epd-norway
Global Program Operator

Environmental Product Declaration

In accordance with 14025 and EN15804 +A2

PAROC SE Produced Stone Wool Thermal Insulation

Owner of the declaration:
Paroc Group Oy

Product name:
PAROC SE Produced Stone Wool Thermal Insulation

Declared unit:
1 m2 of stone wool with a thermal resistance of 1 m2K/W.

Product category /PCR:
CEN Standard EN 15804+A2 serves as core PCR. NPCR PART A Construction Products and Services NPCR 012 Part B for Thermal Insulation Products.

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-4340-3565-EN

Registration number:
NEPD-4340-3565-EN

Issue date: 05.04.2023

Valid to: 05.04.2028

ver2-040523

The Norwegian
EPD Foundation

General information

Product:
PAROC SE Produced Stone Wool Thermal Insulation

Program Operator:
The Norwegian EPD Foundation
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Declaration Number:
NEPD-4340-3565-EN

This declaration is based on Product Category Rules:
CEN Standard EN 15804+A2 serves as core PCR. NPCR PART A Construction Products and Services NPCR 012 Part B for Thermal Insulation Products.

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

Declared unit:
1 m^2 of stone wool with a thermal resistance (R) of 1 m^2K/W.

Declared unit with option:

Functional unit:
1 m^2 of stone wool with thermal resistance (R) of 1 m^2K/W. 1 m^2 of the reference product, PAROC eXtra, at R=1 is at a weight of 1,06 kg. The impact excludes any lamination.

Verification:
Independent verification of the declaration and data, according to ISO14025:2010

internal ☐ external ☒

Martin Erlandsson, IVL

Independent verifier approved by EPD Norway

Owner of the declaration:
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Manufacturer:
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Place of production:
Hällekis and Hässleholm, Sweden

Management system:
ISO 9001 and ISO 14001

Organisation no:
887294852

Issue date:
05.04.2023

Valid to:
05.04.2028

Year of study:
2021

Comparability:
EPDs from other programmes than EPD Norway may not be comparable.

The EPD has been worked out by:
Emelia Samuelsson, Owens Corning

Emelia Samuelsson

Approved

Manager of EPD Norway

Product

Product description:

PAROC® stone wool insulation in naturally non-combustible and durable. It is made of natural stone (~98%) and air (~2%). As stone wools thermal performance is based on static air, insulation products keep their energy saving abilities and dimensions in different temperature and moisture conditions during the life cycle of a building.

The products covered by this declaration are PAROC stone wool thermal insulation products manufactured in Hällekis and Hässleholm, Sweden using cupola furnaces and renewable electricity.

Product specification:

The average composition used for this EPD is calculated based on line consumption figures for raw materials. The raw materials are mainly natural stones and resin binder.

Materials	%
Stone Wool Fiber	>97
Binder (phenol-formaldehyde-urea-copolymer)	<2
Dustbinding (mineral 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: 0,033-0,050 W/mK, EN 12939 and EN 12667
- Fire class: A1, EN 13501-1:2007+A1:2009

Complete technical specifications can be found on www.paroc.com

Market:

This EPD is intended for the markets that receives PAROC building insulation products from the factories in Hällekis and Hässleholm, Sweden. Those markets are mainly Sweden, Norway, Denmark and Finland.

Reference service life, product:

The reference service life of PAROC products is equal to the reference service life of the building. For the purpose of this EPD the reference service life if considered to be minimum 60 years, which is usually the assumption about the lifetime of the building where this is installed.

Reference service life, building:

The reference service life of a building is set to 60 years in this EPD.

LCA: Calculation rules

Declared unit:

The declared unit refers to 1 m^2 of PAROC eXtra with a thermal resistance (R) of 1 m^2K/W, thickness of 36 mm and weight of 1,06 kg.

The specific product, PAROC eXtra, is a stone wool slab with a density of 29,5 kg/m^3 and thickness of 95 mm.

The impact indicators for another product can be calculated by multiplying the results of the EPD with the respective scaling factor for the products covered by this EPD. A table with the products available in the scaling table and their respective scaling factors is provided within the 'Additional technical information' section.

Data quality:

All primary data are collected line specific, based on the financial year 2021. The production data from Hällekis and Hässleholm involves production lines with cupola furnaces and renewable electricity.

The background data has been taken from the latest available GaBi database (/GaBi TS) CUP 2022.2. The requiremens for data quality and background data correspond to the specificiations of EN 15804+A2. The process data and the used background data are consistent.

The data quality can be qualified as good.

Allocation:

The allocation correspond to the specifications of EN 15804+A2. Allocation and other methodological choices are made consistently throughout the model. As a worst-case approach, price allocation is considered for the plant.

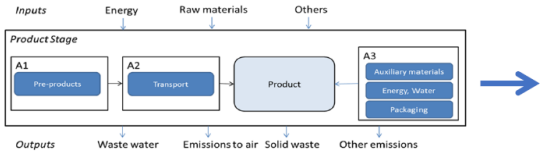

Figure 1. Schematic representation of the LCA system boundaries for the production module (A1-A3)

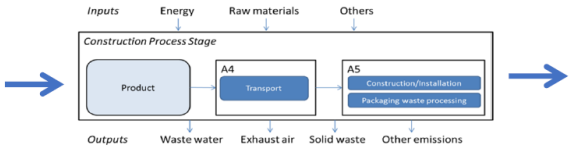

Figure 2. Schematic representation of the LCA system boundaries for the construction process stage (A4-A5)

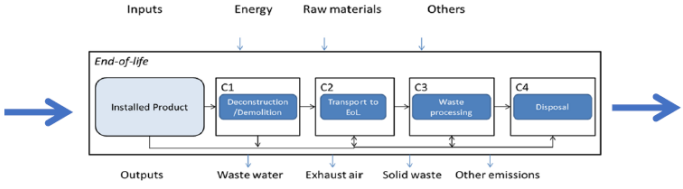

Figure 3. Schematic representation of the LCA system boundaries for the End-of-life stage (C1-C4)

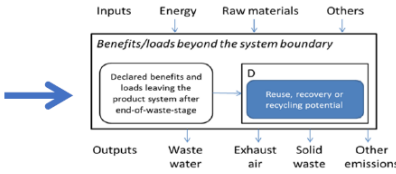

Figure 4. Schematic representation of the LCA system boundaries for the benefits and loads beyond the product system boundary in module D

System boundary:

The system boundary of the EPD follows the modular structure defined by EN15804+A2. The flowchart above represents the system boundaries for the product, construction process, end-of-life and benefits (D). The use stage (B1-B7) relating to the building site is not included in this study, as there are no activites and no significant environmental impact in the use stage.

Cut-off criteria:

All data from the production data acquisition has been considered, i. e. all basic materials used per formulation, utilized thermal energy, internal fuel consumption and electric power consumption, direct production waste, and all emission measurements available. All material and energy flows, except paper for labels in packaging, with a proportion of less than 1% have been considered. The neglected flow (paper label for packaging) does not exceed 1% of the impact categories. Machines and facilities required during production are neglected.

The declared unit of stone wool is without any coating.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD. There are no maintenance (B2), repair (B3), replacements (B4) or refurbishments (B5) required during the use of PAROC stone wool thermal insulation products in standard conditions. They do not require energy (B6) or water (B7) during their operational life. No significant emissions to the indoor environment occur in module (B1). Therefore, modules B1-B7 are not relevant for this EPD.

Transport from production place to assembly/user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption (l/t.km)	value (l/t for total distance)
Truck	30	Truck, Euro 5, 27 t payload	308	0,006	1,85

The A4 distance is calculated as average distance for the Swedish market. Distances estimated for other markets are given in the table below.

Market	Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption (l/t.km)	value (l/t for total distance)
Norway	Truck	30	Truck, Euro 5, 27 t payload	525	0,006	3,15
Denmark	Truck	30	Truck, Euro 5, 27 t payload	280	0,006	1,68

Assembly (A5)

	Unit	Value
Auxiliary	kg	0,00
Water consumption	m^3	0,00
Electricity consumption	kWh	0,00
Other energy carriers	MJ	0,00
Material loss	kg	0,02
Output materials from waste treatment	kg	0,06
Dust in the air	kg	0,00

The installation in general takes place manually. Thus, machines or energy expenditures are not taken into account. Most products are self-supporting and do not need support. Installation losses have been accounted for 2% as a conservative approach. Within module A5 a site related packaging waste processing is included in the LCA. It is assumed that packaging material as leftover of the installed product is for 100% collected and incinerated.

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0,00
Collected as mixed construction waste	kg	0,00
Reuse	kg	0,00
Recycling	kg	0,00
Energy recovery	kg	0,00
To landfill	kg	1

Although mineral wool products from Paroc can be recycled, they are estimated as being 100% landfilled after the use phase as the most conervative approach. Post-consumer recycling scenarios are not considered within this study, however in Finland, Sweden and Norway a REWOOL take back system is well-established for stone wool waste.

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption (l/t.km)	value (l/t for total distance)
Truck	50	Truck, Euro 5, 27 t payload	50	0,006	0,30

The distance representes an average distance to landfill, the stone wool is in general not transported alone to landfill, therefore a load factor of 50% is considered in this case.

Benefits and loads beyond the system boundaries (D)

Benefits are considered in module D for the thermal and electrical energy, generated in module A5, due to thermal treatment of packaging waste (polyethylene film and wooden pallets) after installation.

Additional technical information

Below a list of products covered by this EPD and their scaling factors. The scaling factor can be used to estimate the environmental performance indicators for the specific products of 1 m^2 when R=1. The environmental performance solely refer to the stone wool, and thus do not include the environmental performance of any potential coatings. Due to this fact, the variation is less than 10% by reason of the density, lambda and binder. The scaling calculation shall be done as follows:

Reference product environmental impact per m^2 (1,30) x scaling factor of specific product (1,00)

Product Group	Product Name	Unit	Value
Flexible Slabs and Mats	PAROC eXtra (i) (p) (70-250 mm thickness, lambda 0,036, average density 29,5 kg/m^3)	1 m^2	1,00
Flexible Slabs and Mats	PAROC eXtra (30-50 mm thickness, lambda 0,036, average density 32,5 kg/m^3)	1 m^2	1,10
Flexible Slabs and Mats	PAROC eXtra plus (45-240 mm thickness, lambda 0,034, average density 42,5 kg/m^3)	1 m^2	1,36
Flexible Slabs and Mats	PAROC eXtra pro (45-198 mm thickness, lambda 0,033, average density 49,5 kg/m^3)	1 m^2	1,54
Flexible Slabs and Mats	PAROC eXtra F (45-95 mm thickness, lambda 0,036, average density 31 kg/m^3)	1 m^2	1,05

Flexible Slabs and Mats	PAROC Sonus (70-100 mm thickness, lambda 0,044, average density 22,5 kg/m³)	1 m²	0,93
Flexible Slabs and Mats	PAROC Sonus (45 mm thickness, lambda 0,044, average density 28 kg/m³)	1 m²	1,16
Flexible Slabs and Mats	PAROC Sonus (45-50 mm thickness, lambda 0,044, average density 27 kg/m³)	1 m²	1,12
Flexible Slabs and Mats	PAROC Solid (45-150 mm thickness, lambda 0,037, average density 30 kg/m³)	1 m²	1,05
Flexible Slabs and Mats	PAROC UNM 37 (z) (30-145 mm thickness, lambda 0,037, average density 30 kg/m³)	1 m²	1,05
Flexible Slabs and Mats	PAROC UNS 39 (z) (70-250 mm thickness, lambda 0,040, average density 26 kg/m³)	1 m²	0,95
Facade	PAROC WAS 50 (50-150 mm thickness, lambda 0,034, average density 45 kg/m³)	1 m²	1,44
Facade	PAROC COS 10 (30 mm thickness, lambda 0,035, average density 95 kg/m³)	1 m²	3,13
Facade	PAROC WAS 35 (t) (tt) (45-250 mm thickness, lambda 0,033, average density 69 kg/m³)	1 m²	2,14
Facade	PAROC WAS 25 (110-130 mm thickness, lambda 0,033, average density 80 kg/m³)	1 m²	2,49
Facade	PAROC Fatio plus (50-200 mm thickness, lambda 0,033, average density 72,5 kg/m³)	1 m²	2,25
Facade	PAROC Fatio plus (30 mm thickness, lambda 0,033, average density 90 kg/m³)	1 m²	2,80
Facade	PAROC COS 10 (50-200 mm thickness, lambda 0,035, average density 64 kg/m³)	1 m²	2,11
Facade	PAROC Linio 10 (50-200 mm thickness, lambda 0,036, average density 85 kg/m³)	1 m²	2,88
Facade	PAROC WAS 25 (t) (tt) (30-100 mm thickness, lambda 0,033, average density 95 kg/m³)	1 m²	2,95
Facade	PAROC COS 15 (95-200 mm thickness, lambda 0,036, average density 88,5 kg/m³)	1 m²	3,00
Facade	PAROC Linio 80 (200-300 mm thickness, lambda 0,040, average density 80 kg/m³)	1 m²	3,01
Facade	PAROC Linio 10 (30 mm thickness, lambda 0,036, average density 108 kg/m³)	1 m²	3,64
Facade	PAROC Linio 10 (20 mm thickness, lambda 0,036, average density 128 kg/m³)	1 m²	4,32
Facade	PAROC Linio 15 (70-250 mm thickness, lambda 0,037, average density 99 kg/m³)	1 m²	3,45
Facade	PAROC COS 15 (20-80 mm thickness, lambda 0,036, average density 109 kg/m³)	1 m²	3,68
Facade	PAROC WAS 25tt (30 mm thickness, lambda 0,033, average density 105 kg/m³)	1 m²	3,26
Facade	PAROC WAB 10tt (17 mm thickness, lambda 0,036, average density 155 kg/m³)	1 m²	5,25
Facade	PAROC Linio 15 (20-30 mm thickness, lambda 0,037, average density 157 kg/m³)	1 m²	5,47
Roofs	PAROC ROL 30 (200-370 mm thickness, lambda 0,038, average density 65 kg/m³)	1 m²	2,33
Roofs	PAROC ROS 20 (t) (50 mm thickness, lambda 0,035, average density 90 kg/m³)	1 m²	2,97
Roofs	PAROC ROX 2 (95-200 mm thickness, lambda 0,036, average density 88,5 kg/m³)	1 m²	3,00
Roofs	PAROC ROL 60 (200-450 mm thickness, lambda 0,039, average density 85 kg/m³)	1 m²	3,12
Roofs	PAROC ROS 30 (g) (t) (50-180 mm thickness, lambda 0,036, average density 104 kg/m³)	1 m²	3,51
Roofs	PAROC ROV 60 1,2 (30-480 mm thickness, lambda 0,038, average density 139 kg/m³)	1 m²	4,97
Roofs	PAROC TURF (100-190 mm thickness, lambda 0,037, average density 120 kg/m³)	1 m²	4,18
Roofs	PAROC ROBSTER 50 (30-50 mm thickness, lambda 0,036, average density 130 kg/m³)	1 m²	4,41
Roofs	PAROC ROBSTER 60 (30-50 mm thickness, lambda 0,036, average density 134 kg/m³)	1 m²	4,54

Roofs	PAROC ROS 50 (100-190 mm thickness, lambda 0,038, average density 125 kg/m³)	1 m²	4,47
Roofs	PAROC ROS 50 (35-100 mm thickness, lambda 0,038, average density 132 kg/m³)	1 m²	4,72
Roofs	PAROC ROU 60, 1,2,3, 4, 5 (10-80 mm thickness, lambda 0,038, average density 139 kg/m³)	1 m²	4,97
Roofs	PAROC ROS 60 (t) (60-120 mm thickness, lambda 0,039, average density 133 kg/m³)	1 m²	4,87
Roofs	PAROC ROS 60 (t) (35-100 mm thickness, lambda 0,039, average density 150 kg/m³)	1 m²	5,51
Roofs	PAROC ROB 50 (t) (30 mm thickness, lambda 0,037, average density 150 kg/m³)	1 m²	5,23
Roofs	PAROC ROB 60 (t) (17-30 mm thickness, lambda 0,038, average density 167 kg/m³)	1 m²	5,98
Roofs	PAROC ROS 80 (t) (20-45 mm thickness, lambda 0,039, average density 185 kg/m³)	1 m²	6,78
Roofs	PAROC ROB 80 (t) (20-30 mm thickness, lambda 0,038, average density 185 kg/m³)	1 m²	6,62
Roofs	PAROC ROB 100 (30 mm thickness, lambda 0,039, average density 200 kg/m³)	1 m²	7,34
Special Applications	PAROC FPY 1 (20-30 mm thickness, lambda 0,037, average density 28 kg/m³)	1 m²	0,98
Special Applications	PAROC NRS 2 (t) (tb) (50-200 mm thickness, lambda 0,035, average density 65 kg/m³)	1 m²	2,14
Special Applications	PAROC FPL 80 (70-200 mm thickness, lambda 0,040, average density 80 kg/m³)	1 m²	3,01
Special Applications	PAROC NRS 2 (t) (tb) (30-45 mm thickness, lambda 0,035, average density 95 kg/m³)	1 m²	3,13
Special Applications	PAROC FPS10 (tt) (50 mm thickness, lambda 0,035, average density 100 kg/m³)	1 m²	3,30
Special Applications	PAROC GRS 20 (50-100 mm thickness, lambda 0,035, average density 100 kg/m³)	1 m²	3,30
Special Applications	PAROC SSB 2t (20-50 mm thickness, lambda 0,037, average density 163 kg/m³)	1 m²	5,66
Special Applications	PAROC GRS 30 (30-100 mm thickness, lambda 0,037, average density 124 kg/m³)	1 m²	4,30
Special Applications	PAROC FPS 14 (t) (20-50 mm thickness, lambda 0,037, average density 140 kg/m³)	1 m²	4,88
Special Applications	PAROC GRS 40 (30-100 mm thickness, lambda 0,037, average density 140 kg/m³)	1 m²	4,88
Special Applications	PAROC FPS 17 (ta) (tta) (20-60 mm thickness, lambda 0,038, average density 170 kg/m³)	1 m²	6,08
Special Applications	PAROC FPS 20 (ta) (20-50 mm thickness, lambda 0,041, average density 200 kg/m³)	1 m²	7,72
Special Applications	PAROC FireSAFE RF30 (50 mm thickness, lambda 0,037, average density 112 kg/m³)	1 m²	3,90
Special Applications	PAROC FireSAFE VF10 (30 mm thickness, lambda 0,033, average density 97,5 kg/m³)	1 m²	3,03
Special Applications	PAROC FireSAFE VF30 (50 mm thickness, lambda 0,038, average density 170 kg/m³)	1 m²	6,08
Special Applications	PAROC FireSAFE RO30 (30-50 mm thickness, lambda 0,038, average density 180 kg/m³)	1 m²	6,44
Special Applications	PAROC FPS10 (tt) (30-200 mm thickness, lambda 0,035, average density 100 kg/m³)	1 m²	3,30
Special Applications	FPB 10 (10 mm thickness, lambda 0,035, average density 100 kg/m³)	1 m²	3,30
Metal Panel Core	PAROC SES 8 (98 mm thickness, lambda 0,041, average density 80 kg/m³)	1 m²	3,09
Metal Panel Core	PAROC SES 18 (ld) (25-98 mm thickness, lambda 0,050, average density 168 kg/m³)	1 m²	7,89
Blowing Wool	PAROC BLT 1 Loft (density 28 kg/m3, lambda 0,042)	1 m²	1,11
Blowing Wool	PAROC BLT 1 Loft (density 30 kg/m3, lambda 0,041)	1 m²	1,16
Blowing Wool	PAROC BLT 1 Frame, slope ≤ 25° (density 35 kg/m³, lambda 0,038)	1 m²	1,25

Blowing Wool	PAROC BLT 1 Frame, slope ≤ 45° (density 45 kg/m³, lambda 0,036)	1 m²	1,53
Blowing Wool	PAROC BLT 1 Frame, slope > 45° (density 47 kg/m³, lambda 0,036)	1 m²	1,59
Blowing Wool	PAROC BLT 1 Frame, slope > 45° (density 65 kg/m³, lambda 0,034)	1 m²	2,08
Blowing Wool	PAROC BLT 3 Loft (density 33 kg/m³, lambda 0,041)	1 m²	1,27
Blowing Wool	PAROC BLT 3 Frame, slope ≤ 45° (density 55 kg/m³, lambda 0,036)	1 m²	1,86
Blowing Wool	PAROC BLT 3 Frame, slope > 45° (density 70 kg/m³, lambda 0,036)	1 m²	2,37
Blowing Wool	PAROC BLT 9 Loft (density 40 kg/m³, lambda 0,041)	1 m²	1,54
Blowing Wool	PAROC BLT 9b Frame, slope (density 60 kg/m³, lambda 0,038)	1 m²	2,15
Blowing Wool	PAROC BLT 9b Frame, slope (density 70 kg/m³, lambda 0,038)	1 m²	2,50
Blowing Wool	PAROC BLT 9b Frame, slope (density 60 kg/m³, lambda 0,038)	1 m²	2,15
Blowing Wool	PAROC BLT 10 Monsonry wall (density 52 kg/m³, lambda 0,037)	1 m²	1,81
Blowing Wool	PAROC SHT 1 (density 45 kg/m³, lambda 0,041)	1 m²	1,74

LCA: Results

The system boundary of the EPD follows the modular structure defined by EN15804+A2. The table identifies the modules included in this study. The use stage (B1-B7) relating to the building site is not included in this study, as there are no activites and no significant environmental impact in the use stage.

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

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
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	MNR	MNR	MNR	MNR	MNR	MNR	MNR	X	X	X	X	X

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	1,30E+00	6,89E-03	1,51E-01	1,10E-02	3,33E-03	0	1,43E-02	-5,16E-02
GWP-fossil	kg CO2 eq.	1,37E+00	6,84E-03	7,65E-02	1,09E-02	3,29E-03	0	1,43E-02	-5,13E-02
GWP-biogenic	kg CO2 eq.	-6,57E-02	0	7,40E-02	9,80E-05	2,09E-05	0	5,53E-05	-2,63E-04
GWP-LULUC	kg CO2 eq.	1,59E-04	3,84E-05	4,10E-06	2,30E-06	1,82E-05	0	2,63E-05	-5,66E-06
ODP	kg CFC11 eq.	4,65E-13	4,13E-16	1,82E-14	1,59E-13	1,95E-16	0	3,35E-14	-3,48E-13
AP	mol H^+ eq.	6,15E-03	5,51E-06	1,41E-04	2,39E-05	1,11E-05	0	1,01E-04	-6,76E-05
EP-freshwater	kg P eq.	3,40E-07	2,06E-08	8,75E-09	3,17E-08	9,74E-09	0	2,42E-08	-7,08E-08
EP-marine	kg N eq.	7,60E-04	1,52E-06	2,04E-05	5,36E-06	5,16E-06	0	2,59E-05	-1,83E-05
EP-terrestial	mol N eq.	2,53E-02	1,86E-05	5,88E-04	5,62E-05	5,76E-05	0	2,84E-04	-1,96E-04
POCP	kg NMVOC eq.	1,88E-03	4,74E-06	5,12E-05	1,45E-05	1,00E-05	0	7,86E-05	-5,13E-05
ADP-M&M	kg Sb eq.	4,89E-08	5,76E-10	1,14E-09	2,96E-09	2,73E-10	0	1,46E-09	-7,76E-09
ADP-fossil	MJ	1,20E+01	9,20E-02	2,46E-01	1,97E-01	4,36E-02	0	1,87E-01	-8,73E-01
WDP	m^3	3,87E-02	6,18E-05	1,44E-02	2,48E-03	2,93E-05	0	1,56E-03	-5,48E-03

GWP-total: *Global Warming Potential;* ***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; See "additional requirements" for indicator given as PO4 eq.* ***EP-marine:*** *Eutrophication potential, fraction of nutrients reaching freshwater end compartment;* ***EP-terrestrial:*** *Eutrophication potential, Accumulated Exceedance;* ***POCP****: Formation potential of tropospheric ozone;* ***ADP-M&M****: Abiotic depletion potential for non-fossil resources (minerals and metals);* ***ADP-fossil:*** *Abiotic depletion potential for fossil resources;* ***WDP:*** *Water deprivation potential, deprivation weighted water consumption*

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

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	2,70E-07	5,74E-11	5,31E-09	1,98E-10	5,89E-11	0	1,24E-09	-5,60E-10
IRP	kBq U235 eq.	1,19E-02	1,66E-05	5,15E-04	5,35E-03	7,89E-06	0	2,31E-04	-1,17E-02
ETP-fw	CTUe	3,27E+00	6,39E-02	6,71E-02	8,65E-02	3,03E-02	0	1,05E-01	-1,92E-01
HTP-c	CTUh	2,47E-09	1,29E-12	5,03E-11	2,48E-12	6,10E-13	0	1,60E-11	-8,81E-12
HTP-nc	CTUh	9,73E-08	7,10E-11	2,00E-09	9,15E-11	3,65E-11	0	1,77E-09	-3,42E-10
SQP	Dimensionless	1,14E+01	3,17E-02	1,60E-02	7,12E-02	1,50E-02	0	3,89E-02	-1,56E-01

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*

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

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

	Potential Soil quality index (SQP)	2

Disclaimer 1 – 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.

Disclaimer 2 – 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

Resource use

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	2,18E+00	5,23E-03	8,03E-01	1,10E-01	2,48E-03	0	6,15E-02	-2,40E-01
RPEM	MJ	7,87E-01	0	-7,54E-01	0	0	0	-3,35E-02	0
TPE	MJ	2,97E+00	5,23E-03	4,86E-02	1,10E-01	2,48E-03	0	2,80E-02	-2,40E-01
NRPE	MJ	1,01E+01	9,22E-02	8,32E-01	1,97E-01	4,37E-02	0	1,48E+00	-8,73E-01
NRPM	MJ	1,88E+00	0	-5,85E-01	0	0	0	-1,29E+00	0
TRPE	MJ	1,20E+01	9,22E-02	2,47E-01	1,97E-01	4,37E-02	0	1,87E-01	-8,73E-01
SM	kg	3,68E-01	0	7,35E-03	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
W	m^3	5,28E-03	5,92E-06	4,25E-04	1,05E-04	2,80E-06	0	4,75E-05	-2,31E-04

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non-renewable primary energy resources used as energy carrier; NRPM Non-renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

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

End of life - Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	2,18E-07	4,42E-13	4,37E-09	1,71E-11	2,09E-13	0	9,61E-12	-1,18E-10
NHW	kg	1,50E-01	1,32E-05	2,30E-02	1,49E-04	6,26E-06	0	9,57E-01	-4,42E-04
RW	kg	8,61E-05	1,14E-07	3,37E-06	3,16E-05	5,38E-08	0	2,08E-06	-6,90E-05

HW Hazardous waste disposed; NHW Non-hazardous waste disposed; RW Radioactive waste disposed

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

End of life – output flow

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	kg	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	6,46E-02	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0	0

ETE	MJ	0	0	0	0	0	0	0	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

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

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	1,74E-02

Additional requirements

Greenhous gas emission 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).

National electricity grid	Unit	Value
Electricity, hydropower, Sweden	kg CO2 -eq/kWh	1,43E-02

Additional environmental impact indicators required in NPCR Part A for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-IOBC	kg CO2 eq.	1,37E+00	6,87E-03	7,65E-02	1,09E-02	3,31E-03	0	1,43E-02	-5,13E-02

GWP-IOBC *Global warming potential calculated according to the principle of instantaneous oxidation.*

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- ☒ The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- ☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- ☐ The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Indoor environment

The products covered by this EPD meet the legal requirements for stone wool thermal insulation.

Carbon footprint

Carbon footprint has not been worked out for the product.

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