

Product Environmental Profile of ZENITH Indoor luminaires

Reference product: ZH34B



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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"	



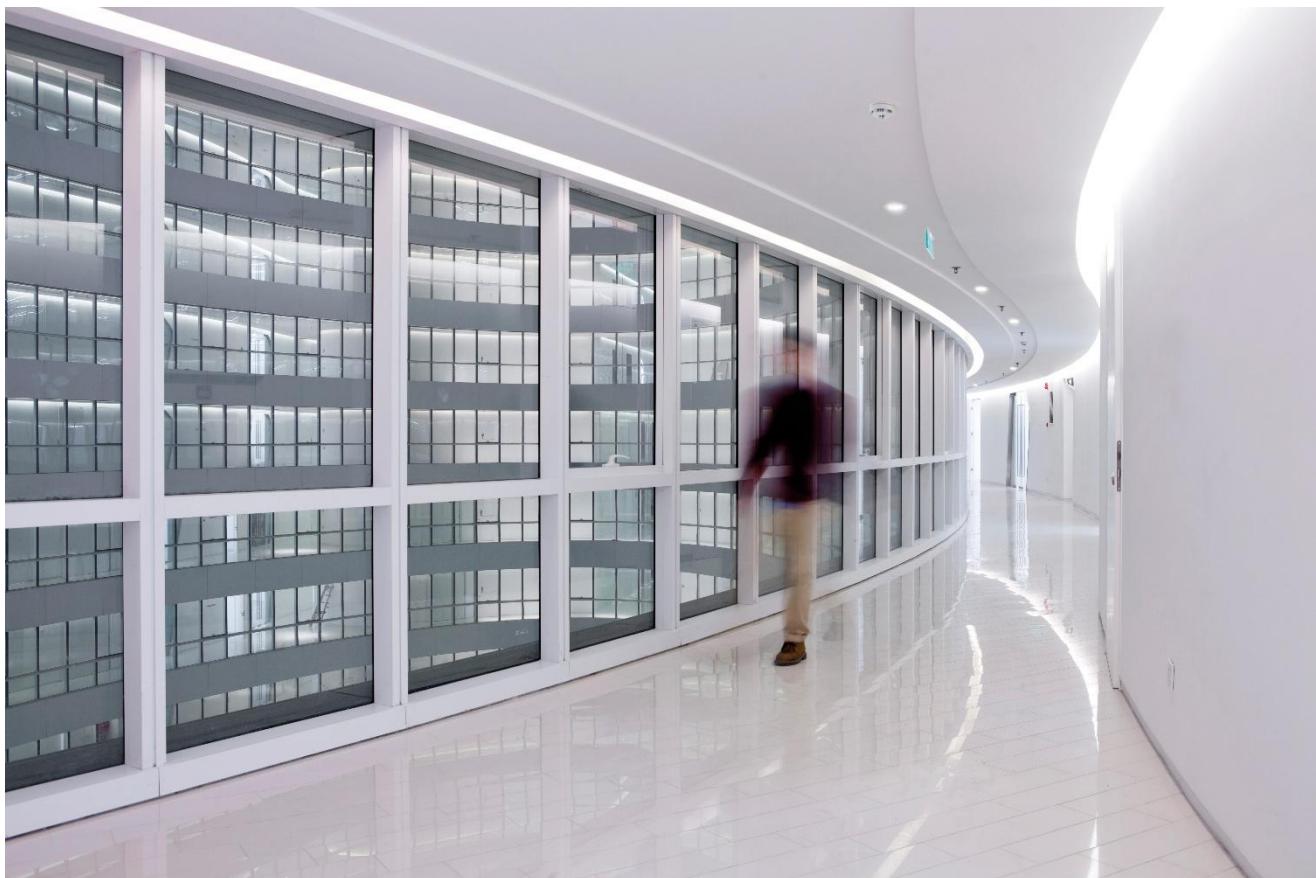


Environmentally Light!





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:**
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ENVIRONMENTAL COMMITMENT OF THE COMPANY

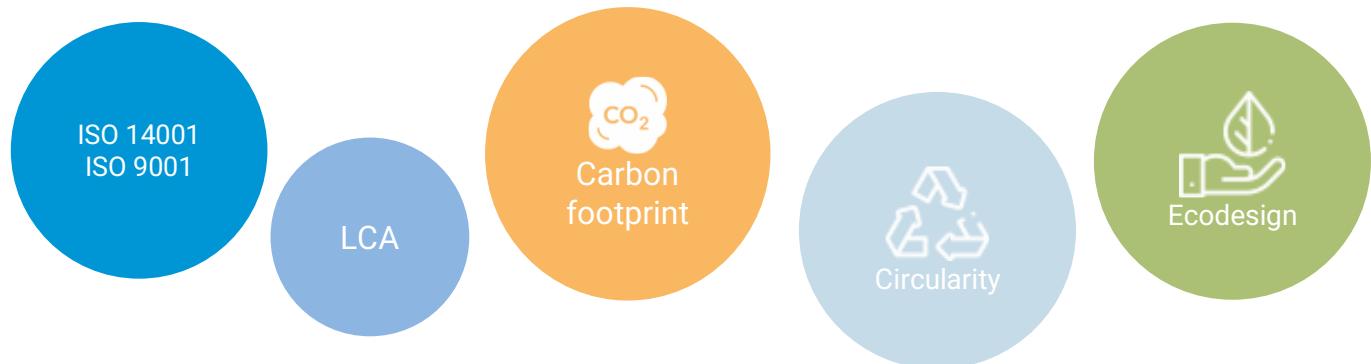
Normagrup Technology is a global company dedicated to the design, manufacture, and marketing of innovative technological solutions in lighting, signage, and emergency and detection systems, backlit fabrics, and hospital headwalls.

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 Zenith ZH34B indoor lighting family, distinguished by the following technical characteristics:

Table 1. Technical characteristics

NORMALIT	Indoor lighting Ref. ZH34B
ZENITH	LED   UNE 60598-2-22 230V 50/60HZ
	Lumen output (lm) 4100 lm
	Color temperatures (K) 4000
	CRI 80
	Hours Life 100.000h
	Macadam ellipses 3
	Beam angle 114
	Photobiological security 0
	Power consumption (W) 27,70
	Power (W) 24
	Voltage 220-240V 50/60Hz
	Power factor 0,96
	Class II
	UGR 19
	IP 20-54
	IK 07
	Energy efficiency B

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

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 Zenith ZH34B production and the sales for 2024 of its predecessor model, Luzerna.



Efficiency and Sustainability at its finest

Zenith

The new, most efficient and sustainable LED panel from Normalit. It is designed for installation in drop ceilings but can also be surface-mounted or suspended using an accessory.

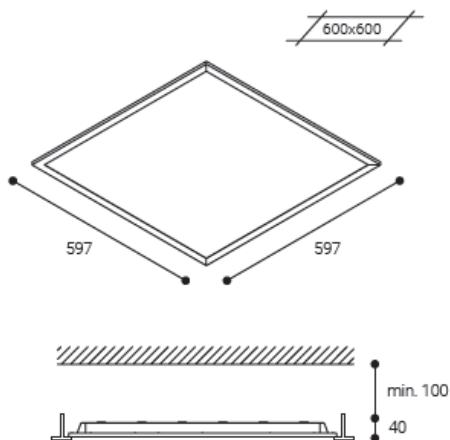
Zenith, the panel that combines efficiency and sustainability without compromising top performance, and is available with the main control technologies

FUNCTIONAL UNIT | REFERENCE PRODUCT

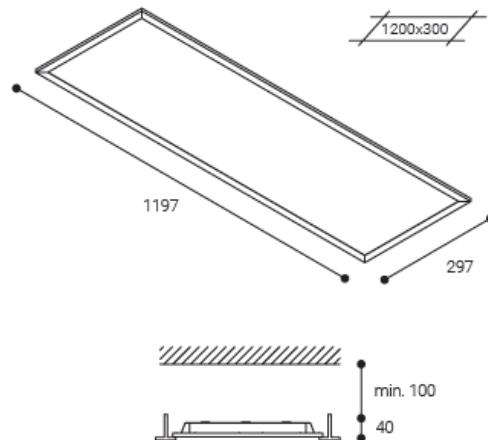
The **reference product** is the luminaire ZENITH, with the reference code ZH34B. It was chosen based on its predecessor model of Luzerna Avant, LX34B, which is the highest-selling product within the Luzerna Avant family, accounting for 51,78% of the total sales in this product line during the period considered, given that Zenith was not yet in the market in 2024.

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.

600 x 600



1200 x 300



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

Table 2. Methodological information

Methodological information	
Product name	ZENITH ZH34B
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	0,0854
Declared unit	One Zenith ZH34B luminaire providing a luminous output of 4.100 lumens over a designated lifetime of 100.000 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:

$$(35.000 \text{h}/100.000 \text{h}) \times (1.000 \text{ lm} / 4.100 \text{ lm}) = 0,0854$$

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 100.000 hours.

In addition to the functional unit, the **declared unit** is defined as a single Zenith ZH34B luminaire that provides 4.100 lumens of lighting over a reference service life of 100.000 hours.

1.3 HOMOGENEOUS ENVIRONMENTAL FAMILY

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

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

ZENITH family	Unit	Reference product's value Zenith ZH34B	Minimum value in product range	Maximum value in product range
Product's gross weight	kg	1,91	1,89	2,98
Power	W	24	24	24,3
Lumens	Lumen	4.100	4.030	4.255

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 ZENITH ZH34B homogeneous family.

Product references of the ZENITH family							
ON/OFF	ZH34GB	CASAMBI NODO + SENSOR	ZH33CSG B	CASAMBI NODO TW	ZH3TWCG B	ACTIVEHE AD NODO TW + SENSOR	ZH3TWH GB
	ZH33GB		ZH34CSG B		ZH3TWCB		ZH3TWH B
	ZH33B		ZH33CSB		ZH4TWCG B		ZH4TWH GB
	ZH34B		ZH34CSB		ZH4TWCB		ZH4TWH B
	ZH43GB		ZH43CSG B	ACTIVEHE AD NODO + SENSOR	ZH33HSG B	ACTIVEHE AD NODO TW	ZH3TWHG B
	ZH44GB		ZH44CSG B		ZH34HSG B		ZH3TWHB
	ZH43B		ZH43CSB		ZH33HSB		ZH4TWHG B
	ZH44B		ZH44CSB		ZH34HSB		ZH4TWHB
DALI	ZH33DGB	CASAMBI NODO	ZH33CGB	ACTIVEHE AD NODO + SENSOR	ZH43HSG B	ACTIVEHE AD NODO TW	
	ZH34DGB		ZH34CGB		ZH44HSG B		
	ZH33DB		ZH33CB		ZH43HSB		
	ZH34DB		ZH34CB		ZH44HSB		
	ZH43DGB		ZH43CGB		ZH33HGB		
	ZH44DGB		ZH44CGB		ZH34HGB		
	ZH43DB		ZH43CB		ZH33HB		
	ZH44DB		ZH44CB		ZH34HB		
TUNABLE WITH (TW)	ZH3TWGB	CASAMBI NODO TW + SENSOR	ZH3TWCS GB	ACTIVEHE AD NODO	ZH43HGB	ACTIVEHE AD NODO TW	
	ZH3TWB		ZH3TWCS B		ZH44HGB		
	ZH4TWGB		ZH4TWCS GB		ZH43HB		
	ZH4TWB		ZH4TWCS B		ZH44HB		

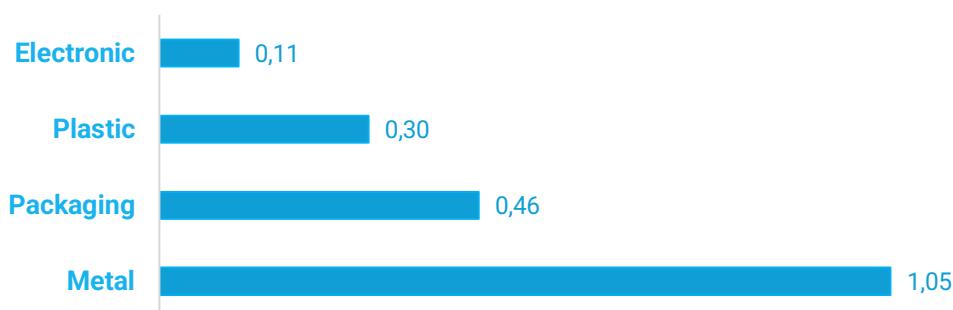
The present PEP declaration is valid for all the products in the described homogeneous environmental family. The extrapolation coefficients at product level (declared unit) and the information of the products included in the homogeneous environmental family can be found in the spreadsheets provided as annex. This information shall be used by the PEP user to extrapolate the impact of a product from the Zenith 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	%
Metal			
	Steel	0,011	1,10
	Aluminium	0,138	13,15
	Galvanized sheet	0,900	85,76
	TOTAL	1,049	100
Plastic			
	Polystyrene	0,3	100
	TOTAL	0,3	100
Electric components			
	Driver circuit	0,077	67,93
	LED circuit	0,018	15,79
	Wires	0,018	7,52
	TOTAL	0,113	100
Packaging			
	100% recycled cardboard	0,446	97,41
	Pallet	3,47E-04	0,08
	Polyethylene film	0,005	1,43
	Instructions	1,0E-04	1,09
	TOTAL	0,458	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 Zenith ZH34B'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. The product comes in collective boxes of 6 units each. One pallet (1200x800mm) carries 24 collective boxes of 6 units each, that is, one pallet carries 144 units of Zenith ZH34B.

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.

As a maintenance task, two drivers will be replaced over the product's service life, since a service life of 40.000h is ensured for the driver. The waste treatment of the initial driver is considered in this stage.

The electricity consumption during the use phase is calculated based on the Spain electrical mix, since 90% 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 10.000 hours and for 24 W of power.



The product has no direct emissions (B1) and is designed so that no parts replacement is necessary (B4). Additionally, no standard repairs (B3) or refurbishments (B5) take place as of now. 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 èdit® 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 89,9% 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 ZENITH ZH34B 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 CO ₂ eq.	9,03E-01	2,18E-02	1,58E-02	2,68E-02	6,49E-03	4,50E-01	3,97E+01	2,38E-03	8,87E-03	2,29E-02	41,183
Climate change - fossil fuels	kg CO ₂ eq.	9,52E-01	2,18E-02	1,36E-02	2,68E-02	8,65E-04	4,48E-01	3,91E+01	2,38E-03	7,42E-03	1,57E-02	40,572
Climate change - land use and land use transformation	kg CO ₂ eq.	1,58E-03	1,17E-05	3,48E-06	7,22E-06	3,13E-07	7,99E-04	5,19E-01	7,87E-07	3,60E-06	8,88E-07	0,521
Climate change - biogenic	kg CO ₂ eq.	5,42E-03	3,69E-06	2,17E-03	4,78E-06	5,62E-03	8,68E-04	1,23E-01	5,01E-07	2,16E-06	2,24E-06	0,137
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.	-5,62E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,44E-03	7,17E-03	-0,047
Freshwater eutrophication	kg P eq.	-5,08E-02	3,69E-06	2,17E-03	4,78E-06	5,62E-03	8,68E-04	1,23E-01	5,01E-07	1,44E-03	7,17E-03	0,089
Marine aquatic eutrophication	kg N eq.	2,39E-05	3,09E-10	6,90E-11	5,39E-10	1,80E-11	1,19E-08	9,18E-07	5,19E-11	7,32E-11	2,18E-11	0,000
Terrestrial eutrophication	mol N eq.	8,28E-03	6,34E-04	2,78E-05	9,54E-05	3,84E-06	7,82E-03	1,82E-01	7,63E-06	1,00E-05	7,27E-06	0,199
Photochemical ozone formation	kg NMVOC eq.	7,40E-04	7,78E-07	1,72E-06	1,48E-06	6,93E-08	7,17E-04	9,78E-03	1,62E-07	2,23E-06	4,52E-07	0,011
Abiotic resource depletion - metals and minerals	kg Sb eq.	1,23E-03	1,58E-04	9,12E-06	3,36E-05	3,81E-06	7,94E-04	3,30E-02	2,57E-06	2,46E-06	2,28E-05	0,035
Abiotic resource depletion - fossils	MJ	1,26E-02	1,75E-03	6,27E-05	3,66E-04	1,35E-05	9,11E-03	3,51E-01	2,79E-05	2,38E-05	2,99E-05	0,375
Water requirement	m ³ depriv.	4,19E-03	4,76E-04	2,23E-05	1,40E-04	6,77E-06	3,46E-03	1,35E-01	1,16E-05	9,48E-06	8,96E-06	0,144



Table 7. Results of mandatory inventory indicators per F.U (1.000 lumens during a reference lifetime of 35,000 hours) of ZENITH ZH34B 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	7,20E-01	-3,9E+01	-4,29E+01	-3,61E+03	-1,30E+02	-2,6E+01	5,13E+02	-4,2E+02	2,06E-02	5,21E-02	-3.763,55	
Use of renewable primary energy resources (used as raw materials)	MJ	6,48E-01	3,92E+01	4,29E+01	3,61E+03	1,30E+02	2,68E+01	0,00E+00	4,25E+02	-1,66E-02	-5,15E-02	4.278,41	9
Total use of renewable primary energy resources	MJ	1,37E+00	2,08E-03	3,26E-03	4,99E-03	2,29E-04	6,96E-01	5,13E+02	5,50E-04	3,98E-03	6,22E-04	514,869	
Use of non-renewable primary energy (excl. resources used as raw materials)	MJ	6,80E+00	-9,0E+01	-9,93E+01	-8,38E+03	-3,00E+02	-5,8E+01	7,21E+02	-9,8E+02	1,08E-02	2,99E-03	-9.182,96	
Use of non-renewable primary energy resources (used as raw materials)	MJ	2,04E-02	9,08E+01	9,94E+01	8,38E+03	3,00E+02	6,22E+01	0,00E+00	9,85E+02	0,00E+00	0,00E+00	9.914,54	2
Total use of non-renewable primary energy resources	MJ	6,82E+00	1,18E-02	7,46E-02	2,41E-02	1,10E-03	3,32E+00	7,21E+02	2,65E-03	1,08E-02	2,99E-03	731,581	
Use of secondary materials	kg	3,81E-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	0,038	
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	9,30E-03	1,93E-05	2,28E-05	3,95E-05	-1,04E-05	4,07E-03	6,12E-01	4,18E-06	1,45E-05	-2,37E-05	0,625	
Hazardous waste	kg	3,54E-03	2,89E-06	6,16E-04	7,98E-06	3,60E-05	3,30E-03	5,08E-02	8,51E-07	2,84E-03	8,01E-03	0,069	
Non-hazardous waste	kg	4,67E-02	3,54E-04	2,45E-03	1,38E-02	4,47E-03	2,76E-02	5,11E+00	1,62E-03	7,64E-04	2,05E-02	5,232	
Radioactive waste	kg	2,25E-05	2,87E-08	8,03E-07	9,00E-08	4,04E-09	1,12E-05	9,18E-03	9,91E-09	4,85E-08	1,11E-08	0,009	



Table 8. Results of mandatory inventory indicators per F.U (1.000 lumens during a reference lifetime of 35,000 hours) of ZENITH ZH34B 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	2,56E-05	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
Materials for recycling	kg	0,00E+00	0,00E+00	4,51E-03	0,00E+00	2,40E-02	5,06E-03	0,00E+00	0,00E+00	4,22E-02	4,69E-04	0,076	
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	-
Exported energy	MJ	0,00E+00	0,00E+00	6,38E-03	0,00E+00	1,14E-01	0,00E+00	0,00E+00	0,00E+00	3,62E-04	2,22E-02	0,143	
Total use of primary energy during the life cycle	MJ	8,19E+00	1,39E-02	7,79E-02	2,91E-02	1,33E-03	4,02E+00	1,23E+03	3,20E-03	1,47E-02	3,61E-03	1.246,450	
Emission of fine particles	incidence of diseases	1,38E-04	6,54E-10	5,28E-09	1,68E-09	7,20E-11	3,39E-08	1,04E-06	1,90E-10	1,40E-10	9,68E-11	0,000	
Ionizing radiation, human health	kBq U-235 eq.	9,09E-02	1,18E-04	3,50E-03	3,66E-04	1,63E-05	4,57E-02	4,01E+01	4,02E-05	1,83E-04	4,34E-05	40,226	
Ecotoxicity (fresh water)	CTUe	1,10E+01	1,91E-02	1,37E-01	4,17E-02	1,70E-01	1,58E+01	1,33E+02	4,47E-03	1,03E-01	4,95E-01	160,401	
Human toxicity, carcinogenic effects	CTUh	4,99E-05	4,59E-12	8,59E-11	3,85E-12	3,54E-13	3,42E-10	1,77E-08	4,03E-13	8,40E-12	2,35E-12	0,000	
Human toxicity, non-carcinogenic effects	CTUh	2,40E-08	6,55E-11	2,63E-10	2,44E-10	2,95E-11	2,08E-08	8,40E-07	2,10E-11	2,32E-11	6,99E-11	0,000	
Impacts related to land use/soil quality	-	4,49E+00	2,10E-02	1,10E-02	1,75E-01	8,54E-03	3,72E+00	3,28E+02	1,99E-02	1,70E-02	1,46E-02	336,467	
Biogenic carbon content of the associated packaging	kg of C	-1,53E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,93E-04	1,95E-03	- 0,013	
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	-	

**Table 9.** Results of mandatory inventory indicators per D.U (for 4.915 lumens for 100.000 hours) of ZENITH ZH34B 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.	10,572	0,255	0,184	0,313	0,075	5,271	465,159	0,027	0,103	0,268	482,232
Climate change - fossil fuels	kg CO2 eq.	11,149	0,255	0,159	0,313	0,010	5,251	457,646	0,027	0,086	0,184	475,084
Climate change - land use and land use transformation	kg CO2 eq.	0,0185	1,37E-04	4,07E-05	8,45E-05	3,66E-06	0,009	6,075	9,21E-06	4,22E-05	1,04E-05	6,103
Climate change - biogenic	kg CO2eq.	0,063	4,31E-05	0,025	5,60E-05	0,065	0,010	1,437	5,86E-06	2,52E-05	2,62E-05	1,602
Ozone depletion	kg CFC-11 eq.	0	0	0	0	0	0	0	0	0	0	-
Acidification	mol H+ eq.	-0,658	0	0	0	0	0	0	0	0,016	0,083	-0,558
Freshwater eutrophication	kg P eq.	-0,595	4,31E-05	0,025	5,60E-05	0,065	0,010	1,437	5,86E-06	0,016	0,083	1,044
Marine aquatic eutrophication	kg N eq.	2,80E-04	3,62E-09	8,07E-10	6,31E-09	2,10E-10	1,39E-07	1,07E-05	6,07E-10	8,57E-10	2,55E-10	0,000
Terrestrial eutrophication	mol N eq.	0,096	0,007	3,25E-04	1,12E-03	4,5E-05	0,091	2,131	8,93E-05	1,17E-04	8,51E-05	2,329
Photochemical ozone formation	kg NMVOC eq.	0,008	9,10E-06	2,01E-05	1,73E-05	8,11E-07	0,008	0,114	1,90E-06	2,61E-05	5,29E-06	0,132
Abiotic resource depletion - metals and minerals	kg Sb eq.	0,014	0,001	1,07E-04	3,94E-04	4,46E-05	0,009	0,386	3,00E-05	2,88E-05	2,67E-04	0,413
Abiotic resource depletion - fossils	MJ	0,147	0,020	7,34E-04	0,004	1,58E-04	0,106	4,105	3,27E-04	2,79E-04	3,50E-04	4,387
Water requirement	m3 depriv.	0,049	0,005	2,61E-04	0,001	7,93E-05	0,040	1,584	1,36E-04	1,11E-04	1,05E-04	1,682



Table 10. Results of mandatory inventory indicators per D.U (for 4.915 lumens for 100.000 hours) of ZENITH ZH34B 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	8,426	-458,873	-502,267	-42.324,3	-1.517,869	-306,005	6.004,55	-4.974,19	0,241	0,610	- 44.069,6
Use of renewable primary energy resources (used as raw materials)	MJ	7,592	458,898	502,305	42.324,358	1.517,872	314,16	0	4974,2	-0,194	-0,603	50.098,589
Total use of renewable primary energy resources	MJ	16,018	0,024	0,038	0,058	0,002	8,154	6.004,55	6,44E-03	0,046	0,007	6.028,911
Use of non-renewable primary energy (excl. resources used as raw materials)	MJ	79,640	-1.063,42	-1.163,293	-98.092,642	-3.517,879	-689,186	8.446,21	-11.528,4	0,126	0,035	-107.528,8
Use of non-renewable primary energy resources (used as raw materials)	MJ	0,239	1.063,56	1.164,167	98092,923	3.517,892	728,112	0	11528,44	0	0	116.095,33
Total use of non-renewable primary energy resources	MJ	79,879	0,138	0,873	0,282	0,012	38,925	8.446,21	0,031	0,126	0,035	8.566,519
Use of secondary materials	kg	0,446	0	0	0	0	0	0	0	0	0	0,446
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	-
Use of non-renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	-
Net use of fresh water	m3	0,108	2,27E-04	2,67E-04	4,62E-04	-1,22E-04	0,047	7,163	4,89E-05	1,70E-04	-2,77E-04	7,321
Hazardous waste	kg	0,041	3,37E-05	0,007	9,35E-05	4,22E-04	0,038	0,594	9,96E-06	0,033	0,093	0,810
Non-hazardous waste	kg	0,546	0,004	0,028	0,161	0,052	0,322	59,875	1,89E-02	0,008	0,240	61,260
Radioactive waste	kg	2,64E-04	3,36E-07	9,40E-06	1,054E-06	4,72E-08	1,32E-04	0,10752	1,16E-07	5,684E-07	1,29E-07	0,108



Table 11. Results of mandatory inventory indicators per D.U (for 4.915 lumens for 100.000 hours) of ZENITH ZH34B 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	0,0003	0	0	0	0	0	0	0	0	0	0,000
Materials for recycling	kg	0	0	0,052	0	0,281	0,059	0	0	0,494	0,005	0,893
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	-
Exported energy	MJ	0	0	0,0748	0	1,335	0	0	0	0,004	0,260	1,675
Total use of primary energy during the life cycle	MJ	95,897	0,162	0,911	0,340	0,015	47,079	14.450,7	0,037	0,172	0,042	14.595,430
Emission of fine particles	incidence of diseases	0,001	7,65E-09	6,18E-08	1,96E-08	8,43E-10	3,97E-07	1,21E-05	2,22E-09	1,63E-09	1,13E-09	0,002
Ionizing radiation, human health	kBq U-235 eq.	1,064	0,001	0,040	0,004	1,91E-04	0,534	469,379	4,71E-04	0,002	5,08E-04	471,029
Ecotoxicity (fresh water)	CTUe	128,791	0,223	1,603	0,487	1,993	184,844	1.553,23	0,052	1,203	5,792	1.878,230
Human toxicity, carcinogenic effects	CTUh	5,85E-04	5,37E-11	1,00E-09	4,50E-11	4,149E-12	4,00E-09	2,06E-07	4,72E-12	9,84E-11	2,75E-11	0,001
Human toxicity, non-carcinogenic effects	CTUh	2,80E-07	7,67E-10	3,07E-09	2,85E-09	3,450E-10	2,43E-07	9,83E-06	2,46E-10	2,72E-10	8,19E-10	0,000
Impacts related to land use/soil quality	-	52,595	0,245	0,128	2,047	0,100	43,585	3.840,59	0,233	0,199	0,171	3.939,898
Biogenic carbon content of the associated packaging	kg of C	-0,179	0	0	0	0	0	0	0	0,004	0,022	- 0,152
Biogenic carbon content of the product	kg of C	0	0	0	0	0	0	0	0	0	0	-



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).

Zenith ZH34B was selected as the representative product. It was chosen based on its predecessor model of Luzerna Avant, LX34B, which is the highest-selling product within the Luzerna Avant family, accounting for 51,78% of the total sales in this product line during the period considered, given that Zenith was not yet in the market in 2024.

The different products within the Zenith 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 'Zenith ZH34B', needed to calculate the coefficients.

Table 12. Parameters of the reference product.

Parameter	Unit	Value for reference product Zenith ZH34B'
Power	W	24
Lumen	lm	4.100
Luminaire structure weight	kg	1,35
Power supply equipment weight	kg	0,10
Lighting source weight	kg	0,02
Packaging weight	kg	0,45
Product weight (no packaging)	kg	1,46
Product weight (including packaging)	kg	1,91

**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:

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