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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Protan AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-1920-845
Registration number:	NEPD-1920-845
ECO Platform reference number:	00001031
Issue date:	06.11.2019
Valid to:	06.11.2024

Protan SE 1.6 Roofing Membrane

Protan AS

www.epd-norge.no

General information

Product:

Protan SE 1.6 Roofing Membrane

Owner of the declaration:

Protan AS
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Program operator:

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Manufacturer:

Protan AS

Declaration number:

NEPD-1920-845-EN

Place of production:

Drammen, Norway

ECO Platform reference number: 00001031

Management system:

ISO 9001 (95-OSL-AQ-6343) og ISO 14001 (NO 97-OSL-SYMI-8015)

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR

Organisation no:

983 599 060

Statement of liability:

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

Issue date: 06.11.2019

Valid to: 06.11.2024

Declared unit:

1 m2 Protan SE 1.6 Roofing Membrane

Year of study:

2019

Declared unit with option:

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

Comparability:

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

Functional unit:

Author of the Life Cycle Assessment:

The declaration is developed using eEPD v3.0 from LCA.no
Approval:
Company specific data are:

Collected/registered by: Sara Salman

Internal verification by:

Verification:

Independent verification of data, other environmental information and the declaration according to ISO14025:2010, § 8.1.3 and § 8.1.4

External

Third party verifier:

Sign

Senior Research Scientist, Anne Rønning

(Independent verifier approved by EPD Norway)

Approved:

Sign

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Protan SE1,6 is a high quality polyester reinforced thermoplastic waterproofing membrane with high tensile and tear strength.

Protan SE 1,6 is used on exposed roof surfaces. The membrane can be mechanically fastened to the load bearing substrate or installed in a Protan vacuum roof system. The membrane can be used on roofs of all shapes and sizes – whether flat, sloped or curved. The membrane is used on warm/compact roof constructions as well as cold/ventilated constructions.

Product specification

Protan SE1,6 contains stabilizers which makes the product resistant to high and low temperatures, UV-resistant and flame retardant.

Materials	%
PVC	40-42
Plasticizer	31-33
Polyester textile	5-6
Fire-, heat-and UV-stabilizers	20-24

Technical data:

Vekt: 1850 g/m²

DoP: DoP315-SE-16-E

TG: https://www.sintefcertification.no/Product/Index/10

CPR: https://www.sintefcertification.no/Product/Index/3546

Market:

Europe

Reference service life, product

Typical 40 years

Reference service life, building

60 years

LCA: Calculation rules

Declared unit:

1 m2 Protan SE 1.6 Roofing Membrane

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do 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. Each product type is manufactured on a specific machine at Protan and has its own measuring system for energy consumption. Therefore, allocation is not relevant for calculating energy consumption in A3. The environmental impact and resource consumption for primary production of recycled materials is allocated to the original product system. Processing and transportation of the material to the production site is allocated to the analysis in this EPD

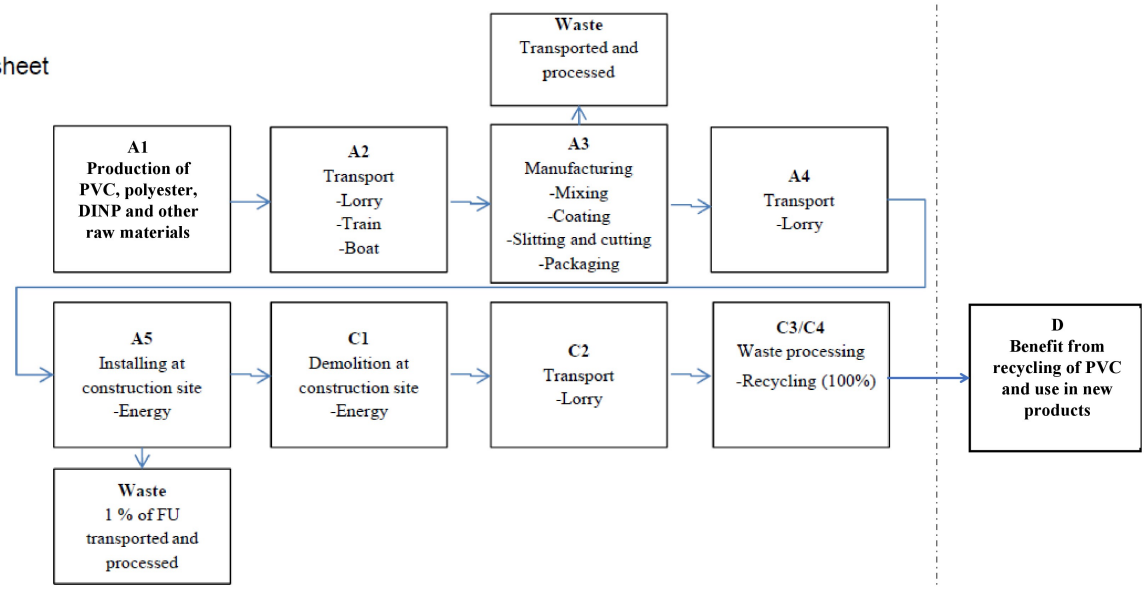
Data quality:

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

Materials	Source	Data quality	Year
Chemicals	Chemicals below cut-off	No data	0
Plasticizer	PlasticsEurope, Eco-profile DINP	EPD	2014
E-PVC	PlasticsEurope, Eco-profile E-PVC	EPD	2014
S-PVC	PlasticsEurope, Eco-profile S-PVC	EPD	2014
Fillers	ecoinvent 3.4	Database	2017
Fire-, heat- and UV-stabilizers	ecoinvent 3.4	Database	2017
Polyester textile	Modified ecoinvent 3.4	Database	2017

System boundary:

Figure 1 Flow sheet



Additional technical information:

LCA: Scenarios and additional technical information

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

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	75,0 %	Truck, lorry over 32 tonnes, EURO 6, CU 75%	300	0,019773	l/tkm	5,93
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Assembly (A5)

.	Unit	Value
Auxiliary	kg	
Water consumption	m^3	
Electricity consumption	kWh	0,0690
Other energy carriers	MJ	
Material loss	kg	0,0175
Output materials from waste treatment	kg	0,3992
Dust in the air	kg	
VOC emissions	kg	

End of Life (C1, C3, C4)

.	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	1,8500
Energy recovery	kg	
To landfill	kg	

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	75,0 %	Truck, lorry over 32 tonnes, EURO 6, CU 75%	1500	0,019773	l/tkm	29,66
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

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Benefits and loads beyond the system boundaries (D)

.	Unit	Value
Erstatting av takbelegg (kg)	kg/DU	1,85

LCA: Results

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

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

Environmental impact

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	4,33E+00	3,98E-02	4,35E-02	0	1,99E-01	4,39E-02	0	-3,68E+00
ODP	kg CFC11 -eq	1,74E-06	8,33E-09	2,10E-09	0	4,16E-08	2,04E-09	0	-4,07E-06
POCP	kg C_2H_4-eq	1,63E-03	6,14E-06	1,15E-05	0	3,07E-05	3,71E-06	0	-1,04E-03
AP	kg SO_2 -eq	1,61E-02	1,02E-04	9,20E-05	0	5,08E-04	1,37E-04	0	-9,34E-03
EP	kg PO_4^{3-} -eq	1,78E-02	1,40E-05	1,34E-04	0	7,02E-05	2,07E-04	0	-1,74E-03
ADPM	kg Sb -eq	1,40E-05	8,27E-08	6,39E-08	0	4,13E-07	6,29E-08	0	-2,41E-05
ADPE	MJ	9,73E+01	6,55E-01	1,91E-01	0	3,27E+00	4,91E-01	0	-8,73E+01

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

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009
*INA Indicator Not Assessed

Resource use

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	9,08E+00	1,17E-02	2,85E-01	0	5,84E-02	1,08E-01	0	-6,85E+00
RPEM	MJ	8,23E-02	0,00E+00	7,13E-04	0	0,00E+00	0,00E+00	0	0,00E+00
TPE	MJ	9,16E+00	1,17E-02	2,86E-01	0	5,84E-02	1,08E-01	0	-6,85E+00
NRPE	MJ	6,98E+01	6,75E-01	2,11E-01	0	3,38E+00	6,76E-01	0	-6,70E+01
NRPM	MJ	4,20E+01	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0	-3,83E+01
TRPE	MJ	1,12E+02	6,75E-01	2,11E-01	0	3,38E+00	6,76E-01	0	-1,05E+02
SM	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0	0,00E+00
RSF	MJ	6,35E-04	0,00E+00	4,90E-05	0	0,00E+00	0,00E+00	0	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0	0,00E+00
W	m^3	7,83E-02	1,59E-04	2,72E-04	0	7,93E-04	2,39E-04	0	-1,43E-01

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
*INA Indicator Not Assessed

End of life - Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	1,13E-03	3,44E-07	1,96E-07	0	1,72E-06	2,43E-06	0	-3,39E-03
NHW	kg	2,73E+00	6,19E-02	3,87E-02	0	3,10E-01	1,01E-02	0	-2,31E-02
RW	kg	INA*	INA*	INA*	0	INA*	INA*	0	INA*

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
*INA Indicator Not Assessed

End of life - Output flow

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0	0,00E+00
MR	kg	0,00E+00	0,00E+00	1,74E-01	0	0,00E+00	0,00E+00	0	0,00E+00
MER	kg	0,00E+00	0,00E+00	2,01E-01	0	0,00E+00	0,00E+00	0	0,00E+00
EEE	MJ	INA*	INA*	INA*	0	INA*	INA*	0	INA*
ETE	MJ	INA*	INA*	INA*	0	INA*	INA*	0	INA*

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
*INA Indicator Not Assessed

Additional Norwegian requirements

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

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

Electricity mix	Data source	Amount	Unit
Elektrisitet, Norge (kWh)	ecoinvent 3.4	31,04	g CO2-ekv/kWh

Dangerous substances

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

Indoor environment

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
EN 15804:2012+A1:2013 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.
Iversen et al., (2018) eEPD v3.0 - Background information for EPD generator system. LCA.no report number 04.18.
Iversen et al., (2018) EPD¬generator for Protan AS, Bakgrunnsrapport og livsløpsdata, LCA.no report number 02.08.
NPCR Part A: Construction products and services. Ver. 1.0. April 2017, EPD-Norge.
NPCR 022 Part B for Roof waterproofing. Ver. 2.0 June 2018, EPD-Norge.

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