

PHILIPS

Maxos fusion

Product declaration



Environmental product declaration of the Maxos fusion configured luminaire (ISO 14021, based on ISO 14040/14044, EN 15804)

Product

Maxos fusion is an adaptable LED trunking system that combines leading application efficiency along with high energy efficacy to fully optimise the lighting layout for projects. In addition, the fusion rail with an electrical track system accommodating up to 13 wires, positions the fusion system to handle a diverse range of electrical schemes including emergency very well and also allowing for seamless integration of additional devices such as sensors to the backbone thereby reducing the ceiling clutter.

Maxos fusion is also compliant with all relevant lighting norms and regulations in warehouse, food & beverage, and automotive spaces. It is designed to use natural resources in a much more effective and regenerative way, closing the materials loop according to Circular Economy design principles.

Application

- (Food) retail
- Industrial halls/areas
- Warehouses/distribution centers



Environmental assessment – results

Material content

Table 1. Material content (base/ancillary materials) for Maxos fusion

Steel	81.2%
Packaging (cardboard, paper, labels)	8.9%
Polycarbonate optical cover	4.2%
Electronics (driver, LED board)	5%
Other (plastics, silicon, cables, connectors)	0.7%

Product weight (including rail and packaging): 7.4 kg

Table 2: Life Cycle Assessment (LCA) boundaries of Maxos fusion

Product stage	Raw material supply	A1
	Transport	A2
	Manufacturing	A3
Construction process stage	Transport from the gate to the site	A4
	Assembly	A5
Use stage	Operational energy use	B6
End of life stage	Transport	C2
	Waste processing	C3
	Disposal	C4
Benefits and loads beyond the system boundaries	Reuse - Recovery- Recycling potential	D

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 EN 15804 serves as the core PCR. Environmental impacts of reference product are representative of product family.

Table 3: Environmental impacts

The tables underneath display the results of the life cycle assessment. For module B6, the RSL is defined as 100,000 hours, the equivalence of 25 years in operation in a roadway luminaire application.

Indicator (cf. glossary)	Total value	Unit	A1-A3	A4	A5	B6	C2	C3	C4	D
GWP	3,36E+03	[kg CO2-Eq.]	4,61%	0,08%	0,03%	95,27%	0,00%	0,01%	0,00%	-0,43%
ODP	3,81E-04	[kg CFC11-Eq.]	9,50%	0,13%	0,02%	90,34%	0,00%	0,01%	0,00%	-0,17%
AP	1,59E+01	[kg SO2-Eq.]	10,13%	0,06%	0,03%	89,77%	0,00%	0,01%	0,00%	-0,77%
EP	2,05E+00	[kg (PO4)3-- Eq.]	10,43%	0,07%	0,06%	89,43%	0,00%	0,01%	0,00%	-0,66%
POCP	7,20E-01	[kg Ethen Eq.]	12,04%	0,06%	0,04%	87,85%	0,00%	0,01%	0,00%	-0,65%
ADPE	1,24E-02	[kg Sb Eq.]	70,35%	0,06%	0,02%	29,56%	0,00%	0,01%	0,00%	-20,01%
ADPF	4,22E+04	[MJ]	9,19%	0,10%	0,02%	90,67%	0,00%	0,01%	0,00%	-0,39%

Table 4: Resource use

Indicator (cf. glossary)	Total value	Unit	A1-A3	A4	A5	B6	C2	C3	C4	D
PERE	9,68E+03	[MJ]	2%	0%	0%	98%	0%	0%	0%	0%
PERM	0,00E+00	[MJ]	0%	0%	0%	0%	0%	0%	0%	0%
PERT	9,68E+03	[MJ]	2%	0%	0%	98%	0%	0%	0%	0%
PENRE	6,99E+04	[MJ]	6%	0%	0%	94%	0%	0%	0%	0%
PENRM	3,45E+01	[MJ]	100%	0%	0%	0%	0%	0%	0%	0%
PENRT	6,99E+04	[MJ]	6%	0%	0%	94%	0%	0%	0%	0%

Interpretation of the LCA results

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 through the recovery of precious metals.

Environmental Assessment – input data

Product

Declared product

1x Maxos fusion

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 reusable rail
- 1x replaceable LED panel containing:
 - 1x built-in Xitanium driver
 - 8x slim LED boards, containing 36 LEDs
 - 1x polycarbonate optical cover
 - Steel housing
 - Mechanical parts made of metal or plastic (driver box, mounting elements etc.)
 - Connectors
 - Cables

Delivery

Rail weight: up to 6.4 kg

Panel weight: up to 2.4 kg

Table 5: Construction data

Name	Value	Unit
Dimension luminaire	2276 x 78.5 x 55 1138 x 78.5 x 55 (incl. panel connector and scissor lock)	mm
Dimension driver	0,00E+00	mm
Dimension LED board	5,64E+03	mm
Luminous flux	3,98E+04	lm
Luminous efficacy	3,35E+01	lm/W
Color temperature	3,35E+01	K
Power	3,35E+01	W
Lifetime L80	3,98E+04	khrs

Environment and health during manufacturing

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

Packaging

Packaging materials are cardboard and polyethylene (PE). Packaging weight is 0.66 kg (with a recycled paper content > 80%).

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, equivalent to 25 years in operation in the case of a retail and/or industrial application. During the lifetime, no component is replaced.

End of Life

In the European Union, luminaires are in scope of the Waste Electrical and Electronic Equipment Directive (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. If Maxos fusion is used as part of a Circular lighting contract, end-of-contract management is secured by Signify.

Further information

Details of the product are published on:

www.philips.com/maxosfusion

Calculation rules

Declared unit

The declared unit is a luminaire system that provides a luminous flux of 12,300 lumens. This luminaire provides sufficient light for retail and/or industrial applications, operated in Europe for 100,000 hours (electricity consumption of 8,200 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 to the area of the user
- Waste processing
- Final disposal for WEEE fraction not recycled
- Recycling of metals from PCBs

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 v3.3.

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.

Allocation

In the aggregated module A1-A3, allocation of energy and auxiliaries was used for assembly of the driver and the luminaire in the Kętrzyn factory.

Methods

- CML - IA baseline V3.04/EU25/Characterization/ Excluding long-term emissions.
- Cumulative energy demand V1.1.

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

Table 6: Life Cycle Assessment scenarios

Name	Value	Unit
Transport to the building site (A4): Road transport from manufacturing plant to the customer		
Transport distance	2200	km
Capacity utilization (including empty runs)	90	%
Packaging	0.66	kg
Operational energy use (B6)		
Electricity consumption	8,200	kWh
Equipment output	0.082	kW
End of life (C1-C4)		
Collected separately	6.8	kg
Recycling	6.8	kg
Reference Service Life In the example of a retail and/or industrial application		
Reference Service Life	25	a

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, 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.

EP (Eutrophication Potential): Potential to cause overfertilization 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 nonrenewable 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.

