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ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	Rockfon (part of ROCKWOOL Group)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	The Norwegian EPD Foundation
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Rockfon Ceiling Tiles, Baffles, Islands and Wall Applications
Rockfon (part of ROCKWOOL Group)

Institut Bauen und Umwelt e.V.

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General Information

Rockfon (part of ROCKWOOL Group)	Rockfon Ceiling tiles
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** Rockfon (part of ROCKWOOL Group) Hovedgaden 501D 2640, Hedehusene, Denmark
Declaration number EPD-RWI-20200018-CBD2-EN	**Declared product / declared unit** 1 m² of installed ceiling tile.
This declaration is based on the product category rules: Mineral panels, 12.2018 (PCR checked and approved by the SVR)	**Scope:** The span of products covered under this declaration is synthetic resin-bonded stone wool materials, which are produced in the form of tiles in the density range from 70 up to 175kg/m³. The products are supplied in thicknesses of 12 up to 160 mm. The declared product in this declaration is Rockfon Arctic with a density of 100kg/m³ and a thickness of 15mm. For the rest of the products scaling factors are provided. For the facing and coating materials, information can be found in the attached Annex. The products included in this EPD are manufactured in Roermond (Netherlands), Cigacice (Poland), Saint Eloy (France), Vyborg (Russia) and Marshall County, Mississippi (USA). The EPD is based on weighted LCA inventory data from the 5 plants. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.
Issue date 10.03.2020	
Valid to 09.03.2025	
 Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	**Verification** The standard *EN 15804* serves as the core PCR Independent verification of the declaration and data according to *ISO 14025:2010* ☐ internally ☒ externally
 Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))	 Dr. Frank Werner (Independent verifier appointed by SVR)

Product

Product description/Product definition
Rockfon stone wool acoustic tiles are traditionally made from volcanic rock (typically basalt or dolomite), an increasing proportion of recycled material, and a low percentage of binder (in Rockfon acoustic tiles this is around 3-4%). The essential component of Rockfon tiles are stone wool fibres, which are monofilament synthetic mineral fibres of non-crystalline structure extracted from a silicate melt. The products described in this EPD are produced in the form of tiles in the density range from 70 up to 175 kg/m³. The products are supplied in thicknesses of 12 up to 160 mm.
The acoustic tiles can have a glass fibre fleece facing and can be coated with water-based dispersion paint. Details for the environmental impacts of this type of facing can be found on the first page of the Annexe. The additional facing of aluminium laminate may be applicable for some products. The environmental impacts of aluminium laminate are presented on the second page of the Annexe.
Product-specific environmental impacts are compiled by applying the relevant scaling factor (listed in the table below) in the Product Specific Scaling formula.

Product Specific Scaling Formula:
Environmental Impact per m^2 $_{\text{product X-with facing}}$ =
Environmental Impact $_{\text{reference product}}$ * scaling factor +
Environmental Impact $_{\text{facing material}}$.

Please note that the scaling factors give the precise amount of material needed to produce the other product types.

Product Name	Scaling Factor
Artic (15 mm) - reference product	1,0
Acoustimass	4,3
Alaska (20 mm)	2,0
Alaska (22 mm)	2,2
Alaska dB 35	2,0
Artic (20 mm)	1,3
Artic (40 mm)	2,7
Blanka A (20 mm)	1,2
Blanka A (25 mm)	1,5
Blanka B/C/D/E/G/M/Z (20 mm)	2,0
Blanka B/C/D/E/G/M/X (25 mm)	2,5
Blanka X (22 mm)	2,2
Blanka Activity	4,0
Blanka Bas	2,0
Blanka dB 35	2,0
Blanka dB 41	3,5
Blanka dB 43	4,4
Blanka dB 46	5,0
Boxer (£ 25 mm)	1,3
Boxer (40 mm CIG)	2,4
Boxer (40 mm ROE & SEL)	1,9
Boxer Wall	2,4
Cinema Black	1,2
Color-all (£ 20 mm)	1,2
Color-all (25 mm)	1,3
Color-all A (40 mm)	1,9
Color-all B (40 mm)	4,0
Color-all D/E	2,0
Color-all X	2,2
Color-All Wall	1,9
Contour	4,0
Cosmos Grey/White (40 mm)	2,7
Cosmos Grey/White (50 mm)	3,3
Cosmos Grey (60 mm)	4,0
Cosmos Grey (80 mm)	5,3
Cosmos Grey (100 mm)	6,7
Eclipse (incl. Wall)	4,0
Ekla (90 kg/m3)	1,2
Ekla (120 kg/m3)	1,6
Ekla Bas	1,3
Ekla dB 41	3,5

Product Name	Scaling Factor
Ekla dB 43	4,4
Ekla Th 40	1,7
Ekla Th 80	3,3
Facett (20 mm)	1,2
Facett (40 mm)	2,4
Facett (50 mm)	3,0
Facett (60 mm)	3,6
Facett (80 mm)	4,8
Facett (100 mm)	6,0
Facett (120 mm)	7,2
Facett (140 mm)	8,4
Facett (160 mm)	9,6
Fibral (20 mm)	1,1
Fibral (25 mm)	1,3
Fibral Multiflex Baffle	2,3
Fusion Blanka/Sonar	2,0
Humitec Baffle	2,3
Hydroclean 12/52	1,1
Hygienic (20 mm)	1,2
Hygienic (40 mm)	1,9
Hygienic Baffle	2,3
Hygienic Plus (20 mm)	1,2
Hygienic Plus (40 mm)	1,9
Industrial Baffle	2,3
Industrial Baffle	2,3
Industrial Black/Nature/Opal (30 mm)	1,4
Industrial Black/Nature/Opal (50 mm)	2,3
Industrial Black/Nature/Opal (100 mm)	3,7
Industrial Black/Nature/Opal (100 mm)	4,7
Industriebatts (25 mm)	1,2
Industriebatts (50 mm)	2,3
Koral A (15 mm)	0,9
Koral A (20 mm)	1,2
Koral A (40 mm)	1,9
Koral E (15 mm)	1,2
Koral E (40 mm) and EI 30	3,2
Koral 100 mm	4,7
Koral Flectoline	1,2
Koral Tenor (15 mm)	0,9

Product Name	Scaling Factor
Koral Tenor (25 mm)	1,2
Koral Wall	1,9
Krios A (20 mm)	1,1
Krios A (25 mm)	1,3
Krios D (20 mm)	2,0
Krios D (25 mm)	2,5
Krios E (20 mm)	1,6
Krios X (22 mm)	2,2
Krios X (25 mm)	2,5
Krios Bas	1,1
Krios O2	1,3
Ligna	1,1
Lithos New	1,2
Logic	0,8
MediCare Air	1,5
MediCare Block	1,3
MediCare Plus A (20 mm)	1,2
MediCare Plus A (25 mm)	1,5
MediCare Plus E (20 mm)	1,6
MediCare Plus X	2,2
MediCare Royal A (20 mm)	1,1
MediCare Royal E (20 mm)	1,6
MediCare Standard (12 mm)	0,8
MediCare Standard A (15 mm)	0,9
MediCare Standard E (15 mm)	1,2
Mono Acoustic Elegant / Ready-Mix (incl. Direct and Flecto)	3,6
Opal Multiflex Baffle	2,3
Pacific	1,0
Pagos Galaxie / Oris	1,1
Pallas	1,1
Pallas HP	1,3
Plafolaine Feu	2,0
Plafolaine Feu	3,6
Rockbaffle Deco	1,7
Rockfon Metal	0,9
Rockfon Metal dB 41	3,0
Rockfon Metal dB 44	4,0
Rockfon Metal dB 46	5,0

Product Name	Scaling Factor
Rockindus (30 mm)	1,4
Rockindus (50 mm)	2,3
Rockindus dB 40	3,0
Rockindus dB 42	4,0
Rocklux	2,2
Rockshed (50 mm)	2,2
Rockshed (75 mm)	3,3
Royal A (£ 20 mm)	1,1
Royal A (25 mm)	1,3
Royal E (15 mm)	1,2
Royal E (20 mm)	1,6
Royal Hygiene (20 mm)	1,1
Royal Hygiene (40 mm)	1,9
Samson (incl. Wall)	2,4
Scholar (20 mm)	1,2
Scholar (incl. Wall) (40 mm)	2,4
Sofit New	0,9
Sonar A/B/C/D/E/G/M/Z (20 mm)	2,0
Sonar A/D/E/M/X (25 mm)	2,5
Sonar X (22 mm)	2,2
Sonar Activity	4,0
Sonar Bas	2,0
Sonar Cut-to	2,5
Sonar dB 35	2,0
Sonar dB 40	3,0
Sonar dB 41	3,5
Sonar dB 42/43	4,4
Sonar dB 44/46	5,0
Soundstop 30 dB	4,4
Soundstop 21 dB	3,0
Soundstop 33 dB	4,8
Swing	1,6
Tabique Plenum	3,7
Tropic A (15 mm)	0,9
Tropic A (20 mm)	1,4
Tropic A (40 mm)	1,9
Tropic E (15 mm)	1,2
Tropic E (20 mm)	1,6
Tropic dB 42	4,4
Universal Baffle	2,3
VertiQ	3,2
VertiQ Metal	1,7

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration *EN 13964:2014 or EN 13162+A1:2015* and the CE-marking.
For the application and use the respective national provisions apply. They meet the requirements of the regulation (EU) Nr. 1272/2008/EU.

Application
Rockfon products include acoustic ceiling tiles, baffles, islands and wall applications. They are available with different coatings and facings in a variety of shapes, thicknesses, and densities and positively contribute to a healthy indoor environment.

Technical Data
The technical specifications listed below cover the range of all the products declared in this EPD. For information regarding specific products please visit https://www.rockfon.co.uk and access the provided Declarations of Performance (DoP).

Constructional data (acc. to EN 13964)

Name	Value	Unit
Gross density	70 - 175	kg/m^3
Reaction to Fire acc. to EN 13964	A1	
Sound absorption coefficient (αw) acc. to EN 13964	up to 1.00	
Susceptibility to the growth of harmful micro-organisms, as dampness acc. to EN 13964	A - not susceptible	
Thermal conductivity acc. to EN 13964	0.04	W/(mK)
Susceptibility to the growth of harmful micro-organisms, through thermal insulation acc. to EN 13964	A	
Durability acc. to EN 13964	Class 1/C/0N	
Sound absorption class	A	
Light reflection	up to 87%	%
Light diffusion	up to >99%	%
Humidity and sag resistance	up to 100% RH and no visible deflection	%
Airborne sound reduction acc. to EN ISO 10848-2 and EN ISO 717-1	up to 42	dB

Performance data of the Rockfon stone wool products are in accordance with the declaration of performance with respect to its essential characteristics according to *EN 13964:2014.*
Emission tests according to *EN 16516:2018* are available from national technical managers

Base materials/Ancillary materials
Composition Rockfon stone wool product:

- non-scarce natural stone and cement [59%]
- slags and other secondary materials or waste materials [19,5%]
- mineral oil and bonding agent [<0,2%]
- binder, a thermoset inert polymer resin [5%]
- Non-woven glass wool facing (optional) [1-15%]
- water-based paints [0-16,5%]

Packaging represents less than 6% of the final product delivered to the customer. The raw materials are non-scarce natural stones, secondary materials and briquettes, which are made of mineral wool waste, secondary materials and by-products from other industries such as slags and cement. The binder is a thermoset inert polymer resin which is polymerized into a solid resin during the production of the final stone wool product. The coating is a waterborne acrylic coating and an additional (optional) polyurethane (PU) coating.
This product/article/at least one partial article contains substances listed in the candidate list (*ECHA PR/19/12*) (date: 16.07.2019) exceeding 0.1 percentage by mass: **no**
Mineral wool fibres produced by ROCKWOOL are classified as non-hazardous under REACH (Regulation (EC) No 1272/2008 of the European Parliament and of the council of 16 December 2008 on classification, labelling and packaging of substances and mixtures).

ROCKWOOL stone wool is registered with REACH under the following definition: “Man-made vitreous (silicate) fibres with random orientation with alkaline oxide and alkali earth oxide ($Na_2O+K_2O+CaO+MgO+BaO$) content greater than 18% by weight and fulfilling one of the Note Q conditions”. ROCKWOOL products produced in Europe fulfil the Note Q requirements. This is certified by the independent certification body EUCEB. (European Certification Board for mineral wool products). More information on EUCEB can be found under www.euceb.org.

Reference service life
A reference service life according to *ISO 15686* is not declared for this EPD. Instead, a service life is declared according to *BBSR table*. According to this table, mineral panels have a service life of more than 50 years in a building. For this EPD the declared value is therefore 50 years.

This is the service life that is used in most existing PCRs and EPDs in the Dutch, German, US and Canadian markets. The mineral wool core in Rockfon products is tested to maintain its properties for at least 50 years. Also, Rockfon products are tested to maintain flatness even in high temperature/ high humidity environments (40°C / 95 % relative humidity). Given this, there is no doubt that Rockfon ceiling tiles could have a technical lifespan of more than 50 years in a normal indoor environment.
Some owners will replace the Rockfon product due to renovations or aesthetics, but not for functional performance reasons. Replacements typically do not happen due to technical failure but are more likely the result of vandalism, accidents, visual appearance, minor refurbishments (e.g. painting an office, changing of tenants) or major refurbishments.

LCA: Calculation rules

Declared Unit
The declared unit refers to 1 m² of installed acoustic ceiling tile or wall panel (within the density range 70 – 175 kg/m³) with the results being representative for a 15 mm thick and 1,5 kg/m² heavy product. This weight per m² is applicable for the stone wool core without the facing. The declared product is Rockfon Arctic with a density of 100kg/m³ and a thickness of 15 mm.

Declared unit

Name	Value	Unit
Declared unit	1	m²
Grammage	1.5	kg/m²
Thickness of the panels	15	mm
Conversion factor to 1 kg	0.667	-

System boundary
EPD type: **Cradle to gate with options, modules C1–C4, and module D**.
The modules considered in the life cycle assessment as per system boundaries are described as follows:

Production
The product stage A1-A3 includes:

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

The environmental impact of co-products coming for example from the steel and electricity plants (e.g. slags, alumina and ashes entering the system as inputs to the manufacturing) is accounted for and economic allocation is applied.
Recycled stone wool comes free of environmental burden, as it enters the product system as waste. Its transport to the factory is accounted for. Modules A1,

A2 and A3 are declared as an aggregated module A1-A3.

Construction/Installation
The Construction Stage A4-A5 includes:

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

The transport in A4 is modelled based on the amount of tiles that fit in a truck that can hold 44 pallets. The values are based on annual average delivery data. 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 7% and according to the modularity principle of *EN 15804*, its impacts are fully allocated to A5. The 7% assumption is used based on the "common scenarios for LCA" internal document from EURIMA (European Insulation Manufacturers Association) but can, in reality, be significantly lower.
The A5 stage, according to *EN 15804* includes also waste processing up to the end-of-waste state or disposal of final residues during the construction process stage and impacts and aspects related to product losses during installation. Finally, the A5 module includes also the corresponding end-of-life considerations for packaging. The assumption for installation waste for this calculation is that it is 100% landfilled but it often also is 100% closed-loop recycled through the Rockfon recycling service offering.

Building Use
The use-stage B1-B7, related to the building fabric includes:

- B1 use or application of the installed product - not part of this EPD;
- B2 maintenance;
- B3 repair;
- B4 replacement;
- B5 refurbishment;
- B6 – Operational energy use:
- B7 – Operational water use:

Rockfon stone wool ceiling tiles are installed permanently in the structure and do not require maintenance, repair, replacement or refurbishment under normal use conditions. Similarly, Rockfon has no operational energy or water use.

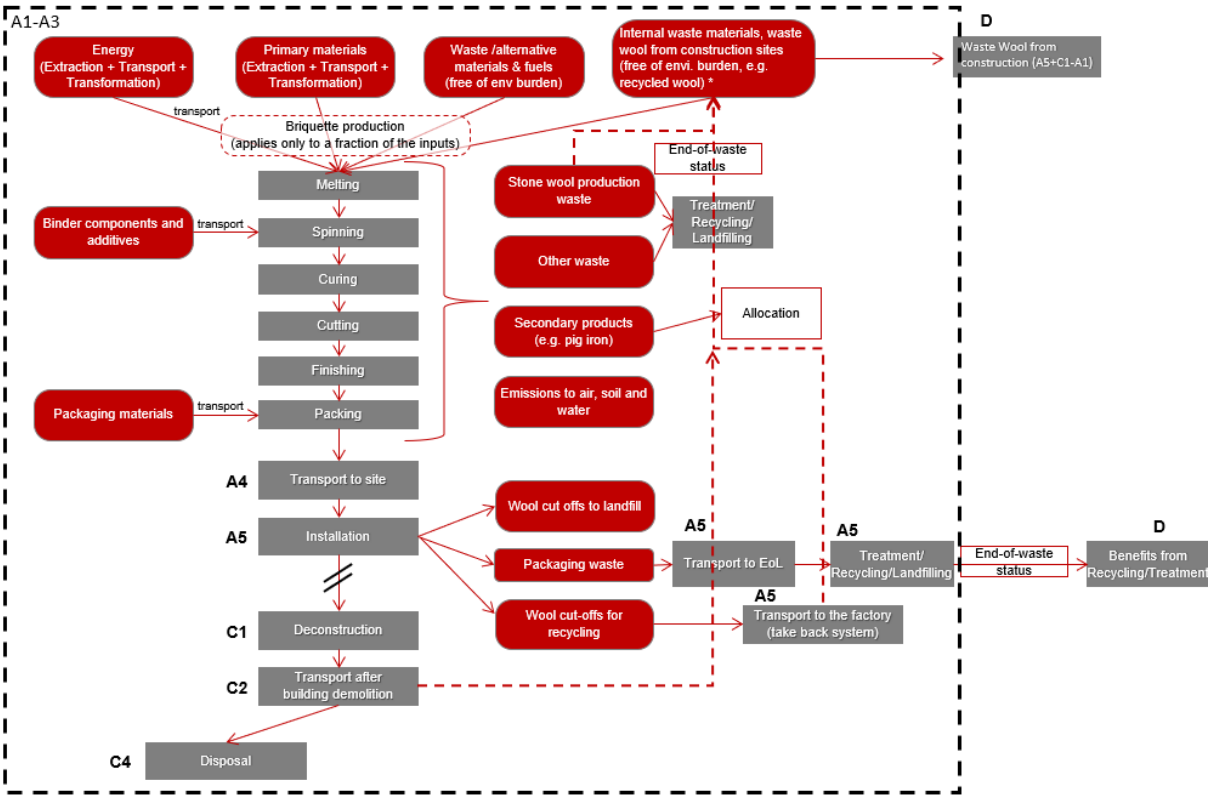
End of Life
The End-of-life stage C1-C4 includes:

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

These stages also include the provision and all transport, provision of all materials, products and related energy and water use. Manual deconstruction is assumed for C1 and no impacts are assigned. The benefits from disposal (heat or electricity recovery) are assigned to module D.

Module D includes reuse, recovery and/or recycling potentials expressed as net loads and benefits. Here the loads from the packaging disposal in A5 and from electricity generation on landfill are considered.

The product system with the system boundaries is presented in the graph below:



Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. . The used background datasets and database version have to be mentioned since they can have an influence on the final results. The used software for the development of the declaration was *GaBi, version 8.0.1.257 by thinkstep*.

LCA: Scenarios and additional technical information

The following technical information for the declared modules can be used for scenario development in a building context.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	38	l/100km
Transport distance	646	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	100	kg/m^3

Installation into the building (A5)

Name	Value	Unit
Electricity consumption	0	kWh
Material loss	7	%

Reference service life

Name	Value	Unit
Life Span (according to BBSR)	> 50	a

End of life (C1-C4)

Name	Value	Unit
Landfilling	15	kg
Transport to landfill	50	km
Utilization rate	50	%

Reuse, recovery and/or recycling potentials (D), relevant scenario information
Any declared benefits and loads from net flows leaving the product system that have not been allocated as co-products and that have passed the end-of-waste state are included in module D. Such declared benefits can occur in stages A5 and C4. The generated energy, such as heat and electricity from waste incineration of packaging is assigned to module D. The benefits are calculated using current average substitution processes. The heat is credited for with heat from natural gas. The electricity is credited for with the specific country's electricity mix. This is also applied for materials that are landfilled as the benefits from electricity production from landfill gas recovery are included in module D.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	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	X	MNR	MNR	MNR	X	X	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² of Rockfon ceiling tile

Parameter	Unit	A1-A3	A4	A5	B2	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO_2-Eq.]	1.56E+0	2.21E-1	2.75E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.79E-3	0.00E+0	2.16E-2	-6.97E-2
ODP	[kg CFC11-Eq.]	2.65E-9	3.66E-17	3.94E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.93E-19	0.00E+0	1.26E-16	-1.34E-14
AP	[kg SO_2-Eq.]	8.42E-3	1.87E-4	6.39E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.38E-6	0.00E+0	1.30E-4	-1.85E-4
EP	[kg $(PO_4)^{3-}$-Eq.]	1.23E-3	4.13E-5	1.06E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.89E-7	0.00E+0	1.47E-5	-1.80E-5
POCP	[kg ethene-Eq.]	6.11E-4	7.02E-7	4.90E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.26E-7	0.00E+0	9.96E-6	-1.79E-5
ADPE	[kg Sb-Eq.]	4.67E-7	1.71E-8	3.14E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.70E-10	0.00E+0	7.96E-9	-2.12E-8
ADPF	[MJ]	1.79E+1	3.01E+0	1.57E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.51E-2	0.00E+0	3.03E-1	-1.42E+0

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE according to EN 15804+A1: 1 m² of Rockfon ceiling tile

Parameter	Unit	A1-A3	A4	A5	B2	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.41E+0	1.75E-1	1.91E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.79E-3	0.00E+0	3.97E-2	-2.06E-1
PERM	[MJ]	2.20E+0	0.00E+0	-1.63E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	3.61E+0	1.75E-1	2.82E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.79E-3	0.00E+0	3.97E-2	-2.06E-1
PENRE	[MJ]	1.77E+1	3.02E+0	1.75E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.53E-2	0.00E+0	3.14E-1	-1.53E+0
PENRM	[MJ]	2.27E+0	0.00E+0	-2.27E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	2.00E+1	3.02E+0	1.73E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.53E-2	0.00E+0	3.14E-1	-1.53E+0
SM	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m^3]	6.84E-3	2.96E-4	8.56E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.40E-6	0.00E+0	7.90E-5	-4.23E-4

Caption	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

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES according to EN 15804+A1: 1 m² of Rockfon ceiling tile

Parameter	Unit	A1-A3	A4	A5	B2	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	3.60E-7	1.68E-7	3.77E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.65E-9	0.00E+0	5.35E-9	-1.70E-9
NHWD	[kg]	1.20E-1	2.45E-4	1.17E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.31E-6	0.00E+0	1.46E+0	-8.99E-4
RWD	[kg]	7.62E-4	4.09E-6	6.06E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.86E-8	0.00E+0	4.21E-6	-2.70E-5
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	3.42E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.05E-2	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	1.53E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	4.60E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

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Annex 1

Self declaration from EPD owner

Specific Norwegian requirements

1 Applied electricity data set used in the manufacturing phase

The selection of the background data for the electricity generation is in line EN 15804. Within the different plants the country specific power grid mix (reference year 2018) is applied.

<0,00985 kg CO2 eqv/MJ> (based on the location of the different plants and according to GaBi database 8.7.1.30 emission factors.

2 Content of dangerous substances

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

☐ The product contains substances that are less than 0.1% by weight given by the REACH Candidate or the Norwegian priority list.

☐ The product contains dangerous substances more than 0.1% by weight given in the REACH candidate list or the Norwegian Priority List, concentrations is given in the EPD:

Dangerous substances from the REACH candidate list or the Norwegian Priority List	CAS No.	Quantity (concentration, wt%/FU(DU)).
Substance 1		
Substance n		

3 Transport from the place of manufacture to a central warehouse

Transport distance and CO_2-eqv./DU from transport of the product from factory gate to central warehouse in Oslo shall be given.

The transport distance here is set as a weighted average, based on the transport distances from all four Nordic factories to Oslo.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy use	Unit	Value (l/t)	CO_2-eqv./DU
Boat	48%	Container Ship	77	2,3E-04	Kg HFO/kg of cargo	0,235	1,7E-03
Truck*	85%	Truck, Euro 6, 17,3t payload	1163	0,38	l/km	58,12	39,6E-01
Railway							

*The capacity utilization has been modelled based on volumetric capacity modelling for the panels, meaning that it was modelled based on the volume of the panels of the reference product that could fit in the truck.

4 Impact on the indoor environment

☒ Indoor air emission testing has been performed; specify test method and reference:

The majority of ROCKFON products meet the requirements for low emissions (M1) according to EN15251: 2007 Appendix E.

☐ No test has being performed

☐ Not relevant; specify _____

epd-norge.no
The Norwegian EPD Foundation

Annex

For the following facing options, applicable to Rockfon ceiling tiles:

- **Glass fibre fleece and dispersion paint (applicable to all Rockfon products in this EPD)**
- **Aluminium laminate facing**

to the

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	ROCKWOOL International A/S (ROCKWOOL Nordics)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	The Norwegian EPD Foundation
Declaration number	EPD-RWI-20200018-CBD1-EN
Registration number	NEPD-2133-964-EN
Issue date	10/03/2020
Valid to	09/03/2025

Rockfon Ceiling Tiles, Baffles, Islands and Wall Applications

Rockfon (part of ROCKWOOL Group)

Institut Bauen und Umwelt e.V.

www.ibu-epd.com / https://epd-online.com

LCA: Results for the facing options

The LCA approach for the facings options follows the general methodology and assumptions from ROCKWOOL International, as these are explained in the background methodology report and have been verified and approved. This Annex is not a stand-alone document and it is used as a supplementary file to the verified EPD for Rockfon ceiling tiles, Baffles, Islands and Wall Applications.

Below the impact assessment results and life cycle indicators are presented, for all the facing options that can be available in a Rockfon ceiling tile. If the provided product has the specific facing, its final impact result is given by adding the result of the product, as calculated above, and the result of the specific facing option. Both results are expressed per m^2 therefore no additional conversion is needed, the final result is given by the formula:

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

The disposal scenario in the end orf lfie is assumed to be landfill for all the options. The first facing option is applicable to all the Rockfon products while the second is optional and applicable only to some.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	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	X	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m^2 Glass Fleece and Paint

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
GWP	[kg CO_2-Eq.]	8,50E-01	3,50E-02	1,04E-01	0,00E+00	0,00E+00	5,41E-03	0,00E+00	8,20E-03	0,00E+00
ODP	[kg CFC11-Eq.]	0,00E+00	5,80E-18	5,70E-11	0,00E+00	0,00E+00	8,87E-19	0,00E+00	4,70E-17	0,00E+00
AP	[kg SO_2-Eq.]	4,00E-03	3,00E-05	2,91E-04	0,00E+00	0,00E+00	4,65E-06	0,00E+00	4,90E-05	0,00E+00
EP	[kg $(PO_4)^{3-}$-Eq.]	3,10E-04	6,50E-06	2,70E-05	0,00E+00	0,00E+00	1,03E-06	0,00E+00	5,60E-06	0,00E+00
POCP	[kg ethene-Eq.]	3,36E-04	1,11E-07	2,51E-05	0,00E+00	0,00E+00	-2,20E-08	0,00E+00	3,74E-06	0,00E+00
ADPE	[kg Sb-Eq.]	1,11E-05	2,71E-09	7,78E-07	0,00E+00	0,00E+00	4,16E-10	0,00E+00	3,04E-09	0,00E+00
ADPF	[MJ]	1,59E+01	4,70E-01	1,18E+00	0,00E+00	0,00E+00	7,29E-02	0,00E+00	1,15E-01	0,00E+00

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE: 1 m^2 Glass Fleece and Paint

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
PERE	[MJ]	2,56E+00	2,80E-02	1,86E-01	0,00E+00	0,00E+00	4,26E-03	0,00E+00	1,51E-02	0,00E+00
PERM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	2,56E+00	2,80E-02	1,86E-01	0,00E+00	0,00E+00	4,26E-03	0,00E+00	1,51E-02	0,00E+00
PENRE	[MJ]	1,71E+01	4,70E-01	1,27E+00	0,00E+00	0,00E+00	7,37E-02	0,00E+00	1,18E-01	0,00E+00
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,71E+01	4,70E-01	1,27E+00	0,00E+00	0,00E+00	7,37E-02	0,00E+00	1,18E-01	0,00E+00
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m^3]	4,21E-03	4,70E-05	3,91E-04	0,00E+00	0,00E+00	7,20E-06	0,00E+00	3,00E-05	0,00E+00

Caption	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

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m^2 Glass Fleece and Paint

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
HWD	[kg]	2,40E-08	2,65E-08	4,00E-09	0,00E+00	0,00E+00	4,10E-09	0,00E+00	2,02E-09	0,00E+00
NHWD	[kg]	1,85E-01	3,90E-05	5,40E-02	0,00E+00	0,00E+00	5,99E-06	0,00E+00	5,50E-01	0,00E+00
RWD	[kg]	5,07E-04	6,40E-07	3,75E-05	0,00E+00	0,00E+00	9,94E-08	0,00E+00	1,59E-06	0,00E+00
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	9,40E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	4,10E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	1,26E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	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	X	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² Aluminium Laminate

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
GWP	[kg CO_2-Eq.]	4,30E-01	7,00E-03	4,00E-02	0,00E+00	0,00E+00	1,02E-03	0,00E+00	2,50E-03	0,00E+00
ODP	[kg CFC11-Eq.]	0,00E+00	1,20E-18	1,20E-11	0,00E+00	0,00E+00	1,70E-19	0,00E+00	1,40E-17	0,00E+00
AP	[kg SO_2-Eq.]	2,20E-03	6,00E-06	1,54E-04	0,00E+00	0,00E+00	8,90E-07	0,00E+00	1,50E-05	0,00E+00
EP	[kg $(PO_4)^{3-}$-Eq.]	1,20E-04	1,30E-06	1,00E-05	0,00E+00	0,00E+00	2,01E-07	0,00E+00	1,70E-06	0,00E+00
POCP	[kg ethene-Eq.]	1,42E-04	2,30E-08	1,03E-05	1,64E-10	0,00E+00	-5,00E-09	0,00E+00	1,14E-06	0,00E+00
ADPE	[kg Sb-Eq.]	9,63E-07	5,10E-10	6,71E-08	0,00E+00	0,00E+00	7,90E-11	0,00E+00	9,20E-10	0,00E+00
ADPF	[MJ]	6,50E+00	1,00E-01	4,60E-01	0,00E+00	0,00E+00	1,39E-02	0,00E+00	3,50E-02	0,00E+00

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE: 1 m² Aluminium Laminate

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
PERE	[MJ]	2,17E+00	6,00E-03	1,54E-01	0,00E+00	0,00E+00	8,10E-04	0,00E+00	4,60E-03	0,00E+00
PERM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	2,17E+00	6,00E-03	1,54E-01	0,00E+00	0,00E+00	8,10E-04	0,00E+00	4,60E-03	0,00E+00
PENRE	[MJ]	7,30E+00	9,00E-02	5,30E-01	0,00E+00	0,00E+00	1,40E-02	0,00E+00	3,60E-02	0,00E+00
PENRM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	7,30E+00	9,00E-02	5,30E-01	0,00E+00	0,00E+00	1,40E-02	0,00E+00	3,60E-02	0,00E+00
SM	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	[m³]	6,21E-03	1,00E-05	4,61E-04	0,00E+00	0,00E+00	1,38E-06	0,00E+00	9,10E-06	0,00E+00

Caption	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

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m² Aluminium Laminate

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
HWD	[kg]	6,00E-09	5,50E-09	9,00E-10	0,00E+00	0,00E+00	7,80E-10	0,00E+00	6,10E-10	0,00E+00
NHWD	[kg]	1,02E-01	8,00E-06	1,90E-02	0,00E+00	0,00E+00	1,14E-06	0,00E+00	1,60E-01	0,00E+00
RWD	[kg]	2,88E-04	1,30E-07	2,06E-05	0,00E+00	0,00E+00	1,94E-08	0,00E+00	4,80E-07	0,00E+00
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	2,00E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	8,00E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	2,60E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

Annex 1

Self declaration from EPD owner

Specific Norwegian requirements

1 Applied electricity data set used in the manufacturing phase

The selection of the background data for the electricity generation is in line EN 15804. Within the different plants the country specific power grid mix (reference year 2018) is applied.

<0,00985 kg CO2 eqv/MJ> (based on the location of the different plants and according to GaBi database 8.7.1.30 emission factors.

2 Content of dangerous substances

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

☐ The product contains substances that are less than 0.1% by weight given by the REACH Candidate or the Norwegian priority list.

☐ The product contains dangerous substances more than 0.1% by weight given in the REACH candidate list or the Norwegian Priority List, concentrations is given in the EPD:

Dangerous substances from the REACH candidate list or the Norwegian Priority List	CAS No.	Quantity (concentration, wt%/FU(DU)).
Substance 1		
Substance n		

3 Transport from the place of manufacture to a central warehouse

Transport distance and CO_2-eqv./DU from transport of the product from factory gate to central warehouse in Oslo shall be given.

The transport distance here is set as a weighted average, based on the transport distances from all four Nordic factories to Oslo.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy use	Unit	Value (l/t)	CO_2-eqv./DU
Boat	48%	Container Ship	77	2,3E-04	Kg HFO/kg of cargo	0,235	1,7E-03
Truck*	85%	Truck, Euro 6, 17,3t payload	1163	0,38	l/km	58,12	39,6E-01
Railway							

*The capacity utilization has been modelled based on volumetric capacity modelling for the panels, meaning that it was modelled based on the volume of the panels of the reference product that could fit in the truck.

4 Impact on the indoor environment

☒ Indoor air emission testing has been performed; specify test method and reference:

The majority of ROCKFON products meet the requirements for low emissions (M1) according to EN15251: 2007 Appendix E.

☐ No test has being performed

☐ Not relevant; specify _____