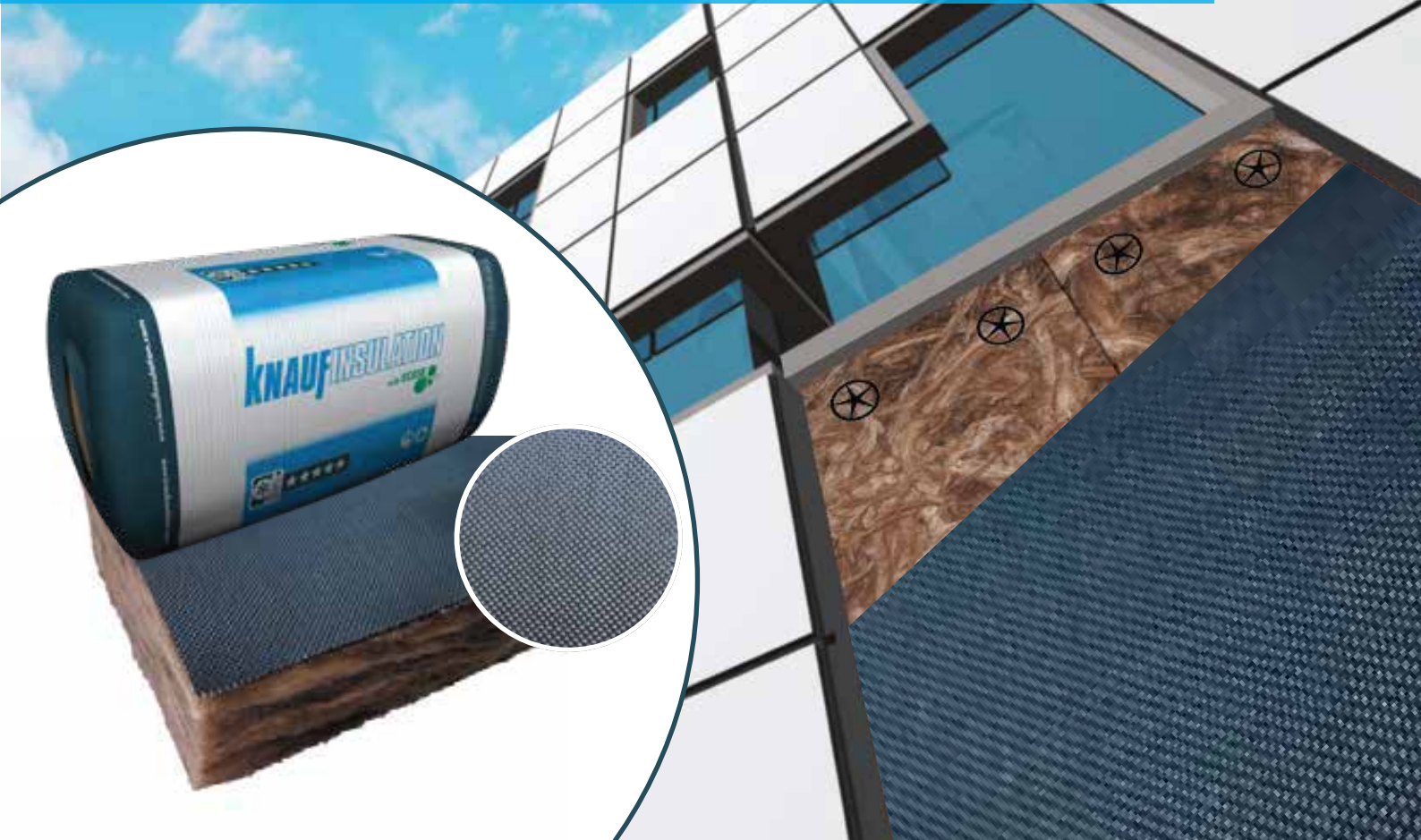


Smart Façade

A range of non-combustible moisture resistant external insulation for Ventilated Façades



Non-combustible



Thermal performance



Acoustic performance



Moisture resistant



Wind wash protection

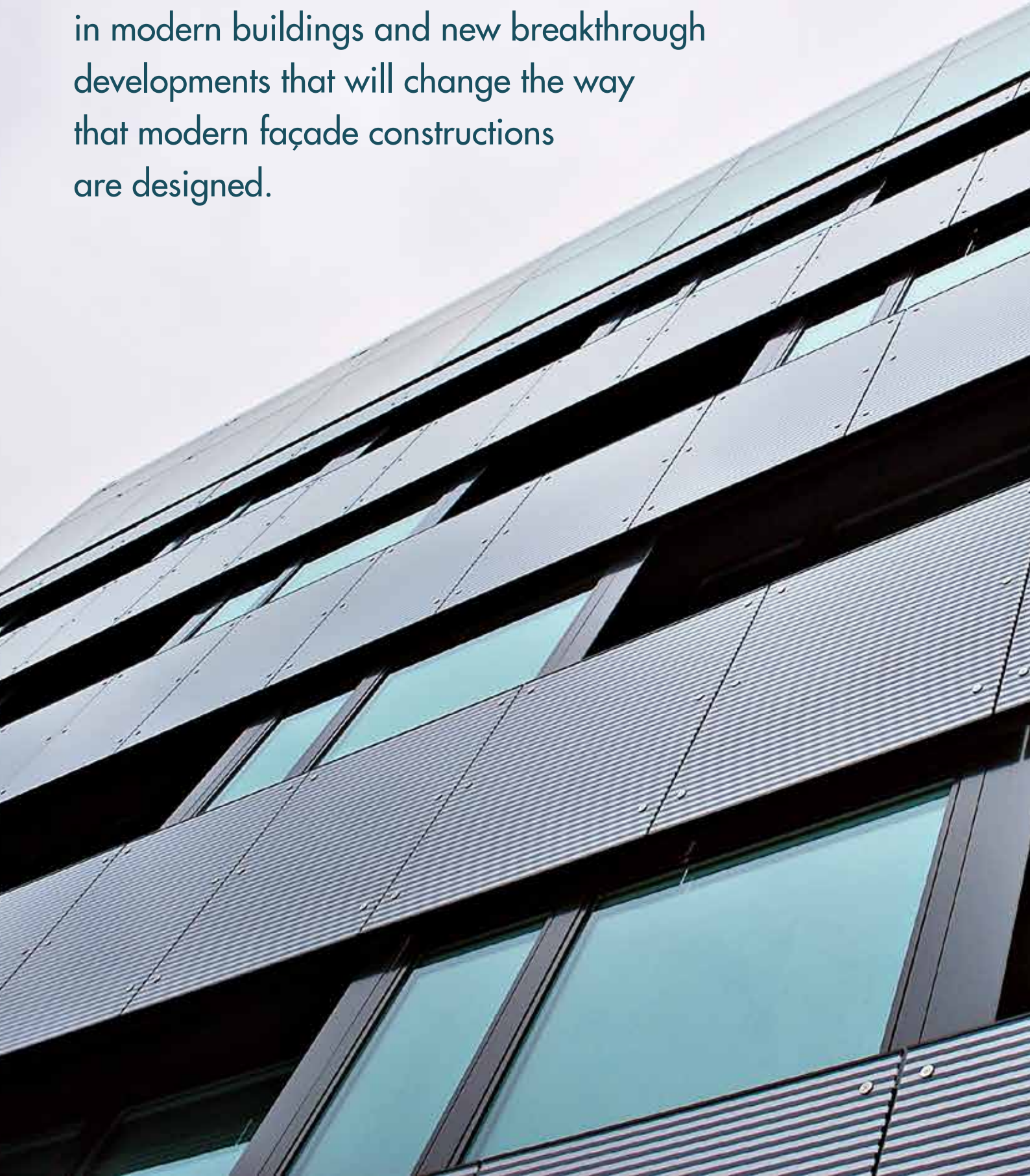
challenge.
create.
care.

TABLE OF CONTENTS

PAGE 10	The importance of Façades in buildings	
	Protecting occupants from weather elements	2
	Why your next project should have a Ventilated Façade?	3
	Thermal and Acoustic Performance	3
PAGE 10	The evolution of façade design	
	Solid masonry	10
	Masonry cavity	10
	Introduction of outside rendered insulation	10
	Lightweight structures with foam insulation	10
	Lightweight structures with rock wool insulation	10
	Lightweight structures with glass wool insulation	10
Ventilated Façade with SmartFaçade insulation	10	
PAGE 10	Introduction of SmartFaçade for modern buildings	
	Over 40 years of global insulation experience	10
	Introduction of game changing product design	10
PAGE 10	New Zealand building regulations for Façade	
	Durability	10
	Fire	10
	Acoustic	10
	Energy Efficiency and Environmental	10
	Moisture	10
PAGE 10	Market leading performance for Façades	
	SmartFaçade product range	10
	Features and benefits of SmartFaçade	10
	Product comparison	10
	Thermal performance	10
	Fire performance	10
	Acoustic performance	10
	Durability and moisture resistance	10
	Sustainability credentials	10
	A Cost-effective solution	10
	Benefits for installers	10
	Compression packaging	10
	Low maintenance	10
	Accreditation and compliance	10
	Warranty	10
	Case studies for SmartFaçade	10
	Installation summary	10

Smart Façade

This brochure will provide a history of Façade building designs, the importance of Ventilated Façades in modern buildings and new breakthrough developments that will change the way that modern façade constructions are designed.





THE IMPORTANCE OF FAÇADES IN BUILDINGS

In New Zealand and around the world, the construction of buildings continues to evolve progressively and façades play an important role in the holistic design of contemporary developments. The design of building façades has matured over time and a new type of façade has emerged as the clear frontrunner to replace standard exterior facings that surround the outside of a building, this is known as Ventilated Façade.

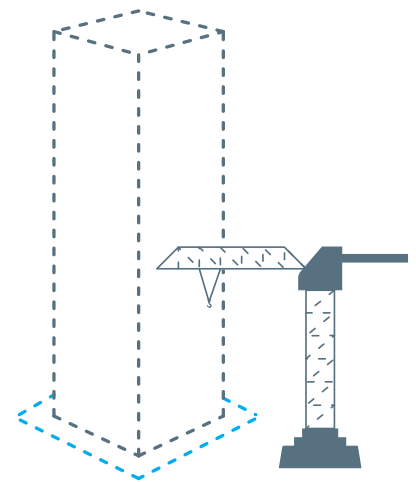
Ventilated façade is a type of façade system where cladding stands off the weathertight substrate to create a gap and to allow drainage and evaporation. Integrating a Ventilated Façade successfully into the design of a building will convey an elegant and modern feel to the architecture and more importantly, when fitted with the correct insulation will deliver real functional performance.

Installing the correct thermal insulation in the Ventilated Façade system will protect occupants from external weather elements, reduce noise disturbance, increase internal comfort and futureproof the building with a sustainable and energy efficient design.

Protecting occupants from weather elements

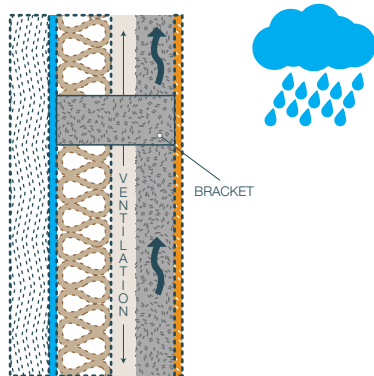
Ventilated Façade systems play a critical role in modern buildings by creating a thermal shell that insulates occupants from the external elements outside. Designing a Ventilated Façade system with suitable external insulation will help keep internal temperatures stable and at comfortable levels.

External insulation also assists in avoiding cold spots in construction and therefore preventing potential negative effects like condensation and mold growth.



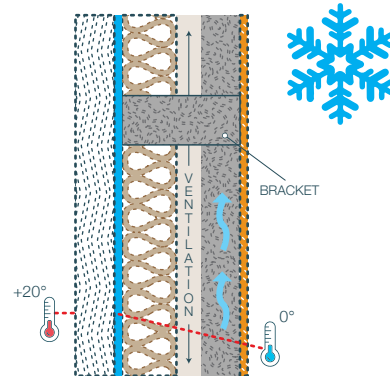
Why your next project should have a Ventilated Façade?

In order to design a Ventilated Façade system that can adequately protect occupants against the weather elements and fire hazards, it is important to choose the right type of insulation.



Water Proofing

Water/weather proof building from external conditions allows any condensation and moisture to drain out.



Thermal Insulation (Cold)

Thermally insulate building from external side reduces heat loss and improves indoor climate temperature.

COMPONENTS:



Dry wall



Insulation



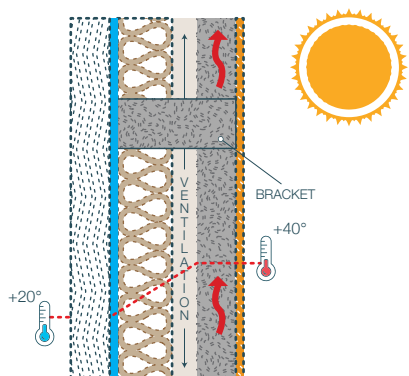
Vertical profile



Façade cladding

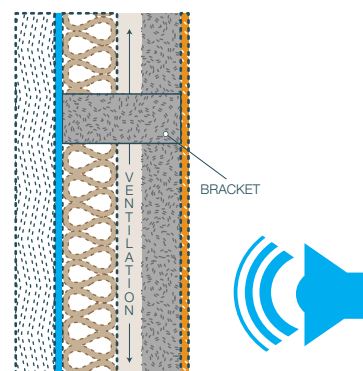
Thermal and Acoustic Performance

Installing Smart Façade improves the thermal performance of the building, reduces the transmission of external noise, provides a barrier to moisture and increases energy savings.



Thermal Insulation (Heat)

In hot climates keeps indoor environment cool and block heat in outside by providing separate layers which don't conduct directly solar gains.



Sound Insulation

By separating external cladding from load bearing structure the airborne noise is efficiently blocked.

THE EVOLUTION OF FAÇADE DESIGN

Lowering energy use

Addressing energy efficiency in buildings is becoming an increasingly important design consideration due to the multiple benefits it provides for occupants and the environment.



Increasing energy efficiency in buildings will provide energy savings that ultimately save building owners and tenant's money on their power bills.

A good level of thermally efficient insulation will store heat in winter and reduce solar gain in summer.

! It is estimated that up to 35% of heat transference occurs through the walls. Correctly applying external insulation is a cost effective way of reducing thermal bridging in the ventilated façade system, which leads to an increase in the building's energy efficiency.

Lowering energy use in buildings also has the environmental benefit of reducing carbon emissions through the reduced need for space heating.

The use of environmentally friendly materials also ensures a sustainable use of natural resources.

Low maintenance and high durability

Ventilated Façade systems play a critical role in modern buildings by creating a thermal shell that insulates occupants from the external elements.



Designing a Ventilated Façade system with suitable external insulation will help keep internal temperatures stable and at comfortable levels.

External insulation also assists in avoiding cold spots in construction and therefore preventing potential negative effects like condensation and mold growth.



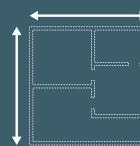
Multiple possibilities of aesthetic finishes



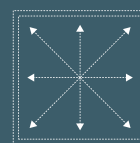
Additional long-term protection of external wall



Reduction of disturbance during building/renovation/recladding



More living area



Insulating from the outside preserves living space

Addressing energy efficiency in buildings is becoming an increasingly important design consideration due to.



Solid Masonry



Masonry with rendered insulation



Lightweight structures with foam insulation



Lightweight structures with rock wool insulation



Lightweight structures with glass wool insulation



Ventilated Façade with SmartFaçade Insulation



INTRODUCTION OF SMART FAÇADE FOR MODERN BUILDINGS

Smart Façade is an innovative range of non-combustible insulation that has been engineered to perform specifically in Ventilated Façade systems. Smart Façade is suitable for insulating new and existing buildings.

As building designs have progressed to be more efficient and aesthetically appealing, construction regulations have also become more stringent. Architects, Specifiers and Builders can now select insulation with confidence, as SmartFaçade offers the premium Ventilated Façade solution, optimised to deliver superior thermal, fire and environmental performance.

Ventilated façade can be defined as a two-step protection system from the elements.

STEP 1 The First layer of defense is the cladding, which will reflect most of the rain and wind.

STEP 2 The second layer of defense is the weathertight surface, which stops any external moisture penetrating through to the building.

A good Ventilated façade system will incorporate external insulation, fitted between the cladding and weather tight sheathing, essentially snugging the building in a thermal layer like a well-fitted jacket.

The Smart Façade range includes 50mm, 75mm and 100mm slabs that are lined with a black woven glass veil that provides an additional barrier to external conditions. The thermal performance of the insulation has a lambda of 0.032W/mK. Furthermore, Smart Façade is made using ECOSE® Technology, a revolutionary bio-based binder that is made with no added phenols or formaldehyde.

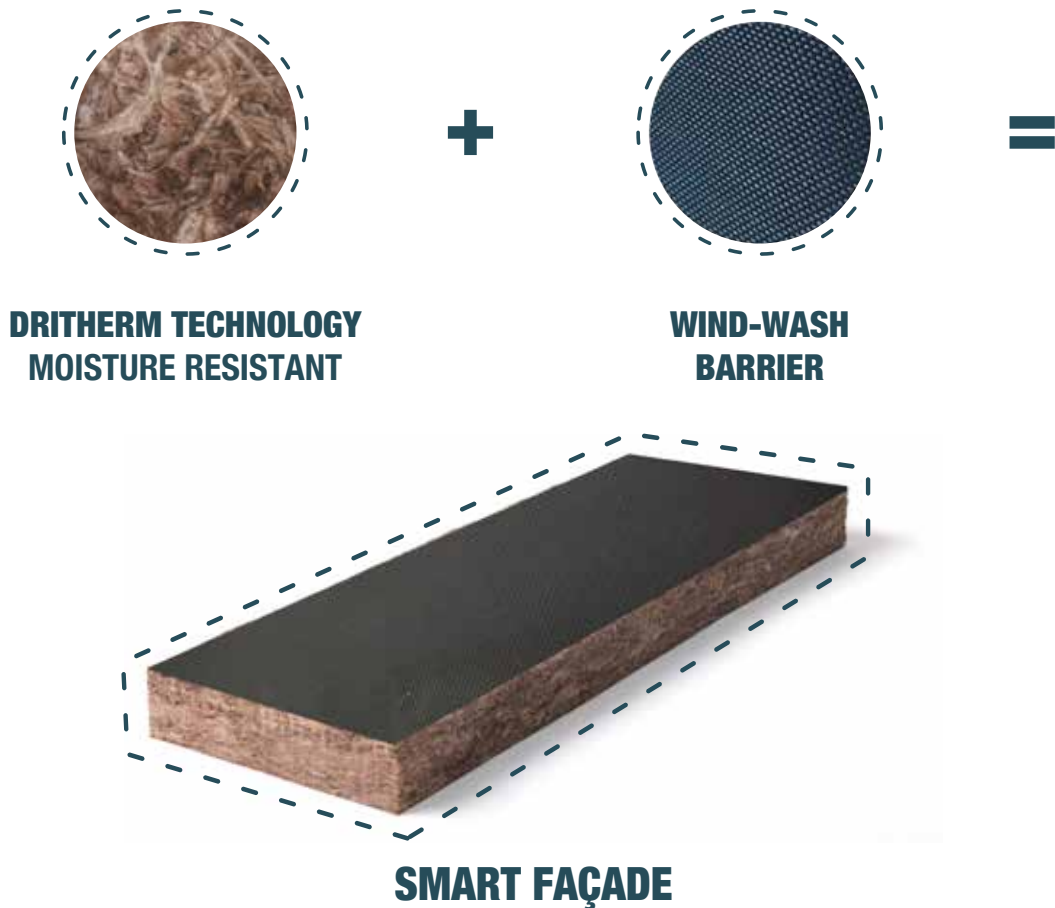


- 1 STRUCTURAL WALL
- 2 MOISTURE RESISTANT, VAPOUR OPEN, NON-COMBUSTIBLE INSULATION
- 3 VENTILATION CAVITY
- 4 INSULATION FIXINGS
- 5 CLADDING

Introducing Game Changing Product Design

The creation of Smart Façade follows two years of extensive research at Knauf Insulations high quality testing facilities. While Smart Façade has all of the features and benefits that you would expect to see from a Knauf Insulation product (soft, non-combustible, ECOSE®), Smart Façade also boasts new breakthrough engineering design features, including a unique Wind-Wash Barrier and DriTherm® Technology.

These technological advancements provide Smart Façade a unique advantage over traditional forms of external insulation, earning Smart Façade some of the highest accolades in independent product certification (BRANZ and Codemark logos).



The woven black veil fabric facing is a hallmark of Smart Façade's unique design better known as a 'wind-wash' barrier'. The Wind-Wash barrier provides protection against windy conditions and air movement in the Ventilated Façade system, thus providing additional protection from the elements. The Woven Veil Facing also provides additional moisture resistance.

! Independent BRANZ research demonstrates that a wind-wash barrier (or insulation facing) will significantly improve the in-situ performance of external insulation.

DriTherm® Technology is Knauf Insulations unique manufacturing process of applying silicone treatment to the insulation. DriTherm® Technology provides Smart Façade with a high level water repellency properties which increase moisture resistance and enhances the products durability in the Ventilated Façade system. The game changing product design makes Smart Façade the superior solution for all cladding systems.



KNAUFINSULATION

Over 40 years of Insulation Experience

Knauf Insulation is part of the Knauf Group (established in 1932), a global leader in the manufacture of building products. With over 40 years of experience in the insulation industry, Knauf Insulation represents one of the most respected names in insulation worldwide. Knauf Insulation operates large-scale mineral wool insulation factories in Europe, North America and more recently, have launched a brand new state-of-the-art manufacturing plant in the Asia Pacific region.

Knauf Insulation has a successful record of accomplishment in the creation of research and development programs that have significantly increased production efficiencies and sustainability in the global insulation industry. In 2009, Knauf Insulation developed a revolutionary binder with no added formaldehyde called ECOSE® Technology. The launch of ECOSE® marked a step change for the construction industry and has continuously won awards for its outstanding sustainability credentials ever since.

The company continued to provide ground-breaking innovation with Knauf Insulation's Next Generation Melting technology (a more sustainable way of melting glass) and enhanced compression technology (to reduce transport emissions).

Throughout the years of experience, Knauf Insulation has built specialised testing facilities and established new product development programs that focus on the commercial imperative of creating premium products that cater to the local market requirements for every application.

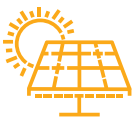
FOR A BETTER WORLD

Knauf Insulation **have always been defined by sustainability.** Knauf Insulation products save energy, cut emissions and are designed to make sure buildings are good for the environment and keep people healthy, safe and well.

The company has **been working on three pillars of sustainability for over a decade.** The focus has been on zero harm, reducing energy use and emissions, recycling production waste, incorporating circular economy principles and constantly campaigning for better and more sustainable buildings.

OUR 2010 TO 2020 HIGHLIGHTS

ENERGY AND RELATED EMISSIONS



↓ **22.7%**
Reduction in energy use

↓ **23.2%**
Reduction in related

SAFETY



Lost Time Accidents reduced by

↓ **56%**

Despite manufacturing output achieving record levels during the past decade, we have continued to reduce our environmental impact per cubic metre of product.

WASTE



Waste to landfill reduced by

↓ **67.3%**

NO_x



NO_x reduced by

↓ **42.7%**

WATER USE



↓ **39.8%**

80.7%

Despite manufacturing output achieving record levels during the decade of 2010 – 2020, Knauf Insulation continued to reduce the environmental impact per cubic metre of product, **but sustainability is a process of continuous improvement.** To build on the track record of success and **do more for people and our environment, in 2020** Knauf insulation unveiled a new sustainability strategy 'For A Better World' to build on the success of the companies mission statement "Our vision is to lead the change in smarter insulation solutions for a better world."

Knauf Insulation is on a mission to decarbonise its manufacturing plants to meet its long-term commitment to deliver net zero embodied carbon products and solutions. Alongside long-term goals Knauf Insulation have taken a leadership position and created **2025 targets** that can be achieved in the short term. The aim is to cut the embodied carbon of insulation products by 15% by 2025. Embodied carbon is the CO₂ generated at every stage of an insulation products' life cycle.

Tackling embodied carbon means examining every stage of the product life cycle including raw material (such as binder, recycled content and supply chains); manufacturing processes (melting and fiberising); packaging and distribution (compression, plastic use, plant allocation and delivery) and circular economy (production offcuts and recycling construction scrap and demolition waste).

BUILDING REGULATIONS FOR FAÇADE IN NEW ZEALAND



Durability

Confirming the use of materials that will remain functional for the minimum periods specified (5, 15 or ≥ 50 years).

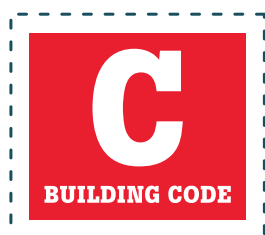
B2 Durability must always be considered when demonstrating compliance with each of the clauses of the Building Code. In other words, it ensures that a building will continue to satisfy the performance of the Building Code throughout its specified intended life.

Under the clause, building materials, components and construction methods are required to be sufficiently durable. They must ensure that the building, without reconstruction or major renovation, continues to satisfy the other functional requirements of the Building Code throughout its life. B2 specifies minimum durability periods building elements must meet with only normal maintenance, being not less than 50, 15 or 5 years.

Smart Façade insulation has been specifically developed to meet building regulations' requirements. Smart Façade if designed, used, installed and maintained in accordance with design and installation guidelines will meet the following provisions of the NZBC:

Clause B2 DURABILITY: Smart Façade insulation products will meet these requirements.

Smart Façade will continue to satisfy the performance of the Building Code throughout its specified intended life.



Fire

C Protection from Fire

Safety objectives for people, other property and firefighting applied to clauses C2 to C6 of the Building Code.

This clause provides objectives that apply to clauses C2 to C6 to:

- (a) safeguard people from an unacceptable risk of injury or illness caused by fire,
- (b) protect other property from damage caused by fire, and
- (c) facilitate firefighting and rescue operations.

SCAN FOR MORE INFORMATION RELATING TO
NON-COMBUSTIBLE EXTERNAL CLADDING:



Clause C/AS2 PROTECTION FROM FIRE: Smart Façade insulation products are not combustible building materials and will contribute to meeting this requirement.

Smart Façade is classified as A1 in accordance with BS EN 13501-1.



Energy Efficiency and Environmental

Provides for the efficient use of energy and sets physical conditions for energy performance. This clause requires housing to meet a building performance index (BPI) not exceeding 1.55 (this is defined in the Verification Method and Acceptable Solution).

It requires enclosed spaces where temperature or humidity are modified to provide adequate thermal resistance and to limit uncontrollable airflow in certain buildings. It also sets out physical conditions likely to affect energy performance, and requirements for hot water systems, artificial lighting and HVAC systems.

Smart Façade insulation products will contribute to meeting these requirements. SmartFaçade offers a range of thicknesses, R-values and thermal conductivities that assist in meeting and exceeding the Building Code requirements.

Additionally Smart Façade will assist in meeting environmental noise (noise heard from outside) requirements addressed in the Resource Management Act 1991 (RMA) in conjunction with the Health Act 1956. Smart Façade insulation provides excellent sound reduction properties.



Moisture

E2 External moisture

External roof, wall claddings and external openings will prevent external moisture from causing undue dampness or damage. This clause requires buildings to be constructed to provide adequate resistance to penetration by, and the accumulation of, moisture from the outside. It contains requirements for roofs, wall claddings and external openings to:

- Prevent water entry
- Prevent water absorption and transmission
- Prevent the accumulation of water allow for dissipation.

E3 Internal moisture

Surfaces in wet areas must be impervious, easily cleaned, and have ventilation to meet conditions for health and safety. This Building Code clause requires buildings to be constructed to avoid fungal growth and excessive moisture. Its provisions relate to habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or accumulate. Its requirements include provisions for:







- Adequate thermal resistance
- Ventilation
- Surfaces to be impervious and easily cleaned.
- Space temperature
- Disposal of overflow water

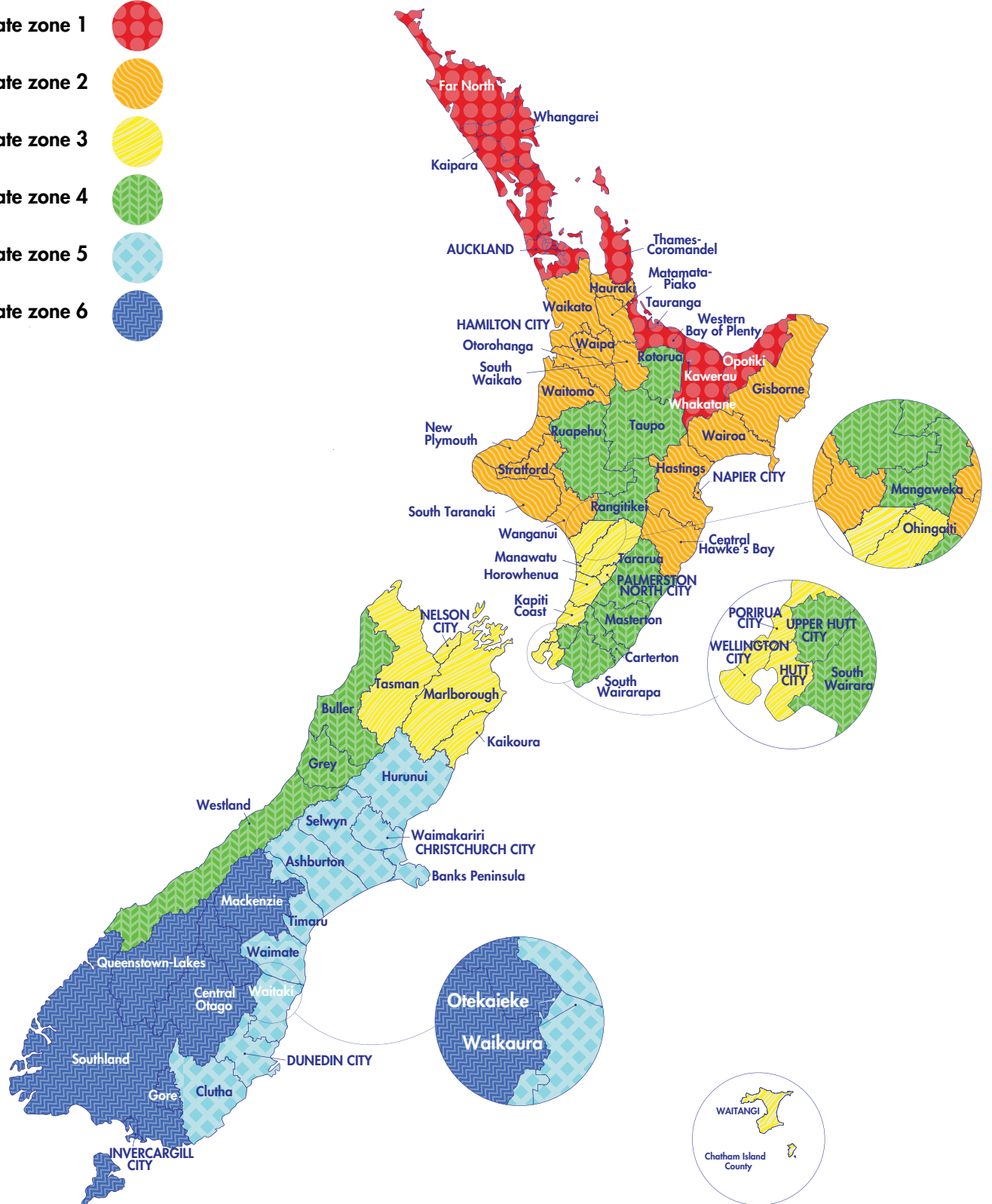


Clauses E2 EXTERNAL and E3 INTERNAL MOISTURE: Smart Façade insulation products will contribute to meeting these requirements by:

Not absorbing water, allowing for water dissipation when used in ventilated cavity and contributing to maintaining thermal resistance.

DETAILED REQUIREMENTS: H1 ENERGY EFFICIENCY

- Climate zone 1 
- Climate zone 2 
- Climate zone 3 
- Climate zone 4 
- Climate zone 5 
- Climate zone 6 



Acceptable Solution H1/AS1

Energy efficiency for all housing, and buildings up to 300m²

Minimum construction R-values for heated ceilings, walls or floors

Building element	Construction R-values (m ² · K/W) ^{(1),(2),(3)}					
	Climate zone 1	Climate zone 2	Climate zone 3	Climate zone 4	Climate zone 5	Climate zone 6
Heated ceiling ⁽⁴⁾	R6.6	R6.6	R6.6	R6.6	R6.6	R6.6
Heated wall	R2.9	R2.9	R2.9	R2.9	R2.9	R2.9
Heated floor	R2.5	R2.5	R2.5	R2.8	R3.0	R3.0

Notes:

- (1) $R_{sp}/R\text{-value} < 0.1$ and R_{sp} is the thermal resistance between the heated plane and the inside air.
- (2) Floor coverings, for example carpet or cork, will reduce the efficiency of the heated floor.
- (3) Climate zone boundaries are shown in Appendix C.
- (4) In roofs with a roof space, where the insulation is installed over a horizontal ceiling, the roof R-value may be reduced to R3.3 for a distance of up to 500 mm from the outer edge of the ceiling perimeter where space restrictions do not allow full-thickness insulation to be installed.

Minimum construction R-values for building elements that do not contain embedded heating systems

Building element	Construction R-values (m ² · K/W) ⁽¹⁾					
	Climate zone 1	Climate zone 2	Climate zone 3	Climate zone 4	Climate zone 5	Climate zone 6
Roof ⁽²⁾	R6.6	R6.6	R6.6	R6.6	R6.6	R6.6
Wall	R2.0	R2.0	R2.0	R2.0	R2.0	R2.0
Floor (slab-on-ground floors)	R1.5	R1.5	R1.5	R1.5	R1.5	R1.5
Floors (other than slab-on-ground floors)	R2.5	R2.5	R2.5	R2.8	R3.0	R3.0
Windows and doors ⁽³⁾	R0.46 ⁽³⁾	R0.46 ⁽³⁾	R0.46	R0.46	R0.50	R0.50
Skylights	R0.46	R0.46	R0.54	R0.54	R0.62	R0.62

Notes:

- (1) Climate zone boundaries are shown in Appendix C.
- (2) In roofs with a roof space, where the insulation is installed over a horizontal ceiling, the roof R-value may be reduced to R3.3 for a distance of up to 500 mm from the outer edge of the ceiling perimeter where space restrictions do not allow the full-thickness of insulation to be installed.
- (3) For building consent applications submitted before 2 November 2023, the minimum construction R-values for windows and doors in climate zones 1 and 2 are permitted to be reduced to R0.37 m²·K/W.

Acceptable Solution H1/AS2

Energy efficiency for all housing, and buildings up to 300m²

Minimum construction R-values for heated roofs, walls or floors

Building element	Construction R-values (m ² · K/W) ^{(1),(2),(3)}					
	Climate zone 1	Climate zone 2	Climate zone 3	Climate zone 4	Climate zone 5	Climate zone 6
Heated roof ⁽⁴⁾	R6.6	R6.6	R6.6	R6.6	R6.6	R7.0
Heated wall	R2.9	R2.9	R3.0	R3.2	R3.4	R3.6
Heated floor	R2.9	R2.9	R2.9	R3.0	R3.2	R3.4

Notes:

- (1) $R_{sp}/R\text{-value} < 0.1$ and R_{sp} is the thermal resistance between the heated plane and the inside air.
- (2) Floor coverings, for example carpet or cork, will reduce the efficiency of the heated floor.
- (3) Climate zone boundaries are shown in Appendix C.
- (4) In roofs with a roof space, where the insulation is installed over a horizontal ceiling, the roof R-value may be reduced to R3.3 for a distance of up to 500 mm from the outer edge of the ceiling perimeter where space restrictions do not allow full-thickness insulation to be installed.

Minimum construction R-values for building elements that do not contain embedded heating systems

Building element	Construction R-values (m ² · K/W) ⁽¹⁾					
	Climate zone 1	Climate zone 2	Climate zone 3	Climate zone 4	Climate zone 5	Climate zone 6
Roof ⁽²⁾	R3.5	R4.0	R5.0	R5.4	R6.0	R7.0
Wall	R2.2	R2.4	R2.7	R3.0	R3.0	R3.2
Floor	R2.2	R2.2	R2.2	R2.4	R2.5	R2.6
Windows and doors ⁽³⁾	R0.33	R0.33	R0.37	R0.37	R0.40	R0.42
Skylights	R0.42	R0.42	R0.46	R0.46	R0.49	R0.51

Notes:

- (1) Climate zone boundaries are shown in Appendix C.
- (2) In roofs with a roof space, where the insulation is installed over a horizontal ceiling, the roof R-value may be reduced to R3.3 for a distance of up to 500mm from the outer edge of the ceiling perimeter where space restrictions do not allow full-thickness insulation to be installed.

MARKET LEADING PERFORMANCE FOR FAÇADES

Smart Façade product range

R-value/ Thermal Resistance	Nominal Density (kg/m ³)	Thickness (mm)	Width (mm)	Length (mm)	Area per Pack (m ²)	Pieces per Pack	Packs per MasterBag	Facing	Water Repellency
R1.6	38.0	50	600	1,200	6.5	9	4	Woven Glass Veil	Silicone
R2.3	38.0	75	600	1,200	4.3	6	4	Woven Glass Veil	Silicone
R3.1	38.0	100	600	1,200	3.6	5	4	Woven Glass Veil	Silicone

Smart Façade R-Value per Systems

Smart Façade/R-value	Thickness (mm)	Masonry substrate construction	Steel or Timber framing with sarking	Cross laminated timber substrate
R1.6	50	R1.9	R4.1	R1.9
R2.3	75	R2.6	R4.8	R2.6
R3.1	100	R3.4	R5.6	R3.4



Low maintenance

- Moisture resistant
- Durable
- Fit and forget
- Does not support fungal growth
- Does not sustain vermin or insects



Freedom of creative design

- Compatible with all types of cladding
- Cost-effective solution
- Aesthetically pleasing finish
- Lightweight, requires minimal fixings



Energy efficient buildings

- Reduced thermal bridging
- High thermal performance - 0.032 W/mK
- Reduce space heating
- Saves money on your power bill



Healthy and comfort

- ECOSE® Technology - no added formaldehyde
- Protection from external elements
- EUCED certified bio-soluble fibre
- EUROFINs certified/Low VOC



Sustainability

- Made from recycled glass bottles
- Reduces carbon emissions
- Compression packed, reducing transport emissions
- Full Life cycle analysis conducted. Environmental Product Declaration (EPD) available for download



Performance

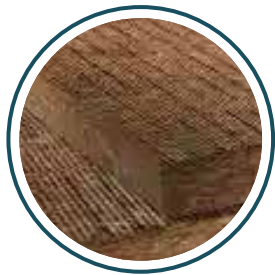
- High thermal performance
- High acoustic performance
- Wind-wash barrier
- Non-combustible (Euroclass A1 and NZ Group 1)
- UV protected
- Vapour permeable

Product Comparison

How does Smart Façade compare to other types of insulation?



GLASS MINERAL WOOL		
THERMAL PERFORMANCE W/(m·K)	Lambda 0.032	✓
FIRE PERFORMANCE	A1 Non-combustible	✓
ACOUSTIC PERFORMANCE	Top in its class	✓
EASE OF INSTALLATION	Easy/more resilient*	✓
SUSTAINABILITY	Made with ECOSE Technology binder	✓
COST	\$	✓
SUITABILITY FOR VENTILATED FACADES	Suitable	✓



ROCK MINERAL WOOL		
THERMAL PERFORMANCE W/(m·K)	Lambda 0.032–0.050	✓
FIRE PERFORMANCE	A1 Non-combustible	✓
ACOUSTIC PERFORMANCE	Good acoustic absorber	✓
EASE OF INSTALLATION	Prone to damage	—
SUSTAINABILITY	Traditionally includes formaldehyde binder	—
COST	\$\$	—
SUITABILITY FOR VENTILATED FACADES	Suitable	✓



PIR (BOARDS)		
THERMAL PERFORMANCE W/(m·K)	Lambda 0.031–0.045	✓
FIRE PERFORMANCE	Cs2-d0 to F	✗
ACOUSTIC PERFORMANCE	Poor sound absorption	✗
EASE OF INSTALLATION	Difficult to install without gaps	✗
SUSTAINABILITY	Derived from petrochemicals	✗
COST	\$\$\$	✗
SUITABILITY FOR VENTILATED FACADES	Possible	—

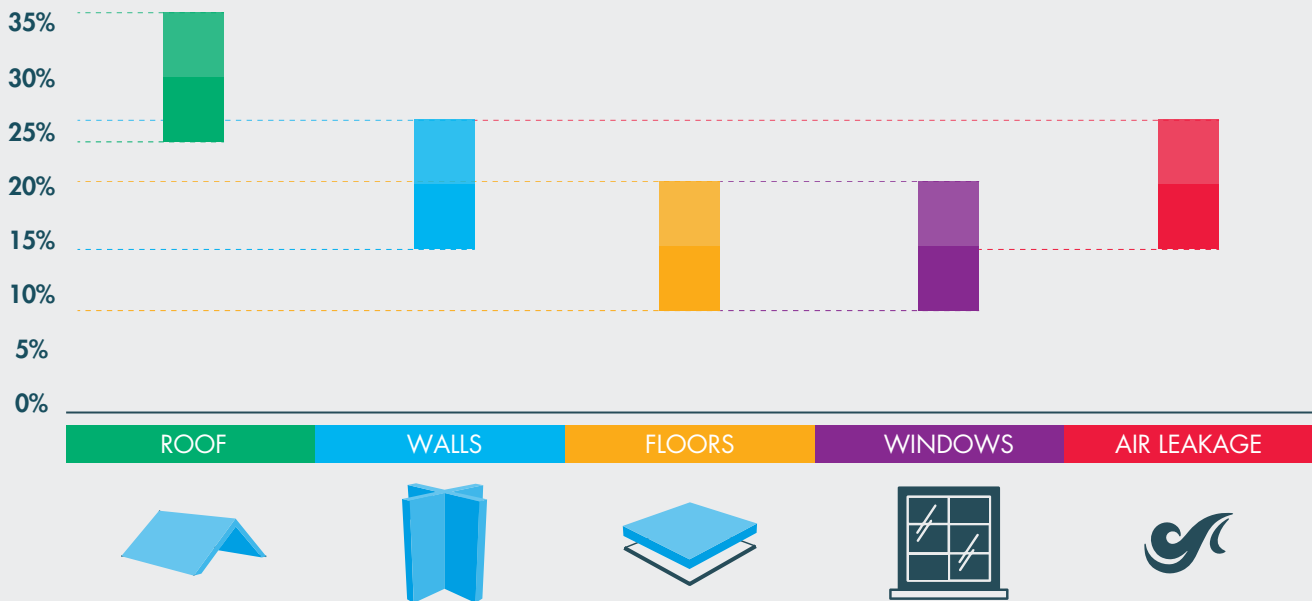


EPS AND XPS		
THERMAL PERFORMANCE W/(m·K)	Lambda 0.031–0.045	✓
FIRE PERFORMANCE	D - F	✗
ACOUSTIC PERFORMANCE	Poor sound absorption	✗
EASE OF INSTALLATION	Difficult to install without gaps	✗
SUSTAINABILITY	Unsustainable	✗
COST	\$\$	—
SUITABILITY FOR VENTILATED FACADES	Not suitable (due to fire risk)	✗

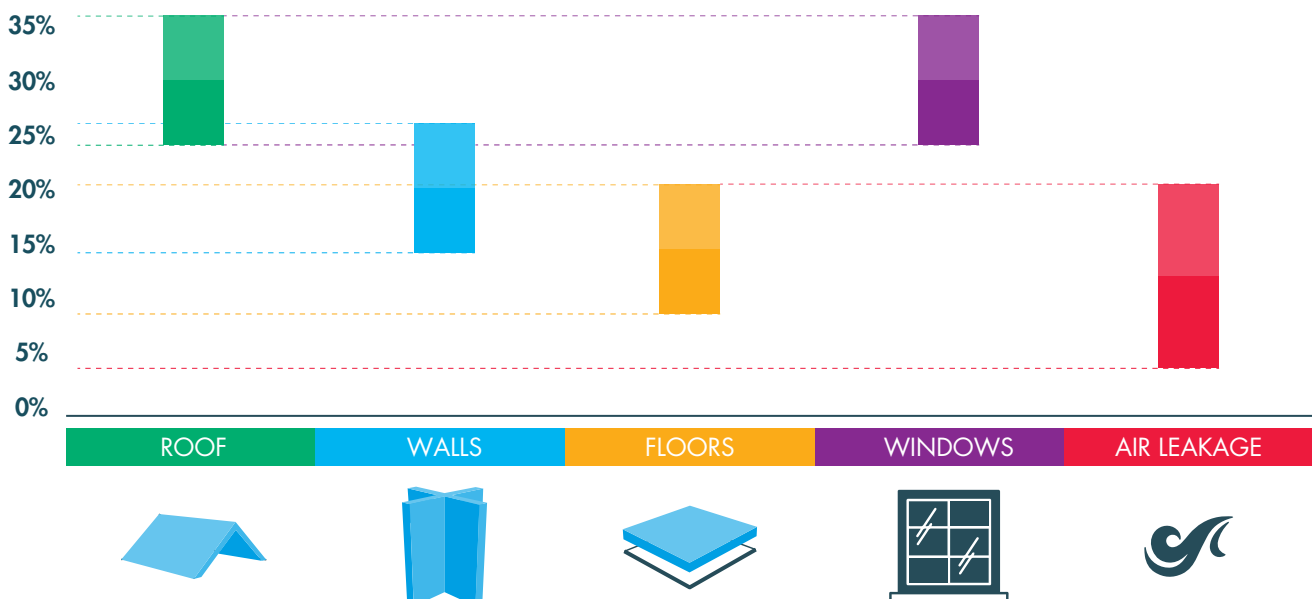
Not all insulation is created equal

Smart Façade has been engineered with inherent in-situ performance due to slabs “knitting” together and therefore less chance of air gaps than rigid PU/PIR/Phenolic boards. The unique wind-wash barrier is designed to protect against UV, moisture and drafting, to maintain the integrity of the insulations superior thermal performance.

Winter heat loss ❄️



Summer heat gain ☀️



Designed to Perform: Thermal

Smart Façade has been specifically developed to improve thermal efficiency of buildings.

Smart Façade is a super high density glass mineral wool which is characterised by low thermal conductivity of 0.032W/(mK).

This makes Smart Façade one of the best thermally performing insulation materials available in modern construction.

Smart Façade is made with a water-repellent additive which means it will maintain its integrity and thermal performance even in the rainy conditions.

Water repellency is a crucial feature in Smart Façade design and it is what makes it a preferred choice for architects and façade engineers.

Thermal Testing

Thermal insulation materials for buildings must comply with AS/NZS 4859.1:2018. This standard provides general criteria, technical provisions and methods of test for materials that are used for thermal insulation within buildings.

Designers, architects, energy assessors and builders need to make sure that products are fit for purpose and meet the requirements of the Standard including declared R-values which are assessed in a very strict process.

Additionally specific information must be contained on the label like nominal thickness of the product, its weight, location of the manufacturing plant and the relevant temperature for the declared thermal values (15°C for New Zealand).

Smart Façade complies with AS/NZS 4859.1:2018 to a mean temperature of 15°C.





Fire Performance

Over the course of the last decade, Buildings and fire safety have made headlines around the world with a number of high profile incidents where insulation materials have been the cause of building fires around the world, including Australia. After every blaze, with depressing regularity, the same questions are raised.

? Why was the building at risk?

? Were fire tests sufficient?

? Was workmanship to blame?

? How can we stop this happening again?

The lessons learnt from previous experiences encourage us to consider fire risk at the earliest stages of any building design. The use of non-combustible materials firstly reduces the possibilities of a fire occurring and secondly prevents fire spreading, keeping fire risk at a minimum.

Ventilated Façades are characterised by the thermal advantages provided by the natural circulation of air in the cavity thanks to the chimney effect. However, the chimney affect becomes a critical factor in a fire situation, facilitating the spread of fire very quickly.

Smart Façade is non-combustible

Smart Façade is certified as non-combustible insulation and will not contribute to fire spread.

Products in the Smart Façade range have an A1 fire response classification and do not contribute to the spread of fire. According to the NZBC, non-combustibility can be assessed through small scale testing of the materials meeting the relevant performance criteria in AS 1530.1 (where the material is Classified as non-combustible) or BS EN 13501-1 (where the material is classified as A1).



Fire Reaction vs. Fire Resistance

What is the difference between fire reaction and fire resistance?

Reaction to fire describes the combustibility of a material — whether it will burn or not — and fire resistance describes how building elements are expected to behave in the event of a fire.

How is fire reaction defined?

There is a clear definition of a product's reaction to fire and it comes from seven levels of combustibility based on tests for the EN13501-1 European Standard. These 'Euroclasses' start at A1 (non-combustible and doesn't burn) and A2 (limited combustibility) and go down to B, C, D, E and F.

Does that mean the protection offered by non-combustible materials varies?

Yes. Tests for A1 and A2 products are designed to show a product is non-combustible, while for the other classes the tests are all about degrees of combustibility.

What about fire resistance?

Fire protection classifications are normally reported in terms of a period of fire resistance, for example 30, 60 or 90 minutes. These classifications relate to what is known as the integrity, thermal insulation and load-bearing capacity of building elements.

Simply, this means how elements — either in combination or individually — stop a fire spreading, how they restrict temperature rise and how the elements' loadbearing capacity is maintained. The best practice is to have excellent fire reaction materials combined through intelligent system design to give excellent fire resistance in a building element.

What is Smart Façade insulation reaction to fire and fire resistance?

Smart Façade insulation range has exceptional fire reaction and fire resistance which means it will not contribute to fire spread.

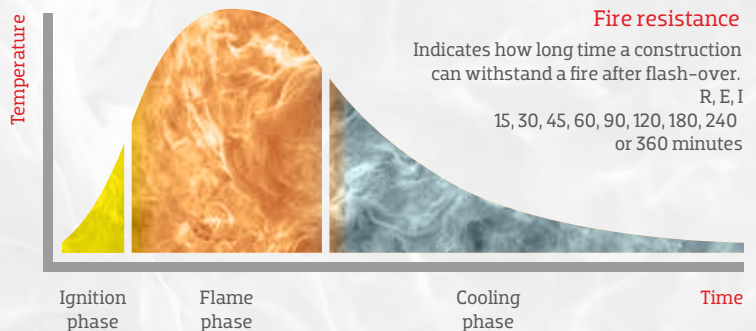
Insulate from paying higher insurance premiums

Insurers are increasingly becoming reluctant to offer the same level of insurances buildings that have been built using non-compliant, combustible materials. This has some serious implications for the building owners.

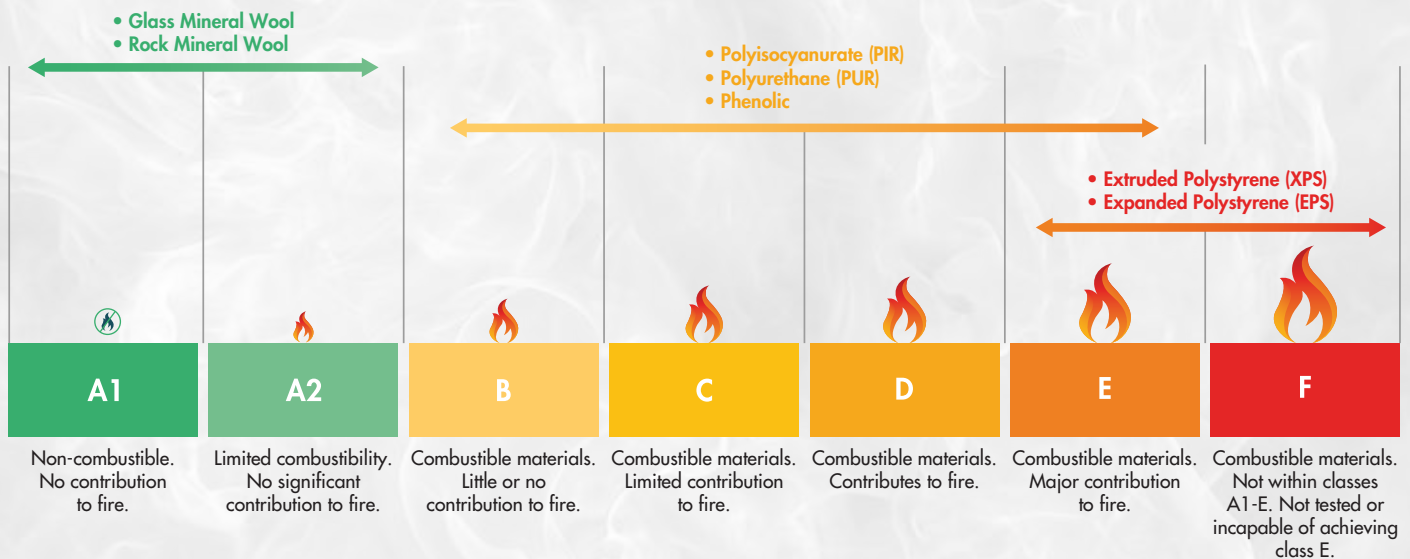
Building designers will now need to consider two sets of rules. One whereby the Building Code allows for alternative solutions and the second, where insurance companies allow for alternative solutions but this may add a premium to the policy. Insurance companies are now setting their own standards/minimum requirements for non-combustibility. Even if the building is passed by the certifier the insurance premiums can be a higher rate if you have used combustible materials fire occurring and secondly prevents fire spreading, keeping fire risk at a minimum.

Reaction to fire
Indicates if the material supplies fuel to the fire before flash-over

Euroclass:
A1/A2, B, C, D, E, F



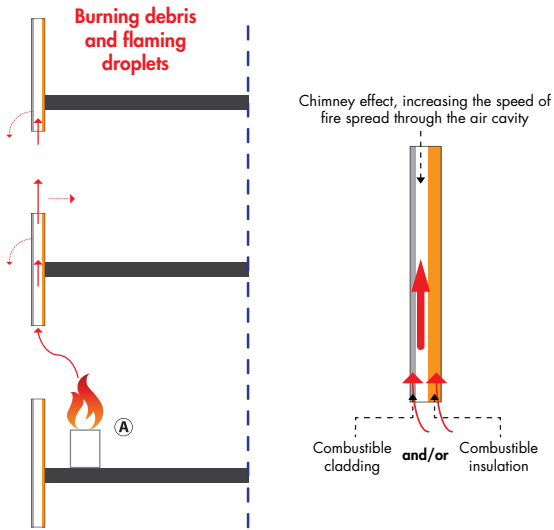
European Reaction to Fire Classification System (Euroclasses)



Ventilated Façade Insulation with Black Woven Facing behaviour is classified: A1, in accordance to the EN 13501-1. The products classified as A1, do not contribute to fire.

Fire spread explained

There are different mechanisms of fire spread depending on where in the building fire originates. Fire spread also depends on materials (combustible or non-combustible) used for construction of a façade system.



Fire originates indoors in close proximity of façade system

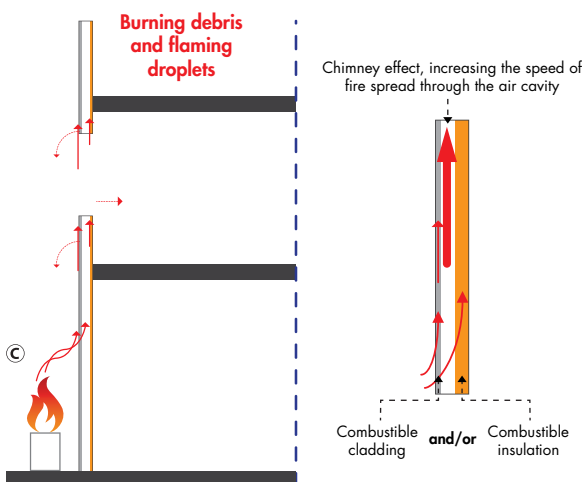
Fire breaks out in a room close to external wall and enters façade system. Due to chimney effect it quickly spreads upwards.

Burning debris and flaming droplets from the cladding can cause secondary fires in the lower part of the façade system.

Fire originates indoors away from façade system

Fire starts away from façade system and reaches flashover, the full room gets involved in the fire generating significant heat flux causing flames to burst out the window.

Very often, the heat flux generated by the fire plume is enough to break the windows in the upper stories generating secondary fires.



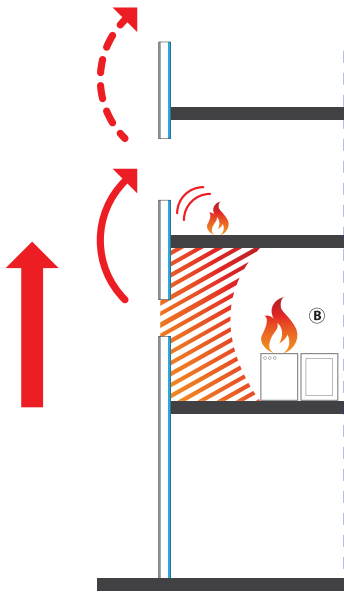
Fire originates outdoors in the vicinity of façade system

Fire breaks out outside the building near the façade system. In this case, the fire can reach the combustible cladding and spread bottom up.

If insulation is combustible, it will contribute to vertical fire spread. Similarly to Diagram A, a chimney effect, will increase the velocity of the fire growth. Burning debris and flaming droplets can cause secondary fires in the lower part of the façade system.

The rapid spread of the fire, can be prevented by the use of non-combustible materials.

Ventilated façades are characterized by the thermal advantages provided by the natural circulation of air in the cavity thanks to the chimney effect. However, the chimney effect becomes a critical factor in a fire situation, facilitating the spread of fire very quickly.



Fire spread with Smart Façade insulation

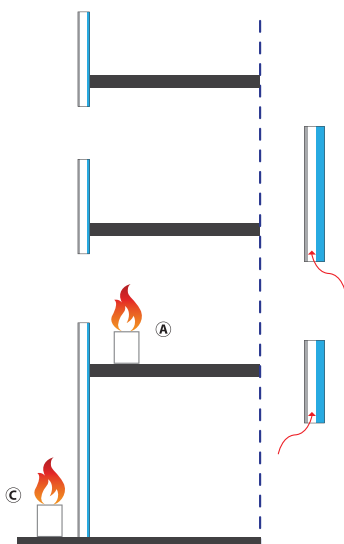
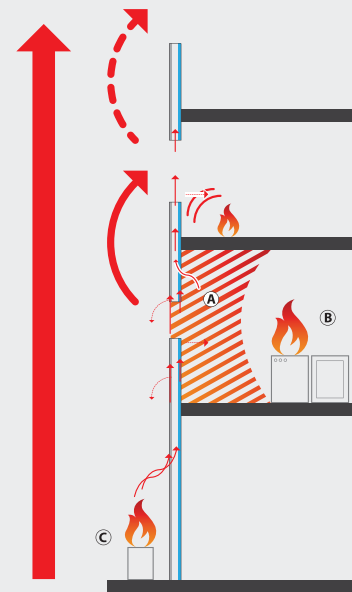
Smart Façade insulation is non-combustible and doesn't contribute to the spread of fire.

Occupants have time to escape. Building is more likely to maintain its integrity as smaller areas are affected by fire.

Fire spread with combustible insulation

Fire spreads fast as combustible insulation provides fuel for the fire. Combustible insulation catches fire quickly spreading up through the façade cavity. The fire, will affect the cladding creating burning debris and droplets to fall and cause secondary fires at ground level.

This way, the whole façade gets involved in an intense and quick fire affecting safety of occupants, fire fighters as well as affecting buildings and areas nearby.



Specify non-combustible insulation and non-combustible cladding

Non-combustible insulation such as Smart Façade and non-combustible cladding material is the best approach to designing your façade system. It will minimize the risk of fire spreading and allow buildings occupants to evacuate.

Acoustic performance

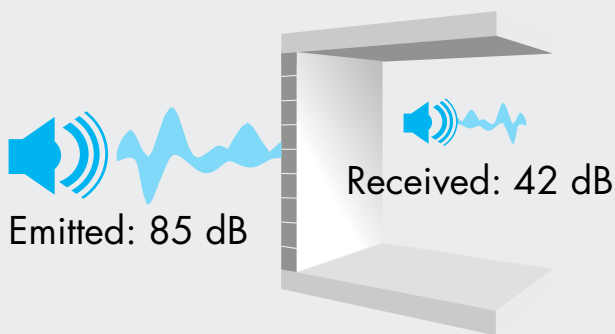
Acoustic performance is becoming an increasingly important consideration when designing a building due to the increase in urbanisation and as such the rise in noise levels around populated areas.

The effects of noise are many; noise causes fatigue, irritation, loss of efficiency and permanent damage to hearing with vulnerable adults and children most susceptible to its effects.

In low mass structures such as rainscreen façade systems, absorption is a critical component to reduce unwanted noise from passing through the system. Smart Façade has excellent acoustic absorbance properties, which contribute to the acoustic performance of the structure onto which it is mounted.

CASE 1

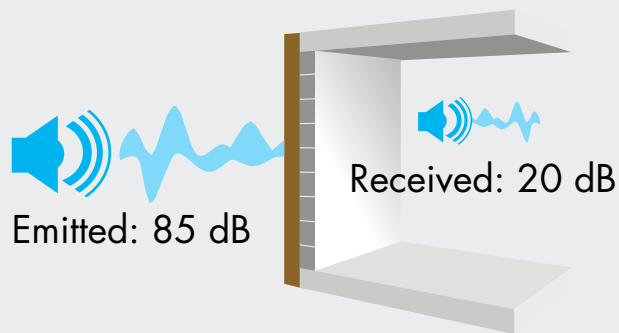
No Insulation



$$R_{A, tr} \text{ wall} = \mathbf{43 \text{ dB}^* \text{ stopped}}$$

CASE 2

External Insulation

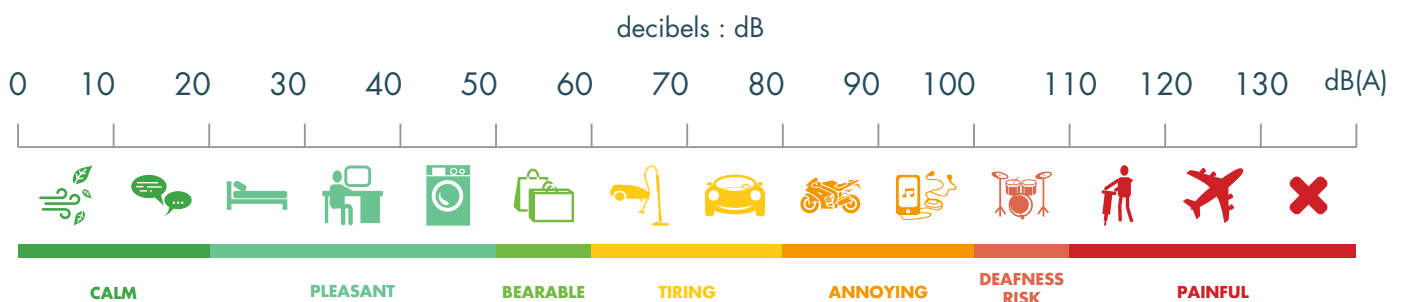


$$R_{A, tr} \text{ wall} + \text{insulation} = \mathbf{65 \text{ dB}^* \text{ stopped}}$$

$$R_{A, tr} = R_w + VS_{tr}$$

*Estimates that may be influenced by technical, architectural or implementation constraints.

Calibrated in decibels (dB)

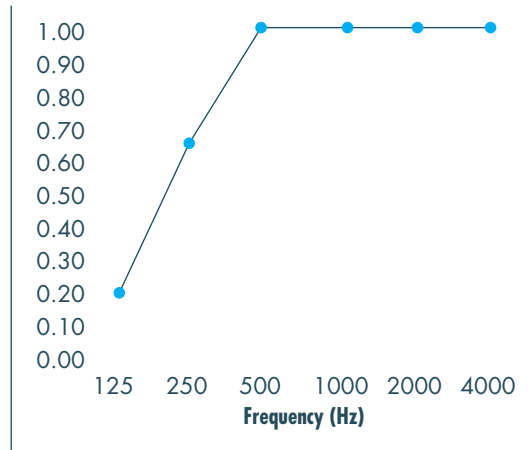


Designed to Perform: Acoustic

Smart Façade insulation is engineered with excellent sound absorption properties that reduces reverberation in the Ventilated Façade system. The utilisation of tiny air pockets allows sound energy to be dissipated in the matrix of fibers resulting in a reduction of airborne sound.

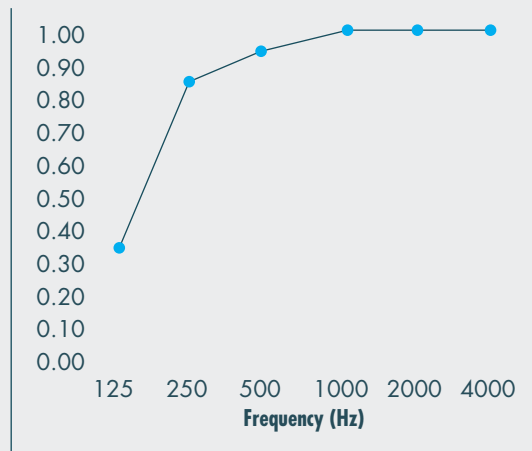
Smart Façade also reduces flanking sound transmission along the wall cavity. Smart Façade offers superior acoustic benefits not found in traditional forms of façade insulation such as rigid foam boards that offer little to no acoustic benefit.

50mm



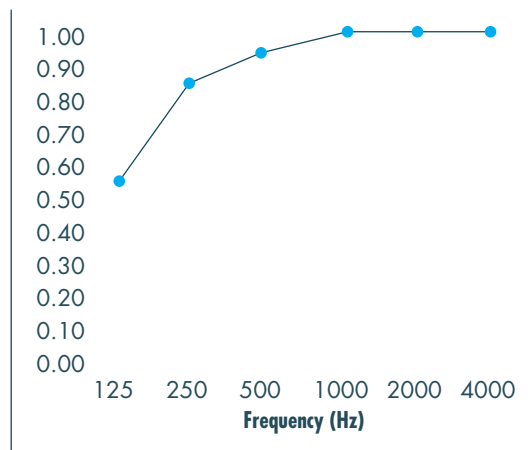
NRC
0.95
SAA
1.01
Standard
ASTM C423

75mm



NRC
0.95
SAA
1.00
Standard
ASTM C423

100mm



NRC
0.95
SAA
1.02
Standard
ASTM C423



Smart Façade Durability and moisture resistance

When considering the design of multi-level buildings, it is important to select fit-for-purpose materials that will 'future proof' the durability and performance of the structures envelope.

Smart Façade insulation has been engineered to perform in Ventilated Façade systems and is suitable to perform specifically in the New Zealand climactic conditions.

Smart Façade is made with Knauf Insulations revolutionary DriTherm® Technology, making the product water repellent to uphold the performance integrity of the Ventilated Façade cavity.

The specialised silicone treatment process of DriTherm® Technology means that the insulation will not absorb moisture and is resistant to transfer of moisture, which has been proven through extensive testing, and a long history of use.

Serrated edges allow adjacent slabs to "knit" together leaving no penetrating air gaps for the passage of liquid water or cold air.

The compression fit between the Smart Façade insulation slabs prevents moisture penetration and cold bridging at joints. By comparison, if moisture penetrates wall and tracks across wall ties on to Polyurethane it would have a major negative impact on the board's performance and structure.

In full fill applications moisture or wind driven rain is trapped at the interface of the insulation and the external leaf, therefore reducing the risk of moisture penetration affecting the inner leaf whereas in partial fill applications wind driven rain can penetrate the open joints in the rigid insulation boards.



Sustainability Credentials

Knauf Insulation glasswool products are produced with low embodied carbon. Made in the APAC regions brand new factory that utilises state-of-the-art technology.

Smart Façade has a low environmental impact because it is made using up to 80 per cent recycled glass and with ECOSE® Technology, a binder that has less embodied energy than traditional formaldehyde-based binders. Smart Façade also features unique compression packaging that fits more product in each pack which results in less deliveries and associated carbon emissions from transport.

How does this compare to other types of insulation materials used in traditional façades?

Smart Façade	PU / PIR
<p>Made from a high content of recycled glass bottles</p> <p>Reduces site wastage and damage compared to chemical foam boards</p> <p>Minimal waste as remaining product can be reclaimed and reused</p>	<p>Contains high embodied energy</p> <p>Is derived from petrochemicals</p> <p>Is non-bio-degradable</p>



Red List Free

Knauf Insulation glasswool does not contain any harmful or unhealthy chemical ingredients included on the International Living Future Institute’s Red List, including no added formaldehyde, no fire-retardant additives or any anti-fungal chemicals. Red List Free certification provides certainty that there are no unhealthy chemicals being installed in your home.



ECOSE® Technology

ECOSE® Technology is a sustainable binder that is less energy intensive than the formaldehyde binders used in traditional glasswool insulation. As there is no formaldehyde or phenols used in the manufacturing process for Knauf Insulation glasswool it also improves the indoor air quality of buildings where these products are installed (compared to conventional glasswool products).



Eurofins

Knauf Insulation glasswool is supported by Eurofins Indoor Air Comfort Gold as an “outstanding material” according to VOC and Indoor Air Quality Emissions certification.

A Cost-effective Solution

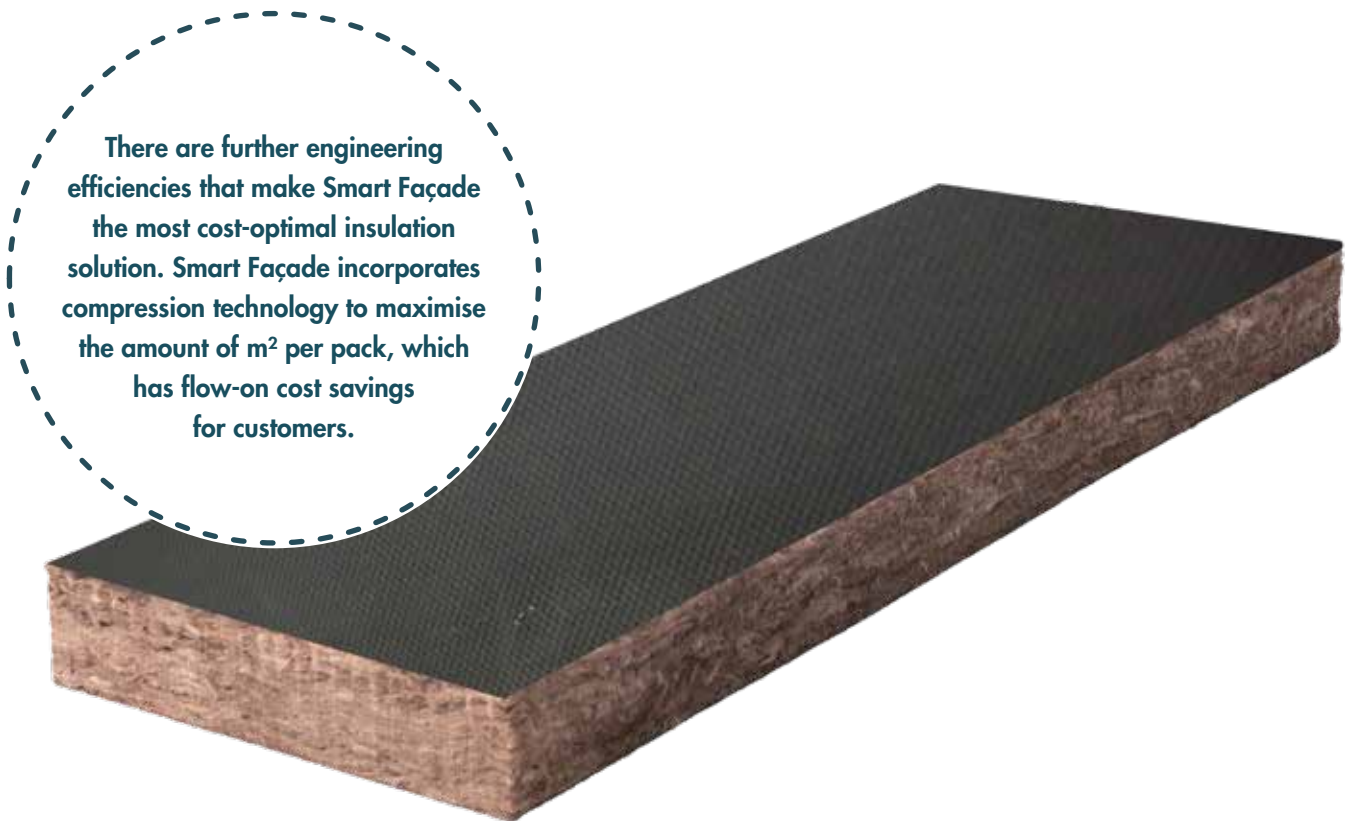
Smart Façade is the most cost effective and established product for the thermal insulation of Ventilated Façade systems and delivers more additional benefits than any other alternative insulation.

Smart Façade is made with Glass Mineral Wool, which is the most cost effective insulation solution to meet the Ventilated Façade performance requirements set out by the New Zealand Building Code.

Cost Comparison for Ventilated Façade Insulation

Insulation Type	Unit	Quantity	List price	Total cost
PIR Board	m ²	1,000	x	x
Rock Mineral Wool	m ²	1,000	x	x
Glass Mineral Wool (Smart Façade)	m ²	1,000	x	x

*cost is based on standard market list prices (2021)



**REDUCED LABOUR AND
SPEED OF INSTALLATION**



**STORAGE
SAVINGS**



**TRANSPORT SAVINGS
(LESS LOADS PER JOB)**

Benefits for Installers



**SUPER-SOFT AND
EASY TO INSTALL**



**EXCELLENT
TENSILE STRENGTH**



**SMOOTHER TO
TOUCH AND HANDLE**



**FLEXIBLE, EASY FIT
BETWEEN SUPPORT
STRUCTURE**



**LOW DUST,
LOW ITCH**



EASY TO CUT



**WIDE RANGE OF LOCALLY
AVAILABLE FIXINGS**



DRITHERM® CAVITY SLAB WARRANTY

1. WARRANTY APPLICATION: Knauf Insulation Pty Ltd (ACN 129 827 336) and Knauf Insulation Ltd (Registered NZ Company No. 35 271 92) – (Knauf) - warrant that DriTherm® Cavity slab products (Product) are manufactured in accordance with AS/NZS4859.1 and are fit for the purpose of insulating double brick cavity walls.

2. WARRANTY COVERAGE: Knauf warrants to the person purchasing the Product (Covered Person) that:

a) The Product has been manufactured so as to be resistant to the passage of water from the outer leaf to the inner leaf in full double brick cavity construction for 50 years from the date of purchase.

b) A person will not be considered a Covered Person if the Product is purchased to be resold or to be transferred into a product that is sold.

3. CONDITIONS OF WARRANTY: Knauf's liability to the Covered Person under this Warranty shall be subject to the following terms and conditions:

A. The claimant must provide proof that he/she is a Covered Person including a receipt showing the date of purchase of the Product and details of the seller and the installer.

B. The Product must be transported and stored in dry conditions at all times between purchase and installation and without bearing the weight of other materials. Knauf will have no liability under this Warranty in respect of wet or water damaged product.

C. The Product must be installed in accordance with Knauf installation instructions and maintained according to AS3-999/NZ2-4246, the NZBC Clauses E2 & E3 (or equivalent) and all other applicable building codes adopted by federal, state or local government or government agencies and applicable to the installation or maintenance of the Product. Failure to properly install or maintain the Product in accordance with this Clause will void this Warranty.

D. The Covered Person may not claim for manufacturing defects under this warranty that appear outside the Product Serviceable Life 50 years after the date of purchase.

E. The Covered Person must provide written notice to Knauf within 30 days after discovery of any claimed defect or failure covered by this Warranty and before beginning any permanent replacement, rectification or repair. The notice must describe the location and details of the defect or failure and such information as is necessary for Knauf to investigate the claim. Photographs of the Product, showing the defect or failure, must accompany the notice. Product samples must be provided.

F. Before commencing any replacement, repair or rectification work, the Covered Person must allow Knauf or Knauf's agent to enter the property where the Product is installed and examine, photograph and take samples of, the Product.

G. Instead of repairing, replacing or rectifying the Product, Knauf may elect to make a full refund of the purchase price of the Product.

H. Knauf will pay the reasonable, direct expenses of the Covered Person claiming under this Warranty. The Covered Person may submit details of their expense claim to Knauf for consideration.

I. For the avoidance of doubt, this Warranty applies only to the Covered Person and does not transfer to any subsequent purchaser of any structure in which the Product has been installed.

4. EXCLUSIONS: Knauf will have no liability under this Warranty in respect of damage or defects resulting from, or in any way attributable to:

(a) the storage, shipping, handling or installation of the Product in an improper manner or in a manner other than as described in the installation instructions;

(b) neglect;

(c) abuse;

(d) misuse;

(e) damage from incorrect design or construction of the structure in connection with which the Product is used;

(f) acts of God including, but not limited to, cyclones, tornados, floods, earthquakes, severe weather, fire or other natural phenomena, (including, but not limited to, unusual climate conditions);

(g) growth of mold, mildew, fungi, bacteria, or any organism; and

(h) lack of proper maintenance.

5. CLAIMS: For any claim by the Covered Person under the terms of this Warranty:

(a) if the Product is found to be non-compliant with this Warranty, Knauf will (at Knauf's sole option) either (i) refund the purchase price; or (ii) repair, replace or rectify the Product.

(b) such claims must be made by written notice:

i. sent to the following address:

Knauf Insulation Warranty Claims Section

PO Box 244

Cannon Hill Queensland 4170

Australia.

Phone +61 7 3393 7300

ii. received within 30 days after discovery of any circumstance giving rise to liability under this Warranty;

iii. containing the details specified in section 3 E above and attaching documentary evidence of the matters specified in section 3 A above.

6. EXCLUSION OF INCIDENTAL AND CONSEQUENTIAL DAMAGES: Under this warranty Knauf shall not be liable for any incidental, special, indirect or consequential damages. Any monetary compensation is limited to a refund of the purchase price of the Product except as required by law.

7. MODIFICATIONS AND ALTERATIONS OF PRODUCT: Knauf shall have no liability under this Warranty for any Product subjected to further processing or alteration by any person other than Knauf or its related companies.

8. SETTLEMENT OF CLAIM: Any refund or material replacement by Knauf pursuant to section 5 above of this Warranty shall constitute a full settlement and release of Knauf by the Covered Person of all claims, potential claims or actions of any Covered Person for damages or other relief under this Warranty.

9. OTHER RIGHTS: The benefits given by this Warranty are additional to other rights and remedies that the Covered Person may have under law.

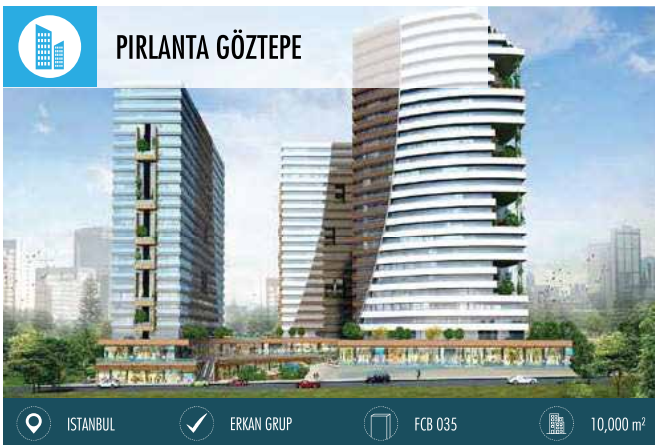
Australian customers: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the Product repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

New Zealand Consumer Guarantees Act: It is acknowledged that where a claimant has acquired the goods and/or services for the purpose of a business, the claimant and Knauf agree that the provisions of the Consumer Guarantees Act 1993 shall not apply to the supply of goods and/or services by Knauf to such business applicants.

10. LIMITATION OF WARRANTY: This Warranty constitutes the only warranty extended by Knauf for the Product. Knauf disclaims all other warranties, express or implied, but does not exclude any statutory warranties or consumer guarantees that may apply and which cannot be excluded at law. For the avoidance of doubt, any and all other warranties or conditions which are not guaranteed by the Australian Consumer Law, the New Zealand Consumer Law or the Competition and Consumer Regulation 2010 (Australia) and which are not expressly included in this Warranty as additional warranties or conditions, are expressly excluded where permitted, including liability for incidental or consequential damages caused by the breach of any express or implied warranty or condition.

11. LIMITATION OF LIABILITY: You may be entitled to statutory consumer guarantees and Knauf does not exclude, restrict or modify those consumer guarantees. In all other respects, in so far as and to the maximum extent that it may lawfully do so, Knauf excludes any liability, whether in tort (including negligence), contract, equity or otherwise, connected with, or arising in relation to, the use or installation of the Product.

This Warranty is given by Knauf Insulation Pty Ltd ACN 129 827 336 and Knauf Insulation Ltd (Registered NZ Company No. 35 271 92).



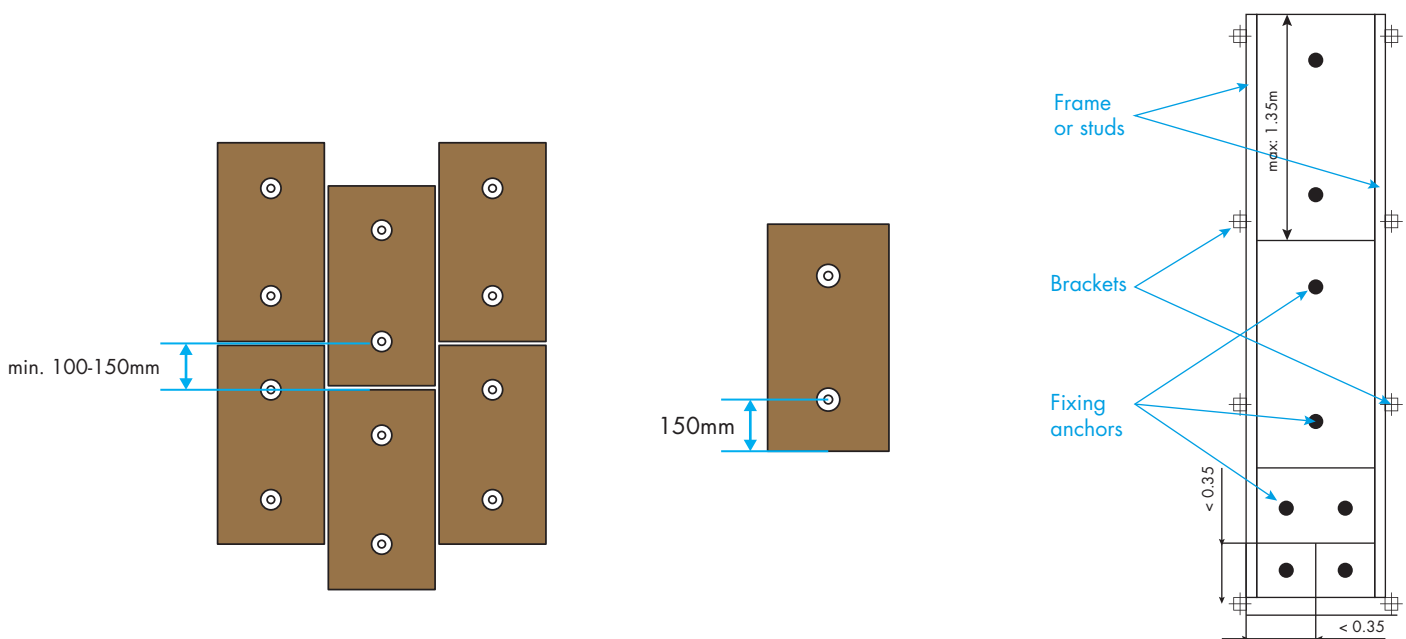
ADVANTAGES

- Allows freedom of design and use of mix of cladding finishes
- Complies with fire regulations for external walls
- Moisture resistant formula repels water
- Suitable for residential projects - stand alone houses, townhouses and high rise apartment blocks
- Suitable for commercial, educational, health (hospitals), offices' projects
- Protection from wind wash effect maintaining thermal efficiency of insulation thanks to the protective facing
- Highest sustainability credentials
- Ease of installation for new-build as well as retrofit projects
- Increased energy efficiency of design
- Cost effective when compared of other insulation types like foams or rock mineral wool

INSTALLATION SUMMARY

SMART FAÇADE INSTALLATION GUIDELINES

- Smart Façade slabs are placed adjacent to each other and located between vertical profiles which are installed before insulation material.
- Smart Façade slabs are tightly butted together at joints and taped on all edges.
- Horizontal joints between slabs should be staggered by at least 100 - 150 mm; coincidental joints should be avoided.
- Smart Façade slabs are fixed into the load bearing wall with the help of anchors. Slabs should be in intimate contact with the building substrate.
- Fixing anchor washer diameter should be $\geq 50\text{mm}$
- General rule is 2 fixing anchors per Smart Façade slab, and distance from the closest edge 150 mm.
- When Smart Façade slab is cut and its dimension is less than or equal to 350mm, 1 fixing anchor is enough, otherwise the rule of 2 fix/slab is to be applied.
- In order to have full performance of insulation material, pillowing effect should be avoided. Pillowing effect is generated by over compression of insulation fixing. Anchors should not compress Smart Façade slab.



For the full installation instructions, guides on fixings and maintenance tips visit www.knaufinsulation.co.nz

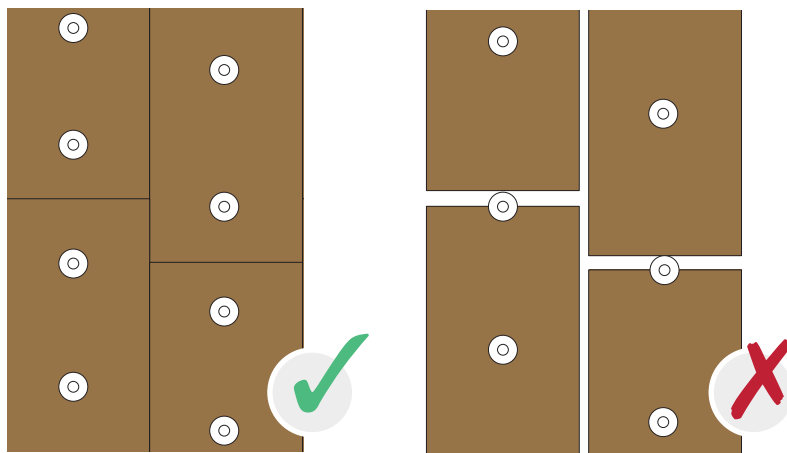
BLACK WOVEN VEIL TO BE FACING OUTWARDS

The woven facing provides additional protection from wind, rain and sun exposure.

SLABS TO BE IN CONTACT WITH EACH OTHER

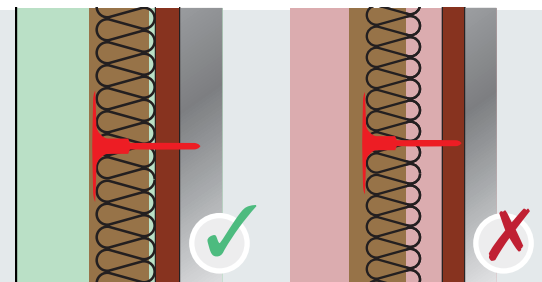
Installed such that they are tightly butted together at joints and joints staggered by 100 - 150mm. Joints need to be tapped.

? **To avoid coincidental joints and maintain acoustic performance.**



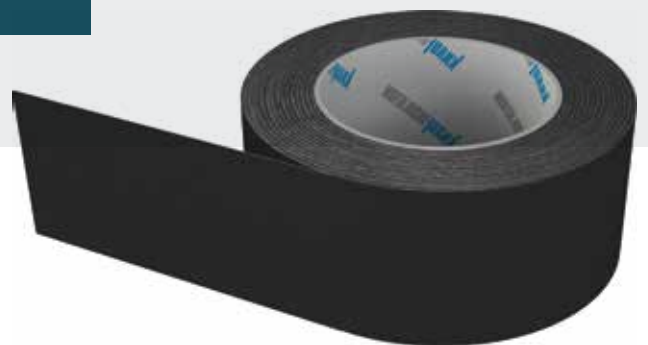
INTIMATE CONTACT WITH SUBSTRATE

Smart Façade should be in direct contact with the building substrate. The nature of the insulation material lends itself to accommodate any irregularities in the surface of the substrate.



ACCESSORIES AVAILABLE

- ✓ Self-adhesive tape
- ✓ Fixing anchors for steel/timber framing



KNAUFINSULATION

KNAUF INSULATION TECHNICAL SUPPORT

Our Technical Support Team provides personal, high level technical support. This includes U-value calculations, fire safety compliance and assistance with CAD drawings from the most experienced team of advisors in the insulation industry. For further information, contact us via phone or email as below.

Building Science Support

- Building science expertise & resources
- Educational seminars/CPD's & architectural/site visits
- Envelope detailing & material specifications

U-Value Calculations

- Codes & standards compliance evaluations
- Effective thermal performance calculations
- 2D & 3D thermal modeling (THERM/HEAT3)
- Overall Insulation detail review

Technical Support

- Product & design specifications
- Codes & standards compliance
- Fire & acoustic expertise
- Installation guidelines



07 3393 7300



info.nz@knaufinsulation.com

Knauf Insulation Pty Ltd 23 Corporate Drive, Cannon Hill, QLD, 4170

For more information please visit www.knaufinsulation.co.nz

All rights reserved, including those of photomechanical reproduction and storage in electronic media. Extreme caution was observed when putting together and processing the information, texts and illustrations in this document. Nevertheless, errors cannot quite be ruled out. The publisher and editors cannot assume legal responsibility or any liability whatever for incorrect information and the consequences thereof. The publisher and editors will be grateful for improvement suggestions and details of possible errors pointed out.