Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Neptolux Escape route lighting products

Family N20 and N40

from

OY Hedengren Security AB

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products from a company, based on a representative product
EPD registration number:	EPD-IES-0031128:001
Version date:	2026-04-21
Validity date:	2031-04-20 *An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com*



GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 *Construction products*, version 2.0.1 Publication Date 2025-06-05. Valid until 2030-04-07.
PCR review was conducted by: *The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR Committee, and if there were conflicts of interest they were excused from the review. Rob Rouwette (chair), Noa Meron (co-chair).*
Life Cycle Assessment (LCA)
LCA accountability: Marko Ronkainen, OY Hedengren Security AB

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: Marcel Gómez Ferrer, Marcel Gómez Consultoria Approved by: International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: OY Hedengren Security AB
Address: Lauttasaarentie 50, 00200 Helsinki, FINLAND
Contact: Marko Ronkainen, marko.ronkainen@hedengren.fi
Description of the organisation: Hedengren is a Finnish, family-owned company with over 100 years of history, providing energy security and building technology solutions and employing approximately 234 people in Finland, Sweden, Norway and Estonia. Hedengren Security supplies fire safety, emergency lighting, intrusion detection, video surveillance and access control systems, including its own brands Prodex FIREscape, Neptolux, HHL and Hedsam.

For additional information about Hedengren Security´s Neptolux escape route lights, please visit the company web site at:
https://www.hedengren.com/securitysolutions/emergency-lighting/escape-route-lighting

PRODUCT INFORMATION

Product name: Neptolux Escape route lighting product, family N20 and N40
Product identification: Emergency escape route light, EN 60598-2-22:2014 + A1:20209, 2531-CPR-CSP1137/20
Visual representation (e.g., an image) of the product:



UN CPC code: 4653 Lighting Equipment; N20 GTIN:06418391000266
N40 GTIN:06418391000273
Product description: Provides sufficient light in an evacuation situation for a predetermined time using a local Ni-MH battery. Thanks to the long-life local battery, this function is available for a minimum of 10 years. The designed lifetime is at least 20 years.

This EPD is of multiple products, based on a representative product. From the Neptolux escape route luminaries product family N20 product has been chosen as the representative product analysed in this EPD as it is the most sold product configuration of these product families.

Models included in this EPD:

- N20 and N40 are standard models
- N20-3 and N40-3, 3 are models with 3-batteries, to be used with temperatures below -25°C or with 3h standby requirement
- N20-CB and N40-CB, are models for centralized battery systems
- N20-X and N40-X are models for adaptive evacuation (red X)
- N20-X3and N40-X3, are models with 3-batteries for adaptive evacuation (red X).

Long life NiMH battery technology advantages:

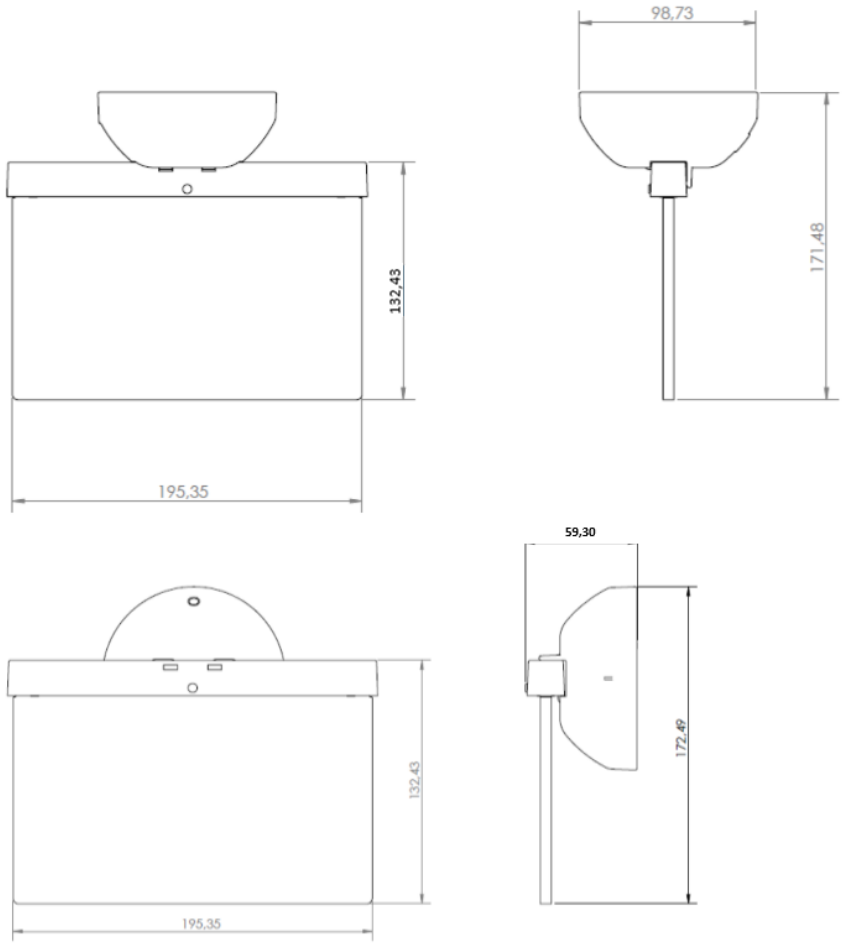
- Lifetime over 10 years at +20 °C ambient temperature
- Good battery performance in cold environment
- Withstands high temperatures for short periods.

Exit sign lens type are standard and sandwich lens (SGR), where the arrow direction is a part of the product description, directions are:

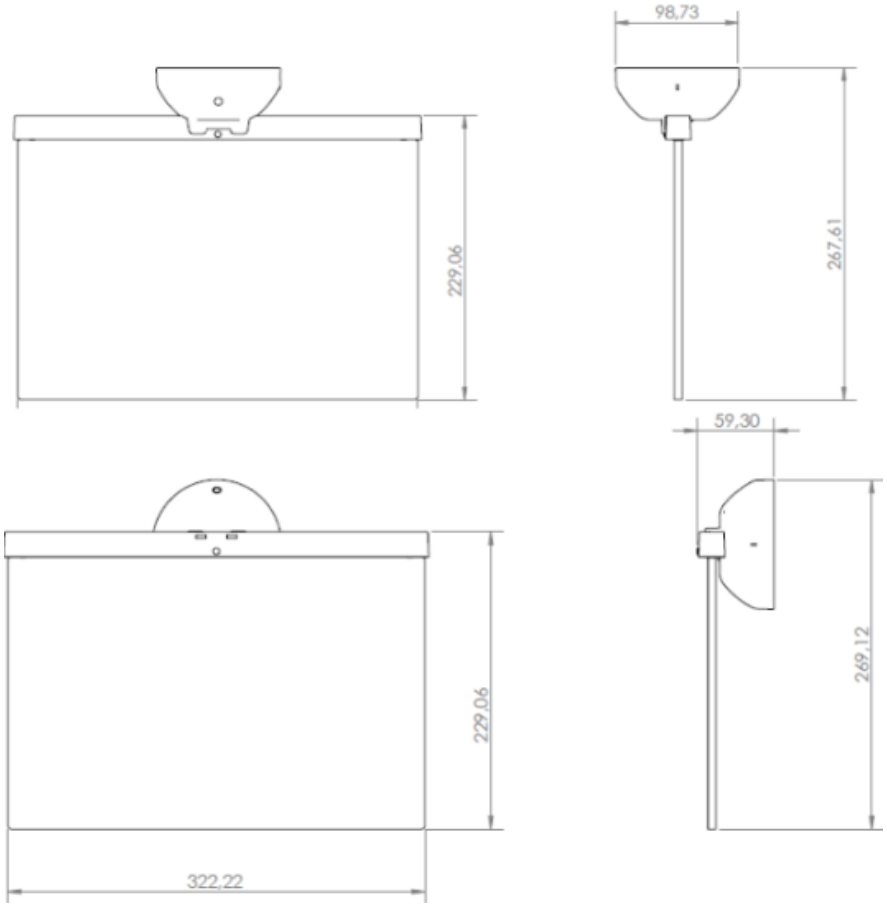


L: Left symbol **R: Right symbol** **D: Down symbol**

N20 measurements:



N40 measurements:



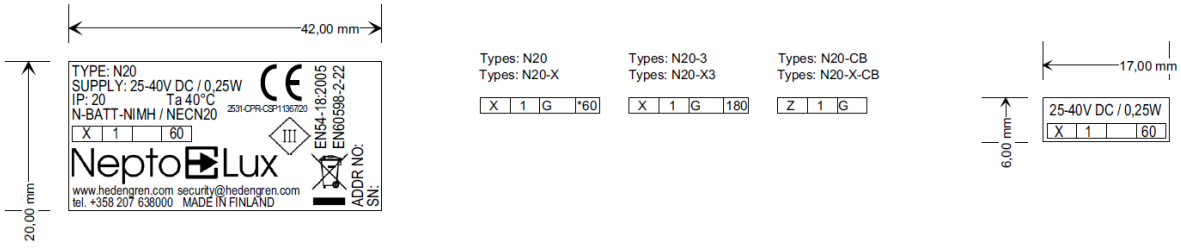
Technical information

Luminary	N20	N40
Input voltage [VDC]	25 – 40	25 – 40
Input voltage [VAC]	25 – 40	25 – 40
Average power consumption from the line (fully charged battery) [W] 1)	0,25	0,53
Maximum power consumption from the line (31V) [mA] 1)	12,70	13,60
Luminance active mode [cd/m^2] (green/white)	9 / 37	8 / 28
Power consumption from the line (31V), Prodex in sleep mode [mA]	1,30	1,30
NiMH battery [V] / [mAh]	1,2/2000	1,2/2000
Battery charge time 100% [h]	12/24	12/24
Standby time light on [h]	6,00	3,00
Fully charged battery voltage [V]	1,60	1,60
Discharged battery voltage	0,80	0,80
Dimensions (width x height x depth) [mm] including base		
Wall mounting	195 x 173 x 60	322 x 270 x 60
Sealing mounting	195 x 172 x 99	322 x 268 x 99
IP-class 2)	55,00	55,00
Operating Temperture 3)	-25 - +40 °C	-25 - +40 °C
Material	PC+ABS, fire resistant	PC+ABS, fire resistant
Colour	White	White
Fire class	UL94 V-O	UL94 V-O
Operating life 3)	+10 years	+10 years
Product approval	EN54-18:2005/AC2007 EN 60598-2-22:2014 + A1:20209	EN54-18:2005/AC2007 EN 60598-2-22:2014 + A1:20210

1) Default brightness 4
2) With separate sealing N-IP-GASKET
3) Battery life shortens with higher temperature. At temperatures above +30°C battery life shortens to 1/3 with every increase of 10°C. Temperatures <25°C, always use 3 battery version or central battery version.

Brightness / current consumption/ light intensity

	Standby time					1h		3h	
	Brightness	Led current mA]	Luminance [Cd/m^2] green	Luminance [Cd/m^2] white	Average power [W]	Max. current from line [mA]	Max consumption from line [NU]	Max. current from line [mA]	Max consumption from line [NU]
N20	0	0			0,04	6,1	3,8	13,8	8,6
N40	0	0			0,04	6,1	3,8	13,8	8,6
N20	1	8			0,08	7,3	4,5	15,0	9,3
N40	1	16			0,15	8,4	5,2	16,1	10,0
N20	2	16			0,12	8,6	5,3	16,3	10,1
N40	2	40			0,21	11,8	7,3	19,5	12,1
N20	3	24			0,16	9,8	6,1	17,5	10,9
N40	3	64			0,38	15,3	9,5	23,0	14,2
N20	4	44	9/11(SGR)	37/80(SGR)	0,25	12,7	7,9	20,6	12,8
N40	4	100	8/11(SGR)	28/ 80(SGR)	0,53	20,4	12,6	28,1	17,4
N20	5	60			0,33	15,4	9,5	23,1	14,3
N40	5	120			0,68	23,3	14,4	31,0	19,2
N20	6	80			0,42	18,1	11,2	25,8	16,0
N40	6	140			0,79	26,1	16,2	33,8	21,0
N20	7	44	9/11(SGR)	37/80(SGR)	0,25	12,7	7,9	20,6	12,8
N40	7	100	8/11(SGR)	28/80(SGR)	0,53	20,4	12,6	28,1	17,4



N20 product´s product- and type labels

Name and location of production site(s): The product is manufactured by a subcontractor at a production facility located in Finland. OY Hedengren Security AB is the owner of the product and is responsible for storing the finished products and delivering them to customer sites.

References: https://www.hedengren.com/securitysolutions/emergency-lighting/escape-route-lighting

CONTENT DECLARATION

Content declaration per declared unit (1 piece of product):

Product content	N20-CB (min) mass, [kg]	N20 representative mass, [kg]	N40-3 (max) mass, [kg]	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
PCB & cable	0,0287	0,0287	0,032	0	0	0
Silicon seal & bunge	0,0008	0,0008	0,001	0	0	0
Plastic cover / parts	0,0995	0,0995	0,128	0	0	0
Exit sign lens	0,161	0,161	0,480	0	0	0
Steel contacts & screws	0,0071	0,0071	0,007	0	0	0
Lens & insulation	0,001	0,001	0,001	0	0	0
Battery		0,027	0,081	0	0	0
TOTAL	**0,2981**	**0,3251**	**0,7298**	**0**	**0**	**0**

Packaging materials	N20-CB (min) mass, [kg]	N20 representative mass, [kg]	N40-3 (max) mass, [kg]	N20 representative mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Packing carton box (for one unit)	0,07563	0,07563	0,10296	17,31	3,40E-02
Manuals & marking material paper	0,0057	0,0057	0,0057	1,30	2,57E-03
Pallet	0,0306	0,0306	0,0458	7,00	1,53E-02
TOTAL	**0,11193**	**0,11193**	**0,15446**	**25,61**	**5,19E-02**

The cardboard packaging and pallet include biogenic C. According to the Ecoinvent process used the amount is 0,450 kg biogenic C / kg cardboard and pallet is 0,50kg biogenic C/kg. This value is multiplied with the amount of cardboard per product to produce the numbers in the following table. Pallet biogenic calculated 0,0306kg/unit *0,5 = 0,0153 kgC/unit.

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
2-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol	247-384-8	3147-75-9	0,001

Note1: led stripe´s lens plastic include 2-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol (UV-329), SCIP notification: https://echa.europa.eu/fi/factsheet/-/factsheet/606645246

LCA INFORMATION

Declared unit: one unit of Neptolux Escape route lighting product.

Conversion factor to mass if mass is not used as functional/declared unit: 0,325kg/unit (representative product N20). The range of kg/unit of all products included in this is 0,2981-0,7298 kg/unit.

Reference service life: 10years

Time representativeness: All specific data related to the production plant and used for the study date from 2024 (1st January - 31st December) except for electricity consumption for manufacturing which data from 2025 (1st January - 31st December).

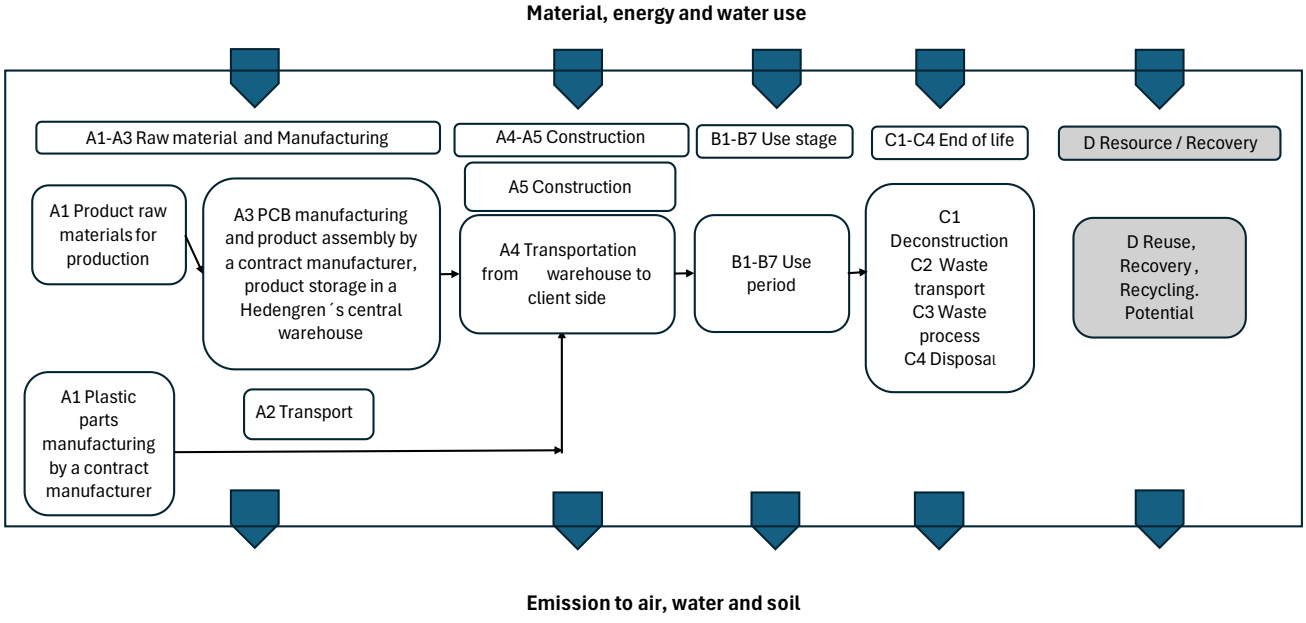
Geographical scope: EU for production of raw materials and manufacturing, EU (Finland, Sweden, Norway, Estonia and UK) for distribution and use.

Database(s) and LCA software used: Database: Ecoinvent v3.12 and Earthster software version 1.8

Description of system boundaries: Cradle to gate with options, modules C1–C4, module D and with optional modules (A1-A3 + C + D and A4-A5 + B1-B7).

An overview of the system is presented below in the system diagram.

System diagram:



A description of the modules is presented below.

Production stage (A1-A3):

A1 Raw Materials
Includes the extraction and processing impacts of all raw materials used in the manufacturing of the exit sign luminaire.
A2 Transport
Covers the transport of the finished products from the manufacturers to Hedengren's central warehouse using lorry >32 metric ton, Euro5.
A3 Manufacturing
Includes the production of purchased electricity (70% nuclear and 30% hydropower) and heat, as well as the treatment of waste generated during the manufacturing process. The GWP-GHG impact of the electricity used in the production of one product is 0,0094 kg CO_2-eq per kWh. Emissions associated with packaging materials and pallets production and transport are also included. In addition, this stage accounts for emissions arising from warehousing (energy consumption and district heating). The GWP-GHG impact of the energy consumption and district heating used in Hedengren´s warehousing is 0,5 kg CO_2-eq per kWh.

Distribution stage, Transportation (A4) and Installation (A5)

A4 Transportation
Includes the environmental impacts arising from the transportation of the product from the central warehouse to the customers using lorry >32 metric ton, Euro5. The calculations are based on a worst-case scenario in which the products are transported 1200 km in Finland, also covering Sweden, Norway, Estonia, north part of Europe, although most products (80%) are transported only about 400 km from the central warehouse.
A5 Installation
Includes the materials required for installation. There is no energy consumption or material loss during installation, except for the generation of packaging waste (cardboard, paper, pallet waste). A5 also covers the waste treatment of the final product's packaging, removed by end users during installation. The packaging waste is assumed to be sent to a municipal waste incineration plant for combustion without energy recovery.

B1–B7 — Use Phase

B1 Use: No additional impacts after installation.
B2 Maintenance: Battery lifetime exceeds 10 years → no maintenance required.
B3 Repair: Design lifetime up to 20 years → no repairs needed.
B4 Replacement: No component replacement foreseen within service life.
B5 Refurbishment: Not required.
B6 Operational Energy Use: Over 10 years: 87 800 h at 0,25 W → 21,90 kWh per product.
B7 Operational Water Use: The product does not need water consumption.

C1–C4 — End-of-Life

C1 De-construction: Manual labor only, negligible impacts.
C2 Transport: Includes the transportation of the product from the installation site to the waste treatment facility (recycling and landfill), in accordance with PCR requirements, over a distance of 80 km.
C3 Waste Processing: Part of the composition of the product is recycled.
PCB: 90% recycled
Battery: 47% recycled
Plastic components: 30,8% recycled.
C4 Disposal: Includes the impacts associated with landfilling. It is assumed that 10% of PCB, 53% of battery and 69,2% of plastics go to landfill.

D — Reuse, Recovery, Recycling Potential: Includes the recycling and recovery potential, presented as net impacts and benefits resulting from recycling. It is assumed that 47% battery, 90% PCB and 30,8% of plastic material are recovered through recycling.
Batteries are assumed to be removed manually before shredding.

Data collection and quality
Specific data for the period 2024/01–2025/12 has been collected from subcontractor and OY Hedengren Security AB. The manufacturing production energy consumption data is considered representative of the 2025 operational conditions. All collected data represents the current situation of OY Hedengren Security AB and its production subcontractor.

Below is presented a summary of the data quality assessment, in line with EN 15941.
The data quality assessment covers temporal, geographical and technological representativeness and is based on the data quality requirements in Table E2 of Annex E of EN 15804. No fair, poor or very poor relevant data contributing more than 30 % to any core indicator, were used in terms of temporal, geographical or technological representativeness. Overall, the data quality is assessed as very good in terms of temporal representativeness and good in terms of geographical and technological representativeness.

Cut-off rules
The exclusion rules follow EN 15804:2012+A2:2019/AC:2021, section 6.3.6. Over 99% of all material and energy inputs have been included.

The excluded flows are:
- Packaging of raw materials

Processes excluded from the scope of the study:
- Long-term emissions
- Purchased services, capital goods, business travel, employee commuting, and energy use from upstream leased office spaces
- Manufacture of equipment used in production
- Bussiness trips
- Maintenance activities at the production plants
- Transportation of personnel to and within the plants
- Diffuse particle emissions during the transport and storage of raw materials

Allocation

Only one type of product is manufactured in the Neptolux product family, so there are no parallel products in the product system and allocation is avoided. According to the information we received from the subcontractor, the amount of energy used in the manufacture of Neptolux products has been measured/calculated to be 2,1 kWh/product

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU
Share of primary data	0,65%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-17,71 / 56,79%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%*			-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Products are manufactured only in one site
ND = not declared, EU = Europe

Share of primary data, of GWP-GHG results for A1-A3

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3 [%]
Material inputs at EMS (manufacturing)	Collected data Database	EPD owner Ecoinvent v3.12	2024	Secondary data	0,00
Consumption of energy used at EMS site in manufacturing of product	Collected data Database	EMS Ecoinvent v3.12	2024	Primary data	0,41
Transportations (fuels)	Collected data Database	EPD owner Ecoinvent v3.12	2024	Primary data	0,20
Transportation pallet	Collected data Database	EPD owner Ecoinvent v3.12	2024	Primary data	0,03
Warehousing	Collected data Database	EPD owner Ecoinvent v3.12	2024	Secondary data	0,00
Total share of primary data, of GWP-GHG results for A1-A3					0,65

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

In the following tables is presented the environmental performance of the declared unit “one unit of Neptolux Escape route lighting product”.
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.
The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Mandatory impact category indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	4,77E +00	5,54E -02	3,85E -01	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	1,98E +00	0,00E +00	0,00E +00	2,75E -03	0,00E +00	2,34E -02	-1,36E +00
GWP-biogenic	kg CO2 eq.	-1,90E -01	0,00E +00	1,90E -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	0,00E +00	0,00E +00	0,00E +00	0,00E +00
GWP-luluc	kg CO2 eq.	8,34E -03	1,94E -05	5,31E -04	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	3,32E -03	0,00E +00	0,00E +00	9,62E -07	0,00E +00	1,58E -06	-3,03E -03
GWP-total	kg CO2 eq.	4,58E +00	5,54E -02	5,76E -01	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	1,99E +00	0,00E +00	0,00E +00	2,75E -03	0,00E +00	2,34E -02	-1,37E +00
ODP	kg CFC 11 eq.	1,17E -06	1,26E -09	1,07E -08	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	1,87E -07	0,00E +00	0,00E +00	6,24E -11	0,00E +00	7,54E -11	-4,97E -07
AP	mol H+ eq.	4,17E -02	1,79E -04	1,03E -02	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	1,49E -02	0,00E +00	0,00E +00	8,89E -06	0,00E +00	2,16E -05	-1,83E -02
EP-freshwater	kg P eq.	2,75E -03	3,95E -06	8,12E -04	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	1,28E -03	0,00E +00	0,00E +00	1,96E -07	0,00E +00	9,46E -06	-1,35E -03
EP-marine	kg N eq.	1,87E -02	6,30E -05	7,29E -04	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	2,31E -03	0,00E +00	0,00E +00	3,12E -06	0,00E +00	8,42E -04	-8,22E -03
EP-terrestrial	mol N eq.	4,98E -02	6,84E -04	9,12E -03	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	2,42E -02	0,00E +00	0,00E +00	3,39E -05	0,00E +00	8,22E -05	-2,00E -02
POCP	kg NMVOC eq.	1,79E -02	2,96E -04	2,88E -03	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	8,56E -03	0,00E +00	0,00E +00	1,47E -05	0,00E +00	3,46E -05	-6,86E -03
ADP-minerals&metals*	kg Sb eq.	4,07E -04	1,61E -07	1,25E -04	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	1,27E -04	0,00E +00	0,00E +00	7,98E -09	0,00E +00	4,95E -09	-3,11E -04
ADP-fossil*	MJ	9,88E +01	8,55E -01	7,06E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	2,66E +01	0,00E +00	0,00E +00	4,24E -02	0,00E +00	6,27E -02	-2,43E +01
WDP*	m3	2,17E +00	4,49E -03	1,88E -01	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	2,57E +00	0,00E +00	0,00E +00	2,23E -04	0,00E +00	-2,29E -02	-1,04E +00
Acronyms	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; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water potential															

** Disclaimer: 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.*

Additional mandatory and voluntary impact category indicators

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO2 eq.	4,79E +00	5,54E -02	3,87E -01	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	1,99E +00	0,00E +00	0,00E +00	2,75E -03	0,00E +00	2,82E -02	-1,37E +00

Resource use indicators

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,66E +01	1,25E -02	2,95E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	8,92E +01	0,00E +00	0,00E +00	6,22E -04	0,00E +00	1,13E -03	-3,09E +00
PERM	MJ	1,84E +00	0,00E +00	-1,84E +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	0,00E +00	0,00E +00	0,00E +00	0,00E +00
PERT	MJ	1,85E +01	1,25E -02	1,11E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	8,92E +01	0,00E +00	0,00E +00	6,22E -04	0,00E +00	1,13E -03	-3,09E +00
PENRE	MJ	8,53E +01	8,04E -01	5,90E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	2,49E +01	0,00E +00	0,00E +00	3,99E -02	2,61E +00	5,95E +00	-2,26E +01
PENRM	MJ	7,84E +00	0,00E +00	6,72E -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	0,00E +00	-2,61E +00	-5,90E +00	0,00E +00
PENRT	MJ	9,32E +01	8,04E -01	6,57E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	2,49E +01	0,00E +00	0,00E +00	3,99E -02	0,00E +00	5,89E -02	-2,26E +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	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	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	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
FW	m3	6,27E -02	1,10E -04	5,18E -03	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	6,33E -02	0,00E +00	0,00E +00	5,46E -06	0,00E +00	-5,32E -04	-2,49E -02
Acronyms	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 nonrenewable 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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	4,54E -03	2,31E -05	7,99E -03	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	6,21E -03	0,00E +00	0,00E +00	1,14E -06	0,00E +00	1,39E -05	3,94E -04
Non-hazardous waste disposed	kg	2,23E +01	7,88E -02	3,33E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	3,71E +00	0,00E +00	0,00E +00	3,91E -03	0,00E +00	2,40E -01	-1,03E +01
Radioactive waste disposed	kg	9,58E -04	2,09E -07	9,97E -06	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	3,84E -05	0,00E +00	0,00E +00	1,04E -08	0,00E +00	1,57E -08	-2,69E -04

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Output flow indicators

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reu-se	kg	0,00E +00	0,00E +00	6,11E -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	0,00E +00	0,00E +00	0,00E +00	0,00E +00
Material for recycling	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	0,00E +00	0,00E +00	0,00E +00	1,19E -01	0,00E +00	0,00E +00
Materials for energy recovery	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	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
Exported energy, electricity	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	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
Exported energy, thermal	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	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00

Additional LCA results (other environmental performance results) of the product(s)

Variation of the results of the different products in the product family:

LCA result of one declared unit product	Unit	A1-A3				A1-A3, A4, A5, B1-B7 and C		
		Min [%]	Representative [%]	Max [%]		Min [%]	Representative [%]	Max [%]
GWP-fossil	kg CO2 Equivalents	-17,67	0,00	56,84		-10,48	0,00	59,57
GWP-biogenic	kg CO2-Equivalents	0,00	0,00	32,24		0,00	0,00	0,00
GWP-luluc	kg CO2-Equivalents	-46,71	0,00	62,30		-29,65	0,00	63,23
GWP-total	kg CO2 Equivalents	-18,52	0,00	57,71		-10,51	0,00	59,58
ODP	kg CFC11 equivalents	-142,02	0,00	93,05		-109,92	0,00	90,14
AP	mol H+ equivalents	-63,09	0,00	74,80		-34,88	0,00	66,43
EP-freshwater	kg P equivalents	-14,96	0,00	38,62		-7,75	0,00	44,41
EP-marine	kg N equivalents	-129,34	0,00	91,26		-78,34	0,00	88,55
EP-terrestrial	mol N equivalents	-22,65	0,00	55,18		-12,58	0,00	56,48
POCP	kg NMVOC equivalents	-26,14	0,00	60,36		-14,66	0,00	60,06
ADP-fossil	MJ	-10,72	0,00	50,78		-7,69	0,00	53,78
ADP-minerals & metals	kg Sb equivalents	-9,12	0,00	25,69		-5,53	0,00	33,23
WDP	m3-world equivalents	-74,17	0,00	82,36		-28,44	0,00	74,89
GWP-GHG	kg CO2 Equivalents	-17,71	0,00	56,79		-11,10	0,00	59,90

End-of-life scenarios

The following table show the environmental impact of the end-of-life stages, assuming that 100% of the product is either recycled or sent to landfill.

		100% Recycling					100% Landfill				
Indicator	**Unit**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO2 Equivalents	0,00E+00	2,75E-03	0,00E+00	0,00E+00	-2,40E+00	0,00E+00	2,75E-03	0,00E+00	3,72E-02	0,00E+00
GWP-biogenic	kg CO2-Equivalents	0,00E+00	1,48E-06	0,00E+00	0,00E+00	2,04E-02	0,00E+00	1,48E-06	0,00E+00	1,94E-02	0,00E+00
GWP-luluc	kg CO2-Equivalents	0,00E+00	9,62E-07	0,00E+00	0,00E+00	-5,16E-03	0,00E+00	9,62E-07	0,00E+00	2,70E-06	0,00E+00
GWP-total	kg CO2 Equivalents	0,00E+00	2,75E-03	0,00E+00	0,00E+00	-2,38E+00	0,00E+00	2,75E-03	0,00E+00	5,66E-02	0,00E+00
ODP	kg CFC11 equivalents	0,00E+00	6,24E-11	0,00E+00	0,00E+00	-1,02E-06	0,00E+00	6,24E-11	0,00E+00	1,17E-10	0,00E+00
AP	mol H+ equivalents	0,00E+00	8,89E-06	0,00E+00	0,00E+00	-4,76E-02	0,00E+00	8,89E-06	0,00E+00	3,51E-05	0,00E+00
EP-freshwater	kg P equivalents	0,00E+00	1,96E-07	0,00E+00	0,00E+00	-2,92E-03	0,00E+00	1,96E-07	0,00E+00	1,54E-05	0,00E+00
EP-marine	kg N equivalents	0,00E+00	3,12E-06	0,00E+00	0,00E+00	-1,71E-02	0,00E+00	3,12E-06	0,00E+00	1,30E-03	0,00E+00
EP-terrestrial	mol N equivalents	0,00E+00	3,39E-05	0,00E+00	0,00E+00	-4,11E-02	0,00E+00	3,39E-05	0,00E+00	1,32E-04	0,00E+00
POCP	kg NMVOC equivalents	0,00E+00	1,47E-05	0,00E+00	0,00E+00	-1,45E-02	0,00E+00	1,47E-05	0,00E+00	5,66E-05	0,00E+00
ADP-fossil	MJ	0,00E+00	4,24E-02	0,00E+00	0,00E+00	-5,16E+01	0,00E+00	4,24E-02	0,00E+00	9,71E-02	0,00E+00
ADP-minerals&metals	kg Sb equivalents	0,00E+00	7,98E-09	0,00E+00	0,00E+00	-5,59E-04	0,00E+00	7,98E-09	0,00E+00	7,91E-09	0,00E+00
WDP	m3-world equivalents	0,00E+00	2,23E-04	0,00E+00	0,00E+00	-2,33E+00	0,00E+00	2,23E-04	0,00E+00	-3,20E-02	0,00E+00
GWP-GHG	kg CO2 Equivalents	0,00E+00	2,75E-03	0,00E+00	0,00E+00	-2,38E+00	0,00E+00	2,75E-03	0,00E+00	5,66E-02	0,00E+00

ABBREVIATIONS

Abbreviation	Definition
EPD	Environmental Product Declaration
PCR	Product Category Rules
ISO	International Organization for Standardization
EN	European Norm (Standard)
CEN	European Committee for Standardization
UN CPC	United Nations Central Product Classification
GTIN	Global Trade Item Number
EU	European Union
EF	Environmental Footprint
JRC	Joint Research Centre (European Commission)
LCA	Life Cycle Assessment
GWP-GHG	Global Warming Potential – Greenhouse Gases (biogenic CO2 set to zero)
GWP-fossil	Global Warming Potential, fossil
GWP-biogenic	Global Warming Potential, biogenic
GWP-luluc	Global Warming Potential, land use and land use change
GWP-total	Global Warming Potential, total
ODP	Ozone Depletion Potential
AP	Acidification Potential
EP-freshwater	Eutrophication Potential, freshwater
EP-marine	Eutrophication Potential, marine
EP-terrestrial	Eutrophication Potential, terrestrial
POCP	Photochemical Ozone Creation Potential
ADP-fossil	Abiotic Depletion Potential, fossil resources
ADP-minerals&metals	Abiotic Depletion Potential, minerals and metals
WDP	Water (user) Deprivation Potential
PERE	Use of renewable primary energy excluding 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 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 material
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
FW	Use of net fresh water
NiMH	Nickel–Metal Hydride (battery type)
PCB	Printed Circuit Board
ABS	Acrylonitrile Butadiene Styrene
PC	Polycarbonate
LED	Light-Emitting Diode
SVHC	Substances of Very High Concern
SCIP	Substances of Concern In Products database
CAS	Chemical Abstracts Service number
EC No.	European Community number
EMS	Electronics Manufacturing Services (provider)
ND	Not Declared

REFERENCES

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
EPD International 2025. General Programme Instructions (GPI) of the International EPD System. Version 5.0.1. www.environdec.com.
ISO 14040:2006 Environmental management - Life cycle assessment - Principles and frameworks.
ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
EN 15804:2012 +A2:2019/AC:2021 Sustainability in construction works - Environmental product declarations - Core rules for the product category of construction products.
EPD System PCR 2019:14 Construction products, version 2.0.1
N20 EPD with symbol final (LCA report (v11; date 2026-04-21）

VERSION HISTORY
Original Version of the EPD, 2026-04-21

EPD
INTERNATIONAL EPD SYSTEM
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