

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

STORBELL

Programme **The International EPD® System, [environdec.com](https://www.environdec.com)**

Programme operator **EPD International AB**

EPD registration number **S-P-09828**

Publication date **2023-07-28**

Valid until **2028-07-26**

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



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General information

Programme information

Programme The International EPD® System

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CEN standard EN 15804 serves as the Core Product Category Rules (PCR).

Product category rules (PCR): PCR 2019:14 Construction products, version 1.11 Published on 2021.02.05, valid until: 2024.12.20.

PCR review was conducted by:

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Independent third-party verification of the declaration and data, according to ISO 14025:2006:

EPD process certification EPD verification

Third party verifier:

TECNALIA R&I Certificación S.L. Auditor: Cristina Gazulla Santos
Accredited by: ENAC. Accreditation no. 125/C-PR283
Approved by: The 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 from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD LAMP S.A.

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Description of the organisation LAMP S.A is a company dedicated to the design, development, and production of indoor and outdoor lighting fixtures with power supply voltage not exceeding 1000V, committed to quality and respect for the environment as strategic factors related to the products and services offered. The company was founded in Terrassa (Spain) in 1972 as a fluorescent store and today there are currently more than 600,000 luminaires of the brand in around 70 countries.

Lamp: Worktitude For Light

"We create lighting solutions that respond to new ways of life by providing well-being through good lighting, generating a positive impact on both people and the environment."

At Lamp we are work and attitude, we are Worktitude for Light.

To make our vision a reality, we work guided by our three strategic axes or Working Paths:



Worktitude for Wellbeing: We understand lighting as a fundamental element to improve people's wellbeing, analyzing the visual and non-visual effects of light.



Worktitude for Innovation: We promote and adopt innovation projects aimed at constant improvement in a transversal manner, understanding that innovation is a systemic and systematic process.



Worktitude for Life: We encourage projects that generate a positive impact on the environment and promote a more sustainable lighting industry.

History

For more than 50 years we have been advising, designing, producing, marketing and implementing technical lighting projects. Our commitment is to turn our clients' lighting challenges into reality with a solvent and tailor-made response to any architectural project in the world.

Lamp S.A. has its headquarters located in Terrassa (Spain), the center where both the production of luminaires and the headquarters function of Lamp and its subsidiaries located in France, Mexico, Colombia, Chile and Dubai.

The history of Lamp, as a company with a strong industrial tradition, is a history of transformation, which runs parallel to the technological changes that have accompanied the lighting industry, and to social changes, since lighting accompanies the transformation of spaces and the way in which people live in them.

Our Values	CUSTOMIZATION / FLEXIBILITY EMPATHY / PASSION EFFECTIVENESS / EFFICIENCY INNOVATION / CREATIVITY
Value Proposition	<p>LIGHT IS OUR DNA: Making our customers' lighting challenges a reality for 50 years. We combine experience, knowledge and constant evolution, from our manufacturing process to our consulting services.</p> <p>INTERNATIONAL VISION, LOCAL COMMITMENT: From our factory and HQ in Terrassa together with the local presence through our 5 subsidiaries, we reach more than 70 countries.</p> <p>HUMAN TEAM: Engineers, designers, technicians and an endless number of professional profiles work together on your next project.</p> <p>CO-CREATION: Forming a single team with our customers, to develop special lighting solutions making each project unique.</p>
Areas of Application	<p>EDUCATION: Light that cares and enhances the educational experience.</p> <p>OFFICE: Light that promotes collaboration and creativity, as dynamic as the needs of the users.</p> <p>COMMON SPACES: Light that creates a welcoming atmosphere without forgetting the technical aspects and good lighting control.</p> <p>HEALTHCARE & WELLNESS: Light focused on comfort and wellness that enhances the user experience.</p> <p>HIGH DENSITY TRANSIT: Efficient and durable light to meet the highest requirements for both users and the architectural space.</p> <p>RETAIL: Light to highlight the essence of your products with the most suitable lighting characteristics.</p> <p>ARCHITECTURAL OUTDOOR: Light adapted to the human scale to create places with their own identity.</p>
Product-related or management system-related certifications	ISO 14001, ISO 9001 and Ecovadis Silver.
Name and location of production site(s)	Name: LAMP S.A. Location: C/ Córdoba, 16, 08226 Terrassa (Barcelona). Spain.

Product information

Product name Stormbell lamp family.

Product identification This EPD covers four lamps produced by LAMP S.A. company. Four different tables of results of the Life Cycle Assessment (LCA) will be presented, one for each typology of luminaire.

These products are made up of two main groups of parts, body and bell. The references differ in body, depending on the diameter 80 mm or 173 mm, three of them with diameter of 80 mm. They also differ in the material of the bell, being different for the four references. Table 1 shows the product references considered, also the name of each model studied.

Table 1. Product name and references codes of the analyzed products.

PRODUCT NAME	REFERENCE
Stormbell 80 + cork bell	ST18SSLLOMF930DOPW + S8BE363CK
Stormbell 80 + PET bell	ST18SSLLOMF930DOPW + S8BE363PT
Stormbell 80 + aluminium bell	ST18SSLLOMF930DOPW + S8BE227W
Stormbell 173 + polycarbonate bell	ST117050WF840NOB + STBE420B

Product description Find below a detailed description of each product and corresponding characteristics tables.



Stormbell 173

ST1 170 30 FL 8 30 N B W

*Included all references of the family STORMBELL

CODE CONFIGURATION TABLE

Model

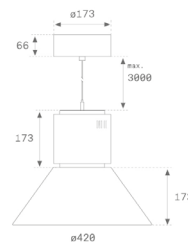
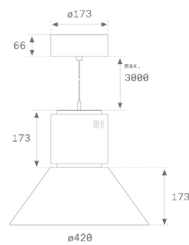
STORMBELL



STORMBELL DECO



Installation



lm / LED

3000 lm / 5000 lm

IRC

80

Opening angles

FLOOD 39° / WIDE FLOOD 57°

Equipment

ON / OFF

Power

26,3

47,4

Finishing

○ White

○ White

● Black

STORMBELL

Familia	Formato	Lm LED	Óptica	IRC	K	Equipo	Acabados Int.	Acabados
ST1	170 ø173 mm	30 3000 lm 50 5000 lm	FL FL 39° WF WFL 57°	8 80	30 3000 K 40 4000 K	N ON / OFF	B Black 04	W White 04
ST1	170	30	FL	8	30	N	B	W

STORMBELL DECO




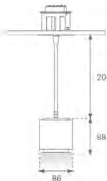
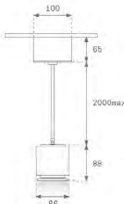
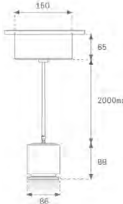
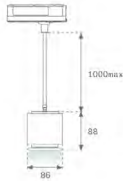
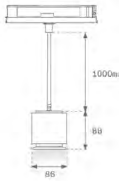
Familia	Formato	Lm LED	Óptica	IRC	K	Equipo	Acabados Int.	Acabados
ST1	170 ø173 mm	30 3000 lm 50 5000 lm	FL FL 39° WF WFL 57°	8 80	30 3000 K 40 4000 K	N ON / OFF	O Opal	W White 04 B Black 04
ST1	170	30	FL	8	30	N	O	W

Stormbell 80

ST18 SE LO SP 9 30 N OP W

*Included all references of the family STORMBELL 80

CODE CONFIGURATION TABLE

Model	RECESSED CEILING ROSE	SURFACE CEILING ROSE	TRACK CEILING ROSE (NS)
			
Installation		ON / OFF  DALI 	ON / OFF  DALI 
lm / LED	1500 lm		
IRC	90		
Opening angles	SPOT 15° / MFL 23° / WIDE FLOOD 57°		
Equipment	ON OFF / DALI		
Power	14 W		
Finishing	○ White		● Black
Materiality	1505-Y10R / 7024 / 3010-G / 2010-Y20R / 3013		

STORMBELL 80

Familia	Instalación	Lm LED	Óptica	IRC	K	Equipo	Acabados Aro	Acabados
ST18	SE Sus. Rec.	LO 1500 lm	SP SP 15°	9 90	27 2700 K	N ON / OFF D DALI	OP Opal	W White
	SS Sus. Sur.		MF MFL 23°		30 3000 K		B Black	B Black
	ST Sus. Track		WF WFL 57°		40 4000 K			1 Materiality
					WB3 WB 3000 K WB4 WB 4000 K			
ST18	SE	LO	SP	9	27	N	OP	W

STORBELL 80 TW

Familia	Instalación	Lm LED	Óptica	IRC	K	Equipo	Acabados Aro	Acabados
ST18	SE Sus. Rec. SS Sus. Sur. ST Sus. Track	LO 1500 lm	SP SP 15° MF MFL 23° WF WFL 57°	9 90	TW Tunable White	D DALI	OP Opal B Black	W White B Black 1 Materiality
ST18	SE	LO	SP	9	TW	D	OP	W

Following, the general description of the studied models is presented:

1. STORBELL 173

Stormbell is a family of LED pendant downlights for indoor use. Due to its design, it is an ideal solution for lighting shops, hotels, restaurants, etc. Stormbell is comprised of a white or black lacquered aluminium extruded lamp body with two types of light outputs, beam angles Flood or Wide Flood and two-colour temperatures (3000K or 4000K). Depending on the application, it has a direct light CORE, or the model Stormbell Deco with a light diffuser effect at the junction of the CORE and the reflector. The reflectors/diffusers are made of special polycarbonate for LED and have three types of finish that offer different lighting possibilities: white, black and opal. The luminaire has an IP20 degree of protection and class I electrical insulation.

2. STORBELL 80

Stormbell 80 is a family of LED pendant downlights for indoor use. Maintaining the rationalist inspiration of its larger predecessor, Stormbell 80 is the miniaturisation of a hood designed to adapt to both hospitality environments and new workspaces, in its individual or System version. The luminaire has 4 types of hood of different shapes and sizes, which generate varied sensations of light and light proximity in the configuration of the spaces.

Stormbell 80 consists of a body made of injected aluminium with a white/black/palette materiality finish, with a black or opal polycarbonate ring for a decorative lighting effect and the possibility of a colour filter accessory, depending on the model. There are different luminous flux in 2700, 3000 and 4000K in standard monocolour LED technology, 3000 or 4000K in WELLBEING LED technology with optimized spectral distribution for circadian activation, or dynamic colour temperatures (2700 - 6500K) Tuneable White LED technology. It has three possible light distribution openings: Spot, Medium Flood and Wide Flood. Control and regulation options ON/OFF or DALI. Suspended installation with surface rosette, recessed or installation to electrified rail.

The three colours of black, white and materiality palette finishes are shown in the following images:



Related to the composition level, all the types of luminaires in the STORBELL family mainly include an aluminium body that contains a polycarbonate diffuser, a LED module, a LED Driver (regulation), electrical cables and fixing elements, such as steel screws, and cable glands and LED fixing elements. According to the tables in the Product Identification section, the difference between the STORBELL and STORBELL 80 models is by the diameter of the body, where the numerical code indicates the diameter in mm of the product. Among the available typologies of each model, they are differentiated by (1) types of installation, (2) types of reflectors and (3) types of regulation. In terms of potential environmental impact, of these, the following characteristics are considered:

1. Types of installation: The dimension of the size of the rosette is different depending on its installation as a surface rosette, recessed or installation on an electrified rail (see Figure 1) and (see Figure 2).

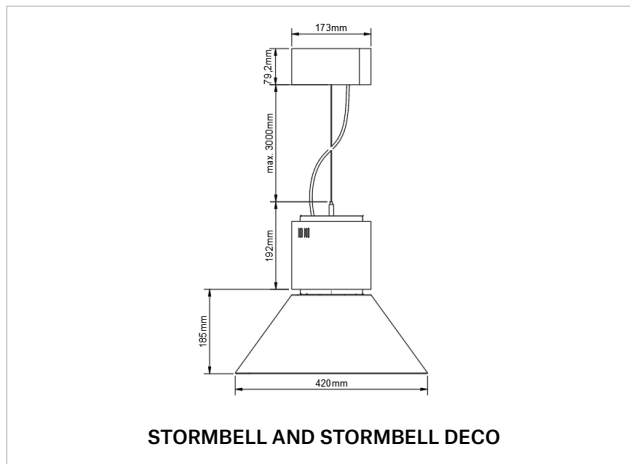


Figure 1. Example of the rosette scheme made of aluminum for surface installation (table 1). In STORBELL 173 and STORBELL DECO models.

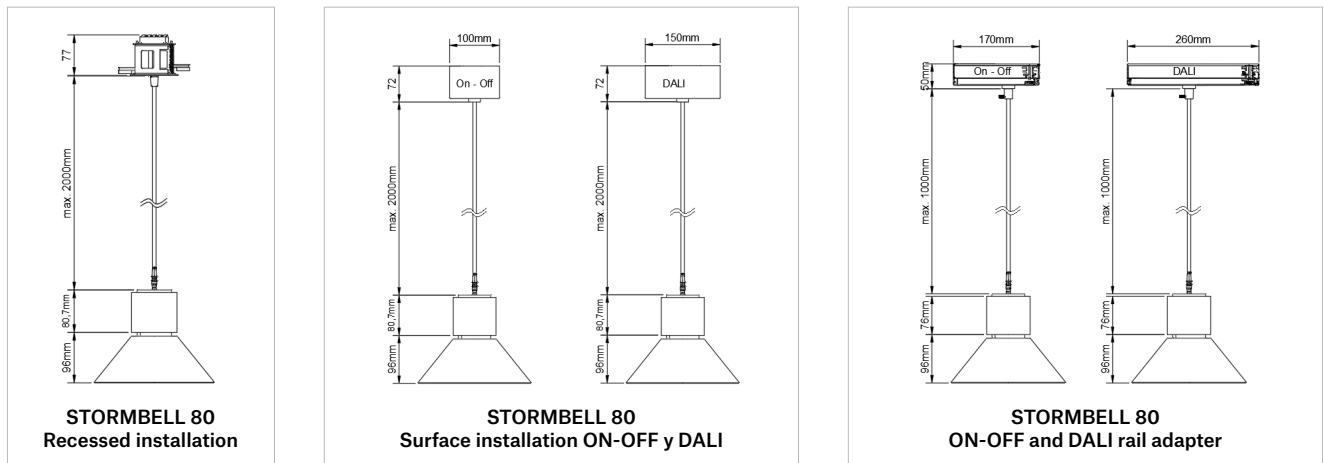


Figure 2. Example of the schemes of rosettes made of aluminum for ON-OFF and DALI recessed installation (left), surface (middle) and ON-OFF and DALI three-phase rail adapter for Nomadic System (right). In STORBELL 80 model.

2.Types of reflectors: Polycarbonate, Aluminium, rPET and rCORK reflector. These pieces are made in different shapes, materials and finishings:

	Polycarbonato <i>STBE420B</i>	Aluminio <i>S8BE227W</i>	R-PET <i>S8BE363PT</i>	R-CORK <i>S8BE363CK</i>
				
Material	Polycarbonate	Aluminium	Polyester felt 40% rPET	Recycled cork 85% recycled cork 5% PUR resin
Colour	Black	Black, White and materiality palette	Black	Cork

3.Types of regulation: On/Off and Dali (Regulable). While these two have a similar casing, the Dali equipment has a more complex PCB, allowing regulation between 1% and 100%, which will consume less energy than the On/Off equipment.

	On / Off	Dali
Nature	Driver	Driver
Weight (kg)	0.043 kg	0.107 g

1. Downlight installation (Model Stormbell 173): Reference ST117050WF840NOB

Suspended downlight model STORMBELL 5000 WW FL WH., LAMP brand. Made of shiny white extruded and injected aluminium body. Model for COB with warm white colour temperature and control gear included on shiny white decorative rose. Flood aluminium reflector. Insulation class I. Lifetime: 50.000 L80 B10

The technical characteristics of these three models are indicated in the following table:

Output flux	4837 lm	Pled	44 W
Plum	47.4 W	K	4000
Efficiency	102 lm/W	IRC	80
UGR	18	MacAdam	3
Light flux	COB	Power supply	100-240V 50/60Hz
Lifetime LED	50.000 L80 B10	Equipment	Electronic



2. Downlight installation (Model Stormbell 80): Reference **ST18SSL0MF930DOPW**

Downlight to suspend model STORMBELL 80 DECO SU SF 1500 WW MFL DA OP/BK LAMP brand. Body made of injected aluminium with white/black/Materiality finish, and with black/opal polycarbonate ring, for decorative lighting effect and possibility of accessory colour filter, depending on his model. COB LED 3000K colour temperature and CRI90. Aluminium reflector MEDIUM FLOOD. Luminaire with ceiling rose and electronic DALI equipment included. Insulation class I. LED lifetime: 50000 L90 B10. Compatible with 4 different models of bells (accessories) that complete the luminaire.

The technical characteristics of these three models are indicated in the following table:

Output flux	1334 lm	Pled	12.2 W
Plum	13.9 W	K	3000
Efficiency	96 lm/W	IRC	90
UGR	18	MacAdam	3
Light flux	COB	Power supply	220-240V 50/60Hz
Lifetime LED	50.000 L90 B10	Equipment	DALI



UN CPC code: 4653 Lighting equipment

Other codes for product classification: [e.g. GTIN, CPV, UNSPSC, NACE/CPA, ANZSIC]

Geographical scope: Global

Products under study are produced in Terrassa (Spain) but can be used at a global scale.

LCA information

Functional unit / declared unit	<p>The declared unit are thousand lumens (1,000 lm) of the STORMBELL interior general luminaire unit for a 5-year life. This lifetime has been selected, because it is the product guarantee offered by the company, although this life is usually longer (50,000 hours of light) although it may lose a little light power.</p> <p>To convert the declared unit to a comparable mass of product (Kg) it has been used the number of lumens of each luminaire and transformed to 1,000 lumens for the four references. The references Stormbell 80 have 1,334 lumens and the references Stormbell 173 have 4,837 lumens.</p> <table border="1"> <thead> <tr> <th>Product name</th> <th>Amount per declared unit (units)</th> <th>Product weight (kg)</th> <th>Kg per declared unit</th> </tr> </thead> <tbody> <tr> <td>Stormbell 80 + cork bell</td> <td>0.75</td> <td>1.029</td> <td>0.771</td> </tr> <tr> <td>Stormbell 80 + PET bell</td> <td>0.75</td> <td>0.893</td> <td>0.669</td> </tr> <tr> <td>Stormbell 80 + aluminium bell</td> <td>0.75</td> <td>1.032</td> <td>0.774</td> </tr> <tr> <td>Stormbell 173 + polycarbonate bell</td> <td>0.21</td> <td>5.216</td> <td>1.078</td> </tr> </tbody> </table> <p>From the Stormbell 80 it has been chosen as a reference product for the study the model Suspend surface – Dali, having MFL 23° and whit colour as this is the most complex and sold product from the family portfolio of products.</p>	Product name	Amount per declared unit (units)	Product weight (kg)	Kg per declared unit	Stormbell 80 + cork bell	0.75	1.029	0.771	Stormbell 80 + PET bell	0.75	0.893	0.669	Stormbell 80 + aluminium bell	0.75	1.032	0.774	Stormbell 173 + polycarbonate bell	0.21	5.216	1.078
Product name	Amount per declared unit (units)	Product weight (kg)	Kg per declared unit																		
Stormbell 80 + cork bell	0.75	1.029	0.771																		
Stormbell 80 + PET bell	0.75	0.893	0.669																		
Stormbell 80 + aluminium bell	0.75	1.032	0.774																		
Stormbell 173 + polycarbonate bell	0.21	5.216	1.078																		
Reference service life	5 years because it corresponds to the product guarantee offered by the company.																				
Time representativeness	All specific data related to the production plant and used for the study date from 2022.																				
Database(s) and LCA software used	<p>The primary inventory data has been obtained from LAMP S.A. corresponding to the 4 references produced in the manufacturing site of LAMP S.A. for the year 2022.</p> <p>The secondary data has been obtained from the generic Ecoinvent version 3.9.1 database, included in the SimaPro v9.5.0.0 software an internationally recognized Life Cycle database. Wherever possible, inventory data relating to the specific study country, or in its absence from Europe in general, has been selected. These have been used for the stage of production and transport of raw materials, as well as for electricity generation or waste management processes, over which the manufacturer has no direct influence.</p>																				
Description of system boundaries	Cradle to gate with options. Therefore, this EPD report considers the scope "cradle to gate with use of energy during the service life, end of life of the product and module D", covering the modules of extraction and processing of raw materials (A1), their transportation to the production plant (A2), the lighting family product manufacturing process (A3), use stage (B1-B7), end of life (C1-C4) and potential benefits and loads from the reuse and recycling of part of the lamp at its end of life (D).																				

Since some of the materials from the lamp can be identified and separated at its end of life, the end-of-life of the product and possible benefits from material recovery of the Stormbell products shall be included in the EPD (i.e., modules C1-C4 and D).

For an EPD of type “b) Cradle to gate with options, modules C1–C4, module D and with optional modules B1-B7 (A1–A3 + B + C + D).”, the PCR 2019:14 requires that a declared unit must be used, and the inclusion of reference service life is mandatory, for this reason a service life of 5 years has been considered, because is the guarantee given by the company for the LED luminaire.

Applicable life cycle stages with the system boundaries and processes are described below:

A1-A3. Product stage

- Raw material supply (A1): This module considers the extraction and processing of raw materials used for the manufacture of the product. Moreover, raw materials’ packaging enabling transportation to the production plant is included. Likewise, the production of the energy necessary for the manufacturing process (electricity, and diesel) is also taken into account.
- Transport of the raw materials (A2): This module consists of the transportation of all raw materials covered by module A1, from the extraction, production, and treatment site to the factory, considering the specific distances of each material supplier.
- Manufacturing of Stormbell lamp (A3): This module refers to the production process of the four lamps manufactured in the production plant. In the plant only the assembly of the different parts that make up the lamp is carried out, although small machining operations are also performed to facilitate the assembly. It includes the combustion of fuels (diesel) and the water consumed during the manufacturing process. It also considers the waste generated from the production process: the treatment and transport from the production plant to the waste manager. Finally, it considers the packaging used and the transport of this packaging from suppliers to the LAMP S.L. factory.

B1-B7. Use life stage

- The use stage considers all the impacts related to the use of the product. In this case, the product does not require maintenance or repair actions, as well as it has no application use, so the impact of modules B1-B5 is 0. On the other hand, the product also does not use water in service, so the module B7 is also 0, only energy is consumed during the lifetime of the product, for this reason only the module B6 has values different of 0.
- Electricity consumption during the service life (B6): This module has been considered as the only relevant module of this life stage. The consumption of electricity consumed during the service life is considered in this module and has been calculated as follows. It has been considered the low voltage electricity mix from Spain (Ecoinvent database), as it is the main region where the products are sold and will be used.
- The aspects considered for the calculations are:
 - The power of the luminaires is of 13.9 W for the Stormbell 80 and 47.4 W for the Stormbell 173.
 - The lamps will be installed mainly in stores, offices or other commercial places and will therefore be used 250 days a year for 8 hours.
 - The service life has been considered to be 5 years of service as this corresponds to the warranty given by the company for the LED luminaire, although it is usual for these lamps to have a longer life.
- Calculation:
 - Taking into account the previous considerations the total electricity consumption per product unit is 139 kwh for the Stormbell 80 and 474 kwh for the Stormbell 173.

$$\text{Stormbell 80} \rightarrow 13.9 \text{ W} \times \frac{1 \text{ KW}}{1000 \text{ W}} \times 8 \frac{\text{hours}}{\text{day}} \times 250 \frac{\text{days}}{\text{years}} \times 5 \text{ years} = 139 \text{ Kwh}$$

$$\text{Stormbell 173} \rightarrow 47.4 \text{ W} \times \frac{1 \text{ KW}}{1000 \text{ W}} \times 8 \frac{\text{hours}}{\text{day}} \times 250 \frac{\text{days}}{\text{years}} \times 5 \text{ years} = 474 \text{ Kwh}$$

– To calculate the electricity consumption into the declared unit, it must be taken into account that the Stormbell 80 emits 1,334 lumens and the Stormbell 173, 4,837, according to the ratio shown below:

$$\text{Stormbell 80} \rightarrow \frac{139 \text{ Kwh}}{1334 \text{ lumens}} \times 1000 \text{ lumens} = 104.20 \text{ Kwh}$$

$$\text{Stormbell 173} \rightarrow \frac{474 \text{ Kwh}}{4837 \text{ lumens}} \times 1000 \text{ lumens} = 97.99 \text{ Kwh}$$

C. End of life stage

- Deconstruction or demolition (C1): This module considers the impacts of deconstruction process. In that case has been neglected as it is a minor impact compared to the building demolition.
- Transport to the waste processing site (C2): This module considers a default distance of 100 km between the building where the product was installed and the waste manager facility.
- Waste processing (C3): This module includes the reconditioning of the lamp pieces for recycling. (for detail, see hypothesis section)
- Disposal (C4): This module includes the final discharge of waste that has not been destined for recovery or treatment processes. (for detail, see hypothesis section)

Considerations about the end of life of the Stormbell lamps:

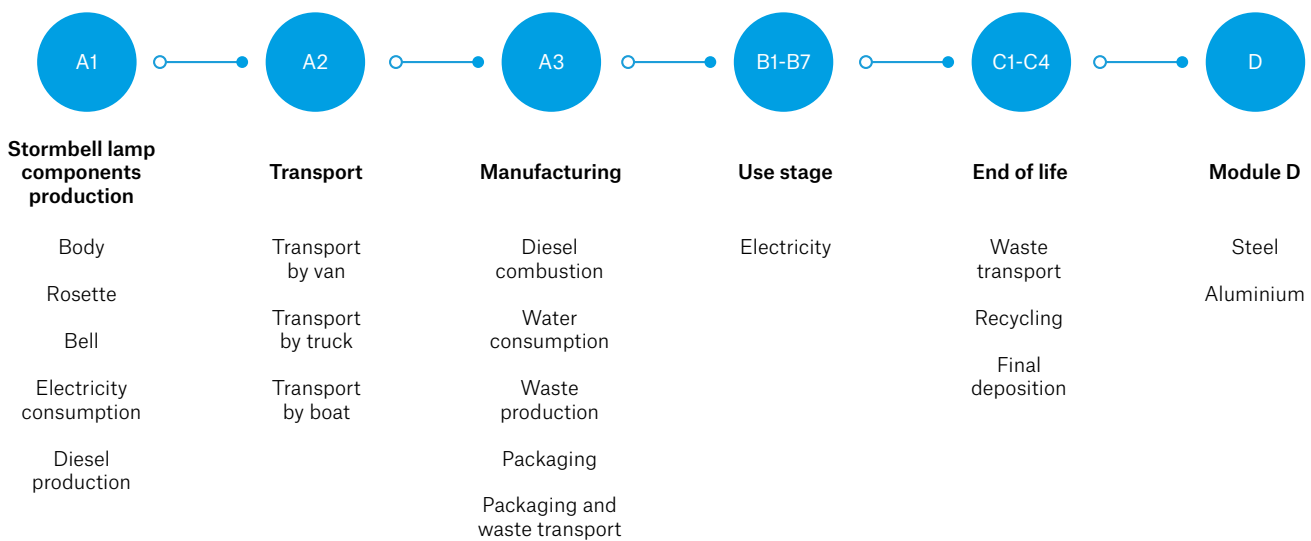
Parámetro	Units per Declared Unit (1000 lumens)	Stormbell 80 + cork bell	Stormbell 80 + PET bell	Stormbell 80 + aluminium bell	Stormbell 173 + polycarbonate bell
Waste collection process, specified by type	Kg collected separately	0.771	0.669	0.774	1.078
	Kg collected mixed with demolition waste	0.00	0.00	0.00	0.00
Recovery process waste, specified by type	Kg for reuse	0.00	0.00	0.00	0.00
	Kg for recycling (Aluminium and steel)	0.688	0.597	0.690	0.962
	Kg for energy recovery	0.00	0.00	0.00	0.00
Waste disposal	Kg to landfill	0.083	0.072	0.084	0.116
Considerations for scenarios development	Distance to waste manager (Km)	100.0	100.0	100.0	100.0

The module collects the most likely scenarios based on the best knowledge currently available.

D. Benefits and loads beyond the system boundary

This module analyses the benefits and burdens related to the processes of recovery, reuse, or recycling of waste from the product under study at their end of life, which could form part of the life cycle of a new product. The benefits and loads have been calculated based on the materials which will be recycled, aluminium and steel, as are the main materials of the product composition. To calculate the benefits of the recycling of these materials it has only been considered the post-consumer composition of the materials, not the recycled composition.

System diagram:



More information:

Company website for more information: <https://www.lamp.es/en>

Name and contact information of LCA practitioner:

Lavola – Anthesis Group
 Rambla de Catalunya, 6, planta 2, 08007 Barcelona
 +34 938 515 055
 www.anthesisgroup.com

Cut-off rules:

In accordance with the provisions of the PCR 2019:14 construction products, version 1.11 and the standard UNE-EN 15804:2012+A2:2020, at least 95% of total inflows and outflows (mass and energy) per module have been included.

The “polluter pays” principle has been applied.

In addition, the following processes have not been included in the scope of the study:

- Manufacture of equipment used in production, buildings, or any other assets.
- Business trips.
- Maintenance activities at the production plants and research and development.
- Transportation of personnel to and within the plants.
- Diffuse particle emissions during the transport and storage of raw materials.

Hypotheses and considerations applied:

The hypotheses assumed during the study are detailed below:

- It has been assumed that all truck transport complies with the EURO 6 emission standard, when carried out within European territory.
- 100 km distance has been assumed for the transport of waste from product deinstallation point to the waste manager's plant.
- Production losses have been considered in A1-Raw materials and A2 transport stages. Losses are different depending on the part of the lamp considered.
- Both for electricity consumption, as for the rest of the plant consumptions, as well as for the generation of waste, an allocation of loads per unit of lamp has been made.
- Regarding the transport of raw materials (module A2), specific distances have been introduced by supplier and material.
- For the transport of waste from the production plant to the waste manager, specific distances have been introduced to each waste manager based on waste type.
- LAMP is adhered to an extended producer responsibility scheme, for which the waste management model of electrical and electronic equipment is applied as established by the WEEE Directive 2012/19/EU that regulates the management of waste of electrical and electronic equipment. The most recent available recycling and reuse rate of the Eurostat Lighting Equipment waste category (89.2% in 2017) 5 has been considered. The materials that are considered to be recycled are aluminium and steel, the two main materials in the composition of the luminaires.

Additional information:

The electricity consumed by the plant is in part self-produced by using a solar photovoltaic installation and the rest of the electricity comes from the electricity network. Concretely, 39% of the electricity requirements are covered by the photovoltaic system and the remaining 61% is consumed from the grid.

In relation to its contribution to the environmental impacts of the product, in average 1 kwh of electricity consumed by the production plant in 2022 is of 1.13E-01 kg of CO₂ eq.

Data quality requirements:

In this study, data quality requirements established by ISO 14025 standards and reference PCRs "PCR 2019:14 Construction products, version 1.11 *Published on 2021.02.05, valid until: 2024.12.20* and UNE-EN 15804:2012+A2:2020 have been applied.

Data has been evaluated through a data quality matrix based on the Product Environmental Footprint Category rules criterion for the data quality management, as it is established in the UNE-EN 15804:2012+A2. As a result of the data quality matrix, it is quantified that the gathered data achieves a medium-good level of quality (3.68 out of 5) in a range of very poor (1), poor (2), medium (3), good (4) and very good (5).

Content information

The information provided in this section is referred to the declared unit of 1,000 lumens.

Stormbell 80 + cork bell

Product components	Weight, kg	Post-consumer material, weight - %	Renewable material, weight - %
Steel and galvanized steel	1.16E-01	0	0
Aluminium	2.17E-01	21	0
Combination: steel + copper	5.70E-02	0	0
Combination: polycarbonate + copper	2.92E-02	0	0
Combination: copper+ PVC	8.25E-03	0	0
Polycarbonate	7.57E-02	0	0
Silicone	7.50E-06	0	0
Other plastics	5.25E-03	0	0
Electronics	9.15E-02	0	0
Other materials	1.50E-03	0	0
Cork bell	1.69E-01	85	—
TOTAL	7.71E-01	1.90E-01 kg	0 kg
Packaging materials	Weight, kg	Weight - % (versus the product)	
Paper	1.17E-01	12.04	
Cardboard	6.82E-02	7.03	
Polyethylene	1.87E-05	0.002	
Other plastics	1.35E-02	1.39	
TOTAL	1.99E-01	20.47	

The product has not any dangerous substance from the candidate list of SVHC for authorization.

Stormbell 80 + PET bell

Product components	Weight, kg	Post-consumer material, weight - %	Renewable material, weight - %
Steel and galvanized steel	1.16E-01	0	0
Aluminium	2.17E-01	21	0
Combination: steel + copper	5.70E-02	0	0
Combination: polycarbonate + copper	2.92E-02	0	0
Combination: copper+ PVC	8.25E-03	0	0
Polycarbonate	7.57E-02	0	0
Silicone	7.50E-06	0	0
Other plastics	5.25E-03	0	0
Electronics	9.15E-02	0	0
Other materials	1.50E-03	0	0
PET bell	6.75E-02	40	—
TOTAL	6.69E-01	7.26E-02 kg	0 kg
Packaging materials	Weight, kg	Weight - % (versus the product)	
Paper	1.17E-01	13.46	
Cardboard	6.82E-02	7.86	
Polyethylene	1.87E-05	0.002	
Other plastics	1.35E-02	1.55	
TOTAL	1.99E-01	22.87	

The product has not any dangerous substance from the candidate list of SVHC for authorization.

Stormbell 80 + Aluminium bell

Product components	Weight, kg	Post-consumer material, weight - %	Renewable material, weight - %
Steel and galvanized steel	1.16E-01	0	0
Aluminium	2.17E-01	21	0
Combination: steel + copper	5.70E-02	0	0
Combination: polycarbonate + copper	2.92E-02	0	0
Combination: copper+ PVC	8.25E-03	0	0
Polycarbonate	7.57E-02	0	0
Silicone	7.50E-06	0	0
Other plastics	5.25E-03	0	0
Electronics	9.15E-02	0	0
Other materials	1.50E-03	0	0
Aluminium bell	1.72E-01	0	—
TOTAL	7.74E-01	4.57E-02 kg	0 kg
Packaging materials	Weight, kg	Weight - % (versus the product)	
Paper	4.62E-02	5.16	
Cardboard	6.15E-02	6.89	
Polyethylene	1.87E-05	0.002	
Other plastics	1.35E-02	1.51	
TOTAL	1.21E-01	13.59	

The product has not any dangerous substance from the candidate list of SVHC for authorization.

Stormbell 173

Product components	Weight, kg	Post-consumer material, weight - %	Renewable material, weight - %
Steel and galvanized steel	2.59E-01	0	0
Aluminium	4.34E-01	3,42	0
Combination: polycarbonate + copper	5.08E-02	0	0
Combination: copper+ PVC	4.28E-02	0	0
Polycarbonate	5.46E-02	0	0
EPDM	3.89E-03	0	0
Silicone	1.55E-04	0	0
Other plastics	3.72E-03	0	0
Electronics	6.14E-02	0	0
Other materials	1.60E-02	0	0
Polycarbonate bell	1.52E-01	0	0
TOTAL	1.08E00	1.49E-02 kg	0 kg
Packaging materials	Weight, kg	Weight - % (versus the product)	
Paper	8.67E-02	6.92	
Cardboard	8.79E-02	7.02	
Polyethylene	4.30E-06	0.0003	
TOTAL	1.75E-01	13.93	

The product has not any dangerous substance from the candidate list of SVHC for authorization.

Environmental Information

The environmental information related to the analysed products has been calculated with the SimaPro software version 9.5.0. As required by PCR 2019:14, construction products version 1.11, the characterization factors indicated in Annex C of the EN 15804:2012+A2 standard have been used to estimate the potential environmental impacts (method EN 15804 + A2 Method V1.02 / EF 3.0 normalization and weighting set). With respect to the results corresponding to the rest of the parameters under study, the following methodologies have been used: EDIP to calculate waste production, CED (Cumulative Energy Demand) to calculate energy use and inventory data for output flows.

The environmental results corresponding to the life cycle of four products of LAMP S.L. of the Stormbell lighting family are presented separately. These are divided by modules, covering the stages defined above in the system boundary section (A1-A3+C1-C4+D+B6), and considering all the impact categories required by the PCR 2019:14 Construction products, version 1.11.

Estimated impact results are only relative statements that do not indicate impact category endpoints, exceedances of assessed thresholds, safety margins, or risks.

Stormbell 80 + cork bell

Potential environmental impact: mandatory indicators according to EN 15804

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - fossil	kg CO ₂ eq.	1.02E+01	N.D.	N.D.	0	0	0	0	0	2.70E+01	0	0	1.55E-02	0	6.82E-03	-3.42E+00
GWP - biogenic	kg CO ₂ eq.	-4.77E-02	N.D.	N.D.	0	0	0	0	0	9.76E-01	0	0	4.01E-05	0	9.32E-03	-3.09E-03
GWP - luluc	kg CO ₂ eq.	4.93E-02	N.D.	N.D.	0	0	0	0	0	2.00E-01	0	0	7.53E-06	0	2.32E-07	-2.95E-04
GWP - total	kg CO ₂ eq.	1.02E+01	N.D.	N.D.	0	0	0	0	0	2.81E+01	0	0	1.56E-02	0	1.61E-02	-3.42E+00
ODP	kg CFC 11 eq.	1.90E-07	N.D.	N.D.	0	0	0	0	0	5.46E-07	0	0	3.29E-10	0	2.26E-11	-2.71E-08
AP	mol H ⁺ eq.	7.97E-02	N.D.	N.D.	0	0	0	0	0	1.31E-01	0	0	3.31E-05	0	6.91E-06	-3.18E-02
EP - freshwater	kg P eq	6.35E-04	N.D.	N.D.	0	0	0	0	0	5.62E-04	0	0	1.23E-07	0	8.93E-09	-1.73E-04
EP - marine	kg N eq.	1.16E-02	N.D.	N.D.	0	0	0	0	0	2.35E-02	0	0	8.14E-06	0	3.11E-06	-3.76E-03
EP - terrestrial	mol N eq.	1.26E-01	N.D.	N.D.	0	0	0	0	0	2.59E-01	0	0	8.48E-05	0	3.29E-05	-4.20E-02
POCP	kg NMVOC eq.	4.01E-02	N.D.	N.D.	0	0	0	0	0	9.10E-02	0	0	5.13E-05	0	9.07E-06	-1.33E-02
ADP - minerals & metals *	kg Sb eq.	3.68E-04	N.D.	N.D.	0	0	0	0	0	1.54E-06	0	0	4.95E-08	0	1.07E-10	1.03E-05

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP - fossil *	MJ	1.23E+02	N.D.	N.D.	0	0	0	0	0	7.49E+02	0	0	2.15E-01	0	8.27E-03	-3.29E+01
WDP*	m3	2.58E+00	N.D.	N.D.	0	0	0	0	0	1.78E+01	0	0	8.67E-04	0	9.50E-04	-2.81E-01

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 consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Potential environmental impact: additional mandatory and voluntary indicators

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - GHG ¹	kg CO2 eq.	1.00E+01	N.D.	N.D.	0	0	0	0	0	2.66E+01	0	0	1.51E-02	0	6.79E-03	-3.33E+00

¹ The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of resources

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2.15E+01	N.D.	N.D.	0	0	0	0	0	1.93E+02	0	0	3.38E-03	0	2.24E-04	-3.76E-01
PERM	MJ	2.50E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
PERT	MJ	2.40E+01	N.D.	N.D.	0	0	0	0	0	1.93E+02	0	0	3.38E-03	0	2.24E-04	-3.76E-01
PENRE	MJ	1.31E+02	N.D.	N.D.	0	0	0	0	0	7.80E+02	0	0	2.28E-01	0	8.85E-03	-3.47E+01
PENRM	MJ	6.22E-01	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
PENRT	MJ	1.32E+02	N.D.	N.D.	0	0	0	0	0	7.80E+02	0	0	2.28E-01	0	8.85E-03	-3.47E+01
SM	kg	1.90E-01	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
FW	m ³	8.73E-02	N.D.	N.D.	0	0	0	0	0	2.56E-01	0	0	3.09E-05	0	1.33E-05	-6.90E-03

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 non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; 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 production and output flows

Waste production

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1.13E-03	N.D.	N.D.	0	0	0	0	0	1.20E-03	0	0	1.37E-06	0	4.84E-08	1.43E-04
Non-hazardous waste disposed	kg	1.55E+00	N.D.	N.D.	0	0	0	0	0	5.04E-01	0	0	1.07E-02	0	7.66E-02	-5.82E-01
Radioactive waste disposed	kg	2.10E-04	N.D.	N.D.	0	0	0	0	0	5.79E-03	0	0	7.07E-08	0	5.01E-09	-3.87E-05

Output flows

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0	0.00E+00	0	0.00E+00
Material for recycling	kg	6.59E-02	N.D.	N.D.	0	0	0	0	0	0	0	0	0	7.30E-01	0	0.00E+00
Materials for energy recovery	kg	1.84E-03	N.D.	N.D.	0	0	0	0	0	0	0	0	0	0.00E+00	0	0.00E+00
Exported energy, electricity	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0	0.00E+00	0	0.00E+00
Exported energy, thermal	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0	0.00E+00	0	0.00E+00

Information on biogenic carbon content

Results per declared unit (1,000 lumens during 5 years of service life)

BIOGENIC CARBON CONTENT	Unit	Quantity
Biogenic carbon content in product	kg C	3.11E-01
Biogenic carbon content in packaging	kg C	3.39E-01

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

Stormbell 80 + PET bell

Potential environmental impact: mandatory indicators according to EN 15804

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - fossil	kg CO ₂ eq.	1.02E+01	N.D.	N.D.	0	0	0	0	0	2.70E+01	0	0	1.36E-02	0	5.97E-03	-3.42E+00
GWP - biogenic	kg CO ₂ eq.	1.27E-01	N.D.	N.D.	0	0	0	0	0	9.76E-01	0	0	3.51E-05	0	8.16E-03	-3.09E-03
GWP - luluc	kg CO ₂ eq.	4.92E-02	N.D.	N.D.	0	0	0	0	0	2.00E-01	0	0	6.59E-06	0	2.03E-07	-2.95E-04
GWP - total	kg CO ₂ eq.	1.04E+01	N.D.	N.D.	0	0	0	0	0	2.81E+01	0	0	1.36E-02	0	1.41E-02	-3.42E+00
ODP	kg CFC 11 eq.	7.98E-07	N.D.	N.D.	0	0	0	0	0	5.46E-07	0	0	2.88E-10	0	1.98E-11	-2.71E-08
AP	mol H ⁺ eq.	7.94E-02	N.D.	N.D.	0	0	0	0	0	1.31E-01	0	0	2.90E-05	0	6.05E-06	-3.18E-02
EP - freshwater	kg P eq	6.32E-04	N.D.	N.D.	0	0	0	0	0	5.62E-04	0	0	1.08E-07	0	7.82E-09	-1.73E-04
EP - marine	kg N eq.	1.15E-02	N.D.	N.D.	0	0	0	0	0	2.35E-02	0	0	7.13E-06	0	2.73E-06	-3.76E-03
EP - terrestrial	mol N eq.	1.25E-01	N.D.	N.D.	0	0	0	0	0	2.59E-01	0	0	7.42E-05	0	2.88E-05	-4.20E-02
POCP	kg NMVOC eq.	3.99E-02	N.D.	N.D.	0	0	0	0	0	9.10E-02	0	0	4.50E-05	0	7.94E-06	-1.33E-02
ADP - minerals & metals*	kg Sb eq.	3.68E-04	N.D.	N.D.	0	0	0	0	0	1.54E-06	0	0	4.33E-08	0	9.34E-11	1.03E-05

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP - fossil *	MJ	1.24E+02	N.D.	N.D.	0	0	0	0	0	7.49E+02	0	0	1.88E-01	0	7.24E-03	-3.29E+01
WDP*	m ³	2.52E+00	N.D.	N.D.	0	0	0	0	0	1.78E+01	0	0	7.59E-04	0	8.32E-04	-2.81E-01

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 consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Potential environmental impact: additional mandatory and voluntary indicators

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - GHG ²	kg CO ₂ eq.	1.01E+01	N.D.	N.D.	0	0	0	0	0	2.66E+01	0	0	1.33E-02	0	5.94E-03	-3.33E+00

² The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15604:2012+A1:2013.

Use of resources

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.84E+01	N.D.	N.D.	0	0	0	0	0	1.93E+02	0	0	2.96E-03	0	1.97E-04	-3.76E-01
PERM	MJ	2.50E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
PERT	MJ	2.09E+01	N.D.	N.D.	0	0	0	0	0	1.93E+02	0	0	2.96E-03	0	1.97E-04	-3.76E-01
PENRE	MJ	1.32E+02	N.D.	N.D.	0	0	0	0	0	7.80E+02	0	0	2.00E-01	0	7.76E-03	-3.47E+01
PENRM	MJ	6.22E-01	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
PENRT	MJ	1.32E+02	N.D.	N.D.	0	0	0	0	0	7.80E+02	0	0	2.00E-01	0	7.76E-03	-3.47E+01
SM	kg	7.26E-02	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
FW	m ³	1.84E+01	N.D.	N.D.	0	0	0	0	0	1.93E+02	0	0	2.96E-03	0	1.97E-04	-3.76E-01

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 non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; 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 production and output flows

Waste production

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1.13E-03	N.D.	N.D.	0	0	0	0	0	1.20E-03	0	0	1.20E-06	0.00E+00	4.24E-08	1.43E-04
Non-hazardous waste disposed	kg	1.43E+00	N.D.	N.D.	0	0	0	0	0	5.04E-01	0	0	9.35E-03	0.00E+00	6.71E-02	-5.82E-01
Radioactive waste disposed	kg	2.21E-03	N.D.	N.D.	0	0	0	0	0	5.79E-03	0	0	6.19E-08	0.00E+00	4.39E-09	-3.87E-05

Output flows

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0	0.00E+00	0	0
Material for recycling	kg	6.59E-02	N.D.	N.D.	0	0	0	0	0	0	0	0	6.40E-01	0	0	0
Materials for energy recovery	kg	1.84E-03	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0
Exported energy, electricity	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0
Exported energy, thermal	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0

Information on biogenic carbon content

Results per declared unit (1,000 lumens during 5 years of service life)

BIOGENIC CARBON CONTENT	Unit	Quantity
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	3.39E-01

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

Stormbell 80 + Aluminium bell

Potential environmental impact: mandatory indicators according to EN 15804

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - fossil	kg CO ₂ eq.	1.34E+01	N.D.	N.D.	0	0	0	0	0	2.70E+01	0	0	1.56E-02	0	6.84E-03	-3.45E+00
GWP - biogenic	kg CO ₂ eq.	1.69E-01	N.D.	N.D.	0	0	0	0	0	9.76E-01	0	0	4.02E-05	0	9.34E-03	-3.10E-03
GWP - luluc	kg CO ₂ eq.	6.38E-02	N.D.	N.D.	0	0	0	0	0	2.00E-01	0	0	7.55E-06	0	2.32E-07	-2.99E-04
GWP - total	kg CO ₂ eq.	1.36E+01	N.D.	N.D.	0	0	0	0	0	2.81E+01	0	0	1.56E-02	0	1.62E-02	-3.46E+00
ODP	kg CFC 11 eq.	2.17E-07	N.D.	N.D.	0	0	0	0	0	5.46E-07	0	0	3.30E-10	0	2.27E-11	-2.73E-08
AP	mol H ⁺ eq.	1.00E-01	N.D.	N.D.	0	0	0	0	0	1.31E-01	0	0	3.32E-05	0	6.93E-06	-3.22E-02
EP - freshwater	kg P eq.	7.22E-04	N.D.	N.D.	0	0	0	0	0	5.62E-04	0	0	1.23E-07	0	8.96E-09	-1.75E-04
EP - marine	kg N eq.	1.46E-02	N.D.	N.D.	0	0	0	0	0	2.35E-02	0	0	8.16E-06	0	3.12E-06	-3.80E-03
EP - terrestrial	mol N eq.	1.59E-01	N.D.	N.D.	0	0	0	0	0	2.59E-01	0	0	8.50E-05	0	3.29E-05	-4.25E-02
POCP	kg NMVOC eq.	5.04E-02	N.D.	N.D.	0	0	0	0	0	9.10E-02	0	0	5.15E-05	0	9.09E-06	-1.35E-02
ADP - minerals & metals*	kg Sb eq.	3.68E-04	N.D.	N.D.	0	0	0	0	0	1.54E-06	0	0	4.96E-08	0	1.07E-10	1.04E-05

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP - fossil *	MJ	1.51E+02	N.D.	N.D.	0	0	0	0	0	7.49E+02	0	0	2.15E-01	0	8.29E-03	-3.33E+01
WDP*	m ³	2.85E+00	N.D.	N.D.	0	0	0	0	0	1.78E+01	0	0	8.69E-04	0	9.53E-04	-2.81E-01

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 consumption.

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Potential environmental impact: additional mandatory and voluntary indicators

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - GHG ³	kg CO ₂ eq.	1.31E+01	N.D.	N.D.	0	0	0	0	0	2.66E+01	0	0	1.52E-02	0	6.81E-03	-3.37E+00

³ The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of resources

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.88E+01	N.D.	N.D.	0	0	0	0	0	1.93E+02	0	0	3.39E-03	0	2.25E-04	-3.78E-01
PERM	MJ	1.45E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
PERT	MJ	2.02E+01	N.D.	N.D.	0	0	0	0	0	1.93E+02	0	0	3.39E-03	0	2.25E-04	-3.78E-01
PENRE	MJ	1.60E+02	N.D.	N.D.	0	0	0	0	0	7.80E+02	0	0	2.29E-01	0	8.88E-03	-3.51E+01
PENRM	MJ	6.22E-01	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
PENRT	MJ	1.61E+02	N.D.	N.D.	0	0	0	0	0	7.80E+02	0	0	2.29E-01	0	8.88E-03	-3.51E+01
SM	kg	4.57E-02	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
FW	m ³	1.01E-01	N.D.	N.D.	0	0	0	0	0	2.56E-01	0	0	3.10E-05	0	1.34E-05	-6.94E-03

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 non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; 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 production and output flows

Waste production

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1.96E-03	N.D.	N.D.	0	0	0	0	0	1.20E-03	0	0	1.37E-06	0	4.86E-08	1.45E-04
Non-hazardous waste disposed	kg	2.00E+00	N.D.	N.D.	0	0	0	0	0	5.04E-01	0	0	1.07E-02	0	7.68E-02	-5.89E-01
Radioactive waste disposed	kg	2.22E-03	N.D.	N.D.	0	0	0	0	0	5.79E-03	0	0	7.08E-08	0	5.03E-09	-3.91E-05

Output flows

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0	0.00E+00	0	0
Material for recycling	kg	6.59E-02	N.D.	N.D.	0	0	0	0	0	0	0	0	7.32E-01	0	0	0
Materials for energy recovery	kg	1.84E-03	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0
Exported energy, electricity	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0
Exported energy, thermal	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0

Information on biogenic carbon content

Results per declared unit (1,000 lumens during 5 years of service life)

BIOGENIC CARBON CONTENT	Unit	Quantity
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	1.97E-01

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

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Potential environmental impact: mandatory indicators according to EN 15804

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - fossil	kg CO ₂ eq.	9.90E+00	N.D.	N.D.	0	0	0	0	0	2.54E+01	0	0	1.85E-02	0	9.39E-03	-8.38E+00
GWP - biogenic	kg CO ₂ eq.	1.84E-01	N.D.	N.D.	0	0	0	0	0	9.18E-01	0	0	4.78E-05	0	1.28E-02	-5.44E-03
GWP - luluc	kg CO ₂ eq.	2.24E-02	N.D.	N.D.	0	0	0	0	0	1.88E-01	0	0	8.97E-06	0	3.19E-07	-7.55E-04
GWP - total	kg CO ₂ eq.	1.01E+01	N.D.	N.D.	0	0	0	0	0	2.65E+01	0	0	1.86E-02	0	2.22E-02	-8.39E+00
ODP	kg CFC 11 eq.	4.45E-07	N.D.	N.D.	0	0	0	0	0	5.14E-07	0	0	3.92E-10	0	3.12E-11	-6.27E-08
AP	mol H ⁺ eq.	8.62E-02	N.D.	N.D.	0	0	0	0	0	1.24E-01	0	0	3.94E-05	0	9.52E-06	-7.92E-02
EP - freshwater	kg P eq.	5.49E-04	N.D.	N.D.	0	0	0	0	0	5.29E-04	0	0	1.46E-07	0	1.23E-08	-4.42E-04
EP - marine	kg N eq.	2.55E-02	N.D.	N.D.	0	0	0	0	0	2.21E-02	0	0	9.70E-06	0	4.29E-06	-9.32E-03
EP - terrestrial	mol N eq.	1.01E-01	N.D.	N.D.	0	0	0	0	0	2.44E-01	0	0	1.01E-04	0	4.52E-05	-1.04E-01
POCP	kg NMVOC eq.	3.30E-02	N.D.	N.D.	0	0	0	0	0	8.56E-02	0	0	6.12E-05	0	1.25E-05	-3.24E-02
ADP - minerals & metals*	kg Sb eq.	2.32E+01	N.D.	N.D.	0	0	0	0	0	1.45E-06	0	0	5.89E-08	0	1.47E-10	2.75E-05

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP - fossil *	MJ	1.10E+02	N.D.	N.D.	0	0	0	0	0	7.05E+02	0	0	2.56E-01	0	1.14E-02	-8.10E+01
WDP*	m ³	2.43E+00	N.D.	N.D.	0	0	0	0	0	1.68E+01	0	0	1.03E-03	0	1.31E-03	-5.23E-01

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 consumption.

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Potential environmental impact: additional mandatory and voluntary indicators

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP - GHG ⁴	kg CO ₂ eq.	9.75E+00	N.D.	N.D.	0	0	0	0	0	2.50E+01	0	0	1.80E-02	0	9.37E-03	-8.18E+00

⁴ The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of resources

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	4.04E+01	N.D.	N.D.	0	0	0	0	0	1.81E+02	0	0	4.03E-03	0	3.09E-04	-7.96E-01
PERM	MJ	2.36E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
PERT	MJ	4.28E+01	N.D.	N.D.	0	0	0	0	0	1.81E+02	0	0	4.03E-03	0	3.09E-04	-7.96E-01
PENRE	MJ	1.40E+02	N.D.	N.D.	0	0	0	0	0	7.33E+02	0	0	2.72E-01	0	1.22E-02	-8.55E+01
PENRM	MJ	1.98E-04	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
PENRT	MJ	1.40E+02	N.D.	N.D.	0	0	0	0	0	7.33E+02	0	0	2.72E-01	0	1.22E-02	-8.55E+01
SM	kg	1.49E-02	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	N.D.	N.D.	0	0	0	0	0	0.00E+00	0	0	0.00E+00	0	0.00E+00	0.00E+00
FW	m ³	2.80E-01	N.D.	N.D.	0	0	0	0	0	2.41E-01	0	0	3.69E-05	0	1.84E-05	-1.36E-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 non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; 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 production and output flows

Waste production

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1.33E-02	N.D.	N.D.	0	0	0	0	0	1.13E-03	0	0	1.63E-06	0	6.67E-08	3.83E-04
Non-hazardous waste disposed	kg	2.45E+00	N.D.	N.D.	0	0	0	0	0	4.74E-01	0	0	1.27E-02	0	1.06E-01	-1.41E+00
Radioactive waste disposed	kg	4.64E-03	N.D.	N.D.	0	0	0	0	0	5.44E-03	0	0	8.42E-08	0	6.90E-09	-9.73E-05

Output flows

Results per declared unit (1,000 lumens during 5 years of service life)

Indicator	Unit	Tot.A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	2.37E-01	N.D.	N.D.	0	0	0	0	0	0	0	0	0	0.00E+00	0	0
Material for recycling	kg	1.97E-02	N.D.	N.D.	0	0	0	0	0	0	0	0	1.01E+00	0	0	0
Materials for energy recovery	kg	7.98E-03	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0
Exported energy, electricity	MJ	1.35E-02	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0
Exported energy, thermal	MJ	2.37E-01	N.D.	N.D.	0	0	0	0	0	0	0	0	0.00E+00	0	0	0

Information on biogenic carbon content

Results per declared unit (1,000 lumens during 5 years of service life)

BIOGENIC CARBON CONTENT	Unit	Quantity
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	3.20E-01

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

Differences versus previous versions

This EPD is the first for this family of lamps.

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LAMP
Worktitude for light