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Product Environmental Profile

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

SYLVANIA START Waterproof Slim family

Registration number	SYLV-00022-V01.01-EN	Drafting rules	PCR–ed4-EN-2021 09 06
Verifier accreditation number	VH44	Supplement-ed by	PSR-0014-ed2.0-EN-2023 07 13
Date of issue	05-2026	Information and reference documents	www.pep-ecopassport.org
PEP prepared by	Feilo Sylvania International Group Kft.	Validity peri-od	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

SYLVANIA START Waterproof Slim is a slimline multipower LED waterproof luminaire, that provide an ideal solution for applications such as workshops, garages and outdoor covered spaces. With its easy access to electrical terminal through end caps with bayonet lock and its tool-free electrical connection due to push-in terminal, you save time and make installation easier. Flexible mounting brackets, which can be positioned freely on the luminaire, make the installation more comfortable. The LED integrated Waterproof fixture is available in 600mm,1200mm,1500mm nominal length and can be a slimline replacement for single and twin 18W/36W/58W fluorescent Waterproof battens.

There is an easy selection between two different light output levels by using the integrated switch and therefore you'll get a high efficiency throughout the range with up to 146lm/W system efficiency.

Different selection leads to different efficiencies:

- 7300lm / 3800lm with a consumption of 52,5W / 26W → 139 lm/W / 146 lm/W
- 4650lm / 2300lm with a consumption of 34,5W / 17W → 135lm/W / 135lm/W
- 2550lm / 1400lm with a consumption of 18,5W / 10,5W → 138lm/W / 133lm/W

The luminaire is connectable due to the through-wiring, which is standard here.

Applicable product standards:

- EN 60598-1 2008 A11 – 2009
- EN 62493 – 2015
- EN 50581 - 2012
- EN 61000-3-3 – 2013
- EN 62471 - 2008
- EN 55015 - 2013
- EN 61547 - 2009

The function of SYLVANIA START Waterproof Slim family with its different main technical features are described below:

- Non dimmable: Without dimming function, only power "On" and "Off".
- Microwave (MW): Microwave motion detector

The SYLVANIA START Waterproof Slim reference product:

"0046427A – START Waterproof Slim 1500 IP66 3800 / 7300lm 840 MW"

belongs to Microwave (MW) series, which works with presence- and luminous detecting microwave sensor.

Its key technological data are listed in Table 1:

Table 1: Key technological data for the Reference product

Information	Unit	
Product code	-	0046427A>
Light source	-	LED module
Power supply	-	Internal
Colour temperature	K	4000
Protection index for water and dust (IP)	-	66
Impact resistance index (IK)	-	08
Nominal operating voltage	V	220-240V
Declared lifetime of the luminaire (L70B50)	h	100.000
Declaration lifetime of the light source	h	100.000
Useful output flux	lm	7300
Total power consumption	W	52.5
Luminous efficiency	lm/W	139
Nominal Product Length	mm	1540
Nominal Product Width	mm	70
Nominal Product Height	mm	85
Reference use scenario	-	workshops, garages and outdoor covered spaces

SYLVANIA START Waterproof Slim family are declared with below lifetime:

- L70B50 100.000 h
- L80B20 100.000 h
- L90B10 67.000 h

L70B50 with 100.000 h is used for LCA analysis.

To define a good average for the three working areas, we assume 4,500 hours/annum in workshops, an average of 6,500 hours/annum in garages and a further 4,000 hours/annum in covered outdoor areas. This results in a calculated value of 5,000 hours/annum. So the defined default use scenario here – for retail using – includes 5.000 annual operating hours, resulting in 20 years total lifetime of the luminaire.

1.2 Overview

The general information used for the PEP are listed in Table 2 below:

Table 2: Basic PEP 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*	0.04795 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	Sylvania START Waterproof Slim
All products of the product family	Table 19- Table 20
Extrapolation rules	Table 21 - Table 22

* The reference flow is calculated as: (1.000/outgoing luminous flux of the analyzed product in lumens) x (35.000/declared product lifetime of the analyzed product in hours)

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

(1.000/7300) x (35.000/100.000) = 0.04795

2 Constituent materials

2.1 Overview

Table 3: Product composition

Information	Weight/product [kg]	Weight/functional unit [kg]	Share [%]
Total weight	2,123	1,02E-01	100,0%
Product	1,563	7,49E-02	73,6%
Packaging	0,561	2,69E-02	26,4%

Note: Total weight per product and – per packaging in this table could differs slightly from the total weight of the product due to rounding inaccuracies

2.2 Product

Table 4: Material composition - product

Information	Weight [in kg]	Value for FU	Share [in %]
Total weight	1,563	7,49E-02	100,0%
Metals	0,360	1,73E-02	23,03%
- Steel	0,3599	1,73E-02	23,03%
Plastics	0,780	3,74E-02	49,904%
- Polycarbonate (PC)	0,757	3,63E-02	48,443%
- Polypropylene (PP)	0,023	1,10E-03	1,5%
Electronics	0,423	2,03E-02	27,06%

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

2.3 Packaging

Table 5 Material composition - packaging

Information	Weight [in kg]	Value for FU	Share [in %]
Total weight	0,561	2,69E-02	100,0%
Paper/cardboard	0,546	2,62E-02	97,4%
Plastics	0,009	4,24E-04	1,6%
Wood	0,006	2,85E-04	1,1%

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)

For the manufacturer sources all parts come from international and Chinese suppliers. The final products are assembled and tested in Chinese factory, under the quality control of Feilo Sylvania International Group Kft.. The manufacturer is certified to ISO 9001:2015 / 14001:2015.

Metal scrap, plastic, waste carton/paper of the production side are mostly recycled, whereas electronic scrap is 100% incinerated with energy recovery and the waste wood is mostly considered as incinerated and landfilled.

The energy model used in manufacturing is based on Sphera's Managed LCA Content V.10:

CN: Electricity grid mix Sphera

Primary data of the transport distances and means of transport of TIER I suppliers have been collected and used to calculate to an average of:

- 155 km by truck (diesel driven, EURO 0-6, >27 t payload, 85% utilization) (means: For all parts),

3.2 Distribution (A4)

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

- 18,000km by ship (heavy fuel oil driven, container ship, 5,000 to 200,000 dwt payload capacity, deep sea)
- 1,400 km by truck (diesel driven, EURO 0-6, >27t payload).

The background assumptions for transportation are listed below.

Table 6: Background information distribution

Information	Unit	Truck	Ship
Fuel type	-	Diesel	Heavy fuel oil
Fuel consumption	l/(kg*km)	2.00E-05	3.24E-06
Total distance	km	1,400	18,000
Capacity utilisation (including empty runs)	%	85	70

3.3 Installation (A5)

The SYLVANIA START Waterproof Slim product family are delivered to customer with all parts needed for their installation. With easy to access electrical terminal through bayonet lock end caps and tool-free electrical connection due to push-in terminal, the power-connecting (link wires with the driver) is carried out in a really short time with no energy and additional material- or tool input. The customer only needs to insert wire ends and handle the bayonet lock end caps. Consequently, no (significant amount of) energy or materials are required to install these products. Packaging waste is treated with reference to chapter 3.5.3.1 of PSR-0014-ed 2.0-2023 07 13.

3.4 Use stage (B1-B7)

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

According to PSR-0014-ED2.0-EN- 2023 07 13, the theoretical energy saving coefficients for the 2 series of SYLVANIA START Waterproof Slim family are:

- Microwave (MW): 0.55
- Non dimmable: 1.0

The SYLVANIA START Waterproof Slim reference product 0046427A is grouped under MW series, which works with a presence- and luminous detecting sensor kit. Therefore, the theoretical energy saving coefficient of the reference product is 0.55.

The declared power consumption of the reference product is 52,5 Watt, and its declared lifetime is 100.000 hours (L70B50).

Combining all this information leads to a total power consumption of 2887,5 kWh.

All other modules of the life cycle stage have no environmental impact, since the product has no direct emissions (B1), no maintenance (B2), and no replacement (B4), repair (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. EOL model is created referring to chapter 2.5.6 End of life treatment scenarios of PCR-ed4-EN-2021 09 06.

The share of the different end of life pathways are shown below. For the energy consumed in material separation, an average European grid mix has been used.

- Incineration with energy recovery: 50.3%
- Landfilling: 31.3%
- Recycling: 18.4%

3.6 Benefits and loads beyond the system boundaries (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 **Fehler! Verweisquelle konnte nicht gefunden werden.**

Table 7: Material flows for benefits and loads beyond the system boundaries.

Information	Unit	Value
Total weight going into reuse	kg/functional unit	0.000
Total weight going into recycling	kg/functional unit	3,85E-02
- Share from product	%	35,8%
- Share from packaging	%	56,6%
- Share from upstream packaging & manufacturing scrap	%	7,6%
Total weight going into incineration with energy recovery	kg/functional unit	4,13E-02
- Share from product	%	91,3%
- Share from packaging	%	6,3%
- Share from upstream packaging & manufacturing scrap	%	2,4%

4 Environmental impacts

4.1 Introduction

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	LCA for Experts 10
Used LCI database	LCA Managed Content Professional 2025.1
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 lumen 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 1000 lumen over a reference lifetime of 35000 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 (0.102 kg product incl. packaging)

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C4	D
GWP - total [kg CO2 eq.]	4,65E+01	2,08E+00	1,10E-03	1,74E-02	2,10E+00	3,25E-02	2,20E-02	0,00E+00	4,43E+01	0,00E+00	4,43E+01	0,00E+00	5,05E-03	6,84E-02	6,80E-04	7,42E-02	-3,81E-02
GWP - fossil [kg CO2 eq.]	4,60E+01	2,12E+00	1,06E-03	1,59E-02	2,14E+00	3,21E-02	1,33E-02	0,00E+00	4,37E+01	0,00E+00	4,37E+01	0,00E+00	4,83E-03	6,84E-02	6,76E-04	7,39E-02	-6,93E-02
GWP - biogenic [kg CO2 eq.]	4,18E-01	-4,24E-02	3,73E-05	1,48E-03	-4,09E-02	3,72E-04	8,65E-03	0,00E+00	4,50E-01	0,00E+00	4,50E-01	0,00E+00	1,71E-04	5,04E-05	1,91E-06	2,23E-04	3,13E-02
GWP - luluc [kg CO2 eq.]	1,49E-01	4,77E-03	1,08E-05	4,94E-05	4,83E-03	1,02E-04	4,67E-05	0,00E+00	1,44E-01	0,00E+00	1,44E-01	0,00E+00	4,97E-05	8,36E-06	1,88E-06	5,99E-05	-1,21E-04
ODP [kg CFC-11 eq.]	1,02E-09	2,09E-11	1,75E-16	9,27E-14	2,10E-11	3,74E-15	3,50E-14	0,00E+00	9,96E-10	0,00E+00	9,96E-10	0,00E+00	8,01E-16	1,26E-13	2,29E-15	1,29E-13	-4,10E-13
AP [Mole of H+ eq.]	1,12E-01	1,58E-02	1,44E-06	5,66E-05	1,59E-02	4,22E-04	3,40E-05	0,00E+00	9,58E-02	0,00E+00	9,58E-02	0,00E+00	6,60E-06	3,26E-05	4,05E-06	4,32E-05	-1,59E-04
EP - freshwater [kg P eq.]	1,07E-04	1,31E-05	2,84E-09	1,42E-08	1,31E-05	3,23E-08	2,93E-07	0,00E+00	9,35E-05	0,00E+00	9,35E-05	0,00E+00	1,30E-08	1,81E-08	3,36E-07	3,68E-07	-3,90E-07
EP - marine [kg N eq.]	2,50E-02	1,84E-03	5,81E-07	1,23E-05	1,85E-03	1,78E-04	1,81E-05	0,00E+00	2,30E-02	0,00E+00	2,30E-02	0,00E+00	2,66E-06	1,01E-05	8,90E-07	1,37E-05	-4,88E-05
EP - terrestrial [Mole of N eq.]	2,80E-01	1,97E-02	6,01E-06	1,33E-04	1,99E-02	1,94E-03	1,53E-04	0,00E+00	2,57E-01	0,00E+00	2,57E-01	0,00E+00	2,75E-05	1,32E-04	9,71E-06	1,69E-04	-5,05E-04
POCP [kg NMVOC eq.]	6,34E-02	5,81E-03	1,30E-06	3,68E-05	5,85E-03	4,86E-04	2,81E-05	0,00E+00	5,70E-02	0,00E+00	5,70E-02	0,00E+00	5,97E-06	3,07E-05	2,81E-06	3,95E-05	-1,46E-04
ADPE [kg Sb eq.]	2,90E-04	2,81E-04	7,01E-11	1,08E-09	2,81E-04	1,21E-09	8,93E-09	0,00E+00	9,09E-06	0,00E+00	9,09E-06	0,00E+00	3,21E-10	1,29E-09	4,59E-11	1,66E-09	-8,60E-09
ADPF [MJ]	9,23E+02	2,93E+01	1,35E-02	1,71E-01	2,94E+01	3,86E-01	1,75E-01	0,00E+00	8,92E+02	0,00E+00	8,92E+02	0,00E+00	6,18E-02	1,06E-01	1,12E-02	1,79E-01	-8,83E-01
WDP [m^3 world equiv.]	1,15E+01	5,38E-01	4,82E-06	4,85E-03	5,43E-01	8,65E-05	1,80E-03	0,00E+00	1,10E+01	0,00E+00	1,10E+01	0,00E+00	2,21E-05	7,74E-03	8,28E-05	7,85E-03	-4,86E-03

Note: All the values have been shortened to 2 decimal places, resulting in a very small rounding difference - compared to the original total value - which stands in the row "Total (Excl. D)"

Table 10: Results indicators describing resource use, waste categories, and output flows per functional unit (0.102 kg product incl. Packaging)

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C4	D
PERE [MJ]	6,19E+02	8,42E+00	1,02E-03	5,56E-02	8,47E+00	1,08E-02	5,21E-02	0,00E+00	6,10E+02	0,00E+00	6,10E+02	0,00E+00	4,66E-03	5,91E-02	1,86E-03	6,56E-02	-7,56E-01
PERM [MJ]	3,97E-01	3,97E-01	0,00E+00	0,00E+00	3,97E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT [MJ]	6,19E+02	8,81E+00	1,02E-03	5,56E-02	8,87E+00	1,08E-02	5,21E-02	0,00E+00	6,10E+02	0,00E+00	6,10E+02	0,00E+00	4,66E-03	5,91E-02	1,86E-03	6,56E-02	-7,56E-01
PENRE [MJ]	9,21E+02	2,79E+01	1,35E-02	1,71E-01	2,81E+01	3,86E-01	1,75E-01	0,00E+00	8,92E+02	0,00E+00	8,92E+02	0,00E+00	6,18E-02	1,06E-01	1,12E-02	1,79E-01	-8,94E-02
PENRM [MJ]	1,36E+00	1,36E+00	0,00E+00	0,00E+00	1,36E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,93E-01
PENRT [MJ]	9,23E+02	2,93E+01	1,35E-02	1,71E-01	2,94E+01	3,86E-01	1,75E-01	0,00E+00	8,92E+02	0,00E+00	8,92E+02	0,00E+00	6,18E-02	1,06E-01	1,12E-02	1,79E-01	-8,83E-01
SM [kg]	1,12E-02	1,12E-02	0,00E+00	0,00E+00	1,12E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,52E-02
RSF [MJ]	1,08E-02	0,00E+00	7,15E-04	0,00E+00	7,15E-04	6,71E-03	1,18E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,28E-03	0,00E+00	0,00E+00	3,28E-03	0,00E+00
NRSF [MJ]	4,03E-01	0,00E+00	1,12E-02	0,00E+00	1,12E-02	3,39E-01	1,84E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,14E-02	0,00E+00	0,00E+00	5,14E-02	0,00E+00
FW [m3]	4,96E-01	2,17E-02	5,03E-07	1,16E-04	2,18E-02	6,30E-06	1,18E-04	0,00E+00	4,73E-01	0,00E+00	4,73E-01	0,00E+00	2,30E-06	2,03E-04	2,43E-06	2,08E-04	-2,15E-04
HWD [kg]	1,20E-06	2,86E-08	5,41E-13	1,39E-10	2,87E-08	1,41E-11	2,93E-09	0,00E+00	1,17E-06	0,00E+00	1,17E-06	0,00E+00	2,48E-12	1,08E-10	2,49E-12	1,13E-10	-4,04E-09
NHWD [kg]	8,20E-01	9,31E-02	1,88E-06	7,49E-04	9,38E-02	3,86E-05	2,51E-03	0,00E+00	6,91E-01	0,00E+00	6,91E-01	0,00E+00	8,63E-06	9,56E-03	2,33E-02	3,29E-02	-1,42E-03
RWD [kg]	1,42E-01	1,11E-03	2,55E-08	4,33E-06	1,11E-03	5,47E-07	4,74E-06	0,00E+00	1,41E-01	0,00E+00	1,41E-01	0,00E+00	1,17E-07	6,15E-06	1,60E-07	6,43E-06	-3,88E-05
CRU [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR [kg]	3,85E-02	8,31E-04	0,00E+00	2,09E-03	2,92E-03	0,00E+00	2,18E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,38E-02	0,00E+00	1,38E-02	0,00E+00
MER [kg]	4,13E-02	0,00E+00	0,00E+00	9,99E-04	9,99E-04	0,00E+00	2,60E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,77E-02	0,00E+00	3,77E-02	0,00E+00
EEE [MJ]	1,11E-01	8,62E-05	0,00E+00	0,00E+00	8,62E-05	0,00E+00	6,88E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,04E-01	0,00E+00	1,04E-01	-4,50E-03
EET [MJ]	2,40E-01	2,00E-04	0,00E+00	0,00E+00	2,00E-04	0,00E+00	1,09E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,29E-01	0,00E+00	2,29E-01	-1,04E-02
Biog. C in product [kg C]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biog. C in packaging [kg C]	0,00E+00	-1,14E-02	0,00E+00	0,00E+00	-1,14E-02	0,00E+00	1,14E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Note: All the values have been shortened to 2 decimal places, resulting in a very small rounding difference - compared to the original total value - which stands in the row "Total (Excl. D)"

Table 11: Additional environmental impact indicators per functional unit (0.102 kg product incl. packaging)

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C7	D
PM [Disease incidences]	9,64E-07	1,60E-07	1,36E-11	7,69E-10	1,61E-07	1,10E-08	2,49E-10	0,00E+00	7,92E-07	0,00E+00	7,92E-07	0,00E+00	6,23E-11	4,15E-10	4,22E-11	5,19E-10	-2,23E-09
IRP [kBq. U235 eq.]	2,34E+01	1,21E-01	3,66E-06	2,73E-04	1,22E-01	7,65E-05	7,76E-04	0,00E+00	2,32E+01	0,00E+00	2,32E+01	0,00E+00	1,68E-05	6,41E-04	2,15E-05	6,79E-04	-6,17E-03
ETP-fw [CTUe]	1,68E+02	1,68E+01	1,75E-02	2,54E-02	1,69E+01	3,54E-01	5,28E-02	0,00E+00	1,51E+02	0,00E+00	1,51E+02	0,00E+00	8,04E-02	3,48E-02	2,38E-02	1,39E-01	-1,67E-01
HTP-c [CTUh]	1,48E-08	6,08E-10	2,37E-13	3,38E-12	6,11E-10	5,12E-12	2,39E-12	0,00E+00	1,42E-08	0,00E+00	1,42E-08	0,00E+00	1,08E-12	3,76E-12	3,30E-13	5,18E-12	-5,22E-11
HTP-nc [CTUh]	3,23E-07	2,39E-08	1,32E-11	5,68E-11	2,40E-08	1,72E-10	1,96E-10	0,00E+00	2,99E-07	0,00E+00	2,99E-07	0,00E+00	6,06E-11	2,51E-10	6,03E-12	3,17E-10	-2,83E-10
SQP [dimensionsless]	3,73E+02	1,48E+01	5,97E-03	2,70E-02	1,48E+01	5,67E-02	2,03E-01	0,00E+00	3,57E+02	0,00E+00	3,57E+02	0,00E+00	2,73E-02	4,28E-02	1,74E-03	7,19E-02	-3,50E+00

Note: All the values have been shortened to 2 decimal places, resulting in a very small rounding difference - compared to the original total value - which stands in the row "Total (Excl. D)"

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 Table 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 of core environmental impact indicators per unit of product

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C7	D
GWP - total [kg CO2 eq.]	9,71E+02	4,35E+01	2,30E-02	3,63E-01	4,39E+01	6,79E-01	4,59E-01	0,00E+00	9,24E+02	0,00E+00	9,24E+02	0,00E+00	1,05E-01	1,43E+00	1,42E-02	1,55E+00	-7,94E-01
GWP - fossil [kg CO2 eq.]	9,59E+02	4,43E+01	2,20E-02	3,32E-01	4,46E+01	6,69E-01	2,78E-01	0,00E+00	9,12E+02	0,00E+00	9,12E+02	0,00E+00	1,01E-01	1,43E+00	1,41E-02	1,54E+00	-1,45E+00
GWP - biogenic [kg CO2 eq.]	8,72E+00	-8,85E-01	7,77E-04	3,08E-02	-8,53E-01	7,75E-03	1,80E-01	0,00E+00	9,38E+00	0,00E+00	9,38E+00	0,00E+00	3,56E-03	1,05E-03	3,99E-05	4,65E-03	6,54E-01
GWP - luluc [kg CO2 eq.]	3,12E+00	9,94E-02	2,26E-04	1,03E-03	1,01E-01	2,14E-03	9,73E-04	0,00E+00	3,01E+00	0,00E+00	3,01E+00	0,00E+00	1,04E-03	1,74E-04	3,93E-05	1,25E-03	-2,53E-03
ODP [kg CFC-11 eq.]	2,12E-08	4,36E-10	3,65E-15	1,93E-12	4,38E-10	7,80E-14	7,30E-13	0,00E+00	2,08E-08	0,00E+00	2,08E-08	0,00E+00	1,67E-14	2,63E-12	4,79E-14	2,69E-12	-8,56E-12
AP [Mole of H+ eq.]	2,34E+00	3,30E-01	3,01E-05	1,18E-03	3,31E-01	8,80E-03	7,09E-04	0,00E+00	2,00E+00	0,00E+00	2,00E+00	0,00E+00	1,38E-04	6,79E-04	8,45E-05	9,02E-04	-3,31E-03
EP - freshwater [kg P eq.]	2,24E-03	2,73E-04	5,92E-08	2,95E-07	2,74E-04	6,74E-07	6,10E-06	0,00E+00	1,95E-03	0,00E+00	1,95E-03	0,00E+00	2,71E-07	3,77E-07	7,02E-06	7,67E-06	-8,14E-06
EP - marine [kg N eq.]	5,22E-01	3,83E-02	1,21E-05	2,57E-04	3,86E-02	3,71E-03	3,77E-04	0,00E+00	4,79E-01	0,00E+00	4,79E-01	0,00E+00	5,55E-05	2,12E-04	1,86E-05	2,86E-04	-1,02E-03
EP - terrestrial [Mole of N eq.]	5,83E+00	4,11E-01	1,25E-04	2,78E-03	4,14E-01	4,06E-02	3,19E-03	0,00E+00	5,37E+00	0,00E+00	5,37E+00	0,00E+00	5,74E-04	2,75E-03	2,02E-04	3,53E-03	-1,05E-02
POCP [kg NMVOC eq.]	1,32E+00	1,21E-01	2,72E-05	7,67E-04	1,22E-01	1,01E-02	5,85E-04	0,00E+00	1,19E+00	0,00E+00	1,19E+00	0,00E+00	1,25E-04	6,41E-04	5,86E-05	8,24E-04	-3,05E-03
ADPE [kg Sb eq.]	6,06E-03	5,87E-03	1,46E-09	2,25E-08	5,87E-03	2,53E-08	1,86E-07	0,00E+00	1,90E-04	0,00E+00	1,90E-04	0,00E+00	6,69E-09	2,70E-08	9,58E-10	3,46E-08	-1,79E-07
ADPF [MJ]	1,92E+04	6,10E+02	2,82E-01	3,56E+00	6,14E+02	8,05E+00	3,65E+00	0,00E+00	1,86E+04	0,00E+00	1,86E+04	0,00E+00	1,29E+00	2,22E+00	2,33E-01	3,74E+00	-1,84E+01
WDP [m³ world equiv.]	2,40E+02	1,12E+01	1,00E-04	1,01E-01	1,13E+01	1,80E-03	3,76E-02	0,00E+00	2,29E+02	0,00E+00	2,29E+02	0,00E+00	4,60E-04	1,61E-01	1,73E-03	1,64E-01	-1,01E-01

Note: All the values have been shortened to 2 decimal places, resulting in a very small rounding difference - compared to the original total value - which stands in the row "Total (Excl. D)"

Table 13: Results indicators describing resource use, waste categories, and output flows per unit of product.

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C4	D
PERE [MJ]	1,29E+04	1,76E+02	2,12E-02	1,16E+00	1,77E+02	2,26E-01	1,09E+00	0,00E+00	1,27E+04	0,00E+00	1,27E+04	0,00E+00	9,72E-02	1,23E+00	3,88E-02	1,37E+00	-1,58E+01
PERM [MJ]	8,28E+00	8,28E+00	0,00E+00	0,00E+00	8,28E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT [MJ]	1,29E+04	1,84E+02	2,12E-02	1,16E+00	1,85E+02	2,26E-01	1,09E+00	0,00E+00	1,27E+04	0,00E+00	1,27E+04	0,00E+00	9,72E-02	1,23E+00	3,88E-02	1,37E+00	-1,58E+01
PENRE [MJ]	1,92E+04	5,82E+02	2,82E-01	3,56E+00	5,86E+02	8,05E+00	3,65E+00	0,00E+00	1,86E+04	0,00E+00	1,86E+04	0,00E+00	1,29E+00	2,22E+00	2,33E-01	3,74E+00	-1,86E+00
PENRM [MJ]	2,83E+01	2,83E+01	0,00E+00	0,00E+00	2,83E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,66E+01
PENRT [MJ]	1,92E+04	6,10E+02	2,82E-01	3,56E+00	6,14E+02	8,05E+00	3,65E+00	0,00E+00	1,86E+04	0,00E+00	1,86E+04	0,00E+00	1,29E+00	2,22E+00	2,33E-01	3,74E+00	-1,84E+01
SM [kg]	2,33E-01	2,33E-01	0,00E+00	0,00E+00	2,33E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-3,16E-01
RSF [MJ]	2,26E-01	0,00E+00	1,49E-02	0,00E+00	1,49E-02	1,40E-01	2,45E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,84E-02	0,00E+00	0,00E+00	6,84E-02	0,00E+00
NRSF [MJ]	8,41E+00	0,00E+00	2,34E-01	0,00E+00	2,34E-01	7,06E+00	3,85E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,07E+00	0,00E+00	0,00E+00	1,07E+00	0,00E+00
FW [m3]	1,03E+01	4,52E-01	1,05E-05	2,41E-03	4,54E-01	1,32E-04	2,46E-03	0,00E+00	9,88E+00	0,00E+00	9,88E+00	0,00E+00	4,80E-05	4,23E-03	5,07E-05	4,33E-03	-4,48E-03
HWD [kg]	2,50E-05	5,97E-07	1,13E-11	2,90E-09	5,99E-07	2,94E-10	6,10E-08	0,00E+00	2,43E-05	0,00E+00	2,43E-05	0,00E+00	5,17E-11	2,25E-09	5,20E-11	2,36E-09	-8,42E-08
NHWD [kg]	1,71E+01	1,94E+00	3,93E-05	1,56E-02	1,96E+00	8,06E-04	5,23E-02	0,00E+00	1,44E+01	0,00E+00	1,44E+01	0,00E+00	1,80E-04	1,99E-01	4,87E-01	6,86E-01	-2,95E-02
RWD [kg]	2,96E+00	2,32E-02	5,31E-07	9,02E-05	2,32E-02	1,14E-05	9,89E-05	0,00E+00	2,94E+00	0,00E+00	2,94E+00	0,00E+00	2,43E-06	1,28E-04	3,35E-06	1,34E-04	-8,08E-04
CRU [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR [kg]	8,03E-01	1,73E-02	0,00E+00	4,37E-02	6,10E-02	0,00E+00	4,54E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,88E-01	0,00E+00	2,88E-01	0,00E+00
MER [kg]	8,61E-01	0,00E+00	0,00E+00	2,08E-02	2,08E-02	0,00E+00	5,42E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,86E-01	0,00E+00	7,86E-01	0,00E+00
EEE [MJ]	2,31E+00	1,80E-03	0,00E+00	0,00E+00	1,80E-03	0,00E+00	1,44E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,16E+00	0,00E+00	2,16E+00	-9,38E-02
EET [MJ]	5,00E+00	4,17E-03	0,00E+00	0,00E+00	4,17E-03	0,00E+00	2,28E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,77E+00	0,00E+00	4,77E+00	-2,17E-01
Biog. C in product [kg C]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biog. C in packaging [kg C]	0,00E+00	-2,37E-01	0,00E+00	0,00E+00	-2,37E-01	0,00E+00	2,37E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Note: All the values have been shortened to 2 decimal places, resulting in a very small rounding difference - compared to the original total value - which stands in the row "Total (Excl. D)"

Table 14: Additional environmental impact indicators per unit of product

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C7	D
PM [Disease incidences]	2,01E-05	3,34E-06	2,84E-10	1,60E-08	3,36E-06	2,28E-07	5,20E-09	0,00E+00	1,65E-05	0,00E+00	1,65E-05	0,00E+00	1,30E-09	8,65E-09	8,81E-10	1,08E-08	-4,65E-08
IRP [kBq. U235 eq.]	4,87E+02	2,53E+00	7,63E-05	5,69E-03	2,53E+00	1,60E-03	1,62E-02	0,00E+00	4,85E+02	0,00E+00	4,85E+02	0,00E+00	3,50E-04	1,34E-02	4,49E-04	1,42E-02	-1,29E-01
ETP-fw [CTUe]	3,50E+03	3,51E+02	3,66E-01	5,29E-01	3,52E+02	7,38E+00	1,10E+00	0,00E+00	3,14E+03	0,00E+00	3,14E+03	0,00E+00	1,68E+00	7,27E-01	4,95E-01	2,90E+00	-3,47E+00
HTP-c [CTUh]	3,09E-07	1,27E-08	4,94E-12	7,05E-11	1,28E-08	1,07E-10	4,99E-11	0,00E+00	2,96E-07	0,00E+00	2,96E-07	0,00E+00	2,26E-11	7,85E-11	6,88E-12	1,08E-10	-1,09E-09
HTP-nc [CTUh]	6,75E-06	4,99E-07	2,76E-10	1,18E-09	5,00E-07	3,59E-09	4,09E-09	0,00E+00	6,23E-06	0,00E+00	6,23E-06	0,00E+00	1,26E-09	5,23E-09	1,26E-10	6,62E-09	-5,91E-09
SQP [dimensionsless]	7,77E+03	3,09E+02	1,24E-01	5,63E-01	3,09E+02	1,18E+00	4,23E+00	0,00E+00	7,45E+03	0,00E+00	7,45E+03	0,00E+00	5,70E-01	8,92E-01	3,64E-02	1,50E+00	-7,30E+01

Note: All the values have been shortened to 2 decimal places, resulting in a very small rounding difference - compared to the original total value - which stands in the row "Total (Excl. D)"

4.4 Data comparison

The environmental profile especially for use stage B6 is very sensitive to the region of input electricity which relies on in which country the luminaires are used. Table 16 (per FU) and Table 17 (per product unit) give a comparison for Global Warming Potential GWP total [kg CO2 eq.] of reference product for use stage B6 with electricity used from different countries of Europe. Table 15: Scaling factor of use stage B6 for GWP total of energy grid mixes for different countries shows the scaling factor for GWP total of energy grid mixes for different countries.

For example:

For the reference product 0046427A, multiply "GWP Total" B6 for EU (4,43E+01/functional unit) with Scaling factor for B6 for Belgium (0.507), The "GWP Total" result for B6 for Belgium (2,25E+01) per functional unit can be worked out.

For other concerned models, first step, need to work out the GWP total of B6 for EU per functional unit or unit of product, based on the extrapolation rules provided in chapter 5 of this report, then by the same way provided above, the GWP total of B6 for different countries can be worked out.

Table 15: Scaling factor of use stage B6 for GWP total of energy grid mixes for different countries

Electricity grid	Scaling Factor for use stage
EU	1.000
AUSTRIA	0,784
BELGIUM	0,507
DENMARK	0,584
FINLAND	0,507
FRANCE	0,250
GERMANY	1,442
HUNGARY	1,016
IRELAND	1,255
ITALY	1,245
NETHERLANDS	1,141
NORWAY	0,147
POLAND	2,668
PORTUGUAL	0,786
ROMANIA	1,165
SPAN	0,740
SWEDEN	0,153
SWITZERLAND	0,430
UK	0,813

Table 16: GWP total [kg CO2 eq.] results for use stage B6 for different country per functional unit (0.102 kg product incl. packaging)

Electricity grid	GWP - total [kg CO2 eq.] B6
EU	4,43E+01
AUSTRIA	3,48E+01
BELGIUM	2,25E+01
DENMARK	2,59E+01
FINLAND	2,25E+01
FRANCE	1,11E+01
GERMANY	6,39E+01
HUNGARY	4,50E+01
IRELAND	5,56E+01
ITALY	5,52E+01
NETHERLANDS	5,05E+01
NORWAY	6,51E+00
POLAND	1,18E+02
POTUGAL	3,48E+01
ROMANIA	5,16E+01
SPAIN	3,28E+01
SWEDEN	6,79E+00
SWITZERLAND	1,91E+01
UK	3,60E+01

Note: The result in this table would be slightly different due to rounding inaccuracies.

Table 17: GWP total [kg CO2 eq.] results for use stage B6 for different country per unit of product

Electricity grid	GWP - total [kg CO2 eq.] B6
EU	9,24E+02
AUSTRIA	7,25E+02
BELGIUM	4,68E+02
DENMARK	5,40E+02
FINLAND	4,69E+02
FRANCE	2,31E+02
GERMANY	1,33E+03
HUNGARY	9,39E+02
IRELAND	1,16E+03
ITALY	1,15E+03
NETHERLANDS	1,05E+03
NORWAY	1,36E+02
POLAND	2,47E+03
POTUGAL	7,26E+02
ROMANIA	1,08E+03
SPAIN	6,84E+02
SWEDEN	1,42E+02
SWITZERLAND	3,97E+02
UK	7,52E+02

Note: The result in this table would be slightly different due to rounding inaccuracies.

4.5 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 very good (DQR = 1.66).

The individual rating for technological, time and geographical representativeness is assessed as very good, excellent and good (DQR = 1,97; 1,00 and 2,02).

5 Extrapolation rules

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

Table 18: Reference values for the extrapolations.

Parameter	Unit	Reference value
Weight of structural/ mechanical parts	kg	1,304
Weight of power equipment	kg	0,109
Weight of light source	kg	0,104
Weight of light management system	kg	0,045
Weight of product (excl. packaging)	kg	1,562
Weight of packaging	kg	0,561
Weight of product (incl. packaging)	kg	2,123
Typical power consumption	W	52,5
Lumen output	lm	7300
Energy saving	-	0,55

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

$$Extrapolation\ coefficient\ at\ the\ product\ level\ x\ \frac{Lighting\ output\ of\ reference\ product\ (lumen)}{Lighting\ output\ of\ product\ concerned\ (lumen)}$$

Lighting output of each product variant and other important properties are listed in the tables below.

Table 19: 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)	Energy saving coefficient
0046425	START Waterproof Slim 600 IP66 1400/2550lm 840	18,5	2550	0,609	0,212	0,079	0,0349	0,000	0,936	1
0046426	START Waterproof Slim 1200 IP66 2300/4650lm 840	34,5	4650	1,071	0,438	0,082	0,0769	0,000	1,668	1
0046427	START Waterproof Slim 1500 IP66 3800/7300lm 840	52,5	7300	1,304	0,549	0,109	0,1042	0,000	2,066	1
0046428	START WATERPROOF SLIM 1200 IP66 4300LM 865	34,5	4300	1,071	0,438	0,082	0,0769	0,000	1,668	1
0046429	START Waterproof Slim 1500 IP66 3800/7300lm 840	52,5	7300	1,304	0,549	0,109	0,1042	0,000	2,066	1

Table 20: Information for product family: Microwave (MW)

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)	Energy saving coefficient
0046425A	START Waterproof Slim 600 IP66 1400/2550lm 840 MW	18,5	2550	0,609	0,224	0,079	0,0349	0,045	0,993	0,55
0046426A	START Waterproof Slim 1200 IP66 2300/4650lm 840 MW	34,5	4650	1,071	0,450	0,082	0,0769	0,045	1,725	0,55
0046427A	START Waterproof Slim 1500 IP66 3800/7300lm 840 MW	52,5	7300	1,304	0,561	0,109	0,1042	0,045	2,123	0,55
0046428A	START WATERPROOF SLIM 1200 IP66 4300LM 865 MW	34,5	4300	1,071	0,450	0,082	0,0769	0,045	1,725	0,55
0046429A	START Waterproof Slim 1500 IP66 3800/7300lm 840 MW	52,5	7300	1,304	0,561	0,109	0,1042	0,045	2,123	0,55

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

Table 21: Extrapolation coefficients at product level for: Non dimmable

Product code	Product name	Power (W)	Lighting output (lm)	Manufacturing stage (A1-A3)	Distribution stage (A4)	Installation stage (A5)	Use stage (B6)	EOL stage (C1 to C4)	Benefits stage (D)
0046425	START Waterproof Slim 600 IP66 1400/2550lm 840	18,5	2550	0,46	0,44	0,38	0,64	0,46	0,46
0046426	START Waterproof Slim 1200 IP66 2300/4650lm 840	34,5	4650	0,80	0,79	0,78	1,19	0,79	0,80
0046427	START Waterproof Slim 1500 IP66 3800/7300lm 840	52,5	7300	0,99	0,97	0,98	1,82	0,97	0,99
0046428	START WATERPROOF SLIM 1200 IP66 4300LM 865	34,5	4300	0,80	0,79	0,78	1,19	0,79	0,80
0046429	START Waterproof Slim 1500 IP66 3800/7300lm 840	52,5	7300	0,99	0,97	0,98	1,82	0,97	0,99

Table 22: Extrapolation coefficients at product level for DALI (DA)

Product code	Product name	Power (W)	Lighting output (lm)	Manufacturing stage (A1-A3)	Distribution stage (A4)	Installation stage (A5)	Use stage (B6)	EOL stage (C1 to C4)	Benefits stage (D)
0046425A	START Waterproof Slim 600 IP66 1400/2550lm 840 MW	18,5	2550	0,49	0,47	0,40	0,35	0,49	0,49
0046426A	START Waterproof Slim 1200 IP66 2300/4650lm 840 MW	34,5	4650	0,81	0,81	0,80	0,66	0,82	0,81
0046427A	START Waterproof Slim 1500 IP66 3800/7300lm 840 MW	52,5	7300	1,00	1,00	1,00	1,00	1,00	1,00
0046428A	START WATERPROOF SLIM 1200 IP66 4300LM 865 MW	34,5	4300	0,81	0,81	0,80	0,66	0,82	0,81
0046429A	START Waterproof Slim 1500 IP66 3800/7300lm 840 MW	52,5	7300	1,00	1,00	1,00	1,00	1,00	1,00

For better understanding: Here is a short explanation:

Non dimmable Without dimming function, only power “On” and “Off”

Microwave (MW) Work with presence and luminous detecting sensor (based on microwave)