epd-norway
Global Program Operator

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 +A2

Owner of the declaration:
Norsk Wavin AS

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-3768-2675-EN

Registration number:
NEPD-3768-2675-EN

Issue date: 03.10.2022
Valid to: 03.10.2027

ver2-101122

Tegra 600

Plastic inspection chamber made of polypropylene according to DIN EN 13598-2.

Manufacturer

Wavin Polska S.A.

wavin
An Orbia business.

The Norwegian
EPD Foundation

General information

Product:
Tegra 600

Program Operator:
The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Tlf: +47 23 08 80 00
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Declaration Number:
NEPD-3768-2675-EN

This declaration is based on Product Category Rules:
CEN standard EN 15804:2012+A2:2019 serves as core PCR, supplied with NPCR Part A, Version 2.0.

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.

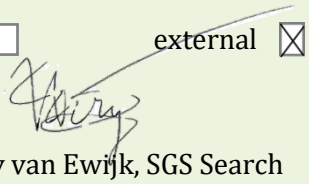
Declared unit:
1 kg Tegra 600

Declared unit with option:
A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Functional unit:
Not applicable.

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

internal ☐ external ☒



Harry van Ewijk, SGS Search
Independent verifier approved by EPD Norway

Owner of the declaration:
Norsk Wavin AS
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Manufacturer:
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e-mail: kontakt_pl@wavin.pl

Place of production:
Dobieżyńska 43, 64-320 Buk, Poland

Management system:
EN ISO 9001:2015 and EN ISO 14001:2015

Organisation no:
823355092

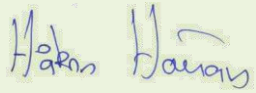
Issue date:
03.10.2022

Valid to:
03.10.2027

Year of study:
2020

Comparability:
EPDs from other programmes than the Norwegian EPD foundation may not be comparable.

The EPD has been worked out by:
Lisa Overmars and Emma Thunnissen,
Ecochain Technologies



Approved (Manager of EPD Norway)

Product

Product description:

Inspection chamber for municipal industrial and domestic drainage system for foul and rainwater systems. Tegra 600 PP can be installed in heavy traffic area according to LM1 (DIN EN 1991-2/NA) former SLW60. Smooth wall pipe and X-Stream pipes can be connected directly. Installation depths up to 6.0 m, in groundwater max. 5.0m, are possible. Tegra is equipped with an integrated flexible ball joints to adjust change in directions and gradients

Product specification:

A typical composition of the Tegra 600, including packaging, covered by this EPD is as follows:

Materials	%
Polypropylene (PP)	64,4%
Additives	1,5%
Packaging	28,7%
Rubber seal	5,4%

The specifications of the products covered in this EPD are:

- Diameter - DN/ID-OD 600
- Material - Polypropylene (PP)
- Chemical resistance - Sewer environment
- Max. installation depth - 6 m
- Max. installation depth in groundwater – 5m
- Traffic load - up to SLW 60
- Cover class - A15-D400

Technical data:

The declared unit of this EPD is 1 kg Tegra 600. The results per kg are based on the product 'Tegra 600 PP Cross 90° DN160 SW' ('base product'). The Table below provides the products covered with this EPD. The selected base product is representative for all products described in this Table; deviations of the LCA results of the other products compared to the base product are not more than 10%.

The list below provides the mass per piece (including packaging). These masses should be used to calculate the LCA results per 1 piece, by multiplying the results of all modules, except 'A5 – installation', presented on page 10-13, with the weight specified below. The LCA results of 'A5 – installation' should be calculated from the LCA results presented on pages 8-9 under 'addtional technical information'.

Product	Mass (kg/pc)	Product	Mass (kg/pc)
Tegra 600 PP Bend 90° DN150 UR-ID XS	33,15	Tegra 600 PP Bend 150° DN250 UR-OD	37,82
Tegra 600 PP Bend 150° DN150 UR-ID XS	33,27	Tegra 600 PP Straight DN250 SW DK	37,96
Tegra 600 PP Straight DN150 UR-ID XS	33,41	Tegra 600 PP Bend 90° DN250 SW DK	38,13
Tegra 600 PP Bend 90° DN160 SW DK	33,47	Tegra 600 PP Bend 150° DN250 SW DK	38,13
Tegra 600 PP Bend 150° DN160 SW DK	33,59	Tegra 600 PP T 90° DN250 X-Stream	38,41
Tegra 600 PP Straight DN160 SW DK	33,73	Tegra 600 PP T 90° DN250 UR-ID	38,77
Tegra 600 PP Bend 120° DN160 SW DK	33,93	Tegra 600 PP Bend 120° DN250 UR-OD	38,83
Tegra 600 PP Straight DN200 UR-ID XS DK	33,96	Tegra 600 PP Straight DN300 X-Stream	38,93
Tegra 600 PP Cross 45° DN160 SW	33,97	Tegra 600 PP Cross 90° DN250 X-Stream	39,13
Tegra 600 PP T 90° DN160 SW	33,99	Tegra 600 PP Bend 120° DN250 SW DK	39,14
Tegra 600 PP Straight DN200 UR-OD	34,15	Tegra 600 PP Straight DN315 UR-ID	39,17
Tegra 600 PP T 90° DN160 SW DK	34,23	Tegra 600 PP Bend 90° DN315 UR-ID	39,17
Tegra 600 PP Bend 90° DN200 UR-ID XS	34,23	Tegra 600 PP Cross 90° DN250 X-Stream	39,37
Tegra 600 PP Bend 120° DN200 UR-OD	34,35	Tegra 600 PP Straight DN315 UR-ID DK	39,41
Tegra 600 PP Straight DN200 SW DK	34,38	Tegra 600 PP Bend 90° DN300 X-Stream	39,43
Tegra 600 PP Bend 150° DN200 UR-OD	34,50	Tegra 600 PP Bend 150° DN315 UR-ID	39,50
Tegra 600 PP Bend 120° DN200 SW DK	34,58	Tegra 600 PP T 90° DN250 UR-OD	39,98
Tegra 600 PP End DN250 X-Stream	34,58	Tegra 600 PP T 90° DN250 SW	40,08
Tegra 600 PP Bend 90° DN200 UR-OD	34,65	Tegra 600 PP Bend 120° DN315 UR-OD	40,22
Tegra 600 PP Bend 150° DN200 SW DK	34,73	Tegra 600 PP T 90° DN250 SW DK	40,32
Tegra 600 PP Cross 90° DN150 UR-ID XS	34,79	Tegra 600 PP Bend 90° DN315 UR-OD	40,33
Tegra 600 PP Bend 90° DN200 SW DK	34,88	Tegra 600 PP Bend 150° DN315 UR-OD	40,33
Tegra 600 PP Cross 90° DN160 SW	34,96	Tegra 600 PP Straight DN315 UR-OD	40,33
Tegra 600 PP Cross 90° DN150 UR-ID XS	35,03	Tegra 600 PP Bend 120° DN315 SW DK	40,62
Tegra 600 PP Cross 45° DN200 XS DK	35,03	Tegra 600 PP Straight DN315 SW DK	40,73
Tegra 600 PP Cross 90° DN160 SW DK	35,19	Tegra 600 PP Bend 90° DN315 SW DK	40,73
Tegra 600 PP T 90° DN200 UR-ID X-Stre DK	35,24	Tegra 600 PP Bend 150° DN315 SW DK	40,73
Tegra 600 PP T 90° DN200 SW	35,62	Tegra 600 PP Cross 90° DN250 UR-OD	41,22
Tegra 600 PP T 90° DN200 UR-OD	35,64	Tegra 600 PP Cross 90° DN250 SW	41,36
Tegra 600 PP T 90° DN200 SW DK	35,86	Tegra 600 PP T 90° DN300 X-Stream	41,60
Tegra 600 PP Cross 45° DN200 SW DK	35,87	Tegra 600 PP Cross 90° DN250 SW DK	41,60
Tegra 600 PP Cross 45° DN160 SW DK	35,96	Tegra 600 PP T 90° DN300 X-Stream DK	41,84
Tegra 600 PP Cross 90° DN200 UR-ID XS	36,27	Tegra 600 PP T 90° DN315 UR-OD	43,70
Tegra 600 PP Cross 90° DN200 UR-ID XS	36,51	Tegra 600 PP T 90° DN315 SW	43,94
Tegra 600 PP Straight DN250 X-Stream	36,60	Tegra 600 PP Cross 90° DN300 X-Stream	44,07
Tegra 600 PP Straight DN250 UR-ID DK	37,08	Tegra 600 PP T 90° DN315 SW DK	44,18
Tegra 600 PP Cross 90° DN200 SW	37,11	Tegra 600 PP Cross 90° DN300 X-Stream	44,31
Tegra 600 PP Cross 90° DN200 UR-OD	37,12	Tegra 600 PP Cross 90° DN315 UR-ID	44,55
Tegra 600 PP Cross 90° DN200 SW DK	37,35	Tegra 600 PP Cross 90° DN315 UR-OD	46,87
Tegra 600 PP Straight DN250 UR-OD	37,65	Tegra 600 PP Cross 90° DN315 SW	47,19
Tegra 600 PP Bend 90° DN250 UR-OD	37,82	Tegra 600 PP Cross 90° DN315 SW DK	47,43

Market:

Europe, but the EPD is specific for Nordic countries.

Reference service life, product:
100 years

Reference service life, building:

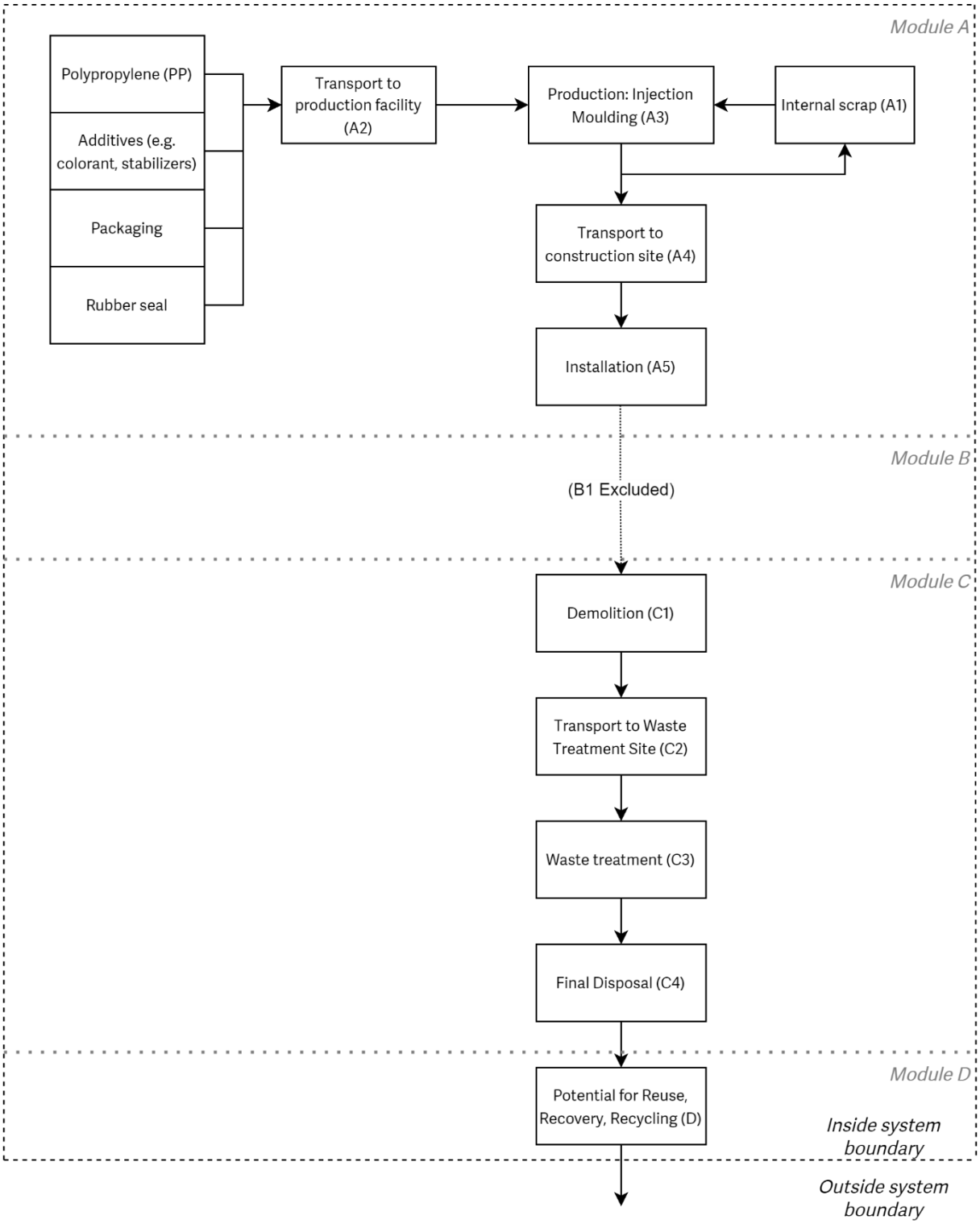
LCA: Calculation rules

Declared unit:
1 kg Tegra 600

Data quality:
For module A1, specific data for product compositions as provided by the manufacturer are used. For module A2, transportation data of the raw materials used to the production site was collected. For module A3, energy consumption and waste production data was collected for production year 2020. The used background processes are derived from Ecoinvent 3.6.

Allocation:
Allocation was carried out in accordance with the povisions of the EN15804. All manufacturing inputs (energy and auxiliary materials) at production site level are allocated to different production processes, followed by allocation of the production processes to the products that are produced using these processes through mass allocation. No secondary materials have been used in the production process.

System boundary:
Modules A1-A5 and C1-D are included. The figure below shows a (simplified) process tree.



Cut-off criteria:

All relevant inputs and outputs - like emissions, energy and materials - have been taken into account in this LCA. In accordance with EN15804, the total neglected input flows per module does not exceed 5% of energy usage and mass.

LCA: Scenarios and additional technical information

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

Transport from production place to assembly/user (A4)

The transportation distance from Buk to Oslo was considerd.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption
Truck	50%	Unspecified	1086	0,027 l diesel/tkm
Boat	50%	Ferry	113	0,0295 kg heavy fuel oil/tkm

Assembly (A5)

Product losses of 2% are considered. This product is used underground, therefore use of an excavator, soil transport, and a gravel foundation are necessary. For the foundation, gravel is used; this gravel is assumed to be transported for 150 km. The excavation of the soil is performed with a hydraulic digger. It is assumed that most of the soil is backfilled; however, the soil replaced by the gravel foundation and the pipe is assumed to be transported elsewhere (150 km). The compation of the soil is considered negligible.

	Unit	Value
Material loss	kg	0,02
Packaging waste	kg	0,286

	Unit	1 piece of Tegra 600
Energy consumption of excavated volume	l/tonne excavated (diesel)	0.13
Excavated mass, total	kg	4320.00
Excavated mass transported to deposite	kg	828.00
Transport distance from construction site	km	150.00
Refilling mass (dirt + gravel foundation)	kg	3589.20
Transport distance for refilling mass to construction site	km	4320.00
Energy used for compaction	kWh or l/tonne compacted	-

End of Life (C1, C3, C4)

Demolition is done manually, and therefore no energy is needed. The considered waste treatment for the pipe is 70% recycling, 20% incineration and 10% landfill.

	Unit	Value
Collected as mixed construction waste	kg	0,71
Reuse	kg	0
Recycling	kg	0,46
Energy recovery	kg	0,18
To landfill	kg	0,07

Transport to waste processing (C2)

The considered distances are 50 km to landfill, 100 km for energy recovery, and 250 km for recycling.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption
Truck	50%	Unspecified	192,1	0,027 l diesel/tkm

Benefits and loads beyond the system boundaries (D)

For the PP and additives, 0,67 kg of saved virgin PP was considered per kg material recycled (total of A5 en C3). For the rubber seal, 0,67 kg of saved virgin EPDM was considered per kg rubber seal recycled. The 67% is the considered quality factor, which means that the product is at least three times recyclable. The benefits from exported energy were calculation from the energy efficiencies for Nothern countries reported by CEWEP, which is equal to an electrical efficiency of 11,0%, and a thermal efficiency of 72,6%. Energy recovery from all materials (including rubber gasket and packaging) was considered. Substition of Norwegian electricity mix and district heating mix was assumed.

	Unit	Value
Saving of virgin PP	kg	0,31
Saving of virgin EPDM	kg	0,002
Substition of electric energy	MJ	0,81
Subsitition of thermal energy	MJ	5,32

Additional technical information

Although most of this EPD can be scaled with the weight of the inspection chamber, this is not the case for module A5 which scales with the diameter of the product.

To calculate the results for a specific product, the masses per piece, as described on page 3-4 (under technical data) should be used to calculate the LCA results per 1 piece, combined with the data in the tables below. This should be done by multiplying the LCA results presented on page 10-13 of all modules, except 'A5 – installation', with the mass per piece. The LCA results of A5 – installation should be calculated from the LCA results presented in the table below.

Impact Category/Parameter	Installation Tegra 600
GWP-total	1.99E+01
GWP-fossil	1.99E+01
GWP-biogenic	1.62E-02
GWP-LULUC	6.83E-03
ODP	4.55E-06
AP	1.19E-01
EP-freshwater	1.65E-04
EP-marine	4.36E-02
EP-terrestial	4.81E-01
POCP	1.37E-01
ADP-M&M	5.01E-04
ADP-fossil	3.04E+02
WDP	1.11E+00

PM	2.02E-06
IRP	1.35E+00
ETP-fw	2.46E+02
HTP-c	9.03E-09
HTP-nc	2.91E-07
SQP	2.52E+02
RPEE	5.21E+00
RPEM	0.00E+00
TPE	5.21E+00
NRPE	3.23E+02
NRPM	0.00E+00
TRPE	3.23E+02
SM	0.00E+00
RSF	0.00E+00
NRSF	0.00E+00
W	1.72E-01
HW	7.81E-04
NHW	1.77E+01
RW	2.07E-03
CR	0.00E+00
MR	0.00E+00
MER	0.00E+00
EEE	0.00E+00
ETE	0.00E+00

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document. Recalculation to results per piece can be done based on the technical data specified on page 3 and 4.

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 – insta-llation	A5 - other	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	9,33E-01	9,97E-02	5,70E-01	8,37E-01	0,00E+00	1,80E-02	6,57E-01	8,79E-03	-1,04E+00
GWP-fossil	kg CO2 eq.	1,70E+00	9,96E-02	5,69E-01	6,17E-02	0,00E+00	1,80E-02	6,57E-01	8,79E-03	-1,04E+00
GWP-biogenic	kg CO2 eq.	-7,69E-01	5,39E-05	4,64E-04	7,75E-01	0,00E+00	1,09E-05	-6,84E-04	7,74E-06	1,79E-04
GWP-LULUC	kg CO2 eq.	9,56E-04	3,74E-05	1,96E-04	2,37E-05	0,00E+00	6,38E-06	9,81E-05	1,52E-07	-4,37E-04
ODP	kg CFC11 eq.	9,48E-08	2,27E-08	1,30E-07	3,44E-09	0,00E+00	4,15E-09	1,30E-08	2,22E-10	-6,54E-08
AP	mol H^+ eq.	6,98E-03	7,83E-04	3,41E-03	2,19E-04	0,00E+00	1,03E-04	5,55E-04	5,32E-06	-3,01E-03
EP-freshwater	kg P eq.	3,27E-05	7,85E-07	4,72E-06	7,99E-07	0,00E+00	1,48E-07	2,84E-06	6,97E-09	-1,26E-05
EP-marine	kg N eq.	1,27E-03	2,52E-04	1,25E-03	5,63E-05	0,00E+00	3,67E-05	1,63E-04	4,01E-06	-5,99E-04
EP-terrestial	mol N eq.	1,45E-02	2,78E-03	1,38E-02	6,36E-04	0,00E+00	4,05E-04	1,80E-03	2,15E-05	-6,99E-03
POCP	kg NMVOC eq.	6,07E-03	7,75E-04	3,91E-03	2,16E-04	0,00E+00	1,16E-04	5,61E-04	8,07E-06	-2,81E-03
ADP-M&M	kg Sb eq.	8,63E-05	2,42E-06	1,43E-05	1,90E-06	0,00E+00	4,66E-07	2,13E-06	5,36E-09	-8,57E-06
ADP-fossil	MJ	5,47E+01	1,51E+00	8,70E+00	1,22E+00	0,00E+00	2,77E-01	1,71E+00	1,62E-02	-2,95E+01
WDP	m^3	1,09E+00	4,45E-03	3,17E-02	2,32E-02	0,00E+00	8,49E-04	3,50E-02	8,49E-05	-4,70E-01

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 Norwegian requirements" for indicator given as PO4 eq.* ***EP-marine:*** *Eutrophication potential, fraction of nutrients reaching freshwater end compartment;* ***EP-terrestial:*** *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 counsumption*

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	A5 – insta-llation	A5 - other	C1	C2	C3	C4	D
PM	Disease incidence	8,59E-08	8,51E-09	5,79E-08	2,62E-09	0,00E+00	1,63E-09	8,88E-09	1,11E-10	-3,04E-08
IRP	kBq U235 eq.	4,88E-02	6,59E-03	3,85E-02	1,48E-03	0,00E+00	1,21E-03	5,15E-03	7,54E-05	-1,68E-02
ETP-fw	CTUe	1,63E+01	1,21E+00	7,03E+00	4,60E-01	0,00E+00	2,25E-01	2,16E+00	1,53E-02	-6,66E+00
HTP-c	CTUh	8,15E-10	4,48E-11	2,58E-10	5,63E-11	0,00E+00	8,00E-12	2,33E-10	4,02E-13	-3,20E-10
HTP-nc	CTUh	1,62E-08	1,41E-09	8,31E-09	5,67E-10	0,00E+00	2,68E-10	2,95E-09	9,17E-12	-6,03E-09
SQP	Dimensionless	7,11E+01	1,22E+00	7,21E+00	1,52E+00	0,00E+00	2,37E-01	1,36E+00	4,16E-02	-3,68E+01

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
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	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
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	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 – installation	A5 - other	C1	C2	C3	C4	D
RPEE	MJ	1,39E+01	2,08E-02	1,49E-01	2,82E-01	0,00E+00	3,97E-03	8,44E-02	6,36E-04	-6,18E+00
RPEM	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
TPE	MJ	1,39E+01	2,08E-02	1,49E-01	2,82E-01	0,00E+00	3,97E-03	8,44E-02	6,36E-04	-6,18E+00
NRPE	MJ	5,87E+01	1,60E+00	9,23E+00	1,31E+00	0,00E+00	2,94E-01	1,82E+00	1,72E-02	-3,19E+01
NRPM	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
TRPE	MJ	5,87E+01	1,60E+00	9,23E+00	1,31E+00	0,00E+00	2,94E-01	1,82E+00	1,72E-02	-3,19E+01
SM	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	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	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	0,00E+00
W	m^3	1,85E-02	1,64E-04	4,92E-03	4,62E-04	0,00E+00	3,13E-05	1,17E-03	2,00E-05	-7,30E-03

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 - installation	A5 - other	C1	C2	C3	C4	D
HW	KG	1,59E-05	3,69E-06	2,23E-05	5,96E-07	0,00E+00	7,08E-07	2,88E-06	1,96E-08	-1,19E-05
NHW	KG	1,40E-01	8,74E-02	5,06E-01	1,72E-02	0,00E+00	1,72E-02	8,65E-02	7,14E-02	-3,97E-02
RW	KG	5,31E-05	1,03E-05	5,93E-05	1,77E-06	0,00E+00	1,88E-06	6,52E-06	1,06E-07	-1,69E-05

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

End of life – output flow

Parameter	Unit	A1-A3	A4	A5 insta-llation	A5 - other	C1	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	1,46E-01	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	3,83E-02	0,00E+00	0,00E+00	0,00E+00	4,62E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	1,15E-01	0,00E+00	0,00E+00	0,00E+00	1,80E-01	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	5,32E+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	8,06E-01

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

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	0,27

Additional Norwegian requirements

Greenhous gas emission 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 prosess(A3).

National electricity grid	Unit	Value
Wind electricity, average (Ecoinvent 3.6)	kg CO2 -eq/kWh	0,0263

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 for GWP has been sub-divided into the following:

GWP-IOBC Climate impacts calculated according to the principle of instantanious oxidation
GWP-BC Climate impacts from the net uptake and emission of biogenic carbon from each module.

Indicator	Unit	A1-A3	A4	A5 - installation	A5 – other	C1	C2	C3	C4	D
GWP-IOBC	kg CO2 eq.	1,70E+00	9,96E-02	5,70E-01	6,17E-02	0,00E+00	1,80E-02	6,58E-01	8,78E-03	-1,05E+00
GWP-BC	kg CO2 eq.	-7,69E-01	5,39E-05	4,64E-04	7,75E-01	0,00E+00	1,09E-05	-6,84E-04	7,74E-06	1,79E-04
GWP	kg CO2 eq.	9,33E-01	9,97E-02	5,70E-01	8,37E-01	0,00E+00	1,80E-02	6,57E-01	8,79E-03	-1,04E+00

GWP-IOBC *Global warming potential calculated according to the principle of instantanious oxidation.* ***GWP-BC*** *Global warming potential from net uptake and emissions of biogenic carbon from the materials in each module.* ***GWP*** *Global warming potential*

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.
- ☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- ☐ The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Indoor environment

The product meets the requirements for low emissions.

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
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