ENVIRONMENTAL AND HEALTH PRODUCT DECLARATION

In compliance with regulation EN 15804 (European Standard)

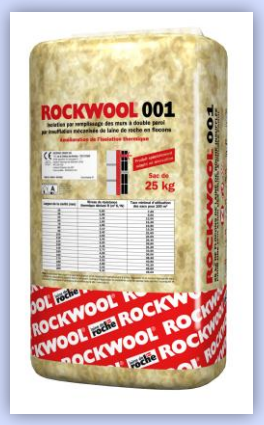
ROCKWOOL 001

50 mm

R=1,30 K.m².W^{-1}

Date of issue: 13/07/2016

Edition: 1.1



ROCKWOOL®
FIRESAFE INSULATION

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Warning

The information contained within this declaration is provided under the responsibility of ROCKWOOL France S.A.S. (producer of the environmental and health product declaration) based on EN 15804 (European Standard).

Any commercial use, full or partial, of information supplied in this document must at least be accompanied by a complete reference to the original environmental and health product declaration as well as its supplier who will be able to supply a full copy.

Regulation EN 15804 is used as definition standards for product categories (PCR).

This declaration was established based on common methodological principles developed by PWC (Price Waterhouse Cooper): July 2014.

Reading guide:

Reading example: -9,0 E -03 = -9,0 x 10-3

The following set of display rules apply:

- When the outcome of the inventory calculation is zero, the value zero is displayed.
- Abbreviation used: N/A : Not Applicable
  FU: Functional Unit
- The units used are explained in front of each rate: kilogram "kg", gram "g", kilowatt-hour "kWh", megajoule "MJ", square metre "m2", kelvin "K", watt "W", kilometre "km", millimetre "mm".

Caution when using environmental and health product declaration in products comparison

The environmental and health product declaration for construction products may not be comparable if the products do not comply with regulation EN 15804.

Regulation EN 15804 sets out the conditions in which the building products can be compared in § 5.3 "Comparability of Environmental Product Declarations for Construction Products" based on information supplied by the environmental and health product declaration:

"An environmental performance comparison of construction products using information in the environmental product declaration must be based on use of the products and their impacts on the building, and must take into account the full life cycle (all the information modules)."

General Information

Manufacturer:

ROCKWOOL France S.A.S.

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FRANCE
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http://www.rockwool.fr

Type of Environmental Declaration: "From the cradle to the grave", Individual environmental and health product declaration

Product category identification regulation: Regulation EN 15804 is used as definition standards for product categories (PCR).

Product name and manufacturer(s) represented: ROCKWOOL 001 50 mm thickness, R= 1,30 K.m².W^{-1} manufactured at Saint Eloy les Mines factory for ROCKWOOL France S.A.S.

The study that allowed this declaration to be written was performed by ROCKWOOL France S.A.S.

Publication date: 13/07/2016, Valid until: 13/07/2021 (validity period of five years)

Independent external verification performed in accordance with the AFNOR-INIE programme by: N/A

Verifier: N/A

Description of the functional unit and product

Description of the functional unit

Considering the functions of this product, the functional unit can be described thus:

Performance of a thermal insulation function on 1m^2 of wall by insuring the thermal resistance of R = 1,30 K.m².W^{-1} for cavity wall insulation.

Product description and use:

This environmental and health product declaration describes the environmental impacts of 1m^2 stone wool.

ROCKWOOL France S.A.S. manufactures with natural and plentiful raw materials (volcanic rock) or from recycled materials (briquettes) by melting and spinning of the stone wool. The products obtained are "a mat of mineral wool" made of a supple and airy structure.
On Earth, the best insulator is dry-still air at 10°C: its coefficient of thermal conductivity, expressed in lambda (λ) is 0.025 W/(m.K) (Watt per metre kelvin degree). The thermal conductivity of mineral wool is close to that of still-air since their lambda varies from 0.030W (m.K) for the most efficient ones to 0.040W (m.K) for the least efficient ones.

By virtue of its tangled structure, stone wool is a porous material that traps air, which makes it one of the best available solutions for insulation. The porous and elastic structure of mineral wool improves sound absorption and impact noise and it also allows for acoustical correction within premises. Finally, as it is based on inherently incombustible minerals, mineral wool does not feed fires or spread flames.

Mineral wool insulation (stone wool) is used in buildings as well as industrial facilities. It guarantees a high-level of comfort, reduces energy costs, minimises carbon dioxide emissions (CO_2), prevents heat escape through sloped roofs, walls, floors, pipes and boilers, and reduces noise pollution and protections houses and industrial facilities from the fire hazards.

The lifetime of a mineral wool product is similar to that of a building, provided the component is part of it (often set at 50 years).

Technical data and physical features:

Product thermal resistance: 1,30 $K.m^2.W^{-1}$ (N° ACERMI: 14/D/015/991)

Product's thermal conductivity: 0,037 W / (m.K)

Reaction to fire: Euroclasse A1

Acoustic properties: N/A

Description of the main components and/or materials for 1m² of product:

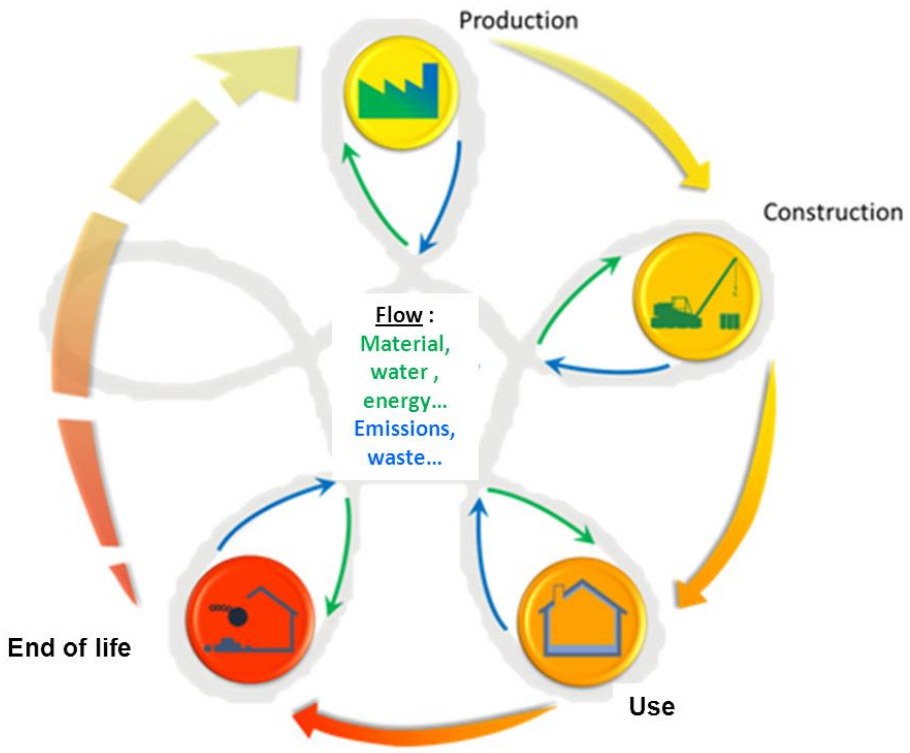
Parameter	Value
Quantity of mineral wool	3 kg
Thickness	50 mm
Surfacing	None
Packaging for transport and distribution	0,05 kg

Reference service life's description

Reference service life	50 years
Reason	The lifetime of reference chosen corresponds to the period around which it is assumed that a building will be renovated due to requirements independent of the lifetime of the product (this may exceed 50 years). The product retains its technical performance for the whole duration of its lifetime.
Maintenance	Not relevant

Life cycle stages

Life cycle diagram



Production stage, A1-A3

Stage description:
The production of mineral wool products is subdivided in three modules: A1 - raw material supply; A2 - transport and A3 - manufacture.
Consolidation of modules A1, A2 and A3 is allowed under standard EN 15804. This regulation is applied to this environmental and health product declaration.

A1 Raw material supply

This module takes into account the supply and treatment of all raw materials and the energy produced before manufacture. It covers the supply of raw materials for manufacture of the binder and mineral fibers in particular, like basalt and slag. In addition to these raw materials, recycled materials (briquettes) are used as input materials.

A2 Transport to manufacturer's location

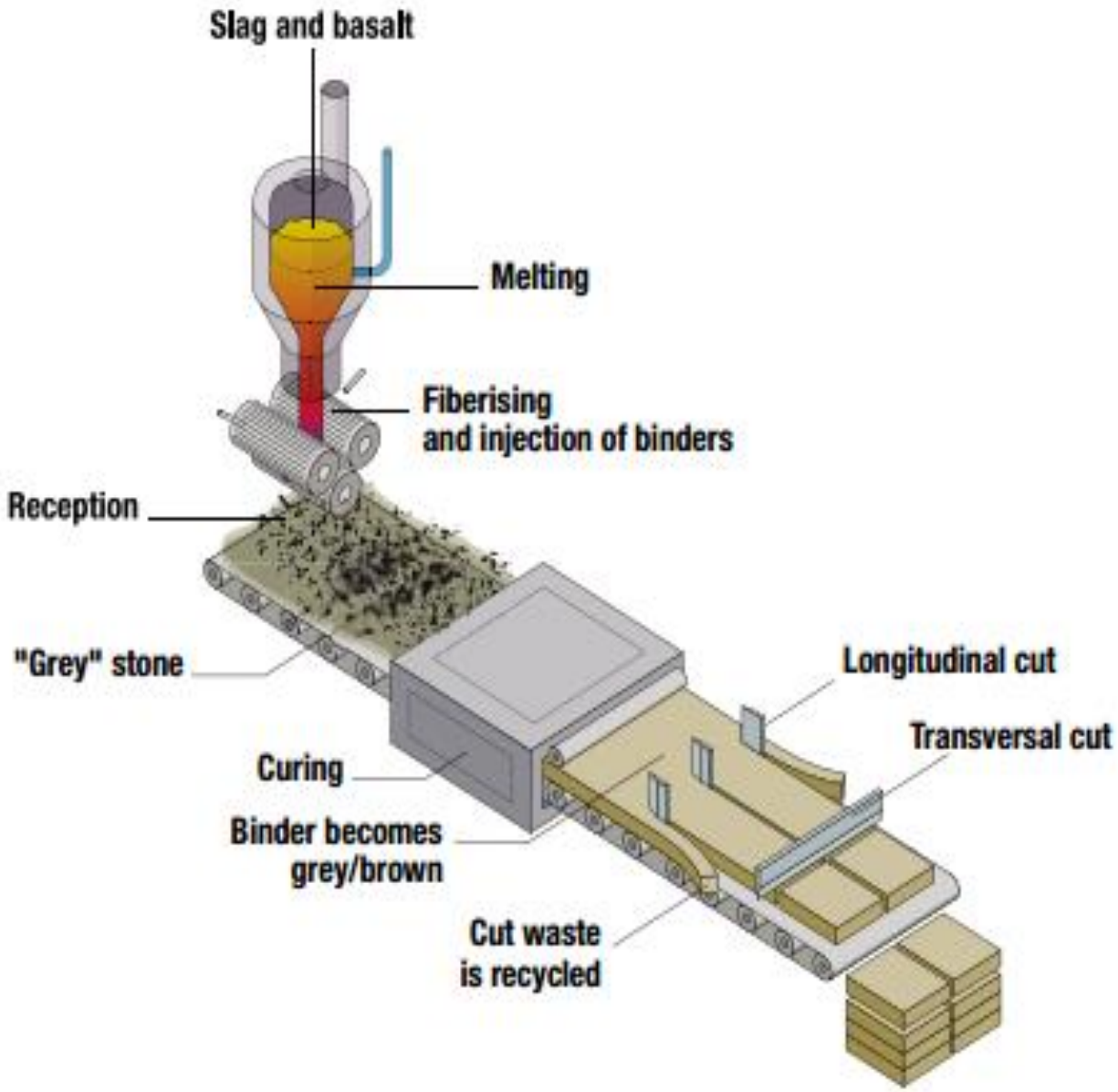
The raw materials are transported to the manufacturing site. The modelling for each of the raw materials includes road or sea transport (average values).

A3 Manufacturing

The manufacture of stone wool includes melting and spinning process phases (please see manufacture procedure diagram). In addition, the production of packaging is taken into account during this stage.

Manufacture procedure diagram

Stone wool production



Construction stage, A4-15

Stage description:
The construction stage is divided in two modules: A4- transport to the building site and A5 - installation in the building.

Description of additional scenarios and technical information:

A4 Transport to the building site:

This module includes transport leaving the factory to the site.
Transport is calculated based on a situation that includes the following parameters:

Parameter	Value
Type of fuel and consumption required by the vehicle or type of vehicle used for transporting, for example, long haul lorry, boat, etc.	Lorry with a 24T carrying capacity, and consumption of 38 litres of diesel to 100 km.
Average distance to the building site:	460 km
Capacity utilisation (including empty return)	100 % of the capacity in volume 30 % of empty return
Density of transported product	250 m² per pallet and 18 pallets per lorry
Volume capacity utilisation factor	See previous information

A5 Installation in building:

This module includes waste products at the time the mineral wool is installed in the building, the production of additional material produced to make up for losses and treatment of site waste. The scenarios used for the amount of waste produced at the time of implementation and the treatment of site waste is as follows:

Parameter	Value
Quantitative description of type of energy (regional mix) and consumption during the installation process.	Electricity : 0,04 kWh
Waste products on the building site before waste treatment generated by installation of the product (defined by type).	2 % of stone wool
Materials (defined by type) generated by waste treatment on the building site, for example, intended for recycling, energy recovery, and removal (defined by area).	Waste packaging is collected and salvaged. All stone wool waste is put in a landfill.

Use stage (excluding potential savings), B1-B7.

Stage description:
The usage stage is divided in seven modules:

- B1 Usage or application of the installed product
- B2 Maintenance
- B3 Repair
- B4 Replacement
- B5 Refurbishment
- B6 Operational energy use
- B7 Operational water use

Description of additional scenarios and technical information:

No technical operations are required during the use stage until the product's end-of-life. Thus, mineral wools do not have an impact during this phase but they do allow for potential energy savings (please see additional information in annex)

End-of-life stage, C1-C4

Stage description:
This phase includes the following end-of-life modules: C1- dismantling, demolition; C2- transport to the waste treatment area; C3- treatment of waste intended for reuse, recovery and/or recycling; C4 - removal.

Description of additional scenarios and technical information:

C1 Dismantling and demolition:

The dismantling of insulating products is part of the demolition of the entire building. In our case, the environmental impact is supposed to be very low and can be disregarded.

C2 Transport to the waste treatment area:

Parameter	Value
Collection process defined by type	3 kg of stone wool (collected with mixed construction waste)
Recovery system is defined by type	No reuse, recycling or energy recovery
Removal is defined by type	3 kg of stone wool put in non-hazardous non-inert waste storage
Hypotheses for scenario development (for example transport)	Lorry with a 24T carrying capacity, and consumption of 38 litres of diesel to 100 km. 30 km

C3 Treatment of waste intended for reuse, recovery and/or recycling:

The product is deemed as being put in a landfill without reuse, recovery and/or recycling.

C4 Disposal:

The stone wool is supposed to be put in non-hazardous non-inert waste storage in full.

Benefits and loads, D

Description of additional scenarios and technical information:

The development potential of module A5 waste packaging is deemed insignificant and may be excluded.

• Information for calculating the life cycle analysis

PCR used	Regulation EN 15804 is used as definition standards for product categories (PCR).
System boundaries	From the cradle to the grave: phases = A1-3, A4-5, B1-7, C1-4 and optional phases = D
Allowances	Allowance criteria are based on mass
Geographical representation And Time period	Country of production: France, Country of use: Spain; Production data: 2015. Secondary database: DEAM and EcoInvent
Result variability	N/A

• Results of the life cycle assessment

The LCA model, aggregation of data and environmental impacts are calculated using TEAM 5.2 ™ software.

Below you will find tables that summarise the results of the LCA.

ENVIRONMENTAL IMPACTS

Environmental Impacts	Production stage	Construction stage		Use stage							End-of-life stage				D Benefits and loads beyond the boundaries of the system
	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 Dismantling/ demolition	C2 Transport	C3 Waste treatment	C4 Disposal	
Global Warming Potential (GWP) *kg CO_2 equiv/UF*	7.6	9.1E-01	0	0	0	0	0	0	0	0	0	5.6E-03	0	0	0
	The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1.														
Ozone Depletion (ODP) *kg CFC 11 equiv/UF*	6.6E-07	6.3E-07	0	0	0	0	0	0	0	0	0	3.9E-09	0	0	0
	Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules..														
Acidification Potential (AP) *kg SO_2 equiv/UF*	5.7E-02	5.5E-03	0	0	0	0	0	0	0	0	0	3.4E-05	0	0	0
	Acid depositions have negative impacts on natural ecosystems and the man-made environment incl, buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport.														
Eutrophication Potential (EP) *kg $(PO_4)^{3-}$ equiv/UF*	3.8E-03	1.3E-03	2.2E-07	0	0	0	0	0	0	0	0	8.3E-06	0	1.1E-05	0
	Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects.														
Photochemical ozone creation (POPC) *kg Ethene equiv/UF*	4.0E-03	4.0E-04	0	0	0	0	0	0	0	0	0	2.5E-06	0	0	0
	Chemical reactions brought about by the light energy of the sun. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.														
Abiotic Depletion Potential for non-fossil resources (ADP-elements) *kg Sb equiv/UF*	5.6E-07	8.1E-10	0	0	0	0	0	0	0	0	0	5.0E-12	0	0	0
Abiotic Depletion Potential for fossil resources (ADP-fossils) *MJ/UF*	224	11	0	0	0	0	0	0	0	0	0	7.0E-02	0	0	0
	Consumption of non-renewable resources, thereby lowering their availability for future generations.														
Air pollution - *m^3/UF*	809	92	0	0	0	0	0	0	0	0	0	5.7E-01	0	0	0
Water pollution - *m^3/UF*	1.1	2.5E-01	1.6E-04	0	0	0	0	0	0	0	0	1.5E-03	0	7.6E-03	0

RESOURCES USE

Resources use	Production stage	Construction stage		Use stage							End-of-life stage				D Benefits and loads beyond the boundaries of the system
	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 Dismantling/ demolition	C2 Transport	C3 Waste treatment	C4 Disposal	
Use of renewable primary energy excluding renewable primary resources used as raw materials -*MJ/UF*	9.1	7.7E-03	0	0	0	0	0	0	0	0	0	4.8E-05	0	0	0
Use of renewable primary energy used as raw materials - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/UF*	9.1	7.7E-03	0	0	0	0	0	0	0	0	0	4.8E-05	0	0	0
Use of non-renewable primary energy excluding non-renewable primary resources used as raw materials -*MJ/UF*	141	11	0	0	0	0	0	0	0	0	0	7.0E-02	0	0	0
Use of non-renewable primary energy used as raw materials - *MJ/UF*	30	3.7E-05	0	0	0	0	0	0	0	0	0	2.3E-07	0	0	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/UF*	171	11	0	0	0	0	0	0	0	0	0	7.0E-02	0	0	0
Use of secondary material - *kg/UF*	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of net fresh water - m^3/*UF*	3.2E-02	1.1E-03	0	0	0	0	0	0	0	0	0	6.7E-06	0	0	0

WASTE CATEGORIES

Waste categories	Production stage	Construction stage		Use stage							End-of-life stage				D Benefits and loads beyond the boundaries of the system
	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 Dismantling/ demolition	C2 Transport	C3 Waste treatment	C4 Disposal	
Hazardous waste disposed - *kg/UF*	5.6E-02	3.4E-04	0	0	0	0	0	0	0	0	0	2.1E-06	0	0	0
Non- hazardous waste disposed - *kg/UF*	2.0	1.5E-03	6.1E-02	0	0	0	0	0	0	0	0	9.4E-06	0	3.0	0
Radioactive waste disposed - *kg/UF*	2.5E-04	1.8E-04	0	0	0	0	0	0	0	0	0	1.1E-06	0	0	0

OUTPUTS FLOWS

Outputs	Production stage	Construction stage		Use stage							End-of-life stage				D Benefits and loads beyond the boundaries of the system
	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 Dismantling/ demolition	C2 Transport	C3 Waste treatment	C4 Disposal	
Components intended for re-use - *kg/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials intended for recycling - *kg/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials intended for energy recovery - *kg/UF*	9.5E-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electrical energy exported outside - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Steam energy exported outside - *MJ/UF*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas energy exported outside - MJ/UF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ENVIRONMENTAL IMPACTS Aggregation of different modules to carry out a "Full stage" or "Full Life Cycle"					
Impacts/flow *unit*	**Production stage**	**Construction stage**	**Use stage**	**End-of-life stage**	**Full life cycle**
ENVIRONMENTAL IMPACTS					
Global Warming Potential (GWP) *kg CO2 equiv/UF*	7.6	9.1E-01	0	5.6E-03	8.5
Ozone Depletion (ODP) *kg CFC 11 equiv/UF*	6.6E-07	6.3E-07	0	3.9E-09	1.3E-06
Acidification Potential (AP) *kg SO2 equiv/UF*	5.7E-02	5.5E-03	0	3.4E-05	6.3E-02
Eutrophication Potential (EP) *kg (PO4)3- equiv/UF*	3.8E-03	1.3E-03	0	1.9E-05	5.2E-03
Photochemical ozone creation (POPC) *kg Ethene equiv/UF*	4.0E-03	4.0E-04	0	2.5E-06	4.4E-03
Abiotic Depletion Potential for non-fossil resources (ADP-elements) *kg Sb equiv/UF*	5.6E-07	8.1E-10	0	5.0E-12	5.6E-07
Abiotic Depletion Potential for fossil resources (ADP-fossils) *MJ/UF*	224	11	0	7.0E-02	235
Air pollution - *m^3/UF*	809	92	0	5.7E-01	901
Water pollution - *m^3/UF*	1.1	2.5E-01	0	9.2E-03	1.4
USE OF RESOURCES					
Use of renewable primary energy excluding renewable primary resources used as raw materials -*MJ/UF*	9.1	7.7E-03	0	4.8E-05	9.1
Use of renewable primary energy used as raw materials - *MJ/UF*	0	0	0	0	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/UF*	9.1	7.7E-03	0	4.8E-05	9.1
Use of non-renewable primary energy excluding non-renewable primary resources used as raw materials - *MJ/UF*	141	11	0	7.0E-02	152
Use of non-renewable primary energy used as raw materials - *MJ/UF*	30	3.7E-05	0	2.3E-07	30
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/UF*	171	11	0	7.0E-02	182
Use of secondary material - *kg/UF*	3.5	0	0	0	3.5
Use of renewable secondary fuels - *MJ/UF*	0	0	0	0	0
Use of non-renewable secondary fuels - *MJ/UF*	0	0	0	0	0
Use of net fresh water - *m3/UF*	3.2E-02	1.1E-03	0	6.7E-06	3.4E-02
Waste categories					
Hazardous waste disposed - *kg/UF*	5.6E-02	3.4E-04	0	2.1E-06	5.7E-02
Non- hazardous waste disposed - *kg/UF*	2.0	6.3E-02	0	3.0	5.0
Radioactive waste disposed - *kg/UF*	2.5E-04	1.8E-04	0	1.1E-06	4.3E-04
Output flows					
Components intended for re-use - *kg/UF*	0	0	0	0	0
Materials intended for recycling - *kg/UF*	0	0	0	0	0
Materials intended for energy recovery - *kg/UF*	9.5E-01	0	0	0	9.5E-01
Electrical energy exported outside - *MJ/UF*	0	0	0	0	0
Steam energy exported outside - *MJ/UF*	0	0	0	0	0
Gas energy exported outside - *MJ/UF*	0	0	0	0	0

• Life cycle interpretation

Environnemental impacts / Stages	Production stage (A1-A3)	Construction stage (A4-A5)	Use stage (B1-B7)	End-of-life stage (C1-C4)	Total life cycle	Benefits and loads beyond the system boundaries (D)
Global warming *kg CO2 equiv /FU*	7.60	0.91	0.00	0.01	8.51 kg CO_2 equiv /UF	0.00
Depletion of abiotic resources (fossil fuels) *MJ/FU*	223.54	11.23	0.00	0.07	234.85 MJ/UF	0.00
Total use of primary energy resources *[1] MJ/FU*	179.72	11.32	0.00	0.07	191.10 MJ/UF	0.00
Net use of fresh water *m^3 /FU*	0.03	0.00	0.00	0.00	0.03 m^3/UF	0.00
Waste disposed*[2] kg/FU*	2.03	0.06	0.00	3.00	5.09 kg/UF	0.00

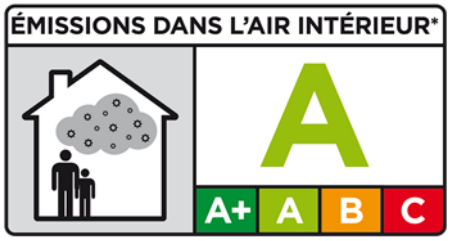
[1] Total of : "Total use of non-renewable primary energy resources" + "Total use of renewable primary energy resources".
[2] Total of : "Hazardous waste disposed" + "Non-hazardous waste disposed" + "Radioactive waste disposed".

• Additional information on the discharge of hazardous substances in the inside air, the ground and water during the use stage

Inside air

VOC and formaldehyde

The health category of the product ROCKWOOL 001 thickness 50 mm is “A” according to the Order of 19 April 2011 on labelling of building, wall coverings or floor products and of paints and varnishes with respect to their emission of volatile pollutants.



Mineral wool and health

- *Mechanical irritation of fibers*

  From January 2009, mineral wool fibers have no longer been classed as R38 due to skin irritation (Directive 2009/2/CE) and, therefore, they no longer have an irritant classification. The largest of these fibers (those with 5µm + diameter) may, just like any foreign body, cause itching. This type of itching is a mechanical reaction, not a chemical reaction. It is temporary.

- *Carcinogen classification of fibers*

  The fiber components of the mineral wool are exempt from the carcinogen category according to the Regulation on classification and labelling of substances and mixtures, Regulation (EC) No 1272/2008 and its first update Regulation (EC) No. 790/2009. They have successfully passed the tests intended for this Regulation and their biopersistence is lower than the values set out in note Q of this text. This exemption is certified by the European Certification Board (EUCEB - www.euceb.org).

  EUCEB certifies that the fibers comply with note Q of Regulation (EC) No 1272/2008. EUCEB guarantees that the exemption tests were performed in compliance with European protocols, manufacturers put control procedures in place during the manufacturing of the products, and third parties controlled and validated the results.

  The involvement of manufacturers in relation to EUCEB consists of:

  - Providing a test report created by a laboratory recognised by EUCEB which proves that the fibers fulfil one of the four conditions for exemption set out in Note Q of Regulation (EC) No. 1272/2008,
  - Having its production submitted to a twice yearly control performed by a third independent party which is recognised by EUCEB (swabs of samples and compliance with initial chemical analysis),
  - Putting control procedures in place in each factory.

The products that correspond to this certification are distinguishable thanks to EUCEB logo, which is placed on their packaging.

➢ *Carcinogen classification of fibers*

The recommendations to follow for implementing mineral wool insulation materials are similar to those usually applied to any type of site and they are as follows:

Cover exposed skin. When working in unventilated area, wear disposable face mask.

Rinse in cold water before washing.

Clean area using vacuum equipment.

Ventilate working area if possible.

Waste should be disposed of according to local regulations.

Wear goggles when working overhead.

In addition, the measures performed on building sites show that professionals installing mineral wool insulators face average exposure, which is lower than the level measured on production sites. These measures are carried out by request of the FILMM (French Mineral Wool Manufacturer's Association) on building sites in France by approved bodies.

	Individual measures performed on operating sites			
Type of applications	Number of measures	Average (f/ml)	Median (f/ml)	Probability of exceeding the limit value for occupational exposure (1/f/ml)
Walls - glass wool on metal framework	9	0.1	0.07	0.07%
Walls - wall lining	7	0.23	0.19	2.01%
Roofs - Glass wool to blow out	8	0.09	0.05	0.12%
Sloping parts of the building- glass wool	4	0.08	0.06	0.00%
Estimation - Slag wool (operator controlled)	6	0.07	0.06	0.00%
Estimation - Slag wool (estimation)	10	0.07	0.06	0.00%

Table: Results of the mineral wool fibers exposure measures performed in 2006 and 2007 on construction sites in France (source: FILMM - French Mineral Wool Manufacturer's Association)

- *Fibers during the life of the building*

OQAI (Indoor Air Quality Observatory) measured concentrations of mineral fibers in ambient air during its pilot study in 2002. These results, according to the OQAI did not show "any apparent specific features of indoor spaces. The measured values are of the order of 10-4 fibers per litre with no marked difference between outside and inside for the measured sites as a whole".

From the analysis of these results and the hierarchy organisation of the pollutants carried out by the OQAI group of experts, a conclusion was reached not to redo the fiber concentration measures in the indoor air of the housing during the 2003-2005 campaign.

The mineral wool fibers only represent a minimal part of the particles and breathable fibers present in the ambient air. In the areas for private or group use, the levels of exposure are of the order of 0.0002 to 0.005 fibers/ml, that is to say, 1/200th of the limit value for occupational exposure (Schneider T., 1995).

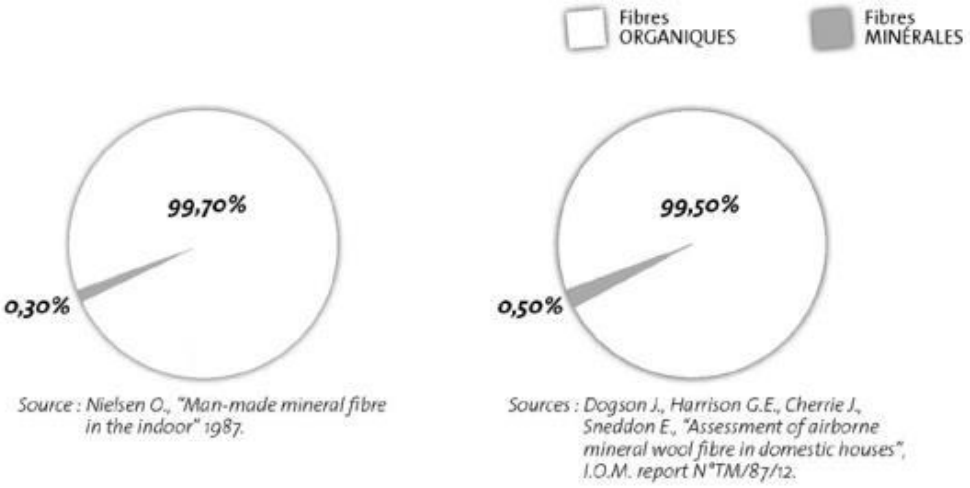


Figure: Fibers breathed in from the indoors air

Radioactive emissions

Not tested.

Not relevant for the product concerned in this environmental and health product declaration.

• Product contribution to life quality inside buildings

Features of the products participating in the creation of hygrothermally comfortable conditions in the building.

Insulation of interior walls contributes to a healthy and comfortable environment and an increase in comfortable heat as it reduces the effects of cold interior walls.

Its moisture barrier prevents any risk of condensation in the interior walls.

As well as comfort, insulation reduces the inside temperature, which is a way of reducing energy consumption.

Because of their manufacturing process, mineral wool offers a large choice of thickness and thermal resistance. Thermal conductivity of mineral wool is between 0.030 W/mK and 0.040 W/mK.

The thermal resistance and aptitude features for usage are certified by ACERMI, which guarantees that the stated performance of the product is trustworthy. In addition, they comply with the CE marking according to standard EN 13162 for manufactured building products. The ACERMI certificate number is: 14/D/015/991.

Mineral wool is rot-resistant by nature and is non-hydrophilic when used in buildings. It does not retain water and in the event of accidental dampening, it recovers its initial properties after it dries.

The natural suppleness of the products and their dimensions allow easy implementation and clean cutting which guarantee the wall has good thermal performance due to perfect draught proofing.

Features of the products participating in the creation of acoustically comfortable conditions in the building.

By nature mineral wool is efficient for insulation and acoustic correction. Its suppleness and apparent porosity are the reasons for this.

When it comes to cavity filling products (partitions; lining), mineral wool plays the role of shock absorber "Mass-spring-mass system". It is independent of facings.

For floating floors products or lining systems, wool guarantees the mechanical connection with the facing.

For acoustic correction products (decorative ceilings, wall claddings, etc.), the absorption coefficient α allows you to discover suitability for use.

For constituent raw materials, the acoustic and fire safety requirements are jointly respected.

Features of the products participating in the creation of acoustically comfortable conditions in the building.

Not affected as in normal using conditions the product is not visible indoors or from the outside.

Features of the products participating in the creation of olfactory comfortable conditions in the building.

Not tested.