

# PHILIPS

## GentleSpace Gen3

### Product declaration



## Environmental product declaration of the GentleSpace GEN3 LED-based luminaire (ISO 14021, based on ISO 14040/14044, EN 15804)

### Product

GentleSpace Gen 3 is a family of adaptable, high-bay lighting solutions for high ceiling and industrial applications. They offer a wide variety of optics, beam angles from very narrow to wide, and a choice of lumen packages, cover materials and mounting options. This means they can be used to create tailor-made lighting solutions for a broad range of applications. The flexible optical system also supports application changes, such as new layouts, as it can easily be adjusted – even after installation. Technical design features include aluminum housing and glass optical covers with a clear lens finish that are ingress (IP65) and impact (IK07, J2 reinforced) protected. GentleSpace works with Interact Industry to unlock the power of IoT connected lighting.

### Application

- Food production and manufacturing
- Warehouses/logistics centers
- Indoor sports halls
- Swimming pools
- Exhibition halls



# Environmental Assessment - results

## Material content

Table 1: Material content (base/ancillary materials) for GentleSpace Gen3

Electric Comp's / Cables PVC	0,02
Paint, Lacquers, Coatings / Paint Powder epoxy based	0,24
Electric Comp's / Connectors	0,09
Metals / Steel	0,33
Metals / Stainless Steel	0,06
Plastics / PC (Polycarbonate)	0,56
Metals / Aluminium Painted	6,18
Gaskets / Silicone	0,11
Glass / Hard glass	3,3
Electric Comp's / PCBA without cables	0,61
Electric Comp's / Electronic ballasts with connectors	0,47
Packaging / Paper	1,94

Product weight (including rail and packaging): 7.4 kg

## LCA results

To measure the environmental footprint of the luminaire, a life cycle assessment was carried out according to ISO 14040/14044. The CEN Norm EN15804 serves as the guideline where possible.

Table 2: Life Cycle Assessment (LCA) System boundaries of GentleSpace Gen3

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

Table 3: Environmental impacts

The tables underneath display the results of the life cycle assessment. For module B6, The RSL is established as 50 000 hours operation, the equivalent of 12,5 years operation in a sport halls and manufacturing sites application.

Indicator (cf. glossary)	Unit	A1-A3	A4	A5	B3	B6	C2	C3	C4	D
GWP	[kg CO <sub>2</sub> Eq.]	2,1E+02	2,2E+00	2,5E-01	4,3E+00	4,5E+03	1,4E-01	6,4E-01	9,2E+00	-1,9E+01
ODP	[kg CFC 11 Eq.]	2,4E-05	4,1E-07	2,2E-08	5,1E-07	5,4E-04	2,6E-08	5,7E-08	4,0E-08	-2,3E-06
AP	[kg SO <sub>2</sub> Eq.]	1,3E+00	9,4E-03	1,9E-03	2,2E-02	2,4E+01	6,1E-04	3,4E-03	1,9E-03	-1,6E-01
EP	[kg (PO <sub>4</sub> ) <sup>3</sup> Eq.]	6,6E-01	1,7E-03	3,0E-04	6,1E-03	3,4E+00	1,1E-04	6,5E-04	1,1E-03	-9,0E-02
POCP	[kg Ethen Eq.]	8,4E-02	3,7E-04	1,1E-04	1,7E-03	9,2E-01	2,4E-05	2,1E-04	1,5E-04	-8,9E-03
ADPE	[kg Sb Eq.]	4,8E-02	5,8E-06	7,8E-06	3,1E-04	7,5E-03	3,8E-07	1,2E-05	4,1E-07	-7,2E-03
ADPF	[MJ]	2,3E+03	3,3E+01	2,9E+00	5,2E+01	5,0E+04	2,2E+00	6,4E+00	2,6E+00	-2,1E+02

Table 4: Resource use

Indicator (cf. glossary)	Unit	A1-A3	A4	A5	B3	B6	C2	C3	C4	D
PERE	[MJ]	2,9E+02	3,9E-01	3,6E-01	3,6E+00	1,7E+04	2,5E-02	8,1E-01	8,9E-02	-3,8E+01
PERM	[MJ]	1,7E+01	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	0,0E+00	-1,4E+01
PERT	[MJ]	3,0E+02	3,9E-01	3,6E-01	3,6E+00	1,7E+04	2,5E-02	8,1E-01	8,9E-02	-5,2E+01
PENRE	[MJ]	2,9E+03	3,6E+01	3,4E+00	6,1E+01	9,9E+04	2,3E+00	9,6E+00	2,9E+00	-2,8E+02
PENRM	[MJ]	1,1E+02	0,0E+00	0,0E+00	6,0E-01	0,0E+00	0,0E+00	0,0E+00	0,0E+00	-9,2E+00
PENRT	[MJ]	3,0E+03	3,6E+01	3,4E+00	6,2E+01	9,9E+04	2,3E+00	9,6E+00	2,9E+00	-2,9E+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	[m <sup>3</sup> ]	IND	IND	IND	IND	IND	IND	IND	IND	IND

## Interpretation of the LCA results

Environmental impacts of the product are dominated by the use phase and in particular electricity consumption of the light product. Such, majority of the impacts are embedded in the electricity generation used by the luminaire over its' long lifetime. The use phase contributes over 85% of the impact in all impact categories except for Abiotic depletion (elements) (ADPE). For ADPE the production phase contributes the majority of the negative impact. This impact to the ADPE is mostly due to extraction of metals used to make electric components (such as copper, gold and silver), and the housing (aluminium and zinc). The end of life of the product is characterized by high rates of disposed luminaires collection, and high rates of recycling of the metal components. That reduces the cumulative impact of production (A1-A3), distribution and installation (A4-A5), use (B3, B6), and end of life (C2-C4) by over 13%, relating to -15% of the total impact over the life cycle in APDE category. In other impact categories end of life phase of the product has a marginal contribution to the reduction of overall impacts.

# Environmental Assessment – input data

## Product

### Declared product

1x GentleSpace Gen3

### 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 gear unit
- Power supply unit with DALI interface (DALI control, DALI dimmable)
- Plug-in connector 5-pole
- Wieland/Adels compatible
- Cord with plug Wieland/Adelis compatible 5-pole

### Driver

- Type Xitanium 300W 0.5–1.4A 300V iXt TD 230V
- Failure rate (max % @lifetime) 10%
- Dimensions, mm 360 x 50 x 28

### LED board

- Type LBA AreaP 1ft 6500lm 840 5R H8
- Dimension board, mm 279 x 160
- Amount of PCBA per luminaire 4
- Number of LEDs per PCBA 120

Table 5: Construction data

Name	Value	Unit
Dimensions	85*490*600	mm*mm*mm
Luminous flux	35000	lm
Luminous efficacy	148	lm/W
Radiation angle	114	deg
Color temperature	4000	K

### Delivery

Product weight: 13,91 kg (including 1,94 kg packaging)  
Dimensions of the packed product:  
790mm\*590m\*143mm

### Environment and health during manufacturing

Manufacturing of the electronic parts of the product is done by suppliers in Poland. Final product assembly is conducted in Signify Hungary Kft.

### Packaging

1,94 kg, cardboard and paper

### Environment and health during use

The product is compliant with the European RoHS Directive 2015/863EU of 31 March 2015 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.

### Condition of use

Designed for indoor high ceiling and industrial applications with average European conditions. It can also support changes in application requirements (such as layout changes) thanks to its flexible optical system, which can be easily adjusted even after installation.

### Reference Service Life

The RSL is established as 50 000 hours operation, the equivalent of 12,5 years operation in a sport halls and manufacturing sites application.

### Further information

Details of the product are published on:  
[www.lighting.philips.com](http://www.lighting.philips.com)

## Calculation rules

### Declared unit

The declared unit is a luminaire with aluminium housing, 1 driver, 4 LED boards, steel fixtures and other constructive components totalling a weight of 11 973 grams excluding packaging, providing a luminous flux of 35 000lm, including luminaire losses. The luminaire, provides sufficient light for a typical indoor sport hall and manufacturing site application, operated in a European context for 50 000 hours.

Table 5: Construction data

Declared unit	Value	Declared unit
BY481P LED350S/840	Unit	1 piece
PSD MB GC SI		

### System boundaries

Cradle to grave with options

Modules A1–A3 include: raw material extraction, processing, energy and materials and manufacture of modules and packaging; energy and materials consumed in the product assembly are excluded.

The following scenarios are also included:

- Transport to installation (A4);
- Disposal of packaging materials (A5);
- Replacement of driver (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, aluminium, steel, plastic and glass 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 readily available data taken from 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 v3.5.

### 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 2019.

### Allocation

Avoided burden approach is applied to allocation of in the use 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 from the end of life of the product or packaging is included.

### Comparability

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

### Methods

- CML - IA baseline V3.05/EU25/Characterization/ Excluding long-term emissions.
- Cumulative energy demand V1.11.

### 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 14025 DIN EN ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.
- ISO 14040:2006, Environmental management — Life cycle assessment — Principles and framework.
- ISO 14044:2006, Environmental management — Life cycle assessment — Requirements and guidelines.

Table 6: Life Cycle Assessment scenarios

Name	Value	Unit
<b>Transport to the site (A4)</b>		
Transport distance	1200	km
Transport mode	truck, unspecified generic	-
Capacity utilisation incl. empty runs	45	%
	203	kg/m <sup>3</sup>
<b>Installation at the site (A5)</b>		
Packaging waste	1,94	kg
<b>Reference service life</b>		
Reference service life	12,5	years
Operating hours per year	4000	hours
Quality of work	L90B50	-
Environment of operation	Average European conditions	-
Usage conditions	Indoor	-
<b>Repair (B3)</b>		
Repair process	Replacement of driver	-
Repair cycle	0,1	number/RSL
Resources	0,47	kg
Transportation distance	4,8	km
Transportation mode	Van	-
<b>Operational energy use (B6)</b>		
Electricity consumption	10106	kWh
Equipment output	235	W
<b>End of life (C1-C4)</b>		
Collected separately	12,23	kg
Sent to recycling, incl. non-collected separately	6,48	kg
Sent to energy recovery, incl. non-collected separately	2,23	kg
Sent to landfilling, incl. non-collected separately	5,25	kg
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	-

### 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](mailto: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 SO<sub>2</sub>, NO<sub>x</sub>, HCl, NH<sub>3</sub> 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 (CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>...) 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.

