

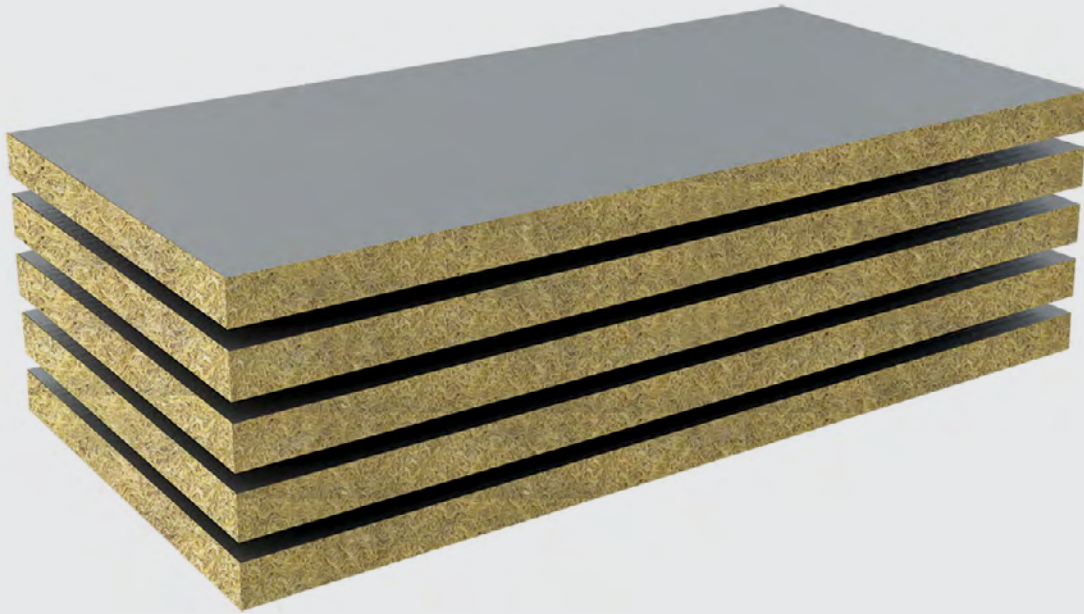
# ENVIRONMENTAL PRODUCT DECLARATION

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

## Stone Wool Boards with Aluminium Foil

from

# RBS Ravago



#### PROGRAMME

The International EPD® System  
[www.environdec.com](http://www.environdec.com)

#### PROGRAMME OPERATOR

EPD International AB & EPD Turkey

#### GEOGRAPHICAL SCOPE

Global

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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: [environdec.com](http://environdec.com)

# PROGRAMME INFORMATION

## Programme Information

**Programme** : The International EPD® System  
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## Information about verification and reference PCR:

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

### Product category rules (PCR)

PCR: PCR 2019:14 Construction products (EN 15804:A2) Version 1.1  
 c-PCR005 Thermal insulation products (EN 16783: 2017)

### PCR review was conducted by

The Technical Committee of the International EPD® System. See [www.environdec.com/TC](http://www.environdec.com/TC) for a list of members.  
 Review chair: Claudia A. Peña, University of Concepción, Chile.  
 The review panel may be contacted via the Secretariat [www.environdec.com/contact](http://www.environdec.com/contact).

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

EPD process verification  EPD verification

### Third party verifier

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### Approved by

International EPD System Technical Commiee,  
 supported by the Secretariat

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes  No

## LCA Study & EDP Design Conducted by

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*RBS Ravago has the sole ownership, liability, and responsibility for the EPD.*

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

# COMPANY INFORMATION

## Owner of the EPD

### RBS RAVAGO İNŞAAT YALITIM ÜRÜNLERİ A.Ş.

Organize San. Böl. 20. Cad. No: 54  
Kayseri / TURKEY

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The owner of the EPD - RBS RAVAGO - operates in more than 350 locations in 40 countries, being a member of the Belgium-based Ravago Group and a leader in the insulation industry by meeting the mineral rockwool requirement of an area of 20,000,000 sqm annually with its wide product range for thermal insulation, sound insulation and fire safety. RBS RAVAGO is located in Kayseri Organized Industrial Zone with its high technology equipment investments in a total area of 80,000 sqm with 56,000 sqm indoor area. RBS RAVAGO is the biggest mineral wool manufacturer in the region with an annual production capacity of 120,000 tonnes.

In addition to 25 different types of mineral rockwool products, RBS RAVAGO is producing Ceramic Wool and Agro used in soilless agriculture. RBS RAVAGO has become the only company in the sector supplying all mineral wool products in the last quarter of 2018 by starting mineral wool production with the new production line of glass wool. RBS RAVAGO, the only manufacturer that can produce all mineralwool insulation materials under the same roof, offers a wide range of products with new RBS RAVAGO bio according to various application areas.



## Production Site

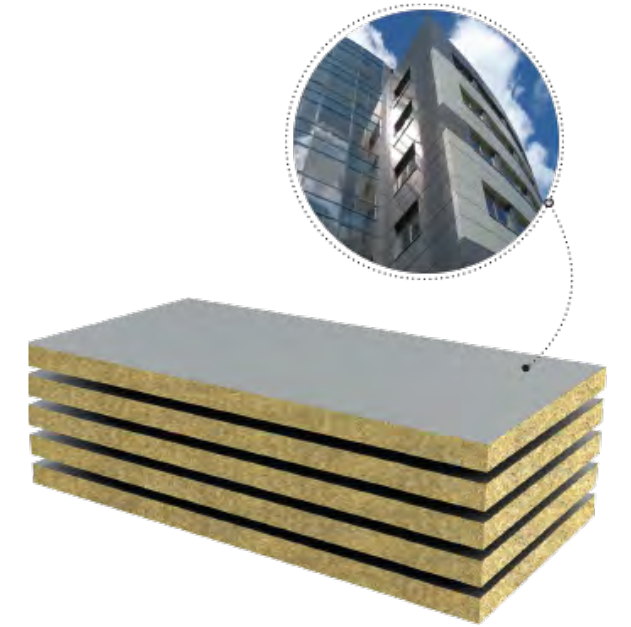
**Kayseri**  
Organize San. Böl. 20. Cad. No: 54  
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# PRODUCT INFORMATION

## Product Name

### Stone Wool Boards with Aluminium Foil

Stone wool boards with aluminium foil is an insulation material which contains %98 natural fibre and obtained by transforming the minerals and inorganic volcanic stones into natural fibre by melting them at high temperatures. Stone wool boards with aluminium foil coated on one side. It ensures heat, sound and fire insulation in granite, marble, aluminium and glass claddings; and ensures fire insulation at air-conditioning surfaces.



## Production

**Inputs:** The raw materials are measured and sent to a melting furnace. For Stone Wool Boards with Aluminium Foil these are basalt, cement and limestone.

**Furnace:** The raw materials are melted in a furnace at very high temperatures, typically between 1300°C to 1500°C. The smoke created during this process is filtered and flue gases are cleaned to minimise any environmental impact.

**Spinning:** The droplets of melt exiting the furnace are spun into fibres. Droplets fall onto rapidly rotating flywheels or the mixture is drawn through tiny holes in rapidly rotating spinners. This process shapes it into fibres.

**Binding:** Small quantities of binding agents are added to the fibres. The structure and density of the product will be adapted according to its final usage.

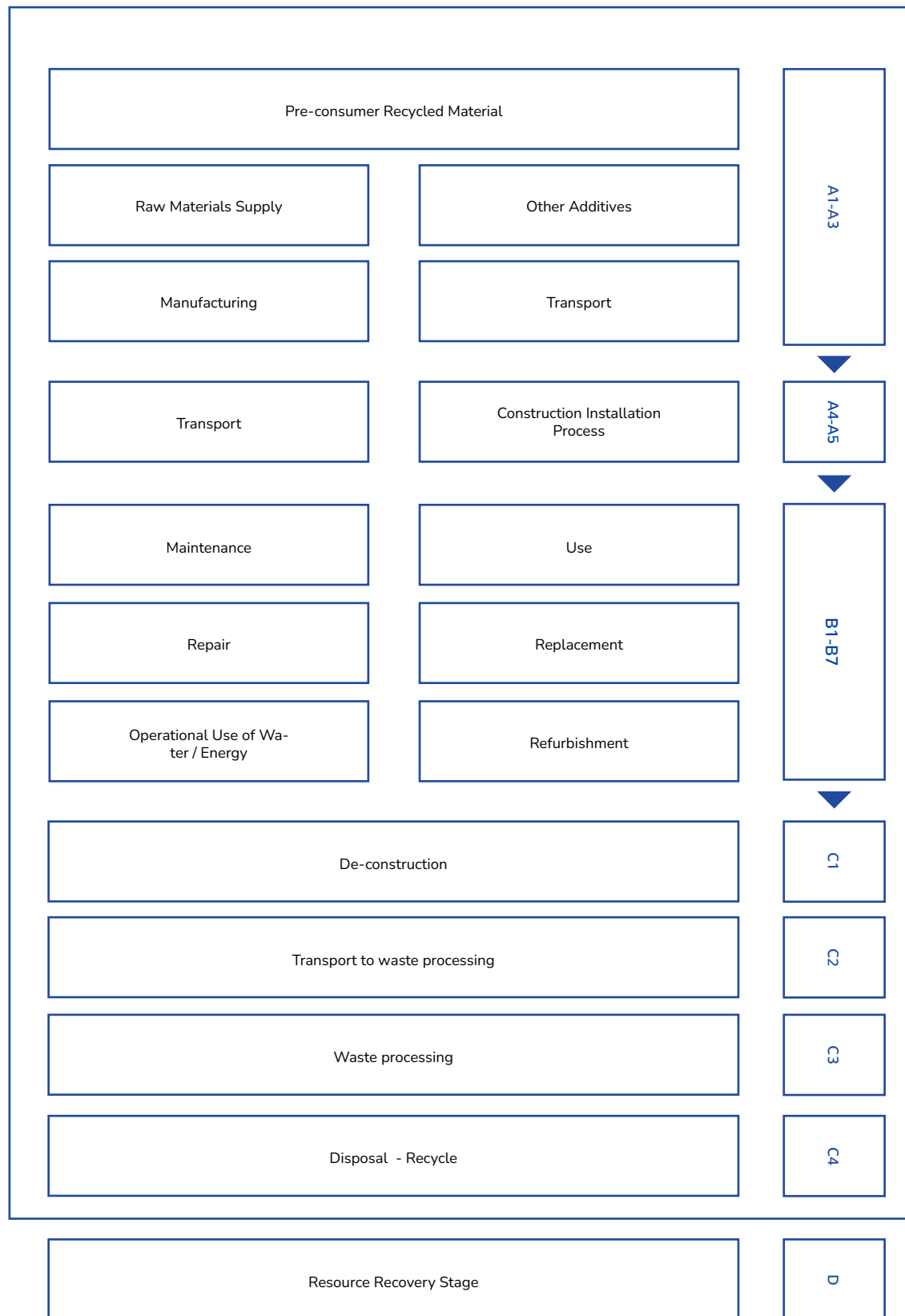
**Curing:** The mineral wool is then hardened in a curing oven at around 200°C.

**Cutting:** The mineral wool is cut to the required size and shape, for example into rolls, batts, boards or it can be customised for use with other products. Off-cuts and other mineral wool scraps are recycled back into the production process, which further reduces inputs and energy requirements.

**Packaging:** Due to its impressive elasticity, mineral wool can be compressed during packaging to reduce its volume.



### System Diagram



### Description of Raw Materials

#### A1 - Raw Materials Supply

This module takes into account raw material extraction, processing and energy used in the production process.

#### A2 - Transport to the Manufacturer

This module includes transportation of the raw materials from supplier to factory gate. Transportation types are considered as seaway and roadway.

#### A3 - Manufacturing

This module includes energy and water consumption during the manufacturing process. Additionally, packaging materials are covered in this module. Followed production processes are as;

- Mixing
- Melting
- Spinning
- Binding
- Curing
- Cutting
- Packaging

#### A4- Transport to the Construction Site

Transport to the construction site is calculated on the basis of a scenario with the parameters described in the attached table.

#### Parameters A4 Module

Average Transport distance (km) 500

Type of fuel and vehicle consumption or type of vehicle used for transport. Transport, freight, lorry >32 metric ton, EURO6

#### A5 - Installation into the Building

Installation into the Building is calculated on the basis of a scenario with the parameters described in the attached table. The treatment of the packaging waste after the installation of the product has been considered.

#### Parameters A5 Module

Loss of materials in construction site	2%
Packaging Wooden pallet	100% incinerated
Packaging Plastic sheet	40% recycled, 60% landfill

#### B1-B7 The Use Stage

- B1: Use
- B2: Maintenance
- B3: Repair
- B4: Replacement
- B5: Refurbishment
- B6: Operational Energy Use
- B7: Operational Water Use

After Stone Wool Boards with Aluminium Foil installation is complete, no actions or technical operations are required during the use stages until the end of life. Therefore, the stonewool has no impact on this stage.

#### C1 - De-construction

The common manual dismantling impact of Stone Wool Boards with Aluminium Foil is considered as very small and can be neglected in C1. Given the scenario that is assumed, environmental impact of de-construction process is not considered in this study.

#### C2 - Transport to Waste Processing

An average distance of 100 km has been assumed for the transport to sorting facility. Transport is calculated on the basis of a scenario with the parameters described in the attached table.

#### Parameters C2 Module

Transport by road*	Lorry. 16-32 metric ton
Distance (km)	100
Database	Ecoinvent v3.7.1

**C3 - Waste Processing for Reuse, Recovery and/or Recycling**

The material and energy expenses required for Module C3 are negligible. It is assumed that there is no sorting or processing required for Stone Wool Boards with Aluminium Foil.

**C4 - Final disposal**

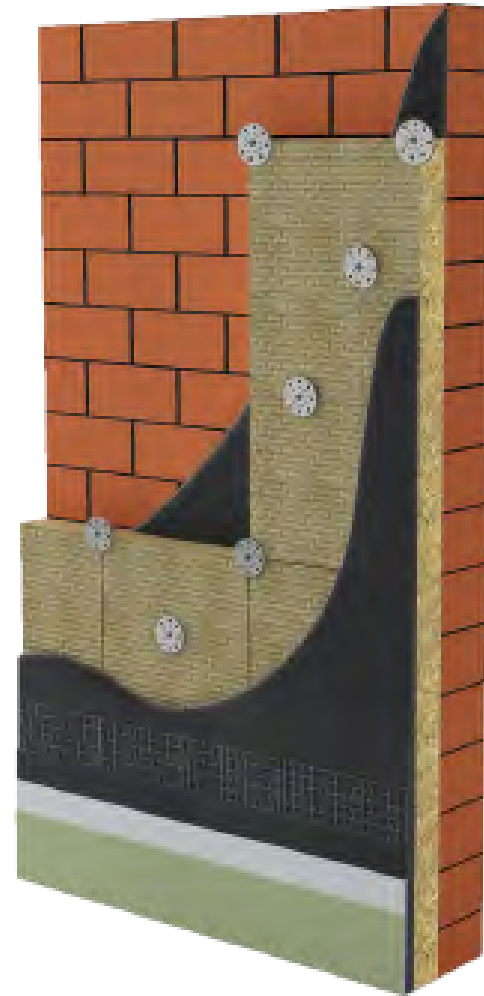
Although Stone Wool Boards with Aluminium Foil products are partly recycled at their end-of-life, an established collection system does not yet exist. Therefore, the assumption chosen in this study, 100% landfill after the use phase, is the most conservative approach.

**D - Reuse, Recovery or Recycling Potential**

Benefits considered in this module originate from Stone Wool Boards with Aluminium Foil packaging recycling or incineration.

**Information on which life cycle stages are not considered**

This EPD covers the cradle to grave and module D stages. After Stonewool Board installation is complete, no actions or technical operations are required during the use stages until the end of life. Therefore, the mineral wool has no impact on B1-B7 modules.



# Content Declaration

**Content Declaration of Stone Wool Boards with Aluminium Foil**

Product	Basalt, weight-%	Limestone, weight-%	Pre-consumer recycled materials, weight-%	Additives, weight-%	Renewable material, weight-%	Biogenic carbon, weight-%
Stone Wool Boards with Aluminium Foil	50-55	25-20	10-15	5-10	0	0

**Content Declaration of Packaging Material**

Stone Wool Boards with Aluminium Foil	Weight, %	Biogenic carbon, kg C
Packaging Nylon	<1	-
Wood	<1	0.0092803

# Environmental Performance

**Potential Environmental Impact**

Mandatory Indicators According to EN 15804

Results for 1 m2 of Stone Wool Boards with Aluminium Foil											
Indicator	Unit	Total	A1-3 Total	A4	A5	B1-7	C1	C2	C3	C4	D
							De-construction demolition	Transport	Waste processing	Disposal	Recycling-potential
GWP-fossil	kg CO2 eq	6.11	5.91	0.13	0.05	0	0	0.03	0	0.01	-0.01
GWP-biogenic	kg CO2 eq	4.83	-0.07	2.2E-04	4.90	0	0	4.5E-05	0	4.6E-05	-2.1E-05
GWP-luluc	kg CO2 eq	0.01	0.01	3.8E-05	9.0E-06	0	0	7.7E-06	0	4.0E-06	-3.0E-06
GWP-total	kg CO2 eq	11.0	5.85	0.13	4.95	0	0	0.03	0	0.01	-0.01
ODP	kg CFC11 eq	3.5E-07	3.1E-07	3.0E-08	3.5E-09	0	0	5.9E-09	0	6.1E-09	-2.2E-10
AP	mol H+ eq	0.05	0.05	4.1E-04	5.5E-04	0	0	8.1E-05	0	1.4E-04	-3.4E-05
EP-freshwater	kg PO43-	3.6E-03	3.4E-03	4.5E-05	1.4E-04	0	0	8.9E-06	0	1.9E-05	-2.9E-06
EP-aquatic freshwater	kg P eq	2.8E-04	2.8E-04	1.1E-06	6.9E-07	0	0	2.2E-07	0	1.5E-07	-1.7E-07
EP-marine	kg N eq	0.01	0.01	9.0E-05	2.6E-04	0	0	1.8E-05	0	4.8E-05	-6.6E-06
EP-terrestrial	mol N eq	0.08	0.08	1.0E-03	2.8E-03	0	0	2.0E-04	0	5.3E-04	-7.3E-05
POCP	kg NMVOC eq	0.03	0.03	3.9E-04	6.8E-04	0	0	7.7E-05	0	1.5E-04	-3.0E-05
ADP-minerals & metals	kg Sb eq	2.8E-05	2.8E-05	3.0E-07	1.0E-07	0	0	6.0E-08	0	3.3E-08	-5.4E-08
ADP-fossil*	MJ, net calorific value	71.4	68.41	2	0.43	0	0	0.40	0	0.41	-0.27
WDP	m3 world eq. deprived	1.27	1.28	0.01	-0.04	0	0	1.5E-03	0	0.02	-3.9E-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.



### Potential Environmental Impact

Additional Mandatory and Voluntary Indicators

Results according to PCR2019:14 for 1 m2 of Stone Wool Boards with Aluminium Foil											
Indicator	Unit	Total	A1-3 Total	A4	A5	B1-7	C1	C2	C3	C4	D
							De-construction demolition	Transport	Waste processing	Disposal	Recycling-potential
GWP - GHG <sup>1</sup>	kg CO2 eq	5.87	5.67	0.12	0.05	0	0	0.02	0	0.01	-0.01

Results according to EN 15804+A2 for 1 m2 of Stone Wool Boards with Aluminium Foil											
Indicator	Unit	Total	A1-3 Total	A4	A5	B1-7	C1	C2	C3	C4	D
							De-construction demolition	Transport	Waste processing	Disposal	Recycling-potential
PM/RI	disease inc.	4.6E-07	4.4E-07	1.1E-08	5.6E-09	0	0	2.2E-09	0	2.7E-09	-3.0E-10
IRP	kBq U-235 eq	0.07	0.06	0.01	6.3E-04	0	0	1.7E-03	0	1.7E-03	-1.3E-04
ET-freshwater	CTUe	113.4	110.5	1.67	0.75	0	0	0.33	0	0.26	-0.09
HT-cancer	CTUh	2.5E-08	2.4E-08	4.7E-11	1.6E-10	0	0	9.5E-12	0	7.7E-12	1.4E-11
HT-non-cancer	CTUh	6.9E-08	6.0E-08	1.6E-09	7.0E-09	0	0	3.2E-10	0	1.6E-10	4.3E-10
SQP	Pt	20.3	16.6	2.27	0.15	0	0	0.45	0	0.87	-0.01

**Acronyms**  
**GWP-GHG** = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology; **IRP** = Ionizing radiation, human health; **ET-freshwater** = Eco-toxicity (freshwater); **HT-cancer** = Human toxicity, cancer effects; **HT-non-cancer** = Human toxicity, non-cancer effects; **SQP** = Potential soil quality index (SQP)

<sup>1</sup> 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. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

### Use of Resources

Results for 1 m2 of Stone Wool Boards with Aluminium Foil											
Indicator	Unit	Total	A1-3 Total	A4	A5	B1-7	C1	C2	C3	C4	D
							De-construction demolition	Transport	Waste processing	Disposal	Recycling-potential
PERE	MJ	5.05	5.02	0.02	0.01	0	0	4.3E-03	0	3.3E-03	-3.7E-03
PERM	MJ	0	0	0	0	0	0	0	0	0	0
PERT	MJ	5.05	5.02	0.02	0.01	0	0	4.3E-03	0	3.3E-03	-3.7E-03
PENRE	MJ	54.7	51.5	2.13	0.47	0	0	0.43	0	0.44	-0.29
PENRM	MJ	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	76.6	73.4	2.13	0.47	0	0	0.43	0	0.44	-0.29
SM	kg	0.61	0.61	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	0.21	0.21	1.7E-03	2.2E-03	0	0	0	0	6.6E-04	0

**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 resources; **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 Production

Results for 1 m <sup>2</sup> of Stone Wool Boards with Aluminium Foil											
Indicator	Unit	Total	A1-3 Total	A4	A5	B1-7	C1	C3	C3	C4	D
							De-construction demolition	Transport	Waste processing	Disposal	Recycling-potential
Hazardous waste disposed	kg	1.1E-04	1.07E-04	0	0	0	0	0	0	0	0
Non-hazardous waste disposed	kg	1.00	0	0	1.94E-03	0	0	0	0	1.00	0
Radioactive waste disposed	kg	0	0	0	0	0	0	0	0	0	0

## Output Flows

Results for 1 m <sup>2</sup> of Stone Wool Boards with Aluminium Foil											
Indicator	Unit	Total	A1-3 Total	A4	A5	B1-7	C1	C3	C3	C4	D
							De-construction demolition	Transport	Waste processing	Disposal	Recycling-potential
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	1.30E-03	0	0	0	0	0	-1.30E-03
Materials for energy recovery	kg	3.35	0	0	3.35	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0

## References

### ISO 14040: 2021

Environmental management - Life cycle assessment - Principles and framework

### ISO 14044: 2021

Environmental management - Life cycle assessment - Requirements and guidelines

### ISO 14025: 2006

Environmental labels and declarations - Type III environmental declarations - Principles and procedures

### ISO 14020: 2000

Environmental labels and declarations - General principles

### EN 15804:2012+A2: 2019

Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

### c-PCR005

Thermal insulation products

### EN 16783: 2017

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

### The International EPD® System

[www.environdec.com](http://www.environdec.com)

### The International EPD® System

The General Programme Instructions v4.0

### The International EPD® System

PCR 2019:14 Construction products v1.1 (EN 15804:A2)

### Ecoinvent 3.7.1

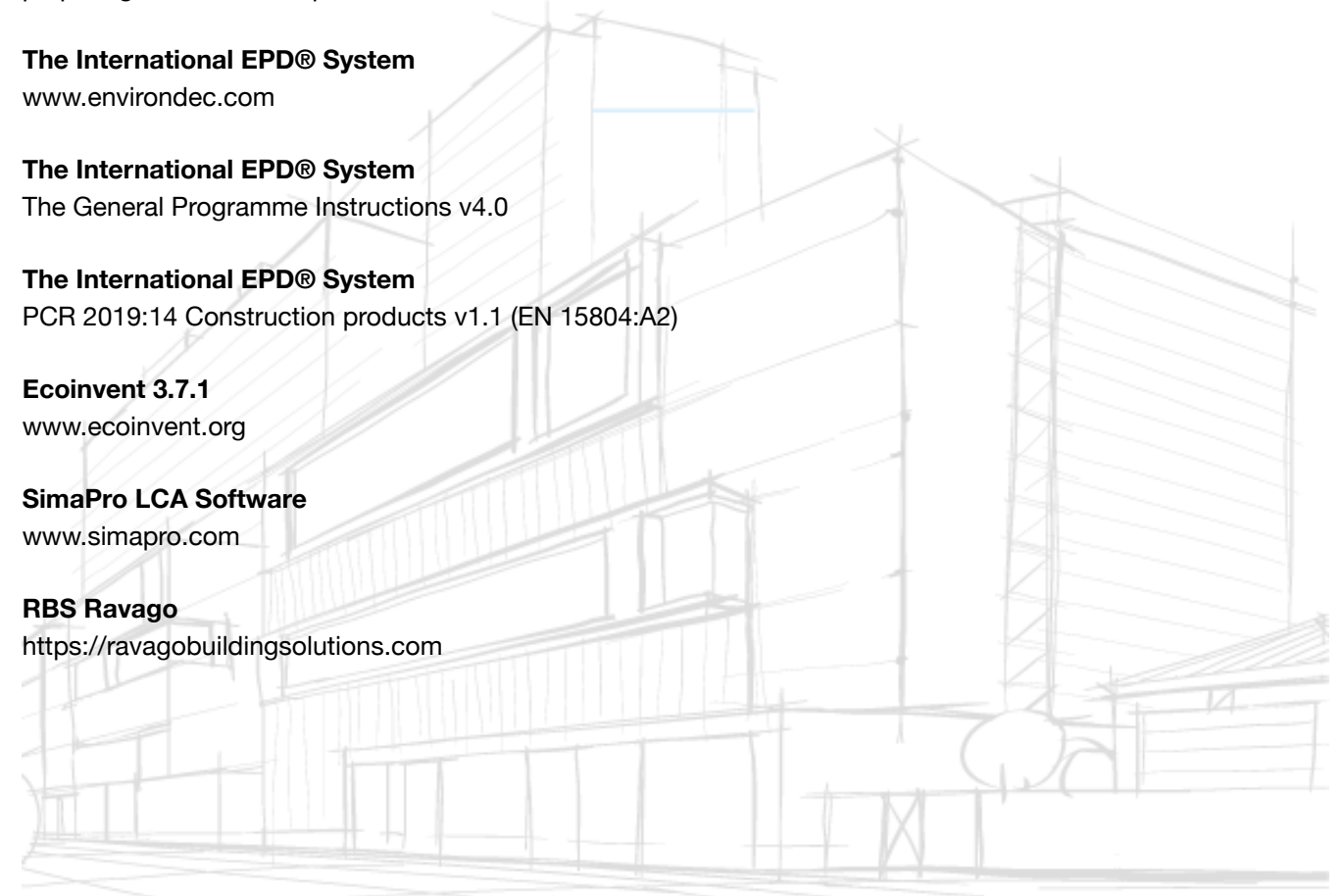
[www.ecoinvent.org](http://www.ecoinvent.org)

### SimaPro LCA Software

[www.simapro.com](http://www.simapro.com)

### RBS Ravago

<https://ravagobuildingsolutions.com>





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## Owner of Declaration

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## LCA Study & EDP Design Conducted By

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