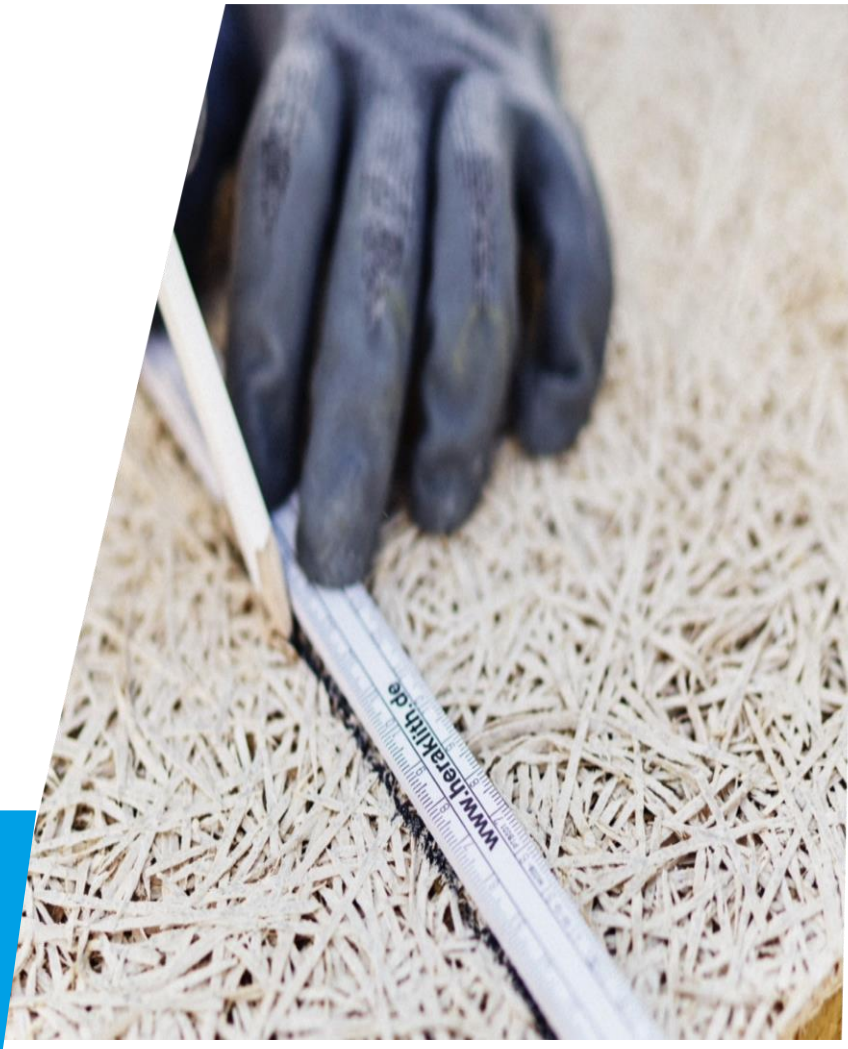
KNAUF INSULATION

ENVIRONMENTAL PRODUCT DECLARATION

Tektalan A2 SmartTec



In accordance with:
ISO 14025, ISO 21930:2017, EN15804+A2:2019/AC:2021

Programme:	The International EPD® System www.environdec.com
Programme operator:	EPD International AB
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Validity date:	2030-09-17

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 .

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

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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-0021233
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Valid until:	2030-09-17
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 37520
Reference year for plant data:	2023
Geographical application scope:	Europe

CEN standard EN 15804+A2 and ISO standard ISO 21930 serve 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 37520 Sub-PCR-005 Thermal insulation products (EN 16783: 2024) Version: 2024-05-03
PCR review was conducted by: The Technical Committee of the International EPD System 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 AB, 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.envrondec.com.
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

General information

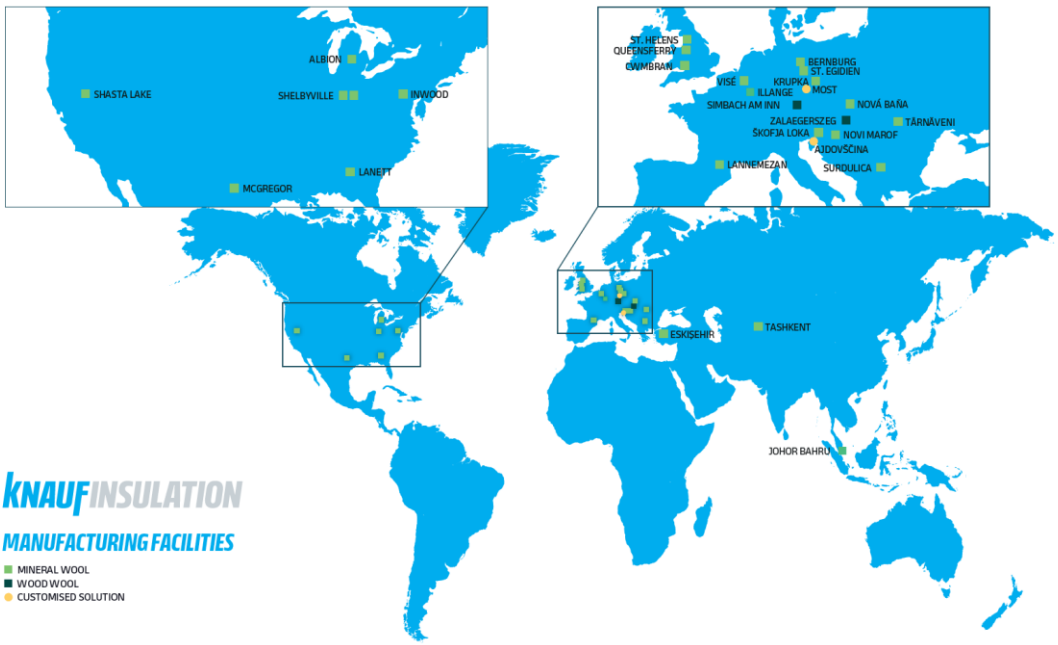
Information about the company

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 for a better world.



The Headquarters is located in Visé, in 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 and Production 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 and the Middle East. The data utilized for the production stage life cycle assessment is related to production plant(s) located in Simbach am Inn (Germany) and Zalaegerszeg (Hungary).

Address: Knauf Insulation Operation GmbH, Heraklithstraße 8, 84359 Simbach am Inn, Bavaria, Germany
Knauf Insulation Kft., Ipartelep 1, 8924 Alsónemesapáti, Hungary

Information about Wood Wool production

The production process of Knauf Insulation wood wool insulation products consists of 4 main processes:

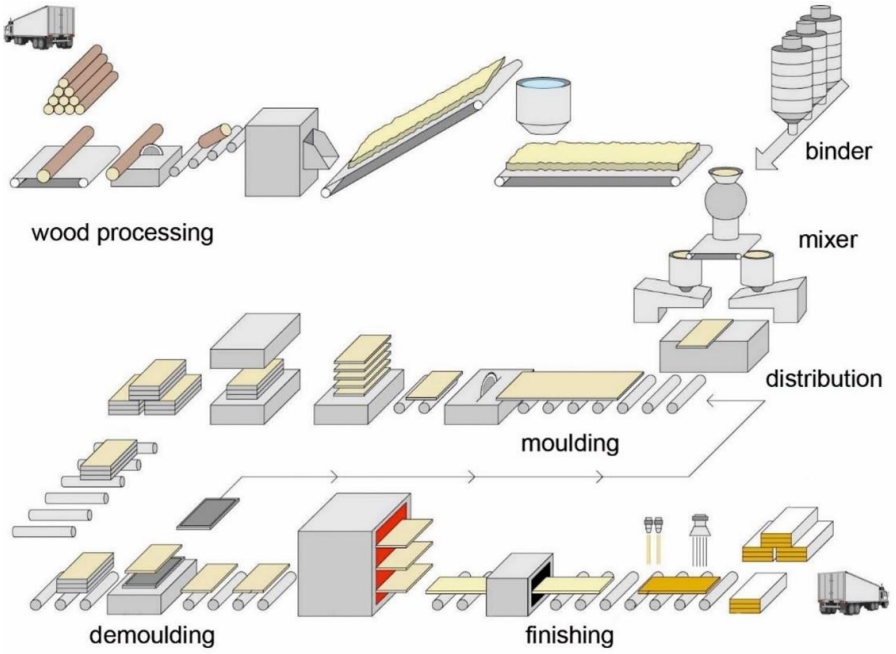
1. Moulding: Preparation and blending of the raw materials followed by deposition of the mixture in a mould of the corresponding size.

2. Demoulding: Demoulding and drying of the products.

3. Gluing: Combination of wood wool layers with other insulation materials (e.g. EPS or RMW).

4. Finishing: Various sizing, forming, cutting and painting operations applied to the boards.

The final product is delivered on pallets packaged with plastic film and cardboard protection. The estimated reference service life for the wood wool insulation boards is about 60 years, as long as the building equipment in which it is used. No maintenance is conducted during the lifetime.



Product information

Product_name

Tektalan A2 SmartTec

Product identification

The declared insulation Tektalan A2-SmartTec is a 2-layered composite wood wool board (WW-C/2 MW, unfaced, painted white) of 1m² (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 W4302GPCPR and W4312GPCPR taking into consideration the harmonized product standard EN 13168 and the CE-marking.

Product description

Tektalan A2-SmartTec is a mineral bound 2-layer wood wool insulation board for subsequent thermal insulation in underground parkings, basements and technical rooms as well as outside ceilings and walls protected from direct weathering.
Application key according to DIN 4108-10: DI-dk, WI-dk.

UN CPC code

37520: Wood wool.

Geographical scope

The product is manufactured in Simbach am Inn (Germany), Zalaegerszeg (Hungary). Energy-related information is described in the next section. Regarding the market area, the product is mainly marketed in Europe (and the Middle East).

Technical Characteristics

Parameter	Value
Thermal conductivity/ EN 12667	RMW = 0,034 W/(mK) at 10°C WW = 0,095 W/(mK) at 10°C
Water vapor diffusion resistance (EN 12086)	RMW = 1 WW = 2-5
Thermal Resistance (ISO 8301)	2,75 m^2K/W
Declared density range/ EN 1602	RMW = 95 kg/m³ (+/-10%) WW = 600 kg/m³ (+/- 15%)

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 1m² of 2-layered composite wood wool board (WW-C/2 MW, unfaced, painted white) Tektalan A2-SmartTec with R-value of 2,75 m^2K/W (for a thickness of 100 mm and a declared lambda of RMW = 0,034 W/(mK) and WW = 0,095 W/(mK)).

Reference service life

The RSL or durability of Tektalan A2-SmartTec 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 Simbach am Inn (2023), Zalaegerszeg (2023). The product group/s considered in this EPD is produced in multiple Knauf Insulation manufacturing sites with equal weight.
The data which is used to carry out the LCA calculations contains app. 50% specific data and app. 50% 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 2025.1. 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: 2020) from Germany and Hungary is selected for Simbach am Inn (Germany) and Zalaegerszeg (Hungary).

Electricity information

Plants (countries)	Electricity mixes	Locations (electricity)	Dataset Reference Year	Impact (kg CO_2eq/kwh)
Simbach a. Inn (Germany)	Residual mix	DE	2022	0,85
Zalaegerszeg (Hungary)	Residual mix	HU	2022	0,36

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 (EPD type b, cradle to gate with options, modules A4-A5, modules B, modules C1–C4, 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
Product weight	17,3 kg
Area	1 m²
Thickness	100 mm
Volume	0,1 m³
Packaging – PE film	0,02 kg
Packaging - Wooden pallet	0,06 kg
Packaging - Cardboard	0,34 kg
Packaging - PET	0,02 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	600 km
Type of fuel and vehicle consumption or type of vehicle used for transport	Truck Euro Mix (34 – 40 t / 27 t payload)
Truck capacity utilisation (including 30% of empty returns)	61 % of the weight capacity
Loss of materials on site	2%
Packaging – PE film	100% incinerated
Packaging - Wooden pallet	100% incinerated
Packaging - Cardboard	100% recycling
Packaging - PET	100% incinerated

The treatment and the transport of the packaging waste after the installation of the product (A5) has 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 Us

Once installation is complete, no actions or technical operations are required during the use stages until the end of life. Therefore, the wood 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.

The declared scenario assumes 100% landfill after the use phase. The potential energy consumption for loading and unloading at a sorting facility as well as for mechanical sorting is accounted for in module C3. The declared environmental impact represents a generic scenario and might vary depending on the case-specific circumstances.

Module C4 includes the environmental burdens of landfilling of the product. The biogenic carbon in the wood share of the product is treated as emissions of biogenic CO_2 from the techno-sphere to the natural environment.

Parameter	Value
Disposal type (wood 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 V, 20 - 28t gross weight / 12,4t payload capacity / 47 L for 100 km (if 100 % utilization)
Truck capacity utilization	61 % of the weight capacity

Module D includes reuse, recovery and/or recycling potentials. 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 incineration.

Recycled material

The product does not contain recycled material.

Conversion factor to mass

The conversion factor used in this EPD involves multiplying the results by 0,058 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:

Therese Daxner
Daxner & Merl GmbH
Schleifmühlgasse 13/24
A - 1040 Vienna (Austria)
Contact: office@daxner-merl.com

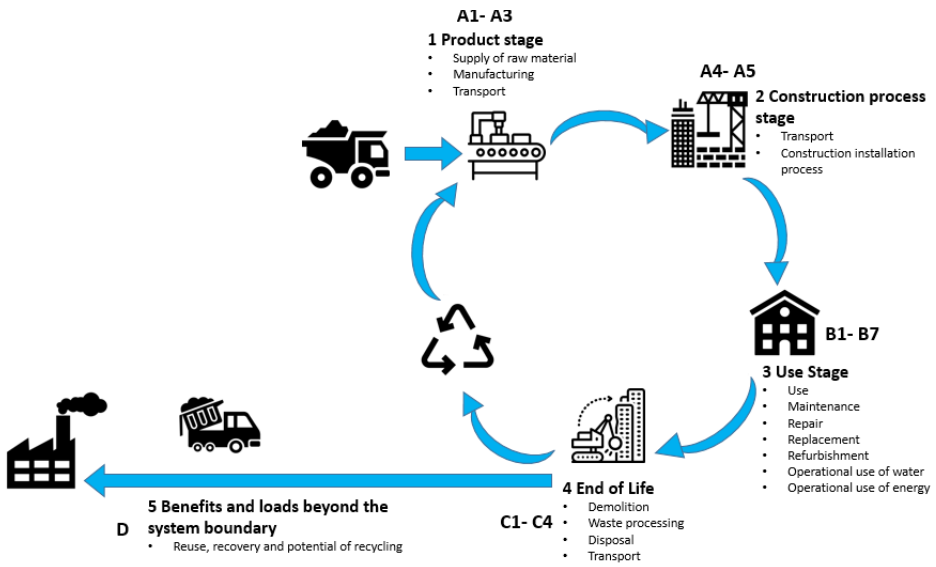
Content Declaration

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)*
Spruce Wood	10 – 15	0	10-15	0,8
Cement	20 – 25	0	0	0
Calcium carbonate powder	5 – 10	0	0	0
PU-glue	1	0	0	0
RMW	40 – 50	0	0	0
Paint	2	0	0	0
Water	12 - 18			

Packaging Materials	**Weight, kg/ DU or FU**	**Weight %** (versus the product)	**Biogenic material, kg C/product** (out of total)
Wooden Pallet	0,1	0,3	0,03
Cardboard/paper	0,3	2,0	0,2
PE film	0,02	0,1	0
PET	0,02	0,1	0
TOTAL	**0,4**	**2,5**	**0,2**

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 product LCA (X = included in the LCA, MND = module is not declared, MNR = module not relevant)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	x	x	MNR	MNR	MNR	x	x	x	x	x	x	x
RER	RER	RER	RER	RER	RER	RER				RER	RER	RER	RER	RER	RER	RER
Tektalan A2 SmartTec – 100 mm																
Specific data share 50 %																
Variation – products 0 %																
Variation – sites 10 %																

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.

The declaration of data sources, reference years, data categories, and share of primary data is summarized in the table below.

Process	Source type	Source	Version number	Reference Year	Data category
Energy for manufacturing	Collected data	Knauf Insulation	-	2023	Primary data
	Database	Sphera	MLC 2025.1	2025	Secondary data
Wood wool board manufacturing	Collected data	Knauf Insulation	-	2023	Primary data
	Database	Sphera	MLC 2025.1	2025	Secondary data

According to PCR 2019:14 Version 2.0.1 infrastructure should be outside of the system boundary (except for energy-related infrastructure), which aligns with Knauf Insulation's approach). However, infrastructure impacts could have been considered in some MLC-background datasets.

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 wood 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 thicknesses

The results of this EPD apply to a thickness of 100 mm, with an R-value of 2,75 m²K/W. As a specific product is declared, no conversion factors are applicable.

Environmental performance

Potential environmental impacts: 1m² of wood wool Tektalan A2 SmartTec with a thickness of 100 mm and the R-value of 2,75 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.

ENVIRONMENTAL IMPACTS										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D****
GWP-fossil	kg CO2 eq.	1,96E+01	8,04E-01	5,55E-01	0,00E+00	0,00E+00	1,73E-01	0,00E+00	2,64E-01	-6,83E-02
GWP-biogenic	kg CO2 eq.	-3,36E+00	1,50E-03	6,35E-01	0,00E+00	0,00E+00	3,24E-04	0,00E+00	3,01E+00	-3,52E-04
GWP-luluc	kg CO2 eq.	2,19E-02	8,45E-03	8,29E-04	0,00E+00	0,00E+00	1,82E-03	0,00E+00	1,08E-03	-9,38E-05
GWP-total	kg CO2 eq.	1,63E+01	8,14E-01	1,19E+00	0,00E+00	0,00E+00	1,75E-01	0,00E+00	3,27E+00	-6,88E-02
ODP	kg CFC 11 eq.	7,80E-11	1,36E-13	8,56E-13	0,00E+00	0,00E+00	2,94E-14	0,00E+00	7,35E-13	-6,41E-13
AP	mol H+ eq.	6,16E-02	1,17E-03	1,47E-03	0,00E+00	0,00E+00	1,17E-03	0,00E+00	1,87E-03	-8,05E-05
EP-freshwater	kg P eq.	2,36E-05	2,21E-06	5,72E-07	0,00E+00	0,00E+00	4,77E-07	0,00E+00	3,93E-07	-6,23E-08
EP-marine	kg N eq.	1,07E-02	4,75E-04	2,88E-04	0,00E+00	0,00E+00	5,80E-04	0,00E+00	4,88E-04	-2,33E-05
EP-terrestrial	mol N eq.	1,16E-01	4,93E-03	3,17E-03	0,00E+00	0,00E+00	6,33E-03	0,00E+00	5,33E-03	-2,60E-04
POCP	kg NMVOC eq.	3,42E-02	1,06E-03	8,74E-04	0,00E+00	0,00E+00	1,11E-03	0,00E+00	1,46E-03	-6,33E-05
ADP-minerals & metals*	kg Sb eq.	1,09E-06	5,46E-08	2,56E-08	0,00E+00	0,00E+00	1,18E-08	0,00E+00	1,63E-08	-6,74E-09
ADP-fossil*	MJ	2,54E+02	1,05E+01	5,79E+00	0,00E+00	0,00E+00	2,27E+00	0,00E+00	3,46E+00	-1,21E+00
WDP*	m^3 world eq.	1,23E+00	3,75E-03	4,47E-02	0,00E+00	0,00E+00	8,09E-04	0,00E+00	2,86E-02	-7,09E-03
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].

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.	1,97E+01	8,14E-01	5,57E-01	0,00E+00	0,00E+00	1,75E-01	0,00E+00	2,66E-01	-6,88E-02

[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 wood wool Tektalan A2 SmartTec with a thickness of 100 mm and the R-value of 2,75 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-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D***
PERE [3]	MJ	2,90E+01	7,93E-01	3,95E-01	0,00E+00	0,00E+00	1,71E-01	0,00E+00	6,68E-01	-3,93E-01
PERM [3]	MJ	3,50E+01	0,00E+00	1,01E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT [3]	MJ	6,40E+01	7,93E-01	1,41E+00	0,00E+00	0,00E+00	1,71E-01	0,00E+00	6,68E-01	-3,93E-01
PENRE [3]	MJ	2,49E+02	1,05E+01	4,03E+00	0,00E+00	0,00E+00	2,27E+00	0,00E+00	3,46E+00	-1,21E+00
PENRM [3]	MJ	4,16E+00	0,00E+00	1,75E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT [3]	MJ	2,54E+02	1,05E+01	5,79E+00	0,00E+00	0,00E+00	2,27E+00	0,00E+00	3,46E+00	-1,21E+00
SM	kg	2,03E-02	0,00E+00	7,82E-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	5,39E-02	3,92E-04	1,57E-03	0,00E+00	0,00E+00	8,45E-05	0,00E+00	8,36E-04	-3,06E-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].*

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

Waste production and output flows: 1m² of wood wool Tektalan A2 SmartTec with a thickness of 100 mm and the R-value of 2,75 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.

OUTPUT FLOWS AND WASTE CATEGORIES

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D*
Hazardous waste disposed	kg	8,65E-06	4,22E-10	1,73E-07	0,00E+00	0,00E+00	9,10E-11	0,00E+00	7,58E-10	-7,61E-10
Non-hazardous waste disposed	kg	3,55E+00	1,47E-03	4,44E-01	0,00E+00	0,00E+00	3,17E-04	0,00E+00	1,73E+01	-6,01E-04
Radioactive waste disposed	kg	7,57E-03	1,99E-05	1,15E-04	0,00E+00	0,00E+00	4,28E-06	0,00E+00	3,67E-05	-9,05E-05
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	3,47E-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	3,20E-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	5,74E-01	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].*

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Additional impact categories and indicators: 1m² wood wool Tektalan A2 SmartTec with a thickness of 100 mm and the R-value of 2,75 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-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D*****
PM	Disease Incidence	5,37E-07	1,07E-08	1,25E-08	0,00E+00	0,00E+00	4,92E-09	0,00E+00	2,33E-08	-6,57E-10
IRP*	kBq U235 eq.	6,49E-01	2,85E-03	1,11E-02	0,00E+00	0,00E+00	6,14E-04	0,00E+00	4,06E-03	-1,49E-02
ETP-fw**	CTUe	8,93E+01	1,37E+01	2,47E+00	0,00E+00	0,00E+00	2,95E+00	0,00E+00	2,68E+00	-1,06E-01
HTP-c**	CTUh	6,05E-09	1,84E-10	1,86E-10	0,00E+00	0,00E+00	3,98E-11	0,00E+00	4,61E-11	-1,23E-11
HTP-nc**	CTUh	4,68E-07	1,03E-08	1,71E-08	0,00E+00	0,00E+00	2,22E-09	0,00E+00	1,72E-09	-2,03E-10
SQP**	dimensionless	3,09E+02	4,65E+00	6,78E+00	0,00E+00	0,00E+00	1,00E+00	0,00E+00	8,55E-01	-2,30E-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].*

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	0,8	3,0
Biogenic carbon content in packaging	0,2	0,7

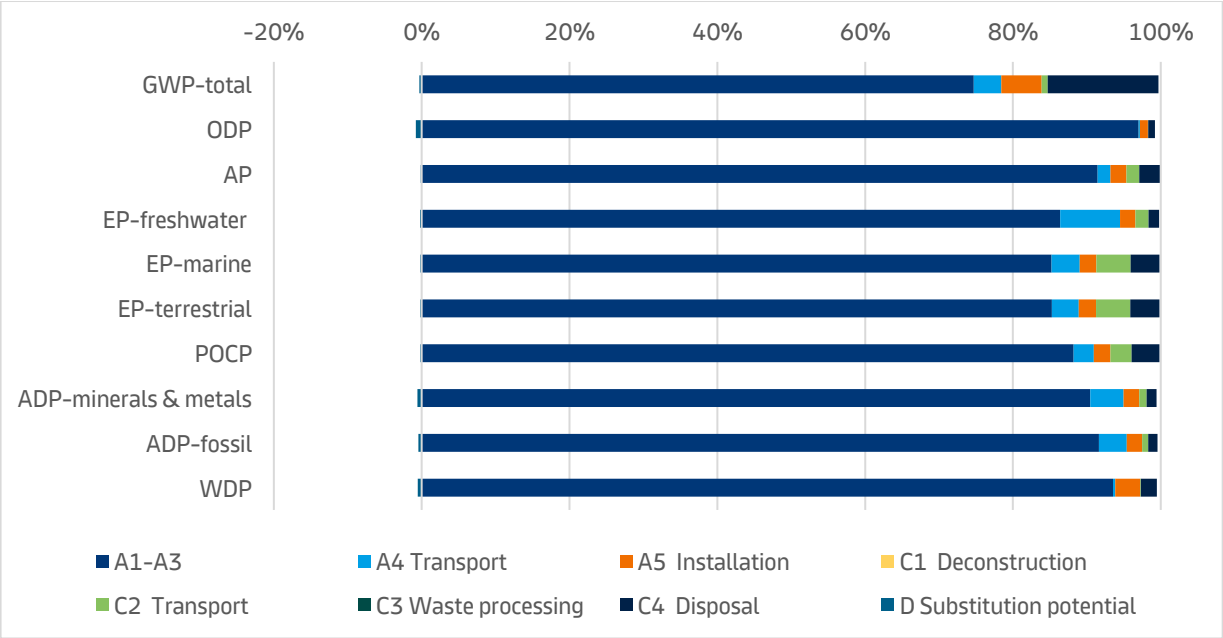
Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

LCA interpretation

Environmental impacts

The comparison of the products' life cycle phases shows a clear dominance of the production phase (modules A1-A3). Environmental impacts in module C4 represent the landfilling of the material.

The biogenic carbon stored in the wood used during production is accounted for as negative impact in the global warming potential (GWP) of modules A1-A3. Wood sequesters biogenic carbon during plant growth. As long as the biogenic carbon is stored in the biomass, it shows a negative contribution to global warming. After the products' use, the sequestered carbon might be released to the atmosphere. This is represented by biogenic carbon dioxide emissions in module C4.



Greenhouse gas emissions from Tektalan multilayer products with a core of rock mineral wool are mainly determined by emissions from the rock mineral wool production. As the rock mineral wool is sourced from Knauf Insulation, the LCA is based on primary data for the rock mineral wool production. Thus, a high quality of the presented results is to be expected.

The declared results for Tektalan A2 SmartTec represent an average of the two Knauf production sites Simbach and Zalaegerszeg. The potential variation due to differences between the sites in module A1-A3 arrives at app. 10% of GWP-GHG.

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	
SVHC	Substances of Very High Concern
EC No.	European Community Number
CAS No.	Chemical Abstracts Service Number
MJ	Megajoule
kg	Kilogram
m^3	Cubic Meter
NMVOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO_2 eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared
DoP	Declaration of Performance
m^2K/W	Meter Squared Kelvin per Watt
MLC	Managed Life Cycle Content (formerly GaBi databases)
PE	Polyethylene
PET	Polyethylene Terephthalate
PU	Polyurethane
R-value	Thermal Resistance
RMW	Rock Mineral Wool
RSL	Reference Service Life
W/(mK)	Watts per Meter-Kelvin
WW	Wood Wool

References

DIN 4108-10
DIN 4108-10:2021-11 Thermal insulation and energy economy in buildings - Part 10: Application-related requirements for thermal insulation materials

DoP W4302GPCPR, W4312GPCPR
Declaration of Performance
www.dopki.com

EN 1602
EN1602: 2013 Thermal insulation products for building applications – Determination of the apparent density

EN 12086
EN 12086: 2013 Thermal insulating products for building applications –determination of water vapour transmission properties

EN 12667
EN 12667: 2001 Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance

EN 13168
EN 13168: 2012+A1:2015 Thermal insulation products for buildings - Factory made wood wool (WW) products - Specification

EN 15804
EN 15804:2012+A2:2019/AC:2021: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

EN 15941
EN 15941:2024 Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data

EN 15978
EN 15978: 2011 Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method

EN 16783
EN 16783:2024 Thermal insulation products - Environmental Product Declarations (EPD) - Product Category Rules (PCR) complementary to EN 15804 for factory made and in-situ formed products

International EPD® System
General Programme Instructions of the International EPD® System. Version 5.0.1
Product category rules (PCR): PCR 2019:14 v.2.0.1 Construction products (EN 15804+A2)
C-PCR-005 Thermal insulation products (EN 16783: 2024) Version: 2025-04-08

ISO 8301
ISO 8301:1991 Thermal insulation — Determination of steady-state thermal resistance and related properties — Heat flow meter apparatus

ISO 9001
ISO 9001:2015-09 Quality management systems - Requirements

ISO 14001
ISO 14001:2015-09 Environmental management systems - Requirements with guidance for use

ISO 14021
ISO 14021:2016 Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)

ISO 14025
DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

ISO 21930
ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services

ISO 45001
ISO 45001:2018-03 Occupational health and safety management systems - Requirements with guidance for use

ISO 50001
ISO 50001:2018-08 Energy management systems - Requirements with guidance for use

LCA for Experts 10.9
LCA for Experts 10.9: Software and database for life cycle engineering. LBP, University of Stuttgart and Sphera, 2024

MLC
Managed LCA Content (MLC), 2025.01. Software-System and Database for Life Cycle Engineering. Stuttgart, Echterdingen: Sphera, 1992-2025. Available at: https://lcadatabase.sphera.com/

***2025_06_10_i-report_EPD-creation* (I-report)**
I-report is an interactive report created with LCA FE (formerly GaBi) based on the scenario. More details about the product characteristics, plant allocation and scenario on i-report

LCA-report_KI_EPDs_Wood-wool_International_EPD-System (EPD-Report)
Calculation rules for the Life Cycle Assessment and Requirements and more details about the production on the LCA-Report

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