PHILIPS

TownGuide

Product declaration

Environmental product declaration
of the TownGuide LED based luminaire

ISO 14021, based on ISO 14040/14044

Product

The TownGuide family provides the option of six different bowl shapes in combination with an extensive range of lumen packages and choice of neutral and warm white LEDs. All this is combined with a long lifetime of 100.000 operating hours. The luminaire family is also equipped with the QR code-based Philips Service tag, which supports installation and maintenance work and enables you to create your digital library of lighting assets and spare parts. Furthermore, thanks to being SR (System Ready), TownGuide is also future-proof and is ready to be paired with both standalone and advanced control and lighting software applications such as Interact City.

Applications

With a wide choice of designs and unbeatable value, TownGuide is ideal for any urban project. The applications range from residential areas, city centres, sports and transportation.

Environmental Assessment - results

Material content

Table 1: base/ancillary materials

Metals / Alloys	47%
Electric Comp's / PCBA with cables	2%
Gaskets / Silicone	1%
LEDs/ LEDs (general)	2%
Plastics / PC/ABS recycled	2%
Plastics / PMMA	2%
Electric Comp's / Electronic ballasts with cables	4%
Plastics / PC (Polycarbonate)	13%
Electric Comp's / Cables PET	8%
Electric Comp's / Cables PVC	1%
Packaging / Paper	18%

Product weight (including packaging): 10,246 kg

LCA results

To measure the environmental footprint of the luminaire, a life cycle assessment was carried out according to ISO 14040/14044. Environmental impacts of reference product are representative of product family.

Table 3: Environmental impacts

Table 3&4 below display the results of the life cycle assessment. For use stage, the RSL is defined as 100,000 hours, the equivalent of 25 years in operation in a roadway luminaire application.

		Absolute				Ratio			
Impact category	**Unit**	Total	Cradle to Gate	Use	End of Life	**Total**	**Cradle to Gate**	**Use**	**End of Life**
Abiotic depletion	kg Sb eq	0.017630455	0.019233168	0.002050878	-0.003653591	100.0%	109.1%	11.6%	-20.7%
Abiotic depletion (fossil fuels)	MJ	16169.614	2071.6311	14098.172	-0.18909922	100.0%	12.8%	87.2%	0.0%
Global warming (GWP100a)	kg CO2 eq	1481.9818	137.20109	1330.2624	14.518406	100.0%	9.3%	89.8%	1.0%
Ozone layer depletion (ODP)	kg CFC-11 eq	0.000152217	1.55E-05	0.000133465	3.24E-06	100.0%	10.2%	87.7%	2.1%
Photochemical oxidation	kg C2H4 eq	0.32453372	0.06553729	0.25875501	0.000241419	100.0%	20.2%	79.7%	0.1%
Acidification	kg SO2 eq	7.4863132	0.99563506	6.4899199	0.000758259	100.0%	13.3%	86.7%	0.0%
Eutrophication	kg PO4--- eq	1.1255961	0.31732816	0.84744928	-0.039181325	100.0%	28.2%	75.3%	-3.5%

Table 4: Resource use

Indicator (cf glossary)	Total value	Unit	Cradle to Gate	Use	End of Life
PERE	4617	[MJ]	3%	98%	- 1%
PERM	47	[MJ]	112%	0%	- 12%
PERT	4664	[MJ]	4%	97%	- 1%
PENRE	29806	[MJ]	8%	92%	0%
PENRM	231	[MJ]	101%	0%	- 1%
PENRT	30037	[MJ]	9%	91%	0%

Interpretation of the LCA results

Environmental impacts of the product are dominated by the use phase associated with the electricity consumption of the lighting product. The use phase contributes over 75% of the impact in all impact categories except for Abiotic depletion (non-fossil) (ADPE), where the production phase contributes the majority the total impact. This impact to the ADPE is mostly due to extraction of virgin materials (such as zinc, copper, gold, tin) used to make electric components and the LED plates in particular, as well as due to extraction and production of alloys used for the manufacturing of metal parts of the product (cover, adapter, and others). Recycling of the electric parts and metal components in the end of life of the product marginally contributes 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 used by over 17%, accounting -21% of the total impact over the life cycle.

Environmental Assessment - input data

Product

Declared product

1x TownGuide based on worst case scenario

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 built-in Xitanium drivers
- 4x LED boards, containing 16 LEDs each
- 1x polycarbonate bowl
- Die cast aluminum housing
- Mechanical parts made of metal or plastic (driver box, mounting elements...)
- Connectors
- Cables

Construction data

Name	Value	Unit
Dimension driver	L=165, W=70, H=38	mm
Dimension LED board	4 x Hexagone 139.5	mm
Luminous flux	4018, +/- 7%	lm
Luminous efficiency	111	lm/W
Radation angle	75 round symmetric	deg
Color temperature	4000, +/- 290K	K
Power	28.2, +/- 11%	W
Lifetime L91B10, Ta = 25˚C	100.000	H

Delivery status

Product weight: 10.25 kg (incl. 1,88 kg packaging).

Manufacture

Manufacturing of the product is divided between Philips Lighting Poland in Pila (for the drivers), Philips Lighting Spain in Valladolid (for the LED boards and the final assembly of the product), and suppliers located in other European countries.

Environment and health during manufacturing

The manufacturing plants of Pila and Valladolid are certified according to ISO 14001 (Environment). In addition, Pila is certified according to OHSAS 18001 (Health and Safety).

Packaging

Packaging materials are paper and cardboard, with minor use of inks, glue and polyethylene (PE) for labeling. Packaging weight is 1881 g.

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.

Reference Service Life

The RSL is established as 100,000 hours operation, the equivalent of 25 years operation in a roadway luminaire application. During the lifetime, no component is replaced.

End of Life

In the European Union, luminaires fall within the 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 and other official collection systems, the collection rate of WEEEs via CRSOs is 85% at maximum. End of life scenario
is further based on a material split and respective recycling rates. Recovery potential for steel and precious metals is evaluated. The energy required for treatment of materials (shredding) is included.

Further information

Details of the product are published on:
https://www.assets.lighting.philips.com/is/content/PhilipsLighting/comf1155-pss-global

Calculation rules

Declared unit

The declaired unit is a luminaire system, with a total weight of 10,25kg including packaging, and providing a luminous flux of 4000 lumens. This luminaire provides sufficient light for a typical industrial application, operated in Europe for 100.000 hours (electricity consumption of 2800kWh).

System boundaries

Type of environmental declaration: cradle-to-grave, including recycling benefits (avoided burden).
The following life stages are included:

- Production: raw material extraction, processing, energy and materials; manufacture of modules; assembly and packaging
- Operational energy use (average European energy mix)
- Transport to the area of the user
- Waste processing
- Final disposal for WEEE fraction not recycled
- Recycling of metals from PCBs.

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 luminaire and drivers
- Data on collection and recycling are based on readily available data taken from generic national statistics

Cut-off criteria

Where no data was available, items that represented 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 v3.4.

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.

Allocation

Assembly of the luminaire in the aggregated module Cradle to Gate includes the processes associated with the assembling only, no general factory use of energy and auxiliaries was allocated.

Methods

- CML - IA baseline V3.05/EU25/Characterization. Excluding long-term emissions.
- Cumulative Energy Demand V1.10 / Cumulative energy demand

Requisite evidence

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

References

- Ecoinvent www.ecoinvent.org
- Life Cycle Assessment - Principles and framework (ISO 14040:2006)
- Life Cycle Assessment - Requirements and guidelines (ISO 14044:2006)

LCA scenarios

Name	Value	Unit
Logistics		
Road freight of components to manufacturing site	4,23	tkm
Air freight of components to manufacturing site	1,91	tkm
Sea freight of components to manufacturing site	112,83	tkm
Road transport from manufacturing site to the customer	0	km
Packaging	1,88	kg
Operational energy use		
Electricity consumption	2800	kWh
Equipment output	28	kW
End of Life		
Collected separately	8,71	kg
Recycled on manufacturing site	0	kg
Sent for recycling to the third parties	8,71	kg
Reference service life		
Useful hours of work	100000	hours
Reference service life in the example of a retail and/or industrial application	25a with assumption of 4000h/year	

Disclaimer

All environmental calculations are made in a European context. The calculations are performed on the most commonly used luminaire in the range. The LCA has been performed in accordance with the processes as used by Philips Lighting. Note that the information provided herein is subject to change. Philips Lighting does not give any representation or warranty as to the accuracy or completeness of the information included herein and shall not be liable for any action in reliance thereon. The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract. Philips Lighting assumes no legal liability or responsibility for any loss or damage resulting from the use of the information thereto given here. For purposes hereof "Philips Lighting" means Philips Lighting N.V. and its subsidiaries and associated companies (directly or indirectly).

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.

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