PHILIPS

OptiVision gen 3.5

Product declaration

Environmental Product Declaration
of the OptiVision LED based luminaire

ISO 14021, based on ISO 14040/14044

Product

The Philips OptiVision LED gen3.5 floodlighting system provides a complete lighting solution for the simplest through to the most complex area and recreational sports lighting applications.

The high-efficiency floodlight comes with a single piece die cast housing, hosting 2 and 3 LED engines respectively, which also function with an external driver box – separate for use at a distance from the floodlight (BV), or pre-fixed onto the mounting bracket of the floodlight (HGB) for ease of installation and lower initial cost.

It meets the highest performance standards, provides outstanding light, quality, uniformity and ensures safety and visual comfort.

Application

Recreational sports lighting applications (Football, Hockey, Basketball, Golf, Tennis, etc), logistics areas (Ports), apron lighting (Airports), Parking and Industrial areas

Environmental assessment - (summary)

Material content

Table 1: Material use

	Weight
Total	36,59
Aluminium	21,91
Electronic ballast with cables	6,30
PC (Polycarbonate)	2,99
Packaging cardboard	2,00
Steel	1,09
PCBA without cables	0,90
Cables PTFE-ETFE-FEB-PFA	0,52
Silicone	0,35
Connectors PA	0,30
PA (polyamide)	0,14
Electric components/OTHERS	0,03
Packaging labels , ink, adhesives	0,03
LEDs	0,01
Metalic coating	0,01

LCA results

To measure the environmental footprint of the luminaire, a life cycle assessment was carried out based on ISO 14040/14044. The assessment was used to prepare the current EPD according to ISO 14021. The assessment is implemented based on a reference product for the ArenaVision/OptiVision family.[a]

Table 2: Environmental impacts

Table 2 & 3 below display the results of the life cycle assessment. For the use stage, the RSL is defined as 50.000 hours, the equivalent of 12.5 years in operation in industrial and sports area application. The OptiVision family includes products with the RSL up to 100.000 hours (equivalent of 25 years in operation).

Impact category	Total	Cradle to Gate	Use	End of Life
Abiotic depletion	100,0%	57,6%	50,4%	-8,0%
Abiotic depletion (fossil fuels)	100,0%	7,6%	93,0%	-0,7%
Global warming (GWP100a)	100,0%	7,6%	93,1%	-0,7%
Ozone layer depletion (ODP)	100,0%	18,3%	81,3%	0,4%
Photochemical oxidation	100,0%	34,6%	66,5%	-1,1%
Acidification	100,0%	7,1%	94,1%	-1,1%
Eutrophication	100,0%	8,4%	92,5%	-0,9%

Table 3: Resource use

Indicator (cf glossary)	Total value	Unit	Cradle to Gate	Use	End of Life
PERE	132 152	[MJ]	3%	98%	0%
PERM	79	[MJ]	119%	0%	-19%
PERT	132 230	[MJ]	3%	98%	0%
PENRE	735 183	[MJ]	5%	96%	0%
PENRM	3 046	[MJ]	102%	0%	-2%
PENRT	738 229	[MJ]	5%	95%	0%

Interpretation of the LCA results

Environmental impacts of the product are mostly dominated by the use phase associated with the electricity consumption by the luminaire system. The use phase contributes over 66% of the impact in all impact categories except for Abiotic depletion (non-fossil) (ADPE), where the production phase contributes the majority of the negative impact (58%). Impacts in Cradle to gate stage (luminaire system production) are associated majorly with manufacturing of electronic components such as LED elements and the driver, and manufacturing of the large aluminium parts. Significant contribution of the luminaire production in the total impacts can be observed also in the categories of photochemical oxidation potential due to aluminium casting processes, and in ozone layer depletion potential due to manufacturing of PTFE cables resistant to heat.

End of life of the product has a marginal contribution to the reduction of overall impacts in all categories apart from ADPE, where recycling in the end of life reduces the cumulative impact of production and use by over 7% (8% of the total impact). This is achieved by high rates of disposed luminaires collection, and high rates of recycling of the metal components in the end of life of the luminaire.

[a] The EPD is focused on representation through the forerunner product of the family rather than through average impacts with assessment of deviations. A family's product with the larger power consumption is expected to have larger impacts, with the leading increase of the impact in the use stage due to larger electricity consumption connected with the extension of the lifetime.

Environmental Assessment - input data

Product

Declared product
1x luminaire (BVP428 HGB)
The luminaire is designed for sports lighting applications.

Technical data
The system comprises a set of modules that are the key building blocks for a luminaire. A typical application has the following technical features:

- 1x dedicated driver 1 710w
- 3 PCBAs mounted with 168LEDs per PCBA distributed in 7 rows of 24, total 504 LEDs
- Mechanical parts made of metal or plastic
- Connectors
- Cables

Delivery Status
Product weight: 36,59kg (including 2,04 kg packaging)

Manufacturing
Manufacturing of the product is done by Signify Valladolid (Spain), including injection moulding of optical plate and optical cover, diecasting of the bracket and the frame, and luminaire system assembly.

Construction data

Name	Value	Unit
Dimension driver	500x129x120	mm
Dimension LED board	504x145x6,3	mm
Luminous flux	202 500	lm
Luminous efficiency	135	lm/W
Color temperature	5 700	K

Packaging
Packaging materials are cardboard, with minor use of polycarbonate cell-air, label paper and ink. Packaging weight is 2 035g.

Use conditions
The product is designed for sports and area lighting applications, can used across the world. Within the study, European use conditions were assumed, with European average electricity mix. Driver comes with DMX / DALI to dim control for energy saving based on customer needs

Environment and health during use
The product is compliant with the European RoHS Directive 2011/65/EU of 8 June 2011 on Restriction of the use of certain Hazardous Substances in Electrical and Electronic equipment and with the European REACH regulation (EC) No 1907/2006 of 18 December 2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals.

End of life
In the European Union, luminaires are in scope of the WEEE directive. Efforts are made to improve collection, reuse and recycling of the product mainly via collective Collection & Recycling Service Organizations (CRSOs). According to Eurostat the collection rate of WEEEs via CRSOs and other officious collection systems, is estimated at 85%. End of life scenario is further based on a material split and respective recycling rates. Recovery potential for steel, aluminium, and precious metals is evaluated.

Calculation rules

Declared unit
The declaired unit is a luminaire system, with a total weight of 36,59kg including packaging, and providing a luminous flux of 202 500 lumens. This luminaire provides sufficient light for sports lighting application, operated in Europe for 50 000 hours (electricity consumption of 75 000kWh for the full service life).

System boundaries
Type of environmental declaration cradle to grave, including recycling benefits (avoided burdain).

The following life cycle stages are included:
- Production: raw materials extraction, processing, energy and materials, manufacture of modules, assembly and packaging.
- Operational energy use (average European energy mix)
- Transport
- Waste processing
- Final disposal for WEEE fraction not recycled
- Recycling of steel and metals from PCB and housing Distribution to the user, maintenance, upgrade and reuse scenarios are not included.

Estimates and assumptions
- Background data are used for suppliers' specific processes.
- Foreground data are used for the assembly of the lighting unit.
- When necessary, generic data was generated based on averaging the data of multiple products of the same category.
- Data on collection and recycling are based on readily available data taken from the generic European and when missing national Dutch statistics.
- The end of life scenario assumes recycling of the separated materials, but does not include energy recovery from incineration of the waste.

Cut-off criteria
Where no data was available, items that represent less than 1% of the total product weight were neglected. No excluded flows were of any known particular environmental concern.

Background data

Necessary background data are sourced from the Ecoinvent database v3.6.

Data quality

Specific data used is less than 5 years old. Background data is geographically representative of the production location, and is less than 10 years old.

Method

CML - IA baseline V3.05/EU25/Characterization. Excluding long-term emissions.

Requisite evidence

Data is based on documentation and bill of materials of the product.

References

- Ecoinvent www.ecoinvent.org
- ISO 14040-44
- DIN EN ISO 14040:2006: Environmental management - Life Cycle Assessment - Principles and Frameworks (ISO 14040:2006) and Requirements and Guidelines (ISO 14044:2006)
- ISO 14021:2016 Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)

Table 4: LCA scenarios table

Name	Value	Unit
Logistics		
Road freight of components to manufacturing site	318,75	tkm
Air freight of components to manufacturing site	0	tkm
Sea freight of components to manufacturing site	0	tkm
Road transport from manufacturing site to the customer	0	km
Packaging	2,03	kg
Operational energy use		
Electricity consumption	75 000	kWh
Equipment output	1500	W
End of Life		
Collected separately	31,40	kg
Recycled on manufacturing site	0	kg
Sent for recycling to the third parties	31,40	kg
Reference service life		
Useful hours of work	50000	hours
Reference service life in the example of a retail and/or industrial application	13	a

www.lighting.philips.com

Disclaimer

All environmental calculations are based on a luminaire used in European context. The calculations are performed on an assumed worst case scenario luminaire in the range. The implemented life cycle analysis is compliant with DIN EN ISO 14040:2006: Environmental management - Life Cycle Assessment - Principles and framework. The LCA has been performed to the best of Signify Lighting's knowledge. No right or claim might be derived from this. Signify Lighting disclaims any and all claims with respect thereto.

Further information

Please contact:
sustainability@signify.com
Collection and Recycling (brochure)
Ecoinvent (website)

Glossary

ADP (Abiotic Depletion Potential): Impact related to the depletion of non-renewable resources, i.e. fossil fuels (ADPF), metals and minerals (ADPE).

AP (Acidification Potential): Contributions of SO2, NOx, HCl, NH3 and HF to the potential acid deposition, causing a wide range of impacts on soil, groundwater, surface water, organisms, ecosystems and buildings.

EP (Eutrophication Potential): Potential to cause over-fertilization of water and soil, which can result in increased growth of biomass.

GWP (Global Warming Potential): Relative measure of how much heat a greenhouse gas (CO2, N2O, CH4...) traps in the atmosphere. It is calculated over a specific time interval, commonly 20, 100 or 500 years.

LCA: Life cycle assessment.

PCR: Product Category Rules.

PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw materials.

PERM: Use of renewable primary energy resources used as raw materials.

PERT: Total use of renewable primary energy resources.

PENRE: Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials.

PENRM: Use of non-renewable primary energy resources used as raw materials.

PENRT: Total use of non-renewable primary energy resources.

POCP (Photo-chemical Oxidation Potential or photochemical smog): Formation of reactive substances (mainly ozone) which are injurious to human health and ecosystems and which also may damage crops.

RSL: Reference service life.