KNAUF INSULATION

ENVIRONMENTAL PRODUCT DECLARATION

Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL



In accordance with:
ISO 14025, EN15804+A2:2019/AC:2021

Programme:	The International EPD® System www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0031083
Publication date:	2026-05-05
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An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com.

Knauf Insulation EPDs are EPD of multiple products, based on a representative product.

Please note that any ancillary materials used for the installation of the product are excluded from the LCA calculations.

EPD INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

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Programme-related information and verification

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm (Sweden) www.environdec.com support@environdec.com
EPD registration number:	EPD-IES-0031083
Published:	2026-05-05
Valid until:	2031-05-05
EPD owner	Knauf Insulation Sprl Rue de Maestricht 95 4600 Visé (Belgium)
Product Category Rules:	PCR 2019:14. Construction products (EN 15804+A2) Version 2.0.1 C-PCR-005 Thermal insulation products (EN 16783: 2024) Version: 2025-04-08
Product group classification:	UN CPC 37
Reference year for plant data:	2025
Geographical application scope:	Europe

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14. Construction products (EN 15804+A2) Version 2.0.1, UN CPC 37 C-PCR-005 Thermal insulation products (EN 16783: 2024) Version: 2025-04-08
PCR review was conducted by: Rob Rouwette (chair), Noa Meron (co-chair) A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com.
External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via EPD verification through: ☒ EPD process certification* without a pre-verified LCA/EPD tool Third-party verification, accountable for the certification: *Bureau Veritas Certification Sverige ABV, Fabriksgatan 13, Göteborg, 41250* Accredited by: *SWEDAC - Sverige AB 1236* *EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.environdec.com.
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

General information

Information about the company

Description of the organisation:

Knauf Insulation is a leading provider of glass and rock mineral wool, as well as wood wool insulation solutions. With more than 40 years of experience in the insulation industry, it is one of the most respected names in insulation worldwide.

As part of the Knauf Group, a €15.4bn turnover family-owned global manufacturer of building materials and construction systems, Knauf Insulation employs more than 6,000 employees and has 28 manufacturing sites in 15 countries, with a turnover of €2.5bn.

Knauf Insulation's mission is to challenge conventional thinking and create innovative insulation solutions that shape the way we live and build in the future, with care for the people who make them, the people who use them and the world we all depend on. Its vision is to lead the change in smarter insulation solutions.



The Headquarters is located in Visé, Belgium.



Product-related or management system-related certifications:

All Knauf Insulation sites which are covered by EPD process certification system, including the sites considered for this EPD, are ISO 9001, ISO 14001, ISO 50001 and ISO 45001 certified under the scope "Design, Development, Production, Marketing & Distribution of Insulation Materials and Systems".

Knauf Insulation supports the Ten Principles of the United Nations Global Compact on human rights, labor, environment and anti-corruption.

Name and location of production site:

The intended application of this product in the construction industry is within Europe. The data used for the production stage life cycle assessment is related to production plant(s) located in Queensferry (United Kingdom).

Address: Chemistry Ln, Queensferry, Deeside CH5 2DA, United Kingdom.

Information about Rock Mineral Wool production

The rock mineral wool (RMW) products for building construction are available in the form of slabs, boards, lamellas and rolls. RMW slabs are used as a thermal, acoustical and fire insulation product.

In general, rock mineral wool product densities range from 20 to 200 kg/m³. The inorganic fraction (92–98%) consists primarily of volcanic rocks, typically basalt, with some dolomite, and an increasing share of recycled inputs such as steel-industry slags. In some manufacturing plants, recycled material is also introduced as briquettes, which are a mixture of stone wool scrap, other secondary materials, and cement.

For the considered products, the remaining fraction is made of bio-based binder components through the ECOSE Technology® binder process.



Product information

Product name(s)

Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL

Product identification

The declared insulation Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL is a rock mineral wool, unfaced slab of 1m^2 (considered for this EPD).

For the placement of the products on the construction market in the European Union/ EFTA (with exception of Switzerland and UK), the Regulation/ (EU) No 305/2011/ applies. The products concerned need Declarations of Performance / DoP R4208LPCPR taking into consideration the harmonized product standard EN 13162 and the CE-marking.

Product description

The main application for Rocksilk® RS45 and Rock4ALL are multi-application building slabs for use in construction and OEM applications. Rocksilk® Flexible Slab (140mm) is used for the thermal and acoustic insulation of a wide variety of constructions. Additionally, Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL is available in various thicknesses on the market. To calculate the environmental impacts for other thicknesses, refer to the "Conversion Factors to Specific Thickness" section.

UN CPC code

37990: Non-metallic mineral products (including mineral wool, expanded mineral materials, worked mica, articles of mica, non-electrical articles of graphite or other carbon and articles of peat).

Geographical scope

The product is manufactured in Queensferry (United Kingdom). Energy-related information is described in the next section. Regarding the market area, the product is mainly marketed in Europe.

Technical Characteristics

Parameter	Value
Thermal conductivity/ EN 12667	0.035 W/(mK) at 10°C
Water vapor diffusion resistance (EN 12086)	1
Thermal Resistance (ISO 8301)	2.85 m^{2}K/W
Declared density range/ EN 1602	45 kg/m^3 (+/-10%)
Melting point of fibers	≥ 1000°C

The density specified in this document is provided solely and exclusively for the purpose of Life Cycle Assessment (LCA) calculations and should not be relied on for safety or any other technical requirements or specifications. Additional technical characteristics of the product can be found in the Declaration of Performance (DoP).

LCA information

Functional unit / **declared unit**

The declared unit is 1m^2 of unfaced rock mineral wool Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL with R-value of 2.85 m^{2}K/W (for a thickness of 100 mm and a declared lambda of 0.035 W/mK).

Reference service life

The RSL or durability of Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL is as long as the lifetime of the building equipment in which it is used (at least 60 years).

Time representativeness & Information on Specific Data

The complete reference year used for the plant(s) production data is 2025. The product group/s considered in this EPD is produced in one single manufacturing plant; therefore, variations issue for sites is not relevant.

The data which is used to carry out the LCA calculations contains more than 60% specific data and less than 40% generic data. Data quality information used in this EPD is compliant with EN 15941.

Database(s) and LCA software used

The LCA model, the data aggregation and environmental impacts are calculated with the software LCA for Experts (GaBi) 10.9 and its content version 2026.1. MLC datasets from the same content version are utilized for these calculations. The impact models used are those indicated in EN 15804:2012+A2:2019 and EF 3.1 (February 2023).

Gas information

Gas input (residual mix reference year: 2022) from United Kingdom (Queensferry) is selected for Queensferry (United Kingdom).

Electricity information

Plants (countries)	Electricity mixes	Locations (electricity)	Dataset Reference Year	Impact (kg $CO_{2,eq}$/kwh)
Queensferry (United Kingdom)	Residual	United Kingdom	2023	0.459

Description of system boundaries

The system boundary of the EPD follows the modularity approach defined by the EN 15804:2012+A2:2019.

The type of EPD is cradle-to-grave and module D.

For a comprehensive assessment, it is strongly recommended to consider the results from all the modules. The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3). Relying exclusively on Modules A1-A3 may lead to incomplete conclusions.

A comprehensive list and detailed explanations of each stage within the EPD are available as follows.

The product stage (A1-A3) includes:

- A1 – raw material extraction and processing, processing of secondary material input (e.g. recycling processes),
- A2 – transport to the manufacturer and
- A3 – manufacturing.

This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of-waste state or disposal of final residues during the product stage.

The LCA results are presented in an aggregated format for the product stage, where modules A1, A2 and A3 are consolidated into a single module, denoted as A1-A3.

Product Parameters	Value
Rock mineral wool weight	4.5 kg
Area	1m²
Thickness	100 mm
Volume	0.1m³
Packaging – PE film	0.06 kg
Packaging - Wooden pallet	0.32 kg

The construction process stage includes:

- A4 - transport to the construction site and
- A5 - installation into the building.

The transport to the building site (A4) and installation (A5) included in this LCA use the following parameters:

Parameter	Value
Average transport distance (truck)	250 km
Type of fuel and vehicle consumption or type of vehicle used for transport (truck)	Truck Euro 6 (28 – 32 t / 22 t payload)
Truck capacity utilisation (including 30% of empty returns)	20 % of the weight capacity
Loss of materials on site	2%
Packaging – PE film	40% recycled, 60% incinerated
Packaging – Wooden Pallets	40% recycled, 60% incinerated

The treatment and the transport of the packaging waste after the installation of the product (A5) have been considered.

The Use stage (B1-B7) includes:

- B1: Use
- B2: Maintenance
- B3: Repair
- B4: Replacement
- B5: Refurbishment
- B6: Operational Energy Use
- B7: Operational Water Use

Once installation is complete, no actions or technical operations are required during the use stages until the end of life. Therefore, the mineral wool has no impact (excluding potential energy savings) on this stage.

The end-of-life stage includes:

- C1 – de-construction, demolition,
- C2 – transport to waste processing,
- C3–waste processing for reuse, recovery and/or recycling and
- C4 – disposal.

This includes provision of all transport, materials, products and related energy and water use. The common manual dismantling impact of insulation is considered as very small and can be neglected in C1.

Although rock mineral wool products from Knauf Insulation are partly recycled at their end-of-life, an established collection system does not yet exist. Therefore, the assumption chosen in this study, 100% landfill (C4) after the use phase, is the most conservative approach.

Parameter	Value
Disposal type (mineral wool)	100% landfill
Average transport distance waste (C2)	80 km
Type of fuel and vehicle consumption or type of vehicle used for transport	Truck-trailer, Euro 6, 34 - 40t gross weight / 27t payload capacity/ 40 L for 100 km (if 100 % utilization)
Truck capacity utilization	50 % of the weight capacity

Module D includes reuse, recovery and/or recycling potential. According to EN 15804:2012+A2:2019 any declared benefits and loads from net flows leaving the product system not allocated as co-products and having passed the end-of waste state shall be included in module D. The benefits considered in module D originate from packaging recycling or incineration.

Recycled material

The mineral wool scrap generated during the manufacturing process is recycled internally and fed back into the mineral wool production process at multiple stages.
The average product recycled content for the considered plant(s), excluding internal recycling, was calculated at 48% in 2025. The calculation is taking into account the % of secondary materials from external supply input into the batch against virgin raw materials supply. The external waste considerations and the calculation methodology applied are also in accordance with the ISO 14021 standard.

Conversion factor to mass

The conversion factor used in this EPD involves multiplying the results by 0.22 to obtain Environmental Impact Indicator results for 1 kg. Please note, an insulation product should always be defined by both its thickness and R-value. Focusing only on the product's weight could result in misinterpretations.

More information:

www.knauf.com

Name and contact information of LCA practitioner:

Clara del Val
Knauf Insulation Sprl
Rue de Maestricht 95, 4600 Visé (Belgium)
Contact: sustainability@knaufinsulation.com

Content Declaration

The product does not contain substances on the "Candidate List of Substances of Very High Concern for Authorisation" in force at the time of the EPD publication under the REACH regulation (if above 0.1% of the mass).

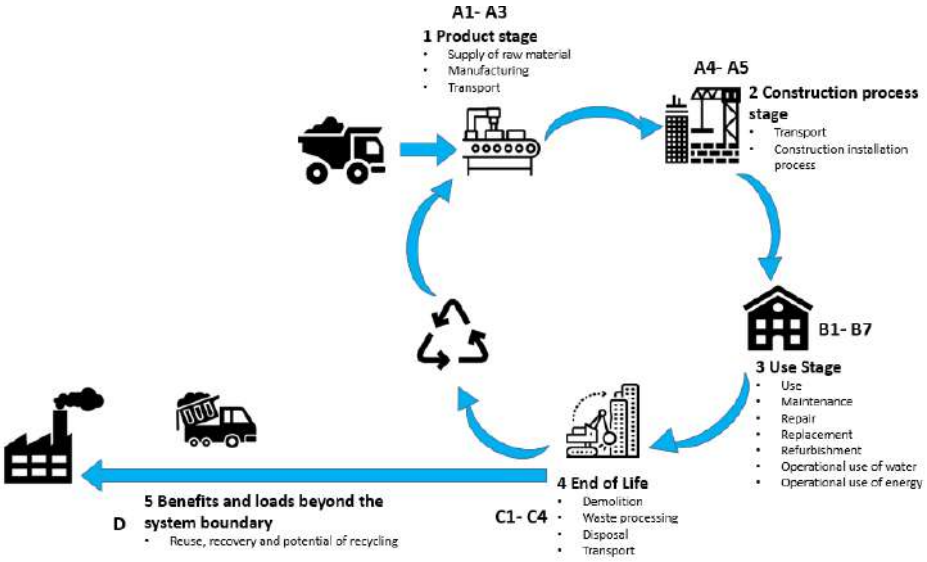
Product components	**Weight %**	**Post-consumer recycled material %** *(out of total)*	**Biogenic material %** *(out of total)*	**Biogenic material, kg C/product** *(out of total)*
Basalt	55 - 60	0	0	0
Dolomite - Limestone	15 - 20	0	0	0
Recovered metallurgical slags	5 – 50	0	0	0
Bio- based binder	0.5 – 5	0	80	0.04
Additives	< 1	0	0	0

Packaging Materials	**Weight, kg/ DU or FU**	**Weight %** (versus the product)	**Biogenic material, kg C/product** (out of total)
Packaging – PE film	0.06	1.33	0
Packaging - Wooden Pallet	0.32	7.11	0.16
TOTAL	0.38	8.44	0.16

Note: This content declaration table applies to all product thickness covered in this EPD. Knauf Insulation EPDs are EPD of multiple products, based on a representative product (Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL, 100 mm).

Material and substance composition is declared as mass range percentages only, in order to protect confidential formulation details. The mass of one declared unit of product, excluding packaging, is 4.5 kg/m^2.

Process flow diagram, declared Modules, geography, share of specific data (in GWP-GHG indicator) & data variation



Life cycle stages and the description of the system boundaries for the reference product LCA (X = included in the LCA, MND = module is not declared)

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe	Europe
Share of specific data	> 60 %																
Variation* – products	<10 %																
Variation** – Sites	0%																

* Variation regarding the average EPD result in terms of GWP-GHG indicator

** Variation regarding the average EPD result in terms of GWP-GHG indicator amongst products covered with this EPD

Data quality assessment

Following EN 15804+A2, data quality assessment must be performed for relevant data, meaning data that make a major contribution and together account for at least 80% of the absolute impact of any core environmental indicator in the EPD, over the assessed life cycle modules, excluding module D. This data quality assessment was conducted based on Geographical, Time, and Technical criteria, as outlined in the referenced standard. Overall, the datasets used for the calculations have been evaluated as "Very Good" and "Good," with only a few rated as "Fair." The "Fair" rating is assigned to cases where datasets represent countries with a development level comparable to the countries of operation but do not precisely match them. For example, this occurs when datasets from Germany or the United States are used as proxies for processes taking place in Europe under the geographical criteria.

According to PCR 2019:14 v.2.0.1, infrastructure should be excluded from the system boundary (except for energy-related infrastructure), which aligns with Knauf Insulation's approach. However, it is possible that some GaBi background datasets may include infrastructure impacts as part of their modelling.

The declaration of data sources, reference years, data categories, and share of primary data for all processes contributing with more than 10% to the GWP-GHG results of modules A1-A3 is summarized in the table below.

Process	Source type	Source	Version number	Reference Year
Energy for manufacturing	Collected data	Knauf Insulation	-	2025
	Database	Sphera	MLC 2026.1	2026
Glass mineral wool + packaging manufacturing	Collected data	Knauf Insulation	-	2025
	Database	Sphera	MLC 2026.1	2026

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Data quality declaration of material processes:

- Components in GMW: secondary data | MLC 2026.1
- Process energy: secondary data | MLC 2026.1

Additional environmental information

All raw materials used in the manufacture of the declared product, the required energy, water consumption and the resulting emissions are considered in the LCA. As a result, recipe components with a share of less than 1% are included. All neglected processes contribute less than 5% to the total mass or less than 5% to the total energy consumption. For information, the impact of the mineral wool plant construction or manufacturing equipment is not taken into account in the life cycle assessment.

Materials required for fixing and installation are not included in the scope of this LCA. The impact of any additional construction products or materials not included in this EPD should be accounted for at building level. Regarding installation, this EPD only includes the environmental impacts relating to the product itself, such as material losses and packaging disposal.

Knauf Insulation adopts a conservative approach in its EPDs.

Conversion factors to specific thickness

The results of this EPD apply to a thickness of 100 mm, with an R-value of 2.85 m²K/W. Multiplication factors for the primary product thickness are provided to calculate the environmental performance for each thickness in the table below. To adjust the results for all indicators across all modules to different thickness, multiply the values in this EPD by the corresponding conversion factor in the table. For thickness not listed, conversion factors can be calculated by dividing the target product thickness by 100 (mm), as the results scale linearly.

Product thickness (mm)	Thickness Conversion factor
25	0.25
30	0.3
40	0.4
50	0.5
60	0.6
75	0.75
140	1.4
150	1.6

Please note that Rocksilk® Flexible Slab (140 mm) is defined as 140 mm thickness. Accordingly, the only applicable thickness conversion factor for this product is 1.4, and it must be applied when calculating results for this specific thickness.

Environmental performance

Potential environmental impacts: 1m² of rock mineral wool Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL with a thickness of 100 mm and the R-value of 2.85 m^2K/W.

These results are representative of all the products mentioned in this EPD.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

ENVIRONMENTAL IMPACTS										
Parameter	**Unit**	**A1-3*****	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D****
GWP-fossil	kg CO2 eq.	7.10E+00	3.23E-01	2.55E-01	0.00E+00	0.00E+00	3.27E-02	0.00E+00	6.74E-02	-1.84E-01
GWP-biogenic	kg CO2 eq.	-8.10E-01	0.00E+00	5.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.91E-01	0.00E+00
GWP-luluc	kg CO2 eq.	2.67E-03	1.35E-03	1.28E-04	0.00E+00	0.00E+00	1.37E-04	0.00E+00	1.22E-04	-1.97E-04
GWP-total	kg CO2 eq.	6.29E+00	3.24E-01	7.65E-01	0.00E+00	0.00E+00	3.28E-02	0.00E+00	4.58E-01	-1.85E-01
ODP	kg CFC 11 eq.	1.37E-11	1.50E-13	5.68E-13	0.00E+00	0.00E+00	1.52E-14	0.00E+00	3.34E-13	-2.47E-12
AP	mol H+ eq.	3.25E-02	3.89E-04	7.49E-04	0.00E+00	0.00E+00	3.85E-05	0.00E+00	4.85E-04	-3.73E-04
EP-freshwater	kg P eq.	2.10E-05	8.03E-07	4.63E-07	0.00E+00	0.00E+00	8.15E-08	0.00E+00	8.56E-08	-6.32E-08
EP-marine	kg N eq.	5.32E-03	1.41E-04	1.35E-04	0.00E+00	0.00E+00	1.40E-05	0.00E+00	1.27E-04	-1.30E-04
EP-terrestrial	mol N eq.	8.02E-02	1.53E-03	1.99E-03	0.00E+00	0.00E+00	1.50E-04	0.00E+00	1.39E-03	-1.45E-03
POCP	kg NMVOC eq.	1.13E-02	3.53E-04	3.04E-04	0.00E+00	0.00E+00	3.50E-05	0.00E+00	3.78E-04	-4.37E-04
ADP-minerals & metals*	kg Sb eq.	6.49E-07	2.29E-08	1.59E-08	0.00E+00	0.00E+00	2.33E-09	0.00E+00	4.69E-09	-2.01E-08
ADP-fossil*	MJ	6.57E+01	4.14E+00	1.68E+00	0.00E+00	0.00E+00	4.20E-01	0.00E+00	8.59E-01	-3.88E+00
WDP*	m^3 world eq.	7.30E-01	1.29E-03	5.81E-02	0.00E+00	0.00E+00	1.31E-04	0.00E+00	7.40E-03	-1.71E-02
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

* Disclaimer 2: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.
**: [Life Cycle D stage covers benefits and loads beyond the system boundary stage (reuse, recovery and recycling potential) therefore, when summing up results, this stage should be considered separately].
*** The indicator's results are calculated using a reference product, with equal weighting between plants, if this is a single plant, it means 100% for that plant

Potential environmental impact – additional mandatory and voluntary indicators										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG [2]	kg CO_2 eq.	7.10E+00	3.25E-01	2.55E-01	0.00E+00	0.00E+00	3.28E-02	0.00E+00	6.76E-02	-1.85E-01

[2] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.

Use of resources: 1m² of rock mineral wool Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL with a thickness of 100 mm and the R-value of 2.85 m²K/W.

These results are representative of all the products mentioned in this EPD.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

RESOURCES USE										
Parameter	**Unit**	**A1-3*****	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D***
PERE [3]	MJ	9.06E+00	2.94E-01	-3.11E+00	0.00E+00	0.00E+00	2.99E-02	0.00E+00	1.79E-01	0.00E+00
PERM [3]	MJ	7.43E+00	0.00E+00	1.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT [3]	MJ	1.65E+01	2.94E-01	-2.96E+00	0.00E+00	0.00E+00	2.99E-02	0.00E+00	1.79E-01	0.00E+00
PENRE [3]	MJ	6.31E+01	4.14E+00	-2.25E+00	0.00E+00	0.00E+00	4.20E-01	0.00E+00	8.59E-01	0.00E+00
PENRM [3]	MJ	2.59E+00	0.00E+00	5.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT [3]	MJ	6.57E+01	4.14E+00	-2.20E+00	0.00E+00	0.00E+00	4.20E-01	0.00E+00	8.59E-01	0.00E+00
SM	kg	1.81E-02	0.00E+00	3.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.24E-02	9.19E-05	1.50E-03	0.00E+00	0.00E+00	9.33E-06	0.00E+00	2.11E-04	-6.56E-04
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

**: [Life Cycle D stage covers benefits and loads beyond the system boundary stage (reuse, recovery and recycling potential) therefore, when summing up results, this stage should be considered separately].*
**** The indicator's results are calculated using a reference product, with equal weighting between plants, if this is a single plant, it means 100% for that plant.*

[3] From International EPD PCR 2.0.1 for Construction Products, the option B, mentioned in Annex 3, was used for the calculation if the primary energy use indicators.

Waste production and output flows: 1m² of rock mineral wool Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL with a thickness of 100 mm and the R-value of 2.85 m^2K/W.

These results are representative of all the products mentioned in this EPD.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

OUTPUT FLOWS AND WASTE CATEGORIES

Parameter	Unit	A1-3***	A4	A5	B1-B7	C1	C2	C3	C4	D*
Hazardous waste disposed	kg	1.68E-08	1.91E-10	5.29E-10	0.00E+00	0.00E+00	1.94E-11	0.00E+00	2.15E-10	1.13E-09
Non-hazardous waste disposed	kg	7.44E-01	7.96E-04	1.26E-01	0.00E+00	0.00E+00	8.09E-05	0.00E+00	4.50E+00	1.05E-03
Radioactive waste disposed	kg	1.54E-03	6.51E-06	4.60E-05	0.00E+00	0.00E+00	6.61E-07	0.00E+00	6.03E-06	-1.46E-04
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	1.51E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	5.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	1.07E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

**: [Life Cycle D stage covers benefits and loads beyond the system boundary stage (reuse, recovery and recycling potential) therefore, when summing up results, this stage should be considered separately].*
**** The indicator's results are calculated using a reference product, with equal weighting between plants, if this is a single plant, it means 100% for that plant.*

Additional impact categories and indicators: 1m² of rock mineral wool Rocksilk® RS45, Rocksilk® Flexible Slab (140mm), Rock4ALL with a thickness of 100 mm and the R-value of 2.85 m²K/W.

These results are representative of all the products mentioned in this EPD.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

ADDITIONAL IMPACT CATEGORIES AND INDICATORS										
Parameter	**Unit**	**A1-3******	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D*****
PM	Disease Incidence	2.37E-07	4.01E-09	5.59E-09	0.00E+00	0.00E+00	4.04E-10	0.00E+00	6.07E-09	-3.65E-09
IRP*	kBq U235 eq.	1.37E-01	8.49E-04	4.99E-03	0.00E+00	0.00E+00	8.62E-05	0.00E+00	6.44E-04	-2.22E-02
ETP-fw**	CTUe	2.16E+01	3.56E+00	6.56E-01	0.00E+00	0.00E+00	3.61E-01	0.00E+00	5.34E-01	-1.36E+00
HTP-c**	CTUh	1.98E-08	7.05E-11	4.05E-10	0.00E+00	0.00E+00	7.16E-12	0.00E+00	1.14E-11	-4.63E-11
HTP-nc**	CTUh	2.27E-06	3.66E-09	4.60E-08	0.00E+00	0.00E+00	3.72E-10	0.00E+00	4.44E-10	-8.66E-10
SQP**	dimensionless	6.01E+01	1.11E+00	1.31E+00	0.00E+00	0.00E+00	1.13E-01	0.00E+00	2.79E-01	-2.15E+01
Acronyms	PM = Particulate matter emissions; IRP= Ionising radiation, human health; ETP-fw: Ecotoxicity (freshwater); ETP-c: Human toxicity, cancer effects; HTP-nc: Human toxicity, non-cancer effects; SQP: Land use related impacts / soil quality									

** Disclaimer 1: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.*
*** Disclaimer 2: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*
****: [Life Cycle D stage covers benefits and loads beyond the system boundary stage (reuse, recovery and recycling potential) therefore, when summing up results, this stage should be considered separately].*
***** The indicator's results are calculated using a reference product, with equal weighting between plants, if this is a single plant, it means 100% for that plant.*

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**kg C**	**kg CO_2 eq.**
Biogenic carbon content in product	4.05E-02	1.48E-01
Biogenic carbon content in packaging	1.60E-01	5.87E-01

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

LCA interpretation

Environmental impacts

All impact categories, except the Abiotic Depletion Potential Element and the Ozone Depletion Potential, are dominated by the manufacturing processes. This can be explained by the huge impact of the energy use (electricity, natural gas and coke) for rock mineral wool production.

In almost all impact categories, the transport to installation (module A4) is quite visible because of the transport emissions. The end-of-life of the product has almost no influence as almost no emissions from inert waste occur (modules C2 & C4).

The Global Warming Potential (GWP-total) is dominated by the manufacturing in the cupola, mostly due to CO2 emissions from raw materials and energy consumption.

The Depletion Potential of the Stratospheric Ozone layer (ODP) is mostly influenced by the manufacturing phase (module A1-A3) and significantly influenced using electricity.

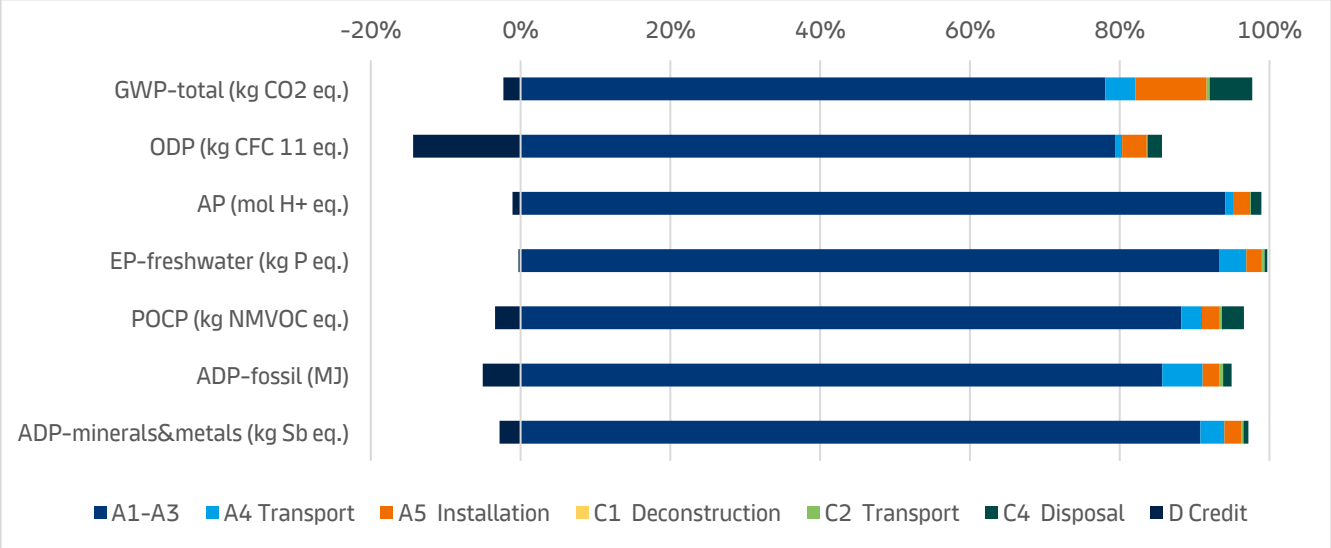
The Acidification Potential (AP) is also dominated by the manufacturing due to the emissions related to the processes and the energy consumption.

The Eutrophication Potential Fresh Water (all EP indicators in total) is significantly influenced by the manufacturing due to emissions from cupola furnace, curing oven and other unit processes.

The Formation Potential of Tropospheric Ozone (POCP) is particularly dominated by the manufacturing (emissions in the cupola furnace and other unit processes).

The Abiotic Depletion Potential for Non-Fossil Resources (ADP- minerals &metals) is mainly due to the raw material extraction.

The Abiotic Depletion Potential for Fossil Resources Potential (ADP-fossil) is dominated by the use of coke as energy carrier. Next to the coke, we have also the impact of natural gas and upstream the electricity energy.



Resources use

Total Use of Non-Renewable Primary Energy Resources (PENRT) is dominated by the manufacturing of rock mineral wool products (especially due to the energy carrier, coke).

Total Use of Renewable Primary Energy Resources (PERT) is dominated by the manufacturing, mostly due to electricity consumption and packaging.

Version history

Version	Date	Difference(s) versus previous version(s)
Original	2026-05-05	-
2	2027-08-25	Density correction and results recalculated for all modules and all indicators, compliance with ISO 21930 removal, product name added and small editorial updates.

Abbreviations

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO_2 eq.)
GWP-total	Total Global Warming Potential (kg CO_2 eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H^+ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m^3)
Resource Use Indicators	
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m^3)

Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MR	Material for Recycling (kg)
MER	Materials for Energy Recovery (kg)
EEE	Exported Energy, Electricity (MJ)
EET	Exported Energy, Thermal (MJ)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
CAS No.	Chemical Abstracts Service Number
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO_2 eq.	Carbon Dioxide Equivalents
DoP	Declaration of Performance
EAC's	Energy Attribute Certificate
EC No.	European Community Number
GMW	Glass Mineral Wool
kg	Kilogram
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
m^2K/W	Meter Squared Kelvin per Watt
m^3	Cubic Meter
MJ	Megajoule
MLC	Managed Life Cycle Content (formerly GaBi databases)
N eq.	Nitrogen Equivalents
ND	Not Declared
NMVOC	Non-Methane Volatile Organic Compounds
P eq.	Phosphorus Equivalents
PE	Polyethylene
PET	Polyethylene Terephthalate
PU	Polyurethane
RMW	Rock Mineral Wool
RSL	Reference Service Life
R-value	Thermal Resistance
Sb eq.	Antimony Equivalents
SVHC	Substances of Very High Concern
W/(mK)	Watts per Meter-Kelvin

References

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Fire behaviour of building materials and building components - Part 17: Melting point of mineral wool insulating materials - Terms and definitions, requirements and test

***2026_07_17 RS45 - QF* (I-report)**
I-report is an interactive report created with GaBi based on the scenario. More details about the product characteristics, plant allocation and scenario on i-report

***BR_RMW_2026* (Background Report)**
Calculation rules for the Life Cycle Assessment and Requirements and more details about the production on the Background Report

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