July 2020

BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

BREEAM (Building Research Establishment Environmental Assessment Methodology) International New Construction[1] 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 and innovation.

KNAUF INSULATION put you on the right track to get the highest result into BREEAM certification!

BREEAM - Credit Category code	Assessment Criteria and Definition	Knauf Insulation Products contribution	Contributes towards
Hea 02 Indoor air quality	Emissions from building products: the insulation materials are one of the 5 product types that needs to meet the emission limits. The following requirements are of application for insulation products: Formaldehyde ≤ 0.06 mg/m³; Total Volatile Organic Compounds ≤1.0 mg/m³; Carcinogens category 1A and B ≤ 0.001 mg/m³	Rock Mineral Wool ECOSE products are in compliance with the higher category (A+) of the French labelling and with the requirements as without added formaldehyde and certified Eurofins Gold[2] for Indoor Air Comfort, see annex 1.	**1 credit**
	Emissions from building products: the insulation materials are one of the 5 product types that could meet the emission limits for **exemplary level** emission criteria. The following requirements are of application: Formaldehyde ≤ 0.01 mg/m³; Total Volatile Organic Compounds ≤0.3 mg/m³; Total Semi-volatile Organic Compounds ≤0.1 mg/m³; Carcinogens category 1A and B ≤ 0.001 mg/m³	Rock Mineral Wool ECOSE products are in compliance with the requirements for exemplary level as without added formaldehyde and certified Eurofins Gold for Indoor Air Comfort, see annex 1.	**1 credit exemplary level**
	Post-construction indoor air quality measurement: the total volatile organic compound & formaldehyde are reported (thresholds for averaged formaldehyde concentration level ≤ 100µg/m³ over 30 minutes & for averaged TVOC≤ 300µg/m³ over 8 hours).	Rock Mineral Wool ECOSE products without added formaldehyde and certified Eurofins Gold for Indoor Air Comfort are helping to stay at a very low concentration level.	**1 credit**
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	Through the insulation level, insulation products contribute to the comfort level (heating and cooling) in accordance to ISO 7730:2005. Thermal modelling can be facilitated through Knauf Insulation expertise and available databases.	**1 credit**

[1] Technical manual : SD233– 2.0:2016
[2] www.product-testing.eurofins.com

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BREEAM INTERNATIONAL NEW CONSTRUCTION

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ROCK MINERAL WOOL with ECOSE

BREEAM - Credit Category code	Assessment Criteria and Definition	Knauf Insulation Products contribution	Contributes towards
Hea 05 Acoustic performance	To insure the building's acoustic performance, including sound insulation, meets the appropriate standards for its purpose.	Products performance aims to reduce indoor ambient noise level and reverberation times in order to comply with regulations or good practices standards, see annex 2.	**1 credit**
Ene 01 Reduction of energy use and carbon emissions	To recognize and encourage buildings designed to minimise operational energy demand, primary energy consumption and CO2 emissions.	Rock Mineral Wool ECOSE products help reducing the 3 parameters: operational energy demand, primary energy consumption and CO2 emissions through the improving of energy building performance (e.g. Uvalue) in accordance with EPBD best practices and ASHRAE standard 90.1-2013 or 90.2-2007 (as applicable).	**15 credits**
Ene 04 Low carbon design	To encourage the adoption of design measures, which reduce building energy consumption and associated carbon emissions and minimise reliance on active building services systems.	Rock Mineral Wool ECOSE products contribute to implement passive design solutions that reduce building energy demand and associated carbon emissions.	**1 credit**
Ene 05 Energy efficiency cold storage	Energy efficient design, installation and commissioning: To encourage the installation of energy efficient refrigeration systems, therefore reducing operational greenhouse gas emissions. The building has been designed to minimize heat loads through high levels of insulation.	Rock Mineral Wool ECOSE products can contribute to high insulation efficiency in the design options.	**1 credit**
Mat 01 Life cycle impacts	To encourage the use of robust and appropriate life cycle assessment tools and specification of construction materials with a low environmental impact over the full life cycle of the building	The Environmental Products Declarations[3] (EPDs) are available and 3rd party verified against EN 15804, this allows to maximise points through Mat 01 calculator and contribute to reach the target of 5 products (10 products for exemplary level) with EPDs for additional points (with confirmation of use on the construction site at Post-Construction Stage)	**1 credit + 1 credit exemplary level** EPD THE INTERNATIONAL EPD® SYSTEM

[3] https://www.knaufinsulation.com/downloads/environmental-product-declaration-epd/rock-mineral-wool-rmw; https://www.environdec.com/EPD-Search/

July 2020

BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

BREEAM - Credit Category code	Assessment Criteria and Definition	Knauf Insulation Products contribution	Contributes towards
Mat 03 Responsible sourcing of construction products	To recognize and encourage the specification and procurement of responsibly sourced construction (RSC) products. Insulation Products with more than 50% recycled content (BREEAM Guidance note18.v3.1 – 2018).	The key process is also covered by EMS (ISO 14001) which allows to meet the criterion of responsible sourced construction (RSC) products, see annex 3.	**3 credits**
Mat 06 Material efficiency	To recognise and encourage measures to optimise material efficiency in order to minimise the environmental impact of material use and waste without compromising on structural stability, durability or service life of the building. This includes procuring materials with higher levels of recycled content.	Rock Mineral Wool ECOSE products contains recycled components and contribute therefore to minimise the environmental impact of insulation, see annex 3.	**1 credit**
Wst 01 Construction waste management	To promote resource efficiency via the effective and appropriate management of construction waste.	Packaging's (wood and plastics) and products itself are recyclable. Products cut-offs can also be used to fill in some remaining tiny gaps in insulation on working site. Mineral wool waste can be reused or recycled no matter the age or type.	**3 credit**
Wst 06 Functional adaptability	To recognise and encourage measures taken to accommodate future changes of uses of the building over its lifespan, this includes the use of products or systems which allow easy replacements.	Rock Mineral Wool ECOSE products and technical principle of implementations may allow easy replacements of each component (Outside and/or inside use) and facilitate future adaptations or insulation reuse.	**1 credit**
Pol 02 NOx emissions	To contribute to a reduction in national NOx emission levels to the use of low emission heat source in the building	High insulation efficiency products can help reducing energy and NOx emissions for heat and hot water supply (i.e: Rock Mineral Wool Technical Solutions products).	**3 credits**
Pol 05 Noise attenuation	To reduce the likelihood of noise, arising from fixed installations on the new development, affecting nearby noise-sensitive buildings.	Attenuation of noise by use of insulation mineral wool absorbers.	**1 credit**

BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

Annex 1: Hea 02 – Indoor Air Quality

Here below the Eurofins Indoor Air Comfort Gold Certificate:

BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

INDOOR AIR COMFORT
eurofins
GOLD
CERTIFIED PRODUCT

Appendix to Certificate

IACG-323-02-01-2018C

Knauf Insulation

receives the Indoor Air Comfort Gold certificate with validity 18 January 2023 for below product group, including subgroups and individual products listed in the following table:

Product group	Production site
Unfaced, paper and aluminum faced Rock Mineral Wool with ECOSE® Technology	Novi Marof, Croatia Nova Bana, Slovakia Surdulica, Serbia Queensferry, United Kigndom

The products in this group are based on identical or similar recipe and are produced under equivalent conditions. Grouping of the products and inspection of the production process is part of the Indoor Air Comfort Gold certification. A worst-case product, which is representative for the whole group, is being tested frequently.

eurofins | Product Testing

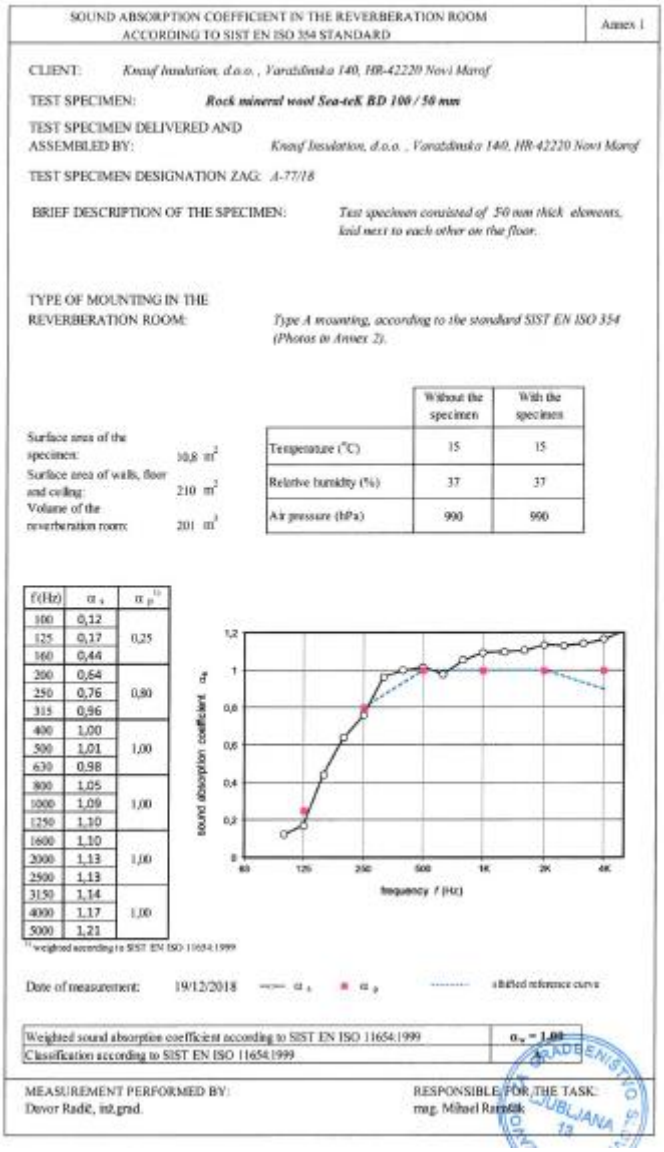
BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

Annex 2: ECOSE Rock Mineral Wool product and sound absorption example

α coefficient is the coefficient for *sound absorption*.



SOUND ABSORPTION COEFFICIENT IN THE REVERBERATION ROOM ACCORDING TO SIST EN ISO 354 STANDARD — Annex 1

CLIENT: *Knauf Insulation, d.o.o., Varaždinska 140, HR-42220 Novi Marof*

TEST SPECIMEN: ***Rock mineral wool Sea-teK BD 100 / 50 mm***

TEST SPECIMEN DELIVERED AND ASSEMBLED BY: *Knauf Insulation, d.o.o., Varaždinska 140, HR-42220 Novi Marof*

TEST SPECIMEN DESIGNATION ZAG: *A-77/18*

BRIEF DESCRIPTION OF THE SPECIMEN: *Test specimen consisted of 50 mm thick elements, laid next to each other on the floor.*

TYPE OF MOUNTING IN THE REVERBERATION ROOM: *Type A mounting, according to the standard SIST EN ISO 354 (Photos in Annex 2).*

Surface area of the specimen: 10,8 m²
Surface area of walls, floor and ceiling: 210 m²
Volume of the reverberation room: 201 m³

	Without the specimen	With the specimen
Temperature (°C)	15	15
Relative humidity (%)	37	37
Air pressure (hPa)	990	990

f (Hz)	α_s	α_p [1)]
100	0,12	0,25
125	0,17	
160	0,44	0,80
200	0,64	
250	0,76	
315	0,96	1,00
400	1,00	
500	1,01	
630	0,98	1,00
800	1,05	
1000	1,09	
1250	1,10	1,00
1600	1,10	
2000	1,13	
2500	1,13	1,00
3150	1,14	
4000	1,17	
5000	1,21	

[1)] weighted according to SIST EN ISO 11654:1999

Date of measurement: 19/12/2018 — α_s * α_p ------ shifted reference curve

Weighted sound absorption coefficient according to SIST EN ISO 11654:1999	α_w = 1,00
Classification according to SIST EN ISO 11654:1999	

MEASUREMENT PERFORMED BY: Davor Radič, inž.grad.

RESPONSIBLE FOR THE TASK: mag. Mihael Remšak

BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

Annex 3: Mat 03 Responsible sourcing of Rock Mineral Wool with ECOSE

Material Category	Key Process	Key Supply Chain Process
Insulation		
Foam Insulation	Insulation manufacture	Main polymer production, e.g. Polystyrene, MDI, Phenolic resin or equivalent
Stone wool, glass & cellular glass made using < 50% recycled input	Product manufacture	Any quarried or mined mineral over 20% of input
Wool	Product manufacture	Wool scouring
Products using > 50% recycled content except those using timber	Product manufacture	Recycled content by default

Here below additional detailed information[4] by production site about waste introduced into the fabrication of the Rock mineral wool. ISO 14001 certifications of main raw materials suppliers (any quarried or mined mineral over 20% input) can be provided on demand.

	Nová Baña (Slovakia)	Novi Marof (Croatia)	Surdulica (Serbia)	Queensferry (UK)
% external waste content (slags and offcuts return from customers)	**30%**	**10%**	**3%**	**31%**
% internal waste content (materials from production lines with further processing into briquettes before it is used)	**15%**	**12%**	**20%**	**0%**
% internal waste content (edge trim from production lines with shredding before it is re-input)	**8%**	**8%**	**8%**	**8%**
Total recycled content	**53%**	**30%**	**31%**	**39%**
BREEAM Mat 04	**contributes towards 1 credit**			

On the next page, please find the ISO 14001 certificate for Key Process.

[4] Most recent data 2018

BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

TÜV NORD

CERTIFICATE

Management system as per
ISO 14001 : 2015

In accordance with TÜV NORD CERT procedures, it is hereby certified that

KNAUF INSULATION S.P.R.L.
Rue de Maestricht 95
4600 Vise
Belgium

with the locations according to the annex

applies a management system in line with the above standard for the following scope

Design, development and production of insulation materials and systems

Certificate Registration No. 44 104 190742
Audit Report No. 3525 0612

Valid from 2019-12-23
Valid until 2022-12-22
Initial certification 2010-12-23

Certification Body
at TÜV NORD CERT GmbH

Essen, 2019-12-19

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.
Validity can be verified at https://www.tuev-nord.de/de/unternehmen/zertifizierung/zertifikatsdatenbank.

TÜV NORD CERT GmbH Langemarckstraße 20 45141 Essen www.tuev-nord-cert.com

IAF

DAkkS Deutsche Akkreditierungsstelle D-ZM-12007-01-00

BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

Certificate Registration No.	Location
44 104 190742-001	KNAUF INSULATION S.P.R.L. Rue de Maestricht 95 4600 Vise, Belgium
44 104 190742-002	KNAUF INSULATION D.O.O. Vipavska 4L 5270 Ajdovščina, Slovenia
44 104 190742-003	KNAUF INSULATION, INC. 1000E North ST MI 49224 Albion, United States
44 104 190742-004	KNAUF INSULATION GMBH Weststrasse 1 06406 Bernburg/Saale, Germany
44 104 190742-005	KNAUF INSULATION LTD. A4051, Croesyceiliog Cwmbran, NP44 2YQ, United Kingdom
44 104 190742-006	KNAUF INSULATION IZOLASYON SANAYI VE TICARET ANONIM ŞIRKETI 75. Yil Mahallesi 1. Cadde 1/G, Küçük Organize Sanayi 26250 Eskişehir, Turkey
44 104 190742-008	KNAUF INSULATION, INC. 4812 Tabler Station Rd., WV 25428 Inwood, United States
44 104 190742-009	KNAUF INSULATION SPOL S.R.O. Industrial Park Krupka, Pod Dolni Drahou 110 41742 Krupka, Czech Republic
44 104 190742-010	KNAUF INSULATION, INC. 3502 43rd Street SW AL 36863 Lanett, United States
44 104 190742-011	KNAUF INSULATION LANNEMEZAN SAS 501 Voie Napoleon III 65300 Lannemezan, France
44 104 190742-012	KNAUF INSULATION S.R.O. Železničný rad 24 96814 Nová Baňa, Slovakia
44 104 190742-013	KNAUF INSULATION D.O.O. Varaždinska 140 Novi Marof, Croatia

BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Certification

ROCK MINERAL WOOL with ECOSE

Certificate Registration No.	Location
44 104 190742-014	KNAUF INSULATION LTD. Queensferry Flintshire, CH5 2DA, United Kingdom
44 104 190742-015	KNAUF INSULATION, INC. 3100 Ashby Rd. Shasta Lake, CA 96019, United States
44 104 190742-016	KNAUF INSULATION, INC. 400 East Walker, Shelbyville Plant 1 IN.46176, United States
44 104 190742-017	KNAUF INSULATION, INC. 1 Knauf Dr., Shelbyville Plant 3 IN.46176, United States
44 104 190742-018	KNAUF INSULATION OPERATION GMBH Heraklithstrasse 8 84359 Simbach/Inn, Germany
44 104 190742-019	KNAUF INSULATION D.O.O. Trata 32 4220 Skofja Loka, Slovenia
44 104 190742-020	KNAUF INSULATION GMBH - Linie 1 Bahnhofstrasse 25 9356 St. Egidien, Germany
44 104 190742-021	KNAUF INSULATION LTD. Stafford Road, St. Helens Merseyside, WA10 3NS, United Kingdom
44 104 190742-022	OOO KNAUF INSULATION Industrialnaya St., Estate 2 Stupino, Moscow Region, 142800, Russion Federation
44 104 190742-023	KNAUF INSULATION D.O.O. BEOGRAD Naselje Belo Polje bb 17530 Surdulica, Serbia
44 104 190742-024	OOO KNAUF INSULATION Kamchatskaya 198 Tyumen 625034, Russian Federation
44 104 190742-025	KNAUF INSULATION KFT. Ipartelep 8924 Alsonemesapati (Zalaegerszeg), Hungary
44 104 190742-026	KNAUF INSULATION OPERATION GMBH - Linie 2 Bahnhofstrasse 25 9356 St. Egidien, Germany

December 2021

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen) is a voluntary standard to assess the integrated evaluation of economic and environmental aspects as well as user comfort in buildings.

The 2020 DGNB assessment system covers key aspects of sustainable building with special focus on people, circular economy, design quality, the UN sustainable development goals, climate protection, and innovation. It includes environmental, economic, socio-cultural and functional aspects, technology, processes and site. The DGNB system comprises a variety of certification schemes for different building uses, for example office, residential, or education. The weighing of the criteria can vary based on the relevant building scheme.

KNAUF INSULATION products can put you on the right track to get the highest results for DGNB certification.

DGNB Criteria Group	Assessment criteria and definition	Knauf Insulation Products contribution	Contributes towards
ENV 1.1.	**Life Cycle Impact Assessment** The objective of the assessment is to quantify and document the environmental performance of the building and compare the results against a defined benchmark. The scope includes the environmental impacts of production, use and end-of-life phases. The building LCA is based on the Life Cycle Energy Modelling (LCEM). Up to 40 points can be awarded if the proposed building's environmental impact is equal to that of the reference building. Up to 50 additional points can be awarded if the impacts are less than the reference building and up to 30 bonus points for climate neutrality. The preference should be given to product-specific EPD where the LCA fulfil EN 15804 requirements.	The Environmental Products Declarations (EPDs) [1] are product specific and 3rd party verified against EN 15804 through German IBU program operator or the International EPD System or INIES. Results of the different LCA indicators are directly available. Because of the high recycled content and the bio-based binder, Global Warming Potential is for example particularly low in comparison to other mineral wool products.	4.5-4.7%

[1] http://www.knaufinsulation.com/en/product-sustainability

December 2021

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

DGNB Criteria Group	Assessment criteria and definition	Knauf Insulation Products contribution	Contributes towards
ENV 1.2.	**Local Environmental Impact** This criterion is focusing on the VOCs content as well as the VOC emissions of the products. Some high risk material and product groups are individually checked and evaluated: halocarbons and partially halocarbons refrigerants and propellants; heavy metals; materials which fall under Biocidal Product Directive; hazardous material according to CLP regulation; organic solvents and plasticisers.	Products are free of halocarbon propellants. ECOSE is certified under Eurofins Indoor Comfort Gold[2] for low VOC emissions. ECOSE Technology products contain no ingredients listed on the REACH Authorization list, Restriction list or Substances of Very High Concern Candidate list[3]. They are inventoried to at least 0.01% by weight (100ppm) and certified DECLARE LBC Red List Free which means no harmful chemical substances[4]. Declare. Living Building Challenge Chemicals Red List Free Red List Free	9-9.5%
ENV 1.3	**Sustainable Resource Extraction** This criterion encourages use of products manufactured using raw materials extracted responsibly.	ISO 14001 certification is a supplier pre-requisite for the extracted raw materials[5] and secondary raw materials or preferred to virgin ones.	2.3-2.4%

[2] www.product-testing.eurofins.com
[3] Compliance letter statement to REACH can be requested for dedicated product's manufacturing plants
[4] See annex 2
[5] ISO 14001 suppliers' certificates can be delivered on demand.

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

DGNB Criteria Group	Assessment criteria and definition	Knauf Insulation Products contribution	Contributes towards
ECO 1.1	**Life Cycle Cost** The aim is to reduce the building's total life cycle costs (LCC) to a minimum. The objective is to facilitate a comparison between different buildings with the same use. Costs incurred throughout the building's entire life cycle are covered within the scheme: construction, occupancy costs and dismantling and disposal costs.	Knauf Insulation solutions help to reduce the occupancy costs by lowering energy consumption and to limit maintenance costs. As due to durability of mineral wool, there is no need for replacement within the considered time period of 50 years building's life.	10-12.9%
ECO 2.1	**Flexibility and adaptability** The ease with which a building can be adapted to changing requirements helps raise user satisfaction; it can prolong the building's service life and lower costs through its life cycle. The space efficiency and adaptability is evaluated on the basis of a checklist including the structure as one of the indicator. In the structure, internal and partition walls have a major role.	The mineral wool that is for example utilized for partition wall can be re-used as the wool is flexible and the panels do not break.	7.5-.6%
SOC 1.1	**Thermal comfort** Thermal comfort makes an important contribution to an efficient and performance-enhancing working and living environment. This is evaluated through a checklist of qualitative and quantitative indicators (operative temperature/heating period, relative humidity/heating period, etc.).	The insulating properties of Knauf Insulation solutions (low thermal conductivity) and the technical information provided for construction are contributing to the increase of thermal comfort.	4.5-5.4%

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

DGNB Criteria Group	Assessment criteria and definition	Knauf Insulation Products contribution	Contributes towards
SOC 1.2	**Indoor air quality** The aim of the criterion is to ensure that indoor air is of sufficient quality not to adversely affect users' health and well-being. The buildings must be with TVOC concentration lower than 3000 µg/m³ and a formaldehyde concentration lower than 120 µg/m³.	Glass Mineral Wool ECOSE products help to meet the requirements as the binder is bio-based and without added formaldehyde, certified Blue Angel[6] and Eurofins Gold[7] for Indoor Air Comfort, see annexe 1	3.6-4.5%
SOC 1.3	**Acoustic comfort** The objective of the criterion is to achieve room acoustic conditions which are appropriate for the intended use and which guarantee a sufficient level of user comfort.	Knauf Insulation products provide excellent sound absorption properties, they can influence significantly the reverberation time behaviour of a room.	Up to 2.9%
TEC 1.2	**Sound insulation** Evaluating the quality of sound insulation of building with the certificate or building components certificates required in the call for tenders. Inspection to determine compliance with the requirements specified in DIN 4109. The following indicators are considered: airborne sound insulation against other residential areas, footfall sound insulation, airborne sound insulation against external noise, insulation from sound from building services.	Knauf Insulation solutions are available to meet the highest noise reduction challenges; all sound protection levels can be met, see annex 4.	Up to 2.3%

[6] https://www.blauer-engel.de/en/s/knauf
[7] www.product-testing.eurofins.com

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

DGNB Criteria Group	Assessment criteria and definition	Knauf Insulation Products contribution	Contributes towards
TEC 1.3	**Quality of the Building envelope** The objective of this criterion is to reduce space heating demand, achieve a high level of thermal comfort, and to prevent damages to the building fabric. The following indicators are included in the evaluation: Thermal transmittance coefficient U, Thermal bridges, air permeability class, amount of condensation, air exchange, solar heat protection.	Knauf Insulation solutions are available to meet requested thermal transmittance coefficients of external building components. Technical guidance are available to avoid thermal bridge and condensation and to reach adequate air permeability class.	2.6 – 3.3 %
TEC 1.6.	**Ease of Recovery and Recycling** The ease of dismantling and recycling of the building structure is evaluated on the basis of a checklist including the following indicators: ease of disassembly, scope of disassembly and recycling and disposal plan.	Knauf Insulation solutions are generally easily disassembled (filler material) and if the sorting has been done appropriately the mineral wool can be recycled (ceiling tiles, bricks…).	3-3.5 %
PRO 1.4.	**Sustainability aspects in tender phase** It has to be checked whether sustainability aspects are integrated into the tender and if the selection of companies commissioned is based on sustainability aspects (equality, conservation of climate and resources, adherence to human rights…)	Knauf Insulation has an integrated certificate QHSEE : ISO 9001/ ISO 14001/ ISO 45001 / ISO 50001, see annex 3. We publish yearly a CSR report and monitor our responsible supply chain. Knauf Insulation supports the Ten Principles of the United Nations Global Compact on human rights, labor, environment and anti-corruption, see annex 5.	1.6%

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

Annex 1: SOC 1.2 : Indoor Air Quality

Here below the Eurofins Indoor Air Comfort Gold Certificate:

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

Annex 2: DECLARE labels

Declare.

Glass Mineral Wool products without facing, with ECOSE Technology®
Knauf Insulation

Final Assembly: Multiple Global Locations
Life Expectancy: Life of Structure Year(s)
End of Life Options: Salvageable/Reusable in its Entirety, Recyclable (100%), Landfill (100%)

Ingredients:

.: EC: 926-099-9 Man-Made Vitreous (silicate) Fibers; Syrups, hydrolyzed starch; Ammonium Sulfate; Mineral Oil; Silane; Silicone oil

Living Building Challenge Criteria: Compliant

I-13 Red List:
■ LBC Red List Free
☐ LBC Red List Approved
☐ Declared

% Disclosed: 100% at 100ppm
VOC Content: Not Applicable

I-10 Interior Performance: AgBB Scheme French A+ 2011
I-14 Responsible Sourcing: Not Applicable

KNF-0043
EXP. 01 AUG 2022
Original Issue Date: 2021

MANUFACTURER RESPONSIBLE FOR LABEL ACCURACY
INTERNATIONAL LIVING FUTURE INSTITUTE® living-future.org/declare

Declare.

Glass Mineral Wool products with paper Kraft or aluminum Kraft facing, with ECOSE Technology®
Knauf Insulation

Final Assembly: Multiple Locations in Europe
Life Expectancy: Life of Structure Year(s)
End of Life Options: Salvageable/Reusable in its Entirety, Recyclable (100%), Landfill (100%)

Ingredients:

.: EC: 926-099-9 Man-Made Vitreous (silicate) Fibers; Kraft paper; Syrups, hydrolyzed starch; PE; Aluminum; Ammonium Sulfate; PVAC Glue; Glass scrim – part 1; Glass scrim – part 2; Mineral Oil; Silane; Silicone oil; Sodium silicate glue

Living Building Challenge Criteria: Compliant

I-13 Red List:
■ LBC Red List Free
☐ LBC Red List Approved
☐ Declared

% Disclosed: 100% at 100ppm
VOC Content: Not Applicable

I-10 Interior Performance: AgBB Scheme French A+ 2011
I-14 Responsible Sourcing: Not Applicable

KNF-0047
EXP. 01 JUL 2022
Original Issue Date: 20XX

MANUFACTURER RESPONSIBLE FOR LABEL ACCURACY
INTERNATIONAL LIVING FUTURE INSTITUTE® living-future.org/declare

https://declare.living-future.org/

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

Annex 3: Knauf Insulation Group QHSEE certificates

Knauf Insulation is certified for all its production plants and corporate sites throughout the world following the below standards:

- Quality Management : ISO 9001: 2015
- Health and Safety Management: ISO 45001: 2018
- Environment Management: ISO 14001: 2015
- Energy Management: ISO 50001: 2011

TÜV NORD

CERTIFICATE

Management system as per
ISO 14001 : 2015

In accordance with TÜV NORD CERT procedures, it is hereby certified that

KNAUF INSULATION S.P.R.L.
Rue de Maestricht 95
4600 Vise
Belgium

with the locations according to the annex

applies a management system in line with the above standard for the following scope

Design, development and production of insulation materials and systems

Certificate Registration No. 44 104 190742
Audit Report No. 3525 0612

Valid from 2019-12-23
Valid until 2022-12-22
Initial certification 2010-12-23

Certification Body
at TÜV NORD CERT GmbH

Essen, 2019-12-19

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.
Validity can be verified at https://www.tuev-nord.de/de/unternehmen/zertifizierung/zertifikatsdatenbank.

TÜV NORD CERT GmbH Langemarckstraße 20 45141 Essen www.tuev-nord-cert.com

IAF DAkkS Deutsche Akkreditierungsstelle D-ZM-12067-01-00

TÜV NORD

CERTIFICATE

Management system as per
ISO 9001 : 2015

In accordance with TÜV NORD CERT procedures, it is hereby certified that

KNAUF INSULATION S.P.R.L.
Rue de Maestricht 95
4600 Vise
Belgium

with the locations according to the annex

applies a management system in line with the above standard for the following scope

Design, development and production of insulation materials and systems

Certificate Registration No. 44 100 190742
Audit Report No. 3524 5466

Valid from 2019-12-23
Valid until 2022-12-22
Initial certification 2010-12-23

Certification Body
at TÜV NORD CERT GmbH

Essen, 2019-12-19

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.
Validity can be verified at https://www.tuev-nord.de/de/unternehmen/zertifizierung/zertifikatsdatenbank.

TÜV NORD CERT GmbH Langemarckstraße 20 45141 Essen www.tuev-nord-cert.com

IAF DAkkS Deutsche Akkreditierungsstelle D-ZM-12067-01-00

December 2021

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

TÜV NORD

CERTIFICATE

Management system as per
DIN ISO 45001:2018

In accordance with TÜV NORD CERT procedures, it is hereby certified that

KNAUF INSULATION S.P.R.L.
Rue de Maestricht 95
4600 Vise
Belgium

with the locations according to the annex

applies a management system in line with the above standard for the following scope

Design, development and production of insulation materials and systems

Certificate Registration No. 44 126 190742
Audit Report No. 3524 5468

Valid from 2019-12-23
Valid until 2022-12-22
Initial certification 2010-12-23

Certification Body
at TÜV NORD CERT GmbH

Essen, 2019-12-19

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.
Validity can be verified at https://www.tuev-nord.de/de/unternehmen/zertifizierung/zertifikatsdatenbank.

TÜV NORD CERT GmbH Langemarckstraße 20 45141 Essen www.tuev-nord-cert.com

DAkkS Deutsche Akkreditierungsstelle D-ZM-12007-01-00

TÜV NORD

CERTIFICATE

for the Energy Management System as per
ISO 50001 : 2011

In accordance with TÜV NORD CERT procedures, it is hereby certified that

KNAUF INSULATION S.P.R.L.
Rue de Maestricht 95
4600 Vise
Belgium

with the locations according to the annex

applies a management system in line with the above standard for the following scope

Design, development and production of insulation materials and systems

Certificate Registration No. 44 764 190742
Audit Report No. 3525 0669

Valid from 2019-12-16
Valid until 2022-12-15
Initial certification 2013-12-17

Certification Body
at TÜV NORD CERT GmbH

Essen, 2019-12-13

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.
Validity can be verified at https://www.tuev-nord.de/de/unternehmen/zertifizierung/zertifikatsdatenbank.

TÜV NORD CERT GmbH Langemarckstraße 20 45141 Essen www.tuev-nord-cert.com

IAF DAkkS Deutsche Akkreditierungsstelle D-ZM-12007-01-00

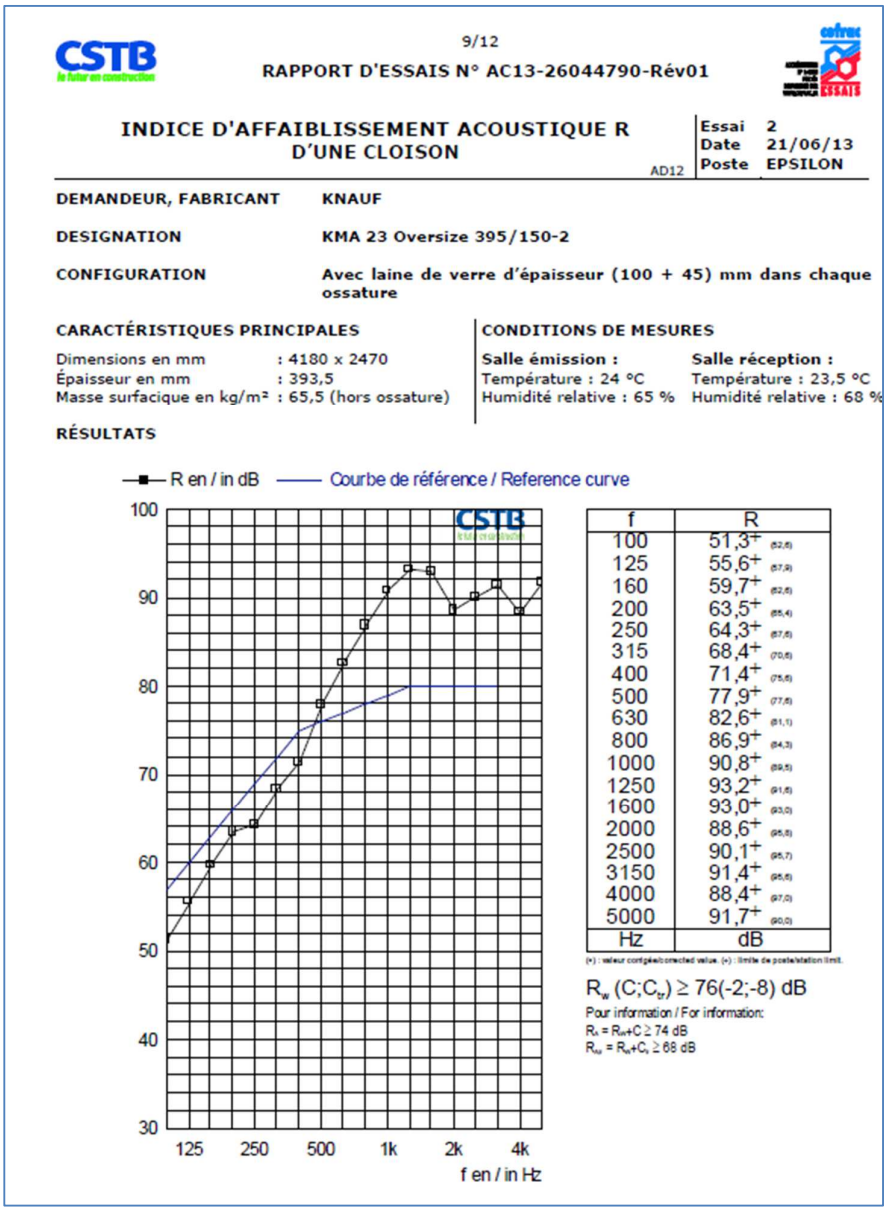
DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

Annex 4: Sound transmission and absorption examples

STC_c in North America is the composite *Sound Transmissions Class* and is equivalent to R_w *Sound Reduction Index* in Europe. *α* coefficient is the coefficient for *sound absorption*.



CSTB

9/12

RAPPORT D'ESSAIS N° AC13-26044790-Rév01

INDICE D'AFFAIBLISSEMENT ACOUSTIQUE R D'UNE CLOISON

AD12

Essai 2
Date 21/06/13
Poste EPSILON

DEMANDEUR, FABRICANT: KNAUF

DESIGNATION: KMA 23 Oversize 395/150-2

CONFIGURATION: Avec laine de verre d'épaisseur (100 + 45) mm dans chaque ossature

CARACTÉRISTIQUES PRINCIPALES

Dimensions en mm : 4180 x 2470
Épaisseur en mm : 393,5
Masse surfacique en kg/m² : 65,5 (hors ossature)

CONDITIONS DE MESURES

Salle émission : Température : 24 °C Humidité relative : 65 %
Salle réception : Température : 23,5 °C Humidité relative : 68 %

RÉSULTATS

R en / in dB — Courbe de référence / Reference curve

f	R
100	51,3+ (52,6)
125	55,6+ (57,9)
160	59,7+ (62,6)
200	63,5+ (65,4)
250	64,3+ (67,6)
315	68,4+ (70,6)
400	71,4+ (75,6)
500	77,9+ (77,6)
630	82,6+ (81,1)
800	86,9+ (84,3)
1000	90,8+ (89,5)
1250	93,2+ (91,6)
1600	93,0+ (93,0)
2000	88,6+ (95,6)
2500	90,1+ (95,7)
3150	91,4+ (95,6)
4000	88,4+ (97,0)
5000	91,7+ (90,0)
Hz	dB

(+) : valeur corrigée/corrected value. (+) : limite de poste/station limit.

R_w (C;C_{tr}) ≥ 76(-2;-8) dB

Pour information / For information:
$R_A = R_w + C \geq 74$ dB
$R_w = R_w + C_i \geq 68$ dB

DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM ACCORDING TO CSN EN ISO 354

Registration no.: **A-604**

Product: **Mineral insulation with ECOSE Technology (IPB 037) – thickness 50 mm**

Specimen description: The sample consist of 12 boards 1350 mm × 625 mm in the test room K4. The boards were produced on the basis of glass fibres with ECOSE technology. They are planned for thermal, sound and anti fire insulation. The specimen was laid freely on a floor and confined to specimen height.

Specimen size: 2,50 m × 4,05 m

Manufacturer: KNAUF INSULATION spol. s r.o. Bucharova 2641, 158 00 Praha 5

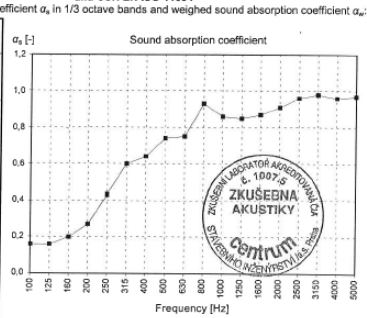
Test room: K4
Room volume: 80,25 m^3
Air temperature: 23,0 °C
Relative humidity:: 46 %

Date of test: August 14, 2012
Fabrication date: August 14, 2012

Reverberation method measurement results according to CSN EN ISO 354 and CSN EN ISO 11654

Sound absorption coefficient α_s in 1/3 octave bands and weighed sound absorption coefficient α_w:

Frequency [Hz]	α_s [-]
100	0,16
125	0,16
160	0,20
200	0,27
250	0,43
315	0,60
400	0,64
500	0,74
630	0,75
800	0,93
1000	0,86
1250	0,85
1600	0,87
2000	0,91
2500	0,96
3150	0,98
4000	0,96
5000	0,97



Evaluation according to CSN EN ISO 11654:
α_w = 0,70 (H)

Specimen area: 10.12 m^2
Basic weight: - kg/m^2

Specimen thickness: 50 mm
Air gap thickness: -

Centrum stavebniho inzenyrstvi a.s. (Centre of Building Engineering)– Acoustic Test Laboratory
Test Laboratory accredited by CAI, No. 1007.5
Prazska 16, 102 21 Prague 10 – Hostivar
phone: 281017111, 281017491 fax: 271751128
e-mail: meller@csias.cz

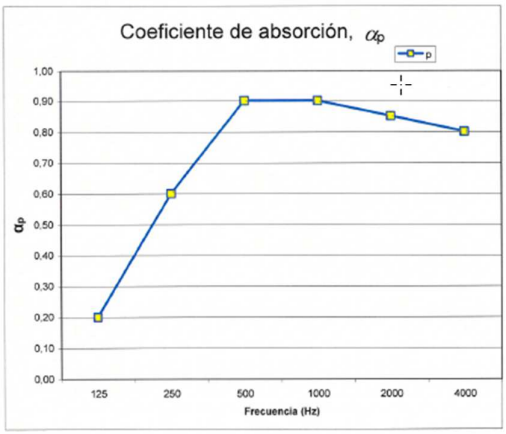
Date: August 20, 2012
Test Laboratory Chief:
Ing. M. Meller, CSc

Protokol o zkoušce č. 2230
Strana 6 / 8

Lugar de medida: Cámara reverberante normalizada de AUDIOTEC. Parc. 28 y 30. Parque Tecnológico de Boecillo. Valladolid. España.
Ensayo realizado: Medición de la absorción acústica en cámara reverberante.
Cliente: KNAUF INSULATION
C/ La Selva, 2. 08820. El Prat de Llobregat (Barcelona)
Fecha: 30 de Enero de 2010.
Composición de la muestra: Lana Mineral Natural ULTRACOUSTIC de 60 mm de espesor y Rd = 1,60 m2.K/W.
Superficie muestra: 11,7 m^2. **Volumen cámara:** 202,12 m^3.
Norma: UNE-EN ISO 354:2004.

Frec(Hz)	125	250	500	1000	2000	4000
α_p	0,20	0,60	0,90	0,90	0,85	0,80

α_w = 0,85



DGNB New Construction Buildings, 2020 International

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE® Technology

Annex 5: United Nations Global Compact

Visé, the 26th of August 2020

H.E. António Guterres
Secretary-General
United Nations
New York, NY 10017
USA

Dear Mr. Secretary-General,

I am pleased to confirm that *Knauf Insulation* supports the Ten Principles of the United Nations Global Compact on human rights, labour, environment and anti-corruption. With this communication, we express our intent to implement those principles. We are committed to making the UN Global Compact and its principles part of the strategy, culture and day-to-day operations of our company, and to engaging in collaborative projects which advance the broader development goals of the United Nations, particularly the Sustainable Development Goals.
Knauf Insulation will make a clear statement of this commitment to our stakeholders and the general public.

We recognize that a key requirement for participation in the UN Global Compact is the annual submission of a Communication on Progress (COP) that describes our company's efforts to implement the Ten Principles. We support public accountability and transparency, and therefore commit to report on progress within *one year* of joining the UN Global Compact, and *annually* thereafter according to the UN Global Compact COP policy. This includes:

- A statement signed by the chief executive expressing continued support for the UN Global Compact and renewing our ongoing commitment to the initiative and its principles. This is *separate* from our initial letter of commitment to join the UN Global Compact.
- A description of practical actions (i.e., disclosure of any relevant policies, procedures, activities) that the company has taken (or plans to undertake) to implement the UN Global Compact principles in each of the four issue areas (human rights, labour, environment, anti-corruption).
- A measurement of outcomes (i.e., the degree to which targets/performance indicators were met, or other qualitative or quantitative measurements of results).

Sincerely yours,

Jean-Claude Carlin
Member of the Knauf Group Management Committee
Insulation Europe / Middle East / Asia

Knauf Insulation SPRL
Rue de Maestricht, 95 – 4600 Visé, Belgium
Tel. +32 4 3790411, Fax +32 4 3790238
TVA BE0467 601 089 – RPM Liège - ING 340-0273333-25
www.knaufinsulation.com

October 2021

LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

LEEDv4.1 (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 into the certification!

LEED - Credit Category code	Definition	Knauf Insulation Products contribution	Contributes towards
Energy and Atmosphere (EA) Optimize Energy Performance	To achieve increasing levels of performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use**.**	ECOSE Technology products help reducing energy demand through very high insulation efficiency (building envelop, partition walls, HVAC equipment, floors and ceilings).	**18 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 (EN 15804-EPDs) are available online for ECOSE Technology products[1].	**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.	ECOSE Technology Products are manufactured with up to 80% of recycled content (pre-consumer and post-consumer waste)[2].	**1 point**

[1] https://www.knaufinsulation.com/downloads/environmental-product-declaration-epd/glass-mineral-wool-ecose%C2%AE-gmw ; https://ibu-epd.com/; http://www.base-inies.fr; https://www.environdec.com/EPD-Search/?query=knauf

[2] See annex1

October 2021

LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

LEED - Credit Category code	Definition	Knauf Insulation Products contribution	Contributes towards
Materials and Resources (MR) Building Product Disclosure and Optimization – Material Ingredients	To encourage the use of products where LCA is available and have environmentally, economically and socially preferable LCA. To reward project for which the products chemical ingredients are inventoried.	ECOSE Technology products contain no ingredients listed on the REACH Authorization list, Restriction list or Substances of Very High Concern Candidate list[3]. They are inventoried to at least 0.01% by weight (100ppm) and certified DECLARE LBC Red List Free which means no harmful chemical substances[4].	**1 point**
Indoor Environmental Quality (EQ) Low-Emitting Materials	To reduce concentrations of chemical contaminants, as Volatile Organic Compound (VOC) that can damage air quality, human health, productivity and the environment. Emissions from ceilings, walls, thermal, and acoustic insulation are a complete category to be assessed.	ECOSE Technology products are compliant with the German AgBB Testing and Evaluation Scheme and the higher category (A+) of the French labelling. The binder is without added phenol formaldehyde. Products with or without facing, (with the exception of the black facing) are certified for Indoor Air Comfort[5] Eurofins Gold and Blue Angel[6].	**3 points**
Indoor Environmental Quality (EQ) Acoustic Performance	To provide spaces that promote occupants' well-being, productivity and communication through effective acoustic design.	ECOSE Technology products have high performance acoustic properties[7]. Products reduce HVAC background noise levels, increase sound insulation of building envelope, partitions, ceilings and aid in controlling reverberation time.	**1 point**

[3] Compliance letter statement to REACH can be requested for dedicated product's manufacturing plants
[4] See annex 2
[5] www.product-testing.eurofins.com and certificate in annex 3
[6] https://www.blauer-engel.de/en/s/knauf
[7] Acoustic test examples,see annex 4

October 2021

LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

LEED - Credit Category code	Definition	Knauf Insulation Products contribution	Contributes towards
Indoor Environmental Quality (EQ) Thermal Comfort	To promote occupants productivity, comfort, and well-being by providing quality thermal comfort.	Insulation is a design alternative strategy. Heat radiation and air-conditioning will be minimized which will have positive comfortability feel and increase productivity for workers.	**1 point**

October 2021

LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

Annex 1: Materials and Resources: Sourcing of Raw Materials

Here enclosed additional detailed information[8] about pre-consumer waste (reintroduction of third party manufacturing scrap into another manufacturing process) and post-consumer waste (produced by the end consumer) utilized in the raw materials batch for the manufacturing of the ECOSE® technology glass mineral wool.

In LEED, total recycled content is the sum of 100% post-consumer recycled content plus 50% of the pre-consumer recycled content.

	Visé (B)	**Lannemezan (Fr)**	**Krupka (Cz)**	**Bernburg (D)**	**Eskisehir (Tr)**	**Abu Dhabi (UAE)**	**Cwmbran (UK)**	**St Helens (UK)**
% pre-consumer waste content	9.4%	4.9%	20.7%	26.8%	44.8%	0%	10%	0%
% post-consumer waste content	58.7%	64.5%	48.5%	32.8%	24.1%	27.5%	51.2%	69.5%
Total recycled content (100% pre-consumer+50% post-consumer)	**63.4%**	**67%**	**58.8%**	**46.2%**	**46.5%**	**27.5%**	**56.2%**	**69.5%**
LEED MR 4	contributes towards 2 points							

Recycled content claims must conform to the definition ISO 14021-1999.

Pre-consumer waste: waste comes from process waste that is used to make a different product. This definition does not include in-house industrial scrap or trimmings, which are normally fed back into the same manufacturing process.

Post-consumer waste: waste which comes from curbside recycling programs (glass, plastic, paper, ect). Other postconsumer feedstock is generated when construction and demolition debris is recycled. To be a feedstock, the raw materials must have served a useful purpose in the consumer market before being used again.

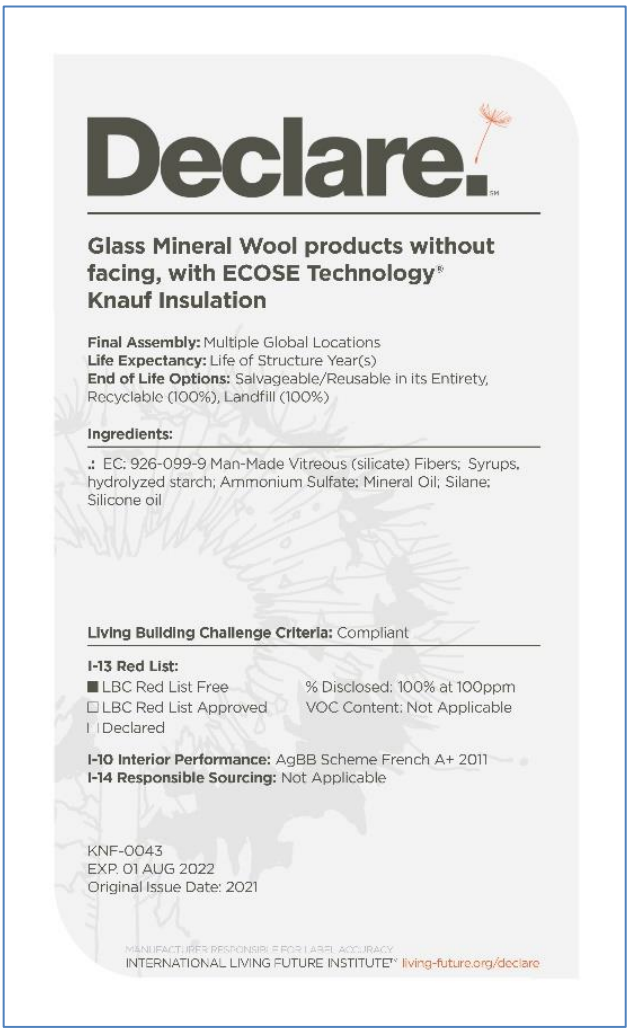
[8] Data 2020

LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

Annex 2: DECLARE labels



https://declare.living-future.org/

LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

Annex 3: Indoor Environmental Quality - Low-Emitting Materials

Here below, an example of Eurofins Indoor Air Comfort Gold Certificate for ECOSE products:

INDOOR AIR COMFORT
eurofins
GOLD
CERTIFIED PRODUCT

Certificate

Indoor Air Comfort Gold

Knauf Insulation unfaced GMW products with ECOSE® Technology

Certified Product

Knauf Insulation

Applicant

The product complies with Indoor Air Comfort Gold requirements for product type, version 7.0 (2020). These include both inspections of factory production according to DIN 18200 and VOC testing according to EN 16516 by an ISO 17025 accredited laboratory, at regular interval.

Indoor Air Comfort Gold certification ensures that low product emission requirements are fulfilled and is a sign of the applicant's focus on quality and contribution to a healthy indoor environment.

Compliance with Indoor Air Comfort Gold means compliance with VOC requirements on low emitting products of:

France VOC class A+, Germany (AgBB/ABG), BREEAM International, BREEAM NOR, BREEAM NL, LEED, WELL Building, SKA Rating, French HQE certification, Italian CAM Edilizia, BVB (Sweden), Eco Product Norway, DGNB, EMICODE EC1Plus, GUT, EU ecolabel, Nordic Swan, Blue Angel DE-UZ 132, M1, Danish Indoor Climate Label, very low emitting products according to EN 16798-1, Singapore Green Label, GreenTag Australia

Product type: Insulation

Certificate number: IACG-323-01-25-2020

Issue date: 15 October 2020

Validity date: 15 October 2025

This certificate is valid as specified if regular surveillance and testing is done.

Thomas Neuhaus
Head of Certification Body

eurofins | Product Testing

LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

INDOOR AIR COMFORT eurofins GOLD CERTIFIED PRODUCT

Appendix to Certificate IACG-323-01-25-2020

Knauf Insulation

receives the Indoor Air Comfort Gold certificate with validity 15 October 2025

for below product group produced at sites as listed:

Product group: Knauf Insulation unfaced GMW products with ECOSE® Technology

Product type: Insulation

Production sites:

Bernburg, Germany
Cwmbran, United Kingdom
Eskisehir, Turkey
Krupka, Czech Republic
Lannemezan, France
St Helens, United Kingdom
Stupino, Russia
Visé, Belgium

The products in this group are based on identical or similar recipe and are produced under equivalent conditions. Grouping of the products and inspection of the production process is part of the Indoor Air Comfort Gold certification. A worst-case product, which is representative for the whole group, is being tested frequently.

eurofins | Product Testing

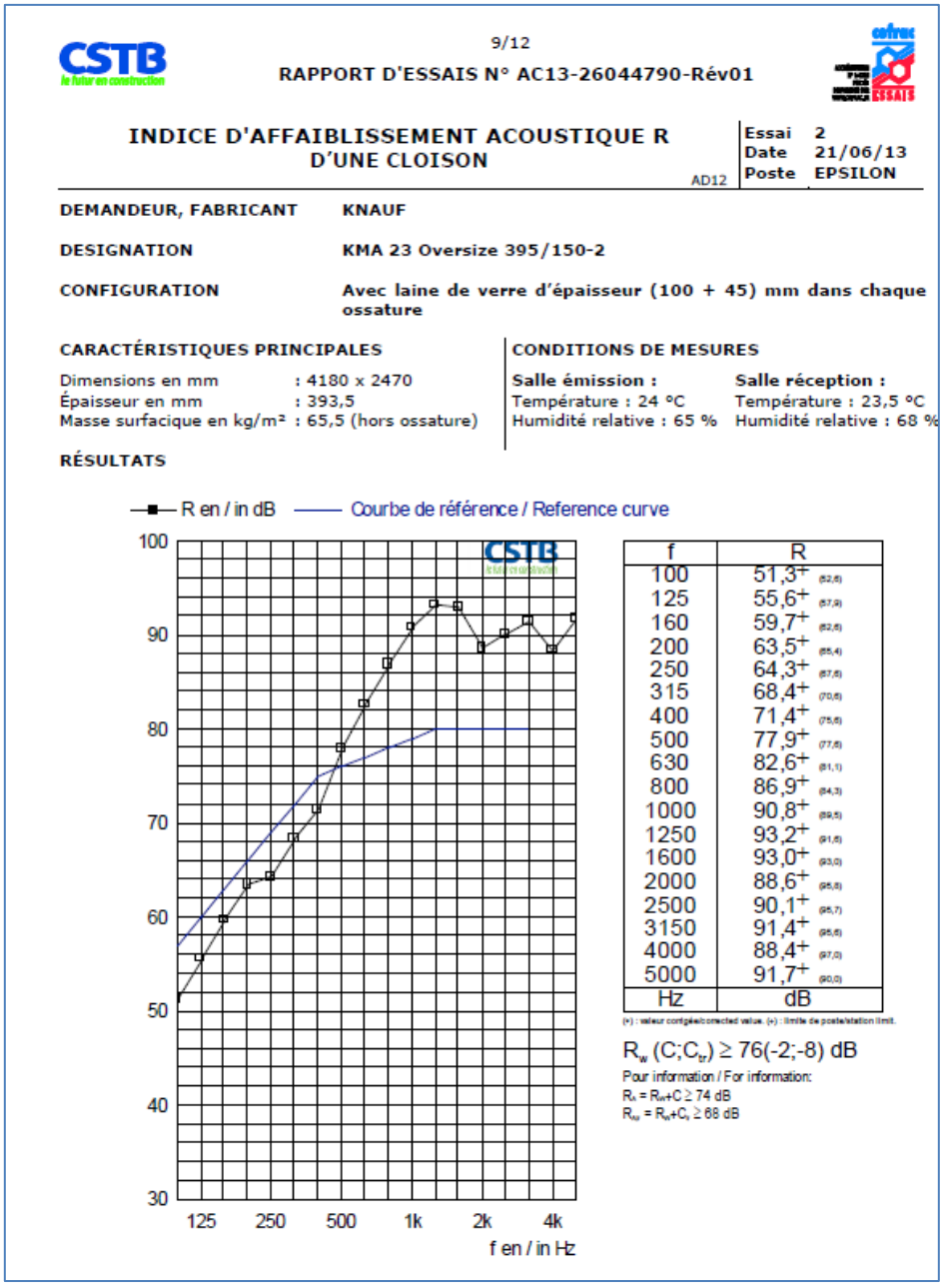
LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

Annex 4: ECOSE product and sound transmission and absorption examples

STC_c in North America is the composite *Sound Transmissions Class* and is equivalent to R_w *Sound Reduction Index* in Europe. *α* coefficient is the coefficient for *sound absorption*.



CSTB — le futur en construction

9/12

RAPPORT D'ESSAIS N° AC13-26044790-Rév01

INDICE D'AFFAIBLISSEMENT ACOUSTIQUE R D'UNE CLOISON

AD12

Essai	2
Date	21/06/13
Poste	EPSILON

DEMANDEUR, FABRICANT KNAUF

DESIGNATION KMA 23 Oversize 395/150-2

CONFIGURATION Avec laine de verre d'épaisseur (100 + 45) mm dans chaque ossature

CARACTÉRISTIQUES PRINCIPALES

Dimensions en mm : 4180 x 2470
Épaisseur en mm : 393,5
Masse surfacique en kg/m² : 65,5 (hors ossature)

CONDITIONS DE MESURES

Salle émission : Température : 24 °C Humidité relative : 65 %
Salle réception : Température : 23,5 °C Humidité relative : 68 %

RÉSULTATS

R en / in dB — Courbe de référence / Reference curve

f	R
100	51,3+ (52,6)
125	55,6+ (57,9)
160	59,7+ (62,6)
200	63,5+ (65,4)
250	64,3+ (67,6)
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630	82,6+ (81,1)
800	86,9+ (84,3)
1000	90,8+ (89,5)
1250	93,2+ (91,6)
1600	93,0+ (93,0)
2000	88,6+ (95,8)
2500	90,1+ (95,7)
3150	91,4+ (95,6)
4000	88,4+ (97,0)
5000	91,7+ (90,0)
Hz	dB

(+) : valeur corrigée/corrected value. (+) : limite de positionnement limit.

R_w (C;C_{tr}) ≥ 76(-2;-8) dB

Pour information / For information:
$R_A = R_w + C \geq 74$ dB
$R_{tr} = R_w + C_i \geq 68$ dB

LEED version 4.1

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM ACCORDING TO CSN EN ISO 354

Registration no.: **A-604**

Product: **Mineral insulation with ECOSE Technology (IPB 037) – thickness 50 mm**

Specimen description: The sample consist of 12 boards 1350 mm × 625 mm in the test room K4. The boards were produced on the basis of glass fibres with ECOSE technology. They are planned for thermal, sound and anti fire insulation. The specimen was laid freely on a floor and confined to specimen height.

Specimen size: 2,50 m × 4,05 m

Manufacturer: KNAUF INSULATION spol. s r.o. Bucharova 2641, 158 00 Praha 5

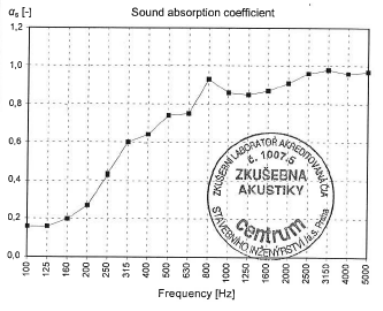
Test room: K4
Room volume: 80,25 m³
Air temperature: 23,0 °C
Relative humidity:: 46 %

Date of test: August 14, 2012
Fabrication date: August 14, 2012

Reverberation method measurement results according to CSN EN ISO 354 and CSN EN ISO 11654

Sound absorption coefficient α_s in 1/3 octave bands and weighed sound absorption coefficient α_w:

Frequency [Hz]	α_s [-]
100	0,16
125	0,16
160	0,20
200	0,27
250	0,43
315	0,60
400	0,64
500	0,74
630	0,75
800	0,93
1000	0,86
1250	0,85
1600	0,87
2000	0,91
2500	0,96
3150	0,98
4000	0,96
5000	0,97



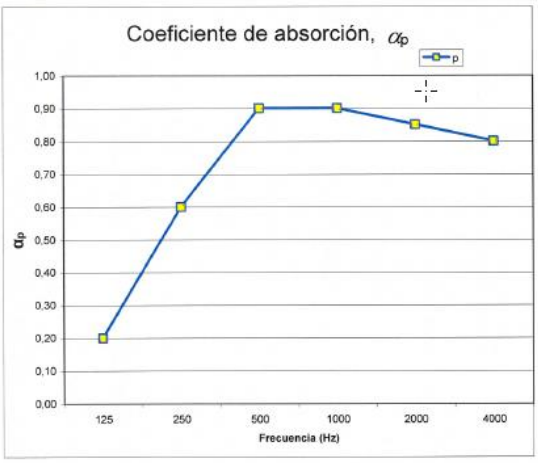
Evaluation according to CSN EN ISO 11654:
α_w = 0,70 (H)

Specimen area: 10,12 m²
Basic weight: - kg/m²
Specimen thickness: 50 mm
Air gap thickness: -

Centrum stavebního inzenyrství a.s. (Centre of Building Engineering)– Acoustic Test Laboratory
Test Laboratory accredited by CAI, No. 1007.5
Prazska 16, 102 21 Prague 10 – Hostivar
phone: 281017111, 281017491 fax: 271751128
e-mail: meller@csias.cz

Date: August 20, 2012
Test Laboratory Chief:
Ing. M. Meller, CSc

Protokol o zkoušce č. 2210
Strana 6 / 8

Lugar de medida: Cámara reverberante normalizada de AUDIOTEC. Parc. 28 y 30. Parque Tecnológico de Boecillo. Valladolid. España.
Ensayo realizado: Medición de la absorción acústica en cámara reverberante.
Cliente: KNAUF INSULATION
C/ La Selva, 2. 08820. El Prat de Llobregat (Barcelona)
Fecha: 30 de Enero de 2010.
Composición de la muestra: Lana Mineral Natural ULTRACOUSTIC de 60 mm de espesor y Rd = 1,60 m2.K/W.
Superficie muestra: 11,7 m². **Volumen cámara:** 202,12 m³.
Norma: UNE-EN ISO 354:2004.

Frec(Hz)	125	250	500	1000	2000	4000	α_w = 0,85
α_p	0,20	0,60	0,90	0,90	0,85	0,80