PHILIPS

CityCharm

Product declaration

Environmental Product Declaration

CityCharm

as per ISO 14021, based on ISO 14040/14044

CityCharm is a family of cylindrical bowl post top luminaires offering two iconic, timeless designs (cordoba and cone) and various accessories, enabling to create a lighting solution that carries a signature. CityCharm provides high visual comfort while maintaining excellent performance thanks to Philips round LEDGINE. It offers a choice of two innovative Philips Lighting technologies: GentleBeam, which maximizes visual comfort, or ClearGuide, which optimizes vertical illumination and visual guidance. A variety of dedicated brackets and masts enables to reshape residential areas and city centres.

CityCharm is made of die cast aluminium with an UV-stabilized polycarbonate bowl. It is integrating the Philips round LEDGINE. It is offered with a choice of 5 optics and a number of light comfort accessories. The luminaires are highly resistant with an IK10 rating. CityCharm is compatible with all standard and advanced Philips lighting systems and Interact City. Easy on-site maintenance of the driver (maintenance from top with screws).

Product

Product family range

The CityCharm is a family of configurator products - individual parts can be chosen from provided options and combined for a product to meet the individual needs. The assembly of the products is implemented on manufacturing site of Valladolid (Spain). The manufacturing site of the product has achieved carbon neutrality as of 2019.
The EPD does not present the assessment of the impacts of the whole range and focused on representation through the most probable worst case scenario rather than through average impacts with assessment of deviations. This approach is based on the Signify developed EPD framework.

Representative product

CityCharm product BDS490 HSR LED100/730 GR I 60 DM DF-S GRB SRT short cable is chosen as a representative product for the family as the luminaire with the highest power consumption over the lifetime. Based on multiple LCA studied of the LED based luminaires, it is defined that the use stage (and electricity consumption in particular) tends to contribute the majority of the life-cycle impacts. Thus, a product with the largest power consumption over the lifetime in the family is most likely to have largest impacts, and thus present a worst case. That choice of a product aligns with pessimistic assumptions and precautionary principle in view of the task to represent other products in the family. This approach is based on the Signify developed EPD framework.

Product application

CityCharm is an outdoor urban post top application luminaire family. Application areas contained are residential areas, inner city and shopping areas, parks, plaza and square, pathways, cycle lanes or urban, office or industrial area parking areas.

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:
- 1 x Xitanium driver
- LED board with 8, 20 or 40 LED when Round Ledgine, 15 LED when ClearGuide
- Bowl in UV stabilised polycarbonate, high pressure injection moulded aluminium spigot, frame, canopy and gear cover
- FP & SR
- Option for SR Zhaga socket or Nema socket
- Option for smart city controls
- Option for no dimming, stand alone dimming, group control or remote smart light pole control
- Option for added cable
- Option for added surge protection.

Delivery status

Product weight: 11,30 kg (including 1,51 kg packaging), dimensions of the packed product: 577mm x 520mm x 515mm.

Driver:

i.	Type	Xi SR 110W 0.2-0.7A SNEMP 230V C150 sXt
ii.	Failure rate (max % @lifetime)	10%
iii.	Dimensions, mm	150 x 90 x 40

LED board

i.	Type	Round LEDGine
ii.	Dimension board, mm	Ø 212 (40LED)
iii.	Amount of PCBA per luminaire	1
iv.	Number of LEDs per PCBA	40

Constructional data

Name	Value	Unit
Dimensions	Ø 555 x 530	Mm*mm
Luminous flux	10000	lm
Luminous efficacy	103	Lm/W
Radiation angle	360	Deg
Colour temperature	3000	K

Base materials/Ancillary materials

Materials	Mass, kg
Metals / Aluminium	4,379
Plastics / PC	2,535
(Polycarbonate)	1,50
Packaging / Paper	0,700
Electric Comp's / EM ballasts (general)	0,412
Electric Comp's / Connectors	0,400
Electric Comp's / PCBA without cables	0,385
Plastic / PC/ABS recycled	0,299
Plastic / Silicone	0,254
Metals / Steel Painted	0,183
Electric Comp's / Cables PVC	0,104
Plastics / PA polyamide	0,096
Metals / Aluminium	0,025
Metals / Stainless Steel	0,017
Electric Comp's / Sensors	0,01
Packaging / Plastic Tape	0,0021
Packaging / Labels , ink, adhesives	0,001
Plastic / Nylon	0,001
Metals / Steel	0,0004
Product weight (including packaging): 11,30 kg	

Manufacturing
Manufacturing of the product is partially done in China or Spain for the PCB/LED board, in Pila (Poland) for the driver, in Italy for the castings (spigot) and in France for the bowl. The cable tubes and gear tray are produced in Spain (Valladolid). Final assembly of the luminaire is performed at the Valladolid manufacturing site in Spain.

Product processing/Installation
The product is an outdoor post top on a stand-alone pole or a wall bracket.

Packaging
1,51 kg, including a cardboard box.

Condition of use
Designed for outdoor use in average European conditions. No extreme exposure to chemicals or pollution is implied. For higher saline environments like near the sea, Marine Salt Protection coating is required and can be ordered from factory.

Applications may apply dimming or lighting controls to lower further energy saving. Product is used in the European market context and assumed to use average European electricity mix.

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 an outdoor public area's application (4 000 hours per year).

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). In the end of life, the luminaire is 85% collected and disassembled. The collected parts are disassembled, and steel, aluminium, glass, electronic parts, and cables are sent to recycling. The quantitative assessments are based on a material split and respective recycling rates. Non-collected and non-recycled after disassembly content is disposed to the municipal waste stream where it undergoes separation, preparation and treatment according to the average European statistics. Waste generated in installation and parts replacement are 100% collected and sent to respective treatment.

Extraordinary effects
• Fire: effects of fire can lead to emissions of PBDD/F (brominated compounds).
• Water: no known impacts on the environment following unforeseeable influence of water, e.g. flooding.
• Mechanical destruction: no known impacts on the environment following unforeseeable mechanical destruction.

Further information
Details of the product are published on:
https://www.lighting.philips.com/

Calculation rules

Declared unit

Declared product	Value	Declared unit
BDS490 HSR LED100/730 GR I 60 DM DF-S GRB SRT short cable	Unit	1 piece

The declared unit is a luminaire with a diecast aluminium housing and polycarbonate bowl, 1 driver, 1 LED boards, cables, other plastic and metal constructive components totalling a weight of 9,79 kg excluding packaging, providing a luminous flux of 10000 lm, including luminaire losses. The luminaire provides sufficient light for a typical outdoor application, operated in a European context for 100 000 hours.

System boundary

Cradle to gate with options
Modules A1-A3 include: raw material extraction, processing, energy and materials and manufacture of modules and packaging.
The following scenarios are also included:
- Transport to installation (A4);
- Disposal of packaging materials (A5);
- Replacement of driver (10% rate), and PCBA (1% rate) (B3);
- Operational energy use (B6);
- Transport to end of life (C2);
- Waste processing (C3);
- Final disposal for WEEE fraction not recycled (C4).
- Benefits and loads beyond system boundary:
Recycling of cardboard packaging, electronics, cables, steel elements of luminaire. (D)

Estimates and assumptions

Background data are used for suppliers' specific processes. Foreground data are used for the assembly of the lighting unit in regards to the components of the luminaire (system). 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 data of the generic European statistics. The end-of-life scenario assumes recycling of the separated materials, but does not include energy recovery from incineration of the waste. Representation of the family is assumed on the worst-case scenario with largest power consumption over the lifetime, and is not compliant with EN15804+A1.

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 Signify database and the Ecoinvent database v3.8.

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.

Period under review

The period under review is the year 2022 for the product composition, RSL, and product performance and characteristics, year 2019 for the energy and material consumption at the assembly factory.

Allocation

Avoided burden approach is applied to allocation of recycled and/or secondary raw materials, as well as loads and benefits beyond the system boundary from material recycling. No loads and benefits beyond the system boundary from energy recovery in the end of life of the product or packaging is included. Energy consumption, material and waste generation at the manufacturing site not attributed to bill of materials of the products, is allocated by partitioning, on the basis of units produced.

Comparability

A comparison or an evaluation of the presented data is only possible if the data to be compared were created according to the Signify/Philips lighting framework and the building context, respectively the product specific characteristics of performance, are taken into account.

LCA: Scenarios and additional technical information

Transport to the site (A4)

Name	Value	Unit
Transport distance	1200	Km
Transport mode	truck, unspecified generic	-
Capacity utilisation incl. empty runs	45	%
Bulk density of transported product	73,13	kg/m3

Installation at the site (A5)

Name	Value	Unit
Packaging waste	1,51	kg

Reference service life

Name	Value	Unit
Reference service life	25	Years
Operating hours per year	4000	Hours
Quality of work	L90B50	-
Environment of operation	Average European conditions. No extreme exposure to chemicals or pollution is implied.	-
Usage conditions	Outdoor	-

Repair (B3)

Name	Value 1	Value 2	Unit
Repair process	Replacement of the driver (main/ emergency module)	Replacement of the PCBA	-
Repair cycle	0,10	0,01	Number/RSL
Resources	0,7	0,4	kg
Transportation distance	4,8	4,8	Km
Transportation mode	Van	Van	-

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	6139,56	kWh
Equipment output	64	W

End of life (C1-C4)

Name	Value	Unit
Collected separately	7,39	kg
Sent to recycling	4,97	kg
Sent to energy recovery	1,44	kg
Sent to landfilling	2,29	kg
Transportation distance from point of use to collection and sorting point	30	km
Transportation distance from collection point to recycling	100	km
Transportation distance from collection point to incineration and landfilling	30	km
Mode of transportation	Truck, unspecified	-

LCA Results

Description of the system boundary (X = included in lca; MND = module not declared; MNR = module not relevant)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundarys
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste Processing	Disposal	Reuse- Recovery- Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	X	MNR	MNR	X	MND	MND	X	X	X	X

Results of the LCA - environmental impact

Parameter	Unit	A1-A3	A4	A5	B3	B6	C2	C3	C4	D
GWP	[kg CO2Eq.]	1,9E+02	1,6E-01	1,3E-01	7,8E+00	2,4E+03	1,3E-01	9,2E-01	7,5E+00	-2,8E+01
ODP	[kg CFC11Eq]	2,2E-05	2,9E-08	1,1E-08	8,6E-07	1,4E-04	2,3E-08	8,6E-08	3,2E-09	-4,1E-06
AP	[kg SO2Eq.]	1,3E+00	6,7E-04	6,4E-04	4,1E-02	1,2E+01	5,3E-04	4,9E-03	2,3E-03	-2,9E-01
EP	[kg (PO4)3Eq]	1,6E-01	1,2E-04	8,0E-05	5,9E-03	1,5E+00	9,9E-05	9,6E-04	3,4E-04	-2,4E-02
POCP	[kg Ethen Eq.]	7,7E-02	2,2E-05	3,7E-05	2,8E-03	4,7E-01	1,7E-05	3,1E-04	9,9E-05	-1,5E-02
ADPE	[kg Sb Eq.]	4,0E-02	4,8E-07	4,4E-06	8,5E-04	2,3E-02	4,0E-07	1,8E-05	4,6E-05	-5,7E-03
ADPF	[MJ]	2,1E+03	2,4E+00	1,6E+00	9,5E+01	2,7E+04	1,9E+00	9,2E+00	2,5E+00	-3,3E+02
Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources									

Results of the LCA - resource use

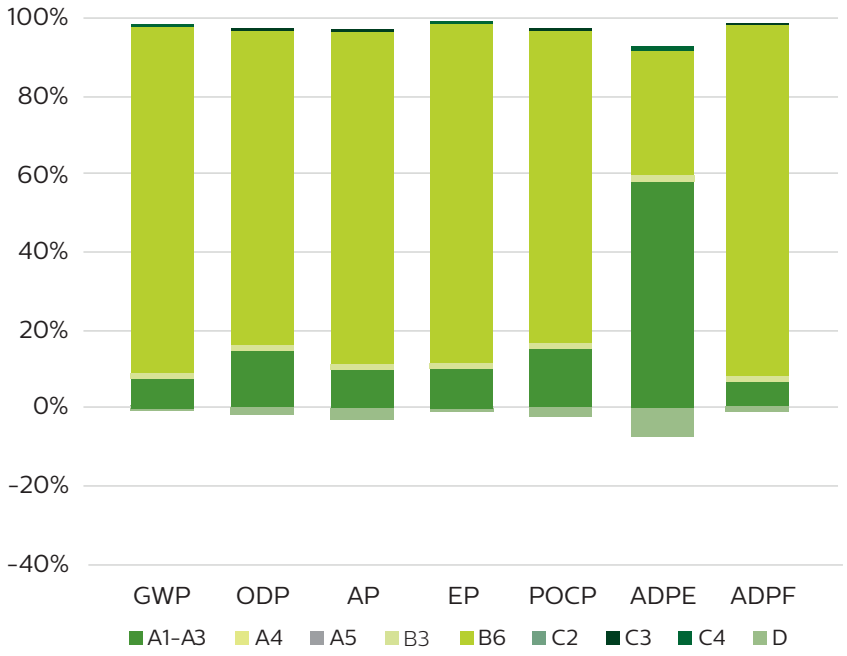
Parameter	Unit	A1-A3	A4	A5	B3	B6	C2	C3	C4	D
PERE	[MJ]	2,7E+02	3,6E-02	1,8E-01	7,2E+00	1,1E+04	2,8E-02	1,2E+00	2,0E-01	-5,2E+01
PERM	[MJ]	2,7E+01	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	-2,1E+01
PERT	[MJ]	3,0E+02	3,6E-02	1,8E-01	7,2E+00	1,1E+04	2,8E-02	1,2E+00	2,0E-01	-7,4E+01
PENRE	[MJ]	2,1E+03	2,6E+00	1,8E+00	1,1E+02	5,4E+04	2,1E+00	1,4E+01	1,6E+00	-3,5E+02
PENRM	[MJ]	5,9E+02	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	-5,2E+01
PENRT	[MJ]	2,6E+03	2,6E+00	1,8E+00	1,1E+02	5,4E+04	2,1E+00	1,4E+01	1,6E+00	-4,1E+02
SM	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND
RSF	[MJ]	IND	IND	IND	IND	IND	IND	IND	IND	IND
NRSF	[MJ]	IND	IND	IND	IND	IND	IND	IND	IND	IND
FW	[m3]	IND	IND	IND	IND	IND	IND	IND	IND	IND
Caption	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; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

Results of the LCA – output flows and waste categories

Parameter	Unit	A1-A3	A4	A5	B3	B6	C2	C3	C4	D
HWD	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND
NHWD	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND
RWD	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND
CRU	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND
MFR	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	4,97
MER	[kg]	IND	IND	IND	IND	IND	IND	IND	1,44	IND
EEE	[MJ]	IND	IND	IND	IND	IND	IND	IND	IND	IND
EET	[MJ]	IND	IND	IND	IND	IND	IND	IND	IND	IND
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy									

Not all background datasets support the methodical approach of the water and waste indicators. The value of the indicator is therefore subject to greater uncertainty. These indicators are thus not declared. IND is used in cases where the inventory does not support the methodological approach or the calculation of the specific indicator.

The life cycle impact assessment by stage (contribution analysis) is illustrated on the figure on the right:



Use phase of the product associated with electricity consumption for lighting (stage B6 on the chart), have the highest and most significant contribution to the overall environmental impacts of the product over its life cycle, in all impact categories except abiotic depletion potential (elements) (ADPE). In particular, impacts in global warming potential (GWP), ozone depletion potential (ODP) acidification potential (AP), eutrophication potential (EP), photochemical ozone creation potential (POCP), and abiotic depletion potential (fossil) (APDF) categories are attributed to the electricity consumption at the rate above 88%. Abiotic depletion potential (elements) (ADPE) has also considerable impact contribution of the product manufacturing including sourcing and processing the raw materials (stage A1-A3 on the chart). This is mostly due to extraction of virgin materials used to make electric components, as well as due to extraction and production of metal mechanical elements. End of life of the product has a marginal contribution to the reduction of overall impacts in all categories apart from ADPE. There, recycling in the end of life reduces the cumulative impact of production (A1-A3), distribution and installation (A4-A5), use (B3, B6), and end of life (C2-C4) by 8,95%, relating to -9,83% of the total ADPE over the life cycle. This is achieved by high rates of luminaires collection in the end of their service, and high rates of recycling of the metals in the end of life of the luminaire.

Requisite evidence

The measurements are based on documentation and bill of materials of the product.

References

EN 15804:2012-04+A1 2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 14021:2016, Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)

ISO 14040:2006, Environmental management — Life cycle assessment — Principles and framework

ISO 14044:2006, Environmental management — Life cycle assessment — Requirements and guidelines

Disclaimer

All environmental calculations are based on a luminaire used in European context. The calculations are performed on the most commonly used 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's knowledge. No right or claim might be derived from this. Signify 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.

www.lighting.philips.com