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Product Environmental Profile of luminaires for indoor lighting PLATO family

Reference product: PLATO OPAL TEKNIK DALI/SWD

General information

Company information
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Environmental commitments
CARDI develops and manufactures, luminaires that meets the markets standards and environmental requirements. based on the latest LED technology enclosed in the most sustainable materials.
Research and development take place continuously in order to meet the requirements of the future.

In times of global warming, efforts are needed to make a difference. CARDI commitment to reducing carbon dioxide emissions is based on being at the development forefront of environmentally friendly and energy-saving products.

Reference product
PLATO OPAL TEKNIK DALI/SWD (595x595x28mm)

The assessed products range covers indoor lighting luminaires from the PLATO family.
The luminaires are used for professional lighting of indoor hospital applications.

Functional unit
The functional unit for this PEP is compliant with PSR rules, and is defined as follow:
"Provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours"
Calculations of environmental impacts of the manufacturing, distribution, installation, use and end-of-life stages are carried out as follows for each life cycle stages:
Enviromental impacts of PEP (for 1000 lumens over 35000 hours)= Environmental impacts of the reference product x (1000/6270) x (35000/100000) = Reference product enviromental impacts x 0.0558

Homogeneous environmental family:

The reference product represents the DL luminaires family, which differs in terms of power and useful output flux (lumens) of the integrated LED installed in the luminaires.

The range of variations for the products in the same family are the following:

Plato family	System power (W)	Luminous flux (lm)	Product mass (g)
Plato Opal Bas	41	5 530	2 751
Plato Opal DALI	41	5 530	2 850
Plato Prisma Bas	41	5 410	2 751
Plato Prisma DALI	41	5 410	2 850
Plato Prisma DIM	41	5 410	2 751
Plato Prisma HE Bas	39.5	6 550	2 850
Plato Opal Teknik DIM	39.5	6 270	2 751
Plato Opal Teknik DALI	39.5	6 270	2 850
Plato Prisma Teknik DIM	39.5	6 150	2 751
Plato Prisma Teknik DALI	39.5	6 150	2 851
Plato Prisma Teknik SENS BT	24	3 610	2 890
Plato 3x12 Opal Teknik DIM	39.5	6 270	3 051
Plato 3x12 Opal Teknik DALI	39.5	6 270	3 150
Plato 3x12 Prisma Teknik DIM	39.5	6 150	3 051
Plato 3x12 Prisma Teknik DALI	39.5	6 150	3 150
Plato Nano Teknik DALI	39.5	6 450	2 850
Plato Nano Teknik IP65 DALI	42	5 950	3 735
Plato Nano Teknik IP65	31	4 490	3 735
Plato Nano Teknik TW DT8	30	4 505	2 850
Plato 3x6 Prisma Teknik DIM	23	3 285	2 135
Plato 3x6 Prisma Teknik DALI	23	3 285	2 222
Plato Nano FS Teknik DALI	39.5	4 590	2 850

Description of reference product

Specification	Unit	Value
Product category	-	Indoor lighting products supplied with light source and control gear
Product name	-	PLATO OPAL TEKNIK DALI/SWD
Light Source / Lifetime @ L80	Hours	100 000
Color temperature	K	3000/4000/5500
Color rendering	Ra	90
Luminous flux	Lm	6270
Luminous efficency	Lm/W	159
Ingress protection	IP	20
Flicker	% (IEEE1789) / SVM / PstLM	<3% / <0,4 SVM / <1,0
Operating voltage	VAC	220-240
Unified Glare Rating	UGR	<22
Dimensions	mm	595x595x28

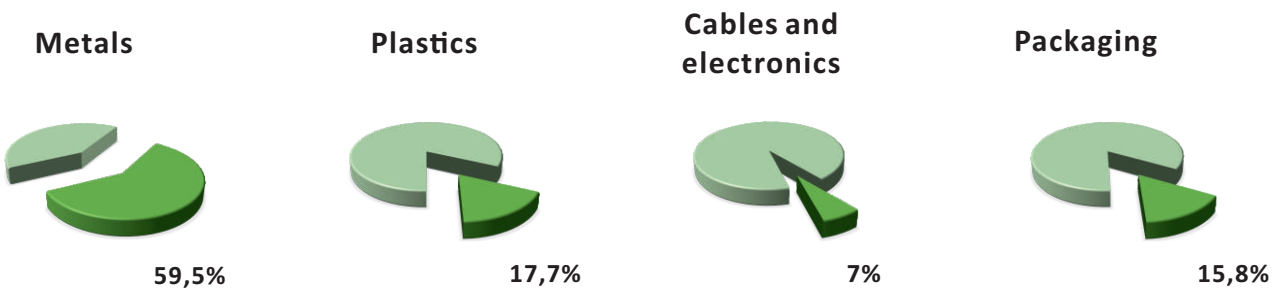
The geographical scope for this PEP was based on the following considerations:
- Technological representativeness takes place in Sweden and China, 2025.
- Supply of the raw materials take place in Europe, China and US while assembly of the products take place in China.
- Distribution centers in which storage takes place in Sweden.
- Installation, use and end-of-life of the products take place in Sweden.

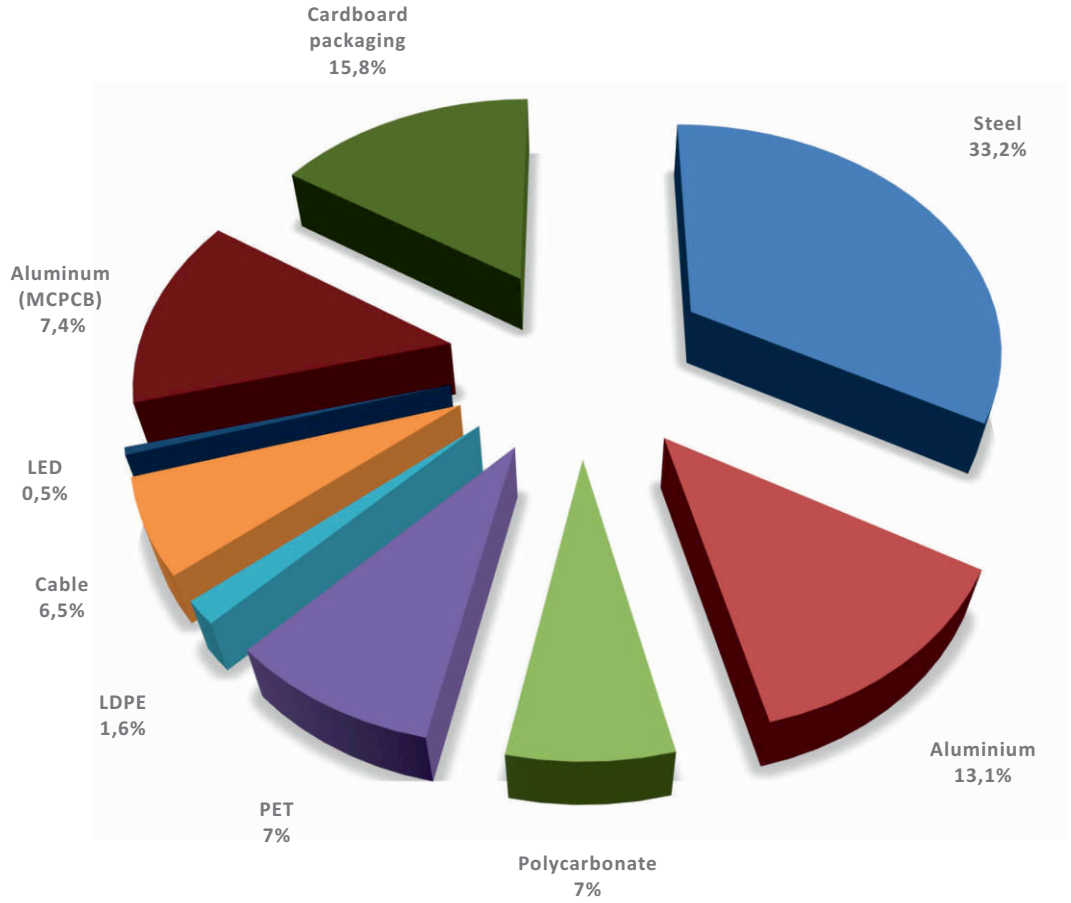
Constituent material

The list below includes materials with a certain amount of recycled content, in order to reduce the impacts linked to production of original material.

In particular:
The main body of the luminaire is made of 100% of recycled PC and extruded aluminum;
The cardboard box of packaging is made of 82% of recycled content.

Total weight of reference product 2849.8g(packaging included)





Manufacturing

Luminaires and control gears are manufactured and assembled in Luminans Dongguan China.
The aluminum and plastic used comes from 100% recycle material.
The treatment of the losses in production are:
Turning of steel parts, casting of aluminum, injection of plastic, soldering of SMD components, HAL finishing and PWB, solder mask deposition.

The upstream transport used during the manufacturing phase is: Europe to China by Boat and Truck, Asia to China by Truck, Local China by Truck.

The environmental management system is Certified according to ISO14001 and ISO 9001.

All lighting products manufactured by Luminans comply to the European directive “2011/65/EU RoHS 2.0 - Restriction of dangerous substances in electrical and electronical equipment”.

Energy used: Electricity Mix; high voltage; 2018; Chine, CN.

Distribution

Products leaving the manufacturing in Dongguan, China by sea with 19,000km, arriving in Sweden then delivered directly to the client's logistics centers by truck 1,000km.

The logistics centers are strategically located to optimize transport efficiency, both in terms of transport distance and means of transport.
The warehouse buildings have been appointed the status of Environmental Building Silver according to Sweden Green Building Council. *All transports are affiliated with Fair Transport and the CO_2 reporting from the transports are in accordance with the Global Logistics Emissions Councils (GLEC) framework.

During 2022, 70% of the goods were transported with vehicles running on HVO100 (Hydrotreated Vegetable Oil) made from 100% renewable resources and is free from any fossil fuels. During 2023 electrical trucks will be introduced to further lower the climate impact.

*This specific fuel wasn’t modelized due to lack of data.

Installation

The luminaires are provided to the client with control gear for installation,
if wiring/connectors are available at point of installation, no further accessories are necessary.
Only standard tools might be necessary for connection.

The EoL treatment of the cardbord packaging used is mainly recycled, partially incinerated and landfill.

Energy used: Electricity Mix; Low voltage; 2018; Sweden, SE.

Use

Energy efficient LED light source with an energy efficency class of ”B” acording to the energy labeling regulation (EU) 2019/2015. The light source is integrated in the luminaire.

The use phase consists of electricity use during the whole lifetime of the product.

The assigned lifetime of the luminaire according to L80 = 100 000 hours.

The Plato family luminaires are equipped with a light management system (named “DIP Switch Power Setting”) capable of reducing electricity consumption by switching the power (3 steps, P_{max} 100% / 70% / 50%) during use.

Energy used: Electricity Mix; Low voltage; 2018; Sweden, SE.

End of life

The product end of life factors is taken into consideration during the design phase. By designing the luminaire according to The Ecodesign Directive (Directive 2009/125/EC). Dismantling and sorting of components or material is made as easy as possible with the perspective, ease of recycling.

the EoL treatment of the product used is mainly recycled, partially incinerated and landfill.

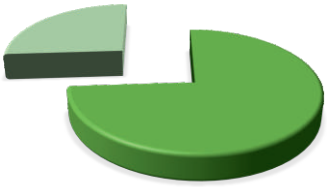
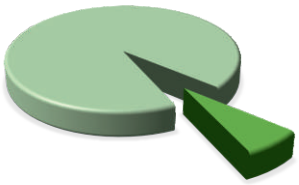
Elements to process specifically:
In accordance with the requirements of this Directive, the electronic components can contain traces of heavy metals which must be removed and sent to specific channels for processing in compliance with the WEEE Directive 2012/19/EU:

- All brominated flame retardants have been replace with none-toxic alternatives.

Energy used: Electricity Mix; Low voltage; 2018; Sweden, SE.

The ESR database was used to modelized the end of life of the product.

According to the data available at the issuing of this report, waste treatment scenarios are as follows:
(Reference info by link: https://kunskapsrummet.com/en/sustainability-report-2022/)

Proportion of luminaire	WEEE waste (Sweden)	Assumption
 74%	Recycling	Transport (100km) and handling of waste based on included materials.
 19%	Incineration with waste energy recovery	Transport (100km) and handling of waste based on included materials.
 7%	Landfill	Transport (100km) and handling of waste based on included materials.

Environmental impacts

The evaluation of environmental impacts examines the stages of the reference product life cycle: manufacturing, distribution, installation, use and end of life.

For each phase, the following modelling elements were taken into consideration:

Manufacture	Material and components of the product, energy consumption, transports, packaging and the waste generated by the manufacturing.
Distribution	Transport between the factory and the final clients.
Installation	The end of life of the packaging.
Use	- Product category: Indoor lighting products and control gear - Use scenario: 5000 hours per year for commercial application. - Swedish energy Mix.
End of life	The ESR database was used to modelized the end of life of the product
Software and database use	EIME v6.3.0.1-20 Database CODDE-2025-04

Unless otherwise specified, the energy models are those integrated in the modules used from the EIME database

Extrapolation

The extrapolation coefficients are given for the environmental impact of the FU, which is the emission of an outgoing artificial luminous flux of 1,000 lumens over 35,000 hours. For each life cycle stage, the environmental impacts of the product are calculated by multiplying the reference product impacts of the declaration with the extrapolation coefficient. The "Total" column shall be calculated by adding the environmental impacts of each life cycle stage."

The extrapolation coefficients calculation at the FU level shall use the following formula:

$$\text{Extrapolation coefficient at the product level} \times \left(\frac{\text{Lighting output of reference product (lm)}}{\text{Lighting output of product concerned (lm)}} \right)$$

Plato family	System power (W)	Luminous flux (lm)	Product mass (g)	Structure mass (g)	Mass of Control Gear (g)	Light Source mass (g)	Mass Lighting Management (g)	Packaging mass (g)
LUM-PL2230 BHDA	39.5	6 270	2 850	2 037	368	13	110	450
LUM-PL2240 BS	41	5 530	2 750	2 037	250	13	93	450
LUM-PL2240 BSDA	41	5 530	2 850	2 037	349	13	110	450
LUM-PL2240P BS	41	5 410	2750	2 037	250	13	93	450
LUM-PL2240P BSDA	41	5 410	2 850	2 037	349	7	110	450
LUM-PL2240P BSD	41	5 410	2 750	2 037	250	7	93	450
LUM-PL2230P BUDA	39.5	6 550	2 850	2 037	349	7	110	450
LUM-PL2230 BHD	39.5	6 270	2 750	2 037	250	7	93	450
LUM-PL2230P BHD	39.5	6 150	2 750	2 037	250	13	93	450
LUM-PL2230P BHDA	39.5	6 150	2 850	2 037	349	13	110	450
LUM-PL2225P BHSR	24	3 610	2 890	2 037	389	13	110	450
LUM-PL1430 BHD	39.5	6 270	3 050	2 237	250	13	93	550
LUM-PL1430 BHDA	39.5	6 270	3 150	2 237	349	13	110	550
LUM-PL1430P BHD	39.5	6 150	3 050	2 237	250	13	93	550
LUM-PL1430P BHDA	39.5	6 150	3 150	2 237	349	13	110	550
LUM-PL2230N BHDA	39.5	6 450	2 850	2 037	349	13	110	450
LUM-PL2240NIP BHDA	42	5 950	3 735	2 337	934	13	250	450
LUM-PL2230NIP BH	31	4 490	3 735	2 337	934	13	250	450
LUM-PL2230N BHDT	30	4 505	2 850	2 037	349	13	110	450
LUM-PL1225P BHD	23	3 285	2 135	1 643	225	7	88	260
LUM-PL1225P BHDA	23	3 285	2 222	1 643	312	7	96	260
LUM-PL2230N BFDA	39.5	4 590	2 850	2 037	349	13	110	450

Plato family	Manufacturing					Distribution	Installation	Use			End of Life
	Structure and packaging	Control gear	Light Source	Lighting	Max			Light Source	Electricity	Max	
LUM-PL2230 BHDA	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LUM-PL2240 BS	1.00	0.68	1.00	0.85	1.00	0.97	1.00	1.00	1.04	1.04	0.84
LUM-PL2240 BSDA	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	0.88
LUM-PL2240P BS	1.00	0.68	1.00	0.85	1.00	0.97	1.00	1.00	1.04	1.04	0.84
LUM-PL2240P BSDA	1.00	0.95	0.53	1.00	1.00	1.00	1.00	0.53	1.04	1.04	0.88
LUM-PL2240P BSD	1.00	0.68	0.53	0.85	1.00	0.97	1.00	0.53	1.04	1.04	0.84
LUM-PL2230P BUDA	1.00	0.95	0.53	1.00	1.00	1.00	1.00	0.53	1.00	1.00	0.88
LUM-PL2230 BHD	1.00	0.68	0.53	0.85	1.00	0.97	1.00	0.53	1.00	1.00	0.84
LUM-PL2230P BHD	1.00	0.68	1.00	0.85	1.00	0.97	1.00	1.00	1.00	1.00	0.84
LUM-PL2230P BHDA	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
LUM-PL2225P BHSR	1.00	1.06	1.00	1.00	1.06	1.01	1.00	1.00	0.61	1.00	0.89
LUM-PL1430 BHD	1.10	0.68	1.00	0.85	1.10	1.07	1.22	1.00	1.00	1.00	0.94
LUM-PL1430 BHDA	1.10	0.95	1.00	1.00	1.10	1.11	1.22	1.00	1.00	1.00	0.97
LUM-PL1430P BHD	1.10	0.68	1.00	0.85	1.10	1.07	1.22	1.00	1.00	1.00	0.94
LUM-PL1430P BHDA	1.10	0.95	1.00	1.00	1.10	1.11	1.22	1.00	1.00	1.00	0.97
LUM-PL2230N BHDA	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88
LUM-PL2240NIP BHDA	1.15	2.54	1.00	2.27	1.31	1.31	1.00	1.00	1.06	1.06	1.15
LUM-PL2230NIP BH	1.15	2.54	1.00	2.27	1.31	1.31	1.00	1.00	0.79	1.00	1.15
LUM-PL2230N BHDT	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.76	1.00	0.88
LUM-PL1225P BHD	0.81	0.61	0.50	0.80	0.75	0.75	0.58	0.50	0.59	0.59	0.66
LUM-PL1225P BHDA	0.81	0.85	0.50	0.87	0.78	0.78	0.58	0.50	0.59	0.59	0.68
LUM-PL2230N BFDA	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88

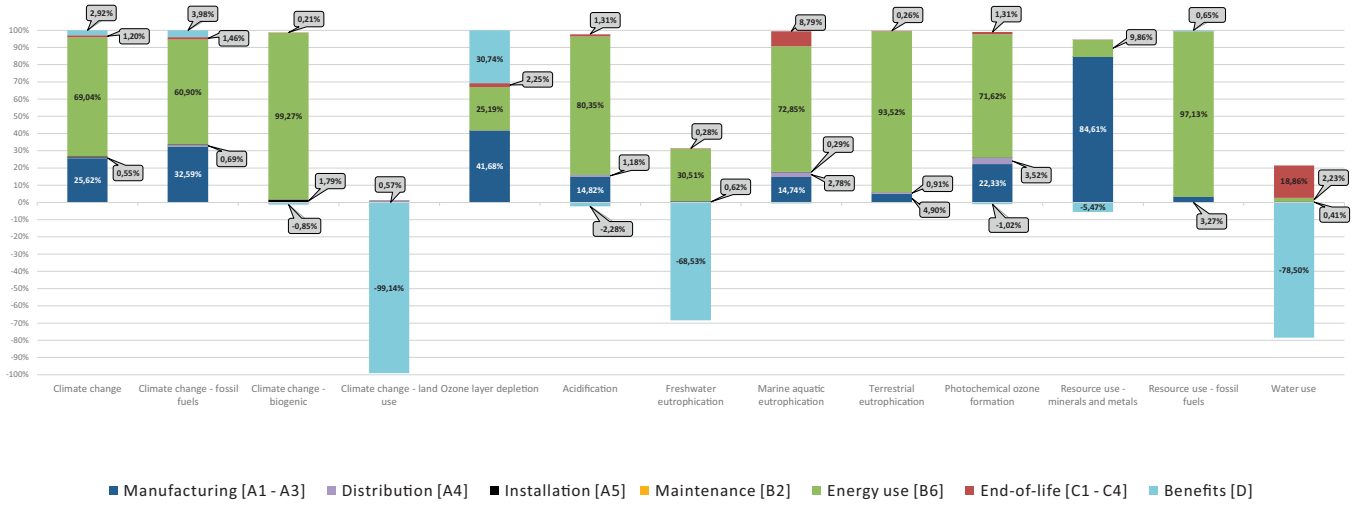
Environmental impacts

The evaluation of environmental impacts examines the manufacturing, distribution, installation, use and end of life stages of the reference product life cycle.

The impacts indicators and impact models used are the ones indicated by the PCR-ed4-EN-2021 09 14.

		Total	Manufacturing [A1 - A3]	Distribution [A4]	Installation [A5]	Use [B1]	Maintenance [B2]	Repair [B3]	Replacement [B4]	Refurbishment [B5]	Operational energy use [B6]	Operational energy use [B7]	Extrapolation rules applied to end-of-life stage [C1 - C4]	Extrapolation rules applied to benefits [D]
PEF-GWP	kg CO2 eq	1,05E+01	2,77E+00	5,91E-02	7,26E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,48E+00	0,00E+00	1,30E-01	3,07E-01
PEF-GWPf	kg CO2 eq	8,20E+00	2,78E+00	5,91E-02	3,16E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,20E+00	0,00E+00	1,25E-01	3,27E-01
PEF-GWPb	kg CO2 eq	2,31E+00	-9,79E-03	1,15E-07	4,09E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,27E+00	0,00E+00	4,95E-03	-1,96E-02
PEF-GWPlu	kg CO2 eq	1,31E-07	8,69E-08	4,24E-08	8,83E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,75E-10	1,51E-05
PEF-ODP	kg CFC-11 eq	3,66E-07	2,20E-07	3,97E-10	4,05E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E-07	0,00E+00	1,19E-08	1,13E-07
PEF-AP	mol H+ eq	1,38E-01	2,09E-02	1,67E-03	8,57E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,14E-01	0,00E+00	1,86E-03	-3,22E-03
PEF-Epf	kg $(PO4)^{3-}$ eq	3,08E-04	6,09E-06	1,35E-07	3,78E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,99E-04	0,00E+00	2,77E-06	-6,72E-04
PEF-Epm	kg N eq	1,35E-02	2,01E-03	3,79E-04	3,93E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,91E-03	0,00E+00	1,20E-03	-7,44E-05
PEF-Ept	mol N eq	4,53E-01	2,23E-02	4,15E-03	2,59E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,25E-01	0,00E+00	1,20E-03	-1,59E-03
PEF-POCP	kg COVNM eq	3,02E-02	6,81E-03	1,07E-03	6,04E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,18E-02	0,00E+00	4,00E-04	-3,11E-04
PEF-ADPe	kg Sb eq	3,31E-04	2,96E-04	1,27E-08	1,58E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,45E-05	0,00E+00	2,00E-07	-1,92E-05
PEF-ADPf	MJ	1,23E+03	3,99E+01	1,07E+00	2,87E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E+03	0,00E+00	1,69E+00	7,93E+00
PEF-WU	m3 eq	3,96E+01	7,47E-01	1,22E-03	2,35E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,12E+00	0,00E+00	3,48E+01	-1,45E+02
ERP	MJ	8,69E+02	3,62E+00	2,20E-03	3,84E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,66E+02	0,00E+00	1,62E-01	-8,11E-01
ERM	MJ	3,17E-01	3,17E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,71E-01
ER	MJ	8,70E+02	3,94E+00	2,20E-03	3,84E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,66E+02	0,00E+00	1,62E-01	-4,40E-01
ENRP	MJ	1,23E+03	3,96E+01	1,07E+00	2,87E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E+03	0,00E+00	1,69E+00	7,09E+00
ENRM	MJ	2,82E-01	2,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,36E-01
ENR	MJ	1,23E+03	3,99E+01	1,07E+00	2,87E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E+03	0,00E+00	1,69E+00	7,93E+00
USM	kg	1,56E-01	1,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
URSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
UNRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NUFW-A2	m^3	1,09E+00	1,74E-02	2,84E-05	1,83E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,65E-02	0,00E+00	9,76E-01	-3,77E+01
HWD	kg	5,27E+00	3,68E+00	1,18E-04	1,56E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,59E+00	0,00E+00	3,85E-06	2,15E-01
NHWD	kg	8,06E+00	1,13E+00	3,78E-03	1,02E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,91E+00	0,00E+00	3,88E-03	8,88E-01
RWD	kg	7,80E-04	3,69E-04	2,88E-06	1,83E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,06E-04	0,00E+00	1,42E-07	6,80E-04
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MRE	kg	4,43E-02	2,37E-02	0,00E+00	2,06E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	1,70E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,70E-03	0,00E+00
Biogenic carbon of product	kg de C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon of packaging	kg de C	0,00E+00	1,26E-01	0,00E+00	-1,26E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	2,10E+03	4,38E+01	1,07E+00	3,25E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,05E+03	0,00E+00	1,85E+00	7,49E+00
PEF-PM	Décès/Kg eq	2,07E-06	1,37E-07	8,94E-09	5,06E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,92E-06	0,00E+00	6,56E-09	4,58E-08
PEF-IR	kBq U235 eq	1,70E+02	7,17E+00	1,07E-03	3,79E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,63E+02	0,00E+00	1,48E-02	8,75E-02
PEF-CTUe	CTUe	5,45E+01	1,08E+01	8,25E-01	4,30E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,14E+01	0,00E+00	1,12E+00	1,72E+00
PEF-CTUh-c	CTUh	1,20E-07	1,15E-07	5,99E-12	3,01E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,27E-09	0,00E+00	1,46E-10	3,07E-07
PEF-CTUh-nc	CTUh	1,21E-07	6,35E-08	8,49E-11	9,06E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,35E-08	0,00E+00	1,35E-08	-6,86E-08
PEF-LU	pas de dimension	2,04E+00	1,73E-02	1,20E-04	8,63E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,62E+00	0,00E+00	4,01E-01	-1,84E+00

Relative contribution of life cycle stages to impact categories



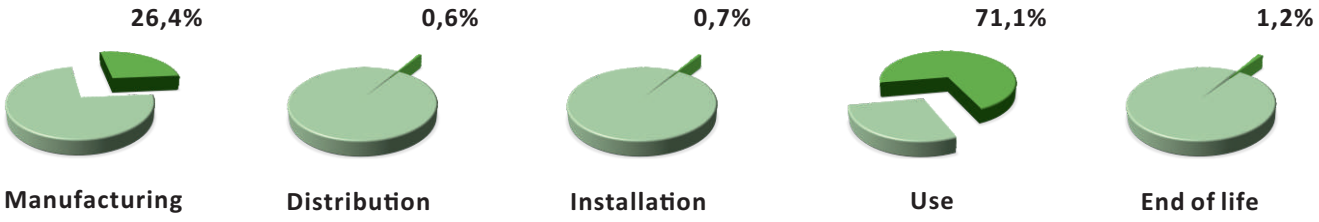
Environmental impacts

The evaluation of environmental impacts examines the manufacturing, distribution, installation, use and end of life stages of the reference product life cycle.

The impacts indicators and impact models used are the ones indicated by the PCR-ed4-EN-2021 09 14.
Indicator calculated with EF 3.0 methodology (EN 15804+A2) v2.0.

		Total	Manufacturing [A1 - A3]	Distribution [A4]	Installation [A5]	Operational energy use [B6]	Operational energy use [B7]	Extrapolation rules applied to end-of-life stage [C1 - C4]	Extrapolation rules applied to benefits [D]
Climate change	kg CO2 eq	1,05E+01	2,77E+00	5,91E-02	7,26E-02	7,48E+00	0,00E+00	1,30E-01	3,07E-01
Climate change - fossil fuels	kg CO2 eq	8,20E+00	2,78E+00	5,91E-02	3,16E-02	5,20E+00	0,00E+00	1,25E-01	3,27E-01
Climate change - Biogenic	kg CO2 eq	2,31E+00	-9,79E-03	1,15E-07	4,09E-02	2,27E+00	0,00E+00	4,92E-03	-1,96E-02
Climate change - Land use	kg CO2 eq	1,31E-07	8,69E-08	4,24E-08	8,83E-10	0,00E+00	0,00E+00	8,75E-10	1,51E-05
Ozone layer depletion	kg CFC-11 eq	3,66E-07	2,20E-07	3,97E-10	4,05E-10	1,33E-07	0,00E+00	1,19E-08	1,13E-07
Acidification	mol H+ eq	1,38E-01	2,09E-02	1,67E-03	8,57E-05	1,14E-01	0,00E+00	1,86E-03	-3,22E-03
Freshwater eutrophication	kg $(PO4)^{3-}$eq	3,08E-04	6,09E-06	1,35E-07	3,78E-07	2,99E-04	0,00E+00	2,77E-06	-6,72E-04
Marine aquatic eutrophication	kg N eq	1,35E-02	2,01E-03	3,79E-04	3,93E-05	9,91E-03	0,00E+00	1,20E-03	-7,44E-05
Terrestrial eutrophication	mol N eq	4,53E-01	2,23E-02	4,15E-03	2,59E-04	4,25E-01	0,00E+00	1,20E-03	-1,59E-03
Photochemical ozone formation	kg COVNM eq	3,02E-02	6,81E-03	1,07E-03	6,04E-05	2,18E-02	0,00E+00	4,00E-04	-3,11E-04
Resource use - minerals and metals	kg Sb eq	3,31E-04	2,96E-04	1,27E-08	1,58E-09	3,45E-05	0,00E+00	2,00E-07	-1,92E-05
Resource use - fossil fuels	MJ	1,23E+03	3,99E+01	1,07E+00	2,87E-01	1,19E+03	0,00E+00	1,69E+00	7,93E+00
Water use	m3 eq	3,96E+01	7,47E-01	1,22E-03	2,35E-03	4,12E+00	0,00E+00	3,48E+01	-1,45E+02

The Global Warming Potential of the reference product is 10,5kg CO_2 distributed among the life cycle steps:



Contact Luminans if you have any questions regarding the calculation of coefficients for impacts others than those presented in this PEP

Registration number: CAR-00007-V01.01-EN	Drafting rules: "PCR-ed4-EN-2021 09 06" Supplemented by "PSR-0014-ed2-FR-2023 07 13"
Verifier accreditation No.: -	Information and reference documents: **www.pep-ecopassport.org**
Date of issue: 08-2025	Validity period: 5 years
Independent verification of the declaration and data, in compliance with ISO 14025 : 2006	
Internal: ☒ External: ☐	
The PCR review was conducted by a panel of experts	
PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019 The components of the present PEP may not be compared with components from any other program.	
Document complies with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations".	