ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804:2012+A2:2019 and ISO 14025 for

ISOVER FASSADE 100

Date of publication: 2023-06-21
Validity: 5 years
Valid until: 2028-06-20
Version 1
Based on PCR 2019-14 Construction products v1.11
Scope of the EPD®: Romania

Registration number in The International EPD System:
S-P-08084

ISOVER SAINT-GOBAIN

EPD®

ECO PLATFORM EPD VERIFIED

EPD VERIFIED

The environmental impacts of this product have been assessed over its whole life cycle. Its Environmental Product Declaration has been verified by an independent third party.

General information

Manufacturer: Saint Gobain Construction Product, ISOVER Business Unit , Mihai Bravu 233, Ploieşti 100410, ROMANIA
Production plant: ISOVER Ploiesti

Program used: The International EPD® System. More information at www.environdec.com
EPD® registration number: S-P-08084
PCR identification: PCR 2019-14 Construction products v1.11 and c-PCR005 Thermal insulation products (EN 16783)

Product name and manufacturer represented: ISOVER FASSADE, Saint Gobain Construction Product Romania, ISOVER Business Unit

UN CPC CODE: 37990

Owner of the declaration: Saint Gobain Construction Product Romania, ISOVER Business Unit

Framework: The LCA is based on 2021/2022 production data for Ploiesti plant in Romania.

Geographical scope: Romania

This EPD covers information modules A1 to C4 + module D (cradle to grave) as defined in EN 15804:2012+A2:2019

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Declaration issued: 2023/06/21, **valid until**: 2028/06/20

Demonstration of verification: an independent verification of the declaration was made, according to EN ISO 14025:2010. This verification was external and conducted by a third party, based on the PCR mentioned above (see information below).

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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CEN standard EN 15804:2012 + A2:2019 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction Products, version 1.11 and c-PCR005 Thermal insulation products (EN 16783)
PCR review was conducted by: El Comité Técnico del Sistema Internacional EPD© President: Claudia A. Peña. Contact via info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Marcel Gomez (Marcel Gómez Consultoria Ambiental; info@marcelgomez.com) In case of recognized individual verifiers: Approved by: The International EPD© System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804:2012 + A2:2019. For further information about comparability, see EN 15804:2012 + A2:2019 and ISO 14025.

Product description

Product description and description of use

This Environmental Product Declaration (EPD®) describes the environmental impacts of 1 m² of mineral wool with a thermal resistance of 2.85 K.m².W^{-1} of ISOVER FASSADE (former name ISOVER FASSADE 100 refers to 100mm). To calculate the range of commercial thicknesses between 50 mm and 250 mm, please see table in additional information chapter “influence of particular thickness".

This EPD applies for one specific product coming from one single plant of Saint Gobain Construction Product Romania, ISOVER Business Unit and is based on the most representative product.

The production site of Saint Gobain Construction Product Romania, ISOVER Business Unit in Ploiesti uses natural raw materials and fusion and fiberizing techniques to produce stone wool. The products obtained come in the form of a "mineral wool mat" consisting of a soft and airy structure.

On Earth, naturally, the best insulator is dry immobile air at 10°C: its thermal conductivity factor, expressed in λ, is 0.025 W/(m.K) (watts per meter Kelvin degree). The thermal conductivity of mineral wool is close to immobile air as its lambda varies from 0.030 W/(m.K) for the most efficient to 0.045 W/(m.K) to the least. With its entangled structure, mineral wool is a porous material that traps the air, making it one of the best insulating materials. The porous and elastic structure of the wool also absorbs noise in the air, knocks and offers acoustic correction inside premises. Mineral wool containing incombustible materials does not fuel fire or propagate flames.

Mineral wool insulation is used in buildings as well as industrial facilities. It ensures a high level of comfort, lowers energy costs, minimizes carbon dioxide (CO_2) emissions, prevents heat loss through pitched roofs, walls, floors, pipes and boilers, reduces noise pollution and protects homes and industrial facilities from the risk of fire. Mineral wool products last for the average building’s lifetime, or as long as the insulated building component is part of the building.

Technical data/physical characteristics (for a thickness of 100 mm):
Thermal resistance of the Product: 2.85 K.m².W-1 (UNE EN 12667)
The thermal conductivity of the mineral wool is: 0.035 W/(m·K) (UNE EN 12667)
Reaction to fire: A1 (SR EN 13501)
Density: 90 kg/m^3

Declaration of the main product components and/or materials

Description of the main components and/or materials for 1 m² of mineral wool with a thermal resistance of 2.85 K.m².W^{-1} for the calculation of the EPD®:

PARAMETER	VALUE
Quantity of stone wool for 1 m² of product	9.00 kg of finished product
Thickness of stone wool	100 mm
Facing	none
Packaging	Polyethylene film: 0.0931 kg/m² Wooden pallet: 0.5260 kg/m² Ribbon wax: 0.0056 kg/m² Label: 0.0026 kg/m²
Product used for the Installation	none

Content declaration:

Product components	Weight, %	Post-consumer material, weight-% (of product)	Renewable material, weight-% (of product)
ISOVER FASSADE	**100%**		
Mineral materials	90 - 98	0	0
Binder	2 - 10	0	0
Additives	< 1	0	0
Packaging materials	**Weight, kg/DU**	**Weight-% (vs the product)**	
Polyethylene film	0.0931	1.03%	
Wooden pallet	0.5260	5.84%	
Ribbon WAX	0.0056	0.06%	
Label	0.0026	0.03%	

At the date of issue of this declaration, there is no “Substance of Very High Concern” (SVHC) in concentration above 0,1% by weight, and neither do their packaging, following the European REACH regulation (Registration, Evaluation, Authorization and Restriction of Chemicals).

The verifier and the program operator do not make any claim nor have any responsibility of the legality of the product.

LCA calculation information

EPD TYPE	Cradle to grave and module D
FUNCTIONAL UNIT	Providing a thermal insulation on 1 m² of product with a thermal resistance of 2.85 K.m2.W-1 during 50 years, with a thickness 100mm and a weight 9 kg/m²
SYSTEM BOUNDARIES	Mandatory Stages = A1-A3 ; A4-A5, B1-B7 ; C1-C4 and D
REFERENCE SERVICE LIFE (RSL)	50 years
CUT-OFF RULES	Life Cycle Inventory data for a minimum of 99% of total inflows to the upstream and core module shall be included. Flows related to human activities such as employee transport are excluded. Transportation in-site is excluded The construction of plants, production of machines and transportation systems are excluded
ALLOCATIONS	Physical allocation based on mass is used. The polluter pays and modularity principles have been followed
GEOGRAPHICAL COVERAGE AND TIME PERIOD	Data included is collected from one production site in Romania Production year from 2021/2022 Background data: Ecoinvent v3.6 (2020) and GaBi LCA database 2020

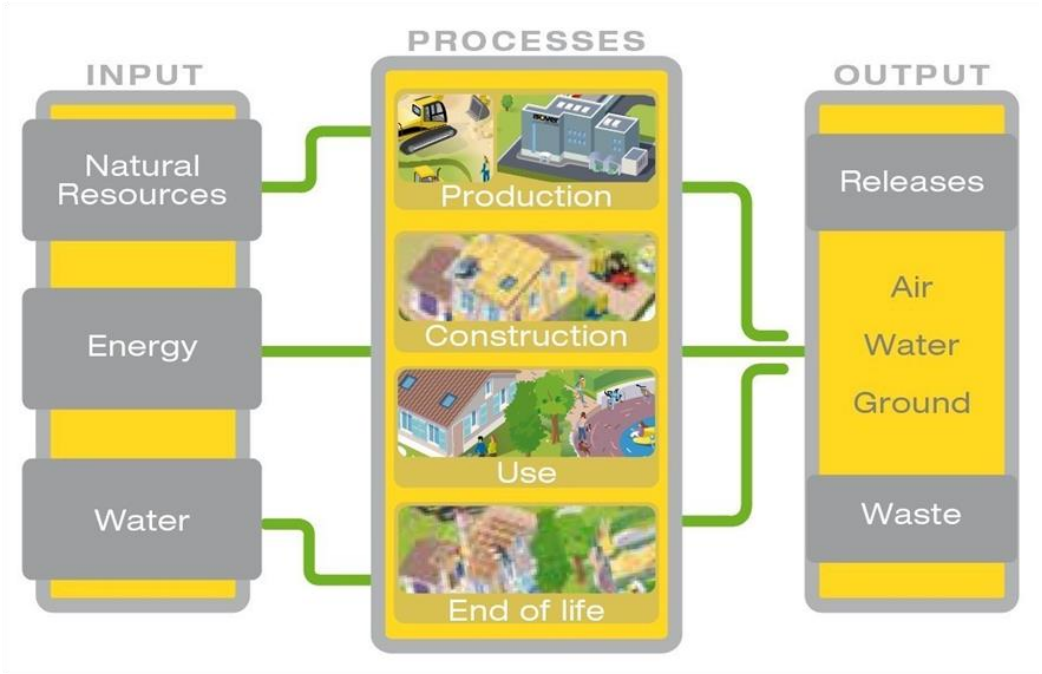
LCA scope

System boundaries (X=included, ND=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	RO	RO	RO	RO	RO	-	-	-	-	-	-	-	RO	RO	RO	RO	RO
Specific data used	> 73% GWP- GHG																
Variation products	One site one product																
Variation sites	One site one product																

Life cycle stages

Flow diagram of the Life Cycle



A1-A3, Product stage

Description of the 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”.

The aggregation of the modules A1, A2 and A3 is a possibility considered by the EN 15804 standard. This rule is applied in this EPD.

Description of the scenarios and other additional technical information:

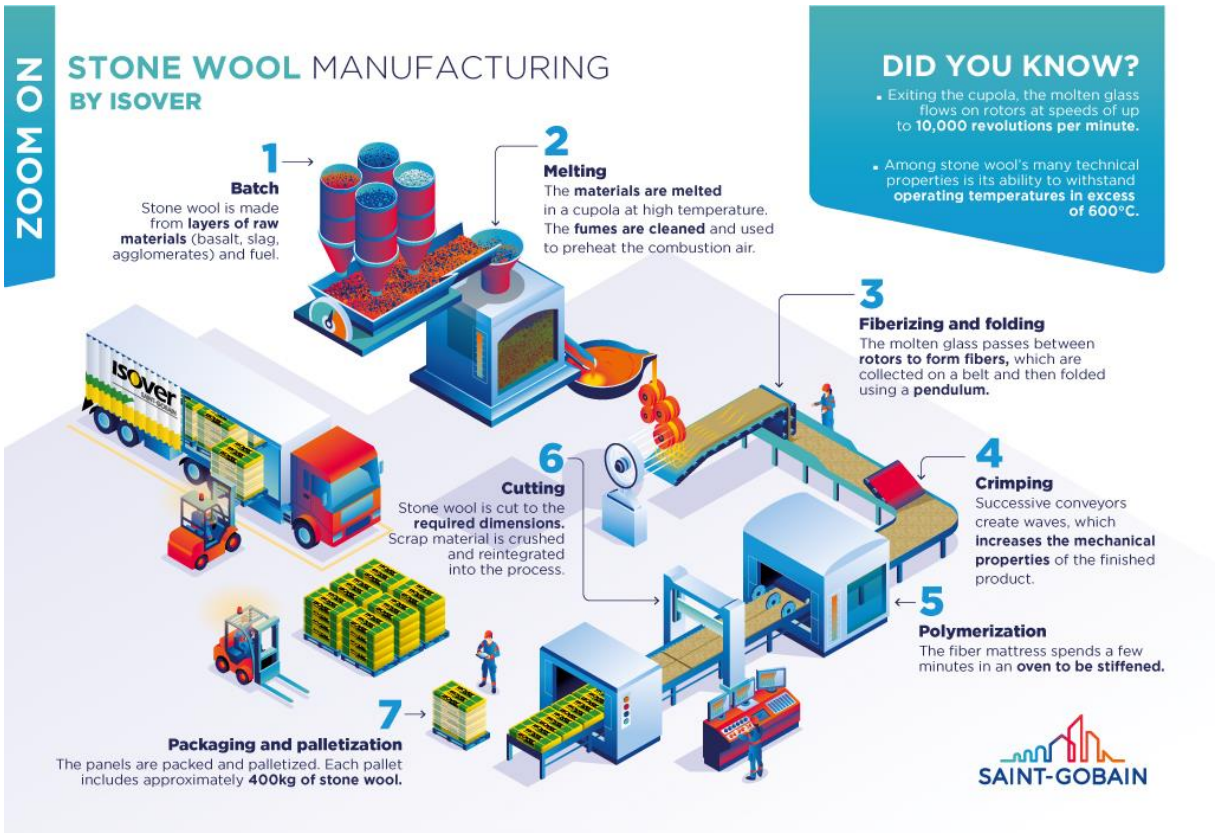
A1, Raw materials supply
This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process.

Specifically, the raw material supply covers production of binder components and sourcing (quarry) of raw materials for fiber production, e.g. Basalt and dolomite for stone wool. Besides these raw materials, recycled materials (agglomerates) are also used as input.

A2, Transport to the manufacturer
The raw materials are transported to the manufacturing site. In our case, the modeling include: road, sea and rail (average values) of each raw material.

A3, Manufacturing
This module includes the manufacturing of the product and packaging. Specifically, it covers the manufacturing of resin, mineral wool (including the processes of fusion and fiberizing showed in the flow diagram), and the packaging. This module also includes the emissions and wastes generated during manufacturing.

Manufacturing process flow diagram



A4-A5, Construction process stage

Description of the stage: the construction process is divided into 2 modules: A4, transport to the building site and A5, installation in the building. Since there is a product loss during installation, the quantification of raw material compensation (A5) and its transport to the building site (A4) are considered.

A4, Transport to the building site: this module includes transport from the production gate to the building site. Transport is calculated on the basis of 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.	Average truck trailer (22 t payload) with a real 7 t payload approx., diesel consumption 38 liters for 100 km
Distance	405 km
Capacity utilisation (including empty returns)	100% of the capacity in volume 24% of empty returns
Bulk density of transported products*	98 kg/m^3
Volume capacity utilisation factor	1

A5, Installation in the building: this module includes:

No additional accessory was taken into account for the implementation phase insulation product.
No energy is needed to install the product (manual installation without tool)

PARAMETER	VALUE/DESCRIPTION
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	10%
Distance	50 km to landfill by truck
Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal (specified by route)	Packaging wastes are 100% collected and modeled as recovered matter (PE film, pallet) and landfill (others). Mineral wool losses are 100% landfilled.

B1-B7, Use stage (excluding potential savings)

Description of the stage: 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

Description of the scenarios and additional technical information:
Once installation is complete, no actions or technical operations are required during the use stages until the end of life stage. Therefore, mineral wool insulation products have no impact (excluding potential energy savings) on this stage.

C1-C4, End of Life Stage

Description of the stage: this stage includes the next modules:

C1, Deconstruction, demolition
The de-construction and/or dismantling of insulation products take part of the demolition of the entire building. In our case, the environmental impact is assumed to be very small and can be neglected

C2, Transport to waste processing
The model use for the transportation (see A4, transportation to the building site) is applied.

C3, Waste processing for reuse, recovery and/or recycling
The product is considered to be landfilled without reuse, recovery or recycling.

C4, Disposal
The mineral wool is assumed to be 100% landfilled.

Description of the scenarios and additional technical information:

End of life:

PARAMETER	VALUE/DESCRIPTION
Collection process specified by type	The entire product, including any surfacing is collected alongside any mixed construction waste. 9.0 kg of mineral wool (collected with mixed construction waste)
Recovery system specified by type	There is no recovery, recycling or reuse of the product once it has reached its end of life phase.
Disposal specified by type	The product alongside the mixed construction waste from demolishing is landfilled. 9.0 kg of mineral wool are landfilled
Assumptions for scenario development (e.g. transportation)	The product alongside the mixed construction waste from demolishing is landfilled. The waste going to landfill is transported by truck with 27 t payload, using diesel as a fuel consuming 38 liters per 100km. Distance covered is 50 km.

D, Reuse/recovery/recycling potential

100% of wastes are landfilled. There is no reuse, nor recovery, nor recycling of this product. Hence, no recycling benefits are reported on stage D. Packaging material is not accounted for in module D.

LCA results

As specified in EN 15804:2012+A2:2019 and the PCR 2019-14 Construction products v1.11. The environmental impacts are declared and reported using the baseline characterization factors are from the ILCD. Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant.

According to the EN 15804:2012+A2:2019 standard, the LCIA results are relative expressions translating impacts into environmental themes such as climate change, ozone depletion, etc. (midpoint impact categories). Thus, the LCIA results do not predict impacts on category endpoints such as impact on the extinction of species or human health. In addition, the results do not provide information about the exceeding of thresholds, safety margins or risks.

All the results refer to a functional unit of 1 m² of product with a thermal resistance of 2.85 K.m2.W-1 during 50 years, with a thickness 100mm and a weight 9 kg/m². To obtain results of others commercial thicknesses see appendix.

Environmental Impacts

		Product stage	Construction stage		Use stage							End of life stage				Reuse, Recovery Recycling
	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.]	1.32E+01	5.52E-01	2.22E+00	0	0	0	0	0	0	0	0	2.77E-02	0	1.53E-01	0
	Climate Change (fossil) [kg CO2 eq.]	1.34E+01	5.39E-01	1.43E+00	0	0	0	0	0	0	0	0	2.70E-02	0	1.42E-01	0
	Climate Change (biogenic) [kg CO2 eq.]	-2.74E-01	1.35E-02	7.90E-01	0	0	0	0	0	0	0	0	6.78E-04	0	1.11E-02	0
	Climate Change (land use change) [kg CO2 eq.]	3.92E-03	3.15E-05	4.38E-04	0	0	0	0	0	0	0	0	1.58E-06	0	4.09E-04	0
	Ozone depletion [kg CFC-11 eq.]	1.18E-05	7.94E-17	1.18E-06	0	0	0	0	0	0	0	0	3.99E-18	0	5.26E-16	0
	Acidification terrestrial and freshwater [Mole of H+ eq.]	8.12E-02	3.37E-03	8.60E-03	0	0	0	0	0	0	0	0	1.60E-04	0	1.02E-03	0
	Eutrophication freshwater [kg P eq.]	1.58E-03	3.16E-07	1.59E-04	0	0	0	0	0	0	0	0	1.60E-08	0	7.49E-07	0
	Eutrophication freshwater [kg (PO4)3 eq.]	5.14E-04	1.03E-07	5.17E-05	0	0	0	0	0	0	0	0	5.20E-09	0	2.44E-07	0
	Eutrophication marine [kg N eq.]	2.15E-02	1.68E-03	2.40E-03	0	0	0	0	0	0	0	0	7.90E-05	0	2.62E-04	0
	Eutrophication terrestrial [Mole of N eq.]	2.35E-01	1.84E-02	2.57E-02	0	0	0	0	0	0	0	0	8.67E-04	0	2.88E-03	0
	Photochemical ozone formation - human health [kg NMVOC eq.]	6.33E-02	3.14E-03	6.75E-03	0	0	0	0	0	0	0	0	1.48E-04	0	7.94E-04	0
	Resource use, mineral and metals [kg Sb eq.][1]	2.13E-05	6.45E-09	2.15E-06	0	0	0	0	0	0	0	0	3.24E-10	0	1.27E-08	0
	Resource use, energy carriers [MJ][1]	1.98E+02	7.42E+00	2.08E+01	0	0	0	0	0	0	0	0	3.73E-01	0	1.86E+00	0
	Water deprivation potential [m³ world equiv.][1]	3.20E+00	5.24E-04	3.22E-01	0	0	0	0	0	0	0	0	2.63E-05	0	1.49E-02	0

[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				D Reuse, recovery, recycling
		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]	4.12E+01	1.80E-01	4.17E+00	0	0	0	0	0	0	0	0	9.04E-03	0	2.44E-01	0
	Primary renewable energy resources used as raw materials (PERM) [MJ] [2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of renewable primary energy resources (PERT) [MJ]	4.12E+01	1.80E-01	4.17E+00	0	0	0	0	0	0	0	0	9.04E-03	0	2.44E-01	0
	Use of non-renewable primary energy (PENRE) [MJ]	1.89E+02	7.44E+00	1.99E+01	0	0	0	0	0	0	0	0	3.74E-01	0	1.86E+00	0
	Non-renewable primary energy resources used as raw materials (PENRM) [MJ] [2]	9.04E+00	0	9.04E-01	0	0	0	0	0	0	0	0	0	0	0	0
	Total use of non-renewable primary energy resources (PENRT) [MJ]	1.98E+02	7.44E+00	2.08E+01	0	0	0	0	0	0	0	0	3.74E-01	0	1.86E+00	0
	Input of secondary material (SM) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Use of renewable secondary fuels (RSF) [MJ]	3.17E-24	0	3.17E-25	0	0	0	0	0	0	0	0	0	0	0	0
	Use of non-renewable secondary fuels (NRSF) [MJ]	3.73E-23	0	3.73E-24	0	0	0	0	0	0	0	0	0	0	0	0
	Use of net fresh water (FW) [m3]	9.94E-02	3.27E-05	1.00E-02	0	0	0	0	0	0	0	0	1.64E-06	0	4.70E-04	0

[2] *For this study, both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values where materials are recycled or recovered, but not when landfilled.

Waste Category & Output flows

Waste Category & Output Flows		Product stage	Construction stage		Use stage							End of life stage				D Reuse, recovery, recycling
		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]	5.02E-08	4.80E-10	7.99E-09	0	0	0	0	0	0	0	0	2.41E-11	0	2.84E-08	0
	Non-hazardous waste disposed (NHWD) [kg]	1.06E+00	1.51E-04	1.07E+00	0	0	0	0	0	0	0	0	7.58E-06	0	9.37E+00	0
	Radioactive waste disposed (RWD) [kg]	4.80E-03	8.44E-06	4.82E-04	0	0	0	0	0	0	0	0	4.24E-07	0	2.12E-05	0
	Components for re-use (CRU) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Materials for Recycling (MFR) [kg]	1.41E-01	0	5.44E-01	0	0	0	0	0	0	0	0	0	0	0	0
	Material for Energy Recovery (MER) [kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported electrical energy (EEE) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Exported thermal energy (EET) [MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Additional voluntary indicators from EN 15804 (according to ISO 21930:2017)

		Product stage	Construction stage		Use stage							End of life stage				Reuse, Recovery Recycling
	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]	**1.34E+01**	**5.39E-01**	**1.43E+00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2.70E-02**	**0**	**1.42E-01**	**0**

[3] 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 and packaging.

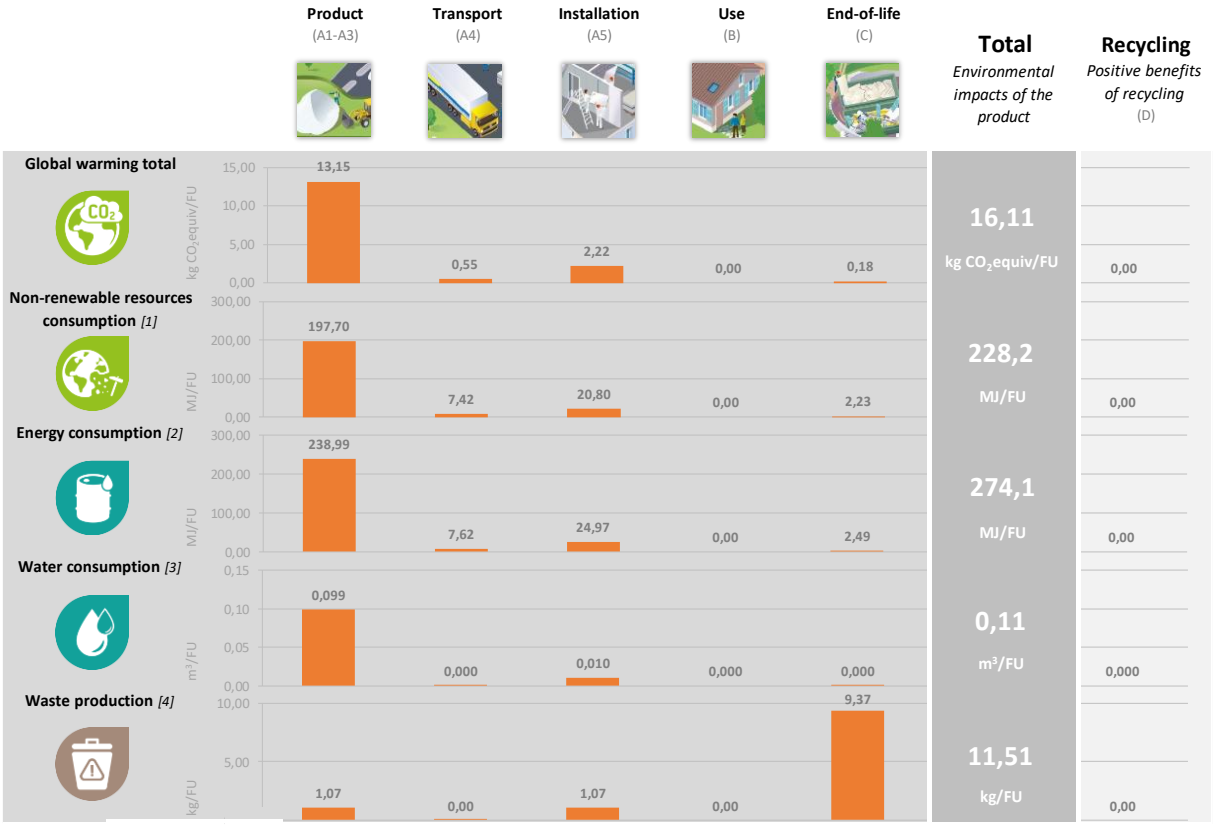
Information on biogenic carbon content

		Product stage
	Biogenic Carbon Content	**A1 / A2 / A3**
	Biogenic carbon content in product [kg]	7.14E-03
	Biogenic carbon content in packaging [kg]	2.22E-01

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

LCA interpretation

The following figure refers to a functional unit of 1 m² of product with a thermal resistance of 2.85 K.m2.W-1 during 50 years, with a thickness 100mm and a weight 9 kg/m². To obtain result of other commercial thicknesses see appendix.



[1] This indicator corresponds to the abiotic depletion potential of fossil resources.
[2] This indicator corresponds to the total use of primary energy.
[3] This indicator corresponds to the use of net fresh water.
[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

Global Warming Potential total (Climate Change total) (GWP total)

The majority of contribution to this environmental impact is from the production modules (A1 – A3). This is primarily because the energy sources of greenhouse gas emissions are predominant in this part of the life cycle. CO_2 is generated upstream from the production of electricity and is also released on site heating raw materials. We can see that other sections of the life cycle also contribute to the GWP; however, the production modules contribute to over 80% of the total contribution. The waste during the installation stage will generate the second highest percentage of greenhouse gas emissions together with the combustion of fuel in transport vehicles.

Non-renewable resources consumption
The consumption of non – renewable resources is once more found to have the highest value in the production modules. This is because a large quantity of natural gas is consumed within the factory to generate the large amount of electricity we use. The contribution to this impact from the other, like transportation upstream and downstream is very small.

Energy Consumption
Modules A1 – A3 have the highest contribution to total energy consumption. Energy in the form of electricity and natural gas is consumed in a vast quantity during the manufacture of mineral wool so we would expect the production modules to contribute the most to this impact category.

Water Consumption
Water is not used in any of the other modules (A4 – A5, B1 – B7, C1 – C4), thus there is not contribution to water consumption. For the production phase, water is used within the manufacturing facility and therefore it reflexes the highest contribution. However, a lot of the water is recycled on site so the contribution is still relatively low.

Waste Production
Waste production does not follow the same trend as the above environmental impacts. The largest contributor is the end of life module. This is because the entire product is sent to landfill once it reaches the end of life state. However, there is still an impact associated with the production module since we do generate waste on site. The very small impact associated with installation is due to the loss rate of product during implementation.

Appendix

Influence of particular thicknesses

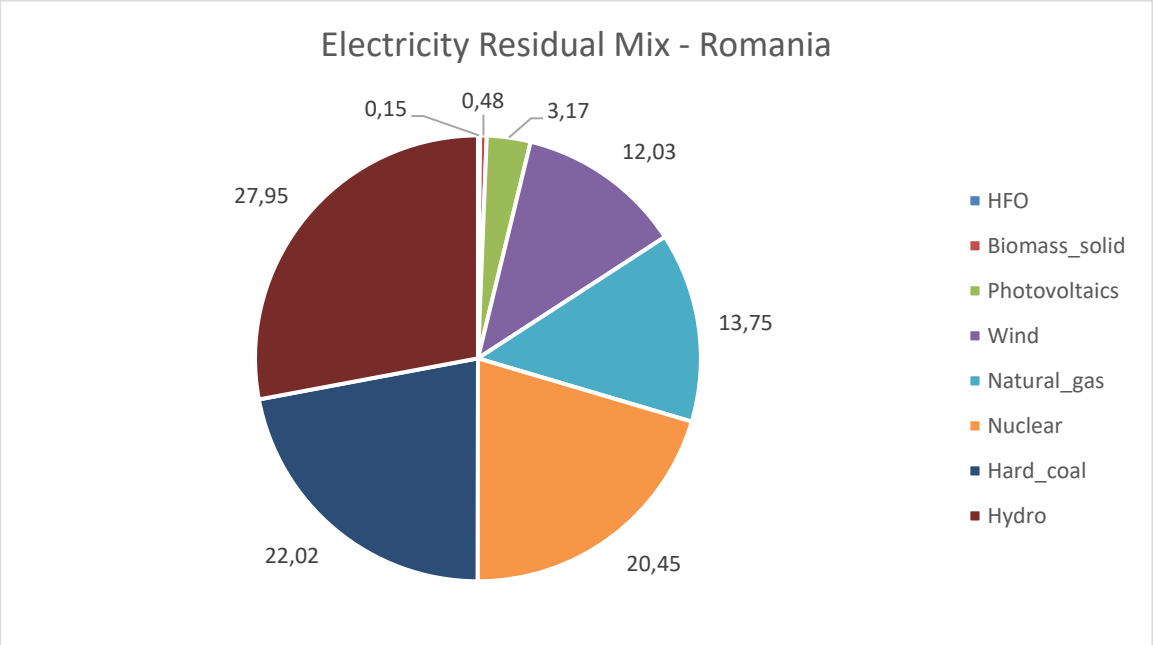
This EPD® includes the range of thicknesses between 30 mm and 250 mm using a multiplication factor in order to obtain the environmental performance of every thickness. In order to calculate the multiplication factors, a reference unit has been selected (value of R= 2.85 m^2*K/W). All the results refer to 100 mm of thickness.

In the table below the main products with specific thicknesses are listed. In order to obtain the environmental performance associated with every specific thickness, the results expressed in this EPD® must be multiplied by its corresponding multiplication factor. Multiplication factors of thicknesses of ISOVER FASSADE not listed below can be calculated as product thickness (mm) / 100 (mm).

Product name	Lambda (W/mK)	Product thickness (mm)	Declared thermal resistance (m2.K/W)	Multiplication factor
FASSADE 50	0.035	50	1.4	1.09
FASSADE 60	0.035	60	1.7	1.05
Declared reference	0.035	100	2.85	1
FASSADE 120	0.035	120	3.4	1.2
FASSADE 140	0.035	140	4	1.4
FASSADE 150	0.035	150	4.25	1.5
FASSADE 160	0.035	160	4.55	1.6
FASSADE 180	0.035	180	5.1	1.8
FASSADE 200	0.035	200	5.7	2
FASSADE 220	0.035	220	6.25	2.2
FASSADE 240	0.035	240	6.85	2.4
FASSADE 250	0.035	250	7.1	2.5

Electricity information

TYPE OF INFORMATION	DESCRIPTION
Location	Representative of average production in Romania
Geographical representativeness description	Split of energy sources in Romania - Biomass: 0.48% - Hard coal: 22.02% - Heavy fuel oil: 0.15% - Hydro: 27.95% - Natural gas: 13.75% - Nuclear: 20.45% - Photovoltaic: 3.17% - Wind: 12.03%
Reference year	2019
Type of data set	Cradle to gate from GaBi database
Source	European Residual Mixes 2019 Association of Issuing Bodies
CO2 emission kg CO2 eq. / kWh	0,472 (EN15804+A2 Climate Change (fossil))


Electricity Residual Mix - Romania
0,15
0,48
3,17
12,03
27,95
13,75
22,02
20,45
HFO
Biomass_solid
Photovoltaics
Wind
Natural_gas
Nuclear
Hard_coal
Hydro

Environmental impacts according to EN 15804:2012 + A1

The following tables presents results of ISOVER FASSADE according to EN 15804 +A1 for 1 m² of product with a thermal resistance of 2.85 K.m2.W-1 during 50 years, with a thickness 100mm and a weight 9 kg/m².

		Product stage	Construction stage		Use stage							End of life stage				Reuse, recovery, recycling
		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
Environmental impacts	Global Warming Potential - fossil (GWP-fossil) [kg CO2eq.]	1.36E+01	5.33E-01	1.44E+00	0	0	0	0	0	0	0	0	2.67E-02	0	1.39E-01	1.36E+01
	Ozone depletion (ODP) [kg CFC 11eq.]	1.53E-05	1.06E-16	1.53E-06	0	0	0	0	0	0	0	0	5.32E-18	0	7.01E-16	1.53E-05
	Acidification potential (AP) [kg SO2eq.]	6.53E-02	2.31E-03	6.87E-03	0	0	0	0	0	0	0	0	1.09E-04	0	8.18E-04	6.53E-02
	Eutrophication potential (EP) [kg (PO4)3-eq.]	1.47E-02	5.74E-04	1.55E-03	0	0	0	0	0	0	0	0	2.70E-05	0	9.21E-05	1.47E-02
	Photochemical ozone creation (POCP) - [kg Ethylene eq.]	4.75E-03	7.03E-05	4.92E-04	0	0	0	0	0	0	0	0	3.31E-06	0	6.59E-05	4.75E-03
	Abiotic depletion potential for non-fossil resources (ADP-elements) [kg Sb eq.]	2.19E-05	6.73E-09	2.20E-06	0	0	0	0	0	0	0	0	3.38E-10	0	4.92E-08	2.19E-05
	Abiotic depletion potential for fossil resources (ADP-fossil fuels) [MJ]	1.83E+02	7.42E+00	1.93E+01	0	0	0	0	0	0	0	0	3.73E-01	0	1.81E+00	1.83E+02

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