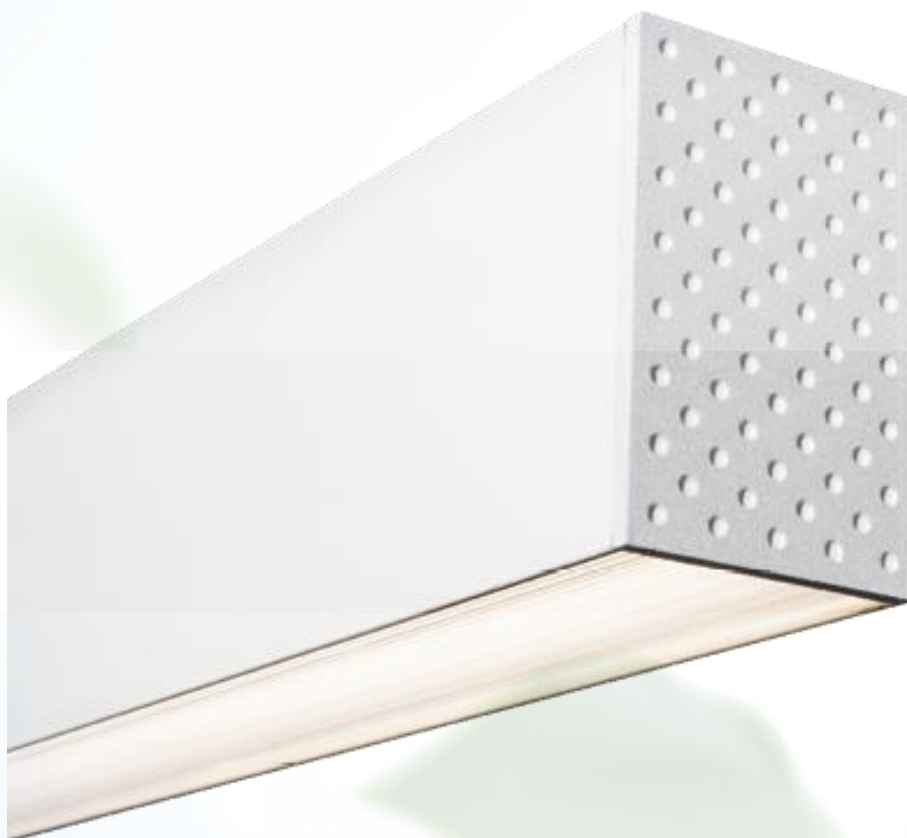


Product Environmental Profile of LINNEA Linear luminaires

Reference product: LI6L4DOB



Registration number: NORM-00004-V01.01-EN	Rules "PCR-ed4-EN 2021 09 06" Supplemented by "PSR-0014-ed2-EN-2023 07 13"
Verifier accreditation number: V45	Information and reference documents: www.pep-ecopassport.org
Date of issue: 11-2025	Validity period: 5 years
Independent verification of the declaration and data, in compliance with ISO 14025:2010: Internal <input type="checkbox"/> External <input checked="" type="checkbox"/>	
The PCR review was conducted by a panel of experts chaired by [...]	
PEP are compliant with XP C08-100-1:2016 and EN 50693:2019 or NF E38-500 :2022 The components of the present PEP may not be compared with components from another program.	
Document in compliance with ISO 14025:2010 "Environmental labels and declarations. Type III environmental declarations"	



Environmentally Light!





Indoor lighting



NORMALIT

by Normagrup



1. GENERAL INFORMATION

1.1 COMPANY INFORMATION

*"Lighting the future with efficient, safe and sustainable
efficient, safe and sustainable technological solutions"*

The strategic approach of our corporate culture is based on a commitment to innovation, industrial excellence, and sustainability as fundamental pillars for moving toward a responsible future.

At Normagrup Technology, we are firmly committed to domestic manufacturing, ongoing research and technological development, and respect for sustainability, through a comprehensive approach that encompasses environmental, social, and economic dimensions, driving ethical and responsible growth.

Since its founding in 1971, the company has undergone a continuous process of development and expansion, becoming a benchmark in the technical lighting and safety sector, with a presence in various international markets. Its production model is governed by a commitment to innovation, care for the planet, occupational safety, equal opportunities, and contribution to local development.

We strive to bring innovative solutions to the market, always guided by a sixth sense engraved in our DNA: **the sense of technology.**





Everything we do is driven by the core principles of the Normagrup DNA:



Innovation

Imagining, creating, and daring to take the road less traveled is the only way to build the future.



Safety

Our very first development was an emergency light fixture, and since then, safety has remained a constant priority at Normagrup.



Confort y control

Our developments aim to make life more comfortable for everyone, with simple and intuitive operation.



Design

We care about the aesthetics and appearance of our products to create pleasant environments



Quality

The customer is the absolute priority of our work, and the quality of our products and services is always aimed at achieving their maximum satisfaction.



Sustainability

We design efficient products based on eco-design principles and with a life cycle aligned with circular economy principles.



Owner of the PEP: Normagrup Technology, S.A.

✦ **Location of production and assembly site:**
Parque Tecnológico de Asturias
C/Ablanal, 1 33428 Llanera. Asturias. España

Legal contact:
Iván Peinado

Contact e-mail:
medioambiente@normagrup.com

Company website:
<https://www.normagrup.com/>

Normagrup Technology
Sede central / Headquarters
Parque Tecnológico de Asturias.
C/Ablanal, 1
33428 Llanera (Asturias)
España / Spain

Normagrup UK
Normagrup Netherlands
Normagrup France

Normagrup.com



Normagrup



ENVIRONMENTAL COMMITMENT OF THE COMPANY

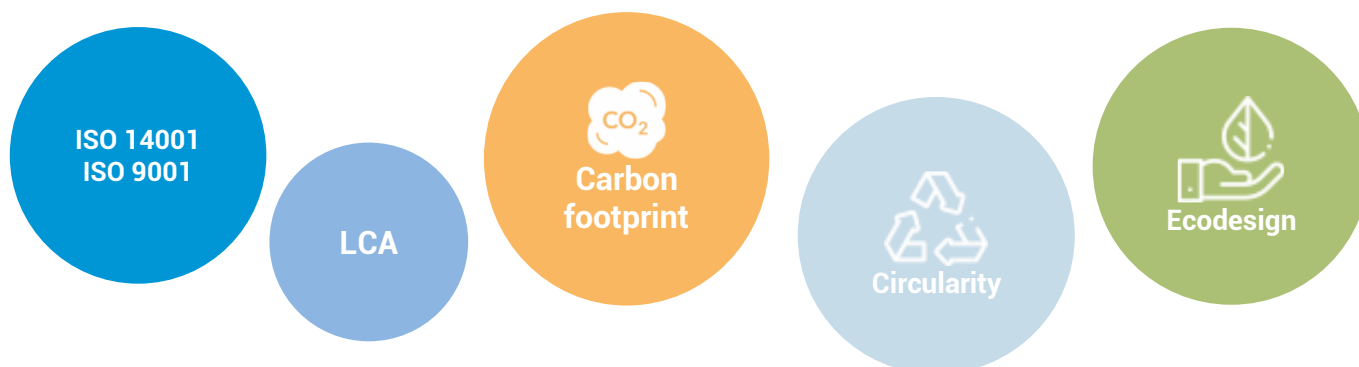
Normagrup Technology is a global company dedicated to the design, manufacture, and marketing of innovative technological solutions in lighting, signage, and emergency and detection systems, backlit fabrics, and hospital headwalls.

Since its origins, Normagrup has integrated environmental protection as a key pillar of its activity, implementing measures aimed at preventing, reducing, and controlling the environmental impacts associated with its production processes and products.

Driven by this strong commitment, an integrated quality and environmental management system was established according to ISO 9001:2015 and ISO 14001:2015, respectively, based on a holistic approach to the continuous improvement of our processes. This enables us to advance toward efficient and resource-optimized manufacturing, minimize waste and emissions, and incorporate sustainability and efficiency criteria at every stage of our products' life cycle.

This vision is embodied in a strong commitment to evaluating the environmental impact of our products through Life Cycle Assessment (LCA), a key tool for objectively quantifying impacts from the manufacturing phase to end-of-life disposal. This approach allows us to progress toward designing safer products that integrate sustainability criteria from the outset, guiding our decisions toward continuous improvement.

The results of this study are reflected in this Environmental Product Declaration (EPD), which serves as a key element for the improvement and transparency of our products.





1.2 PRODUCT DESCRIPTION AND METHODOLOGY

This Environmental Product Declaration (EPD), represents the Linnea LI6L4DOB indoor lighting family, distinguished by the following technical characteristics:

Table 1. Technical characteristics

NORMALIT		Indoor Lighting Ref. LI6L4DOB
LINNEA		LED UNE 60598-2-22 230V 50/60HZ
Linear luminaires: Linnea. Manufactured with extruded aluminium profiles. Lacquered with polyester high performance through electrostatic application and subsequent curing. UV and corrosion resistant. Diffuser: conical de-glaring prism. Light distribution: Directa. Color: White.		
	Gross lumen output (lm)	6000 lm
	Net lumen output	3666 lm
	Color temperatures (K)	4000
	CRI	80
	Hours Life L80B10	60.000h
	Hours Life L70B10	60.000h
	Macadam ellipses	3
	Beam angle	87
	Photobiological security	0
	Power consumption (W)	44,22
	Power (W)	40,2
	Voltage	220-240V 50/60Hz
	Power factor	0,95
	Class	I
	UGR	19
	IP	30
	IK	08
	Energy efficiency	C

For more information please click [here](#).



LINNEA

Linear luminaire designed to be suspended or recessed, which stands out for its **minimalist design** and **homogeneous lighting with optimum visual comfort** thanks to its diffuser.



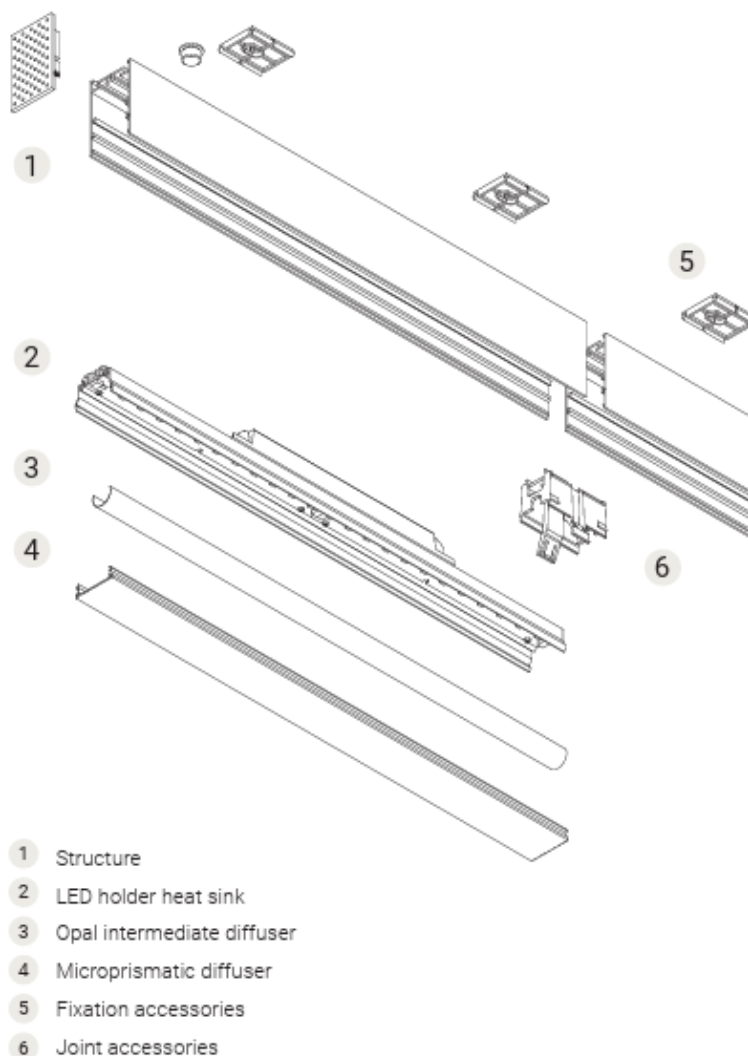
The EPD is structured according to the life cycle stages established by the standards Product Category Rules (PCR-ed4-EN-2021 09 06) and the Product Specific Rules (PSR-0014-ed2-EN-2023 07 13) and is based on the UNE-EN 15804:2012+A2:2020 standard. These stages cover the “cradle to grave” phases (A1-C4). The primary data used in the LCA calculation are representative of Linnea LI6L4DOB production and sales for 2024.



FUNCTIONAL UNIT | REFERENCE PRODUCT

The **reference product** is the linear luminaire LINNEA, with the reference code LI6L4DOB. It is the highest-selling product within the Linnea family, accounting for 9,44% of the total sales in this product line during the period considered.

The **functional unit (FU)** of the study is to provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours. This functional unit is chosen in accordance with the specifications of the Product Category Rules (PCR-ed4-EN-2021 09 06) and the Product Specific Rules (PSR-0014-ed2-EN-2023 07 13), which apply for luminaires.





The following information has been used to generate the Environmental Product Declaration.

Table 2. Methodological information

Methodological information	
Product name	LINNEA LI6L4DOB
Functional unit	Provide lighting that delivers an outgoing artificial luminous flux of 1.000 lumens during a reference lifetime of 35.000 hours.
Reference Flow	0,1591
Declared unit	One Linnea LI6L4DOB luminaire providing a luminous output of 3.666 lumens over a designated lifetime of 60.000 hours.
Reference service life	35.000 h
Life cycle stages covered	Cradle to grave
Product category according to PSR	Luminaires (indoor lighting)

The **reference flow** for this study is defined as:

$$\frac{35.000 \text{ (h)}}{\text{assigned product lifetime of the reference product (h)}} \times \frac{1.000 \text{ (lm)}}{\text{outgoing luminous flux of the reference product (lm)}} =$$

Consequently, the reference flow of the reference product corresponds to:

$$(35.000/60.000) \times (1.000 \text{ lm} / 3.666 \text{ lm}) = 0,1591$$

The **reference service life (RSL)** is 35.000 hours in accordance with the Product Specific Rules (PSR-0014-ed2-EN-2023 07 13) for luminaire. The **declared service life (DSL)** refers to the period during which the luminaire is expected to operate under normal conditions before being taken out of service and is 60.000 hours.

In addition to the functional unit, the **declared unit** is defined as a single Linnea LI6L4DOB luminaire that provides 3.666 lumens of lighting over a reference service life of 60.000 hours.



1.3 HOMOGENEOUS ENVIRONMENTAL FAMILY

The reference product represents the Linnea family, all the products in this family differ in terms of power and weight. **Table 3** shows the range of variations.

Table 3. Range of variation within the family of products.

LINNEA family	Unit	Reference product's value Linnea LI6L4DOB	Minimum value in product range	Maximum value in product range
Product's gross weight	kg	6,46	5,92	10,76
Power	W	40,2	26,8	104,5
Lumens	Lumen	3.666	3.666	16.500

The rest of the products that belong to the same homogeneous family and are covered by this PEP are listed in **Table 4**.

Table 4. Product references included in the LINNEA LI6L4DOB homogeneous family.

Product references of the LINNEA family					
Direct lighting		Direct lighting		Indirect lighting	
L=1.125mm	L=1.685mm	L=1.125mm	L=1.685mm	L=1.125mm	L=1.685mm
LI4L3OB	LI6L3OB	LE4L3OB	LE6L3OB	LM4L3OB	LM6L3OB
LI4H3OB	LI6H3OB	LE4H3OB	LE6H3OB	LM4H3OB	LM6H3OB
LI4L4OB	LI6L4OB	LE4L4OB	LE6L4OB	LM4L4OB	LM6L4OB
LI4H4OB	LI6H4OB	LE4H4OB	LE6H4OB	LM4H4OB	LM6H4OB
LI4L3DOB	LI6L3DOB	LE4L3DOB	LE6L3DOB	LM4L3DOB	LM6L3DOB
LI4H3DOB	LI6H3DOB	LE4H3DOB	LE6H3DOB	LM4H3DOB	LM6H3DOB
LI4L4DOB	LI6L4DOB	LE4L4DOB	LE6L4DOB	LM4L4DOB	LM6L4DOB
LI4H4DOB	LI6H4DOB	LE4H4DOB	LE6H4DOB	LM4H4DOB	LM6H4DOB

The present PEP declaration is valid for all the products in the described homogeneous environmental family. The extrapolation coefficients at product level (declared unit) and the information of the products included in the homogeneous environmental family can be found in the spreadsheets provided as annex. This information shall be used by the PEP user to extrapolate the impact of a product from the Linnea family, based on technical parameters of the considered product, as shown in **Annex II** (Annex II. Extrapolation coefficients).

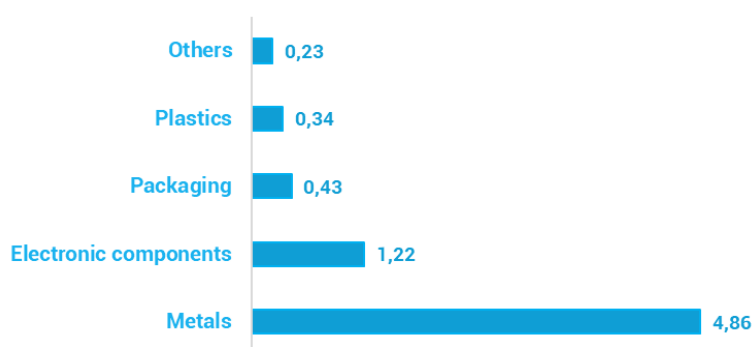


2. CONSTITUENT MATERIALS

Table 5. Weigh by material of the reference product.

	kg	%
Plastics		
Polycarbonate	0,337	99,4
Polypropylene	1,60E-03	0,1
Polyamide	4,00E-04	0,5
TOTAL	0,339	100
Metals		
Stainless aluminium	0,029	0,6
Aluminium	4,826	99,4
TOTAL	4,856	100
Electric components		
Driver circuit	0,216	17,7
Led circuit	0,138	11,3
Electronics	0,551	45,2
Wires	0,315	25,8
TOTAL	1,22	100
Packaging		
100% recycled cardboard	0,359	83,5
Pallet	0,008	1,9
Instructions	2,00E-04	0,05
Polyethylene film	0,062	14,5
TOTAL	0,430	100
Others		
Powder coating	0,225	100
TOTAL	0,225	100

Graph 1. Weight distribution by material type.





3. ADDITIONAL ENVIRONMENTAL INFORMATION

Normagrup has integrated environmental protection as a key pillar of its activity, implementing measures aimed at preventing, reducing, and controlling the environmental impacts associated with its production processes and products. Since 2019, we have been calculating our organizational carbon footprint and are working to reduce our greenhouse gas emissions. In line with this goal, we have created an emission absorption project: [Normagrup Forest](#).

The following sections outline the measures taken by Normagrup to minimise the product's environmental impact across all stages of the product's life cycle.



MANUFACTURING: A1-A3

A1 – Supply of raw materials.

A2 – Transport of raw materials.

A3 – Manufacturing.

Regarding the supply of raw materials, all suppliers with whom we maintain supply relationships have been previously assessed to be aligned with our corporate principles. They have accepted our [Code of Conduct](#) and are committed to meeting our [environmental requirements](#).

For Linnea LI6L4DOB's packaging, Normagrup uses only 100% recycled cardboard as primary and secondary packaging.

As for the manufacturing, Normagrup has a photovoltaic electricity production centre at the main production plant, which allows to reduce the need for non-renewable electricity in our facilities.



DISTRIBUTION AND INSTALLATION: A4-A5

A4 – Distribution.

A5 – Installation.

Normagrup aims for a smart transportation by maximising the available space during the distribution stage. One pallet (1200x800mm) carries 6 boxes (85x55x1810mm) of Linnea LI6L4DOB.

During installation, energy consumption is considered negligible because it is carried out manually, although electric tools such as drills may be used. The product comes ready to be installed by the end-user. In this stage, the product is unpacked and therefore the packaging waste is generated during the installation. The waste of packaging materials is treated using default values according to PCR-ed4-EN-2021 09 06 and PSR-0014-ED2.0-EN-2023 07 13 for distances and waste treatment statistics are based on Eurostat.



USE: B1-B7

B1 - Use.

B2 - Maintenance.

B3 - Repair.

B4 - Replacement.

B5 - Rehabilitation.

B6 – In service energy use.

B7 - In-service water use

The use stage concerns the maintenance (B2) during the product's life cycle and the electricity consumption (B6) associated with the operation of the product.

There are no maintenance tasks involved in this luminaire, since the service of the light source and of the driver are equal or longer than the product's service life.

The electricity consumption during the use phase is calculated based on the Spain electrical mix, since more than 99% of the sales are made in this country, and the remaining sales happened in the European market. Therefore, the electricity consumption scenario is based on the average Spanish electricity grid mix and is estimated over a lifetime of 60.000 hours and for 40,2 W of power.



The product has no direct emissions (B1) and requires no maintenance (B2). Additionally, no refurbishments (B5) take place as of now and the use of the product does not involve water consumption (B7).



C1-C4 END OF LIFE

C1 - Deconstruction/Demolition

C2 – Waste transport

C3 – Waste processing

C4 - Provision

The product is required to be professionally collected and recycled in accordance with the EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE). The company fulfils its responsibility within the EU by participating in national WEEE schemes. We meet our extended producer responsibility obligations by adhering to a national SCRAP.

The waste treatment scenario of each material and component was determined based on public data provided by Eurostat in 2022 and available datasets.

Table 5. Waste treatment scenarios considered.

Scenario	Recycling and incineration with energy recovery	Incineration and landfill	Modelling assumptions
Wire	62%	38%	Transport (100 km) and treatments based on Eurostat for Europe 2022.
Metal	77%	23%	Transport (100 km) and treatments based on Eurostat for Europe 2022.
Plastic	40%	60%	Transport (100 km) and treatments based on Eurostat for Europe 2022.
Electronic	70%	30%	Transport (100 km) and treatments based on available datasets.



4. ENVIRONMENTAL IMPACTS

The environmental impact assessment examines the stages of the reference product's life cycle: manufacturing, distribution, installation, use, and end of life. It is representative of the products marketed and used in Europe.

The Life Cycle Assessment (LCA) model was developed using the online tool *édit®* in combination with the SimaPro 10.2.0.2 software to evaluate the environmental impact associated with the reference product. Data concerning material and energy flows entering the product system were primarily sourced from the Ecoinvent v3.11.1 database.

The impact indicators and models used are those specified by the reference standards PCR-ed3-EN-2015 04 02 and PSR-0014-ed2-EN-2023 07 13. The environmental indicators are calculated for the total life cycle and each life cycle stage (i.e., manufacturing, distribution, installation, use and end-of-life) of the reference product. This environmental declaration has been developed by considering an outgoing luminous flux of 1.000 lumens during a reference lifetime of 35.000 hours.

For the use stage, the electricity consumption scenario considers the geographic area of Europe, specifically Spain, since 99,4% of the sales were made in Spain. Overall, datasets were selected based on their geographical representativeness, prioritizing those most closely aligned with the location of each life cycle stage.



RESULTS

Table 6. Results of mandatory inventory indicators per F.U (1.000 lumens during a reference lifetime of 35,000 hours) of Linnea LI6L4DOB luminaire.

Stage	Unit	1. Manufacturing			2. Distribution	3. Installation	4. Use		5. End of life			Total
Impact category		A1	A2	A3	A4	A5	B2	B6	C2	C3	C4	
Climate change - total	kg CO2 eq.	1,59E+01	6,20E-01	1,03E+01	1,32E-01	9,92E-03	0,00E+00	3,72E+01	2,01E-02	1,78E-01	2,01E-01	64,551
Climate change - fossil fuels	kg CO2 eq.	1,59E+01	6,20E-01	1,03E+01	1,32E-01	1,28E-03	0,00E+00	3,66E+01	2,01E-02	1,32E-01	6,11E-02	63,692
Climate change - land use and land use transformation	kg CO2 eq.	2,75E-02	2,09E-04	2,67E-03	4,38E-05	4,66E-07	0,00E+00	4,86E-01	6,66E-06	6,41E-05	1,07E-05	0,516
Climate change - biogenic	kg CO2eq.	7,54E-02	1,30E-04	4,54E-02	2,78E-05	8,63E-03	0,00E+00	1,15E-01	4,23E-06	3,84E-05	2,64E-05	0,245
Ozone depletion	kg CFC-11 eq.	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	0,000
Acidification	mol H+ eq.	-8,77E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,59E-02	1,40E-01	0,098
Freshwater eutrophication	kg P eq.	-1,22E-02	1,30E-04	4,54E-02	2,78E-05	8,63E-03	0,00E+00	1,15E-01	4,23E-06	4,59E-02	1,40E-01	0,343
Marine aquatic eutrophication	kg N eq.	8,93E-05	1,34E-08	5,90E-07	2,88E-09	2,68E-11	0,00E+00	8,59E-07	4,39E-10	1,30E-09	2,43E-10	0,000
Terrestrial eutrophication	mol N eq.	2,02E-01	2,45E-03	3,08E-02	4,24E-04	5,67E-06	0,00E+00	1,70E-01	6,45E-05	1,78E-04	5,68E-05	0,407
Photochemical ozone formation	kg NMVOC eq.	1,79E-02	4,17E-05	8,63E-04	9,02E-06	1,02E-07	0,00E+00	9,16E-03	1,37E-06	3,96E-05	6,29E-06	0,028
Abiotic resource depletion - metals and minerals	kg Sb eq.	2,37E-02	7,80E-04	9,03E-03	1,43E-04	5,76E-06	0,00E+00	3,09E-02	2,17E-05	4,37E-05	6,21E-05	0,065
Abiotic resource depletion - fossils	MJ	2,57E-01	8,51E-03	9,53E-02	1,55E-03	1,97E-05	0,00E+00	3,28E-01	2,36E-04	4,23E-04	1,92E-04	0,692
Water requirement	m3 depriv.	8,89E-02	3,32E-03	7,11E-02	6,43E-04	1,01E-05	0,00E+00	1,27E-01	9,79E-05	1,68E-04	6,21E-05	0,291



Table 7. Results of mandatory inventory indicators per F.U (1.000 lumens during a reference lifetime of 35,000 hours) of Linnea LI6L4DOB luminaire.

Stage	Unit	1. Manufacturing			2. Distribution	3. Installation	4. Use		5. End of life			Total
Impact category		A1	A2	A3	A4	A5	B2	B6	C2	C3	C4	
Use of renewable primary energy (excl. resources used as raw materials)	MJ	2,71E+01	-1,0E+05	-6,66E+02	-2,36E+04	-1,94E+02	0,00E+00	4,80E+02	-3,5E+03	6,00E-01	1,07E+00	-135.156
Use of renewable primary energy resources (used as raw materials)	MJ	9,94E-01	1,08E+05	6,74E+02	2,36E+04	1,94E+02	0,00E+00	0,00E+00	3,59E+03	-5,29E-01	-1,0E+00	135.673,5
Total use of renewable primary energy resources	MJ	2,81E+01	1,41E-01	8,68E+00	3,06E-02	3,41E-04	0,00E+00	4,80E+02	4,65E-03	7,07E-02	8,63E-03	517,126
Use of non-renewable primary energy (excl. resources used as raw materials)	MJ	1,20E+02	-2,4E+05	-1,55E+03	-5,47E+04	-4,51E+02	0,00E+00	6,75E+02	-8,3E+03	1,91E-01	3,81E-02	-313.633
Use of non-renewable primary energy resources (used as raw materials)	MJ	4,78E-01	2,49E+05	1,56E+03	5,47E+04	4,51E+02	0,00E+00	0,00E+00	8,33E+03	0,00E+00	0,00E+00	314.445,2
Total use of non-renewable primary energy resources	MJ	1,20E+02	6,81E-01	1,56E+01	1,47E-01	1,63E-03	0,00E+00	6,75E+02	2,24E-02	1,91E-01	3,81E-02	812,024
Use of secondary materials	kg	5,71E-02	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	0,057
Use of renewable secondary fuels	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	0,000
Use of non-renewable secondary fuels	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	0,000
Net use of fresh water	m3	1,63E-01	1,07E-03	2,03E-02	2,32E-04	-1,66E-05	0,00E+00	5,73E-01	3,54E-05	2,58E-04	4,85E-05	0,758
Hazardous waste	kg	4,00E-02	2,18E-04	1,31E-02	4,73E-05	5,08E-05	0,00E+00	4,76E-02	7,20E-06	5,04E-02	7,92E-02	0,231
Non-hazardous waste	kg	9,65E-01	4,09E-01	5,02E-01	8,98E-02	6,84E-03	0,00E+00	4,79E+00	1,37E-02	1,36E-02	1,21E-01	6,908
Radioactive waste	kg	4,51E-04	2,53E-06	1,03E-04	5,51E-07	6,05E-09	0,00E+00	8,60E-03	8,38E-08	8,63E-07	1,67E-07	0,009



Table 8. Results of mandatory inventory indicators per F.U (1.000 lumens during a reference lifetime of 35,000 hours) of Linnea LI6L4DOB luminaire.

Stage	Unit	1. Manufacturing			2. Distribution	3. Installation	4. Use		5. End of life			Total
Impact category		A1	A2	A3	A4	A5	B2	B6	C2	C3	C4	
Components for reuse	kg	1,33E-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	0,001
Materials for recycling	kg	0,00E+00	0,00E+00	5,95E-02	0,00E+00	3,98E-02	0,00E+00	0,00E+00	0,00E+00	3,99E-01	1,49E-02	0,514
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	0,000
Exported energy	MJ	0,00E+00	0,00E+00	6,60E-02	0,00E+00	1,34E-01	0,00E+00	0,00E+00	0,00E+00	1,15E-02	2,06E-01	0,417
Total use of primary energy during the life cycle	MJ	1,48E+02	8,22E-01	2,42E+01	1,78E-01	1,97E-03	0,00E+00	1,16E+03	2,71E-02	2,62E-01	4,68E-02	1329,150
Emission of fine particles	incidence of diseases	5,16E-04	4,86E-08	1,93E-07	1,06E-08	1,07E-10	0,00E+00	9,71E-07	1,61E-09	2,48E-09	8,40E-10	0,001
Ionizing radiation, human health	kBq U-235 eq.	1,82E+00	1,03E-02	4,27E-01	2,24E-03	2,45E-05	0,00E+00	3,75E+01	3,40E-04	3,25E-03	6,51E-04	39,788
Ecotoxicity (fresh water)	CTUe	3,18E+02	1,15E+00	2,62E+01	2,48E-01	2,61E-01	0,00E+00	1,24E+02	3,78E-02	1,83E+00	4,61E+00	476,552
Human toxicity, carcinogenic effects	CTUh	1,86E-04	1,06E-10	5,60E-09	2,24E-11	4,92E-13	0,00E+00	1,65E-08	3,41E-12	1,49E-10	2,22E-11	0,000
Human toxicity, non-carcinogenic effects	CTUh	7,61E-07	5,37E-09	4,97E-08	1,17E-09	4,31E-11	0,00E+00	7,86E-07	1,78E-10	4,13E-10	4,17E-10	0,000
Impacts related to land use/soil quality	-	1,04E+02	5,06E+00	9,44E+00	1,11E+00	1,29E-02	0,00E+00	3,07E+02	1,68E-01	3,02E-01	1,05E-01	427,391
Biogenic carbon content of the associated packaging	kg of C	-2,39E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,25E-02	3,81E-02	0,027
Biogenic carbon content of the product	kg of C	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	0,000



Table 9. Results of mandatory inventory indicators per D.U (for 3.666 lumens for 60.000 hours) of Linnea LI6L4DOB luminaire.

Stage	Unit	1. Manufacturing			2. Distribution	3. Installation	4. Use		5. End of life			Total
Impact category		A1	A2	A3	A4	A5	B2	B6	C2	C3	C4	
Climate change - total	kg CO2 eq.	9,99E+01	3,90E+00	6,48E+01	8,31E-01	6,23E-02	0,00E+00	2,34E+02	1,26E-01	1,12E+00	1,26E+00	405,724
Climate change - fossil fuels	kg CO2 eq.	9,98E+01	3,89E+00	6,45E+01	8,31E-01	8,07E-03	0,00E+00	2,30E+02	1,26E-01	8,29E-01	3,84E-01	400,327
Climate change - land use and land use transformation	kg CO2 eq.	1,73E-01	1,31E-03	1,68E-02	2,75E-04	2,93E-06	0,00E+00	3,05E+00	4,18E-05	4,03E-04	6,74E-05	3,244
Climate change - biogenic	kg CO2eq.	4,74E-01	8,16E-04	2,85E-01	1,75E-04	5,43E-02	0,00E+00	7,22E-01	2,66E-05	2,41E-04	1,67E-04	1,537
Ozone depletion	kg CFC-11 eq.	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	-
Acidification	mol H+ eq.	-5,51E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,88E-01	8,79E-01	0,616
Freshwater eutrophication	kg P eq.	-7,70E-02	8,16E-04	2,85E-01	1,75E-04	5,43E-02	0,00E+00	7,22E-01	2,66E-05	2,88E-01	8,79E-01	2,153
Marine aquatic eutrophication	kg N eq.	5,61E-04	8,41E-08	3,71E-06	1,81E-08	1,69E-10	0,00E+00	5,40E-06	2,76E-09	8,17E-09	1,53E-09	0,001
Terrestrial eutrophication	mol N eq.	1,27E+00	1,54E-02	1,93E-01	2,67E-03	3,57E-05	0,00E+00	1,07E+00	4,06E-04	1,12E-03	3,57E-04	2,557
Photochemical ozone formation	kg NMVOC eq.	1,13E-01	2,62E-04	5,43E-03	5,67E-05	6,43E-07	0,00E+00	5,76E-02	8,63E-06	2,49E-04	3,95E-05	0,176
Abiotic resource depletion - metals and minerals	kg Sb eq.	1,49E-01	4,90E-03	5,67E-02	8,98E-04	3,62E-05	0,00E+00	1,94E-01	1,37E-04	2,75E-04	3,90E-04	0,406
Abiotic resource depletion - fossils	MJ	1,62E+00	5,35E-02	5,99E-01	9,77E-03	1,24E-04	0,00E+00	2,06E+00	1,49E-03	2,66E-03	1,21E-03	4,349
Water requirement	m3 depriv.	5,59E-01	2,09E-02	4,47E-01	4,04E-03	6,36E-05	0,00E+00	7,96E-01	6,15E-04	1,06E-03	3,90E-04	1,829



Table 10. Results of mandatory inventory indicators per D.U (for 3.666 lumens for 60.000 hours) of Linnea LI6L4DOB luminaire.

Stage	Unit	1. Manufacturing			2. Distribution	3. Installation	4. Use		5. End of life			Total
Impact category		A1	A2	A3	A4	A5	B2	B6	C2	C3	C4	
Use of renewable primary energy (excl. resources used as raw materials)	MJ	1,71E+02	-6,7E+05	-4,18E+03	-1,48E+05	-1,22E+03	0,00E+00	3,02E+03	-2,2E+04	3,77E+00	6,71E+00	-849.506,1
Use of renewable primary energy resources (used as raw materials)	MJ	6,25E+00	6,76E+05	4,24E+03	1,48E+05	1,22E+03	0,00E+00	0,00E+00	2,26E+04	-3,32E+00	-6,6E+00	852.756,51
Total use of renewable primary energy resources	MJ	1,77E+02	8,86E-01	5,46E+01	1,92E-01	2,15E-03	0,00E+00	3,02E+03	2,92E-02	4,44E-01	5,43E-02	3.250,323
Use of non-renewable primary energy (excl. resources used as raw materials)	MJ	7,52E+02	-1,5E+06	-9,73E+03	-3,44E+05	-2,83E+03	0,00E+00	4,24E+03	-5,2E+04	1,20E+00	2,40E-01	-1.971.296
Use of non-renewable primary energy resources (used as raw materials)	MJ	3,01E+00	1,57E+06	9,82E+03	3,44E+05	2,83E+03	0,00E+00	0,00E+00	5,23E+04	0,00E+00	0,00E+00	1.976.400
Total use of non-renewable primary energy resources	MJ	7,55E+02	4,28E+00	9,78E+01	9,26E-01	1,02E-02	0,00E+00	4,24E+03	1,41E-01	1,20E+00	2,40E-01	5.103,859
Use of secondary materials	kg	3,59E-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	0,359
Use of renewable secondary fuels	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	-
Use of non-renewable secondary fuels	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	-
Net use of fresh water	m3	1,02E+00	6,75E-03	1,28E-01	1,46E-03	-1,04E-04	0,00E+00	3,60E+00	2,22E-04	1,62E-03	3,05E-04	4,762
Hazardous waste	kg	2,51E-01	1,37E-03	8,23E-02	2,97E-04	3,19E-04	0,00E+00	2,99E-01	4,52E-05	3,17E-01	4,97E-01	1,449
Non-hazardous waste	kg	6,07E+00	2,57E+00	3,15E+00	5,65E-01	4,30E-02	0,00E+00	3,01E+01	8,59E-02	8,54E-02	7,62E-01	43,421
Radioactive waste	kg	2,83E-03	1,59E-05	6,46E-04	3,46E-06	3,81E-08	0,00E+00	5,40E-02	5,27E-07	5,42E-06	1,05E-06	0,058



Table 11. Results of mandatory inventory indicators per D.U (for 3.666 lumens for 60.000 hours) of Linnea LI6L4DOB luminaire.

Stage	Unit	1. Manufacturing			2. Distribution	3. Installation	4. Use		5. End of life			Total
Impact category		A1	A2	A3	A4	A5	B2	B6	C2	C3	C4	
Components for reuse	kg	8,33E-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	0,008
Materials for recycling	kg	0,00E+00	0,00E+00	3,74E-01	0,00E+00	2,50E-01	0,00E+00	0,00E+00	0,00E+00	2,51E+00	9,38E-02	3,229
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	-
Exported energy	MJ	0,00E+00	0,00E+00	4,15E-01	0,00E+00	8,40E-01	0,00E+00	0,00E+00	0,00E+00	7,25E-02	1,29E+00	2,622
Total use of primary energy during the life cycle	MJ	9,32E+02	5,16E+00	1,52E+02	1,12E+00	1,24E-02	0,00E+00	7,26E+03	1,70E-01	1,65E+00	2,94E-01	8.354,182
Emission of fine particles	incidence of diseases	3,24E-03	3,06E-07	1,21E-06	6,64E-08	6,74E-10	0,00E+00	6,10E-06	1,01E-08	1,56E-08	5,28E-09	0,003
Ionizing radiation, human health	kBq U-235 eq.	1,14E+01	6,46E-02	2,69E+00	1,40E-02	1,54E-04	0,00E+00	2,36E+02	2,14E-03	2,04E-02	4,09E-03	250,082
Ecotoxicity (fresh water)	CTUe	2,00E+03	7,21E+00	1,64E+02	1,56E+00	1,64E+00	0,00E+00	7,81E+02	2,37E-01	1,15E+01	2,90E+01	2.995,293
Human toxicity, carcinogenic effects	CTUh	1,17E-03	6,65E-10	3,52E-08	1,41E-10	3,09E-12	0,00E+00	1,04E-07	2,14E-11	9,39E-10	1,39E-10	0,001
Human toxicity, non-carcinogenic effects	CTUh	4,78E-06	3,38E-08	3,13E-07	7,34E-09	2,71E-10	0,00E+00	4,94E-06	1,12E-09	2,60E-09	2,62E-09	0,000
Impacts related to land use/soil quality	-	6,55E+02	3,18E+01	5,93E+01	6,96E+00	8,08E-02	0,00E+00	1,93E+03	1,06E+00	1,90E+00	6,62E-01	2.686,304
Biogenic carbon content of the associated packaging	kg of C	-1,50E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,86E-02	2,40E-01	0,168
Biogenic carbon content of the product	kg of C	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	-



5. EXTRAPOLATION RULES

The extrapolation rules followed are based on the specifications of the PCR-ed4-EN-2021 09 06 and the Product Specific Rules (PSR-0014-ed2-EN-2023 07 13).

Linnea LI6L4DOB was selected as the representative product due to the market share of Linnea LI6L4DOB. It is the highest-selling product within the Linnea family, accounting for 9,44% of the total sales in this product line during the period considered.

The different products within the Linnea family differ in terms of power, dimensions and lumens. Other product parameters that vary among the various products of the family are weight of parts, product mass and energy consumption. A sensitivity analysis was carried out to assess the potential variability of the most influential parameters: product mass and energy consumption. Additionally, extrapolation coefficients were calculated and evaluated. In cases where multiple coefficients were available for a given stage, the most representative one was selected. For example, in the use stage, the extrapolation rule applicable to the electricity consumption was chosen.

The rules defined shall be applied using the Extrapolation coefficients file provided as annex (ANNEX II. Extrapolation coefficients.xlsx). Please refer to the table below for the data on reference product 'Linnea LI6L4DOB', needed to calculate the coefficients.

Table 12. Parameters of the reference product.

Parameter	Unit	Value for reference product Linnea LI6L4DOB
Power	W	40,2
Lumen	lm	3.666
Luminaire structure weight	kg	5,64
Power supply equipment weight	kg	0,87
Lighting source weight	kg	0,14
Packaging weight	kg	0,43
Product weight (no packaging)	kg	6,64
Product weight (including packaging)	kg	7,07

**The lumens and power are considered in the LCA to establish the total energy consumption and calculate the results at FU level.*

The calculation of extrapolation coefficients at the functional unit level shall be performed using the following formula:

$$\text{Extrapolation coefficient at the product level} \times \frac{\text{Lighting output of reference product (lm)}}{\text{Lighting output of concerned product (lm)}}$$