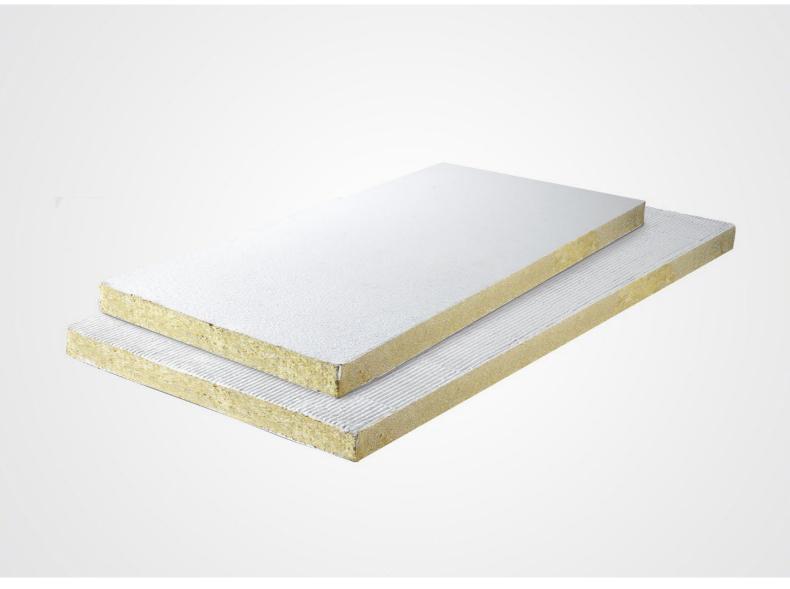


Environmental Product Declaration

in accordance with ISO 14025 and EN 15804+A2

Protecta FR Board 2-S





Business and Industry
Foundation for
Environmental
Product Declarations

Owner of the declaration:

Polyseam AS

Product:

Protecta FR Board 2-S

Declared device:

1 m2

The declaration is based on PCR:

EN 15804:2012+A2:2019 serves as core PCR NPCR 012:2022 Part B for Thermal insulation products

Programme operator: The

Business and Industry Foundation for Environmental Product Declarations

Declaration number:

NEPD-5256-4593-EN

Publication number:

NEPD-5256-4593-EN

Approved Date: 25/10/2023

Valid until: 25/10/2028

EPD Software:

LCA.no EPD generator ID: 96546



General information

Product

Protecta FR Board 2-S

Program operator:

P.O. Box 5250 Majorstuen, 0303 Oslo, Norway The Business and Industry Foundation for Environmental Product Declarations Phone: +47 23 08 80 00 Web: post@epd-norge.no

rest poste opa norganie

Declaration number: NEPD-5256-4593-EN

The declaration is based on PCR:

EN 15804:2012+A2:2019 serves as core PCR NPCR 012:2022 Part B for Thermal insulation products.

Statement of Liability:

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

Declared device:

1 m2 Protecta FR Board 2-S

Declared device with option:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Functional unit:

1 m2 Protecta FR Board painted on two sides. The board is 60mm thick and has a specific gravity of 160 kg/m3. The painted surface has a specific gravity of 1.3-1.4 kg/ltr. Thermal conductivity: 0.038 W/mK

General information about verification of EPD from tools:

Independent verification of data, other environmental information and EPD has been carried out in accordance with ISO 14025:2010, chapters 8.1.3 and 8.1.4. Verification of each EPD is carried out in accordance with the EPD Norway's guidelines for verification and approval which require EPD tools to be i) integrated into the company's environmental management system, ii) procedures for use of EPD tools approved by the EPD Norway and iii) the process is reviewed annually by an independent 3rd party verifier. See Appendix G of the EPD-Norway guidelines for more information about EPD tools

Verification of EPD tools:

Independent third-party verification of tools, background data and test EPDs is done in accordance with EPD-Norway's procedures and guidelines for verification and approval of EPD tools.

Third-party verifier:

Owner of the declaration:

Polyseam AS

Contact person: Andrea Bogstad Phone: +47 33 30 67 00 Email: post.no@polyseam.com

Producer:

Polyseam Ltd

Production site:

Polyseam Ltd St Andrews Road 15

HD1 6SB Huddersfield, West Yorkshire, United Kingdom

Quality/Environmental System:

ISO 9001, ISO 14001

Org. en.:

986 426 051

Approved Date: 25/10/2023

Valid until: 25/10/2028

Year of study:

2022

Comparability:

EPDs of construction products are not necessarily comparable if they do not comply with NS-EN 15804 and are seen in a building context.

Preparation and verification of environmental product

declaration: The declaration has been prepared and verified using the EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is

integrated into the company's environmental management system, and

approved by the EPD Norway EPD is prepared by: Andrea Bogstad

Company-specific data and EPD controlled by: Wol Hluchan

Approved:

Håkon Hauan, CEO EPD-Norway

Elisabet Amat - GREENIZE projects (does not require signature)



Product

Product Description:

The Protecta FR Board has been developed to prevent the spread of fire and smoke through openings in fire-rated walls and covers where these are broken for the installation of several technical penetrations. FR Board will often also maintain the sound resistance of the structure in which it is mounted

FR Board has a core consisting of high-density stone wool, covered with FR Coating. The Coating provides an important barrier against the penetration of fire, smoke and hot gases through the stone wool. This reduces the temperature increase, which means that the system protects against heat conduction in the general technical installations.

The FR Board is available with Coating on one or both sides and is determined with regard to what is to be fireproofed and the desired fire resistance. At the construction site, FR Board must be used together with FR Acrylic for sealing around penetrations and against adjacent structures.

Product specification:

Materials	Value	Unit
MATERIALS		
Paint	25-30	%
Mineral	70-75	%
PACKAGING		
Packaging - Wood	1,55	Kg
Packaging - Plastic	0,11	Kg

Technical data:

The product has a third party approved European Technical Assessment issued in accordance with Regulation (EU) No. 305/2011 on the basis of EAD 350454-00-1104, based on tests carried out according to EN 1366-3, -4 & -12 in conjunction with EN 1363-1. The product is CE marked for Europe.

For more information, see https://www.protecta.co.uk/no/product/fr-board/

Market Area:

Norway.

Lifetime, product:

60 years of correct installation.

Lifetime, building or construction:

60 years.

LCA: Calculation rules

Declared device:

1 m2 Protecta FR Board 2-S

Cut-off criteria:

All important raw materials and energy use are included. The production process for the raw materials and energy flows included in very small amounts (less than 1%) is not included. These cut-off criteria do not apply to hazardous materials and substances.

Allocation:

Allocation is made in accordance with provisions of EN 15804. Incoming energy and water, as well as the production of waste in own production, are allocated equally between all products through mass allocation. The environmental impact and resource consumption of the primary production of recycled materials is allocated to the original product system. The processing process and transportation of the material to the production site are allocated to the analysis in this EPD.

Data quality:

Specific data for the product mix are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the given year of the study. Background data are based on EPDs according to EN 15804 and various LCA databases. The data quality of the raw materials in A1 is presented in the table below.



Materials	Source	Data quality	Year
Mineral	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Wood	Modified ecoinvent 3.6	Database	2019
Chemical	ecoinvent 3.6	Database	2019
Chemical	Modified ecoinvent 3.6	Database	2019
Solvent	ecoinvent 3.6	Database	2019
Bind	ecoinvent 3.6	Database	2019
Pigments	ecoinvent 3.6	Database	2019
Packaging - Paper	ecoinvent 3.6	Database	2019
Preservative	ecoinvent 3.6	Database	2019



System limits (X=included, MND=module not declared, MNR=module not applicable)

	ı	Product phase Assembly phase		phase		Application phase							Final		End-of-life gains and loads (D)		
	Raw materials	Transport	Manufacture	Transport	Construction/instal lation phase	Custom	Maintenance	Repair	Replacements	Renovation	Operational energy use	Operational water use	Disassembly	Transport	Waste treatment	Waste for final treatment	Reuse/recovery/recyclin g potential
Ì	A1	A2	A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	C3	C4	D
	Χ	X	X	X	X	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	MONTH	Χ	X	Χ	X	X

System limits:

The life cycle analysis is a cradle-to-grave study, excluding the use phase (B1-B7). This includes the extraction and production of raw materials and packaging, transport to the production site, the production process itself, transport to the construction site, waste management upon installation of the product, demolition, transport to waste treatment, the waste treatment itself, disposal of masses as well as avoided emissions and use of resources in a new product.

A1 and A2: The product is repackaged on smaller pallets upon arrival in Norway, this process is included.

A4: Transport from factory in England to Norway is included. 300km of transport from our warehouse to construction site is also added according to PCR.

A5: Manual installation is taken as a basis, electricity is not taken into account. No sealants/adhesives are included. Our fire rated products are system approved and we have EPDs for the necessary products. We expect that EPDs for the used products will also be enclosed as documentation. 2% material wastage is included at installation. All packaging is sent to average waste disposal.

C1: Average datasets are used for demolition.

C2: 50km transport to the nearest waste treatment plant as a basis. C3: No

part of the product is assumed to have been sent for incineration.

C4: The entire product is assumed to have been sent to landfill. The stone wool can be recycled if the paint is removed. We consider the likelihood of this practice being implemented to be minimal.

D: Reuse, recovery and recycling set to zero. The following flowchart illustrates the system limits of the analysis:



Additional technical information:

The Protecta FR Board can be easily removed by removing the screws fixed in the plate. Can be reused if the product is undamaged. Can also be repaired with Protecta FR Coating paint (spray painted) if paint has flaked off.

Polyseam's factory is certified according to the ISO 14001 Environment Management (EMS) Standard. This framework guides in reducing and managing the impact of production on the environment.

Read more here https://www.polyseam.com/sustainability/



LCA: Scenarios and other technical information

The following information describes the scenarios for the modules in the EPD.

Transport from production site to user (A4)	Capacity utilisation incl. returns (%)	Distance (km)	Fuel/Energy consumption	Unit	Value (litres/tonn e)
Ship, Ferry, Sea (km)	50,0 %	1117	0,034	L/TKM	37,98
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	69	0,043	L/TKM	2,97
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	300	0,043	L/TKM	12,90
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	138	0,043	L/TKM	5,93
Construction phase (A5)	Unit	Value			
Material loss during instalation (kg)	Units/DU	0,20			
Waste treatment of material lost during instalation (kg)	kg/DU	0,20			
Waste, packaging, pallet, EUR wooden pallet, reusable, to average treatment (kg)	Kg	2,63			
Waste, packaging, plastic film (LDPE), to average treatment (kg)	Kg	0,12			
Disassembly (C1)	Unit	Value			
Demolition of building and mixed material collection, 0,012kWh per kg demolished material (kg)	kg/DU	11,93			
Transport to waste treatment (C2)	Capacity utilisation incl. returns (%)	Distance (km)	Fuel/Energy consumption	Unit	Value (litres/tonn e)
Truck, over 32 tonnes, EURO 6 (km) - Europe	53,3 %	50	0,023	L/TKM	1,15
Waste for final treatment (C4)	Unit	Value			
Waste, paint, to landfill (kg)	kg/DU	2,78			
Waste, stone wool, to landfil (kg)	kg/DU	7,50			



LCA: Results

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

Envir	Environmental impact												
	Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D	
	GWP Total	kg CO2 - Eq	9.38E+00	1.75E-01	5.57E-01	2.45E+00	4.24E+00	4.77E-02	5.20E-02	0	3.65E-01	0	
	GWP fossil	kg CO2 - Eq	1.19E+01	1.75E-01	5.39E-01	2.45E+00	2.49E-01	4.77E-02	5.20E-02	0	3.64E-01	0	
	GWP-biogenic	kg CO2 - Eq	-2.52E+00	7.25E-05	1.76E-02	7.87E-04	3.99E+00	8.95E-06	2.23E-05	0	5.36E-05	0	
	GWP-luluc	kg CO2 - Eq	1.25E-02	6.19E-05	6.14E-04	1.26E-03	1.74E-04	3.76E-06	1.58E-05	0	1.67E-05	0	
	ODP	kg CFC11 - Eq	8.21E-07	3.97E-08	4.80E-08	5.17E-07	2.71E-08	1.03E-08	1.25E-08	0	2.49E-08	0	
CF .	AP	moles H+ -Eq	1.04E-01	5.06E-04	1.88E-03	5.08E-02	4.41E-04	4.99E-04	1.67E-04	0	5.78E-04	0	
	EP-FreshWater	kg P-eq	4.17E-04	1.40E-06	1.38E-05	1.35E-05	5.83E-06	1.74E-07	4.13E-07	0	7.05E-07	0	
	EP-Marine	kg N-eq	1.07E-02	1.01E-04	3.81E-04	1.25E-02	1.07E-04	2.20E-04	3.66E-05	0	2.04E-04	0	
	EP-Terrestial	mol N - eq	1.77E-01	1.13E-03	4.14E-03	1.39E-01	1.12E-03	2.39E-03	4.09E-04	0	2.25E-03	0	
	POCP	kg NMVOC -Eq	5.49E-02	4.33E-04	1.08E-03	3.68E-02	3.41E-04	6.65E-04	1.60E-04	0	7.22E-04	0	
250	ADP- minerals&metals1	kg Sb - eq	1.11E-04	4.76E-06	6.71E-06	3.71E-05	1.01E-06	7.33E-08	9.26E-07	0	5.68E-07	0	
	ADP-fossil1	МЈ	1.97E+02	2.65E+00	1.10E+01	3.37E+01	1.19E+00	6.57E-01	8.44E-01	0	1.73E+00	0	
<u>%</u>	WDP1	m3	1.73E+03	2.54E+00	4.75E+01	1.81E+01	4.58E+00	1.40E-01	6.47E-01	0	4.42E+00	0	

GWP total = Global warming potential overall; GWP fossil = Global warming potential fossil fuels; GWP biogenic = Global warming potential biogenic sources; GWP-luluc = Global warming potential land use and land use changes; ODP = Potential for stratospheric ozone depletion; AP = Acidification potential for sources on land and water; EP = eutrophication potential of freshwater, oceans and soil; POCP = Potential for photochemical oxidant formation; ADP-minerals&metals = Abiotic depletion potential of non-fossil resources, minerals and metals; ADP-fossil = Abiotic depletion potential of fossil resources, fossil fuels; WDP = Depletion potential of water resources

Environmental impact note

[&]quot;Reading example: 9.0 E-03 = 9.0*10 -3 = 0.009"

^{*}INA Indicator Not Assessed

^{1.} The results of this environmental impact indicator should be used with caution as the uncertainty of the results is high or there is limited experience in the use of the indicator.



Supp	Supplementary indicators of environmental impact													
Inc	licator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D		
	PM	Disease incidence	5.80E-07	1.09E-08	7.49E-09	1.00E-07	6.77E-09	6.04E-08	4.77E-09	0	1.16E-08	0		
	IRP2	kgBq U235 -eq	4.72E-01	1.16E-02	1.77E-01	1.46E-01	4.98E-03	2.86E-03	3.69E-03	0	7.42E-03	0		
	ETP-fw1	CTUe	2.31E+02	1.96E+00	7.95E+00	2.17E+01	4.91E+00	3.59E-01	6.17E-01	0	1.04E+00	0		
40.4 ***********************************	HTP-c1	CTUh	4.02E-08	0.00E+00	2.01E-10	0.00E+00	2.75E-10	1.20E-11	0.00E+00	0	4.80E-11	0		
8	HTP-nc1	CTUh	1.53E-07	2.14E-09	6.77E-09	2.54E-08	2.19E-09	3.34E-10	5.97E-10	0	8.51E-10	0		
	SQP1	dimensionless	1.61E+02	1.91E+00	9.26E+00	1.28E+01	9.47E-01	7.98E-02	9.67E-01	0	4.67E+00	0		

PM = Particulate emissions; IRP = Ionizing radiation (health effect); ETP-fw = Ecotoxicity (fresh water); HTP-c = Toxicity impact on humans, cancer; htp-nc= Toxicity effects on humans, effects other than cancer; SQP = Impacts on land use change/soil quality

[&]quot;Reading example: 9.0 E-03 = 9.0*10 -3 = 0.009"

^{*}INA Indicator Not Assessed

^{1.} The results of this environmental impact indicator should be used with caution as the uncertainty of the results is high or there is limited experience with the use of the indicator.

^{2.} This category of influence deals mainly with the eventual effect of low-dose ionizing radiation on human health in the nuclear fuel cycle. It does not take into account effects due to possible nuclear accidents, occupational exposures or due to the removal of radioactive waste in underground facilities. Potential ionizing radiation from the soil, from radon and from some building materials is also not measured by this indicator.



Resourc	ce use											
	dicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
OF OF	PERE	МЈ	2.88E+01	3.78E-02	3.03E+00	3.32E-01	2.19E-01	3.58E-03	1.06E-02	0	3.23E-02	0
Z.	PERM	МЈ	2.34E+01	0.00E+00	0.00E+00	0.00E+00	-3.65E+01	0.00E+00	0.00E+00	0	0.00E+00	0
₽£	PERT	МЈ	5.22E+01	3.78E-02	3.03E+00	3.32E-01	-3.63E+01	3.58E-03	1.06E-02	0	3.23E-02	0
	PENRE	МЈ	1.55E+02	2.65E+00	1.10E+01	3.37E+01	1.19E+00	6.57E-01	8.44E-01	0	1.73E+00	0
År	PENRM	МЈ	4.53E+01	0.00E+00	0.00E+00	0.00E+00	-5.14E+00	0.00E+00	0.00E+00	0	0.00E+00	0
IA.	PENRT	МЈ	2.01E+02	2.65E+00	1.10E+01	3.37E+01	-3.94E+00	6.57E-01	8.44E-01	0	1.73E+00	0
<u> </u>	SM	Kg	2.82E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	2.99E-04	0
2	RSF	МЈ	3.20E-01	1.35E-03	4.38E-03	1.06E-02	3.80E-03	0.00E+00	3.71E-04	0	6.93E-04	0
	NRSF	МЈ	9.28E-02	4.82E-03	5.10E-03	2.74E-02	1.25E-02	0.00E+00	1.24E-03	0	2.07E-03	0
96	FW	m3	1.42E-01	2.84E-04	4.43E-03	2.50E-03	9.84E-04	3.38E-05	9.60E-05	0	1.95E-03	0

PERE = Renewable primary energy used as an energy carrier; PERM = Renewable primary energy used as raw material; PERT = Total use of renewable primary energy; PENRE = Non-renewable primary energy used as an energy carrier; PENRM = Non-renewable primary energy used as raw material; PENRT = Total use of nonrenewable primary energy; SM

⁼ Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water.

[&]quot;Reading example: 9.0 E-03 = 9.0*10 - 3 = 0.009" *INA Indicator Not Assessed



End of li	ife - Waste	:										
Ind	icator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	HWD	Kg	2.63E-02	1.37E-04	3.35E-02	1.53E-03	2.00E-01	1.93E-05	4.62E-05	0	8.56E-05	0
Ū	NHWD	Kg	1.20E+00	1.33E-01	6.53E-02	7.66E-01	2.53E-01	7.78E-04	7.34E-02	0	1.03E+01	0
ā	RWD	Kg	3.77E-04	1.81E-05	8.82E-05	2.32E-04	0.00E+00	4.56E-06	5.76E-06	0	7.25E-06	0

HWD = Disposed of hazardous waste; NHWD = Disposed of non-hazardous waste; RWD = Disposed of radioactive waste

"Reading example: 9.0 E-03 = 9.0*10 -3 = 0.009" *INA Indicator Not Assessed

End of lif	End of life - Output flow														
Indica	ator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D			
@D	CRU	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E+00	0.00E+00	0.00E+00	0	0.00E+00	0			
&\>	MFR	Kg	7.38E-02	0.00E+00	1.12E-01	0.00E+00	1.04E-01	0.00E+00	0.00E+00	0	2.81E-04	0			
DF	MORE	Kg	2.37E-03	0.00E+00	9.13E-07	0.00E+00	2.26E-01	0.00E+00	0.00E+00	0	2.27E-06	0			
50	EEE	MJ	5.45E-02	0.00E+00	8.77E-02	0.00E+00	9.09E-02	0.00E+00	0.00E+00	0	1.96E-05	0			
D	EET	MJ	8.25E-01	0.00E+00	1.33E+00	0.00E+00	1.38E+00	0.00E+00	0.00E+00	0	2.97E-04	0			

CRU = Components for reuse, MFR Materials for recycling, MER = Materials for energy recovery, EEE = Exported electrical energy; EET = Exported thermal energy

"Reading example: 9.0 E-03 = 9.0*10 -3 = 0.009"

*INA Indicator Not Assessed

Biogenic carbon content information											
Indicator	Unit	At port									
Content of biogenic carbon in product	kg C	5.09E-04									
Content of biogenic carbon in packaging	kg C	6.92E-01									

Note: 1 kg of biogenic carbon corresponds to 44/12 kg of CO2



Additional requirements

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

The national production mix from imports, low voltage (including production of transmission lines, as well as direct emissions and losses in grids) is used for applied electricity in the production process (A3). Background data are presented in the table below. Characterization factors from EN15804:2012+A2:2019 are used.

Electricity mix	Data source	Amount	Unit
Electricity, United Kingdom, Market mix (kWh)	ecoinvent 3.6	386,67	g CO2-eq/kWh
Electricity, United Kingdom, Solar (kWh)	ecoinvent 3.6	78,98	g CO2-eq/kWh

Dangerous substances

The product has not been supplied with substances from the REACH Candidate List or the Norwegian priority list.

Indoor environment

The Protecta FR Board is emission tested by Normec Product Testing. Satisfies minimum requirements for contaminants as well as the pattern valid level for indoor air quality as stated in the BREEAM-NOR Manual 2022 v6.0 - New building.

FR Brannplate is also listed in the Nordic Ecolabel portal for construction products that can be used in Nordic Swan ecolabelled buildings generation 3.

Additional environmental information

Additional in	Additional indicators of environmental impact needed in NPCR Part A for construction products												
Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D		
GWPIOBC	kg CO2 -eq	1.16E+01	1.75E-01	6.33E-01	2.45E+00	2.49E-01	4.77E-02	5.20E-02	0	3.95E-02	0		

GWP-IOBC: Global warming potential calculated on the principle of immediate oxidation. To increase the clarity 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 the context of the Swedish Public Procurement Act.



Bibliography

NS-EN ISO 14025:2010 Environmental labels and declarations - Environmental product declarations type III - Principles and procedures. NS-EN ISO 14044:2006 Environmental management - Life cycle assessments -

Requirements and guidelines.

NS-EN 15804:2012+A2:2019 Sustainable buildings - Environmental product declarations - Basic product category rules for

 $construction\ products.\ ISO\ 21930:2017\ Sustainability\ in\ buildings\ and\ civil\ engineering\ works\ -$

Core rules for environmental product declarations of construction products and services.

ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.

Iversen et al., (2021) eEPD v2021.09 Background information for EPD generator tool system verification, LCA.no Report number: 07.21

Vold et. al., (2022) EPD generator for NPCR 012 Thermal insulation, Background information for EPD generator application and LCA data, LCA.no report number: 07.22.

NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD Norway.

NPCR 012 Part B for Part B for Thermal insulation products, Ver. 2.0, 31.03.2022, EPD Norway.

Testrapport SPT2023-R076 - VOC Emission Test Report

and norge	Program operator and publisher	Phone: +47 23 08 80 00
© epd-norge	Business Foundation for Environmental Product	email: post@epd-norge.no
Global program operatør	Declarations P.O. Box 5250 Majorstuen, 0303 Oslo,	web: www.epd-norge.no
	Norway	
'Polyseam.	Owner of the declaration:	Phone: +47 33 30 67 00
đ	Polyseam AS	email: post.no@polyseam.com
	Raven Road 7, 3174 Revetal	web: https://www.polyseam.com/
(LCA)	Author of the Life Cycle Report	Phone: +47 916 50 916
.no	LCA.no AS	email: post@lca.no
	Dokka 6B, 1671	web: www.lca.no
(LCA)	EPD generator developer	Phone: +47 916 50 916
	LCA.no AS	email: post@lca.no
EGG PLATFORM	Dokka 6B,1671 Kråkerøy	web: www.lca.no
VERIFIED	ECO Platform	web: www.eco-platform.org
	ECO Portal	web: ECO Portal