




# Product Environmental Profile

## EPD according to ISO 14025

### Floodlight FL11

Registration number	SITE-00003-V01.01-EN	Drafting rules	PEP-PCR-ED4-EN-2021 09 06
Verifier accreditation number	VH45	Supplemented by	PSR-0014-ED2.0-EN- 2023 07 13
Date of issue	15.05.2024	Validity period	5 years
EPD prepared by	Sphera Solutions 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 Product information

The Floodlight FL 11 maxi pro (5XA779127Q01AA) is a luminaire with primary light control with lens of Polymethylmethacrylate (PMMA). The primary optical cover is made of transparent glass, whereas the housing is made of a powder coated diecast aluminium.

The light distribution type is RS04 with an asymmetric direct light distribution. The light source of the luminaire is a high power LED with a rated luminous flux of 189.880 lm and a luminous efficiency of 133 lm/W. The luminaire can be controlled remotely via DALI2. It is preprogrammed in the workshop. With optional accessories a control by means of Zhaga and Casambi is possible. The luminaire is powered by cable with a nominal operating voltage between 220 and 240 V or between 380 and 400V.

The product bears the CE-marking, is ENEC, VDE certified, and can be used for outdoor applications at ambient temperature between -40 and +30°C.

Table 1 summarizes the key technological data of the analyzed product.

**Table 1: Key technological data**

Information	Unit	
Product code	-	5XA779127Q01AA
Light source	-	LED
Power supply	-	50/60 Hz
Colour temperature	K	5,000
Protection index for water and dust (IP)	-	66
Impact resistance index (IK)	-	07
Nominal operating voltage	V	220 – 240 / 380 - 400
Declared lifetime of the luminaire (L96B10)	Hours	75,000
Declaration lifetime of the light source	Hours	75,000
Useful output flux	Lumen	189880
Electrical input power (Nominal power)	W	1428
Electrical input power (Typical power)	W	563
Luminous efficiency	Lumen/W	133
Length	mm	1002
Width/Diameter	mm	655
Height	mm	346
Reference use scenario	-	Outdoor application

Based on the declared lifetime of the luminaire and the average annual operating hours by the selected building type according to EN 13201-5:2016, the luminaire has the following annual service time:

**Table 2: Use scenario**

Type of building	Annual operating hours by default	Operational lifetime (years)
Outdoor application (urban / tunnel / zone, open space)	75,000	18.75

Following the requirements of the PSR, the operational lifetime is 18.75 years.

## 1.2 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*	0.0025 pieces
Life cycle stages covered	Cradle-to-grave and Module D
Product category according to PSR	Luminaires
Product family name	Floodlight FL 11
All products of the product family (Each entry stands for a cluster of variants; "****" is a placeholder for different product codes)  (Values on power consumption refer to 50% of the nominal power)	<p><b>5XA779127Q01AA (reference product)</b></p> <p>5XA779?1*** mx: [250-312W] [58213-72455lm]                      5XA779?1*** mx: [250-312W] [72456-90184lm]                      5XA779?1*** mx: [250-312W] [90185-112250lm]                      5XA779?1*** mx: [250-312W] [112251-139715lm]                      5XA779?1*** mx: [313-395W] [60000-75718lm]                      5XA779?1*** mx: [313-395W] [75719-95555lm]                      5XA779?1*** mx: [313-395W] [95556-120589lm]                      5XA779?1*** mx: [313-395W] [120590-152182lm]                      5XA779?1*** mx: [313-395W] [152183-192051lm]                      5XA779?1*** mx: [396-536W] [68229-92309lm]                      5XA779?1*** mx: [396-536W] [92310-124890lm]                      5XA779?1*** mx: [396-536W] [124891-168970lm]                      5XA779?1*** mx: [396-536W] [168971-228607lm]</p> <p>5XA779?2*** mxpro: [344-466W] [99722-134918lm]                      5XA779?2*** mxpro: [344-466W] [134919-182537lm]                      5XA779?2*** mxpro: [467-580W] [120000-149036lm]                      5XA779?2*** mxpro: [467-580W] [149037-185099lm]                      5XA779?2*** mxpro: [467-580W] [185100-229888lm]                      5XA779?2*** mxpro: [581-786W] [100595-136099lm]                      5XA779?2*** mxpro: [581-786W] [136100-184135lm]                      5XA779?2*** mxpro: [581-786W] [184136-249125lm]</p>
Extrapolation rules	The tables in the last section provide information about the used extrapolation rules and the resulting extrapolation factors according to the applied PSR.

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 product correspond to:

$$(1,000/189,880) \times (35,000/75,000) = 0.0025 \text{ pieces per functional unit}$$

## 2. Constituent materials

### 2.1 Overview

**Table 4: Packed product composition**

Information	Weight [in kg]	Share
Total Weight	36.63	100.0%
Product	30.01	81.9%
Packaging	6.62	18.1%
Accessories	0	0.0%

### 2.2 Product

**Table 5: Material composition - product**

Information	Weight [in kg]	Share
Total Weight	30.01	100.0%
Metal	17.61	58.7%
-Aluminium	16.72	55.7%
-Steel	0.89	3.0%
Glass	2.80	9.3%
Electronics	7.28	24.3%
Plastic	1.67	5.6%
-Polyester	0.44	1.5%
-PMMA	1.20	4.0%
-PA	0.01	<0.1%
-PE	0.07	0.2%
Adhesive/Sealant	0.30	1.0%
Other	0.15	0.5%
Electromechanicals	0.19	0.6%

### 2.3 Packaging

**Table 6: Material composition - packaging**

Information	Weight [in kg]	Share
Total Weight	6.62	100.0%
Cardboard	6.60	99.7%
Paper	0.02	0.3%

## 3. Information on life cycle stages

### 3.1 Manufacturing (A1-A3)

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Electronic components including the control gear are largely sourced from Asia, mechanical components from Europe. For higher wattages the production takes place in Eastern Europe. Other production steps at the Siteco factory in Traunreut (Germany) are the manufacturing of LED modules, plastic injection moulding of the lenses, painting of housing and final assembly, as well as parameterization of the product. The Siteco factory in Traunreut in Germany is ISO 9001 / 14001 / 45001 / 50001 certified.

Module A2 considers the transportation of the raw materials to Siteco's facility. Based on the location of the tier I suppliers, the scenarios given by the PCR have been used:

- International: 19.000 km Ship + 1.000 km Truck (diesel driven, EURO 0-6, >27t payload, 85% utilization)
- Intracontinental: 3.500 km Truck (diesel driven, EURO 0-6, >27t payload, 85% utilization)
- Local/domestic: 1.000 km Truck (diesel driven, EURO 0-6, >27t payload, 85% utilization)

### 3.2 Distribution (A4)

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The main market of the product is Europe with a special focus on the DACH region (Germany, Austria, Switzerland). For this reason, the transport distance has been calculated as weighted average based on sales statistics. As a result, intracontinental transport with 730 km by truck is considered.

The background assumptions for the transportation are listed below.

**Table 7: Background information distribution**

Information	Unit	Truck
Fuel type	-	Diesel
Fuel consumption	l/(kg*km)	1.99E-05
Total distance	km	730
Capacity utilisation (including empty runs)	%	85
Bulk density of transported products	kg/m <sup>3</sup>	n.a.
Volume capacity utilisation factor	-	n.a.

### 3.3 Installation (A5)

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The product is designed for simplified installation (i.e. only fixation with screws). No energy or material input is required. During installation, the product is unpacked and the packaging becomes waste. Siteco uses partnerships to get approximately 80% of these materials into recycling processes. The rest is sent to incineration processes with energy recovery. The LCA model used to calculate the environmental impacts follows these assumptions.

### 3.4 Use stage (B1-B6)

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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 operational electricity consumption over the entire lifetime of the product is 1440 kWh. It has been calculated according to PSR edition 2. Since the main market of the product is the DACH region, the calculations consider a mix of the average German national grid mix (70% as proxy for the DACH region) and an average European grid mix (30%).

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

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The product falls under the Waste from Electrical and Electronic Equipment (WEEE) directive 2012/19/EU subcategory 4. Primary data on the treatment of the product has been used. The EoL scenario displays an European average and is the following:

- Incineration without energy recovery: 5%
- Incineration with energy recovery: 5%
- Landfilling: 5%
- Recycling<sup>1</sup>: 85%

No environmental burdens for the deinstallation of the product (C1) are considered, since it can be deconstructed manually.

The End-of-life (EoL) stage uses a default distance for the shipment of collected waste to approved treatment centers of 100 km by truck (diesel driven, EURO 0-6, >27t payload, 85% utilization) according to the PSR (C2).

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

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Incineration with energy recovery and recycling of the product and packaging generates environmental benefits by avoiding the production of primary materials or energy. The amount and types of waste streams from the product and packaging are listed in Table 8.

**Table 8: 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	6.12E-02
- Share from product	%	78
- Share from packaging	%	22
Total weight going into incineration with energy recovery	kg/functional unit	1.42E-02
- Share from product	%	77

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<sup>1</sup> The recycling scenario for the product excl. packaging considers recycling processes for all metals and incineration with energy recovery for all other material groups.

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- Share from packaging	%	23
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# 4. Environmental impacts

## 4.1 Introduction

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

**Table 9: Basic information LCA model**

Information	Value
Used LCA software	LCA for Experts 10
Used LCI database	Sphera Managed LCA Content Professional 2023.2 + Extension 2023.2
PCR version	PEP-PCR-ED4-EN-2021 09 06
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 10: Core environmental impact result indicators per functional unit (0.09 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	B6	C2	C3	C4	D
GWP - total [kg CO <sub>2</sub> eq.]	2.19E+01	4.03E-01	2.14E-02	-1.48E-02	3.97E-03	1.33E-02	2.14E+01	4.45E-04	2.15E-02	1.50E-03	-1.11E-01
GWP - fossil [kg CO <sub>2</sub> eq.]	2.16E+01	4.02E-01	2.12E-02	1.32E-02	3.92E-03	7.12E-03	2.12E+01	4.40E-04	2.15E-02	1.50E-03	-1.10E-01
GWP - biogenic [kg CO <sub>2</sub> eq.]	2.48E-01	7.97E-04	4.19E-05	-2.81E-02	8.99E-06	6.15E-03	2.69E-01	1.01E-06	1.31E-05	2.04E-06	-1.06E-03
GWP - luluc [kg CO <sub>2</sub> eq.]	3.74E-03	3.46E-04	1.53E-04	6.32E-05	3.68E-05	2.23E-05	3.12E-03	4.13E-06	6.89E-07	5.23E-07	-1.04E-04
ODP [kg CFC-11 eq.]	5.37E-10	1.86E-12	2.48E-15	2.26E-13	5.17E-16	1.44E-14	5.35E-10	5.80E-17	2.86E-14	3.54E-15	-3.65E-13
AP [Mole of H+ eq.]	3.84E-02	2.63E-03	1.41E-04	7.06E-05	4.63E-06	1.37E-05	3.55E-02	5.20E-07	9.22E-06	2.12E-06	-9.16E-04
EP - freshwater [kg P eq.]	1.18E-04	2.05E-06	6.13E-08	4.87E-07	1.45E-08	2.07E-07	1.15E-04	1.63E-09	7.67E-09	1.70E-09	-3.16E-07
EP - marine [kg N eq.]	1.11E-02	3.10E-04	5.12E-05	3.16E-05	1.55E-06	6.12E-06	1.07E-02	1.74E-07	3.20E-06	7.00E-07	-8.16E-05
EP - terrestrial [Mole of N eq.]	1.15E-01	3.33E-03	5.66E-04	3.13E-04	1.83E-05	5.82E-05	1.11E-01	2.05E-06	4.18E-05	8.01E-06	-8.72E-04
POCP [kg NMVOC eq.]	2.75E-02	1.00E-03	1.37E-04	8.32E-05	4.04E-06	1.25E-05	2.63E-02	4.53E-07	8.41E-06	1.94E-06	-3.00E-04
ADPE [kg Sb eq.]	8.13E-05	7.76E-05	1.14E-09	4.61E-09	2.64E-10	3.17E-09	3.72E-06	2.95E-11	2.21E-10	3.18E-11	-2.01E-05
ADPF [MJ]	3.41E+02	5.45E+00	2.85E-01	2.00E-01	5.41E-02	9.99E-02	3.35E+02	6.07E-03	4.42E-02	6.96E-03	-1.45E+00
WDP [m <sup>3</sup> world equiv.]	1.72E+00	1.08E-01	2.07E-04	2.59E-03	4.80E-05	7.66E-04	1.60E+00	5.38E-06	3.20E-03	5.22E-04	-2.71E-02

**Table 11: Result indicators describing resource use, waste categories, and output flows per functional unit (0.09 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	B6	C2	C3	C4	D
PERE [MJ]	2.80E+02	1.91E+00	1.66E-02	3.89E-01	3.94E-03	8.20E-02	2.78E+02	4.42E-04	1.73E-02	2.18E-03	-1.05E+00
PERM [MJ]	2.58E-01	2.73E-02	0.00E+00	2.86E-01	0.00E+00	-5.48E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT [MJ]	2.81E+02	1.94E+00	1.66E-02	6.75E-01	3.94E-03	2.71E-02	2.78E+02	4.42E-04	1.73E-02	2.18E-03	-1.05E+00
PENRE [MJ]	3.41E+02	5.26E+00	2.86E-01	2.00E-01	5.43E-02	1.00E-01	3.35E+02	6.09E-03	3.01E-01	6.96E-03	-1.45E+00
PENRM [MJ]	-6.95E-02	1.87E-01	0.00E+00	-3.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.56E-01	0.00E+00	0.00E+00
PENRT [MJ]	3.41E+02	5.45E+00	2.86E-01	2.00E-01	5.43E-02	1.00E-01	3.35E+02	6.09E-03	4.42E-02	6.96E-03	-1.45E+00
SM [kg]	4.28E-02	3.63E-02	0.00E+00	6.43E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.56E-02
RSF [MJ]	3.23E-03	0.00E+00	0.00E+00	0.00E+00	2.91E-03	0.00E+00	0.00E+00	3.26E-04	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	5.07E-02	0.00E+00	0.00E+00	0.00E+00	4.56E-02	0.00E+00	0.00E+00	5.11E-03	0.00E+00	0.00E+00	0.00E+00
FW [m3]	1.31E-01	3.41E-03	1.82E-05	1.39E-04	4.32E-06	1.21E-04	1.27E-01	4.84E-07	8.10E-05	1.29E-05	-1.17E-03
HWD [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
NHWD [kg]	1.90E-08	6.40E-08	8.89E-13	4.11E-09	1.68E-13	3.61E-09	-5.28E-08	1.89E-14	3.96E-13	8.99E-14	-1.00E-08
RWD [kg]	3.45E-01	4.37E-02	3.99E-05	7.91E-04	8.28E-06	4.19E-04	2.87E-01	9.29E-07	3.29E-03	1.00E-02	-1.60E-02
CRU [kg]	3.95E-02	2.03E-04	4.93E-07	8.17E-06	1.02E-07	2.34E-06	3.93E-02	1.14E-08	3.68E-06	3.92E-07	-5.63E-05
MFR [kg]	5.84E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-02	0.00E+00	0.00E+00	4.52E-02	0.00E+00	0.00E+00
MER [kg]	1.70E-02	0.00E+00	0.00E+00	7.21E-04	0.00E+00	3.31E-03	0.00E+00	0.00E+00	1.29E-02	0.00E+00	0.00E+00
EEE [MJ]	3.90E-02	3.58E-04	0.00E+00	1.38E-03	0.00E+00	5.98E-03	0.00E+00	0.00E+00	3.13E-02	0.00E+00	0.00E+00
EET [MJ]	9.06E-02	8.30E-04	0.00E+00	3.23E-03	0.00E+00	1.39E-02	0.00E+00	0.00E+00	7.26E-02	0.00E+00	0.00E+00
Biog. C in product [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
Biog. C in packaging [kg]	-5.69E-03	-3.19E-04	0.00E+00	-6.80E-03	0.00E+00	1.42E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: Full forms of the acronyms can be found in the annex.

### 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 section 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: Core environmental impact result 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 CO <sub>2</sub> eq.]	8.75E+03	1.61E+02	8.57E+00	-5.91E+00	1.59E+00	5.32E+00	8.57E+03	1.78E-01	8.60E+00	6.01E-01	-4.44E+01
GWP - fossil [kg CO <sub>2</sub> eq.]	8.65E+03	1.61E+02	8.49E+00	5.30E+00	1.57E+00	2.85E+00	8.46E+03	1.76E-01	8.60E+00	6.00E-01	-4.39E+01
GWP - biogenic [kg CO <sub>2</sub> eq.]	9.90E+01	3.19E-01	1.68E-02	-1.12E+01	3.60E-03	2.46E+00	1.07E+02	4.03E-04	5.25E-03	8.15E-04	-4.25E-01
GWP - luluc [kg CO <sub>2</sub> eq.]	1.50E+00	1.38E-01	6.10E-02	2.53E-02	1.47E-02	8.92E-03	1.25E+00	1.65E-03	2.76E-04	2.09E-04	-4.16E-02
ODP [kg CFC-11 eq.]	2.15E-07	7.44E-10	9.93E-13	9.05E-11	2.07E-13	5.74E-12	2.14E-07	2.32E-14	1.14E-11	1.42E-12	-1.46E-10

AP [Mole of H+ eq.]	1.54E+01	1.05E+00	5.64E-02	2.82E-02	1.85E-03	5.46E-03	1.42E+01	2.08E-04	3.69E-03	8.49E-04	-3.66E-01
EP - freshwater [kg P eq.]	4.73E-02	8.19E-04	2.45E-05	1.95E-04	5.81E-06	8.26E-05	4.62E-02	6.52E-07	3.07E-06	6.79E-07	-1.27E-04
EP - marine [kg N eq.]	4.43E+00	1.24E-01	2.05E-02	1.26E-02	6.21E-04	2.45E-03	4.27E+00	6.96E-05	1.28E-03	2.80E-04	-3.27E-02
EP - terrestrial [Mole of N eq.]	4.60E+01	1.33E+00	2.26E-01	1.25E-01	7.32E-03	2.33E-02	4.42E+01	8.20E-04	1.67E-02	3.20E-03	-3.49E-01
POCP [kg NMVOC eq.]	1.10E+01	4.02E-01	5.46E-02	3.33E-02	1.62E-03	4.99E-03	1.05E+01	1.81E-04	3.37E-03	7.75E-04	-1.20E-01
ADPE [kg Sb eq.]	3.25E-02	3.10E-02	4.55E-07	1.84E-06	1.05E-07	1.27E-06	1.49E-03	1.18E-08	8.85E-08	1.27E-08	-8.05E-03
ADPF [MJ]	1.36E+05	2.18E+03	1.14E+02	7.99E+01	2.17E+01	4.00E+01	1.34E+05	2.43E+00	1.77E+01	2.78E+00	-5.80E+02
WDP [m³ world equiv.]	6.86E+02	4.34E+01	8.29E-02	1.04E+00	1.92E-02	3.06E-01	6.40E+02	2.15E-03	1.28E+00	2.09E-01	-1.09E+01

Table 13: Result 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	B6	C2	C3	C4	D
PERE [MJ]	1.12E+05	7.64E+02	6.64E+00	1.56E+02	1.58E+00	3.28E+01	1.11E+05	1.77E-01	6.92E+00	8.71E-01	-4.19E+02
PERM [MJ]	1.03E+02	1.09E+01	0.00E+00	1.14E+02	0.00E+00	-2.19E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT [MJ]	1.12E+05	7.75E+02	6.64E+00	2.70E+02	1.58E+00	1.09E+01	1.11E+05	1.77E-01	6.92E+00	8.71E-01	-4.19E+02
PENRE [MJ]	1.36E+05	2.11E+03	1.14E+02	8.01E+01	2.17E+01	4.00E+01	1.34E+05	2.44E+00	1.20E+02	2.79E+00	-5.81E+02
PENRM [MJ]	-2.78E+01	7.49E+01	0.00E+00	-1.44E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.03E+02	0.00E+00	0.00E+00
PENRT [MJ]	1.36E+05	2.18E+03	1.14E+02	8.00E+01	2.17E+01	4.00E+01	1.34E+05	2.44E+00	1.77E+01	2.79E+00	-5.81E+02
SM [kg]	1.71E+01	1.45E+01	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.22E+01
RSF [MJ]	1.29E+00	0.00E+00	0.00E+00	0.00E+00	1.16E+00	0.00E+00	0.00E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	2.03E+01	0.00E+00	0.00E+00	0.00E+00	1.82E+01	0.00E+00	0.00E+00	2.05E+00	0.00E+00	0.00E+00	0.00E+00
FW [m3]	5.22E+01	1.37E+00	7.29E-03	5.56E-02	1.73E-03	4.82E-02	5.07E+01	1.93E-04	3.24E-02	5.18E-03	-4.68E-01
HWD [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
NHWD [kg]	7.59E-06	2.56E-05	3.56E-10	1.64E-06	6.73E-11	1.44E-06	-2.11E-05	7.54E-12	1.58E-10	3.60E-11	-4.02E-06
RWD [kg]	1.38E+02	1.75E+01	1.60E-02	3.16E-01	3.31E-03	1.68E-01	1.15E+02	3.71E-04	1.32E+00	4.01E+00	-6.40E+00
CRU [kg]	1.58E+01	8.11E-02	1.97E-04	3.27E-03	4.07E-05	9.36E-04	1.57E+01	4.56E-06	1.47E-03	1.57E-04	-2.25E-02
MFR [kg]	2.34E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.30E+00	0.00E+00	0.00E+00	1.81E+01	0.00E+00	0.00E+00
MER [kg]	6.78E+00	0.00E+00	0.00E+00	2.88E-01	0.00E+00	1.32E+00	0.00E+00	0.00E+00	5.17E+00	0.00E+00	0.00E+00
EEE [MJ]	1.56E+01	1.43E-01	0.00E+00	5.50E-01	0.00E+00	2.39E+00	0.00E+00	0.00E+00	1.25E+01	0.00E+00	0.00E+00
EET [MJ]	3.62E+01	3.32E-01	0.00E+00	1.29E+00	0.00E+00	5.57E+00	0.00E+00	0.00E+00	2.90E+01	0.00E+00	0.00E+00
Biog. C in product [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
Biog. C in packaging [kg]	-2.28E+00	-1.28E-01	0.00E+00	-2.72E+00	0.00E+00	5.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: Full names of the acronyms can be found in the annex.

## 5. Extrapolation rules

The extrapolation coefficients included in the PEP Eco-passport have been developed according to the valid PCR & PSR. Table 14 shows the key properties of the reference product, function as extrapolation basis.

**Table 14: Reference values for the extrapolation**

Parameter	Unit	Reference product (5XA779127Q01AA)
Weight of structural/ mechanical parts	kg	22.54
Weight of power equipment	kg	5.93
Weight of light source	kg	1.54
Weight of light management system	kg	0
Weight of product (excl. packaging)	kg	30.01
Weight of packaging	kg	6.62
Typical power consumption	W	563
Lumen output	lm	189,880
Weight of product (incl. packaging)	kg	36.63

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

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

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

**Table 15: Extrapolation coefficients at the product level**

Product code	Fabrication stage	Distribution stage	Installation stage	Use stage	End of life stage
5XA779?1... mx: [250..312W] [58213..72455lm]	0.66	0.84	1.00	0.5 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [250..312W] [72456..90184lm]	0.66	0.84	1.00	0.5 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [250..312W] [90185..112250lm]	0.66	0.84	1.00	0.5 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [250..312W] [112251..139715lm]	0.66	0.84	1.00	0.5 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [313..395W] [60000..75718lm]	0.66	0.84	1.00	0.63 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [313..395W] [75719..95555lm]	0.66	0.84	1.00	0.63 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [313..395W] [95556..120589lm]	0.66	0.84	1.00	0.63 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [313..395W] [120590..152182lm]	0.66	0.84	1.00	0.63 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [313..395W] [152183..192051lm]	0.66	0.84	1.00	0.63 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [396..536W] [68229..92309lm]	0.66	0.84	1.00	0.83 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [396..536W] [92310..124890lm]	0.66	0.84	1.00	0.83 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [396..536W] [124891..168970lm]	0.66	0.84	1.00	0.83 x Lifetime of concerned product / 75,000	0.80
5XA779?1... mx: [396..536W] [168971..228607lm]	0.66	0.84	1.00	0.83 x Lifetime of concerned product / 75,000	0.80

5XA779?2... mxpro: [344..466W] [99722..134918lm]	0.82	1.00	1.00	0.72 x Lifetime of concerned product / 75,000	1.00
5XA779?2... mxpro: [344..466W] [134919..182537lm]	0.82	1.00	1.00	0.72 x Lifetime of concerned product / 75,000	1.00
5XA779?2... mxpro: [467..580W] [120000..149036lm]	0.82	1.00	1.00	0.93 x Lifetime of concerned product / 75,000	1.00
5XA779?2... mxpro: [467..580W] [149037..185099lm]	0.82	1.00	1.00	0.93 x Lifetime of concerned product / 75,000	1.00
5XA779?2... mxpro: [467..580W] [185100..229888lm]	0.82	1.00	1.00	0.93 x Lifetime of concerned product / 75,000	1.00
5XA779?2... mxpro: [581..786W] [100595..136099lm]	0.82	1.00	1.00	1.21 x Lifetime of concerned product / 75,000	1.00
5XA779?2... mxpro: [581..786W] [136100..184135lm]	0.82	1.00	1.00	1.21 x Lifetime of concerned product / 75,000	1.00
5XA779?2... mxpro: [581..786W] [184136..249125lm]	0.82	1.00	1.00	1.21 x Lifetime of concerned product / 75,000	1.00

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

**Table 16: Information about the product family**

Product Code	Weight of structural/mechanical parts	Weight of power equipment	Weight of light source	Weight of light management system	Weight of product (excl. packaging)	Weight of packaging	Typical power consumption	Lumen output	Weight of product (incl. packaging)
Unit	kg	kg	kg	kg	kg	kg	W	lm	kg
5XA779127Q01AA	22.54	5.93	1.54	0.00	30.01	6.62	563	189880	36.63
5XA779?1... mx: [250..312W] [58213..72455lm]	17.15	5.93	1.03	0.00	24.10	6.62	281	65334	30.72
5XA779?1... mx: [250..312W] [72456..90184lm]	17.15	5.93	1.03	0.00	24.10	6.62	281	81320	30.72
5XA779?1... mx: [250..312W] [90185..112250lm]	17.15	5.93	1.03	0.00	24.10	6.62	281	101218	30.72
5XA779?1... mx: [250..312W] [112251..139715lm]	17.15	5.93	1.03	0.00	24.10	6.62	281	125983	30.72
5XA779?1... mx: [313..395W] [60000..75718lm]	17.15	5.93	1.03	0.00	24.10	6.62	354	108800	30.72
5XA779?1... mx: [313..395W] [75719..95555lm]	17.15	5.93	1.03	0.00	24.10	6.62	354	85637	30.72
5XA779?1... mx: [313..395W] [95556..120589lm]	17.15	5.93	1.03	0.00	24.10	6.62	354	108073	30.72
5XA779?1... mx: [313..395W] [120590..152182lm]	17.15	5.93	1.03	0.00	24.10	6.62	354	136386	30.72
5XA779?1... mx: [313..395W] [152183..192051lm]	17.15	5.93	1.03	0.00	24.10	6.62	354	172117	30.72
5XA779?1... mx: [396..536W] [68229..92309lm]	17.15	5.93	1.03	0.00	24.10	6.62	466	80269	30.72
5XA779?1... mx: [396..536W] [92310..124890lm]	17.15	5.93	1.03	0.00	24.10	6.62	466	108600	30.72
5XA779?1... mx: [396..536W] [124891..168970lm]	17.15	5.93	1.03	0.00	24.10	6.62	466	146930	30.72
5XA779?1... mx: [396..536W] [168971..228607lm]	17.15	5.93	1.03	0.00	24.10	6.62	466	198789	30.72
5XA779?2... mxpro: [344..466W] [99722..134918lm]	22.54	5.93	1.54	0.00	30.01	6.62	405	117320	36.63
5XA779?2... mxpro: [344..466W] [134919..182537lm]	22.54	5.93	1.54	0.00	30.01	6.62	405	158728	36.63
5XA779?2... mxpro: [467..580W] [120000..149036lm]	22.54	5.93	1.54	0.00	30.01	6.62	524	134518	36.63
5XA779?2... mxpro: [467..580W] [149037..185099lm]	22.54	5.93	1.54	0.00	30.01	6.62	524	167068	36.63
5XA779?2... mxpro: [467..580W] [185100..229888lm]	22.54	5.93	1.54	0.00	30.01	6.62	524	207494	36.63
5XA779?2... mxpro: [581..786W] [100595..136099lm]	22.54	5.93	1.54	0.00	30.01	6.62	684	118347	36.63
5XA779?2... mxpro: [581..786W] [136100..184135lm]	22.54	5.93	1.54	0.00	30.01	6.62	684	160118	36.63
5XA779?2... mxpro: [581..786W] [184136..249125lm]	22.54	5.93	1.54	0.00	30.01	6.62	684	216630	36.63

# Annex

Indicator	Acronym [Unit]
Renewable primary energy (without raw material)	PERE [MJ]
Renewable primary energy (raw material)	PERM [MJ]
Total use of renewable primary energy	PERT [MJ]
Non-renewable primary energy (without raw material)	PENRE [MJ]
Non-renewable primary energy (raw material)	PENRM [MJ]
Total use of non-renewable primary energy	PENRT [MJ]
Use of secondary materials	SM [kg]
Use of renewable secondary fuels	RSF [MJ]
Use of non-renewable secondary fuels	NRSF [MJ]
Net use of fresh water	FW [m <sup>3</sup> ]
Hazardous waste disposed	HWD [kg]
Non-hazardous waste disposed	NHWD [kg]
Radioactive waste disposed	RWD [kg]
Components for reuse	CRU [kg]
Materials for recycling	MFR [kg]
Materials for energy recovery	MER [kg]
Exported electricity	EEE [MJ]
Exported thermal energy	EET [MJ]
Biogenic carbon content of the product	Biog. C in product [kg]
Biogenic carbon content of the associated packaging	Biog. C in packaging [kg]
Global Warming Potential, total	GWP - total [kg CO <sub>2</sub> eq.]
Global Warming Potential, fossil	GWP - fossil [kg CO <sub>2</sub> eq.]
Global Warming Potential, biogenic	GWP - biogenic [kg CO <sub>2</sub> eq.]
Global Warming Potential, land use and land use change	GWP - luluc [kg CO <sub>2</sub> eq.]
Ozone depletion	ODP [kg CFC-11 eq.]
Acidification	AP [Mole of H <sup>+</sup> eq.]
Eutrophication, freshwater	EP - freshwater [kg P eq.]
Eutrophication, marine	EP - marine [kg N eq.]
Eutrophication, terrestrial	EP - terrestrial [Mole of N eq.]
Photochemical ozone formation, human health	POCP [kg NMVOC eq.]
Resource use, mineral and metals	ADPE [kg Sb eq.]
Resource use, fossils	ADPF [MJ]
Water use	WDP [m <sup>3</sup> world equiv.]