

Knauf Academy

Bucuresti,  
September 09  
2017

# ECOSE® Technology for Sustainable Buildings

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- **Sustainability, what is at stake?**
- **Beyond traditional mineral wool: ECOSE Technology®**
- **Beyond regulations to voluntary Green Building Rating Systems**
- **Tools for use in Green Building Rating Systems:  
Life Cycle Analysis (LCA) – Environmental Product Declaration (EPD)**
- **Examples of Mineral Wool ECOSE Technology documentation for Green Building Rating Systems**
- **Conclusion: Impact of ECOSE Technology**

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## Sustainability, what is at stake?

### International report confirms Earth is hot and getting hotter

2015 topped 2014 as warmest year on record

- Global surface, and sea surface temperature, highest on record
- Greenhouse gases highest on record
- COP 21 Paris (meeting in Paris for the climate) had agreement from everybody and is combatting sceptics

Better construction and use of buildings in the EU would influence:

42% of our **final energy consumption**,  
35% of our **greenhouse gas emissions**  
and more than 50% of all **extracted materials**;



Energy savings is the biggest energy deposit of any country

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### Energy savings

- Available in every building
- easy to extract
- Pay once
- Strategic independence



### Oil / gas deposit

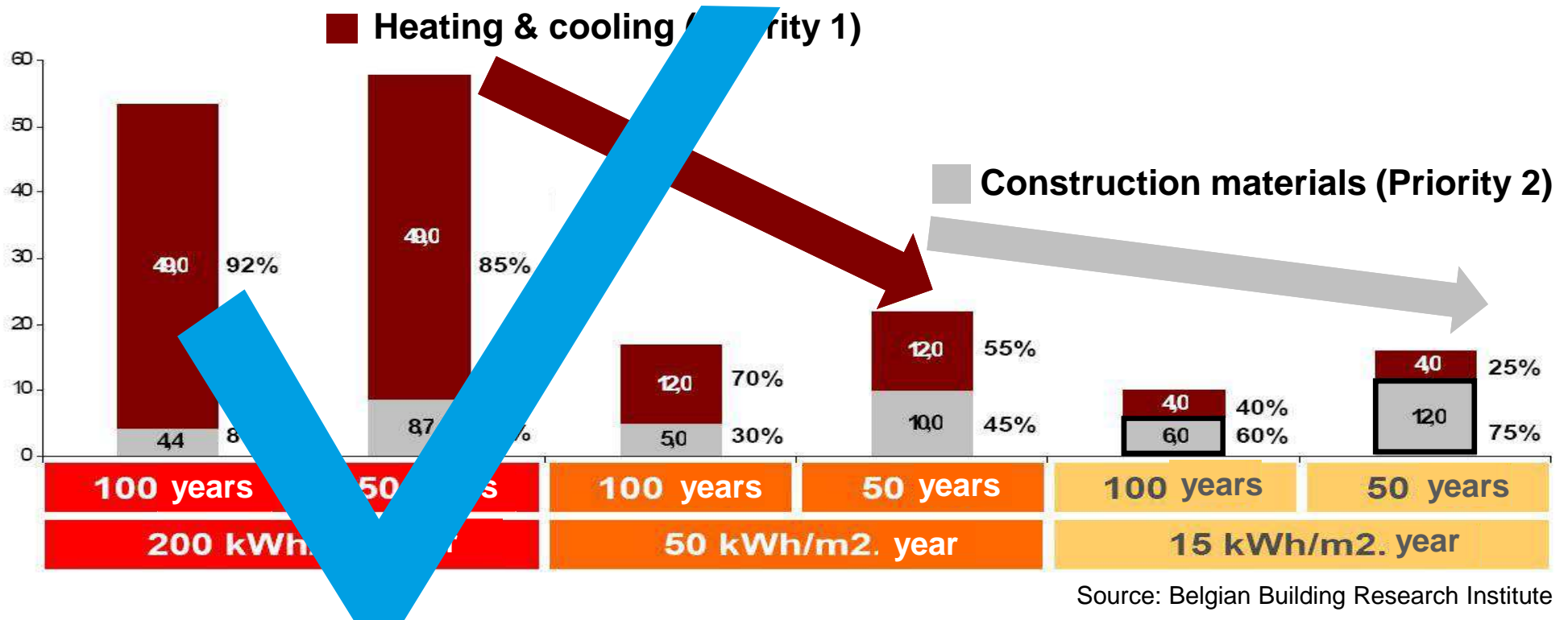
- Available in Romania for how long
- Difficult to extract
- Pay, pay, pay \$\$\$, € € €
- Strategic dependence



Image credits: CC-BY-SA Wikimedia Commons

## Evolution of Building Environmental impact (energy)

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Reducing H&C energy demand was, and still is, the right priority but now, additionally, we need to care about the construction products



**We have a collective  
responsibility to  
progress and find  
solutions to the global  
challenges**



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## Beyond traditional mineral wool: ECOSE® Technology by Knauf Insulation



## Indoor Air Quality and Environmental Impact

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### ECOSE, a revolutionary technology:

- New **binder** technology without added formaldehyde
- Based on **rapidly renewable materials** instead of petro-based chemicals
- Reduces **impact on environment** through lower embodied energy
- Reduces **workplace exposures** and pollutant **manufacturing emissions**
- **Impact on indoor air quality** once installed in buildings



A step change in  
sustainability  
for binder technology



## Superior level of sustainability

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Mineral wool with ECOSE Technology delivers a superior level of sustainability...

- Manufactured from naturally occurring and/or recycled materials
- Free from formaldehyde, phenols and acrylics
- Contributes to improved indoor air quality compared to our conventional mineral wool
- Improves the overall sustainability of buildings
- Lower embodied energy
- Improves the overall sustainability of buildings



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## Beyond regulations to voluntary Green Buildings Rating Systems

## Green Building Rating Systems in a nutshell

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# THE RISE OF GBRS IN EUROPE

4 WELL

14,400 BREEAM

2,390 HQE

1,770  
LEED

1,201  
DGNB

CERTIFIED PROJECTS  
\*non-residential buildings

Source: Knauf Insulation compilation (2017)

	BREEAM	LEED	HQE	DGNB	WELL
Country of origin	UK	USA	France	Germany	USA
Creation date	1990	1998	2004	2007	2014
Organism	BRE	USGBC / GBCI	Cerway / Certiv��a	DGNB	IWBI / GBCI
# of main themes	10	9	14	6	7
Performance levels	Pass / Good / Very Good / Excellent / Outstanding	Certified / Silver / Gold / Platinum	Bon / Tr��s Bon / Excellent / Exceptionnel	Bronze / Silver / Gold / Platinum	Silver / Gold / Platinum
Audit schedule	Design Post-Construction Or combined	Pre-certification (optional for LEED CS) Design Post-Construction	Schematic (optional) Design Post-Construction	Pre-certification option Post-construction	Pre-certification option Post-construction
Audit process	BREEAM Assessor report reviewed by BRE	LEEDOnline report reviewed by GBCI	Onsite audit by an auditor accredited by Certiv��a	DGNB team verifies the DGNB auditor report	WELL assessor report reviewed by GBCI and onsite audit by GBCI
Accreditations	BREEAM AP	LEED AP with or without specialty	R��f��rent certification MOE/MOA	DGNB Consultant	WELL AP

## In Green Building Rating Systems , a clear tendency



**In all Green Building Rating Systems, increasing focus on:**

■ **Construction Materials sourcing:**

- Responsible supply chain (Raw materials ISO 14001 certified suppliers)...
- Recycled content
- Wood from sustainable forest (FSC certification)...

■ **Products and Buildings Life Cycle Assessment (LCA):**

- Environmental Product Declarations (EPDs)
- Building Life Cycle Assessment
- Building Life Cycle Costing

■ **Indoor air quality and comfort:**

- Reduced formaldehyde emissions and VOCs
- Thermal & acoustic comfort

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## Tools for use in Green Building Rating Systems: LCA - EPD

# The question is...

## ... how to measure, analyze and communicate product's environmental impact?

Life Cycle Assessment (LCA)  
Environmental Product Declaration (EPD)



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## Examples of Mineral Wool ECOSE Technology documentation for Green Building Rating Systems



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Environmental Product Declaration Krauf insulation – Smart Roof Top / Norm

EPD are available for architects, contractors, assessors to use

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**ENVIRONMENTAL PRODUCT DECLARATION**  
as per ISO 14025 and EN 15026

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# Where is the information available?

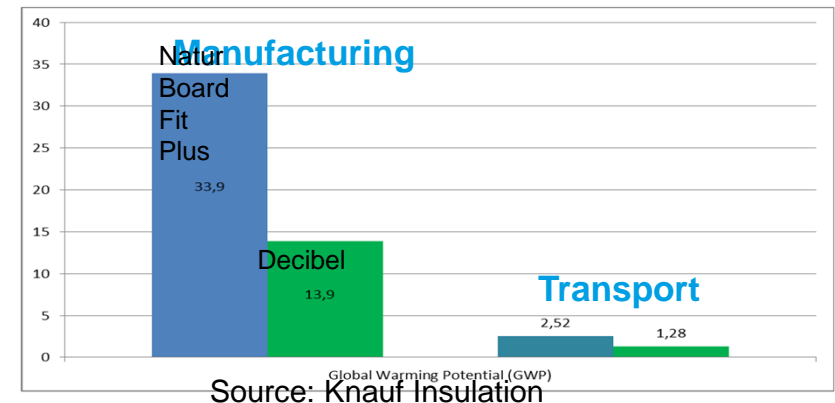
<http://www.knaufinsulation.com/en/environmental-product-declaration-epd>



## Life Cycle Assessment – LCA , impact of ECOSE

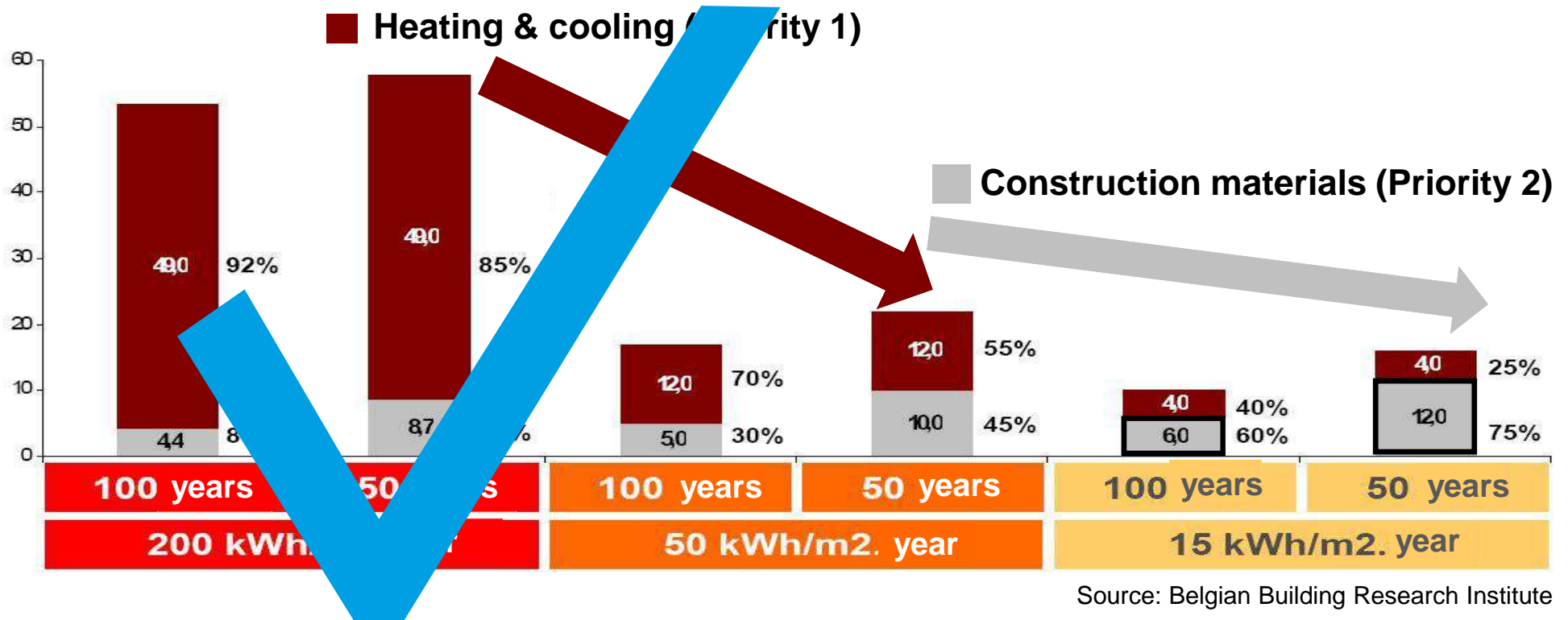


- Climate change, circular economy:
  - **GWP (Global Warming Potential) and Resource Used** are THE LCA priority indicators of the EU Commission building framework, LEVELS (August 2017) => **ECOSE Technology and recycled content** are significantly contributing to improve these indicators
- EcoDesign: for some applications (i.e. partition walls), replacing NaturBoard Fit Plus by Decibel with ECOSE improve environmental impact
  - ❑ **NaturBoard Fit Plus = 1 m<sup>3</sup> NaturBoard Fit Plus**
  - ❑ **Decibel = 1 m<sup>3</sup> Decibel**
- All Knauf Insulation ECOSE products are covered by a LCA. It demonstrates **transparency and leadership** in the way we want to position our innovation. These LCA are available for buildings LCA calculations.



## Evolution of Building Environmental impact (energy)

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Reducing H&C energy demand was, and still is, the right priority but now, additionally, we need to care about the construction products



## Indoor Air Comfort Gold for Knauf Insulation products with ECOSE Technology means....

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- Very low emissions from products
- no impact on Indoor Air Quality

Due to ECOSE Technology:

- No added formaldehyde



VOC TEST REPORT  
Indoor Air Comfort GOLD®

14 April 2016



LEEDv4 : Low Emitting Materials credit (3 points)

# Knauf Insulation Factsheets for Green Building Rating Systems

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July 2016

**BREEAM INTERNATIONAL NEW CONSTRUCTION 2016**  
PRODUCT DATA FOR CERTIFICATION  
GLASS MINERAL WOOL ECOSE

BREEAM (Building Research Establishment Environmental Assessment Methodology) International New Construction<sup>1</sup> is a voluntary standard that defines high performance green buildings which are healthier, more environmentally responsible and more profitable structures. Using independent assessors, BREEAM examines criteria covering a range of issues in sections that evaluate: management processes, health and wellbeing, energy, transport, water, materials, waste, land use and ecology, pollution.

KNAUF INSULATION products can put you on the right track for the highest result for certification!

BREEAM Credit Category code	Assessment criteria and definition	Knauf Insulation Products contribution	Contribution towards
Hea 02 Indoor air quality	Emissions from building products: the insulation materials are one of the 5 product types that need to meet the emission limits. The following requirements are of application for insulation products: Formaldehyde ≤ 0.05 mg/m <sup>3</sup> Total volatile Organic Compounds ≤ 1.0 mg/m <sup>3</sup> Carcinogens category 1A and B ≤ 0.001 mg/m <sup>3</sup> Post-construction indoor air quality measurement: the total volatile organic compound and formaldehyde are measured and reported (thresholds for averaged formaldehyde concentration level is 100µg/m <sup>3</sup> over 30 minutes and for averaged TVOCs 300µg/m <sup>3</sup> over 8 hours).	MINERAL F are in compliance with the requirements of the European standard EN 12068 for indoor air quality. MINERAL F is a certified European standard (CE mark) and is a low concentration of formaldehyde.	20 points
Hea 04 Thermal comfort	To ensure that appropriate thermal comfort levels are achieved through design, and controls are selected to maintain a thermally comfortable environment for occupants.	Thermal insulation products facilitate the achievement of thermal comfort levels by reducing heat loss/gain through the building envelope.	1 point

<sup>1</sup> Technical manual : 00233 – 1.0.2016  
<sup>2</sup> www.product-testing.eurofins.com  
<sup>3</sup> www.product-testing.eurofins.com  
<sup>4</sup> www.bimetrica.com

For additional information please contact [Sustainability@knaufinsulation.com](mailto:Sustainability@knaufinsulation.com)

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July 2016

**BREEAM INTERNATIONAL NEW CONSTRUCTION 2016**  
PRODUCT DATA FOR CERTIFICATION  
MINERAL PLUS

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Hea 04 Thermal comfort	To ensure that appropriate thermal comfort levels are achieved through design, and controls are selected to maintain a thermally comfortable environment for occupants.	Thermal insulation products facilitate the achievement of thermal comfort levels by reducing heat loss/gain through the building envelope.	1 point

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**urbanscape** **knauf INSULATION**  
(It's time to save energy)

June 2016

**LEED version 4**  
PRODUCT DATA FOR CERTIFICATION  
URBANSCAPE GREEN ROOF SYSTEMS

LEEDv4 (Leadership in Energy and Environmental Design) is a voluntary standard that defines high performance green buildings which are healthier, more environmentally responsible, and more profitable structures. Credits for certification can be earned in various categories, each with a unique focus on sustainable design: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation and design process.

KNAUF INSULATION products can put you on the right track for the highest result for certification!

LEED Credit Category code	LEEDv4 Definition	Knauf Insulation Products contribution	Contribution towards
Sustainable Sites Rainwater management	To reduce runoff volume and improve water quality by replicating the natural hydrology and water balance of the site.	Urbanscape products are a rainwater control system that helps reducing peak rate of runoff from the site. (See annex 1: Urbanscape Green Roof Performance Evaluation Tool).	3 points
Sustainable Sites Heat Island Reduction	To minimize effects on microclimates and human and wildlife habitats by reducing heat islands.	Temperatures on the roof can be up to 45°C lower which reduce heat island effect and extend life of waterproofing (up to 50%).	2 points
Sustainable Sites Protect or restore habitats	To conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.	The Urbanscape vegetated roof is counted toward the overall restored area calculation.	2 points
Sustainable Sites Open Space	To create exterior open space that encourages interaction with the environment, social interaction, passive recreation, and physical activities.	Vegetated roof is an open space qualified for its environmental benefits. The presence of green areas has a relaxing psychological effect, helps to reduce blood pressure and lowers the heartbeat.	1 point
Energy and Atmosphere (EA) Optimize Energy Performance	To achieve increasing levels of performance to reduce environmental and economic harm of excessive energy use.	Urbanscape products help reducing heating/cooling energy demand. (See annex 1: Urbanscape Green Roof Performance Evaluation Tool).	20 points

For additional information please contact [Sustainability@knaufinsulation.com](mailto:Sustainability@knaufinsulation.com)

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**LEED version 4**  
PRODUCT DATA FOR CERTIFICATION  
WOOD WOOL - HERAKLITH

LEEDv4 (Leadership in Energy and Environmental Design) is a voluntary standard that defines high performance green buildings which are healthier, more environmentally responsible, and more profitable structures. Credits for certification can be earned in various categories, each with a unique focus on sustainable design: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation and design process.

KNAUF INSULATION products can put you on the right track to get the highest result for certification!

LEED Credit Category code	Definition	Knauf Insulation Products contribution	Contribution towards
Energy and Atmosphere (EA) Optimize Energy Performance	To achieve increasing levels of performance beyond the prerequisite standard to reduce environmental and economic harm associated with excessive energy use.	Heraklith products help reducing energy demand through very high insulation efficiency.	20 points
Materials and Resources (MR) Building Product Disclosure and Optimization – Environmental Product Declarations	To encourage the use of products where Life Cycle Assessment (LCA) is available and have environmentally, economically and socially preferable LCA. To reward project including products with verified LCA.	Third party verified Environmental Product Declarations (EPDs) are available on line for Heraklith products.	2 points
Materials and Resources (MR) Building Product Disclosure and Optimization – Sourcing of Raw Materials	To encourage the use of products where LCA is available and have environmentally, economically and socially preferable LCA. To reward project including products verified to be extracted or sourced in a responsible manner.	Heraklith Products are manufactured with up to 80% of wood-based materials certified following FSC labels (remaining part is the binder).	1 point

<sup>1</sup> <http://www.knaufinsulation.com/en/product-sustainability>  
<sup>2</sup> See annex 1

For additional information please contact [Sustainability@knaufinsulation.com](mailto:Sustainability@knaufinsulation.com)

<http://www.knaufinsulation.com/en/sustainable-buildings-and-green-building-rating-systems>



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## Conclusion: Impact of ECOSE Technology



## Impact of ECOSE Technology

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- New binder technology
- Based on **rapidly renewable materials** instead of petro-based chemicals
- Reduces **impact on environment** through lower embodied energy
- Reduces **workplace exposures** and pollutant **manufacturing emissions**
- **Impact on indoor air quality** once installed in buildings

No added formaldehyde

Bio-based

Global Warming Potential

Low Emitting Materials  
Indoor Air Comfort Gold

Documented by Knauf Insulation with:

- Certifications
- Factsheets
- Environmental Product Declarations (EPD)





## Knauf Insulation mission



Our mission is to **challenge** conventional thinking and **create** innovative insulation solutions that shape the way we live and build in the future, with **care** for the people who make them, the people who use them and the world we all depend on.



## Knauf Insulation mission

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challenge.



create.



care.

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Thank you