

PHILIPS

GentleSpace gen2

Product declaration



Environmental Product Declaration for the GentleSpace gen2 Circular Economy ready luminaire (ISO 14021)



About

This document describes the environmental performance of the Circular Economy ready luminaire used in combination with Circular lighting. Assessment carried out according to ISO 14021.

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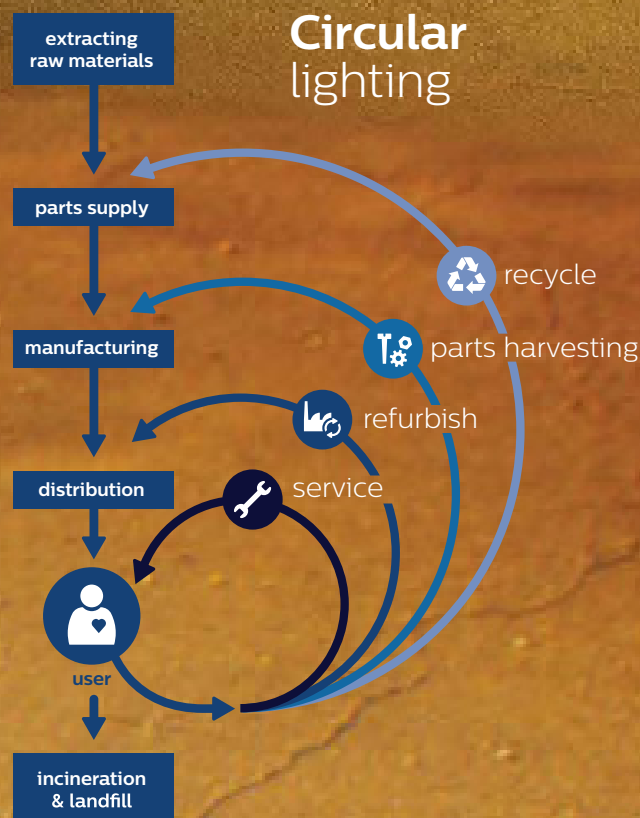
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Introduction to Circular lighting

For a sustainable world, the transition from a linear to a Circular Economy is essential. A Circular Economy aims to decouple economic growth from the use of natural resources by using these resources more effectively. With that goal in mind, at Philips Lighting we offer our customers Circular lighting solutions.

Circular lighting changes light consumption and breaks away from the traditional way of doing business. Use, not ownership, is now the key element – you no longer need to purchase products that provide light, but rather only buy the light itself. This revolutionary way of doing business has great benefits – there's no need to invest in equipment, and we take care of the management, maintenance and innovation. This type of lighting management also includes the entire financial process – which means it's backed by a reliable partner who understands the full lighting lifecycle.

Circular lighting leads to maximum re-use of equipment, helping to conserve natural resources while reducing costs to users.



Product introduction

GentleSpace gen2 Circular Economy ready luminaire

The Philips GentleSpace gen2 Circular Economy ready luminaire is a high efficiency luminaire that complies with the strictest environmental regulations in existence. It is a 1:1 replacement for conventional high-bay fluorescent luminaires. Based on LED technology, GentleSpace gen2 delivers energy savings of up to 60% compared to conventional lighting. And when combined with controls and connected to lighting systems, savings can be as high as 80%.

Thanks to the variety of optics available for GentleSpace gen2, it is suitable for a wide range of high ceiling applications. Since it requires minimum maintenance, it is particularly suited to areas where luminaires are difficult to access. This also makes it ideal for continuous production operations, where interruptions that cause downtime need to be avoided. It is an ideal solution for the food and pharmaceutical industries too, because it is easy to clean and does not contain glass (which can contaminate products if it shatters).

The GentleSpace gen2 Circular Economy ready luminaire is developed to meet the increasing importance and popularity of sustainable high-bay lighting in industrial applications. It is part of a series of products optimized for the Circular lighting service model. It is designed to use natural resources in a much more effective and regenerative way, closing the materials loop according to Circular Economy principles (see page 5). Thanks to modular assembly and design, maintenance is easy, and it is simple to upgrade (see page 5). It also offers optimal performance throughout its lifetime. End-of-contract management is straightforward since the luminaire can be repurposed in several ways: in a Circular lighting contract; to a second-hand market; via extraction of spare parts; and eventually into recycled materials.



Key advantages of the GentleSpace gen2 GRN/25klm Circular Economy ready luminaire

- The product introduces a range of environmental features that makes it suited to the Circular Economy.

Easy to service:

- The system can be upgraded to 'GreenWarehouse'
- Equipped with the Philips Service tag to provide information on upgrades, remaining lifetime, spare parts and environmental declaration

Smooth end-of-contract management:

- Accessible information on who to contact and where to send it back
- Asset tracking and product return service
- Easy disassembly and use of materials suited for high material recovery

Optimized performance: compare to benchmark (see Circularity, in next column)

- Higher energy efficiency
- Low failure rate
- Longer lifetime up to 70,000 hrs
- Even higher energy saving of up to 60% compared to conventional HID
- Additional saving of up to 20% using GreenWarehouse upgrade

Other benefits in combination with Circular lighting

The combination of the luminaire and the Circular lighting service contract provides hassle-free, future-proofed light without investment costs. Tangible benefits include:

- Predictable cost structure
- A reduction in total cost of performance
- Philips Lighting organizes the repurposing of the luminaire at the end of the contract

Sustainable focal areas



Energy

- Nominal power: 164 W
- Luminous efficacy: 152 lm/W



Substances

- EU RoHS compliant
- EU REACH compliant



Weight and Materials

- Weight of product: 16.4 kg
- Composition: see graph 1 on page 6



Packaging

- Composition of packaging: cardboard, labels, adhesives, polyethylene (PE)
- Weight of paper/cardboard: 2.4 kg
- Weight of plastics: 30 g



Circularity

- **Upgradeability:** Upgradable to connected lighting system
- **Maintenance:** 15% longer lifetime than the benchmark
- **Modular design:** Includes standardized components
- **Disassembly:** Non-destructive, less than five steps
- **Recycling:** Product breakdown into separated materials' waste streams (no potted drivers, glued connections, difficult interlocks...)

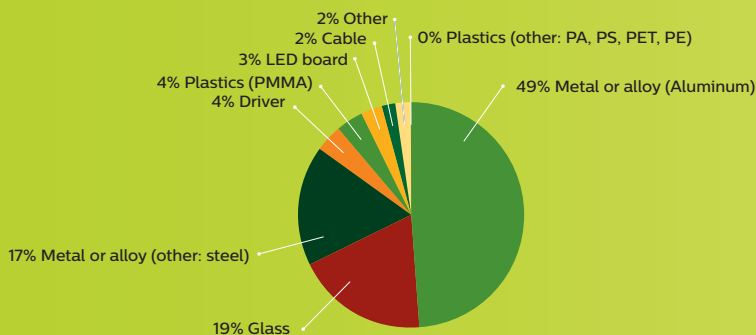
Product features of the benchmark (GentleSpace gen2 Economy/25klm)

- High-quality mechanical structure delivering IP65 proof and IK07 ratings
- High-end optics delivering excellent quality of light
- High efficacy up to 144 lm/W
- Long lifetime of typically 60,000 hrs
- Easy installation and maintenance
- Versatility of product use in diverse and demanding applications
- Easy to install

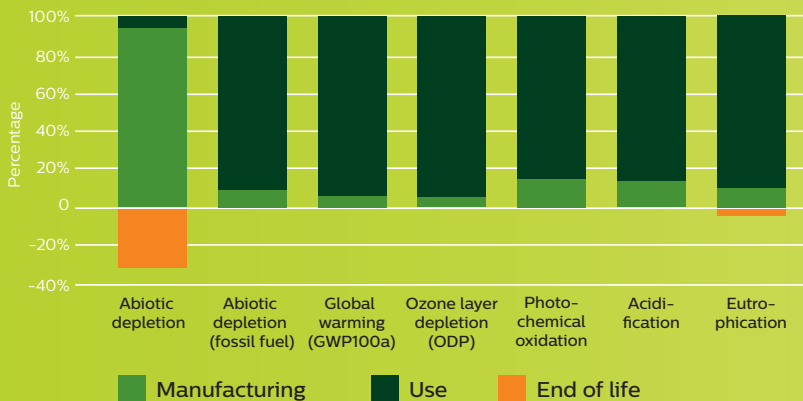
Environmental Assessment (summary)

Graph 1: Material content (base/ancillary materials) of the Circular Economy ready luminaire

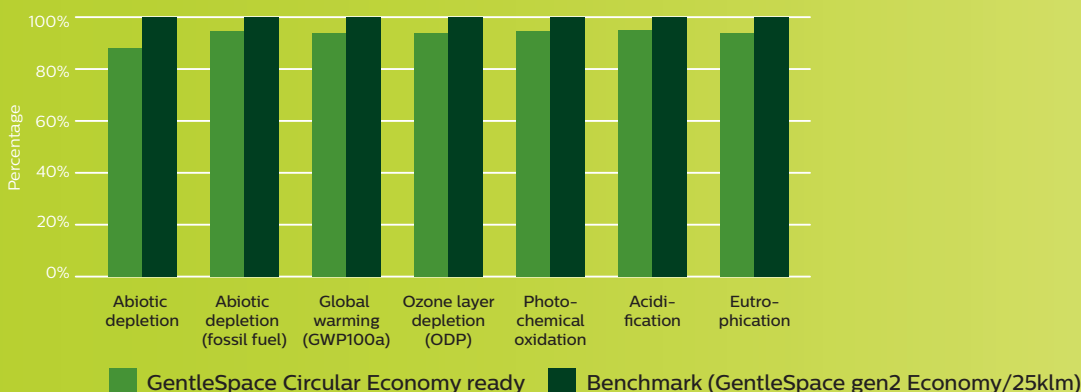
Metal or alloy (Aluminum)	8,1kg	49%
Glass	3,2kg	19%
Metal or alloy (other: steel)	2,8kg	17%
Driver	0,6kg	4%
Plastics (PMMA)	0,6kg	4%
LED board	0,5kg	3%
Cable	0,3kg	2%
Other	0,3kg	2%
Plastics (other: PA, PS, PET, PE)	0,1kg	0%



Graph 2: Life cycle impacts of the Circular Economy ready luminaire



Graph 3: Advantages of the Circular Economy ready luminaire



Life Cycle Assessment results (Graph 2)

To measure the environmental footprint of the luminaire, a Life Cycle Assessment was carried out.

For all impact categories except the Abiotic Depletion Potential (ADPE, non-fossil), the dominant phase is the use phase, associated with electricity consumption and its related generation. In particular, the contribution to global warming potential (GWP) is for 95% associated with the use phase and 5% with the production phase.

The production phase has a minor contribution to the overall environmental impact, but is nevertheless the main contributor to the ADPE. This arises from the extraction of virgin material, mainly gold, silver and copper used to make electronic components. Recycling the system provides a significant reduction in ADPE by the recovery of precious metals.

Advantages of the Circular Economy ready luminaire (Graph 3)

A comparative study shows that the GentleSpace Circular Economy ready version outperforms its linear reference on all impact categories, in particular on ADPE, where benefits exceed 10%. This is due to two combined effects:

- Increased lifetime (from 60,000 hrs to 70,000 hrs) leads to reduced resource consumption to produce the same amount of light during 70,000 hrs.
- Improved collection (from 85% to 100%) results in a higher material recovery rate at the end of life.

Environmental Assessment (input data)



Product

Declared product

1x GentleSpace gen2 GRN/25klm Circular Economy ready.

The luminaire is designed for a broad range of applications such as parking garages, cold storage facilities, industrial halls, food production centers and car washes.

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:

- 2x Xitanium driver
- 16x LineP LED boards, containing 22 LEDs
- 1x glass plate
- Mechanical parts made of metal or plastic (housing, driver box, mounting elements...)
- Connectors
- Cables

Construction data

Name	Value	Unit
Dimension driver	360 x 30 x 21	mm
Dimension LED board	280 x 40 x 1.65	mm
Dimension luminaire	600 x 450 x 150	mm
Luminous flux	25000	lm
Luminous efficacy	152	lm/W
Color temperature	4000	K

Delivery

Product weight: 18.8 kg (incl. 2.4 kg packaging).

Packaging

Packaging materials are cardboard and polyethylene (PE). Packaging weight is 2.4 kg.

Use conditions

Applications may apply dimming or lighting controls to allow further energy saving.

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 and other officious 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.

Circular lighting includes end-of-contract management by Philips Lighting. The GentleSpace gen2 Circular Economy ready luminaire will be 100% collected and then repurposed (re-use in a Circular lighting service contract, to a second-hand market, via extraction of spare parts and eventually into recycled materials).

Life Cycle Assessment calculation rules

Declared unit

The declared unit is a luminaire system, with a total weight of 18.8 kilograms including packaging, and providing a luminous flux of 25,000 lumens. This luminaire provides sufficient light for a typical industrial application, operated in Europe for 70,000 hours (electricity consumption of 11480 kWh).

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
- Waste processing
- Final disposal for WEEE fraction not recycled
- Recycling of steel and 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 driver
- 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 v3.3.

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 V3.03/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
- Life Cycle Assessment - Principles and framework (ISO 14040:2006)
- Life Cycle Assessment - Requirements and guidelines (ISO 14044:2006)

Disclaimer

All environmental calculations are based on a Circular Economy ready luminaire used in combination with Circular lighting, in a European context. The calculations are performed on the most commonly used luminaire in the range. Circular Economy ready luminaires are identified by means of a design element. The Life Cycle Assessment 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:
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[Circular lighting \(brochure\)](#)

[Collection and Recycling \(brochure\)](#)

[Ecoinvent \(website\)](#)

[Circular Economy design principles \(website\)](#)

Glossary

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

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

Circular Economy ready luminaire (CEC): Luminaire designed to keep its components and materials at its highest utility and value at all times.

Circular lighting contract: performance contract including End of Life management by Philips Lighting

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

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.

GreenWarehouse: A smart lighting system designed to save costs and reduce energy consumption. It enables the user to apply different dimming schedules in different areas, and also increases savings through presence detection.

LCA: Life Cycle Assessment.

Ozone Depletion Potential: Potential of emissions of chlorofluorohydrocarbons (CFCs) and chlorinated hydrocarbons (HCs) for depleting the ozone layer.

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.

