

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and
EN 15804:2012+A2:2019/AC:2021 for:

ISOVER U Protect Wired Mat 4.0 Alu1

50 mm, 30 mm, 40 mm, 60 mm

Version 1

Version Date: 2025/07/18

Validity: 5 years

Validity Date: 2030/07/18

EPD of multiple product, based on a
representative product



INTERNATIONAL EPD SYSTEM

The International EPD® System
Programme operator: EPD international AB
Registration number: EPD-IES-0025250:001



An EPD may be updated or depublished if conditions change. To
be find the lates version of the EPD and to confirm its validity, see
www.environdec.com.



Isover, Saint-Gobain

General information

Programme information

PROGRAMME:	The International EPD® System
ADDRESS:	EPD International AB - Box 210 60 - SE-100 31 Stockholm - Sweden
WEBSITE:	www.environdec.com
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PCR information

Product Category Rules (PCR)

CEN standard EN 15804:2012 + A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction Products, version 2.0

Complementary PCR: (c-PCR-005), 2019-12-20. Thermal insulation products (EN 16783:2017)

PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com for a list of members.

Chairs of the PCR review: Rob Rouwette (chair), Noa Meron (co-chair).

Verification

External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via EPD verification through:

- ☒ Individual EPD verification without a pre-verified LCA/EPD tool
- ☐ Individual EPD verification with a pre-verified LCA/EPD tool
- ☐ EPD process certification* without a pre-verified LCA/EPD tool
- ☐ EPD process certification* with a pre-verified LCA/EPD tool
- ☐ Fully pre-verified EPD tool

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

- ☒ EPD verification by individual verifier

Third party verifier: Dr. Andrew Norton, a.norton@renuables.co.uk

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third part verifier: ☐ Yes ☒ No

Ownership and limitation on use of EPD

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

EPDs within the same product category but published in different EPD programmes may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterization factors); and be valid at the time of comparison.

Information about EPD owner

Address and contact information of the EPD owner: SAINT-GOBAIN ISOVER G+H AG, Willstätterstraße 60, 40549 Düsseldorf

Description of the organization of the EPD owner SAINT-GOBAIN ISOVER G+H AG, Industriestraße 11, 19386 Lübz

Management system-related certification: EN ISO 9001:2015; EN ISO 14001:2015

LCA Practitioner: Heike Zehnter, SAINT-GOBAIN LCA-Team Germany, heike.zehnter@saint-gobain.com

Communication: The intended use of this EPD is for B2B communication.

Product information

Product name: ISOVER U Protect Wired Mat 4.0 Alu1, 50 mm
ISOVER U Protect Wired Mat 4.0 Alu1, 30 mm
ISOVER U Protect Wired Mat 4.0 Alu1, 40 mm
ISOVER U Protect Wired Mat 4.0 Alu1, 60 mm



Visual representation of the product:

UN CPC CODE: 37990 Non-metallic mineral products n.e.c.

(Including mineral wool, expanded mineral materials, worked mica, articles of mica, non-electrical articles of graphite or other carbon and articles of peat)

Manufacturing site(s): SAINT-GOBAIN ISOVER G+H AG, Industriestraße 11, 19386 Lübz



Product description

ISOVER U Protect Wired Mat 4.0 Alu1, 50 mm also 30 mm, 40 mm, 60 mm is a stone wool-based high-performance mineral wool with a melting point > 1000 °C and RAL quality mark of the Gütegemeinschaft Mineralwolle e. V.. Approved in accordance with the Hazardous Substances Ordinance, Chemicals Prohibition Ordinance and Regulation (EC) No. 1272/2008 Note Q. Manufactured using a patented production process without melting beads and with high resilience. ULTIMATE offers equivalent or even better performance in fire, thermal and sound insulation applications than conventional stone wool, even with a significantly reduced density, and can easily replace it in all applications.

ISOVER U Protect Wired Mat 4.0 Alu1 is quilted on the upper side (visible side) with a galvanized wire yarn on galvanized wire mesh and black aluminium laminated.

To calculate the impact of the range of commercial thicknesses between 30 mm and 60 mm, see the table "Conversion to specific thickness" in the additional information section.

For more information:

<https://www.isover-technische-isolierung.de/produkte/u-protect-wired-mat-40-alu1#documents>

Technical data/physical characteristics:

PARAMETER	VALUE / DESCRIPTION			
Quantity for 1 m ² of finished product	3,69 kg/m ²	2,37 kg/m ²	3,03 kg/m ²	4,35 kg/m ²
Thickness	50 mm	30 mm	40 mm	60 mm
Facing	Wired mat black			
Product used for installation	none			

TECHNICAL ASPECT	VALUE / DESCRIPTION				STANDARD
Thickness	50 mm	30 mm	40 mm	60 mm	
Thermal resistance	1,60 K.m ² .W ⁻¹ (temperature 10°C)				EN 12667
Thermal conductivity	0,031 W/(m.K) (temperature 10°C)				EN 12939 EN 12667
Reaction to fire	A1				EN 13501-1
Density	66 kg/m ³				

APPLICATION	VALUE / DESCRIPTION
Intended use and key functionalities	ThIBELL Thermal Insulation for Building Equipment and Industrial Installations
Expected influence on the operational aspects and impact of the building or other construction work	none
Restrictions to a type of construction or building	none
Lifespan	50 years

Content declaration

This EPD uses the **50 mm** thickness as a reference. The content declaration is representative of this thickness.

Quantity for 1 m² with 3,69 kg/m² of finished product

Product components	Mass [kg]	Post-consumer recycled material [mass - % of product]	Biogenic material [mass - % of product]	Biogenic material [kg C/DU]
Mineral materials	80 – 90 %	0 %	0 %	0,00E+00
Binder	0,5 – 2,0 %	0 %	0 %	0,00E+00
Facing	10 – 15 %	0 %	0 %	0,00E+00
Sum	100%			
Packaging materials	Mass [kg]	Mass - % [vs the product]	Biogenic material, weight [kg C/DU]	
Low-density polyethylene (LDPE) film	5,00E-02	1,4 %	0,00E+00	
Wooden Pallet	1,41E-01	3,8 %	5,78E-02	

Hazardous substances

During the life cycle of the product, one or more hazardous substances listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” have been used in a percentage higher than 0.1% of the weight of the product.

LCA Information

TYPE OF EPD	Cradle to gate with options, module C1-C4, module D and optional modules (A4–A5 + B1–B7).
DECLARED UNIT	1 m ² of product with a thermal resistance of 1,60 K.m ² .W ⁻¹ (temperature 10°C), a thickness of 50 mm, and a density of 66 kg/m ² .
SYSTEM BOUNDARIES	Cradle to gate with options, module C1-C4, module D and optional modules (A4–A5 + B1–B7).
REFERENCE SERVICE LIFE (RSL)	The Reference Service Life (RSL) of the insulation product is 50 years, provided that the product is installed correctly into the building. This 50-year value is the amount of time that we recommend our products last without refurbishment and corresponds to standard building design life.
CUT-OFF RULES	<p>In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than 5% of the whole mass and energy used, as well as the emissions to the environment occurred.</p> <p>Flows related to human activities, such as employee transport, are excluded.</p> <p>The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.</p>
ALLOCATIONS	<p>Allocation has been avoided when possible, and when not possible, a mass allocation has been applied.</p> <p>The polluter pays and the modularity principles as well have been followed.</p>
DATA QUALITY ASSESSMENT	Data quality of primary and secondary data had been judged by its precision (measured, calculated, or estimated), completeness (e.g., unreported emissions), consistency (degree of uniformity of the methodology applied), and representativeness (geographical, technological, and temporal).
GEOGRAPHICAL COVERAGE AND TIME PERIOD	<p>Scope: Europe</p> <p>Data is collected from one production site, SAINT-GOBAIN ISOVER G+H AG, Industriestraße 11, 19386 Lütz, located in Germany</p> <p>Data collected for the year 2024</p>
BACKGROUND DATA SOURCE	Databases Sphera CUP2024.2 and ecoinvent v.3.10 GWP100, EN 15804. Version: EF 3.1, February, 2023
SOFTWARE	Sphera LCA for experts (GaBi) 10

Data quality declaration

PROCESS	SOURCE TYPE	SOURCE	REFERENCE YEAR	DATA CATEGORY	SHARE OF PRIMARY DATA OF GWP-GHG RESULTS FOR A1-A3
Plant data					
Electricity	Database	Sphera 2024.2/ecoinvent 3.10	<5 years old	Primary data	0,2%
Thermal Energy	Database	Sphera 2024.2/ecoinvent 3.10	<5 years old	Primary data	46,8%
Total share of primary data					47,0%

Description of system boundaries

System boundaries (X=included. MND=module not declared)

	PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
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	GL O	GL O	DE	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU

Life cycle stages

A1-A3. Product stage

The product stage of the mineral wool products is subdivided into 3 modules A1, A2 and A3 respectively “raw material supply”, “transport” and “manufacturing”.

A1. Raw materials supply

This module includes the extraction and transformation of raw materials.

A2. Transport to the manufacturer

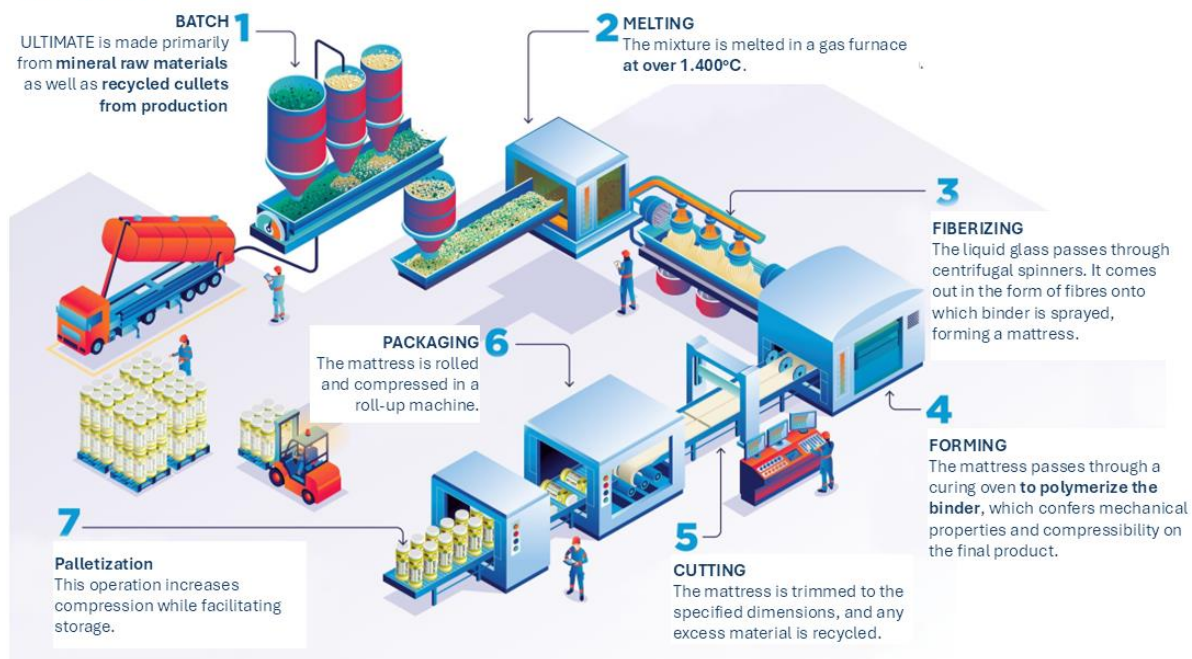
This module includes the transportation of raw materials and packaging to the manufacturing site. The modelling includes road, boat, and/or train transportation.

A3. Manufacturing

This module includes the manufacture of products (such as fusion, fiberizing, etc.) and the manufacture of packaging. The production of packaging material is considered at this stage. The processing of any waste arising from this stage is also included.

Manufacturing process flow diagram

ULTIMATE MANUFACTURING BY ISOVER



Mineral wool is made from high-temperature molten glass that is blown away using centrifugal force to form fine cotton-like fibers. Then, a binder is sprayed on the material to form it, and the product is heated in an oven. Hereafter, the product is cut to size and packed.

A4-A5. Construction process stage

The construction process is divided into 2 modules: A4, Transport to the building site, and A5, Installation in the building.

A4. Transport to the building site

This module includes transport from the production gate to the building site. Transport is calculated based on a scenario with the parameters described in the following table.

PARAMETER	VALUE / DESCRIPTION
Fuel type and consumption of vehicle or vehicle type used for transport, e.g., long-distance truck, boat, etc.	Freight truck, maximum load weight of 27 t, real load 24 t, and consumption of 0.38 liters per km
Distance	100 km by truck
Capacity utilization (including empty returns)	100% of the capacity in volume 68% of the capacity in weight 30% of empty returns
Bulk density of transported products	66 kg/m ³
Volume capacity utilization factor	1 (by default)

To adjust the effects of transport for further distances, you will find the corresponding multiplication factors in the table 'Influence of transportation to other countries' by additional information.

A5. Installation in the building

This module includes: the installation of the product, the surplus of raw materials and packaging (cradle to gate) to compensate for the loss of product during the installation, the transport and management of packaging and product waste.

Assumption:

- A loss of 2% of the product is considered during the installation
- The wooden pallet is reused 1-2 times before end-of-life
- The transport of product waste is modelled as in C2-C4.
- No additional accessory, water, or energy was considered for the installation of the insulation product.

PARAMETER	VALUE / DESCRIPTION
Waste of materials on the building site before waste processing, generated by the product's installation (specified by type)	Product: 0,07 kg/DU Pallet: 0,14 kg/DU PE film: 0,05 kg/DU
Transport of packaging waste	Recycling: 50 km
Output materials (specified by type) as results of waste processing at the building site, e.g., of collection for recycling, for energy recovery, disposal (specified by route)	Product losses: 0,06 kg/DU to recycling (100%) Pallet: 0,14 kg/DU to recycling (100%) PE film: 0,05 kg/DU to recycling (100%)
Direct emissions to ambient air, soil, and water	None

B1-B7. Use stage (excluding potential savings)

The use stage is divided into the following modules:

- **B1:** Use
- **B2:** Maintenance
- **B3:** Repair
- **B4:** Replacement
- **B5:** Refurbishment
- **B6:** Operational energy use
- **B7:** Operational water use

The product has a reference service life of 50 years. This assumes that the product will last in situ with no requirements for maintenance, repair, replacement, or refurbishment throughout this period. Therefore, it has no impact at this stage.

C1-C4. End of Life Stage

This stage includes the following modules:

- **C1: Deconstruction, demolition.** The deconstruction and/or dismantling of the product takes part of the demolition of the entire building. In our case, the energy considered for demolition is 0.045 MJ/kg.
- **C2: Transport to waste processing**
- **C3: Waste processing for recycling**
- **C4: Waste disposal**, including physical pre-treatment and site management.

Description of the scenarios and additional technical information for the end of life:

PARAMETER	VALUE/DESCRIPTION
Energy for demolition	0,045 MJ/kg diesel
Collection process specified by type	The entire product, including any facing, is collected with mixed construction waste. 5,34 kg of product
Recovery system specified by type	The product is recycled when it has reached its end-of-life phase.
Disposal specified by type	5,34 kg of product are recycled
Assumptions for scenario development (e.g., transportation)	The waste going to recycling is transported 50 km by truck from deconstruction/demolition sites to recycling plant.

D. Reuse/recovery/recycling potential

In module D, it's declared the environmental benefits and loads from reusable products, recyclable materials, or energy recovery. Module D considers:

- Inputs of secondary raw materials: recycled raw materials for product and packaging (pre- and post-consumer)
- Outputs of secondary materials: product and/or packaging sent to recycling,
- Exported energy (electric or thermal): product and/or packaging sent to incineration with energy recovery.

Environmental performance

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors based on EF 3.1. Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

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).

Disclaimer 1: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the following indicators:

- Resource use, mineral and metals [kg Sb eq.]
- Resource use, energy carriers [MJ]
- Water deprivation potential [m³ world equiv.]
- Land use [Pt]
- Human toxicity (cancer) [CTUh]
- Human toxicity(noncancer) [CTUh]
- Ecotoxicity (freshwater [CTUe]

Disclaimer 2: The impact category Ionizing radiation, human health [kBq U235 eq.] 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 material is also not measured by this indicator.

Disclaimer 3: The assumptions for the modules are in accordance with the project report (LCA study).








The following non-mandatory additional environmental indicators are not declared:

- Ecotoxicity freshwater [CTUe]
- Particulate Matter emissions [Disease incidence]
- Cancer human health effects [CTUh]
- Ionizing radiation - human health [kBq U235 eq.]
- Non-cancer human health effects [CTUh]
- Land Use [Pt].

Results refer to a functional/declared unit of 1 m² of mineral wool with thermal resistance of 1,60 K.m².W⁻¹ (temperature 10°C) for a thickness of 50 mm.











To obtain the sustainability results for all other thicknesses, please refer to the sections 'Declaration of variation' and 'Additional environmental information', where you will find a table with the conversion factors.

Environmental Impacts

		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
Environmental indicators		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Climate Change [kg CO2 eq.]	7,03E+00	2,89E-02	3,77E-01	0	0	0	0	0	0	0	0,00E+00	2,96E-02	0,00E+00	5,53E-02	-9,10E-02
	Climate Change (fossil) [kg CO2 eq.]	7,22E+00	2,84E-02	1,64E-01	0	0	0	0	0	0	0	0,00E+00	2,90E-02	0,00E+00	5,46E-02	-9,22E-02
	Climate Change (biogenic) [kg CO2 eq.]	-2,04E-01	7,83E-05	2,13E-01	0	0	0	0	0	0	0	0,00E+00	8,14E-05	0,00E+00	4,72E-04	1,22E-03
	Climate Change (land use change) [kg CO2 eq.]	7,69E-03	4,70E-04	2,08E-04	0	0	0	0	0	0	0	0,00E+00	4,74E-04	0,00E+00	3,02E-04	-5,07E-05
	Ozone depletion [kg CFC-11 eq.]	3,00E-07	2,82E-15	6,25E-09	0	0	0	0	0	0	0	0,00E+00	4,16E-15	0,00E+00	1,11E-10	-5,10E-09
	Acidification terrestrial and freshwater [Mole of H+ eq.]	2,42E-02	3,13E-05	5,60E-04	0	0	0	0	0	0	0	0,00E+00	3,79E-05	0,00E+00	3,83E-04	-2,92E-04
	Eutrophication freshwater [kg P eq.]	3,03E-05	1,19E-07	1,08E-06	0	0	0	0	0	0	0	0,00E+00	1,21E-07	0,00E+00	1,91E-07	-2,16E-06
	Eutrophication marine [kg N eq.]	4,54E-03	1,03E-05	1,14E-04	0	0	0	0	0	0	0	0,00E+00	1,36E-05	0,00E+00	1,06E-04	-4,98E-05
	Eutrophication terrestrial [Mole of N eq.]	5,28E-02	1,26E-04	1,30E-03	0	0	0	0	0	0	0	0,00E+00	1,63E-04	0,00E+00	1,12E-03	-5,42E-04
	Photochemical ozone formation - human health [kg NMVOC eq.]	1,58E-02	2,93E-05	4,06E-04	0	0	0	0	0	0	0	0,00E+00	3,76E-05	0,00E+00	3,18E-04	-6,85E-04
	Resource use, mineral and metals [kg Sb eq.] ¹	4,33E-06	2,38E-09	1,76E-07	0	0	0	0	0	0	0	0,00E+00	2,46E-09	0,00E+00	1,50E-08	-8,74E-07
	Resource use, energy carriers [MJ] ¹	9,78E+01	3,65E-01	2,25E+00	0	0	0	0	0	0	0	0,00E+00	3,72E-01	0,00E+00	7,53E-01	-3,55E+00
	Water deprivation potential [m³ world equiv.] ¹	1,95E+00	4,16E-04	4,39E-02	0	0	0	0	0	0	0	0,00E+00	4,37E-04	0,00E+00	1,22E-02	-4,27E-02









¹ The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Resources Use


Resources Use indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
 Use of renewable primary energy (PERE) [MJ] ²	1,95E+01	3,08E-02	4,08E-01	0	0	0	0	0	0	0	0,00E+00	3,20E-02	0,00E+00	1,16E-01	-7,97E-02
 Primary energy resources used as raw materials (PERM) [MJ] ²	2,12E+00	0,00E+00	-2,12E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 Total use of renewable primary energy resources (PERT) [MJ] ²	2,16E+01	3,08E-02	-1,71E+00	0	0	0	0	0	0	0	0,00E+00	3,20E-02	0,00E+00	1,16E-01	-7,97E-02
 Use of non-renewable primary energy (PENRE) [MJ] ²	9,53E+01	3,65E-01	2,20E+00	0	0	0	0	0	0	0	0,00E+00	3,72E-01	0,00E+00	7,53E-01	-3,55E+00
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ] ²	2,74E+00	0,00E+00	-2,20E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 Total use of non-renewable primary energy resources (PENRT) [MJ] ²	9,81E+01	3,65E-01	2,98E-03	0	0	0	0	0	0	0	0,00E+00	3,72E-01	0,00E+00	7,53E-01	-3,55E+00
 Use of secondary material (SM) [kg]	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 Use of renewable secondary fuels (RSF) [MJ]	4,53E-28	0,00E+00	9,05E-30	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 Use of non-renewable secondary fuels (NRSF) [MJ]	5,32E-27	0,00E+00	1,06E-28	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 Use of net fresh water (FW) [m3]	5,04E-02	3,46E-05	1,12E-03	0	0	0	0	0	0	0	0,00E+00	3,57E-05	0,00E+00	3,26E-04	-9,93E-04

² From EPD International Construction Product PCR 2.0 (Annex 3). Option B was retained to calculate the primary energy use indicators.



Waste Category & Output flows

Waste Category & Output Flows		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Hazardous waste disposed (HWD) [kg]	8,76E-02	1,18E-11	2,80E-03	0	0	0	0	0	0	0	0,00E+00	1,42E-11	0,00E+00	3,90E-04	-1,80E-03
	Non-hazardous waste disposed (NHWD) [kg]	1,66E+00	5,67E-05	1,35E-01	0	0	0	0	0	0	0	0,00E+00	6,07E-05	0,00E+00	3,72E+00	-2,09E-02
	Radioactive waste disposed (RWD) [kg]	2,26E-04	4,72E-07	4,94E-06	0	0	0	0	0	0	0	0,00E+00	6,77E-07	0,00E+00	6,87E-06	-2,21E-06
	Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	2,40E-02	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Materials for Recycling (MFR) [kg]	0,00E+00	0,00E+00	1,72E-01	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Exported electrical energy (EEE) [MJ]	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Exported thermal energy (EET) [MJ]	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional voluntary indicators from EN 15804

		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
Environmental indicators		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	GWP-GHG [kg CO2 eq.] ³	7,21E+00	2,87E-02	1,64E-01	0	0	0	0	0	0	0	0,00E+00	2,93E-02	0,00E+00	5,47E-02	-8,88E-02

Information on biogenic carbon content

		PRODUCT STAGE
Biogenic Carbon Content		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0,00E+00
	Biogenic carbon content in packaging [kg]	5,78E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

Regarding packaging, biogenic carbon is quantified due to wooden pallets production.

³ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Declaration of variation

Variation between products

According to PCR 2.0, since this EPD is multi-product, the variation of impact between products shall be declared.

The following table provides this variation of impact between

- reference and minimum (if the minimum is not the reference product).
- reference and the maximum (if the maximum is not the reference product).
- the minimum and the maximum.

DEVIATION (A1-A3)	BETWEEN 50 mm REFERENCE AND 30 mm	BETWEEN 50 mm REFERENCE AND 60 mm	BETWEEN 30 mm MINIMUM AND 60 mm MAXIMUM
GWP-GHG	-22,6%	+11,4%	+43,8%

Additional environmental information:

Conversion to specific thicknesses

This EPD® includes the range of products with different thicknesses between 30 mm and 60 mm. A multiplication factor can be applied to obtain the environmental performance of every thickness. All the results of this EPD® refer to the reference thickness of 50 mm with a value thermal conductivity of 0,031 W/(m·K) (temperature 10°C).

Technical data and physical characteristics for other material thicknesses on page 2 and 3.

To obtain the environmental performance associated with every specific thickness, the results expressed in this EPD® must be multiplied by its corresponding multiplication factor. The calculation of the conversion factor is based on the GWP-GHG indicator for A1-A3.

ISOVER U PROTECT WIRED MAT 4.0 ALU1

Thickness [mm]	50	30	40	60
Thermal resistance	1,60 K.m ² .W ⁻¹ (temperature 10°C)			
	A1-A3 representative product	A1-A3 conversion factors		
GWP-GHG	7,21E+00	0,77	0,89	1,11
Climate Change [kg CO ₂ eq.]	7,03E+00	0,77	0,88	1,12
Climate Change (fossil) [kg CO ₂ eq.]	7,22E+00	0,77	0,89	1,11
Climate Change (biogenic) [kg CO ₂ eq.]	-2,04E-01	1,01	1,01	0,99
Climate Change (land use change) [kg CO ₂ eq.]	7,69E-03	0,77	0,88	1,12
Ozone depletion [kg CFC-11 eq.]	3,00E-07	0,61	0,81	1,19
Acidification terrestrial and freshwater [Mole of H ⁺ eq.]	2,42E-02	0,84	0,92	1,08
Eutrophication freshwater [kg P eq.]	3,03E-05	1,03	1,02	0,99
Eutrophication marine [kg N eq.]	4,54E-03	0,84	0,92	1,08
Eutrophication terrestrial [Mole of N eq.]	5,28E-02	0,82	0,91	1,09
Photochemical ozone formation - human health [kg NMVOC eq.]	1,58E-02	0,83	0,91	1,09
Resource use, mineral and metals [kg Sb eq.]	4,33E-06	0,79	0,90	1,10
Resource use, energy carriers [MJ]	9,78E+01	0,74	0,87	1,13
Water deprivation potential [m ³ world equiv.]	1,95E+00	0,76	0,88	1,12
Total use of renewable primary energy resources (PERT) [MJ]	2,16E+01	0,76	0,88	1,12
Total use of non-renewable primary energy resources (PENRT) [MJ]	9,81E+01	0,74	0,87	1,13

Electricity information

The SAINT-GOBAIN ISOVER G+H AG factory based in Lüz uses electricity with Guarantee of Origin certificate (GO).

Hence, the electricity mix considered for the manufacturing of the studied product is modelled according to the electricity mix described in the Guarantee of Origin certificate. The amount of electricity purchased with GO covers 100% of the electricity consumption on the manufacturing site.

TYPE OF INFORMATION	DESCRIPTION
Location	Representative of the Guarantee of Origin purchased by Saint-Gobain
Share of electricity covered by the Guarantee of Origin	100% of the energy consumption is covered by the GO
Energy sources for electricity	Share of energy sources Hydro 100% 2% transmission losses
Dataset version	Sphera CUP2024.2
Source	Guarantee of Origin certificate: Ökostrom Zertifikat Pfalzwerke
GWP-GHG CO ₂ eq.	0,0172 kg of CO ₂ eq./kWh

An EPD is valid for 5 years. Therefore, the GO will be prolonged continuously to be valid for the whole validity of the EPD. If not prolonged, the EPD will be updated.

Influence of transportation to other countries

The result of stage A4 (transportation of product) in the table of this EPD refers to transportation of 100 km. This product might also be delivered to the countries in the table below. To adapt the impact of transportation in the A4 column, the results expressed in this EPD must be multiplied by a corresponding multiplication factor below.

Location	Average Distance [km]	Multiplication Factor
Europe (EPD reference value)	100	1
Germany	350	3,5
Austria	816	8,2
Belgium	450	4,5
Czech Republic	484	4,8
Denmark	631	6,3
England	1013	10,1
Finland	1973	19,7
France	726	7,3
Hungary	1148	11,5
Ireland	1495	14,9
Italy	1654	16,6
Netherlands	360	3,6
Norway	1039	10,4
Poland	948	9,5
Romania	1484	14,8
Slovakia	854	8,5
Slovenia	1000	10,0
Spain	2031	20,3
Switzerland	688	6,9
Turkey	2803	28,0

Abbreviation

DU	Declared unit
EPD	Environmental Product Declaration
eq.	equivalents
FU	Functional unit
g	gram
GJ	Giga Joules (as Net Calorific Value)
kg	kilogram
kWh	kilowatt-hour
L	liter
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory Analysis
LCIA	Life Cycle Impact Assessment
MJ	Mega Joules (as Net Calorific Value)
m ² ·K/W	kilowatt per square meter
PCR	Product Category Rules
RSL	Reference Service Life (in years)
ton	metric ton
W/(m.K)	Watts per meter-Kelvin
GWP	Global warming potential
GWP-GHG	Global warming potential – Greenhouse Gas
GHG	Greenhouse gas
GO	Guaranty of origin
AIB	Association of issuing bodies
IOBC	Instantaneous Oxidation of Biogenic Carbon
EF	Environmental footprint

References

1. ISO 14040:2006 Environmental Management - Life Cycle Assessment - Principles and framework.
2. ISO 14044:2006 Environmental Management - Life Cycle Assessment - Requirements and guidelines.
3. ISO 14025:2006 Environmental labels and Declarations - Type III Environmental Declarations - Principles and procedures.
4. EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
5. EN 15941 Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data
6. EPD International. General Program Instructions (GPI) for the International EPD® System (version 5.0.1) <http://www.environdec.com/>.
7. European Chemical Agency, Candidate List of substances of very high concern for Authorization. <https://echa.europa.eu/candidate-list-table>.
8. Product Environmental Footprint Category Rules (PEFCRs) for products in buildings (2019).
9. The International EPD System PCR 2019:14 Construction products and Construction services. Version 2.0
10. EN 16783 Thermal insulation products - Environmental Product Declarations (EPD) - Product Category Rules (PCR) complementary to EN 15804 for factory made and in-situ formed products
11. ISOVER U Protect Wired Mat 4.0 Alu1 - product Information: <https://www.isover-technische-isolierung.de/produkte/u-protect-wired-mat-40-alu1>
12. ISOVER U Protect Wired Mat 4.0 Alu1 - technical documents: <https://www.isover-technische-isolierung.de/documents/drahtnetzmatte/u-protect-wired-mat-4.0-alu1.pdf>

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and
EN 15804:2012+A2:2019/AC:2021 for:

ISOVER U Protect Wired Mat 4.0 Alu1

75 mm, 70 mm, 80 mm, 90 mm,
100 mm, 120 mm

Version 1

Version Date: 2025/07/18

Validity: 5 years

Validity Date: 2030/07/18

**EPD of multiple products, based on a
representative product**



INTERNATIONAL EPD SYSTEM

The International EPD® System
Programme operator: EPD international AB
Registration number: EPD-IES-0025249:001



An EPD may be updated or depublished if conditions change. To
be find the lates version of the EPD and to confirm its validity, see
www.environdec.com.



Saint-Gobain ISOVER

General information

Programme information

PROGRAMME:	The International EPD® System
ADDRESS:	EPD International AB - Box 210 60 - SE-100 31 Stockholm - Sweden
WEBSITE:	www.environdec.com
E-MAIL:	support@environdec.com

PCR information

Product Category Rules (PCR)

CEN standard EN 15804:2012 + A2:2019/AC:2021 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction Products, version 2.0

Complementary PCR: (c-PCR-005), 2019-12-20. Thermal insulation products (EN 16783:2017)

PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com for a list of members.

Chairs of the PCR review: Rob Rouwette (chair), Noa Meron (co-chair).

Verification

External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via EPD verification through:

- ☒ Individual EPD verification without a pre-verified LCA/EPD tool
- ☐ Individual EPD verification with a pre-verified LCA/EPD tool
- ☐ EPD process certification* without a pre-verified LCA/EPD tool
- ☐ EPD process certification* with a pre-verified LCA/EPD tool
- ☐ Fully pre-verified EPD tool

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

- ☒ EPD verification by individual verifier

Third party verifier: Dr. Andrew Norton, a.norton@renuables.co.uk

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third part verifier: ☐ Yes ☒ No

Ownership and limitation on use of EPD

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

EPDs within the same product category but published in different EPD programmes may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterization factors); and be valid at the time of comparison.

Information about EPD owner

Address and contact information of the EPD owner: SAINT-GOBAIN ISOVER G+H AG, Willstätterstraße 60, 40549 Düsseldorf

Description of the organization of the EPD owner: SAINT-GOBAIN ISOVER G+H AG, Industriestraße 11, 19386 Lüz

Management system-related certification: EN ISO 9001:2015; EN ISO 14001:2015

LCA Practitioner: Heike Zehnter, SAINT-GOBAIN LCA-Team Germany, heike.zehnter@saint-gobain.com

Communication: The intended use of this EPD is for B2B communication.

Product information

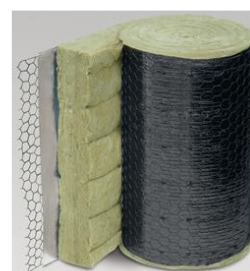
Product name: ISOVER U Protect Wired Mat 4.0 Alu1, 75 mm
ISOVER U Protect Wired Mat 4.0 Alu1, 70 mm
ISOVER U Protect Wired Mat 4.0 Alu1, 80 mm
ISOVER U Protect Wired Mat 4.0 Alu1, 90 mm
ISOVER U Protect Wired Mat 4.0 Alu1, 100 mm
ISOVER U Protect Wired Mat 4.0 Alu1, 120 mm

Visual representation of the product:

UN CPC CODE: 37990 Non-metallic mineral products n.e.c.

(Including mineral wool, expanded mineral materials, worked mica, articles of mica, non-electrical articles of graphite or other carbon and articles of peat)

Manufacturing site(s): SAINT-GOBAIN ISOVER G+H AG, Industriestraße 11, 19386 Lüz



Product description

ISOVER U Protect Wired Mat 4.0 Alu1, 75 mm also 70 mm, 80 mm, 90 mm, 100 mm, 120 mm are a stone wool-based high-performance mineral wool with a melting point > 1000 °C and RAL quality mark of the Gütegemeinschaft Mineralwolle e. V.. Approved in accordance with the Hazardous Substances Ordinance, Chemicals Prohibition Ordinance and Regulation (EC) No. 1272/2008 Note Q. Manufactured using a patented production process without melting beads and with high resilience. ULTIMATE offers equivalent or even better performance in fire, thermal and sound insulation applications than conventional stone wool, even with a significantly reduced density, and can easily replace it in all applications.

ISOVER U Protect Wired Mat 4.0 Alu1 is quilted on the upper side (visible side) with a galvanized wire yarn on galvanized wire mesh and black aluminium laminated.

To calculate the impact of the range of commercial thicknesses between 70 mm and 120 mm, see the table "Conversion to specific thickness" in the additional information section.

For more information:

<https://www.isover-technische-isolierung.de/produkte/u-protect-wired-mat-40-alu1#documents>

Technical data/physical characteristics:

PARAMETER	VALUE / DESCRIPTION					
Quantity for 1 m ² of finished product	5,34 kg/m ²	5,01 kg/m ²	5,67 kg/m ²	6,33 kg/m ²	6,99 kg/m ²	8,31 kg/m ²
Thickness	75 mm	70 mm	80 mm	90 mm	100 mm	120 mm
Facing	Wired mat black					
Product used for installation	none					

TECHNICAL ASPECT	VALUE / DESCRIPTION						STANDARD
Thickness	75 mm	70 mm	80 mm	90 mm	100 mm	120 mm	
Thermal resistance	1,60 K.m ² .W ⁻¹ (temperature 10°C)						EN 12667
Thermal conductivity	0,031 W/(m.K) (temperature 10°C)						EN 12939 EN 12667
Reaction to fire	A1						EN 13501-1
Density	66 kg/m ³						

APPLICATION	VALUE / DESCRIPTION
Intended use and key functionalities	ThIBELL Thermal Insulation for Building Equipment and Industrial Installations
Expected influence on the operational aspects and impact of the building or other construction work	none
Restrictions to a type of construction or building	none
Lifespan	50 years

Content declaration

This EPD uses the **75 mm** thickness as a reference. The content declaration is representative of this thickness.

Quantity for 1 m² with 5,934 kg/m² of finished product

Product components	Mass [kg]	Post-consumer recycled material [mass - % of product]	Biogenic material [mass - % of product]	Biogenic material [kg C/DU]
Mineral materials	85 – 95 %	0 %	0 %	0,00E+00
Binder	0,5 – 2,0 %	0 %	0 %	0,00E+00
Facing	5 – 12 %	0 %	0 %	0,00E+00
Sum	100%			
Packaging materials	Mass [kg]	Mass - % [vs the product]	Biogenic material, weight [kg C/DU]	
Low-density polyethylene (LDPE) film	5,00E-02	1,4 %	0,00E+00	
Wooden Pallet	1,41E-01	3,8 %	5,78E-02	

Hazardous substances

During the life cycle of the product, one or more hazardous substances listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” have been used in a percentage higher than 0.1% of the weight of the product.

LCA Information

TYPE OF EPD	Cradle to gate with options, module C1-C4, module D and optional modules (A4–A5 + B1–B7).
DECLARED UNIT	1 m ² of product with a thermal resistance of 1,60 K.m ² .W ⁻¹ (temperature 10°C), a thickness of 75 mm, and a density of 66 kg/m ² .
SYSTEM BOUNDARIES	Cradle to gate with options, module C1-C4, module D and optional modules (A4–A5 + B1–B7).
REFERENCE SERVICE LIFE (RSL)	The Reference Service Life (RSL) of the insulation product is 50 years, provided that the product is installed correctly into the building. This 50-year value is the amount of time that we recommend our products last without refurbishment and corresponds to standard building design life.
CUT-OFF RULES	<p>In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than 5% of the whole mass and energy used, as well as the emissions to the environment occurred.</p> <p>Flows related to human activities, such as employee transport, are excluded.</p> <p>The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.</p>
ALLOCATIONS	<p>Allocation has been avoided when possible, and when not possible, a mass allocation has been applied.</p> <p>The polluter pays and the modularity principles as well have been followed.</p>
DATA QUALITY ASSESSMENT	Data quality of primary and secondary data had been judged by its precision (measured, calculated, or estimated), completeness (e.g., unreported emissions), consistency (degree of uniformity of the methodology applied), and representativeness (geographical, technological, and temporal).
GEOGRAPHICAL COVERAGE AND TIME PERIOD	<p>Scope: Europe</p> <p>Data is collected from one production site, SAINT-GOBAIN ISOVER G+H AG, Industriestraße 11, 19386 Lübz, located in Germany</p> <p>Data collected for the year 2024</p>
BACKGROUND DATA SOURCE	Databases Sphera CUP2024.2 and ecoinvent v.3.10 GWP100, EN 15804. Version: EF 3.1, February, 2023
SOFTWARE	Sphera LCA for experts (GaBi) 10

Data quality declaration

PROCESS	SOURCE TYPE	SOURCE	REFERENCE YEAR	DATA CATEGORY	SHARE OF PRIMARY DATA OF GWP-GHG RESULTS FOR A1-A3
Plant data					
Electricity	Database	Sphera 2024.2/ecoinvent 3.10	<5 years old	Primary data	0,3%
Thermal Energy	Database	Sphera 2024.2/ecoinvent 3.10	<5 years old	Primary data	54,5%
Total share of primary data					54,8%

Description of system boundaries

System boundaries (X=included. MND=module not declared)

	PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
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	GL O	GL O	DE	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU

Life cycle stages

A1-A3. Product stage

The product stage of the mineral wool products is subdivided into 3 modules A1, A2 and A3 respectively “raw material supply”, “transport” and “manufacturing”.

A1. Raw materials supply

This module includes the extraction and transformation of raw materials.

A2. Transport to the manufacturer

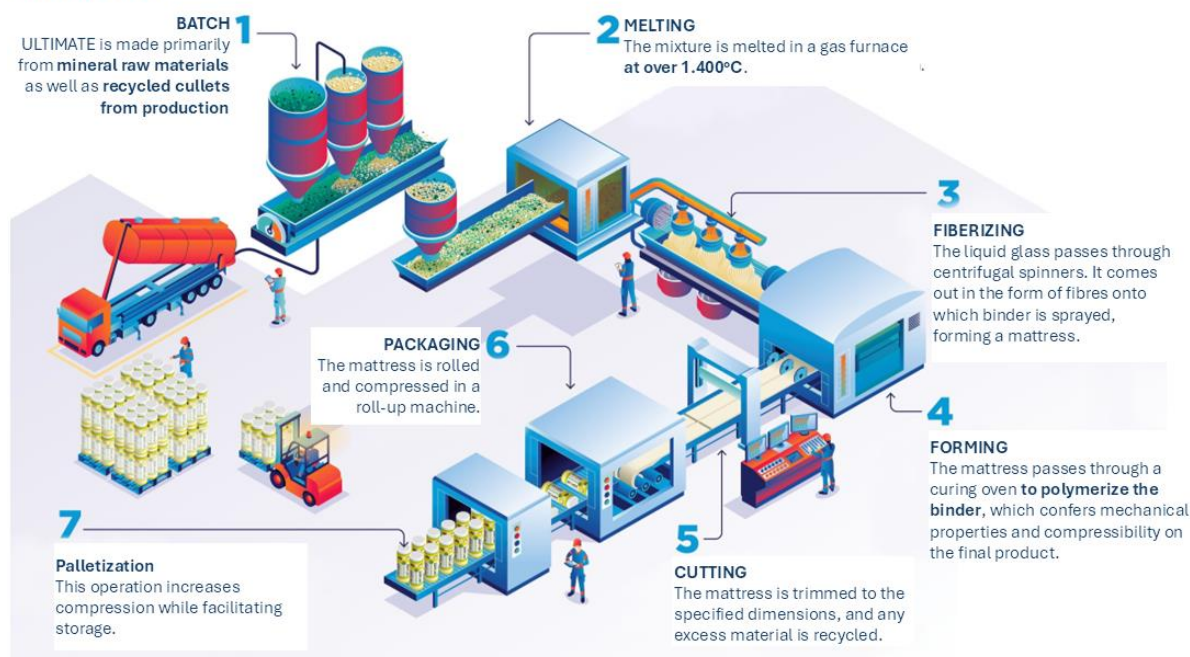
This module includes the transportation of raw materials and packaging to the manufacturing site. The modelling includes road, boat, and/or train transportation.

A3. Manufacturing

This module includes the manufacture of products (such as fusion, fiberizing, etc.) and the manufacture of packaging. The production of packaging material is considered at this stage. The processing of any waste arising from this stage is also included.

Manufacturing process flow diagram

ULTIMATE MANUFACTURING BY ISOVER



Mineral wool is made from high-temperature molten glass that is blown away using centrifugal force to form fine cotton-like fibers. Then, a binder is sprayed on the material to form it, and the product is heated in an oven. Hereafter, the product is cut to size and packed.

A4-A5. Construction process stage

The construction process is divided into 2 modules: A4, Transport to the building site, and A5, Installation in the building.

A4. Transport to the building site

This module includes transport from the production gate to the building site. Transport is calculated based on a scenario with the parameters described in the following table.

PARAMETER	VALUE / DESCRIPTION
Fuel type and consumption of vehicle or vehicle type used for transport, e.g., long-distance truck, boat, etc.	Freight truck, maximum load weight of 27 t, real load 24 t, and consumption of 0.38 liters per km
Distance	100 km by truck
Capacity utilization (including empty returns)	100% of the capacity in volume 68% of the capacity in weight 30% of empty returns
Bulk density of transported products	66 kg/m ³
Volume capacity utilization factor	1 (by default)

To adjust the effects of transport for further distances, you will find the corresponding multiplication factors in the table 'Influence of transportation to other countries' by additional information.

A5. Installation in the building

This module includes: the installation of the product, the surplus of raw materials and packaging (cradle to gate) to compensate for the loss of product during the installation, the transport and management of packaging and product waste.

Assumption:

- A loss of 2% of the product is considered during the installation
- The wooden pallet is reused 1-2 times before end-of-life
- The transport of product waste is modelled as in C2-C4.
- No additional accessory, water, or energy was considered for the installation of the insulation product.

PARAMETER	VALUE / DESCRIPTION
Waste of materials on the building site before waste processing, generated by the product's installation (specified by type)	Product: 0,07 kg/DU Pallet: 0,14 kg/DU PE film: 0,05 kg/DU
Transport of packaging waste	Recycling: 50 km
Output materials (specified by type) as results of waste processing at the building site, e.g., of collection for recycling, for energy recovery, disposal (specified by route)	Product losses: 0,06 kg/DU to recycling (100%) Pallet: 0,14 kg/DU to recycling (100%) PE film: 0,05 kg/DU to recycling (100%)
Direct emissions to ambient air, soil, and water	None

B1-B7. Use stage (excluding potential savings)

The use stage is divided into the following modules:

- **B1:** Use
- **B2:** Maintenance
- **B3:** Repair
- **B4:** Replacement
- **B5:** Refurbishment
- **B6:** Operational energy use
- **B7:** Operational water use

The product has a reference service life of 50 years. This assumes that the product will last in situ with no requirements for maintenance, repair, replacement, or refurbishment throughout this period. Therefore, it has no impact at this stage.

C1-C4. End of Life Stage

This stage includes the following modules:

- **C1: Deconstruction, demolition.** The deconstruction and/or dismantling of the product takes part of the demolition of the entire building. In our case, the energy considered for demolition is 0.045 MJ/kg.
- **C2: Transport to waste processing**
- **C3: Waste processing for recycling**
- **C4: Waste disposal**, including physical pre-treatment and site management.

Description of the scenarios and additional technical information for the end of life:

PARAMETER	VALUE/DESCRIPTION
Energy for demolition	0,045 MJ/kg diesel
Collection process specified by type	The entire product, including any facing, is collected with mixed construction waste.
Recovery system specified by type	The product is recycled when it has reached its end-of-life phase.
Disposal specified by type	3,69 kg of product are recycled
Assumptions for scenario development (e.g., transportation)	The waste going to recycling is transported 50 km by truck from deconstruction/demolition sites to recycling plant.

D. Reuse/recovery/recycling potential

In module D, it's declared the environmental benefits and loads from reusable products, recyclable materials, or energy recovery. Module D considers:

- Inputs of secondary raw materials: recycled raw materials for product and packaging (pre- and post-consumer)
- Outputs of secondary materials: product and/or packaging sent to recycling,
- Exported energy (electric or thermal): product and/or packaging sent to incineration with energy recovery.

Environmental performance

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors based on EF 3.1. Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

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).

Disclaimer 1: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the following indicators:

- Resource use, mineral and metals [kg Sb eq.]
- Resource use, energy carriers [MJ]
- Water deprivation potential [m³ world equiv.]
- Land use [Pt]
- Human toxicity (cancer) [CTUh]
- Human toxicity(noncancer) [CTUh]
- Ecotoxicity (freshwater [CTUe]

Disclaimer 2: The impact category Ionizing radiation, human health [kBq U235 eq.] 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 material is also not measured by this indicator.

Disclaimer 3: The assumptions for the modules are in accordance with the project report (LCA study).








The following non-mandatory additional environmental indicators are not declared:

- Ecotoxicity freshwater [CTUe]
- Particulate Matter emissions [Disease incidence]
- Cancer human health effects [CTUh]
- Ionizing radiation - human health [kBq U235 eq.]
- Non-cancer human health effects [CTUh]
- Land Use [Pt].

Results refer to a functional/declared unit of 1 m² of mineral wool with thermal resistance of 1,60 K.m².W⁻¹ (temperature 10°C) for a thickness of 75 mm.











To obtain the sustainability results for all other thicknesses, please refer to the sections 'Declaration of variation' and 'Additional environmental information', where you will find a table with the conversion factors.

Environmental Impacts

		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
Environmental indicators		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Climate Change [kg CO2 eq.]	9,07E+00	4,12E-02	4,21E-01	0	0	0	0	0	0	0	0,00E+00	4,28E-02	2,22E-01	0,00E+00	-1,92E+00
	Climate Change (fossil) [kg CO2 eq.]	9,27E+00	4,04E-02	2,08E-01	0	0	0	0	0	0	0	0,00E+00	4,20E-02	2,21E-01	0,00E+00	-1,92E+00
	Climate Change (biogenic) [kg CO2 eq.]	-2,02E-01	1,12E-04	2,13E-01	0	0	0	0	0	0	0	0,00E+00	1,18E-04	1,54E-04	0,00E+00	2,64E-03
	Climate Change (land use change) [kg CO2 eq.]	9,91E-03	6,69E-04	2,56E-04	0	0	0	0	0	0	0	0,00E+00	6,86E-04	2,81E-04	0,00E+00	-5,89E-03
	Ozone depletion [kg CFC-11 eq.]	4,46E-07	4,01E-15	9,24E-09	0	0	0	0	0	0	0	0,00E+00	6,02E-15	3,61E-09	0,00E+00	-5,09E-09
	Acidification terrestrial and freshwater [Mole of H+ eq.]	2,91E-02	4,47E-05	6,81E-04	0	0	0	0	0	0	0	0,00E+00	5,48E-05	1,41E-03	0,00E+00	-1,70E-02
	Eutrophication freshwater [kg P eq.]	2,94E-05	1,70E-07	1,11E-06	0	0	0	0	0	0	0	0,00E+00	1,74E-07	2,52E-06	0,00E+00	2,91E-06
	Eutrophication marine [kg N eq.]	5,47E-03	1,47E-05	1,41E-04	0	0	0	0	0	0	0	0,00E+00	1,97E-05	5,49E-04	0,00E+00	-3,54E-03
	Eutrophication terrestrial [Mole of N eq.]	6,47E-02	1,80E-04	1,64E-03	0	0	0	0	0	0	0	0,00E+00	2,35E-04	6,00E-03	0,00E+00	-3,88E-02
	Photochemical ozone formation - human health [kg NMVOC eq.]	1,93E-02	4,17E-05	5,07E-04	0	0	0	0	0	0	0	0,00E+00	5,44E-05	1,91E-03	0,00E+00	-1,09E-02
	Resource use, mineral and metals [kg Sb eq.] ¹	5,45E-06	3,39E-09	2,24E-07	0	0	0	0	0	0	0	0,00E+00	3,56E-09	1,27E-06	0,00E+00	7,68E-06
	Resource use, energy carriers [MJ] ¹	1,30E+02	5,20E-01	2,94E+00	0	0	0	0	0	0	0	0,00E+00	5,38E-01	3,12E+00	0,00E+00	-1,45E+01
	Water deprivation potential [m³ world equiv.] ¹	2,55E+00	5,93E-04	5,65E-02	0	0	0	0	0	0	0	0,00E+00	6,32E-04	5,27E-02	0,00E+00	-2,99E-01









¹ The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Resources Use


Resources Use indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
 Use of renewable primary energy (PERE) [MJ] ²	2,59E+01	4,39E-02	5,36E-01	0	0	0	0	0	0	0	0,00E+00	4,63E-02	8,25E-02	0,00E+00	1,24E-01
 Primary energy resources used as raw materials (PERM) [MJ] ²	2,12E+00	0,00E+00	-2,12E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 Total use of renewable primary energy resources (PERT) [MJ] ²	2,80E+01	4,39E-02	-1,58E+00	0	0	0	0	0	0	0	0,00E+00	4,63E-02	8,25E-02	0,00E+00	1,24E-01
 Use of non-renewable primary energy (PENRE) [MJ] ²	1,27E+02	5,20E-01	2,89E+00	0	0	0	0	0	0	0	0,00E+00	5,38E-01	3,12E+00	0,00E+00	-1,49E+01
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ] ²	3,00E+00	0,00E+00	-2,20E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 Total use of non-renewable primary energy resources (PENRT) [MJ] ²	1,30E+02	5,20E-01	6,94E-01	0	0	0	0	0	0	0	0,00E+00	5,38E-01	3,12E+00	0,00E+00	-1,49E+01
 Use of secondary material (SM) [kg]	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
 Use of renewable secondary fuels (RSF) [MJ]	6,79E-28	0,00E+00	1,36E-29	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-6,85E-28
 Use of non-renewable secondary fuels (NRSF) [MJ]	7,97E-27	0,00E+00	1,59E-28	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-8,05E-27
 Use of net fresh water (FW) [m3]	6,44E-02	4,94E-05	1,42E-03	0	0	0	0	0	0	0	0,00E+00	5,16E-05	1,23E-03	0,00E+00	-1,11E-02

² From EPD International Construction Product PCR 2.0 (Annex 3). Option B was retained to calculate the primary energy use indicators.



Waste Category & Output flows

Waste Category & Output Flows		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Hazardous waste disposed (HWD) [kg]	1,15E-01	1,68E-11	3,46E-03	0	0	0	0	0	0	0	0,00E+00	2,06E-11	6,61E-03	0,00E+00	1,53E-02
	Non-hazardous waste disposed (NHWD) [kg]	2,14E+00	8,08E-05	1,72E-01	0	0	0	0	0	0	0	0,00E+00	8,78E-05	5,10E+00	0,00E+00	4,07E-01
	Radioactive waste disposed (RWD) [kg]	2,45E-04	6,72E-07	5,23E-06	0	0	0	0	0	0	0	0,00E+00	9,80E-07	1,29E-06	0,00E+00	4,33E-04
	Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	2,40E-02	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Materials for Recycling (MFR) [kg]	0,00E+00	0,00E+00	2,79E-01	0	0	0	0	0	0	0	0,00E+00	0,00E+00	5,34E+00	0,00E+00	0,00E+00
	Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Exported electrical energy (EEE) [MJ]	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Exported thermal energy (EET) [MJ]	0,00E+00	0,00E+00	0,00E+00	0	0	0	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional voluntary indicators from EN 15804

		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE CYCLE
Environmental indicators		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	GWP-GHG [kg CO2 eq.] ³	9,27E+00	4,09E-02	2,09E-01	0	0	0	0	0	0	0	0,00E+00	4,24E-02	2,20E-01	0,00E+00	-1,97E+00

Information on biogenic carbon content

		PRODUCT STAGE
Biogenic Carbon Content		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0,00E+00
	Biogenic carbon content in packaging [kg]	5,78E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

Regarding packaging, biogenic carbon is quantified due to wooden pallets production.

³ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Declaration of variation

Variation between products

According to PCR 2.0, since this EPD is multi-product, the variation of impact between products shall be declared.

The following table provides this variation of impact between

- reference and minimum (if the minimum is not the reference product).
- reference and the maximum (if the maximum is not the reference product).
- the minimum and the maximum.

DEVIATION (A1-A3)	BETWEEN 75 mm REFERENCE AND 70 mm	BETWEEN 75 mm REFERENCE AND 120 mm	BETWEEN 70 mm MINIMUM AND 120 mm MAXIMUM
GWP-GHG	-4,5%	+39,7%	+46,3%

Additional environmental information:

Conversion to specific thicknesses

This EPD® includes the range of products with different thicknesses between 70 mm and 120 mm. A multiplication factor can be applied to obtain the environmental performance of every thickness. All the results of this EPD® refer to the reference thickness of 75 mm with a value thermal conductivity of 0,031 W/(m·K) (temperature 10°C).

Technical data and physical characteristics for other material thicknesses on page 2 and 3.

To obtain the environmental performance associated with every specific thickness, the results expressed in this EPD® must be multiplied by its corresponding multiplication factor. The calculation of the conversion factor is based on the GWP-GHG indicator for A1-A3.

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Thickness [mm]	75	70	80	90	100	120
Thermal resistance	1,60 K.m ² .W ⁻¹ (temperature 10°C)					
	A1-A3 representative product	A1-A3 conversion factors				
GWP-GHG	9,27E+00	0,96	1,04	1,13	1,22	1,40
Climate Change [kg CO ₂ eq.]	9,07E+00	0,96	1,05	1,14	1,23	1,41
Climate Change (fossil) [kg CO ₂ eq.]	9,27E+00	0,95	1,04	1,13	1,22	1,40
Climate Change (biogenic) [kg CO ₂ eq.]	-2,02E-01	1,00	1,00	0,99	0,99	0,97
Climate Change (land use change) [kg CO ₂ eq.]	9,91E-03	0,96	1,04	1,13	1,22	1,40
Ozone depletion [kg CFC-11 eq.]	4,46E-07	0,93	1,07	1,20	1,33	1,59
Acidification terrestrial and freshwater [Mole of H ⁺ eq.]	2,91E-02	0,97	1,04	1,10	1,17	1,31
Eutrophication freshwater [kg P eq.]	2,94E-05	1,01	0,99	0,98	0,96	0,94
Eutrophication marine [kg N eq.]	5,47E-03	0,97	1,03	1,10	1,17	1,30
Eutrophication terrestrial [Mole of N eq.]	6,47E-02	0,96	1,04	1,11	1,18	1,33
Photochemical ozone formation - human health [kg NMVOC eq.]	1,93E-02	0,97	1,03	1,11	1,18	1,32
Resource use, mineral and metals [kg Sb eq.]	5,45E-06	0,96	1,04	1,12	1,21	1,37
Resource use, energy carriers [MJ]	1,30E+02	0,95	1,05	1,15	1,25	1,44
Water deprivation potential [m ³ world equiv.]	2,55E+00	0,95	1,04	1,14	1,23	1,41
Total use of renewable primary energy resources (PERT) [MJ]	2,80E+01	0,95	1,05	1,14	1,23	1,41
Total use of non-renewable primary energy resources (PENRT) [MJ]	1,30E+02	0,95	1,05	1,15	1,25	1,44

Electricity information

The SAINT-GOBAIN ISOVER G+H AG factory based in Lüz uses electricity with Guarantee of Origin certificate (GO).

Hence, the electricity mix considered for the manufacturing of the studied product is modelled according to the electricity mix described in the Guarantee of Origin certificate. The amount of electricity purchased with GO covers 100% of the electricity consumption on the manufacturing site.

TYPE OF INFORMATION	DESCRIPTION
Location	Representative of the Guarantee of Origin purchased by Saint-Gobain
Share of electricity covered by the Guarantee of Origin	100% of the energy consumption is covered by the GO
Energy sources for electricity	Share of energy sources Hydro 100% 2% transmission losses
Dataset version	Sphera CUP2024.2
Source	Guarantee of Origin certificate: Ökostrom Zertifikat Pfalzwerke
GWP-GHG CO ₂ eq.	0,0172 kg of CO ₂ eq./kWh

An EPD is valid for 5 years. Therefore, the GO will be prolonged continuously to be valid for the whole validity of the EPD. If not prolonged, the EPD will be updated.

Influence of transportation to other countries

The result of stage A4 (transportation of product) in the table of this EPD refers to transportation of 100 km. This product might also be delivered to the countries in the table below. To adapt the impact of transportation in the A4 column, the results expressed in this EPD must be multiplied by a corresponding multiplication factor below.

Location	Average Distance [km]	Multiplication Factor
Europe (EPD reference value)	100	1
Germany	350	3,5
Austria	816	8,2
Belgium	450	4,5
Czech Republic	484	4,8
Denmark	631	6,3
England	1013	10,1
Finland	1973	19,7
France	726	7,3
Hungary	1148	11,5
Ireland	1495	14,9
Italy	1654	16,6
Netherlands	360	3,6
Norway	1039	10,4
Poland	948	9,5
Romania	1484	14,8
Slovakia	854	8,5
Slovenia	1000	10,0
Spain	2031	20,3
Switzerland	688	6,9
Turkey	2803	28,0

Abbreviation

DU	Declared unit
EPD	Environmental Product Declaration
eq.	equivalents
FU	Functional unit
g	gram
GJ	Giga Joules (as Net Calorific Value)
kg	kilogram
kWh	kilowatt-hour
L	liter
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory Analysis
LCIA	Life Cycle Impact Assessment
MJ	Mega Joules (as Net Calorific Value)
m ² ·K/W	kilowatt per square meter
PCR	Product Category Rules
RSL	Reference Service Life (in years)
ton	metric ton
W/(m.K)	Watts per meter-Kelvin
GWP	Global warming potential
GWP-GHG	Global warming potential – Greenhouse Gas
GHG	Greenhouse gas
GO	Guaranty of origin
AIB	Association of issuing bodies
IOBC	Instantaneous Oxidation of Biogenic Carbon
EF	Environmental footprint

References

1. ISO 14040:2006 Environmental Management - Life Cycle Assessment - Principles and framework.
2. ISO 14044:2006 Environmental Management - Life Cycle Assessment - Requirements and guidelines.
3. ISO 14025:2006 Environmental labels and Declarations - Type III Environmental Declarations - Principles and procedures.
4. EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
5. EN 15941 Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data
6. EPD International. General Program Instructions (GPI) for the International EPD® System (version 5.0.1) <http://www.environdec.com/>.
7. European Chemical Agency, Candidate List of substances of very high concern for Authorization. <https://echa.europa.eu/candidate-list-table>.
8. Product Environmental Footprint Category Rules (PEFCRs) for products in buildings (2019).
9. The International EPD System PCR 2019:14 Construction products and Construction services. Version 2.0
10. EN 16783 Thermal insulation products - Environmental Product Declarations (EPD) - Product Category Rules (PCR) complementary to EN 15804 for factory made and in-situ formed products
11. ISOVER U Protect Wired Mat 4.0 Alu1 - product Information: <https://www.isover-technische-isolierung.de/produkte/u-protect-wired-mat-40-alu1>
12. ISOVER U Protect Wired Mat 4.0 Alu1 - technical documents: <https://www.isover-technische-isolierung.de/documents/drahtnetzmatte/u-protect-wired-mat-4.0-alu1.pdf>