


# Product Environmental Profile

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



## Sylvania Opticlip Terra family

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PEP prepared by	Feilo Sylvania International Group Kft.	Validity period	5 years
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)			
PEPs 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 any other program.			
Document complies with ISO 14025 : 2006 « Environmental labels and declarations. Type III environmental declarations»			

# 1. General information

## 1.1 Product information

The Sylvania Opticlip Terra family is the new ultra light weight construction with a Lifespan of 62.500 hrs (made by L80B20) and a 5 year warranty.

The Sylvania Opticlip Terra family is available in:

- Non dimmable
- DALI (DA)
- SSA
- SSA01D

The Sylvania Opticlip Terra family is designed around the removable and interchangeable light engines set flat on the surface of the fixture, connected with a plug & play cable to the driver. The design is strongly focused on sustainability with an impact resistance of IK02 and an ingress protection of IP20.

With the updated PIR Sensor, the Sylvania Opticlip Terra SylSmart-enabled versions communicated with external lighting control systems and therefor have greater energy savings.

Additional – not standard – accessories are ceiling mounted, suspended, or recessed in plasterboard by clips for usage in different applications.

The Sylvania Opticlip Terra family is clustered by the following main technical features:

- Non dimmable: Without dimming function, only power on and off.
- DALI (DA): Work with DALI lighting management system.
- SSA: Work with PIR sensor which can be connected to Sylvania wireless lighting management system Sylsmart Connect (Silvair).
- SSA01D: Work with Sylvania wireless lighting management system Sylsmart Connect (Silvair).

The technological key data of the Sylvania Opticlip Terra reference product “0041952 - SYLVANIA OPTICLIP TERRA 600 840 SSA03 WH” are listed below:

**Table 1: Key technological data of reference product**

Information	Unit	Data
Product code	-	0041952
Light source	-	Pcb_Ln_49.2*3.9_4080
Power supply	-	OTI DX 50/220...240/1A4 NFC
Colour temperature	Kelvin	4.000
Protection index for water and dust (IP)	-	20
Impact resistance index (IK)	-	02
Nominal operating voltage	Volt	220 - 240
Declared lifetime of the luminaire (L80B20)	Hours	62.500
Declaration lifetime of the light source	Hours	62.500
Useful output flux	Lumen	3.300
Total power consumption	Watt	27
Luminous efficiency	Lumen / Watt	122
Length	mm	595
Width/Diameter	mm	595
Height	mm	44
Reference use scenario	-	All indoor applications

In the reference scenario, the product has 2,500 annual operating hours, resulting in a lifetime of 25 years.

## 1.2 Overview

The general information used for the EPD are listed below:

**Table 2: 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*	0.1697 pieces of product
Life cycle stages cover (according to EN15804+A2)	Cradle-to-grave and Module D
Product category according to PSR	Luminaires
Product family name (if family EPD)	Sylvania Opticlip Terra
All products of the product family (if family EPD)	Table 16 – Table 19
Extrapolation rules (if family EPD)	Table 20 – Table 23

\* The reference flow has a luminous flux of 3.300 lumen and a reference lifetime of 62.500 hours (2.500 hours annually for 25 years). The reference flow is calculated as:

$(1,000/\text{outgoing luminous flux of the analyzed product in lumens}) \times (35,000/\text{declared product lifetime of the analyzed product in hours})$

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

$$(1\ 000/3\ 300) \times (35\ 000/62\ 500) = 0.1697$$

## 2 Constituent materials

### 2.1 Overview

Table 3 shows the overview of the product composition of the reference product; in particular the weight per product and -per functional unit, plus the overall share.

**Table 3: Product composition**

Information	Weight [kg] / product	Weight [kg] / functional unit	Share [in %]
Total weight	2,307	0,392	100
Product	1,451	0,246	62,9
Packaging	0,856	0,145	37,1
Additional equipment	0	0	0

### 2.2 Product

The material composition for the reference product – per se – is summarized in the following table:

**Table 4: Material composition - product**

Information	Weight [kg] / product	Weight [kg] / functional unit	Share [in %]
Total weight	1,4511	0,246	100
Metals	0,0176	0,003	1,213
Plastics	0,036	0,006	2,48
Electronics (incl. wires)	0,6475	0,110	44,62
Carton / Paper	0,75	0,127	51,686

*Note: The total weight in this table differs slightly from the total weight of the product due to rounding inaccuracies.*

### 2.3 Packaging

The material composition for the packaging of the reference product is summarized in the following table:

**Table 5: Material composition - packaging**

Information	Weight [kg] / product	Weight [kg] / functional unit	Share [in %]
Total weight	0,856	0,145	100
Paper/cardboard	0,764	0,130	89,3
Plastics	0,035	0,006	4,0
Wood	0,057	0,010	6,7

*Note: The total weight in this table differs slightly from the total weight of the product due to rounding inaccuracies.*

## 3 Information on life cycle stages

### 3.1 Manufacturing (A1-A3)

Most of the product components are produced by the suppliers of Feilo Sylvania GmbH. Main part of the luminaire is in Carton and is produced by a local and French supplier.

A major share of the electronic parts are sourced from China followed by Bulgaria.

At the site of Feilo Sylvania in Saint-Etienne (France), all parts are assembled, labelled, and tested, before the product is packed for transportation to customers.

Feilo Sylvania in Saint-Etienne is also certified to ISO 9001:2015 and 14001:2015.

Metal, plastic, carton/paper scraps of the production site is recycled, whereas other waste streams (wood, polymer components and some electronic parts) are considered as waste for incineration with energy recovery. The energy model used in manufacturing is based on Sphera’s Managed LCA Content V.10:

FR: Electricity grid mix Sphera (database 2023.2)

### 3.2 Distribution (A4)

The main market of the product is Europe. For this reason, an intracontinental transport following PEP-PCR-ed4-EN-2021 09 06 is considered 3 500 km by truck (diesel driven, EURO 0-6, >27t payload).

The background assumptions for the transportation are listed below.

**Table 6: Background information distribution**

Information	Unit	Truck	Ship
Fuel type	-	Diesel	-
Fuel consumption	l/(kg*km)	1,99E-05	-
Total distance	km	3.500	-
Capacity utilisation (including empty runs)	%	85	-

### 3.3 Installation (A5)

The product can easily be installed with hooks and tool free. No energy or material input is required.

Packaging waste is recovered refer to chapter 3.5.3.1 of PSR-0014-ed2.0-2023.

### 3.4 Use stage (B1-B7)

During the use stage of the product, the product only consumes electricity (B6). The main market of the product is Europe. Consequently, an average European electricity grid mix (database from Sphera) has been used for the calculations.

According to [PSR-0014-ED2.0-EN- 2023 07 13](#), the theoretical energy saving coefficients for the 4 series of SYLVANIA Opticlip Terra family are:

- Non dimmable: 1,0
- DALI (DA): 0,5
- SSA: 0,5
- SSA01D: 0,5

the SYLVANIA Opticlip Terra reference product 0041952 is grouped under SSA series and is capable to be connected to Sylvania wireless lighting management system Sylsmart Connect. Therefore, the theoretical energy saving coefficient of the reference product is 0.5

The declared power consumption of the reference product is 27 Watts and its assigned lifetime is 62,500 hours (L80B20).

Combining all these information leads to a total power draw of 843,75 kWh.

All other modules of the life cycle stage have no environmental impact, since the product has no direct emissions (B1), no maintenance (B2), no replacement (B4), no standard repairs (B3), or refurbishment activities (B5). The luminaire does not consume water during its use (B7).

### 3.5 End of life (C1-C4)

The product falls under the Waste from Electrical and Electronic Equipment (WEEE) directive 2012/19/EU subcategory 4. Primary data regarding the recycling quote of the product have been used. The share of the different end-of-life pathways are shown below and represent a European average.

- Incineration with energy recovery: 44,1 %
- Landfilling: 12,5 %
- Recycling: 43,4 %

### 3.6 Benefits and loads beyond the system boundaries stage (D)

Incineration with energy recovery and recycling of the product, packaging, and manufacturing scrap generate environmental benefits by avoiding the production of primary materials or energy. The amount and type of waste streams are listed in Table 7.

**Table 7: 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	0,224
- Share from product	%	47,8
- Share from packaging	%	51,3
- Share from upstream packaging & manufacturing scrap	%	0,9
Total weight going into incineration with energy recovery	kg/functional unit	0,127
- Share from product	%	85,3
- Share from packaging	%	13,2
- Share from upstream packaging & manufacturing scrap	%	1,5

# 4 Environmental impacts

## 4.1 Introduction

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

**Table 8: Basic information LCA model**

Information	Value
Used LCA software	GaBi 10
Used LCI database	LCA Managed Content Professional 2023.2 + Extension 2023.2
PCR version	PEP-PCR-ED4-EN-2021 09 06
PSR version	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

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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 9: Results core environmental impact indicators per functional unit (0.3915 kg product incl. packaging)

	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	B1	B2	B3	B4	B5	B6	B7	C1	
GWP - total [kg CO2 eq.]	4,85 E+01	1,45 E+00	4,58 E-03	3,89 E-02	8,69 E-02	1,24 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,66 E+01	0,00 E+00	0,00 E+00	1,56 E-02	1,87 E-01	1,22 E-02	1,53 E-01
GWP - fossil [kg CO2 eq.]	4,85 E+01	1,92 E+00	4,46 E-03	3,85 E-02	8,22 E-02	6,48 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,62 E+01	0,00 E+00	0,00 E+00	1,48 E-02	1,59 E-01	2,11 E-03	-1,52 E-01
GWP - biogenic [kg CO2 eq.]	2,77 E-02	-4,76 E-01	9,96 E-05	4,01 E-04	3,87 E-03	5,92 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,02 E-01	0,00 E+00	0,00 E+00	6,95 E-04	2,83 E-02	1,01 E-02	3,05 E-01
GWP - luluc [kg CO2 eq.]	8,32 E-03	2,02 E-03	1,92 E-05	5,31 E-06	7,59 E-04	1,88 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,02 E-03	0,00 E+00	0,00 E+00	1,36 E-04	1,78 E-04	1,74 E-06	-2,98 E-04
ODP [kg CFC-11 eq.]	8,64 E-10	9,41 E-12	4,32 E-16	1,61 E-12	1,07 E-14	1,21 E-13	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	8,52 E-10	0,00 E+00	0,00 E+00	1,92 E-15	1,63 E-13	3,54 E-15	-1,21 E-12
AP [Mole of H+ eq.]	1,12 E-01	1,25 E-02	4,90 E-05	9,30 E-05	9,55 E-05	1,12 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	9,87 E-02	0,00 E+00	0,00 E+00	1,72 E-05	1,48 E-04	8,01 E-06	-6,13 E-04
EP - freshwater [kg P eq.]	1,92 E-04	1,55 E-05	8,09 E-09	2,08 E-07	3,00 E-07	1,79 E-06	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,72 E-04	0,00 E+00	0,00 E+00	5,38 E-08	1,64 E-06	3,40 E-07	-3,73 E-06
EP - marine [kg N eq.]	2,59 E-02	2,10 E-03	2,05 E-05	2,91 E-05	3,20 E-05	5,11 E-05	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,36 E-02	0,00 E+00	0,00 E+00	5,75 E-06	6,58 E-05	3,34 E-06	-2,35 E-04
EP - terrestrial [Mole of N eq.]	2,71 E-01	2,21 E-02	2,25 E-04	2,83 E-04	3,77 E-04	4,70 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,47 E-01	0,00 E+00	0,00 E+00	6,78 E-05	6,68 E-04	2,47 E-05	-2,29 E-03
POCP [kg NMVOC eq.]	6,97 E-02	6,27 E-03	5,59 E-05	7,09 E-05	8,32 E-05	1,10 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	6,30 E-02	0,00 E+00	0,00 E+00	1,50 E-05	1,45 E-04	1,16 E-05	-6,39 E-04
ADPE [kg Sb eq.]	3,49 E-04	3,41 E-04	1,59 E-10	1,16 E-08	5,43 E-09	2,56 E-08	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	7,14 E-06	0,00 E+00	0,00 E+00	9,76 E-10	2,53 E-08	5,58 E-11	-3,31 E-08
ADPF [MJ]	1,01 E+03	2,99 E+01	5,73 E-02	4,33 E+00	1,12 E+00	8,38 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	9,72 E+02	0,00 E+00	0,00 E+00	2,01 E-01	8,63 E-01	3,15 E-02	-2,34 E+00
WDP [m <sup>3</sup> world equiv.]	1,08 E+01	4,42 E-01	2,89 E-05	1,49 E-02	9,90 E-04	4,82 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,03 E+01	0,00 E+00	0,00 E+00	1,78 E-04	2,05 E-02	3,74 E-05	-1,89 E-02

**Table 10: Results indicators describing resource use, waste categories, and output flows per functional unit (0.3915 kg product incl. packaging)**

	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	B1	B2	B3	B4	B5	B6	B7	C1	C2	
PERE [MJ]	5,95 E+02	1,02 E+01	2,17 E-03	1,07 E+00	8,12 E-02	2,46 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,81 E+02	0,00 E+00	0,00 E+00	1,46 E-02	2,40 E-01	2,84 E-03	-4,51 E+00	
PERM [MJ]	2,57 E+00	4,80 E+00	0,00 E+00	0,00 E+00	0,00 E+00	-2,23 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	-2,09 E+00	
PERT [MJ]	5,98 E+02	1,50 E+01	2,17 E-03	1,07 E+00	8,12 E-02	2,24 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,81 E+02	0,00 E+00	0,00 E+00	1,46 E-02	2,40 E-01	2,84 E-03	-6,60 E+00	
PENRE [MJ]	1,01 E+03	2,83 E+01	5,75 E-02	4,33 E+00	1,12 E+00	9,74 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	9,72 E+02	0,00 E+00	0,00 E+00	2,01 E-01	8,63 E-01	3,15 E-02	-7,67 E-01	
PENRM [MJ]	1,65 E+00	1,78 E+00	0,00 E+00	0,00 E+00	0,00 E+00	-1,35 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	-1,57 E+00	
PENRT [MJ]	1,01 E+03	3,01 E+01	5,75 E-02	4,33 E+00	1,12 E+00	8,39 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	9,72 E+02	0,00 E+00	0,00 E+00	2,01 E-01	8,63 E-01	3,15 E-02	-2,34 E+00	
SM [kg]	9,99 E-02	9,99 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,66 E-04	
RSF [MJ]	7,68 E-02	3,99 E-03	1,51 E-03	0,00 E+00	5,99 E-02	6,35 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,08 E-02	0,00 E+00	0,00 E+00	0,00 E+00	
NRSF [MJ]	1,32 E+00	1,51 E-01	5,04 E-02	0,00 E+00	9,40 E-01	9,97 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,69 E-01	0,00 E+00	0,00 E+00	0,00 E+00	
FW [m3]	4,91 E-01	1,80 E-02	2,41 E-06	1,78 E-03	8,90 E-05	9,40 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,69 E-01	0,00 E+00	0,00 E+00	1,60 E-05	1,30 E-03	1,87 E-06	-9,69 E-04	
HWD [kg]	2,50 E-07	2,68 E-07	1,80 E-13	-1,71 E-10	3,47 E-12	2,89 E-08	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	-7,61 E-08	0,00 E+00	0,00 E+00	6,23 E-13	2,84 E-08	2,65 E-12	-4,39 E-08	
NHWD [kg]	8,73 E-01	8,79 E-02	6,98 E-06	1,31 E-03	1,71 E-04	1,61 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	7,12 E-01	0,00 E+00	0,00 E+00	3,07 E-05	2,78 E-02	2,78 E-02	-7,47 E-03	
RWD [kg]	1,57 E-01	9,40 E-04	8,72 E-08	1,36 E-03	2,10 E-06	2,04 E-05	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,55 E-01	0,00 E+00	0,00 E+00	3,77 E-07	2,23 E-05	3,73 E-07	-1,02 E-04	
CRU [kg]	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	
MFR [kg]	2,23 E-01	8,31 E-06	0,00 E+00	2,02 E-03	0,00 E+00	1,15 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,07 E-01	0,00 E+00	0,00 E+00	
MER [kg]	1,27 E-01	0,00 E+00	0,00 E+00	1,88 E-03	0,00 E+00	1,68 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,09 E-01	0,00 E+00	0,00 E+00	
EEE [MJ]	2,55 E-01	-1,96 E-04	0,00 E+00	0,00 E+00	0,00 E+00	4,02 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,15 E-01	0,00 E+00	0,00 E+00	
EET [MJ]	5,19 E-01	-4,55 E-04	0,00 E+00	0,00 E+00	0,00 E+00	8,42 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,35 E-01	0,00 E+00	0,00 E+00	
Biog. C in product [kg]	-5,47 E-02	-5,47 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,47 E-02	
Biog. C in packaging [kg]	0,00 E+00	-5,99 E-02	0,00 E+00	0,00 E+00	0,00 E+00	5,99 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	

Table 11: Additional environmental impact indicators per functional unit (0,3915 kg product incl. packaging)

	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	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
PM [Disease incidences]	9,74 E-07	1,38 E-07	1,25 E-09	7,91 E-10	6,96 E-10	9,53 E-10	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	8,30 E-07	0,00 E+00	0,00 E+00	1,25 E-10	1,39 E-09	7,73 E-11	-7,47 E-09
IRP [kBq. U235 eq.]	2,62 E+01	1,10 E-01	1,28 E-05	3,47 E-01	3,13 E-04	3,37 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,57 E+01	0,00 E+00	0,00 E+00	5,62 E-05	3,55 E-03	5,51 E-05	-1,42 E-02
ETP-fw [CTUh]	2,91 E+02	1,91 E+01	4,07 E-02	2,78 E-01	7,99 E-01	1,21 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,70 E+02	0,00 E+00	0,00 E+00	1,44 E-01	1,42 E-01	2,50 E-02	-7,74 E-01
HTP-c [CTUh]	1,75 E-08	3,09 E-09	7,84 E-13	2,67 E-11	1,62 E-11	1,23 E-11	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,43 E-08	0,00 E+00	0,00 E+00	2,92 E-12	1,56 E-11	1,36 E-12	-4,99 E-11
HTP-nc [CTUh]	2,61 E-07	3,07 E-08	3,02 E-11	1,68 E-10	7,22 E-10	6,35 E-10	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,28 E-07	0,00 E+00	0,00 E+00	1,30 E-10	8,26 E-10	1,27 E-10	-1,07 E-09
SQP [dimensionsless]	4,55 E+02	7,02 E+01	1,18 E-02	4,38 E-01	4,66 E-01	1,18 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,81 E+02	0,00 E+00	0,00 E+00	8,38 E-02	1,17 E+00	2,73 E-03	-4,00 E+01

### 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 1.. 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 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	B1	B2	B3	B4	B5	B6	B7	C1	
GWP - total [kg CO2 eq.]	2,86 E+02	8,52 E+00	2,70 E-02	2,29 E-01	5,12 E-01	7,32 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,75 E+02	0,00 E+00	0,00 E+00	9,20 E-02	1,10 E+00	7,19 E-02	9,05 E-01
GWP - fossil [kg CO2 eq.]	2,86 E+02	1,13 E+01	2,63 E-02	2,27 E-01	4,85 E-01	3,82 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,72 E+02	0,00 E+00	0,00 E+00	8,71 E-02	9,37 E-01	1,24 E-02	-8,93 E-01
GWP - biogenic [kg CO2 eq.]	1,63 E-01	-2,81 E+00	5,87 E-04	2,36 E-03	2,28 E-02	3,49 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,37 E+00	0,00 E+00	0,00 E+00	4,10 E-03	1,66 E-01	5,94 E-02	1,80 E+00
GWP - luluc [kg CO2 eq.]	4,90 E-02	1,19 E-02	1,13 E-04	3,13 E-05	4,47 E-03	1,11 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,96 E-02	0,00 E+00	0,00 E+00	8,04 E-04	1,05 E-03	1,03 E-05	-1,75 E-03
ODP [kg CFC-11 eq.]	5,09 E-09	5,55 E-11	2,54 E-15	9,49 E-12	6,28 E-14	7,14 E-13	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,02 E-09	0,00 E+00	0,00 E+00	1,13 E-14	9,60 E-13	2,09 E-14	-7,10 E-12
AP [Mole of H+ eq.]	6,58 E-01	7,39 E-02	2,89 E-04	5,48 E-04	5,63 E-04	6,61 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,81 E-01	0,00 E+00	0,00 E+00	1,01 E-04	8,70 E-04	4,72 E-05	-3,61 E-03
EP - freshwater [kg P eq.]	1,13 E-03	9,12 E-05	4,77 E-08	1,22 E-06	1,77 E-06	1,05 E-05	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,02 E-03	0,00 E+00	0,00 E+00	3,17 E-07	9,69 E-06	2,00 E-06	-2,20 E-05
EP - marine [kg N eq.]	1,53 E-01	1,24 E-02	1,21 E-04	1,71 E-04	1,89 E-04	3,01 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,39 E-01	0,00 E+00	0,00 E+00	3,39 E-05	3,88 E-04	1,97 E-05	-1,39 E-03
EP - terrestrial [Mole of N eq.]	1,60 E+00	1,30 E-01	1,33 E-03	1,67 E-03	2,22 E-03	2,77 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,45 E+00	0,00 E+00	0,00 E+00	3,99 E-04	3,94 E-03	1,46 E-04	-1,35 E-02
POCP [kg NMVOC eq.]	4,11 E-01	3,70 E-02	3,29 E-04	4,18 E-04	4,90 E-04	6,49 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,71 E-01	0,00 E+00	0,00 E+00	8,81 E-05	8,54 E-04	6,82 E-05	-3,77 E-03
ADPE [kg Sb eq.]	2,05 E-03	2,01 E-03	9,35 E-10	6,84 E-08	3,20 E-08	1,51 E-07	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,21 E-05	0,00 E+00	0,00 E+00	5,75 E-09	1,49 E-07	3,29 E-10	-1,95 E-07
ADPF [MJ]	5,95 E+03	1,76 E+02	3,38 E-01	2,55 E+01	6,58 E+00	4,94 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,73 E+03	0,00 E+00	0,00 E+00	1,18 E+00	5,08 E+00	1,85 E-01	-1,38 E+01
WDP [m <sup>3</sup> world equiv.]	6,35 E+01	2,61 E+00	1,70 E-04	8,75 E-02	5,83 E-03	2,84 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	6,07 E+01	0,00 E+00	0,00 E+00	1,05 E-03	1,21 E-01	2,20 E-04	-1,11 E-01

Table 13: Results indicators describing resource use, waste categories, and output flows 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	B1	B2	B3	B4	B5	B6	B7	C1	
PERE [MJ]	3,51 E+03	5,98 E+01	1,28 E-02	6,31 E+00	4,79 E-01	1,45 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,42 E+03	0,00 E+00	0,00 E+00	8,60 E-02	1,41 E+00	1,67 E-02	-2,66 E+01
PERM [MJ]	1,51 E+01	2,83 E+01	0,00 E+00	0,00 E+00	0,00 E+00	-1,32 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	-1,23 E+01
PERT [MJ]	3,52 E+03	8,81 E+01	1,28 E-02	6,31 E+00	4,79 E-01	1,32 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,42 E+03	0,00 E+00	0,00 E+00	8,60 E-02	1,41 E+00	1,67 E-02	-3,89 E+01
PENRE [MJ]	5,94 E+03	1,67 E+02	3,39 E-01	2,55 E+01	6,60 E+00	5,74 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,73 E+03	0,00 E+00	0,00 E+00	1,19 E+00	5,09 E+00	1,86 E-01	-4,52 E+00
PENRM [MJ]	9,71 E+00	1,05 E+01	0,00 E+00	0,00 E+00	0,00 E+00	-7,97 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	-9,28 E+00
PENRT [MJ]	5,95 E+03	1,78 E+02	3,39 E-01	2,55 E+01	6,60 E+00	4,94 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,73 E+03	0,00 E+00	0,00 E+00	1,19 E+00	5,09 E+00	1,86 E-01	-1,38 E+01
SM [kg]	5,88 E-01	5,88 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,16 E-03
RSF [MJ]	4,53 E-01	2,35 E-02	8,89 E-03	0,00 E+00	3,53 E-01	3,74 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	6,35 E-02	0,00 E+00	0,00 E+00	0,00 E+00
NRSF [MJ]	7,78 E+00	8,90 E-01	2,97 E-01	0,00 E+00	5,54 E+00	5,87 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	9,96 E-01	0,00 E+00	0,00 E+00	0,00 E+00
FW [m3]	2,89 E+00	1,06 E-01	1,42 E-05	1,05 E-02	5,24 E-04	5,54 E-03	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,76 E+00	0,00 E+00	0,00 E+00	9,42 E-05	7,63 E-03	1,10 E-05	-5,71 E-03
HWD [kg]	1,47 E-06	1,58 E-06	1,06 E-12	-1,01 E-09	2,04 E-11	1,71 E-07	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	-4,48 E-07	0,00 E+00	0,00 E+00	3,67 E-12	1,67 E-07	1,56 E-11	-2,58 E-07
NHWD [kg]	5,15 E+00	5,18 E-01	4,11 E-05	7,70 E-03	1,01 E-03	9,50 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,20 E+00	0,00 E+00	0,00 E+00	1,81 E-04	1,64 E-01	1,64 E-01	-4,40 E-02
RWD [kg]	9,25 E-01	5,54 E-03	5,14 E-07	8,00 E-03	1,24 E-05	1,20 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	9,11 E-01	0,00 E+00	0,00 E+00	2,22 E-06	1,31 E-04	2,20 E-06	-6,01 E-04
CRU [kg]	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
MFR [kg]	1,32 E+00	4,90 E-05	0,00 E+00	1,19 E-02	0,00 E+00	6,76 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	6,29 E-01	0,00 E+00	0,00 E+00
MER [kg]	7,51 E-01	0,00 E+00	0,00 E+00	1,11 E-02	0,00 E+00	9,93 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	6,41 E-01	0,00 E+00	0,00 E+00
EEE [MJ]	1,50 E+00	-1,16 E-03	0,00 E+00	0,00 E+00	0,00 E+00	2,37 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,27 E+00	0,00 E+00	0,00 E+00
EET [MJ]	3,06 E+00	-2,68 E-03	0,00 E+00	0,00 E+00	0,00 E+00	4,96 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,56 E+00	0,00 E+00	0,00 E+00
Biog. C in product [kg]	-3,23 E-01	-3,23 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,23 E-01
Biog. C in packaging [kg]	0,00 E+00	-3,53 E-01	0,00 E+00	0,00 E+00	0,00 E+00	3,53 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00

Table 14: Additional 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	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM [Disease incidences]	5,74 E-06	8,16 E-07	7,35 E-09	4,66 E-09	4,10 E-09	5,61 E-09	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,89 E-06	0,00 E+00	0,00 E+00	7,37 E-10	8,17 E-09	4,56 E-10	-4,40 E-08
IRP [kBq. U235 eq.]	1,54 E+02	6,49 E-01	7,54 E-05	2,04 E+00	1,84 E-03	1,98 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,52 E+02	0,00 E+00	0,00 E+00	3,31 E-04	2,09 E-02	3,25 E-04	-8,39 E-02
ETP-fw [CTUe]	1,71 E+03	1,12 E+02	2,40 E-01	1,64 E+00	4,71 E+00	7,11 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,59 E+03	0,00 E+00	0,00 E+00	8,47 E-01	8,39 E-01	1,47 E-01	-4,56 E+00
HTP-c [CTUh]	1,03 E-07	1,82 E-08	4,62 E-12	1,57 E-10	9,56 E-11	7,27 E-11	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	8,43 E-08	0,00 E+00	0,00 E+00	1,72 E-11	9,17 E-11	8,01 E-12	-2,94 E-10
HTP-nc [CTUh]	1,54 E-06	1,81 E-07	1,78 E-10	9,92 E-10	4,25 E-09	3,74 E-09	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,34 E-06	0,00 E+00	0,00 E+00	7,64 E-10	4,87 E-09	7,51 E-10	-6,31 E-09
SQP [dimensionsless]	2,68 E+03	4,14 E+02	6,98 E-02	2,58 E+00	2,75 E+00	6,93 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,25 E+03	0,00 E+00	0,00 E+00	4,94 E-01	6,90 E+00	1,61 E-02	-2,36 E+02

#### 4.4 Data quality

The underlying LCA model has been developed in Sphera’s LCA software LCA for Experts V.10 and with datasets from Sphera’s Managed LCA Content. The overall DQR for the representativeness has been calculated as average of the individual ratings according to the PCR respectively the Product Environmental Footprint Guide, version 6.3. Consequently, the overall representativeness is assessed as good (DQR = 2.13).

The individual rating for technological, time and geographical representativeness is assessed as good (DQR = 2.43, 1.71 and 2.24).

## 5 Extrapolation Rules

The extrapolation coefficients included in the PEP Eco-passport have been developed according to the valid PCR & PSR. Table 13 shows the key properties of the reference product, function as extrapolation basis.

**Table 15: Reference values for the extrapolations**

Parameter	Unit	Reference value
Weight of structural/ mechanical parts	kg	0,786
Weight of power equipment	kg	0,352
Weight of light source	kg	0,278
Weight of light management system	kg	0,018
Weight of product (excl. packaging)	kg	1,451
Weight of packaging	kg	0,856
Weight of product (incl. packaging)	kg	2,307
Typical power consumption	W	27
Lumen output	lm	3.300
Energy saving coefficient	-	0,5

The extrapolation at the level of the functional unit needs to be done according to the following formula:

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

Lumen output of each product variant and other important properties are listed in the table below.

**Table 16: Information for product family: Non dimmable**

Product code	Product name	Power (W)	Lighting output (lm)	Luminaire structure weight (kg)	Product packaging weight (kg)	Control gear weight (kg)	Light source weight (kg)	Light management weight (kg)	Total weight (kg)
0041950	Opticlip Terra 600 840 WH	26,00	3300.00	0,79	0,85	0,27	0,28	0,00	2,19
0041953	Opticlip Terra 600 830 WH	26,00	3100.00	0,79	0,85	0,27	0,28	0,00	2,19

**Table 17: Information for product family: DALI (DA)**

Product code	Product name	Power (W)	Lighting output (lm)	Luminaire structure weight (kg)	Product packaging weight (kg)	Control gear weight (kg)	Light source weight (kg)	Light management weight (kg)	Total weight (kg)
0041951	Opticlip Terra 600 840 DALI WH	26,00	3300,00	0,79	0,85	0,27	0,28	0,00	2,19
0041954	Opticlip Terra 600 830 DALI WH	26,00	3100,00	0,79	0,85	0,27	0,28	0,00	2,19

**Table 18: Information for product family: SSA**

Product code	Product name	Power (W)	Lighting output (lm)	Luminaire structure weight (kg)	Product packaging weight (kg)	Control gear weight (kg)	Light source weight (kg)	Light management weight (kg)	Total weight (kg)
0041952 (Reference)	Opticlip Terra 600 840 SSA03 WH	27,00	3300,00	0,80	0,86	0,35	0,28	0,02	2,31
0041955	Opticlip Terra 600 830 SSA03 WH	27,00	3100,00	0,80	0,86	0,35	0,28	0,02	2,31

**Table 19: Information for product family: SSA01D**

Product code	Product name	Power (W)	Lighting output (lm)	Luminaire structure weight (kg)	Product packaging weight (kg)	Control gear weight (kg)	Light source weight (kg)	Light management weight (kg)	Total weight (kg)
0041956	OPTICLIP TERRA 600 840 SSA01D WH	27,00	3300,00	0,80	0,86	0,35	0,28	0,02	2,31
0041957	OPTICLIP TERRA 600 840 SSA01D WH	27,00	3100,00	0,80	0,86	0,35	0,28	0,02	2,31

The required extrapolation coefficients at the product level are listed in the following tables.

**Table 20: Extrapolation coefficients at product level for Non dimmable**

Product code	Product name	Power (W)	Manufacturing stage (A1-A3)	Distribution stage (A4)	Installation stage (A5)	Use stage (B6)	EoL stage (C1 to C4)	Benefits stage (D)
0041950	Opticlip Terra 600 840 WH	26,00	0,95	0,95	0,98	1,93	0,93	0,95
0041953	Opticlip Terra 600 830 WH	26,00	0,95	0,95	0,98	1,93	0,93	0,95

**Table 21: Extrapolation coefficients at product level for DALI (DA)**

Product code	Product name	Power (W)	Manufacturing stage (A1-A3)	Distribution stage (A4)	Installation stage (A5)	Use stage (B6)	EoL stage (C1 to C4)	Benefits stage (D)
0041951	Opticlip Terra 600 840 DALI WH	26,00	0,95	0,95	0,98	0,96	0,93	0,95
0041954	Opticlip Terra 600 830 DALI WH	26,00	0,95	0,95	0,98	0,96	0,93	0,95

**Table 22: Extrapolation coefficients at product level for SSA**

Product code	Product name	Power (W)	Manufacturing stage (A1-A3)	Distribution stage (A4)	Installation stage (A5)	Use stage (B6)	EoL stage (C1 to C4)	Benefits stage (D)
0041952	OPTICLIP TERRA 600 840 SSA03 WH	27,00	1,00	1,00	1,00	1,00	1,00	1,00
0041955	OPTICLIP TERRA 600 830 SSA03 WH	27,00	1,00	1,00	1,00	1,00	1,00	1,00

**Table 23: Extrapolation coefficients at product level for SSA01D**

Product code	Product name	Power (W)	Manufacturing stage (A1-A3)	Distribution stage (A4)	Installation stage (A5)	Use stage (B6)	EoL stage (C1 to C4)	Benefits stage (D)
0041956	OPTICLIP TERRA 600 840 SSA01D WH	27,00	1,00	1,00	1,00	1,00	1,00	1,00
0041957	OPTICLIP TERRA 600 840 SSA01D WH	27,00	1,00	1,00	1,00	1,00	1,00	1,00

**DALI (DA):** Work with DALI lighting management system.

**SSA:** Work with PIR sensor which can be connected to Sylvania wireless lighting management system Sylsmart Connect (Silvair).

**SSA01D:** Work with Sylvania wireless lighting management system Sylsmart Connect (Silvair)