



# ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Paroc AB
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
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Valid to:	22.10.2023

## Paroc Acoustics

PARAFON Buller (White, Nature, Grey, Black)  
OEM products

Paroc AB



## General information

### Product:

PARAFON Buller (White, Nature, Grey, Black)  
OEM customized products

### Program operator:

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NEPD-1657-658-EN

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### Place of production:

Skövde, Sweden

### Management system:

ISO 14001 and ISO 9001

### This declaration is based on Product Category Rules:

CEN Standard EN 15804 serves as core PCR  
NPCR 010 rev1, Building Boards

### Organisation no:

887294852

### Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. No program operator shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

### Issue date:

22.10.2018

### Valid to:

22.10.2023

### Declared unit:

1 m<sup>2</sup> of installed ceiling tile

### Year of study:

2017

### Declared unit with option:

1 m<sup>2</sup> of installed ceiling tile

### Comparability:

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

### Functional unit:

1 m<sup>2</sup> of installed ceiling tile

### The EPD has been worked out by:

Josefina Johansson

  **PAROC**

### Verification:

The CEN Norm EN 15804 serves as the core PCR.  
Independent verification of the declaration and data,  
according to ISO14025:2010

internal  external

Third party verifier:



Martin Erlandsson, IVL  
(Independent verifier approved by EPD Norway)

Approved:

  
Håkon Hauan  
Managing Director of EPD-Norway

## Product

### Product description:

PARAFON products are sound absorbing tiles and panels for suspended ceilings and free hanging applications. The products core material are non combustible stone wool and facing material are pre painted glass fibre tissue with color, durability variations. PARAFON products are intended for use indoor and are certified according to EN 13964:2014 for Suspended Ceilings.

### Product specification:

PARAFON products covered in this EPD are produced of stone wool in 40 kg/m<sup>3</sup> density and with glass fibre facing thicknesses in a range from 50-135 g/m<sup>2</sup>. However, the values declared in the EPD are based on a hypothetical worst product of the products in this range. The product thicknesses vary from 30-200 mm and LCA value according to thickness is to be find in table on page 7.

For more information, please visit:  
<http://www.paroc.com/solutions-and-products/solutions/room-acoustics>



### Technical data: (of worst case product)

Weight: 1,00 kg

Size: 600x1200x30 mm

For more information; see Bibliography, page 9

Materials	kg	%
Mineral wool	0.86	86
Facings	0.10	10
Binder, coatings, dustbinding	0.04	4
Total product	1.00	100%
Packaging	0.04 kg	
Total: Product + Packaging	1,04 kg	

### Reference service life, product:

The reference service lifetime of Parafon Acoustic Ceiling Tiles is 50 years.

### Reference service life, building:

The reference service lifetime of 50 years has been assumed for the building in all calculations.

### Market:

Main market areas are the Nordic countries. The scenarious bevond cradle-to-gate are based on Norwegian market.

Industrial Ceiling Products	Edge profiles	Thickness (mm)
PARAFON Buller Nature	A	30, 50, 100
PARAFON Buller White	A	30, 50, 100
PARAFON Buller Grey	A	30, 50, 100
PARAFON Buller Black	A	30, 50, 100
OEM customized products	A	18-200

## LCA: Calculation rules

### Declared unit:

1 m<sup>2</sup> of installed ceiling tile (thickness: 30 mm, weight per 1 m<sup>2</sup>: 1,4 kg)

### System boundary:

Table below identifies the modules included in this study: The production stage (module A1-A3) covers the following steps:

- Raw materials production (e.g. diabase, dolomite)
- Binder components production (e.g. resin)
- Transports of raw materials and pre-products to manufacturing plant
- Product manufacturing (power, thermal energy, auxiliaries, emissions)
- Production of packaging materials

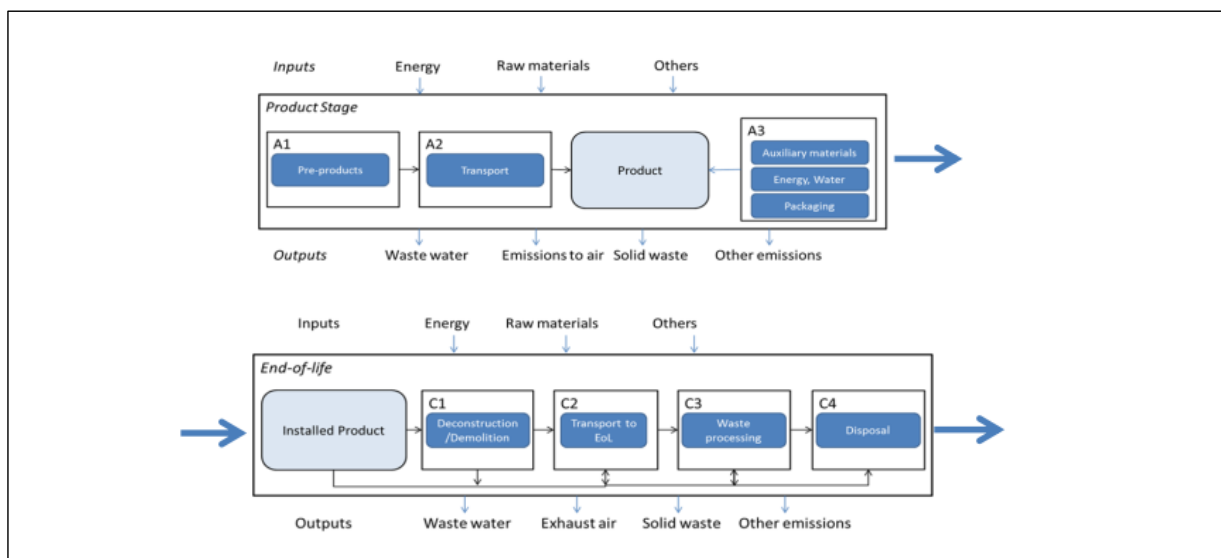
- Waste management, water treatment, end-of-life of residues

With the exception of Modules A1 to A3 (describing the manufacturing of stone wool) all other modules are calculated on the basis of assumptions or scenarios.

The following scenarios were considered in this study:

- module C4 (landfill).

Figure 1. Schematic representation of LCA system boundaries for the production module (A1-A3) and the End-of-Life (C1-C4). In this study, only in the end-of-life of the product, only C4 was considered.



### Data quality:

The stone wool production data is site specific from PAROC plants Hässleholm and Hällekis in Sweden. The acoustics ceiling tiles are made of refined stone wool at PARAFON plant in Skövde, Sweden. The inventory for the stone wool manufacturing at Hällekis and Hässleholm, and the ceiling plant in Skövde, covers the year 2015 and is representative for the current manufacturing.

For life cycle modeling the GaBi ts Software System for Life Cycle Assessment, developed by thinkstep AG, is used (/GaBi ts 2016/). All relevant background datasets are taken from the GaBi ts software database. To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs.

Background data refer to the years 2012 till 2015 (/GaBi ts 2016/) with a country specific scope as far as available, e.g. for raw material extraction and production, transportation, fuels and energy supply.

All relevant processes (foreground and background) have been considered when modelling stone wool production. The process data and the used background data are consistent. The data quality can be qualified as good.

### Cut-off criteria:

All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts (<1%) are not included. This cut-off rule does not apply for hazardous materials and substances.

### Allocation:

The allocation is made in accordance with the provisions of EN 15804.

Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation.

Effects of primary production of recycled materials allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

## LCA: Scenarios and additional technical information

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

### End of Life (C2, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling	kg	0
Energy recovery	kg	0
To landfill	kg	1.44

Paroc maintains and offers its customers a used product take-back system called "Paroc Re-Wool" to enable the recycling of old stone wool/acoustic boards.

As module A5 is not declared (including product installation and packaging disposal) and from module C4 (product disposal on landfill) no potential benefits arise module D is not declared.

## LCA: Results

Life Cycle Impact Assessment results represent the environmental impacts for the life cycle of Parafon Acoustic Board from cradle to gate - with options.

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

Product stage			Assembly 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	MND	MND	MND	MND	MND	MND	MND	MNR	MNR	MND	MND	MND	X	MND	

### Environmental impact

Parameter	Unit	A1-A3	C4
GWP	kg CO <sub>2</sub> -eqv	14,1*	2.23E-02
ODP	kg CFC11-eqv	4.73E-09	2.48E-13
POCP	kg C <sub>2</sub> H <sub>4</sub> -eqv	4.64E-04	1.29E-05
AP	kg SO <sub>2</sub> -eqv	6.23E-03	1.34E-04
EP	kg PO <sub>4</sub> <sup>3-</sup> -eqv	4.45E-03	1.82E-05
ADPM	kg Sb-eqv	2.00E-05	7.71E-09
ADPE	MJ	158	0.29

\*including 0,094 kg CO<sub>2</sub>-eq uptake of biogenic carbon dioxide included in product (0) and packaging (0,094).

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.

### Resource use

Parameter	Unit	A1-A3	C4
RPEE	MJ	68.5	-
RPEM	MJ	1.34	-
TPE	MJ	69.8	0.643
NRPE	MJ	187	-
NRPM	MJ	2.48	-
TRPE	MJ	189	0.566
SM	kg	0.159	-
RSF	MJ	0	-
NRSF	MJ	0	-
W	m <sup>3</sup>	0.172	1.16E-04

Reading example:  $9,0 \text{ E-}03 = 9,0 \cdot 10^{-3} = 0,009$

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

### End of life - Waste

Parameter	Unit	A1-A3	C4
HW	kg	9.09E-05	6.87E-09
NHW	kg	6.74E-01	1.39
RW	kg	2.05E-03	4.20E-06

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

## End of life - Output flow

Parameter	Unit	A1-A3	C4
CR	kg	0	0
MR	kg	0	0
MER	kg	0	0
EEE	MJ	0	0
ETE	MJ	0	0

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

Scaling of these EPD results of the declared product to other products with different thicknesses in the same density range (see above) can be done by using the following multiplication facts. The results are conservative for thicknesses >50 mm, since the 30 mm alternative is used as basis for the scaling factor:

Available thicknesses in product group	Scaling factor of LCA results
18 mm	0.60
30 mm	1.00
50 mm	1.67
100 mm	3.33
150 mm	5.00
200 mm	6.67

Key environmental indicators	Unit	Cradle to gate A1-A3	Transport *****
Global warming	kg CO <sub>2</sub> -eqv	2.21	0.02
Energy use	MJ	37.73	-
Dangerous substances	*	-	-

\* The product contains no substances from the REACH Candidate list of the Norwegian priority list

\*\*\*\*\* Transport from production site to central warehouse in Norway

## Additional Norwegian requirements

### Greenhouse 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).

Data source	Amount	Unit
GaBi ts database SP 30 (2016)	0.0431	CO <sub>2</sub> -eqv/kWh

### Dangerous substances

- 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 contain 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 (Avfallsforkiften, Annex III), see table.

### Transport

Transport from production site to central warehouse in Norway is: 245 km

### Indoor environment




The product meets the requirements for low emissions (M1) according to EN 15251: 2007 Appendix E. PAROC stone wool products fulfil the most stringent requirement (M1) in the Finnish voluntary system for building material emissions developed by the Finnish Society of Indoor Air Quality and Climate in Finland. Our stone wool products are recognized as low emitting products, for which they have been tested since 1995. PAROC low emitting products are recognized by the M1 label.

### Carbon footprint

Carbon footprint has not been worked out for the product.

## Bibliography

ISO 14025:2010	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14040:2006	<i>Environmental management - Life cycle assessment - Principles and framework</i>
ISO 14044:2006	<i>Environmental management - Life cycle assessment - Requirements and guidelines</i>
EN 15804:2012+A1:2013	<i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
Dr. Iris Matzke, Yannick Bernard	<i>Background report for EPD of Paroc Parafon Acoustic Board. Revised October 2018.</i>
PCR	<i>NPCR 010 rev1, Building Boards, The Norwegian EPD Foundation, 12/2013</i>

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