

Environmental Product Declaration

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

Building Insulation Products

Low density range from Saint-Eloy-les-Mines, FR

from

ROCKWOOL® Italia S.p.A.

Programme:	The International EPD® System, www.environdec.com
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

Programme:	The International EPD® System
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Accountabilities for PCR, LCA and independent third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR):
Construction products, PCR 2019:14, Version 1.2.5, UN CPC 37990
Sub-PCR-005 Thermal insulation products (EN 16783: 2017) Version: 2019-12-20

PCR review was conducted by: The Technical Committee of the International EPD@ System

Life Cycle Assessment (LCA)

LCA accountability: Nikolaos Emmanouil (nikolaos.emmanouil@rockwool.com)

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006
via: EPD verification by EPD Process Certification*

Third-party verification: Bureau Veritas Italia S.p.A is an approved certification body accountable for third-party verification

Third-party verifier is accredited by: Accredia, accreditation number N.011H

*For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI.

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 registered in different EPD programmes, or not compliant with EN 15804, may not be comparable.

For two EPDs to be comparable, they must:

- be based on the same PCR (including the same version number) or fully aligned PCRs or versions of PCRs;
- cover products with identical functions, technical performances, and use (e.g. identical declared/functional units);
- have equivalent system boundaries and descriptions of data;
- apply equivalent data quality requirements, methods of data collection, and allocation methods;
- apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors);
- have equivalent content declarations;
- be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.



Company information

Owner of the EPD
ROCKWOOL Italia S.p.A. – via Canova, 12, 20145 Milano (IT).

Contact
ufficio.tecnico@rockwool.it

Description of the organisation
ROCKWOOL Italia S.p.A. is part of the ROCKWOOL Group, with over 80 employees, we are the local organization offering a full range of high-performing and sustainable insulation products for the building construction sector.
At ROCKWOOL, we are committed to enriching the lives of everyone who experiences our product solutions. Our expertise is perfectly suited to tackle many of today's biggest sustainability and development challenges, from energy consumption to noise pollution and fire resilience.
Our product range reflects the diversity of the world's needs, while supporting our stakeholders in reducing their own carbon footprint.
Stone wool is a versatile material and forms the basis of all our businesses across the ROCKWOOL group. With more than 12'400 passionate colleagues in over 40 countries, we are the world leader in stone wool solutions.

Product-related or management system-related certifications
ISO 9001, ISO 14001, ISO 50001, ISO 45001, all referred to the production site.

Name and location of production site
ROCKWOOL FRANCE S.A.S., 111 rue du Château des Rentiers, 75013 Paris (FR) at the production site located in Saint Eloy les Mines, Z.I. Puits du Manoir, 63700 (FR).



Product information

Product name

This EPD is covering numerous ROCKWOOL products, destined to Italian market.
This EPD is intended to be available to ROCKWOOL Italia S.p.A. customers and can also be used in other markets that receive products from the factory in Saint Eloy les Mines, excluded France due to different EPD requirements.
The reference product name is Rockmur Kraft (60-210 mm).
The scaling factors can be used to estimate the environmental performance indicators for each specific product.

Product Name	Weight (kg/m²,R=1m²K/W)	Scaling factor
Deltarock	1,7	1,5
Fieltro 128 - Rocklim 128*	0,9	0,8
Le Flocon 2	1,9	1,7
Rockbardage nu	1,7	1,5
Rockcalm	1,5	1,3
Rockfacade	1,3	1,2
Rockglace*	1,4	1,2
Rockin L	2,0	1,8
Rockmur kraft* (45 mm)	1,3	1,1
Rockmur kraft* (60-210 mm)	1,1	1,0
Rockmur nu (45 mm)	1,3	1,1
Rockmur nu (60-210 mm)	1,1	1,0
Roulrock alu*	0,9	0,8
Roulrock kraft* (200 mm)	0,9	0,8
Roulrock kraft* (60-160 mm)	0,9	0,8

*Products with extra facings. LCA results for the facings are available in Annex 1.

Environmental Impact per m^2 product X = Environmental Impact reference product × scaling factor.
Please note that the scaling factors give the precise amount of material needed to produce the other product types.

Product identification

The product standards that apply are:

- EN 13162:2012+A1:2015 Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification
- EN 14303:2009+A1: 2013 Thermal insulation products for building equipment and industrial installations - Factory made mineral wool (MW) products – Specification
- EN 14064-1:2010 Thermal insulation products for buildings – In-situ formed loose-fill mineral wool (MW) products – Part 1: Specification for the loose-fill products before installation.

Note: Product Le Flocon 2 is not covered by a product standard.

Product characteristics
Specific characteristics and additional functionalities shall be taken into account when applying the EPDs in the building context:

- Most ROCKWOOL stone wool material is classified as non-combustible (Euroclass A1), the best reaction to fire class according to EN13501-1.
- ROCKWOOL stone wool products are often applied because of their acoustic properties. For example, a well-constructed wall using ROCKWOOL stone wool insulation can help comply with acoustic regulation requirements in average building typologies.
- ROCKWOOL stone wool products are durable without any ageing of the thermal performance. They are dimensional stable and both water repellent and moisture resistant.

More specific product information can be found on www.rockwool.it or through the local ROCKWOOL sales organizations.
Guidance on safe and effective installation could be provided through the local organization.

ROCKWOOL stone wool is circular by nature, it is recyclable over and over again. It can be reintroduced in the production process and converted back into stone wool.

ROCKWOOL stone wool waste is classified as non-hazardous. ROCKWOOL insulation waste is covered by the non-hazardous entry (17 06 04) in the List of Wastes of the European Waste Catalogue.

Product description
This EPD documents the potential environmental impacts of 1m^2 of ROCKWOOL stone wool insulation with a thermal resistance (R-value) equal to 1 m^2K/W. The intended use of the EPD is to communicate quantified environmental impacts of construction products for application in the assessment of the environmental performance of buildings.

ROCKWOOL stone wool thermal insulation is a durable and firesafe insulation material that can be used to insulate against heat, cold, fire, vibrations, and noise.
ROCKWOOL stone wool is made primarily from abundantly available volcanic rock, an increasing proportion of recycled ROCKWOOL stone wool material and a cured resin binder.
Other materials utilised in the production of ROCKWOOL stone wool are wastes, by-products from other industries.

Stone wool is available with different densities and thermal conductivities, and it is used in many applications of everyday life, ranging from roofs, loft, walls, floors, to fire prevention solutions and HVAC systems.
The products covered by this declaration are for building insulation application, in particular for General Building Insulation (GBI), roofs, façades and HVAC. The faced and unfaced synthetic resin-bonded stone wool materials described in this declaration are produced in the form of slabs, loose wool or rolls for use in building applications in the density range from 23 up to 55 kg/m^3.

ROCKWOOL stone wool is a non-combustible material that does not react to fire. Stone wool's built-in fire protection is natural and not dependent on flame retardants. Stone wool withstands temperatures exceeding 1000 degrees Celsius, and retains its fire performance throughout its lifetime.

The insulation properties of stone wool is primarily achieved by the immobile air within in the open structure of the product. Therefore, the declared insulation property will remain constant for the declared lifetime of the product. This also allows the product to absorb noise and sound and contribute to a better indoor acoustic climate.

ROCKWOOL stone wool fibres are proven to be safe to manufacture, install and live with.
Health and safety installation instructions shall always be followed. ROCKWOOL stone wool fibres comply with the European REACH regulation and do not have any health-related classifications. ROCKWOOL insulation products do not contain flame retardants and blowing agents, and are proven not to have a negative impact on the indoor environment.

The packaging is included in the assessment.

Information on the environmental impacts of facings, e.g. glass fleece or aluminium can be found in the relevant Annex 1. Where applicable, environmental indicators values from facings should be added.

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)

Geographical scope
This EPD is intended to be available to ROCKWOOL Italia S.p.A. customers.
This EPD can also be used in other markets that receive products from the factory in Saint Eloy les Mines, excluded France due to different EPD requirements.



LCA information

Functional unit / declared unit	1m^2 of ROCKWOOL stone wool insulation with a thermal resistance (R-value) equal to 1 m^{2}K/W
Density of reference product	32 kg/m^3
Thickness of reference product	35 mm
Scope	Cradle to Grave
Reference service life	60 years
Energy used for manufacturing process	French electricity residual mix and non-renewable energy materials

Functional unit / declared unit
This EPD documents the potential environmental impacts of 1m^2 of ROCKWOOL® stone wool insulation with a thermal resistance (R-value) equal to 1 m^{2}K/W.
A product of 32 kg/m^3 density and a notional thickness of 35 mm thick fulfils the declared unit specification and provides a base dataset from which product specific data can be calculated.

Reference service life
ROCKWOOL stone wool thermal insulation products are extremely durable and provide effective performance for the lifetime of a building or host structure, with no need to be replaced, The thermal, fire-resistance, and acoustic performance of ROCKWOOL stone wool products, when correctly installed, remains the same during 60 years reference service life or as long as the insulation is part of the building.

Time representativeness
Plant production data for the complete year 2022.
The products considered in this EPD are produced in one single manufacturing plant; therefore, variations issue for sites is not relevant.
The data which is used to carry out the LCA calculations contains >90% specific data and below 10% generic data.

Database and LCA software used
The LCA model, the data aggregation and environmental impacts are calculated with the software LCA for Expert (GaBi) 10.7 and its content version 2023.1.
The impact models used are those indicated in EN 15804:2012+A2:2019.

Description of system boundaries

The LCA is performed as a "cradle-to-grave" study, addressing all life cycle stages identified in the EN 15804+A2. All major raw materials, energy, electricity use, and waste are included for all life cycle modules. Use stage B1-7 modules are considered but are not relevant, as there are no activities and no significant environmental impact in the use stage.

The product stage **A1-A3** includes:

- Provision of preliminary products and energy and relevant upstream processes;
- Transporting the raw materials and preliminary materials to the plant;
- Production process in the plant including energy inputs and emissions;
- Electricity consumption;
- Waste processing up to the end-of-waste state or disposal of waste residues, during the production stage;
- Production of packaging;
- Manufacturing of products and co-product.

In the product system under assessment, the slags, alumina, and ashes are considered by-products from the steel and coal fired electricity production respectively with the application of economic allocation, so their environmental impact is accounted for.
Recycled stone wool comes free of environmental burden, as it enters the product system as waste. Recycled fuels also come free of environmental burden, but their transport to the factory is accounted for.
During the melting of raw materials pig iron is created in the cupola furnace. Pig iron is a co-product, which is subsequently sold to the market and economic allocation is applied.

Modules A1, A2 and A3 are be declared as an aggregated Module A1-3

The Construction Stage **A4-A5** includes:

- A4 transport to the building site
- A5 installation to the building

The transport in A4 is modelled by volume, as the most conservative approach. The default vehicle is the truck, and all the values are based on annual average delivery data.

Parameter	Value
Average transport distance	776 km
Type of vehicle used for transport	Truck Euro 6 (20-26 t / 17,3 t payload)
Truck capacity utilisation (including 30% empty returns)	0,3

In A5 the default installation is assumed to be manual, therefore, no energy consumption or ancillary equipment is needed.
The product waste from installation is assumed to be 2% and according to the modularity principle of EN 15804 its impacts are fully allocated to A5.
The A5 stage includes also waste processing up to the end-of-waste state or disposal of final residues during the construction process stage and impacts and aspects related to product losses during installation.
The waste management scenario for packaging materials has been adjusted to represent waste management shares for recycling and incineration, specific to the Italian market (EUROSTAT 2020).

Parameter	Value
Auxiliaries	0
Water consumption	0
Electricity consumption	0
Other energy carriers	0
Material loss	2%
Cardboard and paper packaging	86% recycling, 7% incineration, 7% landfill
Plastic Packaging	44% recycling, 45% incineration, 12% landfill
Wood packaging	47% recycling, 3% incineration, 50% landfill

Finally, the A5 module also includes the corresponding end-of-life considerations for packaging. The credits from heat and electricity recovery from incineration, or material recycling from module A5 are attributed to module D.

For the use-stage **B1-B7**, the impacts in stages B2-87 are zero.
ROCKWOOL stone wool insulation products do not require maintenance (B2), repair (B3), replacement (B4), or refurbishment (B5) during use in standard conditions. They do not use energy (B6) or water (87) during use of the building related to the building fabric.

The End-of-life stage **C1-C4** includes:

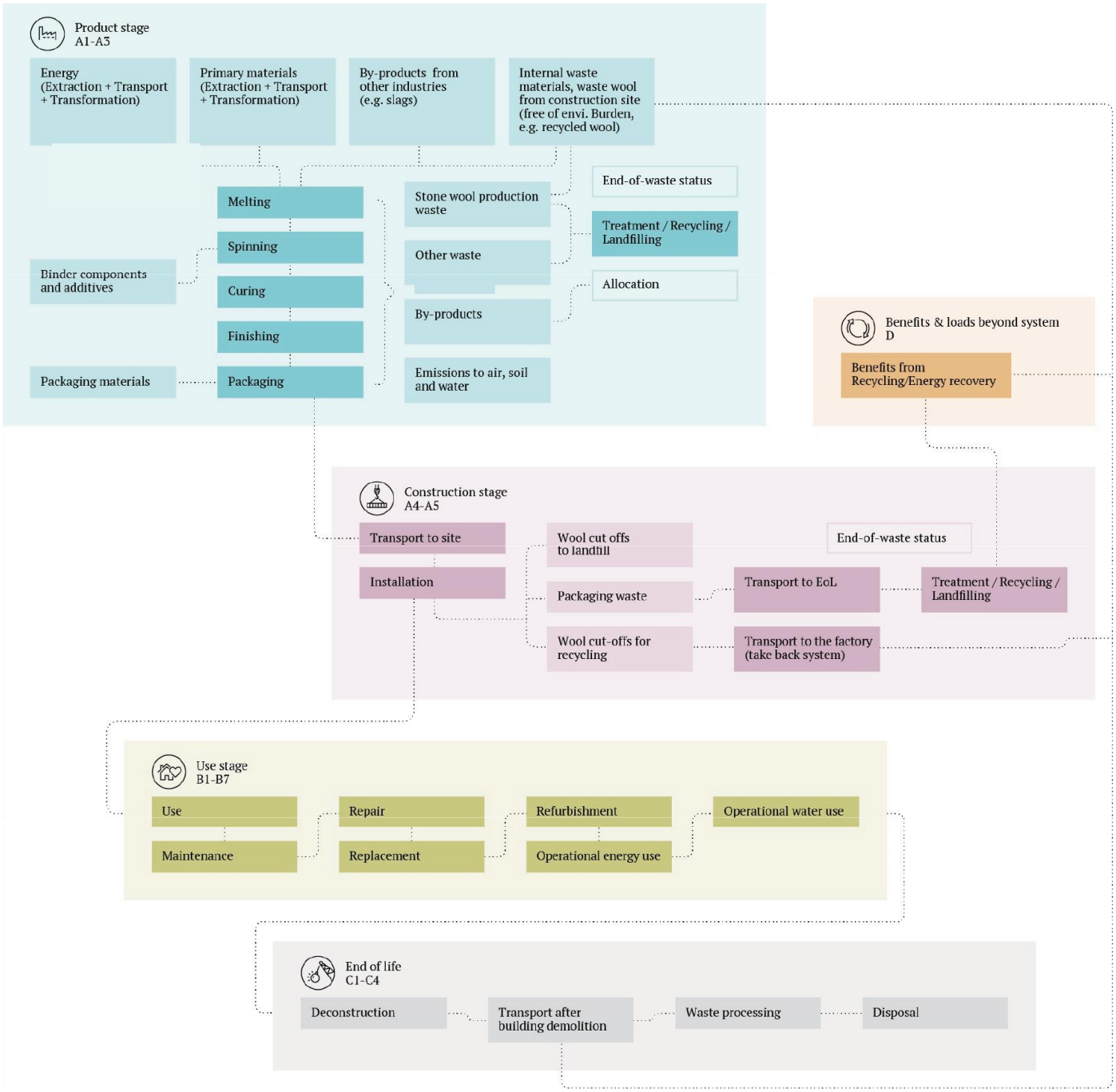
- C1 de-construction, demolition;
- C2 transport to waste processing
- C3 waste processing for reuse, recovery and/or recycling
- C4 disposal

These stages also include provision and all transport, provision of all materials, products and related energy and water use. Manual deconstruction is assumed for C1, therefore no impacts are assigned. The scenario applied for module C2 can be seen in the table below. For module C4 a scenario of 100% landfill is assumed.

Parameter	Value
Average transport distance to landfill	50 km
Type of vehicle used for transport	Truck Euro 6 (20-26 t / 17,3 t payload)
Truck capacity utilisation (including 30% empty returns)	0,5

Module **D** includes reuse, recovery and/or recycling potentials expressed as net impacts and benefits. Here the credits for the packaging disposal in A5 and the recycling potential of ROCKWOOL material in C are considered.

Below a schematic representation of the system boundaries is shown.

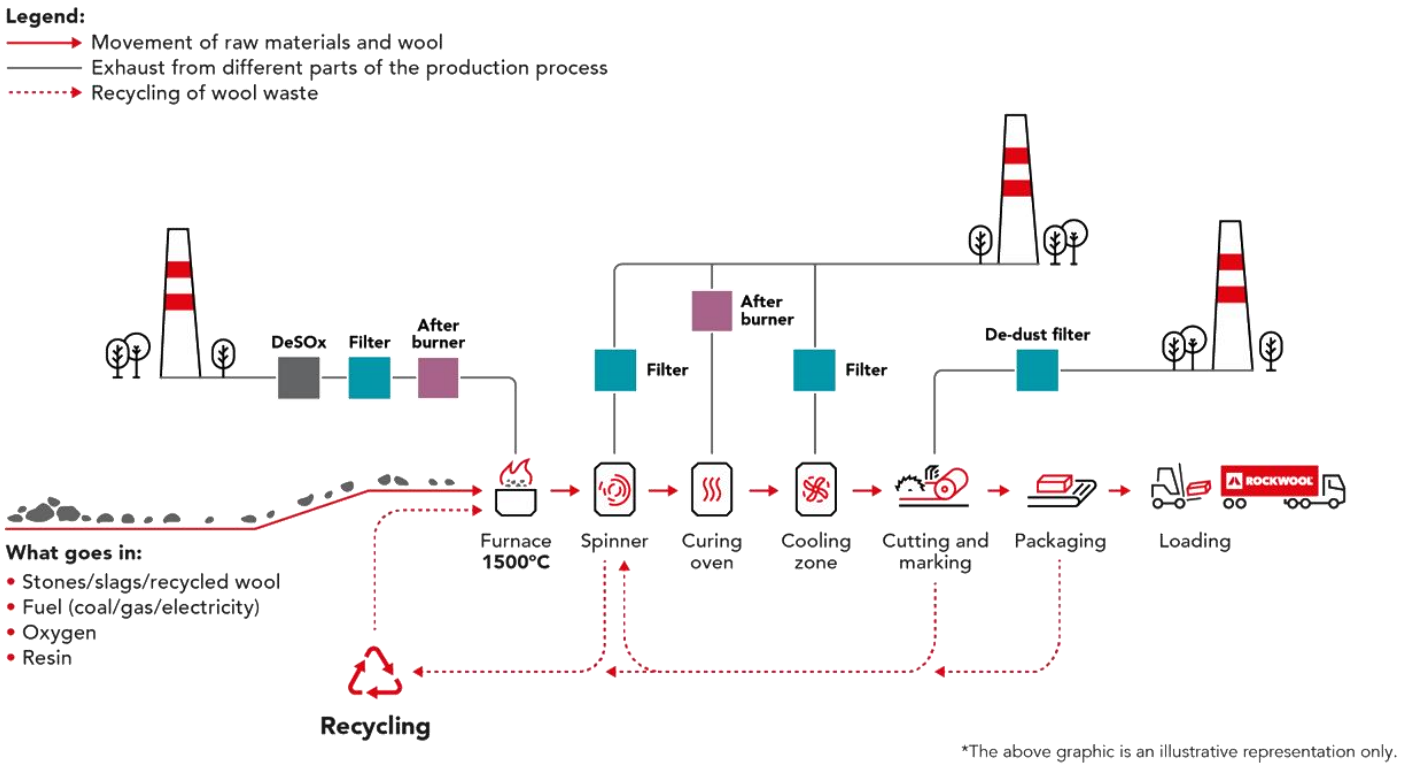

Product stage
A1-A3
Energy (Extraction + Transport + Transformation)
Primary materials (Extraction + Transport + Transformation)
By-products from other industries (e.g. slags)
Internal waste materials, waste wool from construction site (free of envi. Burden, e.g. recycled wool)
Melting
Spinning
Curing
Finishing
Packaging
Binder components and additives
Packaging materials
Stone wool production waste
Other waste
By-products
Emissions to air, soil and water
End-of-waste status
Treatment / Recycling / Landfilling
Allocation
Benefits & loads beyond system
D
Benefits from Recycling/Energy recovery
Construction stage
A4-A5
Transport to site
Installation
Wool cut offs to landfill
Packaging waste
Wool cut-offs for recycling
End-of-waste status
Transport to EoL
Treatment / Recycling / Landfilling
Transport to the factory (take back system)
Use stage
B1-B7
Use
Maintenance
Repair
Replacement
Refurbishment
Operational energy use
Operational water use
End of life
C1-C4
Deconstruction
Transport after building demolition
Waste processing
Disposal

Description of the production process

Raw material, mainly volcanic rocks, are melted at around 1500 °C. The molten rock is channelled onto high-speed spinners, injecting air to create the fibres.

A binder is added to hold the wool strands together, along with a water-repellent oil.

The fibres are then collected and layered on large conveyor belt-type machinery, where the layers are compressed and sent onward to where the wool and binder are cured and later cooled, before being sent to cutting and packaging and then shipping to customers.



*The above graphic is an illustrative representation only.

Data quality

The quality of the data of this specific EPD is assessed as good and appropriate.
Primary data are collected consistently from production site in Saint Eloy les Mines, France, in the reference year 2022 and represent stabilized production.
Generic data is from LCA FE (GaBi) version 10.7, database content 2023.1

Allocation

The allocation is made in accordance with the provisions of EN 15804+A2.
Production activities, electricity and energy consumption and waste generation are allocated equally among all products from the production site through mass allocation. The environmental impact of co-products coming for example from the steel and electricity plants (e.g. slags, alumina and ashes entering the system as inputs to the manufacturing) is accounted for and economic allocation is applied. Besides stone wool, pig iron is produced during the melting process of raw materials and sold. The iron is considered to be a co-product. Iron as a co-product is allocated by economic value. This is in line with EN15804+A2.

Cut-off criteria

All major raw materials and all the essential energy are included. All hazardous materials and substances are considered in the inventory. Data sets within the system boundary are complete and fulfil criteria for the exclusion of inputs and output criteria. All data, materials and energy consumptions have been specified according to the production data and have been considered within the inventory analysis.

	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	EU	EU	FR	IT	IT	IT	IT	IT	IT	IT	IT	IT	IT	IT	IT	IT	IT
Specific data used		>90%															
Variation – products		>10%															
Variation – sites		0%															

Content information

Product components	Weight %	Pre-consumer material Weight %	Post-consumer material Weight %
Stone wool	62	0	0
Recovered metallurgical slags	33	100	0
Binder	5	0	0
Mineral oil	<1	0	0
Total	100	100	0

Packaging materials	Weight (kg)	Weight % (versus the product)
Wooden pallet	0,0606	88
Cardboard/paper	0,0006	1
Plastic film	0,0078	11
Total	0,0690	100

The materials in the table above represent the quantities needed to produce the declared unit.
The percentage of binder in the final ROCKWOOL products is on average 0-5%.

Results of the environmental performance indicators

The results are calculated for the declared product of 1m^2 Rockmur Kraft with density of 32 kg/m^3 and thickness 35mm for R=1 m^{2}K/W.
Scaling factors can be used to calculate results for other products included in this EPD, by multiplying the scaling factor with the respective results per impact category and module.

Core Environmental Impact indicators according to EN 15804

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	9,31E-01	1,47E-01	1,68E-01	0,00E+00	0,00E+00	3,38E-03	0,00E+00	3,61E-02	-7,59E-02
GWP-fossil	kg CO_2 eq.	1,06E+00	1,45E-01	4,08E-02	0,00E+00	0,00E+00	3,39E-03	0,00E+00	1,69E-02	-2,22E-02
GWP-biogenic	kg CO_2 eq.	-1,28E-01	0,00E+00	1,27E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,92E-02	-5,36E-02
GWP-LULUC	kg CO_2 eq.	6,15E-04	1,33E-03	4,37E-05	0,00E+00	0,00E+00	3,11E-05	0,00E+00	4,97E-05	-2,90E-05
ODP	kg CFC 11 eq.	1,16E-09	1,26E-14	2,75E-11	0,00E+00	0,00E+00	2,95E-16	0,00E+00	6,57E-17	-1,52E-13
AP	mol H^+ eq.	8,23E-03	1,89E-04	1,90E-04	0,00E+00	0,00E+00	4,23E-06	0,00E+00	1,21E-04	-6,75E-05
EP-freshwater	kg P eq.	7,18E-06	5,24E-07	2,88E-07	0,00E+00	0,00E+00	1,22E-08	0,00E+00	2,84E-08	-6,33E-08
EP-marine	kg N eq.	8,46E-04	6,63E-05	4,23E-05	0,00E+00	0,00E+00	1,47E-06	0,00E+00	3,14E-05	-2,03E-05
EP-terrestrial	mol N eq.	2,36E-02	7,98E-04	5,69E-04	0,00E+00	0,00E+00	1,77E-05	0,00E+00	3,44E-04	-2,22E-04
POCP	kg NMVOC eq.	1,89E-03	1,63E-04	8,27E-05	0,00E+00	0,00E+00	3,65E-06	0,00E+00	9,49E-05	-6,26E-05
ADP-minerals&metals*	kg Sb eq.	1,38E-07	9,28E-09	3,29E-09	0,00E+00	0,00E+00	2,17E-10	0,00E+00	1,60E-09	-2,26E-09
ADP-fossil*	MJ	1,49E+01	1,96E+00	4,02E-01	0,00E+00	0,00E+00	4,57E-02	0,00E+00	2,25E-01	-4,64E-01
WDP*	m^3	1,00E-01	1,66E-03	4,03E-03	0,00E+00	0,00E+00	3,88E-05	0,00E+00	1,81E-03	-7,34E-03

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

**Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP- GHG[1]	kg CO_2 eq.	1,06E+00	1,47E-01	4,08E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

[1]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 CO_2 is set to zero.

Resource use indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ	8,60E-01	1,38E-01	5,17E-02	0,00E+00	0,00E+00	3,24E-03	0,00E+00	3,02E-02	-6,84E-01
PERM	MJ	1,37E+00	0,00E+00	-9,22E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,23E+00	1,38E-01	4,25E-02	0,00E+00	0,00E+00	3,24E-03	0,00E+00	3,02E-02	-6,84E-01
PENRE	MJ	1,46E+01	1,96E+00	3,87E-01	0,00E+00	0,00E+00	4,58E-02	0,00E+00	2,25E-01	-4,64E-01
PENRM	MJ	3,77E-01	0,00E+00	7,55E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,49E+01	1,96E+00	3,94E-01	0,00E+00	0,00E+00	4,58E-02	0,00E+00	2,25E-01	-4,64E-01
SM	kg	2,95E-03	0,00E+00	5,91E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	4,66E-01	0,00E+00	9,31E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	4,69E-03	1,52E-04	1,53E-04	0,00E+00	0,00E+00	3,56E-06	0,00E+00	5,54E-05	-1,91E-04

Acronyms

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Waste indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,54E-07	7,25E-12	5,25E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	7,40E-02	2,83E-04	4,54E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	1,89E-03	2,53E-06	4,08E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Output flow indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	3,66E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	5,12E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	5,84E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional impact categories and indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	Disease incidence	2,37E-07	1,27E-09	4,98E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
IRP	kBq U235 eq.	4,85E-01	3,66E-04	1,02E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETP - fw	CTUe	5,45E+00	1,36E+00	2,18E-01	4,03E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP - c	CTUh	7,86E-10	2,78E-11	1,87E-11	2,96E-15	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP - nc	CTUh	6,25E-09	1,48E-09	4,29E-10	3,66E-17	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SQP	-	2,36E+01	8,16E-01	5,05E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acronyms	PM= Particulate matter emissions; IRP= Ionising radiation, human health; ETP-fw= Ecotoxicity (freshwater); ETP-c= Human toxicity, cancer effects; HTP-nc= Human toxicity, non-cancer effects; SQP= Land use related impacts / soil quality									

Biogenic Carbon content

Results per declared unit

Indicator	Unit	Value
Biogenic carbon content in product	Kg C	5,23E-03
Biogenic carbon content in packaging	Kg C	3,05E-02

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

Annex 1: Facings

The LCA approach for the facings options follows the general methodology and assumptions as for the stone wool insulation products.

This annex includes impact assessment results and life cycle indicators for all facing options relevant for the products covered by this EPD.

The results are given per m^2 facing applied.

The environmental impact of a product with facing is calculated as follows:

$$\text{Environmental Impact per } m^2{}_{\text{product-with facing}} = \text{Environmental Impact}_{\text{product without facing}} + \text{Environmental Impact}_{\text{facing material}}$$

The disposal scenario is assumed to be landfill for all the facing options.
The following facings are included in this annex:

- Aluminium foil
- Nonwoven glass fleece
- Kraft paper

The system boundaries are identical to those applied in the main document.

Results for Aluminium foil facing per 1m²

Core Environmental Impact indicators according to EN 15804

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	6,90E-01	9,71E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-fossil	kg CO_2 eq.	6,96E-01	9,62E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-biogenic	kg CO_2 eq.	-6,21E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-LULUC	kg CO_2 eq.	1,92E-04	8,81E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ODP	kg CFC 11 eq.	4,26E-12	8,33E-16	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
AP	mol H^+ eq.	3,21E-03	1,25E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-freshwater	kg P eq.	4,29E-07	3,47E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-marine	kg N eq.	4,93E-04	4,39E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-terrestrial	mol N eq.	5,37E-03	5,28E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP	kg NMVOC eq.	1,64E-03	1,08E-05	0,00E+00	0,00E+00	-1,75E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-minerals&metals*	kg Sb eq.	3,51E-08	6,14E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-fossil*	MJ	9,39E+00	1,29E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
WDP*	m^3	1,03E-01	1,10E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

**Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP- GHG[1]	kg CO_2 eq.	6,96E-01	9,71E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

[1]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 CO_2 is set to zero.

Resource use indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ	4,13E+00	9,15E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	4,13E+00	9,15E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRE	MJ	9,41E+00	1,30E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	9,41E+00	1,30E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	9,51E-03	1,01E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Acronyms: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Waste indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4,93E-10	4,80E-13	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	1,88E-01	1,87E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	5,62E-04	1,68E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Output flow indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional impact categories and indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	Disease incidence	3,59E-08	8,42E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
IRP	kBq U235 eq.	1,14E-01	2,42E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETP - fw	CTUe	3,21E+00	9,03E-02	0,00E+00	3,87E-08	-3,60E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP - c	CTUh	3,77E-10	1,84E-12	0,00E+00	2,84E-15	-2,64E-15	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP - nc	CTUh	8,02E-09	9,76E-11	0,00E+00	3,52E-17	-3,27E-17	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SQP	-	1,98E+00	5,40E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acronyms	PM: Particulate matter emissions; IRP: Ionising radiation, human health; ETP-fw: Ecotoxicity (freshwater); ETP-c: Human toxicity, cancer effects; HTP-nc: Human toxicity, non-cancer effects; SQP: Land use related impacts / soil quality									

Biogenic Carbon content

Results per declared unit

Indicator	Unit	Value
Biogenic carbon content in product	Kg C	0,00E+00
Biogenic carbon content in packaging	Kg C	0,00E+00

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

Results for Nonwoven glass fleece facing per 1m²

Core Environmental Impact indicators according to EN 15804

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1,12E-01	7,77E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-fossil	kg CO_2 eq.	1,16E-01	7,70E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-biogenic	kg CO_2 eq.	-4,06E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-LULUC	kg CO_2 eq.	3,17E-05	7,05E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ODP	kg CFC 11 eq.	3,70E-12	6,66E-16	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
AP	mol H^+ eq.	8,05E-04	9,98E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-freshwater	kg P eq.	3,43E-07	2,77E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-marine	kg N eq.	1,13E-04	3,51E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-terrestrial	mol N eq.	1,31E-03	4,22E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP	kg NMVOC eq.	3,39E-04	8,63E-06	0,00E+00	0,00E+00	-1,75E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-minerals&metals*	kg Sb eq.	2,01E-08	4,91E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-fossil*	MJ	2,04E+00	1,03E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
WDP*	m^3	1,34E-02	8,77E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

**Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP- GHG[1]	kg CO_2 eq.	1,16E-01	7,77E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

[1]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 CO_2 is set to zero.

Resource use indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ	6,08E-01	7,32E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	6,08E-01	7,32E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRE	MJ	2,04E+00	1,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,04E+00	1,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	4,58E-04	8,07E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Acronyms: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Waste indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,61E-10	3,84E-13	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	1,19E-02	1,50E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	5,82E-05	1,34E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Output flow indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional impact categories and indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	Disease incidence	5,69E-09	6,74E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
IRP	kBq U235 eq.	6,36E-03	1,94E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETP - fw	CTUe	4,73E-01	7,22E-02	0,00E+00	3,81E-08	-3,60E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP - c	CTUh	2,56E-10	1,47E-12	0,00E+00	2,80E-15	-2,64E-15	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP - nc	CTUh	1,36E-09	7,81E-11	0,00E+00	3,47E-17	-3,27E-17	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SQP	-	1,30E+00	4,32E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Acronyms: PM= Particulate matter emissions; IRP= Ionising radiation, human health; ETP-fw= Ecotoxicity (freshwater); ETP-c= Human toxicity, cancer effects; HTP-nc= Human toxicity, non-cancer effects; SQP= Land use related impacts / soil quality

Biogenic Carbon content

Results per declared unit

Indicator	Unit	Value
Biogenic carbon content in product	Kg C	0,00E+00
Biogenic carbon content in packaging	Kg C	0,00E+00

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

Results for Kraft paper facing per 1m²

Core Environmental Impact indicators according to EN 15804

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	-1,08E-01	1,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-fossil	kg CO_2 eq.	4,02E-02	1,15E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-biogenic	kg CO_2 eq.	-1,49E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP-LULUC	kg CO_2 eq.	1,54E-04	1,06E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ODP	kg CFC 11 eq.	4,04E-12	9,99E-16	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
AP	mol H^+ eq.	2,23E-04	1,50E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-freshwater	kg P eq.	1,65E-06	4,16E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-marine	kg N eq.	9,49E-05	5,27E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP-terrestrial	mol N eq.	9,13E-04	6,34E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP	kg NMVOC eq.	2,56E-04	1,30E-05	0,00E+00	0,00E+00	-1,75E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-minerals&metals*	kg Sb eq.	1,27E-08	7,36E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADP-fossil*	MJ	5,99E-01	1,55E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
WDP*	m^3	8,73E-03	1,32E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

**Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP- GHG[1]	kg CO_2 eq.	4,04E-02	1,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

[1]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 CO_2 is set to zero.

Resource use indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	MJ	2,94E+00	1,10E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERM	MJ	1,35E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	4,29E+00	1,10E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRE	MJ	6,00E-01	1,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	6,00E-01	1,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	3,90E-04	1,21E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Acronyms

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Waste indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	2,02E-08	5,76E-13	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	3,12E-03	2,24E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	kg	2,81E-05	2,01E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Output flow indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Additional impact categories and indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	Disease incidence	3,88E-09	1,01E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
IRP	kBq U235 eq.	4,62E-03	2,90E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETP - fw	CTUe	2,67E-01	1,08E-01	0,00E+00	3,92E-08	-3,60E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP - c	CTUh	1,27E-11	2,20E-12	0,00E+00	2,88E-15	-2,64E-15	0,00E+00	0,00E+00	0,00E+00	0,00E+00
HTP - nc	CTUh	6,42E-10	1,17E-10	0,00E+00	3,57E-17	-3,27E-17	0,00E+00	0,00E+00	0,00E+00	0,00E+00
SQP	-	1,97E+01	6,48E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acronyms	PM= Particulate matter emissions; IRP= Ionising radiation, human health; ETP-fw= Ecotoxicity (freshwater); ETP-c= Human toxicity, cancer effects; HTP-nc= Human toxicity, non-cancer effects; SQP= Land use related impacts / soil quality									

Biogenic Carbon content

Results per declared unit

Indicator	Unit	Value
Biogenic carbon content in product	Kg C	3,87E-02
Biogenic carbon content in packaging	Kg C	0,00E+00

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

Additional environmental information

ROCKWOOL ESG performance

In 2022, ROCKWOOL ranked 16th overall among the world's most sustainable companies and #1 globally among Building Products companies, according to the prestigious Corporate Knights Global 100 most sustainable companies index.



For analysis and rankings on ROCKWOOL ESG visit: https://www.rockwool.com/group/about-us/sustainability/esg/

ROCKWOOL decarbonisation commitment

ROCKWOOL is a net carbon negative company with our stone wool building insulation sold in 2022 saving in its lifetime[1] more than 100 times the energy consumed, and CO_2 emitted in its production. Saving energy and reducing emissions create a significant positive impact, helping communities and society at large to build greater climate change resilience.

Over its lifetime ROCKWOOL building insulation sold in 2022 will save 197 million tonnes CO_2 emissions, equivalent to more than 38 million homes' annual electricity use[2]. So while the production is energy-intensive, ROCKWOOL is are saving far more – actually, 100 times[3] more energy than is consumed and carbon that is emitted to make these products.
There are currently no standard methodologies for calculating the avoided emissions of products also known as Scope 4 emissions, although there are developments in that field that ROCKWOOL supports[4].

[1] 65 years

[2] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

[3] The calculation "100 times" is based on the principle of ceteris paribus.

[4] World Resource Institute, 2019, Estimating and reporting the comparative emissions impacts of products: Avoided emissions are emission reductions that occur outside of a product's lifecycle or value chain, but as a result of the use of that product https://ghgprotocol.org/estimating-and-reporting-avoided-emissions
https://www.linkedin.com/posts/dominic-waughray-bb20942_week2-avoidedemissions-greenhousegasemissions-activity-6998159859711930369-93qD?utm_source=share&utm_medium=member_ios

Circularity of ROCKWOOL stone wool

ROCKWOOL stone wool is based on stone, one of the most abundant raw materials on the planet[5]. Although stone is plentiful, it is still important to minimise the use of natural resources. This is especially true in the construction sector, which produces one-third of all waste globally[6], much of which ends up in landfill.

The vast majority of ROCKWOOL products can be easily removed when a building is renovated or demolished and recycled back into new products – without losing performance.

By recycling stone wool, the consumption of primary materials is reduced and replaced by recycled wool, and the waste going to landfill is also reduced.



Recycled, recovered and by-product content for Italian CAM

Recycled, recovered and by-product content are expressed quantitatively as a percentage, calculated as shown below.

$$X\,(\%) = \frac{A}{P} \times 100$$

Where:

X is the recycled/recovered/by-product content, expressed as a percentage;

A is the mass of recycled/recovered/by-product material;

P is the mass of product.

Recycled content	Recovered content	External by-product content	Internal by-product content
9%	0%	26%	0%

[5] TW Dahl, et al. (2011), International Geology Review (Volume 53 Numbers 7–8, June–July 2011) 'The human impact on natural rock reserves using basalt, anorthosite, and carbonates as raw materials in insulation products', p. 901

[6] https://www.bbc.com/future/article/20211215-the-buildings-made-from-rubbish

Durability of ROCKWOOL stone wool

ROCKWOOL stone wool is durable by nature, just like the basalt rock it is made from. It keeps its shape and thermal performance in all conditions, and is resistant to both corrosion and mould. Its performance is unaffected by weather, humidity, or temperature changes – and needs no technical supervision or maintenance throughout the building's lifetime.

The thermal, fire-resistance, and acoustic performance of ROCKWOOL stone wool products, when correctly installed, remains the same during the life time of the building.[7]

Safety of ROCKWOOL stone wool and information regarding its disposal

ROCKWOOL stone wool fibres are proven to be safe to manufacture, install and live with. They comply with the European REACH regulation and do not have any health-related classifications.

ROCKWOOL insulation products do not contain flame retardants and blowing agents, and are proven not to have a negative impact on the indoor environment.

ROCKWOOL stone wool does not contain SVHC or CMR substances (Carcinogen, Mutagen, Reprotoxic) under REACH >0,1%. The products do not contain CLP classified substances >0,1%.

The non-hazardous nature of ROCKWOOL stone wool products leads, as regards their disposal, to the attribution of the European Waste Catalog (CER – Catalogo Europeo dei Rifiuti) code 17 06 04. Compliance with Note Q must be verified with an evaluation of the documentation relating to the source material of the waste.

If there is no documentary analysis that certifies that the product complies with Note Q, the waste is classified as a precaution with the code EWC 17 06 03.

In Italy, in 2016 the document "Artificial Glass Fibres (FAV) – Guidelines for the application of the legislation relating to the risks of exposure and prevention measures for the protection of health" was approved. The document contains in-depth information regarding the identity and properties of artificial vitreous fibres, their classification according to the regulatory aspects in force, in addition to the indications operational for the implementation and disposal and management of waste containing FAV. The national legislation on hazard classification derives from this document.

According to the current Italian regulation, the waste consisting of mineral wool can be disposed of in landfills for non-hazardous waste, regardless of their classification as dangerous or non-hazardous. The waste is directly within the landfill in dedicated cells, made with the same criteria used for inert waste. Dispose the packaging materials in accordance with local regulations.

For more information visit https://www.rockwool.com/it/download-strumenti/approfondimento-salute-e-sicurezza/

More details about ROCKWOOL's environmental work

https://www.rockwool.com/it/chi-siamo/sostenibilita/

https://www.rockwool.com/group/about-us/sustainability/

[7] FIW, Durability Project Mineral Wool(2016), p.29, Chapter 7 "Conclusions and Outlook" + EN 13162 "Thermal insulation products for buildings -Factory made mineral wool (MW) products -Specification "

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Thermal insulation products - Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations.

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

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

EN 15804
EN 15804:2012-04+A2 2013: Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products.

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