




BREEAM INTERNATIONAL NEW CONSTRUCTION

Product Data for Building Certification

GLASS MINERAL WOOL ECOSE

BREEAM (Building Research Establishment Environmental Assessment Methodology) INTERNATIONAL NEW CONSTRUCTION¹ 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 products can put you on the right track for the highest result into the 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 $\leq 0.06 \text{ mg/m}^3$; Total Volatile Organic Compounds $\leq 1.0 \text{ mg/m}^3$; Carcinogens category 1A and B $\leq 0.001 \text{ mg/m}^3$	Glass Mineral Wool ECOSE products without any added formaldehyde are in compliance with the higher category (A+) of the French labelling system and with the requirements of the Eurofins Gold ² for Indoor Air Comfort, see annexe 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 $\leq 0.01 \text{ mg/m}^3$; Total Volatile Organic Compounds $\leq 0.3 \text{ mg/m}^3$; Total Semi-volatile Organic Compounds $\leq 0.1 \text{ mg/m}^3$; Carcinogens category 1A and B $\leq 0.001 \text{ mg/m}^3$	Glass Mineral Wool ECOSE products (with the exception of the products with black glass veil) are in compliance with the requirements for exemplary level as without any added formaldehyde and certified Eurofins Gold for Indoor Air Comfort, see annexe 1.	1 credit exemplary level 
	Post-construction indoor air quality measurement: the total volatile organic compound and formaldehyde are measured and reported (thresholds for averaged formaldehyde concentration level $\leq 100 \mu\text{g/m}^3$ over 30 minutes and for averaged TVOC $\leq 300 \mu\text{g/m}^3$ over 8 hours).	Glass Mineral Wool ECOSE products without any added formaldehyde and certified Eurofins Gold for Indoor Air Comfort are helping to stay at a very low concentration level ((with the exception of the products with black glass veil).	1 credit

¹Technical manual : SD233 – 2.0:2016

² www.product-testing.eurofins.com

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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	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
Hea 05 Acoustic performance	To insure the building's acoustic performance, including sound insulation, meets the appropriate standards for its purpose	Products reduce HVAC background noise, increase sound insulation of building envelope, partitions, ceilings and aid in controlling reverberation time ³ .	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.	Glass 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 credit
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.	Glass 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 greenhouse gas emissions. The building has been designed to minimize heat loads through high levels of insulation.	Glass Mineral Wool ECOSE products can contribute to high insulation efficiency in the design options.	1 credit

³ See annex 2 : Laboratory analysis example

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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 ⁴ (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   
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 note 18.v3.1 – 2018).	Products comply with RSC as they have minimum 50% and up to 80% recycled content (external cullet). The key process is also covered by EMS (ISO 14001) which allows to meet the criterion of responsible sourced construction (RSC) products. ⁵	3 credit
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.	Glass Mineral Wool ECOSE products contain up to 80% of recycled components (external cullet) and contribute therefore to minimise the environmental impact of insulation, see annexe 2.	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 some remaining tiny holes 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.	Glass Mineral Wool ECOSE products and technical principle of implementations may allow easy replacements of each component (Outside and/or inside use) and	1 credit

⁴ <https://www.knaufinsulation.com/downloads/environmental-product-declaration-epd/glass-mineral-wool-ecose%2%AE-gmw>; <https://ibu-epd.com/>; <http://www.base-inies.fr>

⁵ Annex 3 : Responsible sourcing details

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Pol 05 Noise attenuation	To reduce the likelihood of noise, arising from fixed installations on the new development, affecting nearby noise-sensitive buildings.	facilitate future adaptations or insulation reuse. Attenuation of noise by use of insulation mineral wool absorbers.	1 credit

Annex 1: Hea 02 : Indoor Air Quality

Here below the Eurofins Indoor Air Comfort Gold Certificate:



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Appendix to Certificate

IACG-323-01-25-2017

Knauf Insulation

receives the Indoor Air Comfort Gold certificate with validity 19 June 2022 for below product group, including subgroups and individual products listed in the following table:

Product group	Production site
Knauf Insulation unfaced GMW products with ECOSE® Technology	<ul style="list-style-type: none"> Abu Dhabi, United Arab Emirates Bemburg, Germany Owmbbran, United Kingdom Eskisehir, Turkey Krupka, Czech Republic Lannamezan, France St Helens, United Kingdom Stupino, Russia Vise, 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.

 | **Product Testing**

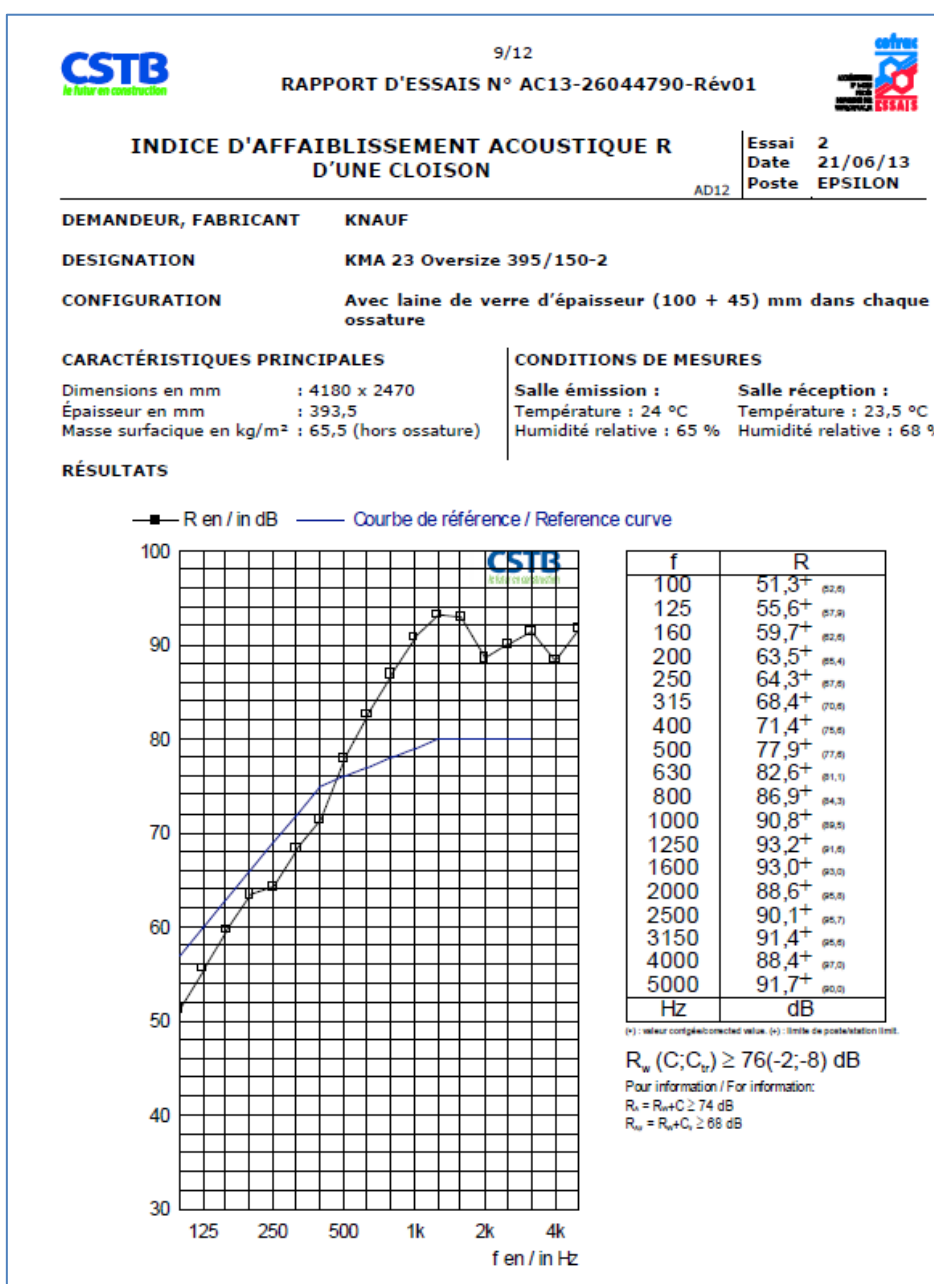
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Annex 2: ECOSE product and sound transmission and absorption examples

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.



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<p style="text-align: center;">MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM ACCORDING TO CSN EN ISO 354</p> <p style="text-align: right;">Registration no.: A-604</p> <p>Product: Mineral insulation with ECOSE Technology (IPB 037) – thickness 50 mm</p> <p>Specimen description: The sample consist of 12 boards 1350 mm x 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.</p> <p>Specimen size: 2,50 m x 4,05 m</p> <p>Manufacturer: KNAUF INSULATION spol. s r.o. Bucharova 2641, 168 00 Praha 5</p> <p>Test room: K4 Date of test: August 14, 2012 Room volume: 80,25 m³ Fabrication date: August 14, 2012 Air temperature: 23,0 °C Relative humidity: 46 %</p> <p style="text-align: center;">Reverberation method measurement results according to CSN EN ISO 354 and CSN EN ISO 11654</p> <p>Sound absorption coefficient α_n in 1/3 octave bands and weighed sound absorption coefficient α_w:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>Frequency [Hz]</th> <th>α_n</th> </tr> </thead> <tbody> <tr><td>100</td><td>0,16</td></tr> <tr><td>125</td><td>0,16</td></tr> <tr><td>160</td><td>0,20</td></tr> <tr><td>200</td><td>0,27</td></tr> <tr><td>250</td><td>0,43</td></tr> <tr><td>315</td><td>0,60</td></tr> <tr><td>400</td><td>0,64</td></tr> <tr><td>500</td><td>0,74</td></tr> <tr><td>630</td><td>0,75</td></tr> <tr><td>800</td><td>0,93</td></tr> <tr><td>1000</td><td>0,86</td></tr> <tr><td>1250</td><td>0,85</td></tr> <tr><td>1600</td><td>0,87</td></tr> <tr><td>2000</td><td>0,91</td></tr> <tr><td>2500</td><td>0,96</td></tr> <tr><td>3150</td><td>0,98</td></tr> <tr><td>4000</td><td>0,96</td></tr> <tr><td>5000</td><td>0,97</td></tr> </tbody> </table> <p style="text-align: center;">Evaluation according to CSN EN ISO 11654: $\alpha_w = 0,70$ (H)</p> <p style="text-align: center;">Specimen area: 10,12 m² Specimen thickness: 50 mm Basic weight: - kg/m² Air gap thickness: -</p> <p style="font-size: x-small;">SI VJPS Centrum stavobního inženýrství a.s. (Centre of Building Engineering) – Acoustic Test Laboratory Test Laboratory accredited by CAI, No. 1007.5 Pražská 16, 102 21 Prague 10 – Hostivar phone: 281017111, 281017491 fax: 271751128 e-mail: meller@csias.cz</p> <p style="text-align: right; font-size: x-small;">Date: August 20, 2012 Test Laboratory Chief: Ing. M. Meller, CSC</p> <p style="text-align: center; font-size: x-small;">Protokol o zkoušce č. 22.1 Strana 6 / 8</p>	Frequency [Hz]	α_n	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	<p>Lugar de medida: Cámara reverberante normalizada de AUDIOTEC. Parc. 28 y 30. Parque Tecnológico de Boecillo. Valladolid. España.</p> <p>Ensayo realizado: Medición de la absorción acústica en cámara reverberante.</p> <p>Ciente: KNAUF INSULATION C/ La Selva, 2. 08820. El Prat de Llobregat (Barcelona)</p> <p>Fecha: 30 de Enero de 2010.</p> <p>Composición de la muestra: Lana Mineral Natural ULTRACOUSTIC de 60 mm de espesor y Rd = 1,60 m².K/W.</p> <p>Superficie muestra: 11,7 m². Volumen cámara: 202,12 m³.</p> <p>Norma: UNE-EN ISO 354:2004.</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>Frequency</th> <th>125</th> <th>250</th> <th>500</th> <th>1000</th> <th>2000</th> <th>4000</th> <th rowspan="2">$\alpha_w = 0,85$</th> </tr> </thead> <tbody> <tr> <td>α_p</td> <td>0,20</td> <td>0,60</td> <td>0,90</td> <td>0,90</td> <td>0,85</td> <td>0,80</td> <td></td> </tr> </tbody> </table> <p style="text-align: center;">Coefficiente de absorción, α_p</p>	Frequency	125	250	500	1000	2000	4000	$\alpha_w = 0,85$	α_p	0,20	0,60	0,90	0,90	0,85	0,80	
Frequency [Hz]	α_n																																																						
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Annex 3: Mat 03 Responsible sourcing of Glass Mineral Wool with ECOSE

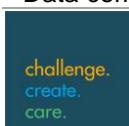
Material Category	Key Process	Key Supply Chain Process
Insulation		
Foam Insulation	Insulation manufacture	Main polymer production, e.g. Polystyrene, MDI, Phenolic resin or equivalent
Stone wool, glass & cellular glass made using < 50% recycled input	Product manufacture	Any quarried or mined mineral 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 information⁶ by production site about yearly average external cullet utilized in the fabrication of the glass mineral wool products.

	Vise (Belgium)	Lannemezan (France)	Krupka (Czech Republic)	Bernburg (Germany)	Eskisehir (Turkey)	Stupino (Ru)	Cwmbran (UK)	St Helens (UK)
Total recycled content (external cullet only)	70.8%	63%	68.9%	59.9%	74.2%	44.1%	64%	79.5%

On the next page, please find the ISO 14001 certificate for Key Process, all Knauf Insulation plants are ISO 14001 certified.

⁶ Data compiled for total year 2019



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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 Visé
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	Valid from 2019-12-23
Audit Report No. 3525 0612	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



INTERNATIONAL ASSOCIATION OF CERTIFICATION BODIES



Deutsche
Akkreditierungsstelle
D-2M-12007-01-00

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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 ŞİRKETİ 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

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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 Herakliithstrasse 2 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, Russian 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