KNAUF INSULATION

it's time to save energy

January 2017

EARTHWOOL® GLASSWOOL

the feel good glasswool insulation

A new generation of softer, safer, environmentally friendly insulation

with ECOSE® TECHNOLOGY

Introducing the new generation of insulation

Earthwool® glasswool insulation with ECOSE® Technology offers superior handling...

Earthwool glasswool insulation doesn't look or feel like any insulation you have ever experienced.

- Softer – virtually itch free
- Odourless – no added formaldehyde
- Naturally brown – no artificial colours added

Earthwool glasswool is a high performance insulation product with combined energy saving, sound absorbing and fire resistance features.

...superior level of sustainability...

The natural brown colour is a result of ECOSE® Technology and represents a level of sustainability, health and safety for glasswool never before achieved:

- Manufactured using recycled glass bottles, naturally occurring raw materials and bonded using a bio-based technology with no added formaldehyde, phenols, acrylics, artificial colours, bleaches or dyes
- Reduces impact on environment through lower embodied energy
- Reduces pollutant manufacturing emissions and workplace exposures
- Improves the overall sustainability of buildings where Earthwool® glasswool is incorporated

...and delivers all the benefits of traditional glasswool!

The thermal, fire resistance, sound absorption and mechanical properties are maintained, with improved product durability.

with ECOSE® TECHNOLOGY

ECOSE® TECHNOLOGY

ECOSE Technology is a revolutionary formaldehyde-free binder technology, based on rapidly renewable materials instead of petro-based chemicals. It reduces embodied energy and delivers superior environmental sustainability.

ECOSE Technology was developed for glass and rock mineral wool insulation, but offers the same potential benefits to other products where resin-substitution would be an advantage, such as in wood based panels, abrasives and friction materials.

www.ecosetechnology.com

Superior handling

A new generation of glasswool that feels good... naturally

Knauf Insulation conducted installer trials throughout Europe featuring over 500 individual installers. These were organised using both internal and external coordinators, including Gruppe Nymphenburg Consult AG.

Softer feel

More than 90% of professional installers stated that Earthwool® glasswool with ECOSE® Technology has a softer feel and is less itchy compared to conventional glasswool.

“This is great stuff! It doesn’t make my skin itch; I can’t believe that this is glasswool.”

Odourless

ECOSE® Technology makes Earthwool® glasswool odourless. More than 80% of installers stated that they prefer the neutral smell of Earthwool glasswool over the smell of traditional glasswool made using formaldehyde.

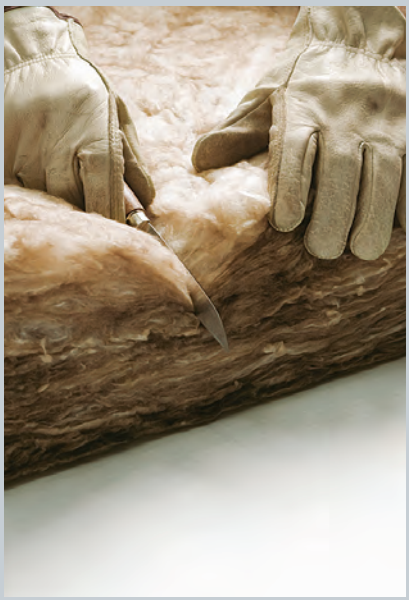
"You really cannot smell it. It's definitely an improvement over the smell of traditional glasswool and makes the product more pleasant to work with."

Easy to cut

A majority of installers also indicated an ease in cutting Earthwool glasswool with ECOSE Technology.

"I prefer this product because, quite simply, it's easy to work with."

with ECOSE® TECHNOLOGY



Earthwool glasswool insulation uses breakthrough proprietary fiberisation technology from Knauf Insulation. Longer more flexible strands of glass combined with ECOSE Technology makes Earthwool glasswool much softer to handle.

Superior level of sustainability

A more sustainable insulation solution

Earthwool® glasswool delivers superior environmental sustainability using patented ECOSE® Technology. Glasswool insulation is already considered to be highly sustainable in terms of its low environmental impact and use of recycled glass bottles. The development of Earthwool glasswool extends the leading position of glasswool as the most important insulation product of the future.

Earthwool glasswool delivers a superior level of sustainability...

Bonded using a bio-based technology

ECOSE Technology is a revolutionary binder technology, based on rapidly renewable materials instead of petro-based chemicals. It contains no added formaldehyde, phenols, acrylics, artificial colours, bleaches or dyes.

Improves sustainability of buildings

Sustainable building has become a growing part of today's construction industry. The superior environmental characteristics of Earthwool glasswool with ECOSE Technology contributes to improving the overall sustainability of buildings in which they are incorporated.

Reduces workplace exposures and pollutant manufacturing emissions

By eliminating phenol and formaldehyde from our manufacturing process, workplace exposure and pollutant manufacturing emissions are significantly reduced.

Reduces environmental impact through lower embodied energy

Binder embodied energy is reduced by up to 70% compared to traditional glasswool, which contributes to further lower the expected GWP (Global Warming Potential).

Cost competitive

Earthwool® glasswool is cost competitive with traditional glasswool to facilitate the market transformation to more sustainable construction.

...in addition to the environmental benefits of conventional glasswool.

Earthwool glasswool products are inherently sustainable because of high recycled and renewable content. Earthwool glasswool saves hundreds of times more energy in use over its lifetime than required to manufacture.

High level of recycled content

Earthwool glasswool is made using up to 80% recycled glass.

Renewable and abundant resources

Sand is natural and one of the world's most abundant resources.

Optimised packaging

Earthwool glasswool products are compressed in packaging up to a ratio of 10 to 1. This optimised packaging allows for reduction of packaging material usage, space saving in storage, reduced energy consumption in transport thus providing a significant overall cost saving and environmental benefit.

with ECOSE® TECHNOLOGY

Delivers all the benefits of traditional glasswool

Proven product performance combined with improved durability

Earthwool® glasswool made using ECOSE® Technology maintains the already very high performance of glasswool and meets all thermal, acoustic and fire resistance criteria of our traditional glasswool products.

Product performance of Earthwool glasswool with ECOSE Technology	In accordance with EN 13162:2008 and:
For all applications	
Thermal resistance and thermal conductivity	EN 12667, EN 12939
Length and width	EN 822
Thickness	EN 823
Squareness	EN 824
Flatness	EN 825
Dimensional stability	EN 1604
Tensile strength parallel to faces	EN 1608
Reaction to fire	EN 13501-1
For specific applications	
Dimensional stability under specified conditions	EN 1604
Compressive stress or compressive strength	EN 826
Tensile strength perpendicular to faces	EN 1607
Point load	EN 12430
Compressive creep	EN 1606
Water absorption	EN 1609, EN 12087
Water vapour transmission	EN 12086
Dynamic stiffness	EN 29052-1
Compressibility	EN 12431, EN 1606
Sound absorption	EN ISO 354, EN ISO 11654
Air flow resistivity	EN 29053

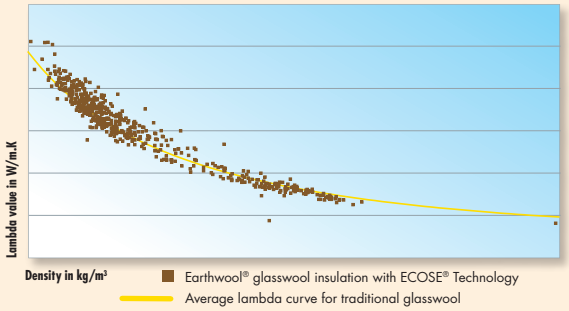
Classification varies according to product characteristics. Detailed information for each single product can be found on product labels, product datasheets, product literature and on the local Knauf Insulation websites.

ECOSE Technology was developed during a five year research and development project aimed at removing formaldehyde from glasswool to improve health and safety. Extensive testing of Earthwool glasswool product performance in internal and external laboratories has confirmed:

- Fitness for use properties – equalling or exceeding that of traditional glasswool.
- Long term product performance – mechanical properties and dimensional stability are maintained to high Knauf Insulation quality control standards and form the basis of a 50 year warranty.
- No attraction to insects, vermin or fungi – extensive testing shows Earthwool glasswool made using ECOSE Technology does not provide a medium for the growth of micro organisms nor does it rot, decay or sustain mould. Independent testing also confirms no attraction of insects, including black ants.
- Enhanced thickness recovery after storage – age testing of Earthwool glasswool in compression packaging shows equal or better recovery compared to our traditional glasswool.

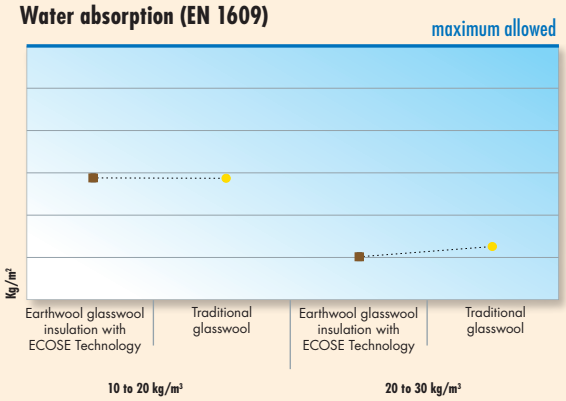
Proven performance

Thermal conductivity (EN 12667, EN 12939)



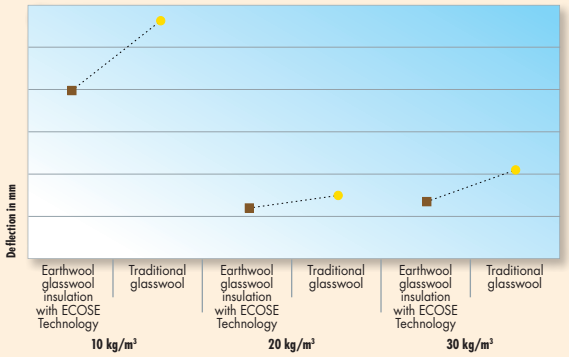
Thermal conductivity properties of Earthwool glasswool insulation with ECOSE Technology are equivalent to our traditional glasswool.

Water absorption (EN 1609)



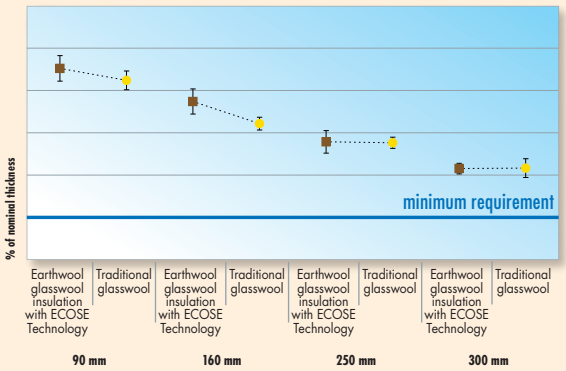
Earthwool glasswool insulation with ECOSE Technology performs equally or better than our traditional glasswool for applications where water repellency is required.

Stiffness after storage (ACERMI method)



The product stiffness of Earthwool glasswool insulation segments with ECOSE Technology is equal or better compared to our traditional glasswool segments.

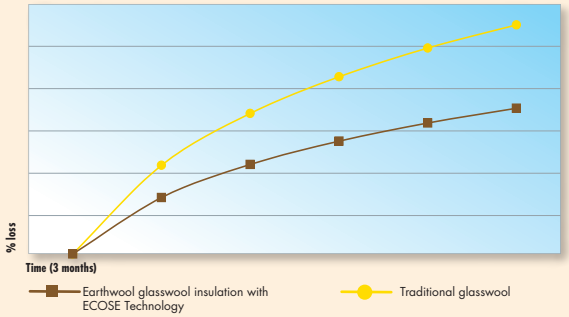
Thickness recovery after storage (EN 823)



The product recovery of Earthwool glasswool insulation with ECOSE Technology is equal or better compared to our traditional glasswool.

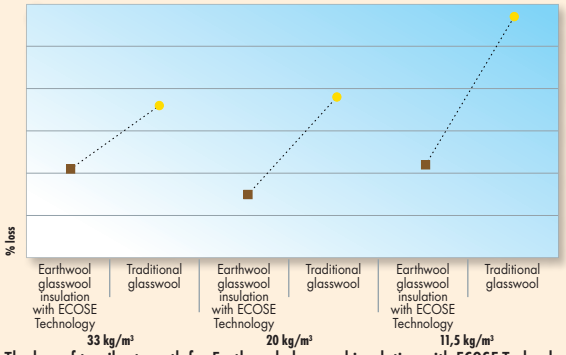
Improved durability

Loss of recovered thickness over time in store



The decay of thickness recovery is slower with Earthwool glasswool insulation with ECOSE Technology compared to our traditional glasswool enhancing product storage durability.

Loss of tensile strength after accelerated ageing (Florida test*) (EN 1608)



The loss of tensile strength for Earthwool glasswool insulation with ECOSE Technology over time is significantly less compared to our traditional glasswool especially for the lighter density products.

* Florida test: 21 cycles of 8 hours duration with relative humidity between 18% and 98% and temperatures of 25°C to 55°C.

with ECOSE® TECHNOLOGY

Compliance with New Zealand and European Standards

Earthwool® glasswool products have superior characteristics compared to our traditional glasswool and comply with all the required New Zealand and European Standards for glasswool insulation.

BRANZ Appraised
Appraisal No.648 [2016]
Wall, Ceiling and Acoustic

BRANZ Appraisal

The Earthwool glasswool insulation range has been assessed by BRANZ to confirm suitability for the New Zealand Building Code NZBC. This includes BRANZ assessment of our technical literature, quality control, installation, service performance and maintenance.

AS/NZS 4859.1:2002

Earthwool glasswool products have been tested to this standard by BRANZ confirming the thermal performance.

CE marking

Earthwool glasswool made with ECOSE® Technology is tested in accordance with all applicable European Norms. All our products comply with the main norm for glasswool insulation: EN 13162: 2008 "Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification".

Biosolubility

The formulation used for Earthwool glasswool insulation has been independently assessed to meet the requirements of the stringent Note Q standard (and is therefore consistent with the highest Australian and New Zealand industry standards), and also assessed by Knauf Insulation against the criteria of the Australian Safety and Compensation Council ASCC Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008 3rd Edition]. As a result of this assessment, Earthwool glasswool insulation is not classified as hazardous according to the NOHSC criteria.

In addition to testing for compliance with New Zealand Standards, Earthwool glasswool is also tested to comply with other national certification schemes including:

EU | France | Germany | United Kingdom | Belgium | Spain | The Netherlands | Switzerland

All Knauf Insulation glasswool manufacturing facilities are producing in accordance to the strict requirements of ISO 9001:2000. Furthermore, most of our plants are certified in accordance to ISO 14001: 2004 and OHSAS 18001:2007 reflecting our strong ambition for continuous improvement with respect to the growing environmental, health and safety aspects.

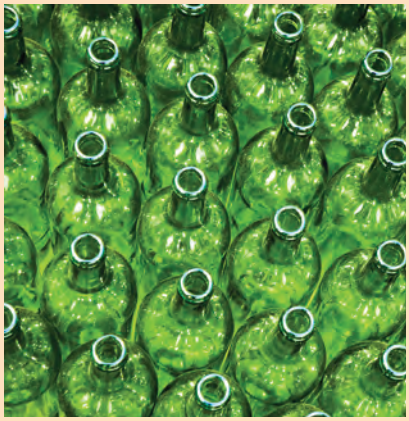
International Recognition

Following the launch of Knauf Insulation glasswool made with ECOSE Technology (ie Earthwool glasswool insulation) in 2009, our new product range has grown its market share in each country in which it has been available. It is increasingly becoming the preferred glasswool product and has received several esteemed awards, endorsements and certificates from various countries.

“In my research, I analyse the connections between fossil fuel use and climate change. Emission of carbon dioxide, the most important greenhouse gas, is of particular importance. One of the best ways to reduce carbon dioxide emissions is to use the energy we currently have more efficiently. And one of the most cost- effective ways to do that is through insulating our homes and buildings properly.

“Knauf Insulation sees the importance of making a more sustainable, climate-friendly product. I look forward to seeing what impact Knauf Insulation mineral wool and ECOSE® Technology have on reducing our climate change impact.”

Kevin Gurney, Associate Professor,
Purdue University College of Science, USA
IPCC Member Co-recipient of 2007 Nobel Peace Prize



Earthwool® glasswool with ECOSE Technology

	Installers and contractors	Architects and consultants	Merchants and distributors	Home owners and building users	Local community
Superior handling	✔	✔	✔		
Superior sustainability	✔	✔	✔	✔	✔
Superior durability	✔	✔	✔	✔	
Proven product performance and quality	✔	✔	✔	✔	
Same price as traditional glasswool	✔	✔	✔	✔	
No added formaldehyde	✔	✔	✔	✔	✔

with ECOSE® TECHNOLOGY

Frequently Asked Questions

Does Earthwool® glasswool insulation with ECOSE® Technology cost more than traditional glasswool that contains phenol and formaldehyde?

No. And in many cases it is cheaper than traditional glasswool insulation.

Does Earthwool glasswool with ECOSE Technology attract insects or vermin?

Earthwool glasswool has been extensively tested and results show it does not attract or sustain insects or vermin.

Why is Earthwool glasswool softer and less itchy than traditional glasswool?

Earthwool glasswool uses a combination of new technologies which make the product more comfortable to handle. Firstly, Knauf Insulation's proprietary fiberisation process creates longer strands resulting in less 'ends' to reduce mechanical irritation. Secondly, Knauf Insulation's patented ECOSE Technology results in a much softer, less 'crunchy' and less dusty insulation product compared to our traditional glasswool products made using formaldehyde.

How does Earthwool glasswool perform in hot and humid weather conditions?

The use of Earthwool glasswool in the external structure of a building will increase thermal resistance and provide the basis for enhanced indoor comfort and energy efficiency. Earthwool glasswool performs similarly to traditional glasswool and is functional in both 'cold and damp' and 'hot and humid' climatic conditions. The use of ventilation and condensation control measures should be incorporated according to local building standards.

How does ECOSE Technology work?

By converting natural organic materials into an inert polymer through a proprietary process, ECOSE Technology is used to create an exceptionally strong binder that bonds strands together. This revolutionary scientific discovery eliminates the need for formaldehyde and phenols found in traditional binders used in various industrial processes.

Why is Earthwool glasswool brown?

The distinctive brown colour of Earthwool glasswool results from ECOSE Technology. This natural binding process leads to a natural shade of earthy brown—free from dye or colourants. This is a result of five years of intensive research and development as part of our commitment to being at the forefront of sustainability. In some cases if Earthwool glasswool is exposed to UV radiation it may result in a white bleaching effect, however product performance is not diminished.

How does the use of ECOSE Technology make Earthwool glasswool more sustainable than traditional glasswool products with formaldehyde?

ECOSE Technology is more sustainable because it uses a natural resin which is up to 70% less energy intensive than traditional formaldehyde binders. With ECOSE Technology, rapidly renewable organic materials replace the traditional chemicals used in standard insulation binders to create more advanced and sustainable products.

What is the health risk of formaldehyde in existing glasswool products?

There is an increased focus on building products which contain formaldehyde or include it in their manufacture. A large number of tests conducted by independent expert laboratories in many countries have shown that, glasswool products are a low source of formaldehyde within buildings and therefore not a risk to the health of occupiers or installers. However, the use of ECOSE Technology will remove formaldehyde from the supply chain and increase the confidence with which glasswools can be used.

How is Earthwool glasswool with ECOSE Technology distinguished from traditional glasswool, in a visible way?

The products distinguish themselves by their natural brown colour and of course packaging. We did not choose the colour it occurs naturally. The ECOSE Technology brand and logo are clearly visible on all packaging where this new technology is used and serves as your complete assurance that there is absolutely no formaldehyde, acrylic, phenol, dye or artificial colours added in the chosen Knauf Insulation product.

What testing has Earthwool glasswool with ECOSE Technology gone through?

Earthwool glasswool products have undergone a comprehensive and rigorous evaluation to determine their environmental effects and acceptability in use and indicate that products with ECOSE Technology improve on the already excellent performance of conventional glasswool products. As with all Knauf Insulation products, Earthwool glasswool has been independently appraised with BRANZ to comply with Australian Standards, and has been CE marked in Europe. Earthwool glasswool also satisfies 'Underwriters Laboratories' criteria (UL) and GREENGUARD® in North America.

What is the warranty of Earthwool glasswool with ECOSE Technology?

A 50 year warranty is available in New Zealand.

with ECOSE® TECHNOLOGY

Knauf Insulation Warranty: Earthwool® glasswool

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 Earthwool® glasswool products (Product) are manufactured in accordance with AS/NZS-4859.1 and are fit for the purpose of insulating ceilings, external timber frame walls, underfloors and internal acoustic partitions, if tested in accordance with the methodology referred to in AS/NZS-4859.1, if properly installed in accordance with the installation instructions and if maintained according to relevant Standards including AS-3999/NZS-4246.

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

A. The Product is free from manufacturing defects for a period of 50 years from the date of purchase.

B. When used for its intended purpose, properly installed in accordance with Knauf installation instructions, tested in accordance with the methodology referred to in AS/NZS-4859.1 and maintained in dry conditions and otherwise in accordance with AS-3999/NZS-4246, the NZBC Clauses E2 and E3 (or equivalent), the Product can be expected to maintain its thermal insulation properties for a period of 50 years from the date of purchase (Product Serviceable Life).

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 AS-3999/NZS-4246, the NZBC Clauses E2 and E3 (or equivalent) and all other applicable building codes adopted by federal, state or local governments or government agencies and applicable to the installation or maintenance. 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 above;

(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.

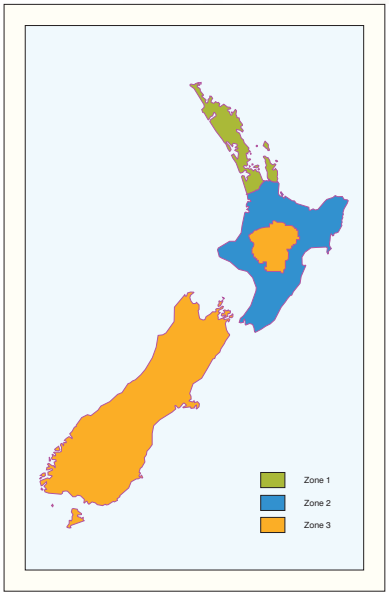
11. LIMITATION OF LIABILITY: You may be entitled to statutory consumer guarantees and Knauf does not exclude, restrict of modify those consumer guarantees. In all other respects, in so far as and to the maximum extent that it may lawfully do so, Knauf excludes any liability, whether in tort (including 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).

About Knauf Insulation

Knauf Insulation is part of the Knauf Group of Companies, a family owned global building material business with annual revenue in excess of €1 billion. As one of the world's leading insulation manufacturers, we are active in more than 35 countries and have over 40 manufacturing sites producing glasswool, rock mineral wool, extruded polystyrene (XPS) expanded polystyrene (EPS) and extruded polyethylene (XPE). With over 5,500 employees, we are global specialists in insulation manufacture, research and development and providers of advanced energy efficiency solutions for buildings for any country and climate.

The Knauf Insulation business in New Zealand supplies a wide range of high performance glasswool products (branded Earthwool® glasswool insulation). State of the art proprietary technology enables our business to manufacture insulation of the highest quality which set new benchmarks in Australia for ease of handling, sustainability, health and safety.



Recognising that New Zealand has unique climatic conditions and therefore specific insulation requirements, Knauf Insulation supplies a range of products to suit local construction methods and proven solutions to provide comfort and energy efficiency in buildings. Long term, equal value partnerships with our customers are an important part of our approach. With continual advancements in building regulations for energy efficiency, acoustic performance, fire resistance and sustainable building materials, we are constantly innovating and enhancing our product range for the New Zealand market.

with ECOSE® TECHNOLOGY

KNAUF INSULATION

it's time to save energy

Knauf Insulation Ltd (New Zealand)
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