epd-norge
Global program operatør

Environmental product declaration

In accordance with ISO 14025 and EN 15804 +A2

i10-1500 LED 16000 HF 840 MB

Glamox

The Norwegian EPD Foundation

Owner of the declaration:
Glamox AS

Declared unit:
1 pcs i10-1500 LED 16000 HF 840 MB

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
IBU PCR - Part B for luminaires, lamps, and components for luminaires

Program operator:
The Norwegian EPD Foundation

Declaration number:

NEPD-3958-2994-EN

Registration number:

NEPD-3958-2994-EN

Issue date: 29.11.2022

Valid to: 29.11.2027

EPD Software:
LCA.no EPD generator

System ID:
53832

General information

Product

i10-1500 LED 16000 HF 840 MB

Program operator:

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

Declaration number:
NEPD-3958-2994-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
IBU PCR - Part B for luminaires, lamps, and components for luminaires

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 pcs i10-1500 LED 16000 HF 840 MB

Declared unit with option:

A1,A2,A3,A4,A5,B6,C1,C2,C3,C4,D

Functional unit:

1 pc i10-1500 LED luminaire manufactured in Glamox Molde. Transport to costumer, installed and used according to a specific lighting regime over 20-years lifetime. Including waste treatment at end-of-life.

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. Individualthird 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 proccess is reviewed annualy. 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. Approval number: NEPDT41.

Third party verifier:

Vito D'Incognito - Take Care International

(no signature required)

Owner of the declaration:

Glamox AS
Contact person: Birger Holo
Phone: +47 97551574
e-mail: birger.holo@glamox.com

Manufacturer:

Glamox AS
Birger Hatlebakks veg 15 , 6415 Molde
Global

Place of production:

Birger Hatlebakks veg 15 , 6415 Molde
Norway

Management system: Glamox production site Molde (Norway
ISO 9001, ISO 14001

Organisation no:

912007782

Issue date: 29.11.2022

Valid to: 29.11.2027

Year of study:

2022

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 is created using EPD tool lca.tools ver EPD2021.09, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD:

Marthe Øyen Gaasø

Reviewer of company-specific input data and EPD:

Jonny Strømme

Approved:

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

i10 is a IP23 luminaire with different lumen packages and types of reflectors in silver coated aluminium giving high flexibility. The luminaire housing is manufactured in unpainted aluzink coated steel.

Product specification

Optic Name: MB - Medium beam. Reflector Material: Silver-coated aluminium. Certification: ENEC
Length 1,559mm. Width 161mm. Height 136mm.

Materials	kg	%
Electronic - Cable and connector	0,04	1,27
Electronic - LED driver	0,28	9,52
Electronic - LED plate	0,09	2,88
Electronic - Light emitting diode	0,00	0,13
Electronic - Resistor	0,00	0,00
Metal - Aluminium	0,39	13,13
Metal - Stainless steel	0,02	0,67
Metal - Steel	1,68	56,26
Plastic - Acrylonitrile butadiene styrene (ABS)	0,07	2,41
Plastic - Plexiglass (PMMA)	0,40	13,47
Rubber, synthetic	0,01	0,20
Silicon products	0,00	0,04
Total	2,98	

Packaging	kg	%
Packaging - Paper	0,28	65,74
Packaging - Plastic	0,08	18,75
Packaging - Polystyrene	0,07	15,51
Total incl. packaging	3,42	

Technical data:

Electrical Data: 1 Fixed output (HF) LED Driver. 220-240V 50-60Hz.
Total Consumption: 113W. Lumen Out: 16031. lm Lumen Per Watt:151lm/W.
Lamp colour temp (K): 4000. Colour Rendering Index: 80. MacAdams Step: 3. Leakage Current (mA):0.30. Energy Class Light Source C. Certification: ENEC
Minimum TA -25ºC Maximum TA 35ºC.

Market:

Norway

Reference service life, product

20 years.
LED Lifetime L80B50 Ta25 (h): 100 000. LED Lifetime L70B50 Max Ta (h): 90 000.

Reference service life, building or construction works

60 years.
Standard service life for buildings according to PCR Part A of EPD Norway.

LCA: Calculation rules

Declared unit:

1 pcs i10-1500 LED 16000 HF 840 MB

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%) can be excluded. 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. 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.

Data quality:

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

Materials	Source	Data quality	Year
Electronic - Cable and connector	ecoinvent 3.6	Database	2019
Electronic - LED plate	ecoinvent 3.6	Database	2019
Electronic - Resistor	ecoinvent 3.6	Database	2019
Metal - Aluminium	ecoinvent 3.6	Database	2019
Metal - Stainless steel	ecoinvent 3.6	Database	2019
Metal - Steel	ecoinvent 3.6	Database	2019
Packaging - Paper	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Polystyrene	ecoinvent 3.6	Database	2019
Plastic - Acrylonitrile butadiene styrene (ABS)	ecoinvent 3.6	Database	2019
Plastic - Plexiglass (PMMA)	ecoinvent 3.6	Database	2019
Rubber, synthetic	ecoinvent 3.6	Database	2019
Silicon products	ecoinvent 3.6	Database	2019
Electronic - Cable and connector	ecoinvent 3.6; manufacturer	Database; technical sheet	2019
Electronic - Light emitting diode	Scholand et al. (2012); Ecoinvent 3.6	LCA literature; database	2019
Electronic - LED driver	ecoinvent 3.6	Supplier specific/database	2019
Metal - Steel	EPD S-P-01921; ecoinvent 3.6	EPD; database	2020

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	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	X	MND	X	X	X	X	X

System boundary:

The analysis is a cradle-to-grave study of one luminaire manufactured and installed, used according to a specific lighting regime over a specific lifetime, including waste treatment at end-of-life.

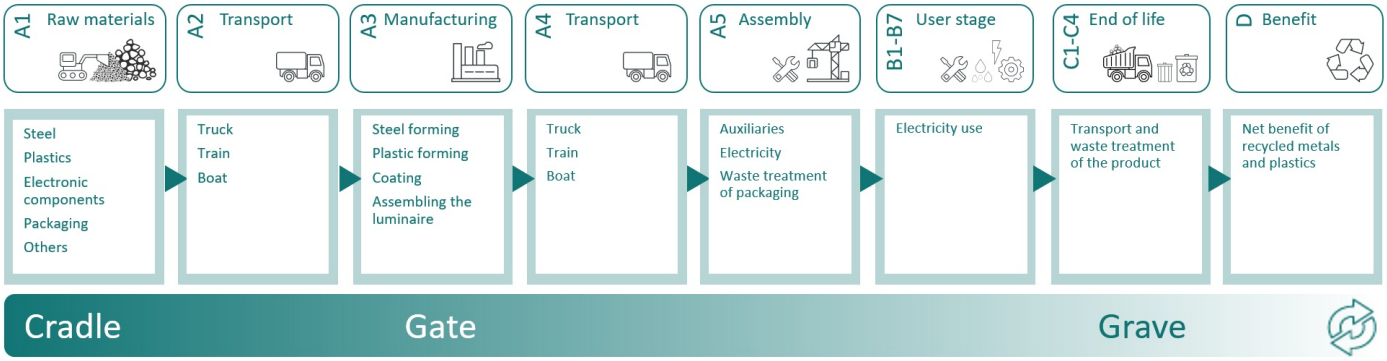
A1-A5 includes the extraction and production of raw materials, transportation to the production site, the production process itself, transport to the market and assembly.

B6 is the operational energy use stage of the luminaire based on a scenario.

C1-C4 includes de-installation of the luminaire, average transport between building site and waste treatment facility, waste processing and disposal. Waste treatment of the product follows the default values provided in EN 50693.

D shows the recyclability of metals and plastics, and allows the producers a credit for the net scrap that is produced at the end of a product's life. The benefits from recycling of net scrap are described in formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of plastic insulation and other parts is also calculated in module D.

The flowchart in the figure below illustrates the system boundaries for the analysis.



Additional technical information:

Please visit our website www.glamox.com for more technical information.

LCA: Scenarios and additional technical information

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

Module A4 = Transport from manufacturing location in Molde to warehouse in Oslo (495 km) + average distribution into the Norwegian market (300 km)

Module B6 = The operational energy use of the luminaire is calculated based on the methodology provided in IBU PCR Part B for luminaires, lamps, and components for luminaires. The energy consumption model for luminaire used in the PCR follows the application scenarios developed in EN 15193:2007. To calculate the electricity use of the luminaire, the following scenario parameters have been applied:
- Active power of the luminaire (Pa) = 113 watt
- Passive power of the luminaire (Pp) = 0 watt
- Daylight time usage (tD) = 2500 hours
- Non-daylight time usage (tN) = 1500 hours
- Standard year time (ty) = 8760 hours
- The occupancy depency factor (FO) = 1 (factor, no unit)
- The daylight dependency factor (FD) = 1 (factor, no unit)
- The product specific constant illuminance factor (FCP) = 1 (factor, no unit)
- The non-daylight dimming factor (FN) = 1 (factor, no unit)
- The application specific empiric lifetime of the luminaire in years (a) = 20 years (corresponding to the reference service life of the product).

Module C2 = Average transport to Norwegian waste treatment facilities.

Modules C3 and C4 = Waste treatment of the product follows the default values provided in EN 50693, Product Category Rules for life cycle assessments of electronic and electrical products and systems, table G.4. This table specified how different types of raw materials used in A1 will likely be treated during the end-of-life of the product. Waste treatments in C3 include material recycling and incineration with and without energy recovery and fly ash extraction. Disposal in C4 consist of landfilling of different waste fractions and of ashes.

Module D = The recyclability of metals, plastics, and electronic components allows the producers a credit for the net scrap that is produced at the end of a product's life. The benefits from recycling of net scrap are described in formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of plastic insulation and other parts is also calculated in module D.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 5 (km)	36,7 %	795	0,044	l/tkm	34,98

Assembly (A5)	Unit	Value			
Waste, cardboard and paper, to average treatment - A5 including transport (kg)	kg	0,28			
Waste, plastic, mixture, to average treatment - A5 including transport (kg)	kg	0,15			

Operational energy (B6)	Unit	Value			
Electricity, Norway (kWh)	kWh/DU	9040,00			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 5 (km)	53,3 %	300	0,023	l/tkm	6,90

Waste processing (C3)	Unit	Value			
Acrylonitrile butadiene styrene (ABS) to recycling	kg	0,01			
Aluminium to recycling (kg)	kg	0,27			
Copper to recycling (kg)	kg	0,01			
Steel to recycling (kg)	kg	1,41			
Waste treatment of non-hazardous waste, incineration with energy recovery and fly ash extraction (kg)	kg	0,00			
Waste treatment of plastic mixture, incineration with energy recovery and fly ash extraction (kg)	kg	0,28			
Waste treatment per kg electronics scrap from PWB, with components, recycling of metals, lead-free - C3 (kg)	kg	0,08			
Waste treatment per kg electronics scrap from PWB, without components, recycling of copper - C3 (kg)	kg	0,04			
Waste treatment per kg used electronic cable, manual seperation (kg)	kg	0,02			
Waste treatment per kg used electronic LED driver, manual seperation (kg)	kg	0,28			
Waste treatment per kg used electronic plug connector, manual seperation (kg)	kg	0,01			
Waste treatment per kg used PWB, shredding and separation - C3 (kg)	kg	0,25			

Disposal (C4)	Unit	Value			
Landfilling of aluminium (kg)	kg	0,12			
Landfilling of ashes from incineration of Non-hazardous waste, process per kg ashes and residues (kg)	kg	0,00			
Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)	kg	0,01			
Landfilling of copper (kg)	kg	0,01			
Landfilling of hazardous waste (kg)	kg	0,13			
Landfilling of non-hazardous waste (kg)	kg	0,00			
Landfilling of plastic mixture (kg)	kg	0,28			
Landfilling of steel (kg)	kg	0,35			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of primary copper with net scrap from printed wiring board (g)	g	29,23			
Substitution of primary gold with net scrap from printed wiring board (g)	g	0,01			
Substitution of primary nickel with net scrap from printed wiring board (g)	g	2,66			
Substitution of primary palladium with net scrap from printed wiring board (g)	g	0,02			
Substitution of primary silver with net scrap from printed wiring board (g)	g	0,45			
Substitution of acrylonitrile butadiene styrene, ABS, granulate (kg)	kg	0,01			
Substitution of primary aluminium with net scrap (kg)	kg	-0,04			
Substitution of primary copper with net scrap (kg)	kg	0,01			
Substitution of primary steel with net scrap (kg)	kg	0,21			
Substitution of electricity, in Norway (MJ)	MJ	0,43			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	6,49			

LCA: Results

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

Environmental impact							
Parameter		Unit	A1	A2	A3	A4	A5
	GWP-total	kg CO_2 -eq	4,25E+01	4,44E-01	4,13E-01	4,54E-01	5,12E-01
	GWP-fossil	kg CO_2 -eq	4,26E+01	4,44E-01	3,89E-01	4,53E-01	1,63E-02
	GWP-biogenic	kg CO_2 -eq	-2,27E-01	1,75E-04	2,25E-02	1,85E-04	4,95E-01
	GWP-luluc	kg CO_2 -eq	6,77E-02	1,65E-04	1,13E-03	1,58E-04	2,42E-06
	ODP	kg CFC11 -eq	2,84E-06	1,00E-07	2,69E-08	1,03E-07	1,67E-09
	AP	mol H+ -eq	3,40E-01	2,87E-03	4,02E-03	1,85E-03	3,62E-05
	EP-FreshWater	kg P -eq	5,04E-03	3,34E-06	2,04E-05	3,56E-06	6,18E-08
	EP-Marine	kg N -eq	4,76E-02	7,95E-04	1,18E-03	5,49E-04	2,04E-05
	EP-Terrestial	mol N eq	7,03E-01	8,81E-03	1,31E-02	6,08E-03	1,30E-04
	POCP	kg NMVOC -eq	1,75E-01	2,54E-03	3,54E-03	1,86E-03	3,94E-05
	ADP-minerals&metals[1]	Kg Sb-eq	1,40E-02	1,13E-05	2,10E-05	1,23E-05	1,74E-07
	ADP-fossil[1]	MJ	5,51E+02	6,61E+00	4,49E+00	6,83E+00	1,13E-01
	WDP[1]	m^3	1,93E+03	5,94E+00	6,37E+02	6,52E+00	2,52E-01

Parameter		Unit	B6	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	2,20E+02	0,00E+00	9,33E-02	7,53E-01	6,64E-02	-1,35E+00
	GWP-fossil	kg CO_2 -eq	2,13E+02	0,00E+00	9,32E-02	7,51E-01	6,56E-02	-1,35E+00
	GWP-biogenic	kg CO_2 -eq	5,89E+00	0,00E+00	3,83E-05	1,21E-03	5,19E-04	-2,82E-03
	GWP-luluc	kg CO_2 -eq	8,79E-01	0,00E+00	2,72E-05	2,24E-04	2,42E-04	3,46E-03
	ODP	kg CFC11 -eq	1,46E-05	0,00E+00	2,15E-08	7,03E-09	4,14E-09	-2,74E-03
	AP	mol H+ -eq	1,67E+00	0,00E+00	3,92E-04	4,97E-04	2,01E-04	-9,08E-02
	EP-FreshWater	kg P -eq	1,53E-02	0,00E+00	7,11E-07	2,91E-06	1,36E-06	-5,23E-04
	EP-Marine	kg N -eq	1,83E-01	0,00E+00	1,18E-04	1,33E-04	8,61E-05	-4,66E-03
	EP-Terrestial	mol N eq	2,38E+00	0,00E+00	1,30E-03	1,43E-03	5,72E-04	-6,43E-02
	POCP	kg NMVOC -eq	6,41E-01	0,00E+00	4,19E-04	3,76E-04	2,26E-04	-1,86E-02
	ADP-minerals&metals[1]	Kg Sb-eq	1,59E-02	0,00E+00	1,59E-06	7,42E-07	2,29E-07	-2,00E-03
	ADP-fossil[1]	MJ	2,91E+03	0,00E+00	1,45E+00	9,71E-01	5,18E-01	-1,71E+01
	WDP[1]	m^3	5,07E+05	0,00E+00	1,11E+00	9,54E+00	4,83E+00	1,72E+02

GWP total Global Warming Potential total; GWP fossil Global Warming Potential fossil fuels ; GWP biogenic Global Warming Potential biogenic; GWP luluc Global W Potential land use change; ODP Ozone Depletion; AP Acidification; EP freshwater Eutrophication aquatic freshwater; EP marine Eutrophication aquatic marine; EP terrestrial Eutrophication terrestrial ;POCP Photochemical zone formation; ADPE Abiotic Depletion Potential minerals and metals; ADPf Abiotic Depletion Potential fossil fuels;

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

1. 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

Remarks to environmental impacts

A luminaire is a product that consumes energy during the use phase. Combined with a relatively long expected lifetime and the environmental impact of generating electricity, the use phase (B6) will normally be the most contributing stage to the overall environmental impact of the declared unit. It is important to be aware that the actual calculations of the effect of B6 is particularly sensitive to which use scenario that is chosen and which energy grid mix that is used.

Additional environmental impact indicators

Parameter		Unit	A1	A2	A3	A4	A5
	PM	Disease incidence	2,88E-06	3,03E-08	6,99E-08	3,26E-08	5,81E-10
	IRP[2]	kgBq U235 eq.	1,86E+00	2,88E-02	6,85E-02	2,99E-02	4,93E-04
	ETP-fw[1]	CTUe	2,34E+03	4,79E+00	1,78E+01	5,03E+00	1,32E-01
	HTP-c[1]	CTUh	8,07E-08	0,00E+00	8,71E-10	0,00E+00	4,00E-12
	HTP-nc[1]	CTUh	1,96E-06	5,22E-09	2,08E-08	5,44E-09	1,52E-10
	SQP[1]	Pt	2,06E+02	4,29E+00	2,18E+00	4,71E+00	1,27E-01

Parameter		Unit	B6	C1	C2	C3	C4	D
	PM	Disease incidence	1,19E-05	0,00E+00	8,21E-09	3,06E-09	3,65E-09	-1,97E-07
	IRP[2]	kgBq U235 eq.	5,28E+01	0,00E+00	6,34E-03	4,82E-03	1,80E-03	-4,84E-02
	ETP-fw[1]	CTUe	1,33E+04	0,00E+00	1,06E+00	2,98E+00	2,94E+02	-6,79E+02
	HTP-c[1]	CTUh	6,33E-07	0,00E+00	0,00E+00	1,51E-09	1,34E-10	-3,99E-09
	HTP-nc[1]	CTUh	1,49E-05	0,00E+00	1,03E-09	8,87E-08	1,13E-09	-2,46E-07
	SQP[1]	Pt	1,47E+03	0,00E+00	1,66E+00	2,31E-01	1,27E+00	-1,74E+01

PM Particulate Matter emissions; IRP Ionizing radiation – human health; ETP-fw Eco toxicity – freshwater; HTP-c Human toxicity – cancer effects; HTP-nc Human toxicity – non cancer effects; SQP Soil Quality (dimensionless)

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

1. 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
2. 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.

Resource use

Parameter		Unit	A1	A2	A3	A4	A5
	PERE	MJ	5,19E+01	8,95E-02	4,72E+01	9,64E-02	2,28E-03
	PERM	MJ	1,13E+01	0,00E+00	0,00E+00	0,00E+00	-1,13E+01
	PERT	MJ	6,32E+01	8,95E-02	4,72E+01	9,64E-02	-1,13E+01
	PENRE	MJ	5,25E+02	6,61E+00	4,50E+00	6,83E+00	1,13E-01
	PENRM	MJ	2,57E+01	0,00E+00	0,00E+00	0,00E+00	-6,03E+00
	PENRT	MJ	5,51E+02	6,61E+00	4,50E+00	6,83E+00	-5,92E+00
	SM	kg	1,97E+00	0,00E+00	5,45E-02	0,00E+00	8,82E-05
	RSF	MJ	9,82E-01	3,17E-03	3,77E-02	3,45E-03	6,71E-05
	NRSF	MJ	3,65E+00	1,01E-02	9,80E-02	1,23E-02	2,28E-04
	FW	m^3	4,28E-01	6,69E-04	3,53E-01	7,20E-04	5,59E-05

Parameter		Unit	B6	C1	C2	C3	C4	D
	PERE	MJ	3,77E+04	0,00E+00	1,83E-02	1,37E-01	1,29E-01	-3,62E+00
	PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	3,77E+04	0,00E+00	1,83E-02	1,37E-01	1,29E-01	-3,62E+00
	PENRE	MJ	2,91E+03	0,00E+00	1,45E+00	9,71E-01	5,18E-01	-1,71E+01
	PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	-2,16E+01	0,00E+00	0,00E+00
	PENRT	MJ	2,91E+03	0,00E+00	1,45E+00	-2,06E+01	5,18E-01	-1,94E+01
	SM	kg	0,00E+00	0,00E+00	0,00E+00	1,32E-04	5,21E-03	6,45E-02
	RSF	MJ	2,96E+01	0,00E+00	6,39E-04	2,12E-03	7,38E-04	-2,00E-02
	NRSF	MJ	7,37E+01	0,00E+00	2,14E-03	-1,16E-03	2,36E-02	3,97E-02
	FW	m^3	2,82E+02	0,00E+00	1,65E-04	1,42E-03	4,45E-04	-9,92E-03

PERE Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM Use of renewable primary energy resources used as raw materials; PERT Total use of renewable primary energy resources; PENRE Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM Use of non renewable primary energy resources used as raw materials; PENRT 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; FW 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	A2	A3	A4	A5
	HWD	kg	2,38E-01	3,32E-04	2,98E-02	3,49E-04	3,03E-04
	NHWD	kg	6,55E+00	2,94E-01	3,25E-01	3,27E-01	7,67E-02
	RWD	kg	1,50E-03	4,51E-05	3,58E-05	4,66E-05	7,50E-07

Parameter		Unit	B6	C1	C2	C3	C4	D
	HWD	kg	1,87E+00	0,00E+00	7,94E-05	2,60E-04	1,45E-01	-8,05E-03
	NHWD	kg	2,24E+02	0,00E+00	1,26E-01	6,35E-02	7,66E-01	-2,47E-01
	RWD	kg	2,61E-02	0,00E+00	9,90E-06	4,17E-06	2,02E-06	-4,02E-05

HWD Hazardous waste disposed; NHWD Non-hazardous waste disposed; RWD 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	A2	A3	A4	A5
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	4,89E-03	0,00E+00	1,02E+00	0,00E+00	3,40E-01
	MER	kg	3,94E-04	0,00E+00	6,35E-06	0,00E+00	7,24E-07
	EEE	MJ	4,10E-03	0,00E+00	1,22E-01	0,00E+00	1,72E-02
	EET	MJ	6,21E-02	0,00E+00	1,85E+00	0,00E+00	2,60E-01

Parameter		Unit	B6	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	0,00E+00	1,70E+00	2,73E-03	6,51E-02
	MER	kg	0,00E+00	0,00E+00	0,00E+00	2,19E-05	6,36E-05	5,78E-05
	EEE	MJ	0,00E+00	0,00E+00	0,00E+00	4,29E-01	5,89E-04	-2,74E-03
	EET	MJ	0,00E+00	0,00E+00	0,00E+00	6,49E+00	8,91E-03	-4,15E-02

CRU Components for re-use; MFR Materials for recycling; MER Materials for energy recovery; EEE Exported electrical energy; EET Exported Energy Thermal

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

Biogenic Carbon Content

Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	1,35E-01

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

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
Electricity, Norway (kWh)	ecoinvent 3.6	24,33	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

Not relevant.

Additional Environmental Information

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0						
Parameter	**Unit**	A1	A2	A3	A4	A5
GWP	kg CO_2 -eq	4,11E+01	4,39E-01	3,94E-01	4,49E-01	5,09E-01
ODP	kg CFC11 -eq	2,95E-06	7,93E-08	3,06E-08	8,16E-08	1,35E-09
POCP	kg C_2H_4-eq	2,03E-02	7,86E-05	1,07E-04	5,99E-05	2,13E-06
AP	kg SO_2 -eq	2,35E-01	1,76E-03	1,80E-03	8,90E-04	1,79E-05
EP	kg PO_4^{3-} -eq	3,17E-02	1,91E-04	1,96E-04	9,50E-05	6,68E-06
ADPM	kg Sb -eq	1,40E-02	1,13E-05	2,10E-05	1,23E-05	1,74E-07
ADPE	MJ	4,75E+02	6,48E+00	2,60E+00	6,69E+00	1,10E-01
GWPIOBC	kg CO_2 -eq	4,30E+01	4,44E-01	3,02E-01	4,54E-01	0,00E+00

Parameter	**Unit**	B6	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	2,10E+02	0,00E+00	9,23E-02	7,51E-01	5,87E-02	-1,30E+00
ODP	kg CFC11 -eq	1,86E-05	0,00E+00	1,74E-08	6,38E-09	3,79E-09	-6,92E-08
POCP	kg C_2H_4-eq	6,26E-02	0,00E+00	1,20E-05	1,76E-05	2,39E-05	-3,03E-03
AP	kg SO_2 -eq	1,32E+00	0,00E+00	1,86E-04	3,80E-04	1,26E-04	-7,69E-02
EP	kg PO_4^{3-} -eq	1,23E-01	0,00E+00	2,03E-05	6,42E-05	3,23E-05	-3,16E-03
ADPM	kg Sb -eq	1,59E-02	0,00E+00	1,59E-06	7,42E-07	2,32E-07	-2,00E-03
ADPE	MJ	1,43E+03	0,00E+00	1,42E+00	8,35E-01	4,86E-01	-1,58E+01
GWPIOBC	kg CO_2 -eq	2,20E+02	0,00E+00	9,33E-02	7,53E-01	9,01E-03	-1,47E+00

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; GWP-IOBC/GHG Global warming potential calculated according to the principle of instantanious oxidation (except emissions and uptake of biogenic carbon)

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