

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Steni AS
Program operator	The Norwegian EPD Foundation
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	NEPD00097E Rev 1
Registration number	MR-NEF-EPD-STE-20140002-EN
ECO EPD Ref.No.	00000084
Issue date	01.02.2014
Valid to	01.02.2019

Steni Colour facade panel 6 mm thickness

Steni AS

Registered under the scope of mutual recognition between Institut Bauen und Umwelt e.V. (IBU) and The Norwegian EPD Foundation

www.bau-umwelt.com



epd-norge.no
The Norwegian EPD Foundation



General information

Steni Colour facade panel 6 mm thickness

Product

Program holder

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo
Phone: +47 23 08 80 00
e-mail: post@epd-norge.no

Declaration number:

NEPD 0097E rev1

This declaration is based on Product Category Rules:

CEN Standard EN 15804 serve as core PCR
Product category rules (PCR) of Building boards.
NPCR 010

Declared unit:

1 m² of Steni Colour facade panel, 6 mm thickness.

Declared unit with option:

1 m² Steni Colour facade panel with a service life of 60 years.

Functional unit:

The environmental product declaration has been

worked out by:

Torhildur Kristjansdottir
SINTEF Building and infrastructure



Verification:

Independent verification of data and other environmental information has been carried out in accordance with ISO14025, 8.1.3.

externally internally

Kari Sørnes

Kari Sørnes, SINTEF Building and infrastructure
(Independent verifier approved by EPD Norway)

Steni AS

Manufacturer

Owner of the declaration:

Steni AS
Contact person: Tor Unneberg
Phone: +47 33 15 56 00
e-mail: tor@steni.no

Place of production:

Lågendalsveien 2633, 3277 Stensholt, Norway

Management system:

ISO 9001:2008, Approval No00022

Org. No:

NO 944012044

Issue date

01.02.2014

Valid to

01.02.2019

Comparability:

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

Year of study:

2013

Approved according to ISO14025, 8.1.4

Sverre Fossdal

Dr. ing. Sverre Fossdal
(Chairman of the Verification Group of EPD-Norway)

Declared unit:

1 m² of Steni colour facade panel 6 mm thickness.

Key environmental indicators	Unit	Cradle to gate A1 - A3	Transport A4 ₁
Global warming	kg CO ₂ -eqv	17	-
Energy use	MJ	179	-
Dangerous substances	*		
Renewable energy	MJ	30	
Non renewable energy	MJ	149	

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

A4₁ Central warehouse is the production site

Product

Product description:

Steni colour facade panel is an exterior wall cladding system. The panel comes with different colours, shapes and thickness. This EPD is based on 6 mm thickness.

Technical data:

The panel is 6 mm thick with an average weight of 12 kg /m². The panel comes in different sizes and shapes.

The panel has SINTEF Technical approval TG 2165.

Market:

Europe

Reference service life:

60 years

Product specification

Materials	kg	%
Polyester	2,12	17 %
Filler	4,93	39 %
Chemical additives	0,06	0,5 %
Crushed stone	4,80	38 %
Fiber glass	0,50	4 %
Top colour - acrylic	0,11	1 %

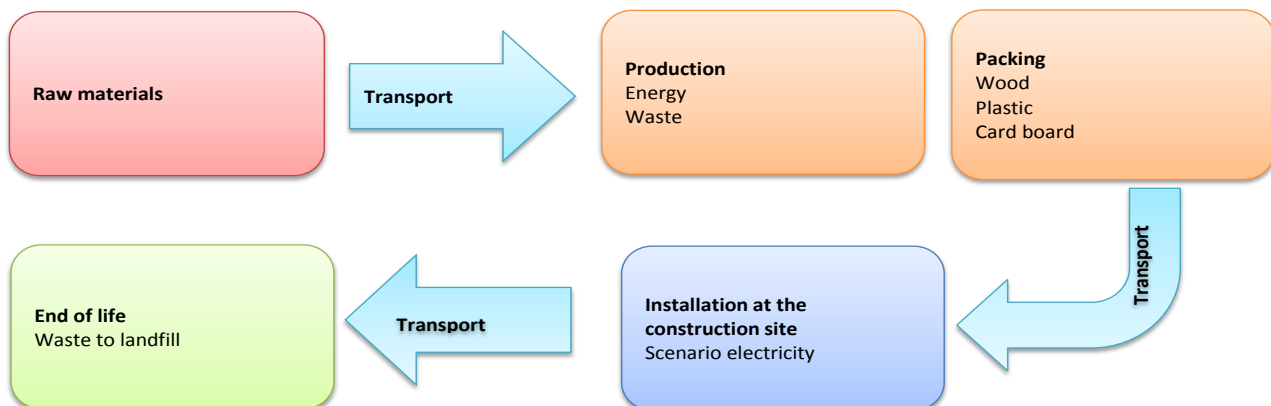
LCA: Calculation rules

Declared unit with option:

1 m² Steni colour facade panel with a service life of 60 years.

System boundary:

The analysis includes steps A1-A3, scenario for A4, A5, B2, C2 and C4 as shown in flow chart.



Data quality:

The data for the production is gathered from Steni and is of good quality. For background data the Ecoinvent database v.2.2 is used, and is considered to be representative.

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 production 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.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck 16-32 tonne	50	Lorry (Euro 4)	300	l/tkm	

Additional information: Transport to central warehouse in Norway is set to 0 km since the central warehouse is at the production location.

Installation in the building (A5)

	Unit	Value
Auxiliary	kg	
Water consumption	m ³	
Electricity consumption	kWh	0,05
Other energy carriers	MJ	
Material loss	kg	
Output materials from waste treatment	kg	
Dust in the air	kg	

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	
Energy recovery	kg	
To landfill	kg	12

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck 16-32 tonne	50	Lorry (Euro 4)	50	l/tkm	

LCA: Results

The results from the EPD show that the largest contribution of the environmental impact is the production of raw materials, A1. Transport, A2, is a significant share of the environmental load.

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

Product stage			Construction installation stage		Use stage								End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	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	MNR	MNR	MNR	MNR	MNR	MNR	MNR	MND	X	MND	X	MND	

Environmental impact

Parameter	A1	A2	A3	A1-A3	A4	A5	C2	C4
GWP	13,77	2,10	0,96	16,84	0,60	3,00E-03	0,10	0,64
ODP	6,69E-07	3,29E-07	4,35E-07	1,43E-06	9,42E-08	9,89E-11	1,57E-08	3,21E-08
POCP	1,77E-03	3,01E-04	4,16E-03	6,23E-03	7,26E-05	2,85E-07	1,21E-05	1,25E-04
AP	3,77E-02	9,48E-03	4,00E-03	5,12E-02	2,29E-03	4,74E-06	3,81E-04	2,05E-03
EP	1,46E-02	2,24E-03	2,55E-03	1,94E-02	6,02E-04	1,81E-06	1,00E-04	3,21E-02
ADPM	3,38E-05	3,92E-06	1,63E-06	3,94E-05	1,15E-06	6,39E-10	1,91E-07	1,55E-07
ADPE	45,66	2,91E-02	12,37	58,06	8,17E-03	2,34E-04	1,36E-03	0,91

GWP Global warming potential (kg CO₂-eqv.); **ODP** Depletion potential of the stratospheric ozone layer (kg CFC11-eqv.); **POCP** Formation potential of tropospheric photochemical oxidants (kg C₂H₄-eqv.); **AP** Acidification potential of land and water (kg SO₂-eqv.); **EP** Eutrophication potential (kg PO₄³⁻-eqv.); **ADPM** Abiotic depletion potential for non fossil resources (kg Sb -eqv.); **ADPE** Abiotic depletion potential for fossil resources (MJ)

Resource use

Parameter	A1	A2	A3	A1-A3	A4	A5	C2	C4
RPEE	12,31	0,45	17,49	30,25	0,13	0,18	0,02	0,05
RPEM								
TPE	12,31	0,45	17,49	30,25	0,13	0,18	0,02	0,05
NRPE	47,79	0,03	19,03	66,86	8,20E-03	2,34E-04	1,37E-03	0,95
NRPM	82,10			82,10				
TRPE	129,89	0,03	19,03	148,96	8,20E-03	2,34E-04	1,37E-03	0,95
SM								
RSF								
NRSF								
W	0,27	1,55E-02	3,83E-02	0,33	4,36E-03	4,32E-05	7,27E-04	3,50E-03

RPEE Renewable primary energy resources used as energy carrier (MJ); **RPEM** Renewable primary energy resources used as raw materials (MJ); **TPE** Total use of renewable primary energy resources (MJ); **NRPE** Non renewable primary energy resources used as energy carrier (MJ); **NRPM** Non renewable primary energy resources used as materials (MJ); **TRPE** Total use of non renewable primary energy resources (MJ); **SM** Use of secondary materials (kg); **RSF** Use of renewable secondary fuels (MJ); **NRSF** Use of non renewable secondary fuels (MJ); **W** Use of net fresh water (m³)

End of life - Waste

Parameter	A1	A2	A3	A1-A3	A4	A5	C2	C4
HW	0,15			0,15				
NHW	0,88			0,88				12,00
RW	0,01			0,01				

HW Hazardous waste disposed (kg); **NHW** Non hazardous waste disposed (kg), **RW** Radioactive waste disposed (kg)

End of life - Output flow

Parameter	A1	A2	A3	A1-A3	A4	A5	C2	C4
CR								
MR	0,10			0,10				
MER								
EEE								
ETE								

CR Components for reuse (kg); **MR** Materials for recycling (kg); **MER** Materials for energy recovery (kg); **EEE** Exported electric energy (MJ); **ETE** Exported thermal energy (MJ)

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

Specific Norwegian requirements

Electricity

The electricity used in the Production phase (A3) at Stensholt, near Larvik in Norway is based on a factor of 39,2 grams CO₂ eq /kWh (Electricity, medium voltage, supply mix, Norway 2007-2011)





Greenhouse gas emissions: 11 kg CO₂ - eq/MJ

Dangerous substances

None of the following substances have been added to the product: Substances on the REACH Candidate list of substances of very high concern (of 01.02.2014) substances on the Norwegian Priority list (of 01.02.2014) and substances that lead to the product being classified as hazardous waste. The chemical content of the product complies with regulatory levels as given in the Norwegian Product Regulations.

Bibliography

ISO 14025:2006	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012	<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>
PCR:2007	<i>Product category rules for preparing an environmental declaration for building boards, NPCR 010.</i>
LCA -Report	<i>LCA- Report for environmental product declarations for Steni façade panels – both Colour and Nature. Torhildur Kristjansdottir, Sintef Building and Infrastructure, November 2013.</i>

 epd-norge.no The Norwegian EPD Foundation	Publisher The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	Phone: +47 23 08 80 00 e-mail: post@epd-norge.no web: www.epd-norge.no
 epd-norge.no The Norwegian EPD Foundation	Program holder The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	Phone: +47 23 08 80 00 e-mail: post@epd-norge.no web: www.epd-norge.no
 steni Building knowledge	Owner of the declaration Steni AS Berganmoen, 3277 Steinsholt, Lardal Norway	Phone: +47 33 15 56 00 Fax e-mail: info@steni.no web: www.steni.no
 SINTEF	Author of the Life Cycle Assessment Torhildur Kristjansdottir Sintef Building and Infrastructure Forskningsveien 3 B, 0314 Oslo, Norway	Phone: +47 94 29 74 33 Fax e-mail: torhildur.kristjansdottir@sintef.no web: www.sintef.no/byggforsk



ANNEX 1

ANNEX 1: Self declaration from EPD owner

Specific German requirements

1 Transport from the place of manufacture to a central warehouse

Transport distance, and CO₂-eqv./DU from transport of the product from factory gate to central warehouse in Frankfurt shall be given. The following table shall be included in the EPD:

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy use	Unit	Value (l/t)	CO ₂ -eqv./DU
Water		Ship, global	163				0,02
Road	50%	Lorry, <32t, Euro 4	1040		l/tkm		2,1
Rail							
Air							
Total							2,12

DU: m² panel

Ecoinvent 3:

Lorry < 32 t, Euro 4: 165 g/tkm

Ship. Global: 10,7g/tkm

Density panel: 0,012 t/m²

Steni a.s
17.12.2014