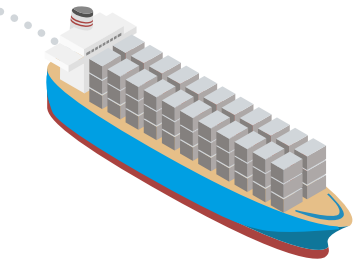
We feed back insulation off-cuts and edge trim into the process, minimising waste and enhancing resource efficiency.



Compression packaging

Our advanced compression technology reduces the volume of our packaged insulation by up to 90%. This enables us to transport more product per truck, reducing our own transport emissions, as well as for our customers and supply chain.

All products are manufactured in accordance with **ISO9001, ISO14001, ISO50001.**



100% renewable electricity

All the electricity used at our manufacturing facility is sourced from renewable energy, reducing our carbon footprint.

Water conservation

We capture rainwater to use as wash water throughout our facility, significantly reducing the need for water from external sources.

Sustainable insulation

A unique combination of ingredients, technology and packaging go into creating our high performance, sustainable insulation.

Recycled glass

Our insulation fibres are crafted with up to 80% recycled glass, supporting resource efficiency and circularity, while reducing waste.

Plant-based binder: ECOSE®

Our unique plant-based binder ECOSE®, cuts upfront carbon emissions by up to 70% compared to the formaldehyde-based alternatives used in traditional glasswool products, offering a lower carbon, healthier choice.

Trapped air

Our glasswool products use trapped air, Earth's best natural insulator, to achieve thermal performance without harmful blowing agents like HFC-134a, which has a GWP 1,430 times higher than carbon dioxide.

Global GreenTag^{CertTM} certified

With Global GreenTag^{CertTM} GreenRate^{TM} Level A certification, our products meet rigorous standards for sustainable building, reflecting our commitment to environmental responsibility.

Eurofins Gold certified for Indoor Air Comfort

Our products hold the Eurofins Gold Certificate for Indoor Air Comfort, promoting healthier indoor environments.

DriTherm® Technology

Our DriTherm® Technology, available in many regions, provides moisture-repellent protection designed to withstand high humidity and ensure long-lasting performance and durability.

Compression packaging

Our products are designed for compression during transport and expand to full thickness once unpacked. This reduces shipping volume and transport emissions.

Naturally non-combustible

Because our glasswool is naturally non-combustible, it doesn't require toxic fire retardants. This provides enhanced fire safety without the potentially harmful additives.

EUCEB certified as bio-soluble

Certified by EUCEB, our fibres are bio-soluble and safe to use. Our insulation is designed with both safety and performance in mind.

Red List Free certification

Our products are free from harmful ingredients on the International Living Future Institute's DECLARE 'Red List'. Every ingredient in our unfaced products is disclosed on our Declare label, for full transparency.

Your partner for better buildings

Knauf Insulation is part of the Knauf Group,
a family-owned, multi-national manufacturer of building materials and construction systems.

+6,000
employees worldwide

28
manufacturing sites & offices

+40
countries

With more than 45 years of experience, we exist to create better buildings. We do this by working in partnership with designers, contractors, merchants, policymakers and others to drive higher standards across the construction industry.

We're committed to continuous improvement in all areas of sustainability and have been working with our strategy 'For A Better World' for a number of years. We've set clear goals to help our customers deliver better buildings that are energy-efficient, lower carbon, healthier and that support a circular economy.

By 2032 we aim to reduce our scope 1 & 2 carbon emissions by 50% and scope 3 emissions by 30%. And we aim to be net zero by 2045.

To ensure our customers reap the benefits of this work, we provide product-specific Environmental Product Declarations, produced to the latest EN15804 +A2 standard. The transparent reporting allows specifiers to easily understand the environmental impact of individual products and make informed decisions to support the sustainability of their builds.

Sustainability is only part of a bigger picture.

All over the world, regulations are setting new standards for comfort, safety and longevity too. Better buildings must achieve complex, multi-faceted performance, in sustainable ways.

In a world that demands more, you need solutions that deliver it. **It's time for insulation without compromise.**

See our sustainability strategy **For A Better World**

Take our training **'Embodied Carbon: How to identify and minimise the impact of materials without compromising system performance'**

Questions about a product? Want to discuss your project?
Speak to your local Knauf Insulation representative

KNAUFINSULATION

INSULATION WITHOUT COMPROMISE

The world demands more from buildings. You should demand more too.

Insist on insulation without compromise.

Products that do more while using less.
Not just thermal comfort, but contributing to fire safety, sustainability, environmental health and peace and quiet too.

The complete package.
Not just high-performance products, but a service offering that supports every stage to make quality construction easier.

Global expertise, delivered locally.
The best of insulation innovation, but customised to specific country and customer needs.

For insulation without compromise, choose Knauf Insulation.

Build on us.

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Build on us.