




# LEDVANCE

## ENVIRONMENTAL PRODUCT DECLARATION

Independent verification of the declaration and data in compliance with ISO 14025: 2006

### LEDVANCE LINEAR COMPACT SWITCH Reference product: LN COMP SWITCH 1200 14 W 4000 K



|   |                      |                 |   |
|---|----------------------|-----------------|---|
| Registration number   | LEDV-00018-V01.01-EN | Drafting rules  | PEP-PCR-ED4-EN-2021 09 06   |
| Verifier accreditation number   | VH08                 | Supplemented by | PSR-0014-ED2.0-EN-2023 07 13  |
| Date of issue   | 04-2024              | Validity period | 5 years   |
| EPD prepared by   | LEDVANCE GmbH        |                 |   |
| Independent verification of the declaration and data in compliance with ISO 14025: 2006                                   |                      |                 |   |
| Internal  |                      | External        | X   |
| The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)                                     |                      |                 |  |
| PEP are compliant with XP C08-100-1:2016 or EN 50693:2019   |                      |                 |   |
| The elements of the present PEP cannot be compared with elements from another program.                                    |                      |                 |   |
| Document in compliance with ISO 14025: 2006 « Environmental labels and declarations. Type III environmental declarations» |                      |                 |   |

# 1. General information

## 1.1 Company information

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Further technical information can be obtained by contacting:

- LEDVANCE GmbH, Parkring 1-5, 85748 Garching, Germany
- or on the website [www.ledvance.com](http://www.ledvance.com)
- or by E-Mail [LCA@ledvance.com](mailto:LCA@ledvance.com).

## 1.2 Reference product information

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The name of the product under study is “LN COMP SWITCH 1200 14 W 4000 K” with the following product description:

### Product benefits

- Compact dimensions
- Little space required thanks to compact dimensions
- Seamless connection of up to 10 luminaires in a line
- Handy switch directly installed on the luminaire
- Low flicker light thanks to special electronic control gear
- Flexible installation in 2 different angles with 2 different mounting options
- Flexible application due to a wide range of available lengths of 300 to 1500 mm.
- Angled connection possible with included cable

### Areas of application

- Direct replacement for luminaires with fluorescent lamps
- Indoor applications
- Corridors, entrance areas, stairwells, living rooms, basements
- Accent lighting
- Public areas
- Cove lighting
- Shelves, furniture integration or under cabinet mounting
- Seamless linear lighting

### Product features

- Built-in switch
- Up to 10 luminaires connectable
- Translucent end caps
- Versions with luminous flux 400...1900 lm available
- High luminous efficacy: up to 112 lm/W
- Glow Wire Test according to IEC 60695-2-12: 850 °C

### Equipment / Accessories

- Equipped with power plug, cable connector and line adapter for connecting further luminaires
- Mounting material for wall and ceiling installations included

## Reference Service Life

LEDVANCE declares for the luminaire following service lifetimes:

- Lifespan L70/B50 at 25 °C: 50,000 h
- Lifespan L80/B10 at 25 °C: 40,000 h
- Lifespan L90/B10 at 25 °C: 30,000 h

The key information about the product is summarized in the following table.

**Table 1: Key technological data**

| Information                |                                 |
|----------------------------|---------------------------------|
| Type of luminaire          | Linear Luminaire                |
| Short Text Product         | LN COMP SWITCH 1200 14 W 4000 K |
| Operating mode             | Integrated LED driver           |
| Lamp type                  | Integrated LED not exchangeable |
| Colour temperature         | 4000 K                          |
| Nominal wattage            | 14 W                            |
| Luminous flux              | 1400 lm                         |
| Colour rendering index Ra  | > 80                            |
| Protection class IK        | IK03                            |
| Type of protection         | IP20                            |
| Nominal voltage            | 220...240 V                     |
| Nominal lifetime (L70/B50) | 50,000 h                        |
| Length                     | 1,174.00 mm                     |
| Height                     | 36.00 mm                        |
| Width                      | 28.00 mm                        |
| Area of Application        | Hotel; Residential Building     |
| LOR (light output ratio)   | $\eta = 87.5\%$                 |

Based on the assigned lifetime according EN 15193-1:2017 for indoor application and the maximum annual operating hours of 5,000 h for hotel taken from the PSR, the luminaire has the following annual service time:

**Table 2: Calculated operation lifetime in years per type of building**

| Type of building     | Annual operating hours by default (h) | Operational lifetime (years) |
|----------------------|---------------------------------------|------------------------------|
| <b>Hotel</b>         | <b>5,000</b>                          | <b>10</b>                    |
| Residential building | 3,500                                 | 14,3                         |

Following the requirements of the PSR, the operational lifetime is 10 years.

## 1.3 Overview

The general information used for the EPD are listed below:

**Table 3: Basic EPD information**

| Information   |   |
|---|---|
| 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 / declared unit*                     | 0.5 product(s)  |
| Life cycle stages covered (according to EN15804+A2) | Cradle-to-grave and Module D  |
| Product category according to PSR                   | Luminaires  |
| Product family name (if family EPD)                 | LINEAR COMPACT SWITCH   |

\* The reference flow is calculated as:

$$\frac{1,000 \text{ lm}}{\text{Outgoing Luminous Flux of the Analyzed Product (lm)}} \times \frac{35,000 \text{ h}}{\text{Declared Product Lifetime of the Analyzed Product (h)}}$$

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

$$\frac{1,000}{1,400} \times \frac{35,000}{50,000} = 0.5$$

## 1.4 Homogeneous environmental family

The reference product represents the LINEAR COMPACT SWITCH family, which differs in terms of power (W), useful output flux (lm) of the integrated LED installed in the luminaries, output colour temperature, weight and length.

The range of variations for the products in the same family are the following:

**Table 4: Range of variation for homogeneous environmental family**

| Criteria           | Unit | Value for the reference product | Minimum value in product range | Maximum value in product range |
|--------------------|------|---------------------------------|--------------------------------|--------------------------------|
| Electrical Power   | W    | 14                              | 4                              | 17                             |
| Useful output flux | lm   | 1,400                           | 400                            | 1,900                          |
| Colour temperature | K    | 4,000                           | 3,000                          | 4,000                          |
| Weight (Product)   | kg   | 0.338                           | 0.185                          | 0.404                          |
| Length             | mm   | 1,173                           | 313                            | 1,473                          |

The present PEP declaration is valid for all the products in the described homogenous environmental family. The spreadsheet provided in paragraph 5 Extrapolation of this document shall be used by the PEP user to extrapolate the impact of the other products from the LINEAR COMPACT SWITCH Family, based on the technical parameters of the considered product, as requested by the PSR.

## 2 Constituent materials

### 2.1 Overview

**Table 5: Product composition**

| Information         | Weight [in kg] | Share [in %] |
|---------------------|----------------|--------------|
| <b>Total weight</b> | <b>0.451</b>   | <b>100</b>   |
| Product             | 0.338          | 74.8         |
| Packaging           | 0.113          | 25.2         |

### 2.2 Product

**Table 6: Material composition - product**

| Information                 | Weight [in kg] | Sum of weight [in kg] | Share [in %] |
|-----------------------------|----------------|-----------------------|--------------|
| <b>TOTAL</b>                |                | <b>0.338</b>          | <b>100</b>   |
| <b>Metals</b>               |                | <b>0.004</b>          | <b>1.2</b>   |
| - Steel                     | 0.004          |                       | 1.2          |
| <b>Plastics</b>             |                | <b>0.177</b>          | <b>52.4</b>  |
| - Polycarbonate (PC)        | 0.177          |                       | 52.4         |
| <b>Others</b>               |                | <b>0.157</b>          | <b>46.4</b>  |
| - Electronics               | 0.023          |                       | 6.7          |
| - Internal & External Wires | 0.134          |                       | 39.7         |

### 2.3 Packaging

**Table 7: Material composition - packaging**

| Information     | Weight [in kg] | Share [in %] |
|-----------------|----------------|--------------|
| <b>TOTAL</b>    | <b>0.113</b>   | <b>100</b>   |
| Paper/cardboard | 0.108          | 95.5         |
| Wood            | 0.001          | 0.1          |
| Plastics        | 0.005          | 4.4          |

Plywood pallet and other secondary packaging with cardboard are used for shipping. In addition, Plywood pallet is reused 28 times and Packaging of raw materials and components is considered as an average quantity of 5 % in mass of the luminaire according to /PSR-0014-ED2.0-EN-2023 07 13/. This additional packaging is not considered in Table 7 as it is an additional assumption.

# 3 Information on life cycle stages

## 3.1 Manufacturing

The manufacturer sources all parts from international suppliers. Within the manufacturing site in China, the product is assembled using energy and auxiliaries, if needed. Afterwards the product is packed in packaging materials and distributed to the client.

The production site has a certified Environmental management system according to ISO 14001:2015.

## 3.2 Distribution

The main market for the product is Europe. For this reason, an Intercontinental transport following PEP-PCR-ed4-EN-2021 09 06 is considered in the model:

- Ship: 19,000 km
- Truck: 1,000 km

The background assumptions for the transportation are listed below.

**Table 8: Background information distribution**

| Information                                 | Unit      | Truck    | Ship           |
|---|-----------|----------|----------------|
| Fuel type                                   | -         | Diesel   | Heavy fuel oil |
| Fuel consumption                            | l/(kg*km) | 2.80E-03 | 2.30E-04       |
| Total distance                              | km        | 1,000    | 19,000         |
| Capacity utilisation (including empty runs) | %         | 85       | 48             |
| Bulk density of transported products        | kg/m3     | n.a.     | n.a.           |
| Volume capacity utilisation factor          | -         | n.a.     | n.a.           |

## 3.3 Installation

The product is installed with an included mounting hook. No energy or material input is required. During installation, the product is unpacked. The packaging materials is treated by applying default values following PSR-0014-ED2.0-EN-2023 07 13.

**Table 9: End of life data for packaging in Europe**

| Treatment scenario                   | Metal | Paper & Cardboard | Wood | Plastics |
|--------------------------------------|-------|-------------------|------|----------|
| Incineration without energy recovery | 0 %   | 0 %               | 0 %  | 0 %      |
| Incineration with energy recovery    | 2 %   | 9 %               | 31 % | 37 %     |
| Landfill                             | 21 %  | 9 %               | 38 % | 23 %     |
| Recycling rate                       | 77 %  | 82 %              | 31 % | 41 %     |

### 3.4 Use

The product has no direct emissions (B1) and is designed so that no maintenance is required (B2) or parts need to be replaced (B4). Furthermore, no standard repairs (B3) or refurbishments (B5) are foreseen. The use of the product does consume electricity (B6), but no water (B7).

The main market for the product is Europe. Therefore, the European average grid mix has been used.

### 3.5 End of life

The product falls under the Waste from Electrical and Electronic Equipment (WEEE) directive 2012/19/EU and its main market is Europe. Therefore, European statistics on the treatment of lighting equipment as subcategory of WEEE from 2018 has been used. The EoL scenario displays a European average and is the following:

- Incineration without energy recovery: 6.5%
- Incineration with energy recovery: 7.6%
- Landfilling: 6.5%
- Recycling: 79.4%

### 3.6 Benefits and loads beyond the system boundaries

The incineration with energy recovery and recycling of the product (incl. packaging) generates environmental benefits by avoiding the production of primary materials or energy. The amount and type of material flows used for the calculation of benefits are listed in Table 10.

**Table 10: Material flows for Benefits and loads beyond the system boundaries**

| Information   | Unit               | Value |
|---|--------------------|-------|
| Total weight going into re-use                            | kg/functional unit | 0     |
| Total weight going into recycling                         | kg/functional unit | 0.134 |
| - Share of metals   | %                  | 1.2   |
| - Share of plastics                                       | %                  | 52.4  |
| - Share of others   | %                  | 46.4  |
| Total weight going into incineration with energy recovery | kg/functional unit | 0.070 |
| - Share of paper  | %                  | 77.9  |
| - Share of others   | %                  | 22.1  |

# 4 Environmental impacts

## 4.1 Introduction

The following table summarizes the key information for the calculation of the environmental impacts:

**Table 11: Basic information LCA model**

| Information       | Value   |
|-------------------|---|
| Used LCA software | GaBi / LCA for experts 10   |
| Used LCI database | GaBi Professional 2023.2 + Electronics Extension 2023.2   |
| PCR version       | PEP-PCR-ED4-EN-2021 09 06   |
| PSR version       | PEP-PSR-0014-ED2.0-EN-2023 07 13  |
| Functional unit   | Provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours |

## 4.2 Results per functional unit

The following results of the environmental declaration have been developed by considering an outgoing artificial luminous flux of 1,000 lumens over a reference lifetime of 35,000 hours. The results refer to the core environmental impact indicators and indicators describing resource use, waste categories, and output flows according to EN 15804:2012+A2:2019.

**Table 12: Results for core environmental impact indicators per functional unit**

|                                  | Total (excl. D) | Raw materials & parts |          | Manufacturing | Distribution | Installation | Use      | End of life |          |          | Benefits and loads beyond the system boundaries |
|----------------------------------|-----------------|-----------------------|----------|---------------|--------------|--------------|----------|-------------|----------|----------|---|
|                                  |                 | A1                    | A2       | A3            | A4           | A5           | B6       | C2          | C3       | C4       | D   |
| GWP - total [kg CO2 eq.]         | 1.16E+02        | 1.93E+00              | 1.23E-02 | 1.21E-02      | 5.85E-02     | 4.50E-02     | 1.14E+02 | 1.16E-02    | 2.23E-01 | 8.06E-03 | -1.92E-01                                       |
| GWP - fossil [kg CO2 eq.]        | 1.15E+02        | 1.94E+00              | 1.22E-02 | 8.64E-02      | 5.83E-02     | 2.70E-02     | 1.13E+02 | 1.14E-02    | 2.23E-01 | 8.06E-03 | -2.57E-01                                       |
| GWP - biogenic [kg CO2 eq.]      | 9.16E-01        | -9.53E-03             | 2.80E-05 | -7.46E-02     | 7.53E-05     | 1.79E-02     | 9.82E-01 | 2.62E-05    | 8.50E-05 | 2.17E-06 | 6.61E-02  |
| GWP - luluc [kg CO2 eq.]         | 1.42E-02        | 1.18E-03              | 1.15E-04 | 2.69E-04      | 1.44E-04     | 7.87E-05     | 1.23E-02 | 1.07E-04    | 5.96E-06 | 6.60E-07 | -5.22E-04                                       |
| ODP [kg CFC-11 eq.]              | 2.10E-09        | 1.42E-11              | 1.61E-15 | 2.56E-13      | 4.96E-15     | 4.99E-14     | 2.08E-09 | 1.51E-15    | 2.21E-13 | 6.53E-15 | -1.13E-12                                       |
| AP [Mole of H+ eq.]              | 2.51E-01        | 8.27E-03              | 1.98E-05 | 2.59E-04      | 1.02E-03     | 4.59E-05     | 2.41E-01 | 1.86E-05    | 7.33E-05 | 6.81E-06 | -2.36E-03                                       |
| EP - freshwater [kg P eq.]       | 4.35E-04        | 1.09E-05              | 4.52E-08 | 1.45E-06      | 6.64E-08     | 7.43E-07     | 4.21E-04 | 4.24E-08    | 5.28E-08 | 2.43E-09 | -1.44E-06                                       |
| EP - marine [kg N eq.]           | 5.96E-02        | 1.37E-03              | 7.66E-06 | 9.77E-05      | 3.64E-04     | 2.10E-05     | 5.77E-02 | 7.18E-06    | 2.32E-05 | 2.92E-06 | -2.55E-04                                       |
| EP - terrestrial [Mole of N eq.] | 6.23E-01        | 1.48E-02              | 8.80E-05 | 9.75E-04      | 3.99E-03     | 1.92E-04     | 6.03E-01 | 8.25E-05    | 3.30E-04 | 3.43E-05 | -2.69E-03                                       |
| POCP [kg NMVOC eq.]              | 1.60E-01        | 4.18E-03              | 1.76E-05 | 2.51E-04      | 1.00E-03     | 4.41E-05     | 1.54E-01 | 1.65E-05    | 6.15E-05 | 7.64E-06 | -7.77E-04                                       |
| ADPE [kg Sb eq.]                 | 2.51E-04        | 2.34E-04              | 8.20E-10 | 1.87E-08      | 1.42E-09     | 1.07E-08     | 1.75E-05 | 7.69E-10    | 1.69E-09 | 2.89E-11 | -1.29E-04                                       |
| ADPF [MJ]                        | 2.41E+03        | 3.12E+01              | 1.69E-01 | 1.19E+00      | 7.37E-01     | 3.48E-01     | 2.38E+03 | 1.58E-01    | 2.95E-01 | 9.21E-03 | -3.63E+00                                       |
| WDP [m³ world equiv.]            | 2.57E+01        | 4.90E-01              | 1.50E-04 | 1.57E-02      | 2.59E-04     | 1.78E-03     | 2.52E+01 | 1.40E-04    | 2.68E-02 | 1.76E-03 | -9.52E-02                                       |



**Table 13: Results for indicators describing resource use, waste categories, and output flows per functional unit**

| Indicator   | Acronym [Unit]            | Value     |
|---|---------------------------|-----------|
| Renewable primary energy (without raw material)     | PERE [MJ]                 | 1.43E+03  |
| Renewable primary energy (raw material)             | PERM [MJ]                 | 9.76E-01  |
| Total use of renewable primary energy               | PERT [MJ]                 | 1.43E+03  |
| Non-renewable primary energy (without raw material) | PENRE [MJ]                | 2.40E+03  |
| Non-renewable primary energy (raw material)         | PENRM [MJ]                | 2.67E+00  |
| Total use of non-renewable primary energy           | PENRT [MJ]                | 2.41E+03  |
| Use of secondary materials                          | SM [kg]                   | 8.19E-02  |
| Use of renewable secondary fuels                    | RSF [MJ]                  | 0.00E+00  |
| Use of non-renewable secondary fuels                | NRSF [MJ]                 | 0.00E+00  |
| Net use of fresh water                              | FW [m3]                   | 2.56E+01  |
| Hazardous waste disposed                            | HWD [kg]                  | -1.47E-07 |
| Non-hazardous waste disposed                        | NHWD [kg]                 | 1.86E+00  |
| Radioactive waste disposed                          | RWD [kg]                  | 3.79E-01  |
| Components for reuse                                | CRU [kg]                  | 0.00E+00  |
| Materials for recycling                             | MFR [kg]                  | 7.71E-02  |
| Materials for energy recovery                       | MER [kg]                  | 9.24E-02  |
| Exported electricity                                | EEE [MJ]                  | 3.69E-01  |
| Exported thermal energy                             | EET [MJ]                  | 8.32E-01  |
| Biogenic carbon content of the product              | Biog. C in product [kg]   | 0.00E+00  |
| Biogenic carbon content of the associated packaging | Biog. C in packaging [kg] | 2.33E-02  |

## 4.3 Results per unit of product

The following results of the environmental declaration have been developed by considering the entire life cycle of one product with the technical properties described in paragraph 1.

**Table 14: Results core environmental impact indicators per unit of product**

|                                  | Total (excl. D) | Raw materials & parts |          | Manufacturing | Distribution | Installation | Use      | End of life |          |          | Benefits and loads beyond the system boundaries |
|----------------------------------|-----------------|-----------------------|----------|---------------|--------------|--------------|----------|-------------|----------|----------|---|
|                                  |                 | A1                    | A2       | A3            | A4           | A5           | B6       | C2          | C3       | C4       | D   |
| GWP - total [kg CO2 eq.]         | 2.32E+02        | 3.87E+00              | 2.47E-02 | 2.43E-02      | 1.17E-01     | 9.00E-02     | 2.28E+02 | 2.32E-02    | 4.46E-01 | 1.61E-02 | -3.83E-01                                       |
| GWP - fossil [kg CO2 eq.]        | 2.31E+02        | 3.89E+00              | 2.44E-02 | 1.73E-01      | 1.17E-01     | 5.40E-02     | 2.26E+02 | 2.29E-02    | 4.46E-01 | 1.61E-02 | -5.14E-01                                       |
| GWP - biogenic [kg CO2 eq.]      | 1.83E+00        | -1.91E-02             | 5.60E-05 | -1.49E-01     | 1.51E-04     | 3.59E-02     | 1.96E+00 | 5.25E-05    | 1.70E-04 | 4.33E-06 | 1.32E-01  |
| GWP - luluc [kg CO2 eq.]         | 2.83E-02        | 2.35E-03              | 2.29E-04 | 5.39E-04      | 2.89E-04     | 1.57E-04     | 2.45E-02 | 2.15E-04    | 1.19E-05 | 1.32E-06 | -1.04E-03                                       |
| ODP [kg CFC-11 eq.]              | 4.20E-09        | 2.84E-11              | 3.22E-15 | 5.11E-13      | 9.92E-15     | 9.99E-14     | 4.17E-09 | 3.02E-15    | 4.42E-13 | 1.31E-14 | -2.26E-12                                       |
| AP [Mole of H+ eq.]              | 5.02E-01        | 1.65E-02              | 3.97E-05 | 5.18E-04      | 2.03E-03     | 9.17E-05     | 4.82E-01 | 3.72E-05    | 1.47E-04 | 1.36E-05 | -4.71E-03                                       |
| EP - freshwater [kg P eq.]       | 8.69E-04        | 2.18E-05              | 9.05E-08 | 2.91E-06      | 1.33E-07     | 1.49E-06     | 8.42E-04 | 8.48E-08    | 1.06E-07 | 4.85E-09 | -2.89E-06                                       |
| EP - marine [kg N eq.]           | 1.19E-01        | 2.75E-03              | 1.53E-05 | 1.95E-04      | 7.28E-04     | 4.20E-05     | 1.15E-01 | 1.44E-05    | 4.65E-05 | 5.84E-06 | -5.10E-04                                       |
| EP - terrestrial [Mole of N eq.] | 1.25E+00        | 2.96E-02              | 1.76E-04 | 1.95E-03      | 7.99E-03     | 3.85E-04     | 1.21E+00 | 1.65E-04    | 6.60E-04 | 6.87E-05 | -5.37E-03                                       |
| POCP [kg NMVOC eq.]              | 3.19E-01        | 8.36E-03              | 3.52E-05 | 5.02E-04      | 2.00E-03     | 8.83E-05     | 3.08E-01 | 3.30E-05    | 1.23E-04 | 1.53E-05 | -1.55E-03                                       |
| ADPE [kg Sb eq.]                 | 5.03E-04        | 4.68E-04              | 1.64E-09 | 3.73E-08      | 2.84E-09     | 2.14E-08     | 3.49E-05 | 1.54E-09    | 3.38E-09 | 5.77E-11 | -2.58E-04                                       |
| ADPF [MJ]                        | 4.82E+03        | 6.23E+01              | 3.37E-01 | 2.37E+00      | 1.47E+00     | 6.97E-01     | 4.75E+03 | 3.16E-01    | 5.91E-01 | 1.84E-02 | -7.26E+00                                       |
| WDP [m³ world equiv.]            | 5.14E+01        | 9.81E-01              | 2.99E-04 | 3.15E-02      | 5.18E-04     | 3.57E-03     | 5.03E+01 | 2.80E-04    | 5.36E-02 | 3.52E-03 | -1.90E-01                                       |

**Table 15: Results indicators describing resource use, waste categories, and output flows per unit of product**

| Indicator   | Acronym [Unit]            | Value     |
|---|---------------------------|-----------|
| Renewable primary energy (without raw material)     | PERE [MJ]                 | 2.86E+03  |
| Renewable primary energy (raw material)             | PERM [MJ]                 | 1.95E+00  |
| Total use of renewable primary energy               | PERT [MJ]                 | 2.86E+03  |
| Non-renewable primary energy (without raw material) | PENRE [MJ]                | 4.81E+03  |
| Non-renewable primary energy (raw material)         | PENRM [MJ]                | 5.33E+00  |
| Total use of non-renewable primary energy           | PENRT [MJ]                | 4.81E+03  |
| Use of secondary materials                          | SM [kg]                   | 1.64E-01  |
| Use of renewable secondary fuels                    | RSF [MJ]                  | 0.00E+00  |
| Use of non-renewable secondary fuels                | NRSF [MJ]                 | 0.00E+00  |
| Net use of fresh water                              | FW [m3]                   | 5.12E+01  |
| Hazardous waste disposed                            | HWD [kg]                  | -2.95E-07 |
| Non-hazardous waste disposed                        | NHWD [kg]                 | 3.71E+00  |
| Radioactive waste disposed                          | RWD [kg]                  | 7.58E-01  |
| Components for reuse                                | CRU [kg]                  | 0.00E+00  |
| Materials for recycling                             | MFR [kg]                  | 1.54E-01  |
| Materials for energy recovery                       | MER [kg]                  | 1.85E-01  |
| Exported electricity                                | EEE [MJ]                  | 7.37E-01  |
| Exported thermal energy                             | EET [MJ]                  | 1.66E+00  |
| Biogenic carbon content of the product              | Biog. C in product [kg]   | 0.00E+00  |
| Biogenic carbon content of the associated packaging | Biog. C in packaging [kg] | 4.66E-02  |

# 5 Extrapolation

## 5.1 Extrapolation rules

Extrapolations rules have been calculated following PCR-ed4-EN-2021 09 14 and PSR-0014-ed2.0- EN-2023 07 18. The defined rules shall be applied using the Extrapolation rules file provided in the following tables.

**Table 16: Extrapolation parameters for reference product**

| Parameter                              | Value for reference product (LN COMP SWITCH 1200 14 W 4000 K) |
|--|---|
| Lighting output [lm]                   | 1,400   |
| Weight of light source [kg]            | 0.008   |
| Weight of luminaire structure [kg]     | 0.321   |
| Weight of control gear [kg]            | 0.009   |
| Weight of light management system [kg] | -   |
| Weight of packaging [kg]               | 0.113   |
| Power [W]                              | 14  |
| Length [mm]                            | 1,173   |

The extrapolation coefficients calculation at the functional unit level shall be taken into account with the following formula:

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

## 5.2 Extrapolation coefficients

The reported extrapolation coefficients are intended at product level (declared unit) and not at functional unit.

- As the concerned product does not have any light management function, the coefficient associated with the light management function is 0.

**Table 17: Calculated Extrapolation coefficients per product**

| Product Name                           | Manufacturing | Distribution | Installation | Use         | EoL         |
|--|---------------|--------------|--------------|-------------|-------------|
| LN COMP SWITCH 300 4 W 3000 K          | 0.56          | 0.49         | 0.32         | 0.29        | 0.55        |
| LN COMP SWITCH 300 4 W 4000 K          | 0.56          | 0.49         | 0.32         | 0.29        | 0.55        |
| LN COMP SWITCH 600 8 W 3000 K          | 0.71          | 0.67         | 0.64         | 0.57        | 0.68        |
| LN COMP SWITCH 600 8 W 4000 K          | 0.71          | 0.67         | 0.64         | 0.57        | 0.68        |
| LN COMP SWITCH 900 12 W 3000 K         | 0.88          | 0.85         | 0.86         | 0.86        | 0.85        |
| LN COMP SWITCH 900 12 W 4000 K         | 0.88          | 0.85         | 0.86         | 0.86        | 0.85        |
| LN COMP SWITCH 1200 14 W 3000 K        | 1.00          | 1.00         | 1.00         | 1.00        | 1.00        |
| <b>LN COMP SWITCH 1200 14 W 4000 K</b> | <b>1.00</b>   | <b>1.00</b>  | <b>1.00</b>  | <b>1.00</b> | <b>1.00</b> |
| LN COMP SWITCH 1500 17W/3000K          | 1.23          | 1.20         | 1.21         | 1.21        | 1.20        |
| LN COMP SWITCH 1500 17W/4000K          | 1.23          | 1.20         | 1.21         | 1.21        | 1.20        |