Environmental product declaration

In accordance with 14025 and EN15804+A2

ROCKWOOL® RockOrbit (70-195mm) for the Swedish market (R=1)



The Norwegian EPD Foundation

Owner of the declaration:
ROCKWOOL Nordics

Product:
ROCKWOOL® RockOrbit (70-195mm) for the Swedish market (R=1)

Declared unit:
1 m2

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR. NPCR Part A Construction products and services.
NPCR 012:2022 Part B for thermal insulation products

EPD Software:
LCA.no EPD generator ID: 55665

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-3414-2027-EN (RW 55665)

Registration number:
NEPD-3414-2027-EN (RW 55665)

Issue date:
16.01.2023

Valid to:
16.01.2028

General information

Product

ROCKWOOL® RockOrbit (70-195mm) for the Swedish market (R=1)

Owner of the declaration:

ROCKWOOL Nordics
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Manufacturer:

ROCKWOOL Nordics
Hovedgaden 501 , DK-2640 Hedehusene
Denmark

Declaration number:

NEPD-3414-2027-EN (RW 55665)

Place of production:

ROCKWOOL factories Moss (electrical melter) & Trondheim (conventional melter)
,
Norway

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR. NPCR Part A Construction products and services.
NPCR 012:2022 Part B for thermal insulation products

Management system:

ISO 14001, ISO 9001

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

CVR nr. 42391719

Declared unit:

1 m2 ROCKWOOL® RockOrbit (70-195mm) for the Swedish market (R=1)

Issue date:

16.01.2023

Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

Valid to:

16.01.2028

Year of study:

2021

Functional unit:

Functional Unit Comparability:
The specific product, referred to in the declared unit is 1 m^2 ROCKWOOL RockOrbit with a thermal resistance R=1m^2K/W for the Swedish market. The referenced product is 34 mm thick with a density of 60 kg/m^3. The weight of the referenced product corresponding to the declared unit is 2,0 kg.

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804:2012+A2:2019 and seen in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Individualthird party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii)the proccess is reviewed annualy. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD:

Vegard Mauren Richardsen

Reviewer of company-specific input data and EPD:

Simon Titusson

Verification of EPD tool:

Approved:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Jane Anderson, ConstructionLCA Ltd.

(no signature required)

Product

Product description:

This EPD documents the potential environmental impacts of 1 m^2 of ROCKWOOL RockOrbit 70-195mm 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.

This EPD is covered by NEPD-3414-2027 available on www.epd-norge.no

Product specification

The average composition used for this EPD is calculated based on average factory consumption figures for raw materials. The raw materials are mainly non-scarce stones, and resin binder.

Materials	Value	Unit
Mineral wool	>95	%
Binder	<5	%
De-duster and water repellency oil	<1	%

Technical data:

For the products covered by this EPD, the performance data are in accordance with the declaration of performance with respect to its essential characteristics according to EN 13162:2012+A1:2015, ""Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification"".

- Thermal conductivity: 0,034 W/mK, reference standards: EN 12939 and EN 12667

- Fire class: A1, reference standard: EN 13501-1:2007+ A1:2009

A full overview of the technical specifications can be found on www.rockwool.se

Market:

This EPD is intended for the Swedish market. The EPD can be used in other specific Nordics markets by adjusting the A4 module to reflect correct transportation distance.

Reference service life, product

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.

Reference service life, building or construction works

In this EPD, the reference service life of a building is set to 60 years.

LCA: Calculation rules

Declared unit:

1 m2 ROCKWOOL® RockOrbit (70-195mm) for the Swedish market (R=1)

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.

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.

Data quality:

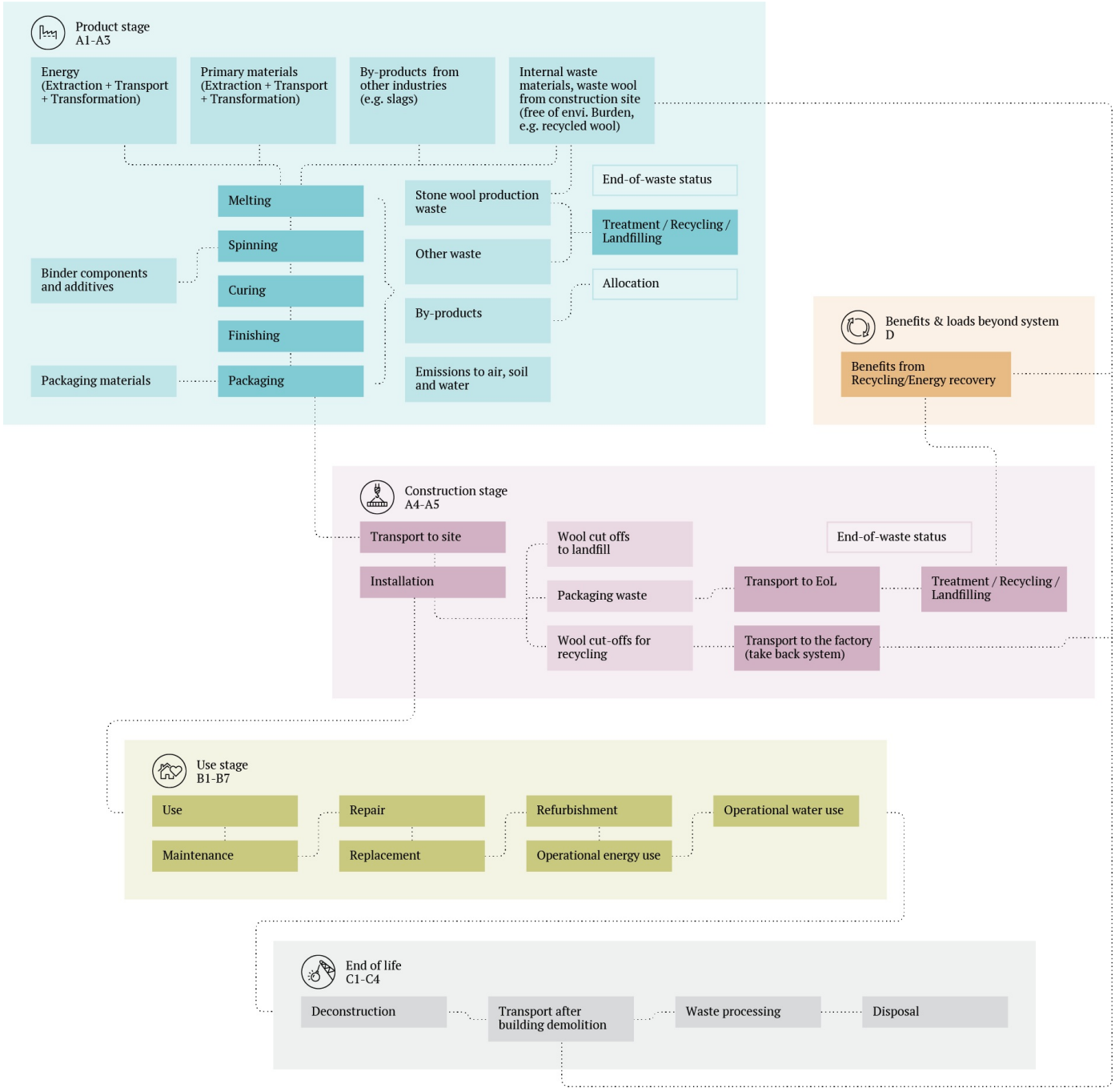
All data represents the applicable geography, time and technology for the specific and generic data, generally assessed as good and very good. Primary data are collected from the specific production sites, in the reference year 2021 and represent stabilized production. Generic data is from GaBi database (version 2021) with GaBi Software version 10.0.1.92.

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:

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, see flowchart below. 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.



LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

The EPD is based on LCA inventory data from the producing factories. The reference flow is a weighted average based on the distribution of production capacity

Transport from production place to assembly/user (A4)
The A4 distance is calculated as weighted average distance for the Swedish market

Assembly (A5)
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+A2 its impacts are fully allocated to A5, following same EoL scenario as in C. The A5 module includes also the corresponding end-of-life considerations for packaging (10 % landfill). The credits from heat and electricity recovery from incineration or material recycling from module A5 (90% recycling and energy recovery) are attributed to module D.

Use stage (B1, B2, B3, B4, B5, B6, B7)
There are no consumables and no maintenance (B2), repair (B3), replacements (B4) or refurbishments (B5) required during the use of ROCKWOOL® thermal insulation products in standard conditions. They do not use energy (B6) or water (B7) during their operational life. No LCA: Scenarios and additional technical information EPD for the best environmental decision 8 significant emissions to the indoor environment occur in module (B1). Therefore, modules B1-B7 are not relevant for this EPD and will not be displayed in the tables below.

Benefits and loads beyond the system boundaries (D)
Benefits in module D are created from packaging materials treatment after installation and recycling potential of stone wool in the end of life. Quantities of packaging materials include both recycled materials and materials sent for energy recovery. Recycling potential of net stone wool material is considered here.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Transport from Moss: Truck, Euro 6, 27t payload (kgkm)	30,0 %	336	0,019	l/tkm	6,38
Transport from Trondheim: Truck, Euro 6, 27t payload (kgkm)	30,0 %	64	0,019	l/tkm	1,22

Transport from production place to user (A4)	Unit	Value			
Transport, Truck, Euro 6, 27t payload (kg/km)	km	400			

Assembly (A5)	Unit	Value			
Auxiliary	kg	0,00			
Cardboard and paper packaging	kg	0,00			
Electricity consumption	kWh	0,00			
Material loss	kg	0,04			
Other energy carriers	MJ	0,00			
Plastic packaging	kg	0,03			
Water consumption	m3	0,00			
Wood packaging	kg	0,08			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Waste transport, Norway: Truck, Euro 6 (kgkm)	50,0 %	150	0,025	l/tkm	3,75

Waste processing (C3)	Unit	Value			
Collected as mixed construction waste	kg	2,00			
Energy recovery	kg	0,00			
Sent for recycling	kg	0,00			
Sent for reuse	kg	0,00			

Disposal (C4)	Unit	Value			
Hazardous waste disposed	kg	0,00			
Sent to landfill	kg	2,00			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Energy recovered	MJ	0,56			
Packaging recycled	kg	0,03			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact										
	Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	1,38E+00	1,18E-01	1,66E-01	0	7,46E-03	0,00E+00	3,65E-02	-6,97E-02
	GWP-fossil	kg CO_2 -eq	1,51E+00	1,17E-01	4,11E-02	0	7,42E-03	0,00E+00	3,66E-02	-7,65E-02
	GWP-biogenic	kg CO_2 -eq	-1,33E-01	4,76E-05	1,24E-01	0	-1,71E-06	0,00E+00	-1,86E-04	6,82E-03
	GWP-luluc	kg CO_2 -eq	9,76E-04	9,24E-04	3,34E-05	0	5,77E-05	0,00E+00	1,08E-04	-5,65E-06
	ODP	kg CFC11 -eq	6,46E-09	0,00E+00	2,74E-10	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	AP	mol H+ -eq	1,32E-02	1,05E-04	2,54E-04	0	7,83E-06	0,00E+00	2,60E-04	-2,12E-04
	EP-FreshWater	kg P -eq	1,81E-05	3,50E-07	5,03E-07	0	2,20E-08	0,00E+00	6,14E-08	-2,05E-08
	EP-Marine	kg N -eq	1,65E-03	3,07E-05	4,19E-05	0	2,57E-06	0,00E+00	6,76E-05	-3,93E-05
	EP-Terrestial	mol N -eq	3,97E-02	3,74E-04	8,65E-04	0	3,08E-05	0,00E+00	7,44E-04	-4,29E-04
	POCP	kg NMVOC -eq	3,98E-03	8,90E-05	9,57E-05	0	6,86E-06	0,00E+00	2,06E-04	-1,29E-04
	ADP-minerals&metals[1]	kg Sb -eq	5,10E-07	2,58E-09	9,57E-09	0	7,04E-10	0,00E+00	3,46E-09	-6,64E-09
	ADP-fossil[1]	MJ	2,02E+01	1,57E+00	4,69E-01	0	9,91E-02	0,00E+00	4,86E-01	-1,97E+00
	WDP[1]	m^3	3,22E-01	1,03E-03	1,95E-02	0	6,51E-05	0,00E+00	3,92E-03	-2,96E-02

GWP total = Global Warming Potential total; GWP fossil = Global Warming Potential fossil fuels; GWP biogenic = Global Warming Potential biogenic; GWP luluc = Global W Potential land use change; ODP = Ozone Depletion; AP = Acidification; EP freshwater = Eutrophication aquatic freshwater; EP marine = Eutrophication aquatic marine; EP terrestrial = Eutrophication terrestrial; POCP = Photochemical ozone formation; ADPE = Abiotic Depletion Potential minerals and metals; ADPF = Abiotic Depletion Potential fossil fuels; WDP = Water depletion potential

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009

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

Remarks to environmental impacts

The main GWP contribution from the product life cycle is linked to the Product stage (A1-A3). This is primarily related to the materials delivered to the factory gate and consumption of
energy.

The CO2 absorbed by the wood in the wooden pallets is represented by a negative GWPbiogenic.

The GWP-Biogenic, e.g. the carbon stored in the wooden pallets, is released during the construction stage phase (A5) where the wood is presumed incinerated with energy recovery.

The benefits from energy recovery (a negative GWP) from incineration of packaging materials (wood pallets and plastic foils) is allocated to Benefits & Loads beyond system (D).

Impacts linked to end of life stages (C1-C4) are primarily linked to transportation of stone wool to recycling or to landfill.

Melting virgin materials or re-melting returned ROCKWOOL stone wool are both similarly energy intensive processes. Increasing the recycling rate for return wool, will therefore not lead to great variations in the overall GWP profile. However, increased recycling will be linked directly to reduction of waste sent to landfill.

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	1,15E-07	8,88E-10	2,27E-09	0	8,00E-12	0,00E+00	3,24E-09	-2,75E-09
	IRP[2]	kgBq U235 -eq	2,92E-02	2,73E-04	2,52E-03	0	1,73E-05	0,00E+00	5,34E-04	-3,35E-04
	ETP-fw[1]	CTUe	6,01E+00	1,13E+00	1,83E-01	0	7,13E-02	0,00E+00	2,76E-01	-2,21E-02
	HTP-c[1]	CTUh	2,41E-09	4,00E-12	3,70E-11	0	0,00E+00	0,00E+00	4,20E-11	-8,00E-12
	HTP-nc[1]	CTUh	1,08E-08	9,52E-10	4,74E-10	0	1,20E-11	0,00E+00	4,50E-09	-2,36E-10
	SQP[1]	dimensionless	2,78E+01	5,39E-01	5,25E-01	0	3,41E-02	0,00E+00	9,80E-02	-1,22E+00

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	1,28E+01	8,79E-02	2,78E-01	0	5,56E-03	0,00E+00	6,54E-02	-2,77E-01
	PERM	MJ	1,45E-01	0,00E+00	-4,34E-03	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	1,29E+01	8,79E-02	2,74E-01	0	5,56E-03	0,00E+00	6,54E-02	-2,77E-01
	PENRE	MJ	1,91E+01	1,57E+00	4,81E-01	0	9,94E-02	0,00E+00	4,86E-01	-1,97E+00
	PENRM	MJ	1,16E+00	0,00E+00	-3,49E-02	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	2,02E+01	1,57E+00	4,46E-01	0	9,94E-02	0,00E+00	4,86E-01	-1,97E+00
	SM	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	FW	m^3	8,38E-03	1,00E-04	4,84E-04	0	6,34E-06	0,00E+00	1,20E-04	-9,46E-04

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	4,49E-07	0,00E+00	9,03E-09	0	0,00E+00	0,00E+00	5,20E-11	-1,65E-10
	NHWD	kg	2,20E-01	2,32E-04	5,38E-02	0	1,47E-05	0,00E+00	2,42E+00	-2,05E-04
	RWD	kg	2,13E-04	1,91E-06	1,67E-05	0	1,21E-07	0,00E+00	5,08E-06	-2,57E-06

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009

End of life - Output flow

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	9,14E-02	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MER	kg	0,00E+00	0,00E+00	5,38E-03	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EEE	MJ	0,00E+00	0,00E+00	1,41E-01	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EET	MJ	0,00E+00	0,00E+00	4,19E-01	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported energy Thermal

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	3,54E-02

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

Additional Norwegian requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, Hydropower, Norway (kWh)	GaBi (version 2021)	14,00	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

Indoor environment

There are no legal requirements for indoor emissions of stone wool thermal insulation products.

Additional Environmental Information

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ODP	kg CFC11 -eq	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
POCP	kg C_2H_4 -eq	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
AP	kg SO_2 -eq	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EP	kg PO_4^{3-} -eq	2,95E-03	4,54E-03	4,23E-05	0	2,53E-04	0,00E+00	1,96E-05	-1,35E-05
ADPM	kg Sb -eq	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ADPE	MJ	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWPIOBC	kg CO_2 -eq	3,13E+00	1,78E-01	4,11E-02	0	1,13E-01	0,00E+00	3,03E-02	-7,65E-02

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; POCP = Formation potential of tropospheric photochemical oxidants; AP = Acidification potential of land and water; EP = Eutrophication potential; ADPM = Abiotic depletion potential for non fossil resources; ADPE = Abiotic depletion potential for fossil resources; GWP-IOBC/GHG = Global warming potential calculated according to the principle of instantanious oxidation (except emissions and uptake of biogenic carbon)

Bibliography

ISO 14025:2010 - Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006 - Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019 - Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
EN 12939:2000 - Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Thick products of high and medium thermal resistance
EN 12667:2001 - Thermal performance of building materials and products – determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Products of high and medium thermal resistance
EN 13501-1:2007+A1:2009 - Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests
ISO 21930:2007 - Sustainability in building construction - Environmental declaration of building products
PCR - NPCR Part A Construction products and services
PCR - NPCR 012:2022 version 2.0. Part B for Thermal insulation products
Larisa Xanthopoulou - Background LCA report for EPDs ROCKWOOL Nordics, Feb. 2022
Larisa Xanthopoulou - ROCKWOOL Rules for publishing EPDs, ver.3, December 2021

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