



April 2009

A brief introduction to **ECOSE™ Technology**



What is **ECOSE™** **Technology?**

...a revolutionary, new, natural, formaldehyde-free binder technology which can be used in the manufacture of glass and rock mineral wool – and many other products – proven to be more sustainable for the environment in which we all live and work.

ECOSE™
TECHNOLOGY

www.ecose-technology.com

Q&A on ECOSE™ Technology

1 What is ECOSE™ Technology?



> **ECOSE™ Technology** is a revolutionary, new, natural, formaldehyde-free binder technology, made from rapidly renewable organic materials instead of oil 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.

2 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 particles or for example mineral wool insulation strands together. This revolutionary scientific discovery eliminates the formaldehyde and phenols found in traditional binders.



3 Is ECOSE™ Technology patented?

> **ECOSE™ Technology** is subject to a number of global patents.

4 Why will products made with ECOSE™ Technology be more sustainable than the comparable standard available products?

> Products made with **ECOSE™ Technology** are more sustainable as they have the added benefit of using a natural resin, which is up to 70% less energy intensive than traditional binders. With **ECOSE™ Technology**, rapidly-renewable organic materials replace the traditional chemicals to create more advanced and sustainable products. And, since there is no formaldehyde or phenol used with **ECOSE™ Technology**, it also helps to reduce our carbon footprint even further.

Shouldn't all insulation have the feel good factor?



ECOSE™ TECHNOLOGY

Revolutionary ECOSE™ Technology sets a new benchmark in sustainability and produces a super-soft insulation the likes of which have never been seen or felt before. Made with recycled bottles and using natural ingredients with no dyes, it is creating eco-friendly insulation that is naturally brown and naturally better for the environment. Handling is improved, as mineral wool with ECOSE™ Technology is so much softer than any others, and with our new transparent packaging, you can really see the difference as well as feel it.

The world of insulation has changed, and ECOSE™ Technology is adding the feel good factor.

For more information please visit www.feelgoodinsulation.com

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with **ECOSE™**
TECHNOLOGY

KNAUFINSULATION
it's time to save energy

Knauf Insulation mineral wool products with **ECOSE™ Technology**

For a more sustainable binder Knauf Insulation selected **ECOSE™ Technology**, which provides the following benefits:

- Natural-organic binder formulation which does not contain phenol, formaldehyde or acrylics
- Reduced manufacturing emissions - reduced impact on the environment through lower embodied energy in the resin
- No artificial colours or dye added

User benefits for Knauf Insulation mineral wool with **ECOSE™ Technology**:

- Superior characteristics of the product contribute to improving the overall sustainability of buildings in which they are incorporated
- Formaldehyde-free binder technology
- Natural colour, perfect match with wood construction
- More friendly to handle, neutral smell, softer and less dusty

The following performance characteristics of Knauf Insulation standard mineral wool products are matched by the Knauf Insulation mineral wool products with **ECOSE™ Technology**:

- Fire-resistance performance
- Non-combustibility: Euroclass A1 to EN 13501 can be achieved
- Thermal insulation performance
- Acoustic absorption performance
- Best value insulation product (R-value)
- High level of recycled content (glass mineral wool)
- Made from recycled, renewable and abundant resources (glass mineral wool)
- Fully recyclable product
- Low transport costs due to high compression rate of the products' packaging (glass mineral wool)
- Fully recyclable packaging
- Relies upon natural air for its thermal insulation properties, rather than the trapped gas in certain foam products



with **ECOSE™** TECHNOLOGY

Q&A on Knauf Insulation mineral wool products with **ECOSE™ Technology**

1 What are Knauf Insulation mineral wool products with **ECOSE™ Technology** made from?

Knauf Insulation mineral wool products with **ECOSE™ Technology** form a new generation of mineral wool insulation, which employ a revolutionary, new bonding agent made from natural and more sustainable organic materials than the non-renewable, phenol-formaldehyde based resins currently used.

2 Why are mineral wool products made with **ECOSE™ Technology** more sustainable than the comparable standard available products?

All Knauf Insulation mineral wool products are inherently sustainable — they have high recycled and renewable content and save hundreds of times more energy in use than required to manufacture them. However, glass and rock mineral wool made with **ECOSE™ Technology** is even more sustainable, as it has the added benefit of using a natural resin, which is up to 70% less energy intensive than traditional binders. With **ECOSE™ Technology**, rapidly renewable organic materials replace the traditional chemicals used in standard insulation binders to create more advanced and sustainable products. And, since there is no formaldehyde or phenol used with **ECOSE™ Technology**, it also helps to reduce our carbon footprint even further.

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

Formaldehyde has recently been reclassified by the International Agency for Research on Cancer (IARC) as a carcinogen. This has increased the 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 mineral wool products are an insignificant 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 mineral wools can be used.

4 How is mineral wool with **ECOSE™ Technology** distinguished from the traditional mineral wool visibly?

The products distinguish themselves by colour and of course packaging. With the new technology the mineral wool results in a distinctive natural brown colour, which we did not choose, it occurred 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. Currently **ECOSE™ Technology** is used in plants which also manufacture traditional products. During the transition to full production with **ECOSE™ Technology**, products may be produced with small residues of conventional binder.

5 Why was **ECOSE™ Technology** selected if current products are considered sustainable?

Sustainability is also about continuous improvement and pushing the technical boundaries. We believe there are always opportunities to improve. This development was driven by our intensive research & development programme to fulfil our desire to provide customers with innovative products to meet the growing market need for more sustainable construction materials — and by our company-wide commitment to greater sustainability in all aspects of our business.

6 How is Knauf Insulation mineral wool with **ECOSE™ Technology** different from traditional glass and rock mineral wool?

It improves the already exceptional environmental credentials of both glass and rock mineral wool because it is manufactured with a brand new kind of binding material which reduces the already low environmental impacts in manufacture, whilst still providing superior product performance. It is also formaldehyde-free.

7 How does mineral wool with **ECOSE™ Technology** perform compared to traditional mineral wool?

When assessed to insulation standards, like EN 13162 and ASTM C665, glass and rock mineral wool products with **ECOSE™ Technology** have the same industry-leading performance as other Knauf Insulation glass and rock mineral wool products, with the additional benefit of being more environmentally friendly, sustainable and easier to handle.

8 What testing have mineral wool products with **ECOSE™ Technology** gone through?

The products have undergone a comprehensive and rigorous evaluation to determine their environmental effects and acceptability in use. This evaluation indicates that products with **ECOSE™ Technology** improve on the already excellent performance of conventional mineral wool products. As with all Knauf Insulation products, the new products comply to the (regional) applicable standards, for example health and safety standards, quality certification for mineral wool products and CE-marking for Europe, as well as 'Underwriters Laboratories' criteria (UL) and GREENGUARD™ in North America.

9 What is the warranty of the mineral wool products with **ECOSE™ Technology**?

The same as for our conventional glass and rock mineral wool products.

10 Why is **ECOSE™ Technology** not yet used on the total mineral wool product range of Knauf Insulation?

It will be! The technology has been applied successfully to glass and rock mineral wool and will be gradually introduced throughout our entire range, in line with our customer demand.

11 Will all Knauf Insulation mineral wool products be made with **ECOSE™ Technology**?

There will still be standard mineral wool products available from Knauf Insulation as long as customers continue to demand them.



KNAUFINSULATION

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