



LEED version 4

PRODUCT DATA FOR CERTIFICATION

GLASS MINERAL WOOL WITH ECOSE TECHNOLOGY

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	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.	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 (EDPs) are available on line 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 LC A 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 and post-consumer) 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>

² See annexe1

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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 contains no ingredients listed on the REACH Authorization or Candidate list or Substances of Very High Concern list. Evidence are available on line ³ .	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 ⁴ Eurofins Gold and Blue Angel ⁵ . 	3 points
Indoor Environmental Quality (EQ) Acoustic Performance	To provide workspaces and classrooms that promote occupants' well-being, productivity, and communications through effective acoustic design.	ECOSE Technology products have high performance acoustic properties ⁶ .	2 points
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

³ <http://www.knaufinsulation.com/en/sustainable-buildings-and-green-building-rating-systems>

⁴ www.product-testing.eurofins.com and certificate in annexe 2

⁵ <https://www.blauer-engel.de/en/s/knauf>

⁶ See annexe 3

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Annexe 1: Materials and Resources: Sourcing of Raw Materials

Here enclosed additional detailed information⁷ about pre-consumer waste (reintroduction of manufacturing scrap back into the manufacturing process) and post-consumer waste (produced by the end consumer) use in the fabrication of the ECOSE technology glass mineral wool.

In LEED, total recycled content is the sum of post-consumer recycled content plus one-half the pre-consumer recycled content based on cost.

	Visé (B)	Lannemezan (Fr)	Krupka (Cz)	Bernburg (D)	Eskisehir (Tr)
%pre-consumer waste content	12.0%	4.0%	18.7%	22.3%	50.9%
% post-consumer waste content	68.4%	58.8%	47.9%	27.2%	27.4%
Total recycled content within LEEDv4 formulation	74.4%	60.8%	57.3%	38.4%	58.8%
LEED MR 4	contributes towards 2 points				

Recycled content claims for products 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.

⁷ Data 2018

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Annexe 2: Indoor Environmental Quality - Low-Emitting Materials

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



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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	Abu Dhabi, United Arab Emirates Bemburg, Germany Cwmbran, United Kingdom Eskisehir, Turkey Krupka, Czech Republic Lannemezan, 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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Annexe 3: ECOSE product and sound absorption example

MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM ACCORDING TO CSN EN ISO 354		Registration no.: A-604																																					
<p>Product: Mineral insulation with ECOSE Technology (IPB 037) – thickness 50 mm</p> <p>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.</p> <p>Specimen size: 2,50 m × 4,05 m</p> <p>Manufacturer: KNAUF INSULATION spol. s r.o. Bucharova 2641, 158 00 Praha 5</p> <p>Test room: K4 Room volume: 80,25 m³ Air temperature: 23,0 °C Relative humidity: 46 %</p> <p style="text-align: right;">Date of test: August 14, 2012 Fabrication date: August 14, 2012</p>																																							
<p>Reverberation method measurement results according to CSN EN ISO 354 and CSN EN ISO 11654</p> <p>Sound absorption coefficient α_s in 1/3 octave bands and weighed sound absorption coefficient α_w:</p>																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Frequency [Hz]</th> <th>α_s [-]</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>	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	
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<p>Evaluation according to CSN EN ISO 11654: $\alpha_w = 0,70$ (H)</p> <p style="text-align: right;">Specimen area: 10.12 m² Specimen thickness: 50 mm Basic weight: - kg/m² Air gap thickness: -</p>																																							
<p>Centrum stavebního 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>Date: August 20, 2012 Test Laboratory Chief: Ing. M. Meller, CSc</p>																																					

Protokol o zkoušce č. 2230
Strana 6/8