

Environmental Product Declaration

In accordance with 14025 and EN15804 +A2

Sedum cassette



Owner of the declaration:
Utomhus Østfold Gress AS

Product name:
Sedum cassette

Declared unit:
1 m² sedum cassette

Product category /PCR:
EN 15804:2012 + A2:2019

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-5903-5178-EN

Registration number:
NEPD-5903-5178-EN

Issue date:
05.02.2024

Valid to:
05.02.2029

General information

Product:

Sedum cassette

Program operator:

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

Declaration number:

NEPD-5903-5178-EN

This declaration is based on Product

Category Rules:

CEN Standard EN 15804+A2 serves as core PCR, as well as NPCR Part A Construction products and services

Statements:

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

Declared unit:

1 m2 sedum cassette

Declared unit with option:

-

Functional unit:

-

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal

external



Julie Lyslo Skullestad

Independent verifier approved by EPD Norway

Owner of the declaration:

Utomhus Østfold Gress AS
Contact person: Ole Christian Trandem
Phone: +47 692 66 050
e-mail: Ole.Trandem@ostfoldgress.no

Manufacturer:

Utomhus Østfold Gress AS
Hasleveien 45, NO-1570 Dilling
Phone: +47 692 66 050
e-mail: info@ostfoldgress.no

Place of production:

Rygge, Moss, Norway

Management system:

-

Organisation no:

952 279 475

Issue date:

05.02.2024

Valid to:

05.02.2029

Year of study:

2022

Comparability:

EPDs from other programmes than the Norwegian *Næringslivets stiftelse for miljødeklarasjoner* may not be comparable.

The EPD has been worked out by:

Kjartan Steen-Olsen, Asplan Viak AS

Approved



Manager of EPD Norway

Product

Product description:

Utomhus Østfold Gress sedum cassettes is a kind of plastic tray filled with a mixture of soil and other components and planted with various species of the Sedum genus. The cassettes with the Sedum are then vegetated on site before being distributed to market and used, primarily, in green roof systems.

Product specification:

The product is based partly on green roof soil substrate, which is also produced on site by Utomhus Østfold Gress AS. The soil is filled in cassettes (trays) made from 100 % recycled plastics, and planted with a mix of Sedum seeds. The final product after the growing period thus consists of the tray, the soil mixture, and fully grown *Sedum*.

Materials	KG	%
Cassette tray	1,5	3,1 %
Soil	45,8	91,7 %
Sedum plant	2,6	5,3 %
Packaging: Wooden pallets	1.0	

Technical data:

Standard dimensions are cassettes with a surface area of 0.24 m², measuring 40 cm by 60 cm, and a standard weight of around 12 kg. The thickness of the cassette including soil is 60 mm and the Sedum plants are grown to a height of 25 mm. The cassettes are stacked and marketed on wooden pallets. Utomhus Østfold Gress buys used pallets for transport. It is conservatively assumed that these pallets can be reused 5 times; hence 1/5 of the production impacts are included in the assessment.

Market:

Norway

Reference service life, product:

-

Reference service life, building:

-

LCA: Calculation rules

Declared unit:

1 m²

Data quality:

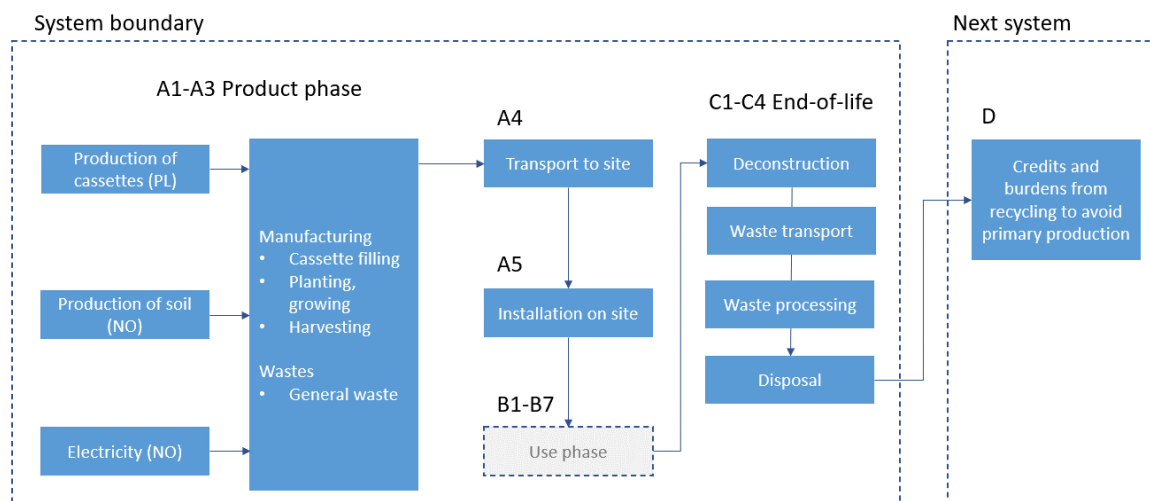
Data has been collected in 2022-2023 and is representative for 2022. Data for the raw material and production and transport (A1-A3 and A4) is based on specific consumption data and technical data sheets. The yearly averages for 2022 are referred to. Generic data is from ecoinvent v3.8, Allocation, Cut-Off by classification, SimaPro v 9.4.0.2. Characterization factors from EN15804: 2012 + A2: 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 allocated to the main product in which the material was used.

System boundary:

The system boundary is from cradle to gate with options, A1-A3, A4, C1, C2, C3, C4 and D. The flow chart for production, transport and end of life is shown in the figure below.



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.

LCA: Scenarios and additional technical information

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

Scenarios have been developed to account for downstream processes such as demolition and waste treatment in accordance with the requirements of EN 15804 and NPCR PART A.

Transport from production place to assembly/user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Truck	50 %	Lorry 24 metric ton, EURO 6	62	0,029 l/tkm	1,8

Assembly (A5)

	Unit	Value
Electricity consumption	kWh	0,141
Other energy carriers	MJ	2,22

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	Kg	N.R.
Collected as mixed construction waste	Kg	N.R.
Reuse	Kg	N.R.
Recycling	Kg	N.R.
Energy recovery	Kg	1,5
To landfill	Kg	68,5

The plastic tray is assumed to go to energy recovery, while the soil and sedum goes to landfilling.

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Waste collection	50 %	Lorry 21 t	19	0,3 l/tkm	5,5
Truck	50 %	Lorry, 16-32t EURO 5	54	0,03 l/tkm	1,7

To provide a plausible scenario for transportation to waste processing, a study of Norwegian waste treatment was used as proxy data (Raadal et al., 2009).

Benefits and loads beyond the system boundaries (D)

	Unit	Value
-		

None assumed.

Additional technical information

-

LCA: Results

The result is valid for the declared unit, 1 m2 sedum cassette.

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

Product stage			Assembly stage		Use stage								End of life stage				Benefits & loads beyond system boundary
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	

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	-2,13E+01	3,79E-01	5,81E-01	1,66E+00	2,73E+00	3,53E-02	3,54E+01	0,00E+00
GWP-fossil	kg CO2 eq.	9,91E+00	3,78E-01	2,33E-01	1,66E+00	2,73E+00	3,41E-02	4,26E+00	0,00E+00
GWP-biogenic	kg CO2 eq.	-3,12E+01	5,74E-04	3,48E-01	6,68E-04	3,19E-03	1,16E-03	3,11E+01	0,00E+00
GWP-LULUC	kg CO2 eq.	6,20E-03	1,08E-04	2,82E-05	1,83E-04	5,19E-04	6,24E-05	6,30E-04	0,00E+00
ODP	CFC11 eq.	3,71E-07	8,35E-09	3,63E-09	2,57E-08	5,00E-08	7,63E-10	2,29E-08	0,00E+00
AP	mol H ⁺ eq.	7,91E-02	7,94E-04	2,09E-03	1,50E-02	1,13E-02	3,04E-04	6,62E-03	0,00E+00
EP-freshwater	kg P eq.	1,98E-04	2,17E-06	8,97E-07	5,84E-06	9,21E-06	8,02E-07	1,27E-05	0,00E+00
EP-marine	kg N eq.	1,47E-02	2,18E-04	9,66E-04	6,94E-03	5,07E-03	1,03E-04	2,54E-03	0,00E+00
EP-terrestrial	mol N eq.	7,17E-01	2,26E-03	1,05E-02	7,56E-02	5,48E-02	1,14E-03	2,72E-02	0,00E+00
POCP	kg NMVO C eq.	3,33E-02	1,37E-03	3,11E-03	2,24E-02	2,37E-02	3,48E-04	8,88E-03	0,00E+00
ADP-M&M	kg Sb eq.	2,51E-05	5,05E-07	9,70E-08	5,65E-07	3,36E-06	1,03E-06	1,87E-06	0,00E+00
ADP-fossil	MJ	9,18E+01	5,48E+00	2,97E+00	2,12E+01	3,30E+01	4,82E-01	1,84E+01	0,00E+00
WDP	m ³	8,76E-01	1,98E-02	6,63E-03	4,33E-02	8,05E-02	8,44E-03	8,89E-01	0,00E+00

GWP-total: Global Warming Potential; **GWP-fossil:** Global Warming Potential fossil fuels; **GWP-biogenic:** Global Warming Potential biogenic; **GWP-LULUC:** Global Warming Potential land use and land use change; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated

Exceedance; **EP-freshwater**: Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See “additional requirements” for indicator given as PO4 eq. **EP-marine**: Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial**: Eutrophication potential, Accumulated Exceedance; **POCP**: Formation potential of tropospheric ozone; **ADP-M&M**: Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil**: Abiotic depletion potential for fossil resources; **WDP**: Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	1,45E-06	2,45E-08	5,69E-08	4,14E-07	2,69E-07	2,83E-07	1,28E-07	0,00E+00
IRP	kBq U235 eq.	3,61E-01	2,25E-03	6,68E-04	4,33E-03	9,48E-03	3,53E-03	9,67E-03	0,00E+00
ETP-fw	CTUe	5,85E+01	2,83E+00	1,52E+00	1,08E+01	1,56E+01	2,49E-01	1,46E+01	0,00E+00
HTP-c	CTUh	4,54E-09	1,07E-10	8,13E-11	4,96E-10	5,54E-10	6,45E-11	8,10E-10	0,00E+00
HTP-nc	CTUh	8,47E-08	4,21E-09	1,95E-09	1,09E-08	1,93E-08	1,30E-09	2,16E-08	0,00E+00
SQP	Dimensionless	1,97E+02	4,79E+00	2,36E-01	1,42E+00	8,39E+00	1,15E+00	4,02E+01	0,00E+00

PM: Particulate matter emissions; **IRP**: Ionising radiation, human health; **ETP-fw**: Ecotoxicity (freshwater); **ETP-c**: Human toxicity, cancer effects; **HTP-nc**: Human toxicity, non-cancer effects; **SQP**: Land use related impacts / soil quality

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
	Acidification potential, Accumulated Exceedance (AP)	None
ILCD type / level 2	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
ILCD type / level 3	Potential Human exposure efficiency relative to U235 (IRP)	1
	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
Potential Soil quality index (SQP)	2	

Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to

possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource use

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	2,63E+02	6,30E-02	5,53E-01	1,21E-01	2,79E-01	1,05E+00	3,30E-01	0,00E+00
RPEM	MJ	3,87E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	2,67E+02	6,30E-02	5,53E-01	1,21E-01	2,79E-01	1,05E+00	3,30E-01	0,00E+00
NRPE	MJ	2,25E+01	5,48E+00	2,97E+00	2,12E+01	3,30E+01	4,82E-01	1,84E+01	0,00E+00
NRPM	MJ	6,93E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	9,18E+01	5,48E+00	2,97E+00	2,12E+01	3,30E+01	4,82E-01	1,84E+01	0,00E+00
SM	kg	3,84E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	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
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
W	m ³	6,24E-02	6,53E-04	4,22E-03	1,50E-03	4,69E-03	7,40E-03	2,25E-02	0,00E+00

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	A4	A5	C1	C2	C3	C4	D
HW	KG	6,70E-02	1,15E-04	1,18E-03	1,85E-04	4,76E-04	3,88E-05	3,03E-02	0,00E+00
NHW	KG	1,66E+00	4,11E-01	1,16E-02	3,03E-02	6,08E-01	8,59E-03	6,87E+01	0,00E+00
RW	KG	3,74E-04	1,41E-06	3,66E-07	2,32E-06	5,59E-06	1,63E-06	5,97E-06	0,00E+00

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

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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	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	0,00E+00	0,00E+00	1,74E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	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
ETE	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

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

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

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	8,36
Biogenic carbon content in the accompanying packaging	kg C	0,45

Additional requirements

Location based electricity mix from the use of electricity in manufacturing

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 (foreground/core) per functional unit.

National electricity grid	Data source	Foreground / core [kWh]	GWP ^{total} [kg CO ₂ - eq/kWh]	SUM [kg CO ₂ - eq]
<i>Norwegian electricity, low voltage</i>	ecoinvent v3.8	1,13	0,039	4,40E-02

Additional environmental impact indicators required in NPCR Part A for construction products

In order to increase the transparency 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 context to Swedish public procurement legislation.

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-IOBC	kg CO ₂ eq.	9,33E+00	3,79E-01	5,81E-01	1,66E+00	2,73E+00	3,53E-02	4,73E+00	0,00E+00

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation.

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

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

Indoor environment






No tests have been carried out on the product concerning indoor climate - not relevant.

Carbon footprint

Carbon footprint has not been worked out for the product.

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+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
PCR PART A	Construction products and services Ver 2
Steen-Olsen (2023)	Life cycle assessment (LCA) report for Green roof soil substrate
Utomhus Østfold Gress AS	Bill of materials – data collection

	Program Operator	tlf	+47 23 08 80 00
	The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	e-post:	post@epd-norge.no
		web	www.epd-norge.no
	Publisher	tlf	+47 23 08 80 00
	The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	e-post:	post@epd-norge.no
		web	www.epd-norge.no
	Owner of the declaration	tlf	+47 69 26 60 50
	Utomhus Østfold Gress	Fax	
	Hasleveien 45, NO-1570 Dilling Norway	e-post:	ostfold@utomhus.no
		web	www.utomhus.no
	Author of the life cycle assessment	tlf	+47 417 99 417
	Asplan Viak AS	Fax	
	Kjørboveien 20, NO-1337 Sandvika Norway	e-post:	asplanviak@asplanviak.no
		web	www.asplanviak.no
	ECO Platform	web	www.eco-platform.org
	ECO Portal	web	ECO Portal