



Streamer

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:
Fagerhults Belysning AB, Åvägen 1, 566 80 Habo, Sweden

Programme:	<i>The International EPD® System, www.environdec.com</i>
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): <i>pcr2019-14 Construction products v1,11 and UN CPC code(s)></i> Together with EN 15804:2012+A2:2019
PCR review was conducted by: <i>The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com</i>
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third-party verifier: Bill Kung, Ecovane Environmental Co., Ltd, Contact via bill.k@1mi1.cn Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves a third-party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 (Svensk Standard Ss-En 15804:2012+a2:2019, 2020) and ISO 14025 (ISO, 2006a). And the General Product Instructions (EPD International, 2021b).

The LCA approach harmonizes with the Product Environmental Footprint Category Rules for building products, cradle to grave (EPD International, 2021a).

The EPD is for one specific product produced at a particular site.



Company information

Owner of the EPD:

Fagerhults Belysning AB

Contact:

Ken Chen (ken.chen@fagerhult.com.cn)

Description:

Fagerhult develops, produces and markets professional lighting solutions for public environments such as offices, schools, retail areas, industries and hospitals, indoor and outdoor. Our lighting knowledge, combined with a wide range of innovative, energy-efficient, less environmental impact lighting solutions, makes us a natural partner for the entire project. Fagerhult is a part of the Fagerhult Group, one of Europe's leading lighting companies with 4,200 employees in 28 countries worldwide.

Product-related or management system-related certifications:

The manufacturing site is ISO 9001 and ISO 14001 certified.

Name and location of production site:

Fagerhult Lighting System (Suzhou) Co. Ltd, Suzhou industrial part, Suzhou, JiangSu, China



Product information

Product family:

Streamer

Product description:

Streamer is a very efficient and compact spotlight for installation on lighting tracks. The fixture can be adopted to either on/off for standard 3-phase track, or with Dali for Control Track. It can be easily directed, rotatable 360° and tilted 0-90° to optimally enhance areas or surfaces in the premises. High colour rendering, with CRI 90 to highlight the illuminated products correctly. There are four light distributions to choose from: narrow, medium, wide or extra wide. Luminaire housing is made of cast aluminium, and comes in classic white or black.

Product identification:

Streamer spotlight. The product comes in alternatives of components, for which the EPD represents a specific setup, represented by article 80300 with a weight of 0.509kg and an effect of 19 watt. The EPD is representative for 80296-80311 (including suffixes-543) regarding Streamer spotlight.

No substances on the Candidate List of SVHC¹ are present in the product or packaging.

¹ Candidate List of substances of very high concern for Authorisation - ECHA (europa.eu)

LCA information

Declared Unit	One Streamer (Article 80300 which represent a family of articles with small variations)
The functional unit	50 000 hours of light in total of the lifetime.
Lifetime - Reference Service Life	50 000 operating hours (10 years).
Technical lifetime	Minimum of 50 000 operation hours (10 years). Imply that parts are not exchanged.
Product group classification	UN CPC 429 Other metal products (no more relevant found).
Goal	Understanding the environmental impact throughout the product life cycle. Internal benefits during product development to reduce the environmental impact. External benefits for stakeholders when they select luminaires in outdoor environments.
Audience	Purchasers of luminaires, lighting installers, lighting designers, architects, property owners and constructors.
Scope	Cradle-to-grave and module D (A, B, C and D).
Time	Data regarding manufacturing is based on the environmental report for 2021, and the allocation to Streamer (80300) is based on the sales in 2021.
Manufacturing Site	Fagerhult Lighting System (Suzhou) Co. Ltd, Suzhou, China.
Geographical Area	Production is represented by China, Use and disposal is represented by China, Australia and Sweden.
Compliant with	ISO 14040-44, attributional LCA ISO 14025 EN 15804:2012+A2:2019 Product category rules (PCR): pcr2019-14 Construction products v1,11
Cut-Off Rules	Environmental aspects that contribute less than 1% to any impact category.
Background Data	Ecoinvent 3,8 - allocation, Cut off. & 1mi1 database.
Foreground Data -primary	Weight of articles and composition of raw materials. Suppliers' location for transport. Packaging, rest materials, water, electricity, heat and waste. Customers distance for distribution to the client. Disposal scenario.
Foreground Data -specific	Manufacturing at Fagerhult, Waste at Fagerhult, Component models with raw material, processing and transport.
Electricity data	Electricity consumption in the A3 module is represented by data for the Jiangsu province, and B6 electricity is represented by data for the national production mix in Ecoinvent 3,8 regionalized for Sweden, China and Australia.
LCA software and database	Simapro 9.2 & EPD China platform

Description of the manufacturing process (A3)



The production site in Suzhou is a modern industrial facility including research and development, production, and assembly of the products. The main environmental aspects are the consumption of raw materials (mostly steel and aluminium), electricity, heat, waste to treatment, water and construction of the facilities.



Assumptions: transportation, usage and end-of-life treatment (A4-D)

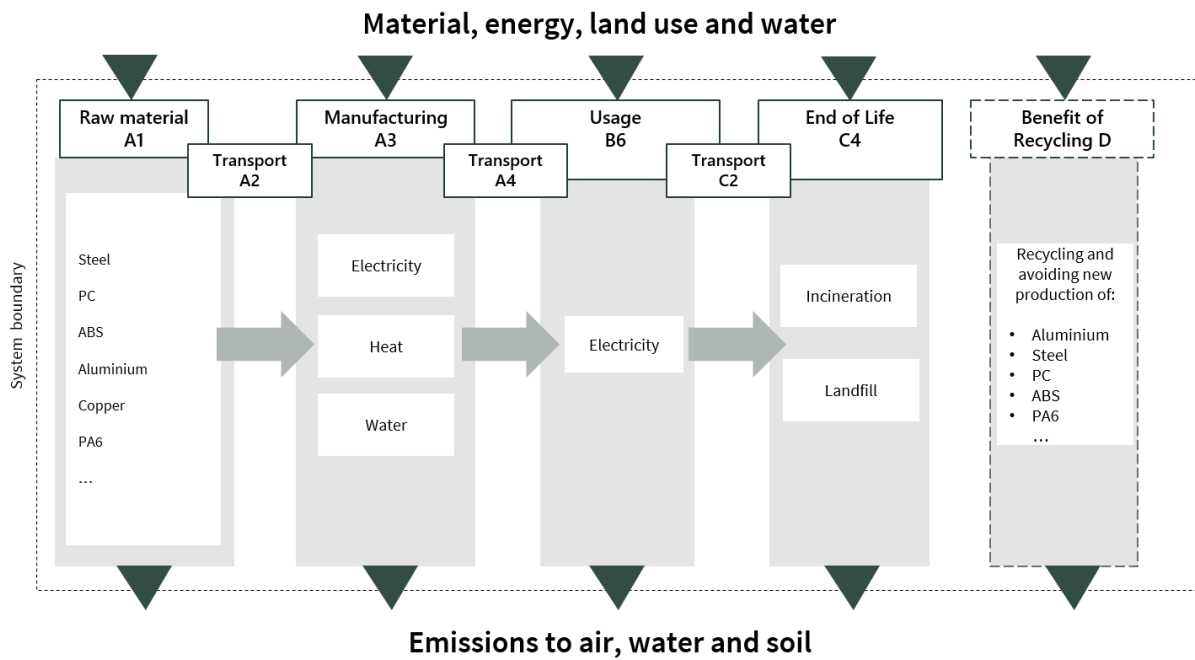
All vehicles involved in road transportation are trucks with a carrying capacity of 16-32 tons and Euro 4 emission standards.

Streamer is assumed to be treated at end of life electrical and electronic equipment waste. At the end of life, the product is assumed to be transported 50 km to nearest treatment center (C2).

In the recycling process (D), the recycling rates are assumed to be 80% of waste aluminium, 60% of waste steel, 50% of waste cardboard. The recycling rates of waste plastics PC, PA6, ABS, PBT and FEP is assumed to be 30%, and the rest of waste plastics are not recycled.

In the waste disposal (C4), the unrecycled waste cardboard and waste plastic are treated by municipal incineration, the unrecycled waste aluminium is assumed to be treated as sanitary landfill, and the unrecycled waste steel is assumed to be treated as inert substances landfill.

System diagram:



This study includes a cradle-to-grave perspective. That means that all processes needed for raw material extraction, manufacturing, transport, usage and end-of-life are included in the study.

Included	Excluded
Production of the components and packaging (A1)	Production of machines.
Transport to manufacturing (A2)	Transport of returned products.
Electricity, water, heat and waste for manufacturing (A3)	Labor and related aspects.
Transport of products to client and to disposal (A4 & C2)	Business travel.
Electricity consumption (user) (B6)	Research and development activities.
Disposal of waste (C4)	
Recycling(D)	

	Raw material		Manufacturing & Transport			Use							End of life				Reuse
	Raw material	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Renovation	Energy during use	Water use	Demolition	Transport	Waste process	Final disposal	Potential benefits of recycling
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Module declared	X	X	X	X	ND	ND	ND	ND	ND	ND	X	ND	ND	X	ND	X	X
Geography	CN	CN/ GLO	CN	CN\ GLO	-	-	-	-	-	-	CN\ SE\ AUS	-	-	CN\ SE\ AUS	-	CN\ SE\ AUS	CN\ SE\ AUS
Type of data	G/S	G	S	G	-	-	-	-	-	-	G	-	-	G	-	G	G

Modules declared: (X = included ND = not declared), geographical scope, share of specific data (in GWP-GHG indicator) and data variation: EPD modules included (G = generic data, S = Specific data).

Material content

The EPD is based on the most representative and most sold product within the product family. The product weight is 0,509 kg.

Material	Specification	Share (% wt)	Weight (kg)	Secondary (%)	Renewable (%)
Steel		2,240%	0,0134		
Plastic	PA6	0,167%	0,0010		
Wax	Paraffin wax	0,044%	0,0003		
Plastic	PC	6,770%	0,0405		
Plastic	ABS	0,334%	0,0020		
LED module		0,207%	0,0012		
Aluminum		4,638%	0,0277		
Stainless steel		2,674%	0,0160		
Steel	SGLC	0,668%	0,0040		
Steel	SPCC	0,241%	0,0014		
Copper		1,488%	0,0089		
Driver		10,028%	0,0600		
COB holder		0,685%	0,0041		
Aluminum	ADC12	65,181%	0,3900	95%	
Powder coating	Polyester	3,510%	0,0210		
Wire1		0,963%	0,0058		
Wire2		0,064%	0,0004		
Glass Fiber		0,022%	0,0001		

Packaging material	Weight (kg)	Secondary (%)	Renewable (%)
Cardboard	0,0487	90%	100%
Plastic bag	0,0046		
Wood pallet	0,0290		100%

Environmental Information

Results per one Streamer (0,509 kg).

Potential environmental impact – mandatory indicators according to EN 15804

Impact category	Unit	A1	A2	A3	A4	B6	C2	C4	D
Climate change – Fossil	kg CO2 eq	7,22e+0	4,25e-2	8,95e-1	2,25e-1	3,37e+2	4,34e-3	2,27e-1	-2,32e+0
Climate change – Biogenic	kg CO2 eq	-3,00e-1	-5,40e-5	-4,40e-3	-1,55e-3	1,23e+1	-5,92e-6	3,84e-2	1,44e-1
Climate change - Land use and LU change	kg CO2 eq	3,84e-2	6,50e-6	1,25e-5	6,09e-5	2,22e+0	7,80e-7	4,37e-7	-3,13e-2
Climate change	kg CO2 eq	6,96e+0	4,25e-2	8,91e-1	2,23e-1	3,52e+2	4,33e-3	2,66e-1	-2,21e+0
Ozone depletion	kg CFC11 eq	2,19e-5	9,34e-9	2,11e-8	1,46e-8	3,98e-6	9,68e-10	7,87e-10	-7,38e-6
Acidification	mol H+ eq	5,79e-2	2,97e-4	4,15e-3	1,46e-3	1,67e+0	2,26e-5	9,43e-5	-1,66e-2
Eutrophication, freshwater	kg P eq	1,09e-2	1,75e-6	8,12e-5	3,54e-5	1,64e-1	1,98e-7	2,18e-6	-2,53e-4
Eutrophication, marine	kg N eq	9,36e-3	7,46e-5	6,68e-4	3,15e-4	3,06e-1	7,37e-6	4,70e-5	-2,89e-3
Eutrophication, terrestrial	mol N eq	9,71e-2	8,21e-4	7,13e-3	3,42e-3	2,99e+0	8,07e-5	3,90e-4	-2,94e-2
Photochemical ozone formation	kg NMVOC eq	3,02e-2	2,34e-4	2,23e-3	9,62e-4	7,85e-1	2,30e-5	9,73e-5	-7,91e-3
Resource use, minerals and metals	kg Sb eq	1,08e-3	9,04e-8	1,70e-7	4,21e-7	2,55e-3	1,15e-8	8,46e-9	-1,86e-5
Resource use, fossils	MJ	1,11e+2	6,12e-1	8,18e+0	2,13e+0	6,47e+3	6,35e-2	8,32e-2	-6,29e+1
Water use	m3 deprive.	2,50e+0	3,39e-3	3,10e-1	2,25e-2	6,18e+1	3,65e-4	7,67e-3	-1,42e+0

Raw material (A1), Transport (A2), Manufacturing (A3), Distribution (A4), Usage (B6), Transport (C2), Final disposal (C4), Recycling (D).

Statement: The estimated impact results shown above are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Climate impact (IPCC) per one Streamer (0,509kg)

Impact category	Unit	A1	A2	A3	A1-A3	A4	B6	C2	C4	D
Climate change	kg CO2 eq	6,85e+0	4,18e-2	8,47e-1	7,74e+0	2,14e-1	3,24e2	4,27e-3	2,27e-1	-2,25e+0

Due to differences in the method EF and IPCC, both results may be necessary to display. The indicator includes all greenhouse gases in the GWP total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of resources

The consumption of resources in terms of energy is measured as primary energy demand with the method CED 1,11.

Category	Unit	A1	A2	A3	A1-A3	A4	B6	C2	C4	D
PERE	MJ	1,50e+1	7,51e-3	2,41e-1	1,52e+1	2,14e-1	1,94e+3	7,71e-4	4,27e-3	-8,33e+0
PERM	MJ	0	0	0	0	0	0	0	0	0
PERT	MJ	1,50e+1	7,51e-3	2,41e-1	1,52e+1	2,14e-1	1,94e+3	7,71e-4	4,27e-3	-8,33e+0
PENRE	MJ	1,27e+2	6,12e-1	1,14e+1	1,39e+2	2,87e+0	8,11e+3	6,34e-2	9,77e-2	-6,51e+1
PENRM	MJ	0	0	0	0	0	0	0	0	0
PENRT	MJ	1,27e+2	6,12e-1	1,14e+1	1,39e+2	2,87e+0	8,11e+3	6,34e-2	9,77e-2	-6,51e+1
SM	Kg	4,14 e-1	0	0	4,14 e-1	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	M3	6,03e-2	8,00e-5	7,29e-3	6,77e-2	5,39e-4	4,57e+0	8,64e-6	1,78e-4	-3,46e-2

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 excl. 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

Waste production and output flows

Waste and the output of materials for recycling are from selected inventory results. Only flows that are leaving the system are included, while waste flows are not included in the model.

Waste production

Indicator	Unit	A1	A2	A3	A1-A3	A4	B6	C2	C4	D
Hazardous waste disposed	kg	0,0	0,0	1,25e-2	1,25e-2	0,0	0,0	0,0	0,0	0,0
Non-hazardous waste disposed	kg	0,0	0,0	2,12e-3	2,12e-3	0,0	0,0	0,0	1,90e-1	0,0
Radioactive waste disposed	kg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Output flows

Indicator	Unit	A1	A2	A3	A1-A3	A4	B6	C2	C4	D
Components for reuse	kg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Material for recycling	kg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	3,91e-1
Materials for energy recovery	kg	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Exported energy, electricity	MJ	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Exported energy, thermal	MJ	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Additional information

The environmental impact of Streamer, from a lifecycle perspective, comes mainly from the electricity consumption in the use phase and the production of raw materials.

Raw material production is the main source of the environmental impact of Streamer on “Ozone depletion” and other aspects. Operation is the main source of environmental impact of Streamer in 12 aspects, such as “Depletion of abiotic resources”, “Climate change”, “Eutrophication” and “Acidification”. The energy comes from the power grids of Sweden, China and Australia. Compared with the power of other countries, the impact of Sweden is relatively small.

The components that contribute the most are the LED power drive, the LED light source, the wires, etc. Thus, any changes in these components or data should be considered in an update.

References

- EPD International. (2021a). CONSTRUCTION PRODUCTS PCR 2019:14 VERSION 1,11.
- EPD International. (2021b). General Programme Instructions for the International EPD® System. Version 4,0.
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- Svensk standard ss-en 15804:2012+a2:2019. (2020).
- Ning Ding, Jincheng Gao.(2022). Life Cycle Assessment of the luminaire Streamer.