

## 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
<b>ENV 1.1.</b>	<p><b>Life Cycle Impact Assessment</b></p> <p>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.</p>	<p>The Environmental Products Declarations (EPDs) <sup>1</sup> are product specific and 3<sup>rd</sup> 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.</p> <div style="text-align: center;"> </div>	4.5-4.7%

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

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<b>ENV 1.2.</b>	<p><b>Local Environmental Impact</b></p> <p>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.</p>	<p>Products are free of halocarbon propellants. ECOSE is certified under Eurofins Indoor Comfort Gold<sup>2</sup> 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<sup>3</sup>. They are inventoried to at least 0.01% by weight (100ppm) and certified DECLARE LBC Red List Free which means no harmful chemical substances<sup>4</sup>.</p> <div style="text-align: center;">   </div>	9-9.5%
<b>ENV 1.3</b>	<p><b>Sustainable Resource Extraction</b></p> <p>This criterion encourages use of products manufactured using raw materials extracted responsibly.</p>	<p>ISO 14001 certification is a supplier pre-requisite for the extracted raw materials<sup>5</sup> and secondary raw materials or preferred to virgin ones.</p>	2.3-2.4%

<sup>2</sup> [www.product-testing.eurofins.com](http://www.product-testing.eurofins.com)

<sup>3</sup> Compliance letter statement to REACH can be requested for dedicated product's manufacturing plants

<sup>4</sup> See annex 2

<sup>5</sup> ISO 14001 suppliers' certificates can be delivered on demand.


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<b>ECO 1.1</b>	<p><b>Life Cycle Cost</b></p> <p>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.</p>	<p>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.</p>	10-12.9%
<b>ECO 2.1</b>	<p><b>Flexibility and adaptability</b></p> <p>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.</p>	<p>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.</p>	7.5-.6%
<b>SOC 1.1</b>	<p><b>Thermal comfort</b></p> <p>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.).</p>	<p>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.</p>	4.5-5.4%

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<b>SOC 1.2</b>	<p><b>Indoor air quality</b></p> <p>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/m<sup>3</sup> and a formaldehyde concentration lower than 120 µg/m<sup>3</sup>.</p>	<p>Glass Mineral Wool ECOSE products help to meet the requirements as the binder is bio-based and without added formaldehyde, certified Blue Angel<sup>6</sup> and Eurofins Gold<sup>7</sup> for Indoor Air Comfort, see annexe 1</p> 	3.6-4.5%
<b>SOC 1.3</b>	<p><b>Acoustic comfort</b></p> <p>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.</p>	<p>Knauf Insulation products provide excellent sound absorption properties, they can influence significantly the reverberation time behaviour of a room.</p>	Up to 2.9%
<b>TEC 1.2</b>	<p><b>Sound insulation</b></p> <p>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.</p>	<p>Knauf Insulation solutions are available to meet the highest noise reduction challenges; all sound protection levels can be met, see annex 4.</p>	Up to 2.3%

<sup>6</sup> <https://www.blauer-engel.de/en/s/knauf>

<sup>7</sup> [www.product-testing.eurofins.com](http://www.product-testing.eurofins.com)

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<b>TEC 1.3</b>	<p><b>Quality of the Building envelope</b></p> <p>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.</p>	<p>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.</p>	2.6 – 3.3 %
<b>TEC 1.6.</b>	<p><b>Ease of Recovery and Recycling</b></p> <p>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.</p>	<p>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...).</p>	3-3.5 %
<b>PRO 1.4.</b>	<p><b>Sustainability aspects in tender phase</b></p> <p>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...)</p>	<p>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.</p>	1.6%

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**Annex 1: SOC 1.2 : Indoor Air Quality**

Here below the Eurofins Indoor Air Comfort Gold Certificate:



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**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:**

<input checked="" type="checkbox"/> LBC Red List Free	% Disclosed: 100% at 100ppm
<input type="checkbox"/> LBC Red List Approved	VOC Content: Not Applicable
<input type="checkbox"/> Declared	

**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](https://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:**

<input checked="" type="checkbox"/> LBC Red List Free	% Disclosed: 100% at 100ppm
<input type="checkbox"/> LBC Red List Approved	VOC Content: Not Applicable
<input type="checkbox"/> Declared	

**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

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### 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





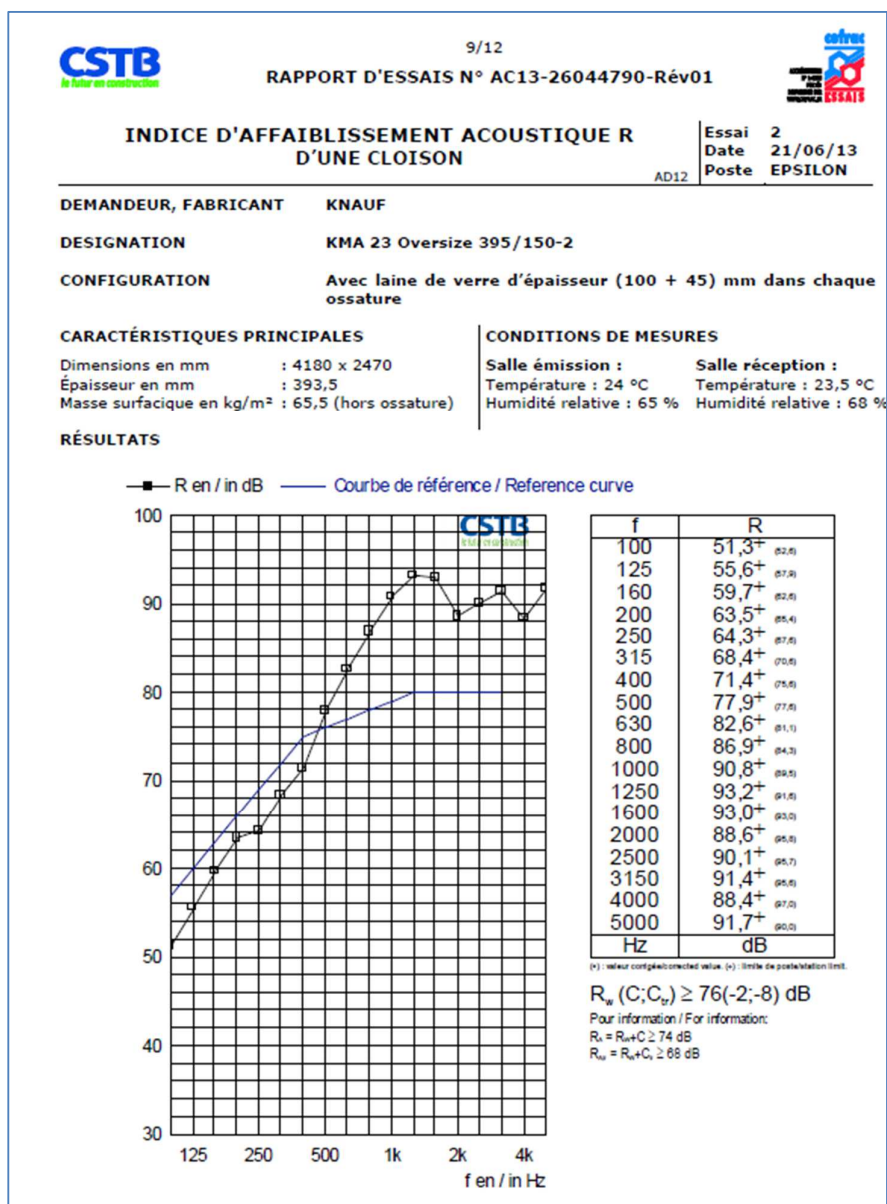
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### Annex 4: Sound transmission and absorption examples

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



## DGNB New Construction Buildings, 2020 International PRODUCT DATA FOR CERTIFICATION GLASS MINERAL WOOL WITH ECOSE® Technology

<p style="text-align: center;"><b>MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM ACCORDING TO CSN EN ISO 354</b></p> <p>Registration no.: <b>A-604</b></p> <p><b>Product:</b> Mineral insulation with ECOSE Technology (IPB 037) – thickness 50 mm</p> <p><b>Specimen description:</b> 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><b>Specimen size:</b> 2,50 m × 4,05 m</p> <p><b>Manufacturer:</b> KNAUF INSULATION spol. s r.o. Bucharova 2641, 158 00 Praha 5</p> <p><b>Test room:</b> K4 <b>Room volume:</b> 80,25 m<sup>3</sup> <b>Air temperature:</b> 23,0 °C <b>Relative humidity:</b> 46 %</p> <p style="text-align: right;"><b>Date of test:</b> August 14, 2012 <b>Fabrication date:</b> August 14, 2012</p>	<p><b>Lugar de medida:</b> Cámara reverberante normalizada de AUDIOTEC. Parc. 28 y 30. Parque Tecnológico de Boecillo. Valladolid. España.</p> <p><b>Ensayo realizado:</b> Medición de la absorción acústica en cámara reverberante.</p> <p><b>Ciente:</b> KNAUF INSULATION C/ La Selva, 2. 08820. El Prat de Llobregat (Barcelona)</p> <p><b>Fecha:</b> 30 de Enero de 2010.</p> <p><b>Composición de la muestra:</b> Lana Mineral Natural ULTRACOUSTIC de 60 mm de espesor y Rd = 1,60 m<sup>2</sup>.K/W.</p> <p><b>Superficie muestra:</b> 11,7 m<sup>2</sup>.      <b>Volumen cámara:</b> 202,12 m<sup>3</sup>.</p> <p><b>Norma:</b> UNE-EN ISO 354:2004.</p>																																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Frecidta</th> <td>125</td> <td>250</td> <td>500</td> <td>1000</td> <td>2000</td> <td>4000</td> <td rowspan="2" style="background-color: yellow;"><b>α<sub>w</sub> = 0,85</b></td> </tr> <tr> <th style="text-align: left;">α<sub>p</sub></th> <td>0,20</td> <td>0,60</td> <td>0,90</td> <td>0,90</td> <td>0,85</td> <td>0,80</td> </tr> </table>		Frecidta	125	250	500	1000	2000	4000	<b>α<sub>w</sub> = 0,85</b>	α <sub>p</sub>	0,20	0,60	0,90	0,90	0,85	0,80																																										
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<p><b>Reverberation method measurement results according to CSN EN ISO 354 and CSN EN ISO 11654</b></p> <p>Sound absorption coefficient α<sub>s</sub> in 1/3 octave bands and weighed sound absorption coefficient α<sub>w</sub>:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Frequency [Hz]</th> <th>α<sub>s</sub> [-]</th> <th>α<sub>w</sub> [-]</th> </tr> </thead> <tbody> <tr><td>100</td><td>0,16</td><td></td></tr> <tr><td>125</td><td>0,16</td><td></td></tr> <tr><td>160</td><td>0,20</td><td></td></tr> <tr><td>200</td><td>0,27</td><td></td></tr> <tr><td>250</td><td>0,43</td><td></td></tr> <tr><td>315</td><td>0,60</td><td></td></tr> <tr><td>400</td><td>0,64</td><td></td></tr> <tr><td>500</td><td>0,74</td><td></td></tr> <tr><td>630</td><td>0,75</td><td></td></tr> <tr><td>800</td><td>0,93</td><td></td></tr> <tr><td>1000</td><td>0,86</td><td></td></tr> <tr><td>1250</td><td>0,85</td><td></td></tr> <tr><td>1600</td><td>0,87</td><td></td></tr> <tr><td>2000</td><td>0,91</td><td></td></tr> <tr><td>2500</td><td>0,96</td><td></td></tr> <tr><td>3150</td><td>0,98</td><td></td></tr> <tr><td>4000</td><td>0,96</td><td></td></tr> <tr><td>5000</td><td>0,97</td><td></td></tr> </tbody> </table> <p style="text-align: center;"> </p> <p style="text-align: center;"> </p>		Frequency [Hz]	α <sub>s</sub> [-]	α <sub>w</sub> [-]	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: <b>α<sub>w</sub> = 0,70 (H)</b></p> <p>Specimen area: 10,12 m<sup>2</sup>      Specimen thickness: 50 mm Basic weight: - kg/m<sup>2</sup>      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          Prazska 16, 102 21 Prague 10 – Hostivar          phone: 281017111, 281017491 fax: 271751128          e-mail: meller@csias.cz       </p> <p style="text-align: right;">         Date: August 20, 2012          Test Laboratory Chief:          Ing. M. Meller, CSc  </p>																																																										
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### Annex 5: United Nations Global Compact

