

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Steni AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2658-1362-EN
Registration number:	NEPD-2658-1362-EN
ECO Platform reference number:	-
Issue date:	03.02.2021
Valid to:	03.02.2026

Terra by Steni

Steni AS



www.epd-norge.no



General information

Product:

Terra by Steni

Program operator:

The Norwegian EPD Foundation
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Declaration number:

NEPD-2658-1362-EN

ECO Platform reference number:

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR and NPCR - Part B 010
NPCR 010:2019 Part B for Building boards

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.

Declared unit:

1 m2 Terra by Steni

Declared unit with option:

A1,A2,A3,A4,A5,B2,C1,C2,C3,C4,D

Functional unit:

1 m2 covering surface of installed building board with a specific function, from cradle-to-grave, with activities needed for a study period of 25

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Individual third party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii) the process is reviewed annually. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Michael M. Jenssen, Asplan Viak AS

(no signature required)

Owner of the declaration:

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Manufacturer:

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Norway

Place of production:

Steni AS
Lågendalsveien 2633 , 3277 STEINSHOLT
Norway

Management system:

ISO 9001:2015, sert. no.: 0102916

Organisation no:

918 150 145

Issue date:

03.02.2021

Valid to:

03.02.2026

Year of study:

2020

Comparability:

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

Development and verification of EPD:

The declaration has been developed and verified using EPD tool lca.tools ver EPD2020.11, developed by LCA.no AS. The EPD tool is integrated into the company's environmental management system, and has been approved by EPD-Norway

Developer of EPD:

Jan Marius Kruse

Reviewer of company-specific input data and EPD:

Herleif Rimstad

Approved:

Sign



Håkon Hauan, CEO EPD-Norge

Product

Product description:

STENI Terra is a robust stone composite panel with stone covered surface(front) designed for use as exterior ventilated cladding on all types of buildings. The panel consist of several layers of materials that are hardened and acrylic cured to give long lasting surface and life time. The panel comes in three different stone colours and panel sizes.

Product specification

STENI Terra comes in three stone colours and tree stock panel sizes. The panel sizes are; 1195x2395mm, 595x2395mm, 595x1195mm

Materials	kg	%
Reinforcement	0,50	3,91
Additives	0,03	0,23
Binder	2,16	16,90
Stone Aggregates	4,00	31,27
Filler, core stone aggregate	6,10	47,69
Total	12,79	

Packaging	kg	
Packaging - Pallet	0,51	
Packaging - Plastic	0,01	
Packaging - Plastic strips	0,00	
Total including packaging	13,31	

Technical data:

STENI Terra is a robust stone composite panel with a core of crushed stone, with an avrage weight of 9,5kg/m2.

Market:

Europe

Reference service life, product

The panel has 25 years as reference service life under normal conditions, assuming installation, use and maintenance instructions are followed.

Reference service life, building

25 years

LCA: Calculation rules

Declared unit:

1 m2 Terra by Steni

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.

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.

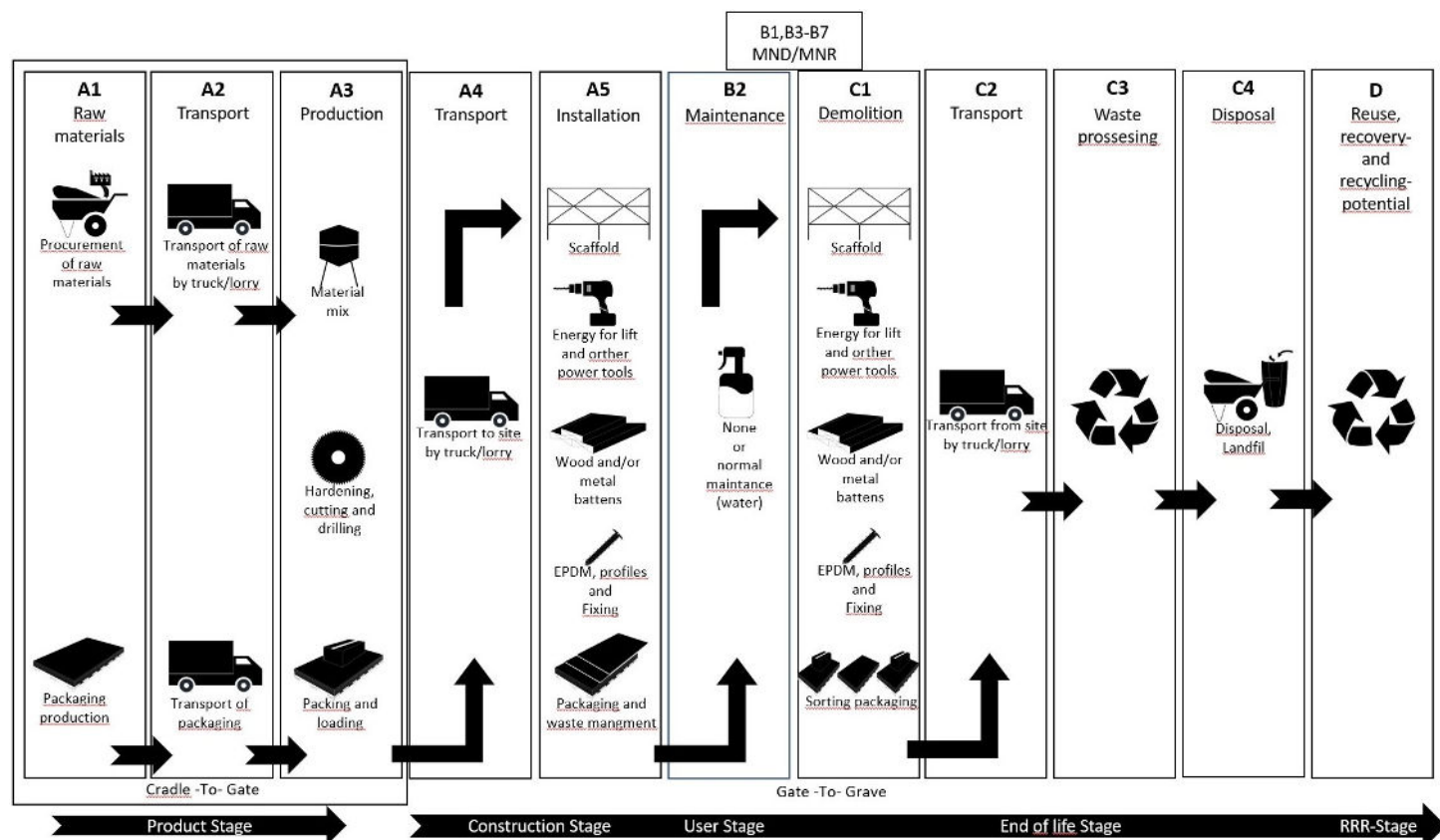
Materials	Source	Data quality	Year
Additives	EcoInvent 3.6	Database	2016
Packaging - Plastic	ecoinvent 3.4	Database	2017
Packaging - Pallet	NorEnviro	Database	2018
Binder	ecoinvent 3.6	Database	2019
Filler, core stone aggregate	ecoinvent 3.6	Database	2019
Reinforcement	ecoinvent 3.6	Database	2019
Stone Aggregates	ecoinvent 3.6	Database	2019
Packaging - Plastic strips	Modified ecoinvent 3.6	Database	2019
Binder	Specific data from supplier 2019	Database	2019

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

System boundary:

The analysis as shown includes "Cradle To Gate" with the modules A1-A3, and with options A4, A5, B2, C1,C2,C3 and C4.



LCA: Scenarios and additional technical information

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

The only maintenance needed is cleaning with water approximately every 10th year. After end of life, the panels will be taken down and sent directly to disposal.

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	38,8 %	Truck, lorry 16-32 tonnes, EURO 6	300	0,043626	l/tkm	13,09
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Assembly (A5)

.	Unit	Value
Auxiliary	kg	
Water consumption	m ³	
Electricity consumption	kWh	0,0050
Other energy carriers	MJ	
Material loss	kg	
Output materials from waste treatment	kg	0,5220
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	9,5004
Reuse	kg	
Recycling	kg	
Energy recovery	kg	
To landfill	kg	9,5000

Maintenance (B2)/Repair (B3)

.	Unit	Value
Maintenance cycle*	.	
Auxiliary	kg	0,0300
Other resources	kg	
Water consumption	m ³	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
VOC emissions	kg	

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	38,8 %	Truck, lorry 16-32 tonnes, EURO 6	50	0,043626	l/tkm	2,18
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

..

Benefits and loads beyond the system boundaries (D)

.	Unit	Value
Substitution of primary aggregates with crushed recycled stone products (kg)		0,07
Substitution of electricity, in Norway (MJ)	MJ/DU	0,73
Substitution of thermal energy, district heating, in Norway (MJ)	MJ/DU	5,04

LCA: Results

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

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 boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction 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	X	MNR	MNR	MNR	MNR	MNR	X	X	X	X	X

Environmental impact

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
GWP	kg CO ₂ -eq	1,15E+01	4,54E-01	6,17E-02	1,09E-02	1,55E-04	7,57E-02	8,27E-03	4,06E-02	-4,88E-02
ODP	kg CFC11 -eq	1,74E-06	8,55E-08	2,32E-09	1,05E-09	1,50E-11	1,43E-08	1,64E-09	1,58E-08	-1,05E-08
POCP	kg C ₂ H ₄ -eq	9,27E-03	6,88E-05	4,79E-06	3,47E-06	3,48E-08	1,15E-05	1,52E-06	1,02E-05	-4,47E-05
AP	kg SO ₂ -eq	3,92E-02	1,07E-03	1,26E-04	5,71E-05	7,25E-07	1,78E-04	4,18E-05	2,95E-04	-2,39E-04
EP	kg PO ₄ ³⁻ -eq	4,19E-03	1,40E-04	3,30E-05	7,16E-06	1,75E-07	2,34E-05	7,41E-06	5,74E-05	-6,16E-05
ADPM	kg Sb -eq	1,88E-05	1,41E-06	3,71E-08	3,99E-08	2,54E-09	2,35E-07	5,04E-10	6,27E-10	-4,03E-07
ADPE	MJ	2,13E+02	6,86E+00	2,59E-01	1,20E-01	1,57E-03	1,14E+00	8,04E-02	1,29E+00	-5,99E-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	B2	C1	C2	C3	C4	D
RPEE	MJ	4,33E+01	1,01E-01	7,16E+00	2,28E-02	2,04E-02	1,69E-02	1,08E-01	2,02E-02	-2,52E+00
RPEM	MJ	9,18E+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
TPE	MJ	6,17E+01	1,01E-01	7,16E+00	2,28E-02	2,04E-02	1,69E-02	1,08E-01	2,02E-02	-2,52E+00
NRPE	MJ	1,67E+02	7,02E+00	8,40E-01	1,84E-01	2,71E-03	1,17E+00	2,11E-01	1,32E+00	-1,36E+00
NRPM	MJ	6,35E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	2,31E+02	7,02E+00	8,40E-01	1,84E-01	2,71E-03	1,17E+00	2,11E-01	1,32E+00	-1,36E+00
SM	kg	2,00E-03	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	4,45E-03	0,00E+00	3,55E-06	0,00E+00	3,55E-06	0,00E+00	0,00E+00	0,00E+00	-1,44E-04
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
W	m ³	6,73E-02	1,33E-03	1,90E-04	3,51E-02	1,13E-06	2,21E-04	5,28E-05	1,52E-03	-4,87E-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"

*INA Indicator Not Assessed

End of life - Waste

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
HW	kg	5,48E-02	4,14E-06	4,10E-07	4,73E-07	3,48E-09	6,89E-07	1,94E-07	1,46E-06	-1,27E-06
NHW	kg	4,22E+00	3,76E-01	2,21E-02	6,90E-03	2,05E-04	6,27E-02	2,38E-03	9,50E+00	-2,78E-02
RW	kg	4,30E-04	4,82E-05	1,33E-06	1,05E-06	1,75E-08	8,03E-06	2,22E-06	8,94E-06	-1,27E-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"

*INA Indicator Not Assessed

End of life - Output flow

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
CR	kg	2,87E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	2,27E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	1,25E+00	0,00E+00	5,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	8,43E-01	0,00E+00	4,10E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	9,09E+00	0,00E+00	4,51E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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
El-mix, Norway (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

Not relevant

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

Vold, M. et al. (2020) EPD-generator for Steni AS, bakgrunnsinformasjon for verifisering, LCA.no report number 03.20

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NPCR 010 Part B for Building Boards. Ver. 3.0 October 2019, EPD-Norge.

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