Hood

Environmental Product Declaration

EPD of multiple products, based on a representative product (sizes 1,2*1,2m, 1,2*1,8m, 1,2*2,4m, 1,2*3m, 1,8*1,8m, 1,8*2,4m, 1,8*3m)

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021
Ateljé Lyktan AB, Fyrvaktaregatan 7, SE-296 35, Sweden

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-07022
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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): PCR2019-14 Construction products v1.3.1 and UN CPC code(s) 4653 Together with EN 15804:2012+A2:2019
PCR review was conducted by: *The Technical Committee of the International EPD® System.* *Review chair: Claudia A. Peña, University of Concepción, Chile. Contact via info@environdec.com*
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Viktor Hakkarainen, VästLCA AB, viktor@vastlca.se *Approved by: The International EPD® System*
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

The LCA approach harmonizes with the Product Category Rules for building products, PCR 2019:14 v1.3.1. The Life Cycle Assessment report (Böckin, 2023) is available to EPD-auditor on request and include all the detailed information required according to ISO 14044 (ISO, 2006b).

Company information

Owner of the EPD
Ateljé Lyktan AB

Contact
Rasmus Nilsson, rasmus.nilsson@ateljelyktan.se

Description
Ateljé Lyktan develops, produces and markets lighting products - with a focus on energy efficiency, sustainability and circularity. We design our products to be used, upgraded and reused in a well-thought-out and flexible way. We make it possible to extend the life of the product by upgrading both hardware and software. The company was founded in 1934. The head office and factory are located in Åhus, located on the shores of the Baltic Sea in the southern Sweden.

Name and location of production site(s)
Ateljé Lyktan AB, Fyrvaktaregatan 7, SE-296 35, Sweden

Product-related or management system-related certifications
Ateljé Lyktan AB is certified according to ISO 9001 and ISO 14001. All products are produced in accordance with the requirements for CE-marking.

Product information

Product name
Hood

Product identification
Hood 1200x1200

Product description
Hood is a lighting luminaire for offices, conference rooms, restaurants, libraries and other open plan environments. Functioning both as a light source and a sound barrier. Hood is measured and evaluated according to ISO 354 and ISO 20189.

Including LED light source, colour temperature 3000K (4000K upon request). Colour rendering CRI 80 (90 upon request). The different colour temperatures do not affect the power consumption and thus has no effect on the environmental impact.

Lifespan: L90 50 000h. The product has a direct light distribution.

Equipped with Tridonic LED DALI driver to regulate the light with amplitude modulation creating a flicker-free light. Dimming 1-100%. The luminaire is delivered as standard with pre-programmed Constant Lumen Output (CLO).

Shades of moulded polyester felt. Frame in lacquered aluminium. Diffuser in opal acrylic.

For this report, the system studied was the life cycle of Hood (from cradle to grave) and its function is to act as a light source in an office environment. The version modelled for this report has a length of 1200 mm, a width of 1200 mm, a height of 600 mm, a weight of 8,87 kg and a power-rating of 23 W. It has an estimated reference service life (RSL) of 20 years.

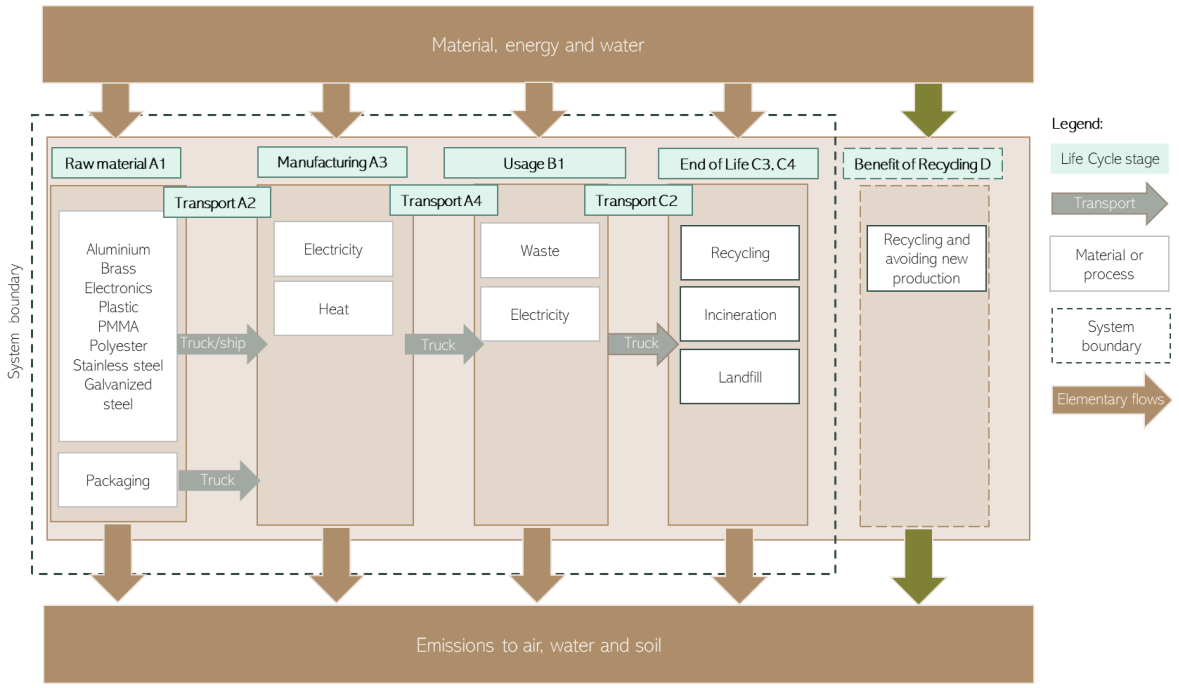
The results will represent the baseline luminaire size. However, conversion factors can be calculated that enable converting the results into environmental impacts for the other available sizes, see Additional Environmental information.

LCA information

Declared Unit	**One (1) Hood luminaire with a length of 1200 mm, a width of 1200 mm, a height of 600 mm, a weight of 8,88 kg and a power-rating of 23 W.**
Function	Office light during the lifetime of one luminaire.
Lifetime	Reference Service Life: 20 years.
Product group classification	UN CPC 4653
Goal and Scope	Understanding the product's environmental impact during the life cycle, for internal product development to reduce the impact but also to our stakeholders when selecting luminaires.
Audience	Primarily purchasers of luminaires but also lighting installers, lighting designers, architects and constructors.
Manufacturing Site	Ateljé Lyktan, Åhus, Sweden.
Geographical Area	Results represent Sweden. The product's main market is Europe.
Compliant with	This EPD follows the "Book-keeping" LCA approach which is defined as attributional LCA in the ISO 14040 standard. In accordance with ISO 14025, ISO 14040 – ISO 140 44 and EN 15804:2012+A2:2019 This EPD follows the Product Category Rules PCR 2019:14 Construction products v1.3.1 valid until 2024-12-20
Cut-Off Rules	The following procedure is followed for the exclusion of inputs and output: - Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts shall be included A screening and expert judgement showed that the following aspects contribute less than 1% and could be cut-off: - Various supplier packaging - Manufacturing waste - Energy and material use in installation - Energy for deconstruction
Background data	The data quality is considered fair. All site-specific data for raw materials, auxiliary materials as well as energy and emissions in the manufacturing process is from 2021 and have been represented with Ecoinvent datasets. All other relevant environmental aspects have been represented by generic Ecoinvent data. Ecoinvent is the world's biggest LCI (Life cycle inventory) data library and the latest and most updated version was used. Ecoinvent contains data for the specific geographical regions relevant for this study. The background data from Ecoinvent 3.9.1 are from 2017-2022.
Foreground data - primary	Weight of articles and composition of raw materials. Suppliers' location for transport and some specific data on energy and material use Packaging, rest materials, electricity, heat and waste.
Electricity data	B6 electricity is represented by data for national production mix in Ecoinvent 3.9.1 regionalized for Sweden.
Allocations	Polluter Pays / Allocation by Classification One allocation rule is applied: the energy and fuel necessary for the manufacture is allocated in kWh by production of the declared unit
Impact Assessment methods	Potential environmental impacts are calculated with Environmental Footprint 3.0 method as implemented in SimaPro 9.5 Resource use values are calculated from Cumulative Energy Demand V1.11.
Based on LCA Report	Miljögiraff LCA Report 1062C Hood - (Daniel Böckin, Miljögiraff AB)
Software	SimaPro 9.5

System diagram

This study has system boundaries of type b, cradle-to-gate with modules C1-C4, D and optional module B. That means that all processes needed for raw material extraction, manufacturing, transport, usage and end-of-life are included in the study. All modules (A1-D) are declared, although some modules (B1-B5, B7, C1, C4) do not have any environmental aspects. Furthermore, modules A5 and C1 are not shown in the system diagram (see all declared modules below and further descriptions of the life cycle under the content and life cycle information below). Infrastructure is included in the EPD.



Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation

Module	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geo-graphy	G/SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Share of specific data, %	3%														
Variation products, %	1,2*1,2m: 0% (declared product) 1,2*1,8m: 82% 1,2*2,4m: 164% 1,2*3m: 245% 1,8*1,8m: 230% 1,8*2,4m: 377% 1,8*3m: 525%														

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

Content and life cycle information

The following table shows the material content of the Hood luminaire and the percentage of recycled and renewable material in the product, for the representative product of size 1,2*1,2m. For other sizes, see the conversion factors under Summary and conversion factors.

Product materials	**Weight, kg**	**Post-consumer material, weight-%**	**Renewable material, weight-%**
Aluminium	1,549	0	0
Brass	0,08	0	0
Electronics	0,9415	0	0
Plastic	0,001	0	0
PMMA	0,54	0	0
Polyester	5,68	0	0
Stainless steel	0,024	0	0
Steel galvanised	0,0352	0	0
Steel	0,025	0	0
Total	8,88	0	0
Packaging materials	**Weight, kg**	**Post-consumer material, weight-%**	**Renewable material, weight-%**
PE packaging	0,00120	0	0
Cardboard	3,64	0	100
EU pallet	0,454	0	99

Dangerous substances from the candidate list of SVHC for Authorisation	**EC No.**	**CAS No.**	**Weight-% per functional or declared unit**
(No dangerous substances exceeding 0,1 wt%)			

The majority of the product weight comes from the polyester and aluminium as well as the electronics.

Manufacturing is done by ateljé Lyktan's suppliers and the components are then transported and manually assembled on site in Åhus, Sweden. Consequently, there is no energy use or production waste in the A3 module.

Packaging is shown in the table above and includes PE, cardboard and pallets for transport.

It is assumed that there are no environmental aspects during **installation** of the product, except the waste management of packaging after installation.

For the **use phase**, the luminaire is assumed to be installed in Sweden (ateljé Lyktan's main market) in an office environment. The lifetime energy consumption of 1,15 MWh was calculated by multiplying the reference service life (RSL=20 years) with the number of use hours per year (2500 hours in an office environment, according to EN15193) and the power draw of Hood (23 W). The energy source was average electricity on the Swedish grid (48,7 g CO2-eq/kWh).

End of life is based on a generic scenario of European waste management (see table below for recycling rates according to R2 numbers in PEF's circular footprint formula. Non-recycled materials are 99% incinerated and 1% landfilled), as an approximation for Swedish waste management, where ateljé Lyktan's main market is located. The exception is the electronics, which are assumed to be separated and the copper and steel recycled while the rest is incinerated.

Waste type	Recycling rate	Waste type	Recycling rate
Cardboard	75%	PE	0%
Packaging paper	62%	PET	0%
Glass	0%	PP	0%
Ferro metals	85%	PS	0%
Aluminium	85%	PVC	0%
Steel	85%	Compost	40,2%
Plastics	0%	Textile	11%

Environmental information

All results are for a representative luminaire size (1,2*1,2m), for other sizes, see conversion factors under Additional environmental information. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. See disclaimers below.

Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	82,0	2,09	0,138	0	0	0	0	0	46,3	0	0	0,246	12,7	0	-11,6
GWP-biogenic	kg CO_2 eq.	-5,76E+00	1,92E-03	6,61E+00	0	0	0	0	0	5,02E-01	0	0	4,51E-05	7,68E-04	0	-6,51E-02
GWP-luluc	kg CO_2 eq.	4,14E-01	1,03E-03	2,34E-05	0	0	0	0	0	3,93E+00	0	0	3,11E-05	1,61E-04	0	-2,05E-01
GWP-total	kg CO_2 eq.	76,6	2,10	6,75	0	0	0	0	0	50,7	0	0	0,246	12,7	0	-11,8
ODP	kg CFC 11 eq.	8,58E-05	4,56E-08	3,00E-09	0	0	0	0	0	1,59E-06	0	0	3,85E-09	1,28E-08	0	-3,58E-07
AP	mol H^+ eq.	6,05E-01	4,57E-03	9,42E-04	0	0	0	0	0	5,26E-01	0	0	1,34E-03	3,20E-03	0	-1,07E-01
EP-freshwater	kg P eq	6,15E-03	1,70E-05	6,66E-07	0	0	0	0	0	3,33E-03	0	0	5,56E-07	4,62E-06	0	-6,53E-04
EP-marine	kg N eq.	9,12E-02	1,13E-03	4,29E-04	0	0	0	0	0	6,91E-02	0	0	5,83E-04	1,50E-03	0	-1,59E-02
EP-terrestrial	mol N eq.	9,48E-01	1,17E-02	4,48E-03	0	0	0	0	0	8,99E-01	0	0	6,32E-03	1,61E-02	0	-2,04E-01
POCP	kg NMVOC eq.	3,16E-01	7,10E-03	1,51E-03	0	0	0	0	0	2,30E-01	0	0	2,47E-03	4,15E-03	0	-5,98E-02
ADP-minerals&metals	kg Sb eq.	5,59E-03	6,84E-06	1,30E-07	0	0	0	0	0	4,52E-03	0	0	1,58E-07	7,71E-07	0	-1,82E-04
ADP-fossil	MJ	1,31E+03	2,97E+01	1,56E+00	0	0	0	0	0	6,96E+03	0	0	3,19E+00	1,70E+00	0	-1,58E+02
WDP	m^3	2,49E+01	1,23E-01	3,51E-02	0	0	0	0	0	8,87E+01	0	0	6,01E-03	3,97E-02	0	-1,32E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.														

Potential environmental impact – additional mandatory and voluntary indicators

Results per declared unit																
Indicator	**Unit**	**Tot. A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG	kg CO_2 eq.	82,9	2,09	0	0	0	0	0	0	51,1	0	0	0,246	12,7	0	-11,8
Particulate matter	disease inc.	4,75E-06	1,55E-07	1,63E-08	0	0	0	0	0	3,57E-06	0	0	3,21E-08	2,23E-08	0	-1,21E-06
Ionising radiation	kBq U-235 eq	5,35E+00	1,51E-02	4,21E-04	0	0	0	0	0	2,43E+02	0	0	4,94E-04	4,04E-03	0	-8,01E-01
Ecotoxicity, freshwater	CTUe	5,51E+02	1,47E+01	2,31E+00	0	0	0	0	0	7,01E+02	0	0	1,55E+00	9,76E+00	0	-3,15E+01
Human toxicity, cancer	CTUh	9,91E-08	9,54E-10	2,29E-10	0	0	0	0	0	1,18E-07	0	0	3,61E-11	2,16E-09	0	-2,81E-08
Human toxicity, non-cancer	CTUh	3,46E-06	2,11E-08	3,58E-09	0	0	0	0	0	5,04E-06	0	0	6,26E-10	2,72E-08	0	-2,36E-07
Land use	Pt	4,71E+02	1,80E+01	2,27E-01	0	0	0	0	0	1,80E+03	0	0	3,54E-01	6,46E-01	0	-4,13E+02

Disclaimer 1: The results of the environmental impact indicators Abiotic depletion for fossil and non-fossil resources, Water depletion potential, Ecotoxicity-freshwater, Human toxicity-cancer, Human toxicity-non-cancer and Land use shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Disclaimer 2: The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

Disclaimer 3: The indicator GWP-GHG includes all greenhouse gases included in 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.

Disclaimer 4: The indicator Ionising radiation deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 5: The use of the results of modules A1-A3 without considering the results of module C is discouraged.

Use of resources

Calculated according to option B in Annex 3 of the PCR.

Results per declared unit																
Indi-cator	Unit	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2,01E +02	4,67E -01	1,58E -02	0	0	0	0	0	3,11E +03	0	0	1,26E -02	1,41E -01	0	-1,82E +02
PERM	MJ	7,77E +01	0,00E +00	-7,75E +01	0	0	0	0	0	0,00E +00	0	0	0,00E +00	0,00E +00	0	0,00E +00
PERT	MJ	2,79E +02	4,67E -01	-7,75E +01	0	0	0	0	0	3,11E +03	0	0	1,26E -02	1,41E -01	0	-1,82E +02
PENRE	MJ	1,40E +03	3,16E +01	1,66E +00	0	0	0	0	0	6,98E +03	0	0	3,39E +00	1,83E +00	0	-1,68E +02
PENRM	MJ.	2,72E +02	0,00E +00	-4,75E -02	0	0	0	0	0	0,00E +00	0	0	0,00E +00	-2,70E +02	0	0,00E +00
PENRT	MJ	1,67E +03	3,16E +01	1,61E +00	0	0	0	0	0	6,98E +03	0	0	3,39E +00	-2,68E +02	0	-1,68E +02
SM	kg	0,00E +00	0,00E +00	0,00E +00	0	0	0	0	0	0,00E +00	0	0	0,00E +00	0,00E +00	0	0,00E +00
RSF	MJ	0,00E +00	0,00E +00	0,00E +00	0	0	0	0	0	0,00E +00	0	0	0,00E +00	0,00E +00	0	0,00E +00
NRSF	MJ	0,00E +00	0,00E +00	0,00E +00	0	0	0	0	0	0,00E +00	0	0	0,00E +00	0,00E +00	0	0,00E +00
FW	m^3	6,92E -01	4,98E -03	2,13E -03	0	0	0	0	0	1,92E +00	0	0	2,41E -04	7,16E -03	0	0,00E +00
Acronyms	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 re-sources; 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[1]

Results per declared unit																
Indicator	Unit	Tot. A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-hazardous waste disposed	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Radioactive waste disposed	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] The reported waste production are flows leaving the system boundary. Since waste treatment processes are part of the system boundary, the indicators are here reported as zero, according to Environdec's "guidance on the resource use and waste indicators" (https://environdec.com/resources/indicators)

Output flows

Results per declared unit																
Indicator	**Unit**	**Tot. A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0,188	0	0	0	0	0	0	0	0	0	0	1,44	0
Materials for energy recovery	kg	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
Exported energy, thermal	MJ	0	0	0,640	0	0	0	0	0	0	0	0	0	24,6	0	0

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	1,83

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.

Summary and conversion factors

From a life cycle perspective, the environmental impact of the Hood luminaire can mainly be attributed to electricity consumption in the use phase. The environmental impact of this electricity is dominated by fossil resource use. Despite using average electricity from the Swedish grid (which has a low climate impact compared to e.g. European average electricity), the **use phase stood for 34%** of total climate impacts (GWP-GHG).

The production of raw materials represents approximately 57% of total climate impacts (GWP-GHG). Most of these come from the production of the LED strips (22%~) as well as polyester (16%~) and aluminium (7%~).

The model of the product system is sensitive to the source of energy in production of the electricity. If wind power is used instead, the total IPCC climate impact would be 21% lower.

The results in this EPD are for a representative luminaire size (1,2*1,2m). Conversion factors were calculated that enable converting the results into environmental impacts for the other available sizes. In practice, new results can be generated by multiplying with the conversion factor. Most materials scale with the number of profile modules (also named “Corners” in this LCA), except the number of LEDs (and thus also the power consumption), which scale with the number of nodes between the profile modules. The conversion factors were calculated by averaging the scaling of the modules and nodes, which in the total results gives an error of up to ca 9% for the largest luminaire size (except for depletion of ozone and mineral resources where the error is up to ca 16-59% for the largest luminaire size). An exception to the conversion factors is the energy in the use phase, which is handled by having a separate conversion factor for the B6 module which is simply the ratio of the power draw compared to the baseline power of 23W.

Size (mm)	Power (W)	Conversion factor for all modules except B6	Conversion factor for B6 module	Comment
1200x1200	23	1	1	Baseline
1200x1800	46	1,82	2	
1200x2400	69	2,64	3	
1200x3000	92	3,45	4	
1800x1800	92	3,30	4	
1800x2400	138	4,77	6	
1800x3000	184	6,25	8	

It follows from the conversion factors that the variation in the results between the smallest and largest product version is maximum ca 700% for all impact categories. Note, however, that the reason for the variation is simply the size and power draw of the luminaire - the variation of impacts per kg or per W is significantly smaller.

References

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