Enviromental Product Declaration

BLACK FOSTER RECESSED

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for: "BLACK FOSTER RECESSED FAMILY" from ARKOSLIGHT S.L.

Programme: **The International EPD System, www.environdec.com**

Programme operator: **EPD International AB**

Type of EPD: **EPD of multiple products from a company**

EPD registration number: **EPD-IES-0029171:001**

Version date: **2026-04-23**

Validity date: **2031-04-23**

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

EPD Type: **Multi-product EPD, based on the average results of the product group.**

This EPD covers the following products:
BLACK FOSTER RECESSED, BLACK FOSTER MICRO RECESSED, BLACK FOSTER ASYMM REC, BLACK FOSTER REC IP54, BLACK FOSTER S RECESSED

ARKOSLIGHT

EPD INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

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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:	support@environdec.com

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

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

For further information about comparability, see EN 15804:2012+A2:2019/AC:2021 and ISO 14025.

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): **EPD International Product Category Rules (PCR) for construction products (PCR 2019:14 v.2.0.1)**

UN CPC Code: **46539 - Other electric lamps and lighting fittings (including lamps and lighting fittings of a kind used for lighting public open spaces or thorough-fares).**

The PCR review was conducted by the International EPD System Technical Committee.
See https://www.environdec.com/about-us/the-international-epd-system-about-the-system for the list of members. Review chair: Claudia Peña, University of Concepción, Chile. The review panel can be contacted through the Secretariat at https://www.environdec.com/contact-us.

Third-party Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ **EPD process certification* without a pre-verified LCA/EPD tool**

Third-party verifier: **Juan Górriz Lafuente**
Accredited by: **CERTINALIA S.L**
EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.envrondec.com.

Procedure for follow-up of data during EPD validity involves third party verifier:

☒ Yes ☐ No

INFORMATION ABOUT EPD OWNER

Owner of the EPD: ARKOSLIGHT S.L.

Address: Calle N – Pol. Ind. El Oliveral 46394 Ribarroja del Turia – Valencia (Spain)

Contact: info@arkoslight.com

Address and contact information of the LCA practitioner commissioned by the EPD owner, if applicable: Juan Górriz - info@arkoslight.com

Description of the organisation: At ARKOSLIGHT, we design, develop, and manufacture high-quality technical lighting to bring well-being and excitement to the spaces we inhabit. Each of our luminaires is an essential, almost invisible medium capable of providing conscious and organic illumination.

Our mission is to support architecture and interior design professionals in designing unique lighting that enhances their spaces.

Lighting is not just a source of light; it's an opportunity to create environments that respect our planet. Our work is moving toward a more sustainable future, where lighting technology embraces the highest performance standards.

From the use of cutting-edge LED technologies to intelligent design and the integration of recyclable materials, every detail has been carefully considered to boost energy efficiency and minimize environmental impact.

Product-related or management system-related certifications: ARKOSLIGHT S.L. is ISO 9001 and ISO 14001 certified. All European products are manufactured in accordance with CE marking requirements. The BLACK FOSTER RECESSED family is ENEC certified.

PRODUCT INFORMATION

Product name: BLACK FOSTER FAMILY

Product identification: GENERAL INTERIOR LIGHTING.

The following EPD covers the ARKOSLIGHT SHOT LIGHT family, including the following models:
- BLACK FOSTER RECESSED
- BLACK FOSTER MICRO RECESSED
- BLACK FOSTER ASYMM REC
- BLACK FOSTER REC IP54
- BLACK FOSTER S RECESSED

UN CPC code: 46539 - Other electric lamps and lighting fittings (including lamps and lighting fittings of a kind used for lighting public open spaces or thorough-fares).

Product description: Black Foster is the product that brings the acclaimed “The Invisible Black” effect to an insulated recessed linear luminaire, available in recessed and trimless versions.The bezel version features such a slim frame that, when switched on, it becomes virtually imperceptible, offering a “visual trimless” aesthetic. Black Foster stands out for its high shielding level, exceptional visual comfort, and its ability to almost completely conceal the light source from direct view.

Luminous Flux	630 lm
Colour Temperature	3000 K
Current	700 mA
Efficacy	100 lm/W
Lifespan	50.000 h

BLACK FOSTER REC 3 FLOOD 3000K N has been selected as the subject of the EPD, as it has the highest number of units sold and the highest revenue within its product range, making it the most representative reference of its product family.

Name and location of production site(s): Calle N – Pol. Ind. El Oliveral 46394 Ribarroja del Turia – Valencia (Spain)

References to any relevant websites for more information or explanatory materials, if applicable: https://www.arkoslight.com/

BLACK FOSTER MICRO RECESSED

BLACK FOSTER RECESSED

BLACK FOSTER ASYMMETRIC RECESSED

Visual representation of the products

CONTENT DECLARATION

• **The mass (weight) of one unit of a product, as purchased or per declared unit**: 297,85 g

• **Content of the product in the form of a list of materials and substances, and their mass**:

Product components	Weight, kg
Plastic	0,18735
Aluminium	0,0865
Copper	0,003233
Electronic components	0,014575
Steel	0,006195
TOTAL	**0,29785**

* The declared composition refers to the representative product of the family.

• **The mass and the content of distribution and/or consumer packaging**:

Packaging components	Weight, kg
Cardboard	0,08
Paper	0,00491
Plastic	0,00756
PLA	0,00136
TOTAL	**0,0938**

* The declared composition refers to the representative product of the family.

• **Information on the environmental and hazardous/toxic properties of a substances contained in the product**: The product does not contain any hazardous substances included in the “Very High Impact Substances Candidate List for Authorization (SVHC)” in a percentage greater than 0.1% of the product’s weight during its life cycle.

• **The declared share of biogenic/recycled materials**:

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Plastic	0,18735	-	-	-
Aluminium	0,0865	-	-	-
Copper	0,003233	-	-	-
Electronic Components	0,014575	-	-	-
Steel	0,006195	-	-	-
TOTAL	**0,29785**	-	-	-

* Post-consumer recycled material data have been obtained from Annex C of the EU’s Product Environmental Footprint Methodology (PEF) and European Environment Agency.

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Cardboard	0,08	20,42%	0,126 kg CO_2 bio
Paper	0,00491	1,25%	0,0077 kg CO_2 bio
Plastic	0,00756	1,93%	-
PLA	0,00136	0,34%	0,00249 kg CO_2 bio
TOTAL	**0,0938**	**23,94%**	**0,1338 kg CO_2 bio**

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

LCA INFORMATION

Functional unit: 1,000 lumens of the BLACK FOSTER REC 3 FLOOD luminaire for 35,000 hours of operation.

Declared unit: 630 lumens from a BLACK FOSTER REC 3 FLOOD luminaire over a lifespan of 50.000 hours.

Conversion factor to mass if mass is not used as functional/declared unit (not applicable for services): 297,855 g per functional unit

Reference service life: 50.000 hours

Time representativeness: The data used for the life cycle analysis cover the period from January 1, 2025, to December 31, 2025, and are representative of all products in the family, as well as the production process. Data sets older than 10 years were not used in this study.

Geographical scope: The life cycle analysis includes all stages from “cradle to grave” and module D (A+B+C+D), from the extraction and transportation of raw materials to the manufacturing of lighting fixtures, to the transportation of the finished product, to its use throughout its useful life, as well as the transportation and final treatment of the waste produced.

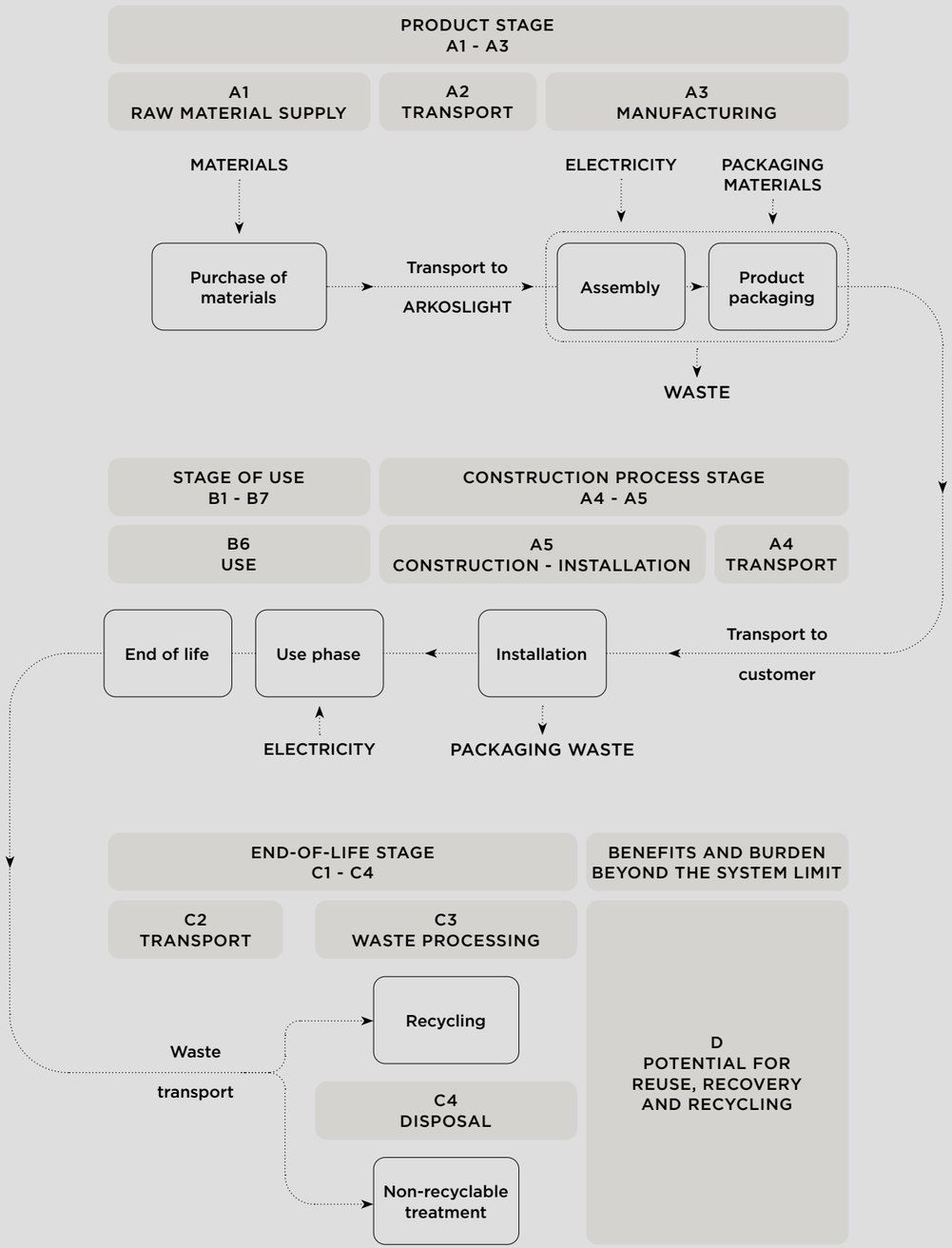
The geographic scope is global, encompassing both the assembly of products in the factory located in Spain and commercial activities carried out in different countries around the world.

Database(s) and LCA software used: The LCA used data measured directly at the company, along with estimates and data from official sources. The study used Simapro 9.6.0.1 calculation software and the Ecoinvent 3.10 database.

Description of system boundaries: The EPD® presented is structured by the life cycle stages established according to the reference regulation PCR 2019:14 for construction products (version 2.0.1), based on the UNE-EN 15804:2012+A2:2020/AC 2021 regulation. This EPD® is from “cradle to grave” and module D (A+B+C+D).

Data quality: The combination of primary and secondary data has been carried out in accordance with the selection criteria of the applicable regulations. The overall quality of the data has been ensured to meet the requirements established by the EPD declaration program.

Process flow diagram:



More information: https://www.arkoslight.com/

The stages considered in the LCA are as follows:

A1-A3 PRODUCT STAGE

The product phase consists of the raw material acquisition stages (A1), raw material transportation to ARKOSLIGHT's facilities (A2), and luminaire manufacturing (A3). For the LCA analysis using the calculation software, all results were grouped into a single product stage A1-A3.

A1 - Raw Material Extraction

This stage refers to the supply of raw materials and prefabricated components for the product, the purchase of high-voltage power from the electricity supplier, and the waste from packaging the raw materials.

A2 - Transport to the Factory

The next module refers to the transport of raw materials and semi-finished products from the supplier companies to the ARKOSLIGHT facilities. For the calculation, transport by ship, truck, or van was considered, depending on the location of each company.

A3 - Manufacturing

The manufacturing process consists of assembling the luminaire components at ARKOSLIGHT's facilities, following the specifications indicated in the assembly sheet. These components are sourced from modules A1–A2. This module also includes the packaging of the finished product.

To calculate the electricity consumption associated with the assembly process, the average assembly time per unit and the energy consumption per assembly table were considered.

Electricity reported in module A3 corresponds to on-site photovoltaic production, representing 35.1% of the total electricity demand of the manufacturing processes. The associated climate impact is 4.83E-9 kg CO_2 eq./kWh (GWP-GHG), calculated using the EN 15804+A2 method in SimaPro. Electricity from the grid is accounted for in upstream processes (module A1). Therefore, the reported value for electricity in A3 reflects only the on-site renewable electricity used in the manufacturing stage and does not represent the total electricity mix.

Packaging materials used for the components during assembly are treated as waste within this module.

The raw data used in this module come directly from the ARKOSLIGHT production plant and are representative of the BLACK FOSTER family production for the year 2025.

A4-A5 CONSTRUCTION PROCESS STAGE

The construction phase refers to the processes carried out after the assembly of the luminaire, the objective of which is to ensure the delivery of the product to the end customer.

A4 - Transportation to the construction site

Module A4 includes the transportation of finished and packaged products from the factory gate to the end customer. For both national and international distribution, truck transportation has been considered.

A weighted average of the mileage associated with the BLACK FOSTER product was taken into account based on its sales during 2025. For truck transport, the distance between the production center and the capital city of the three countries with the highest sales volumes was taken as a reference, as these represent the largest share of the market and therefore provide a representative estimate of the logistical impact.

Vehicle type and fuel	EURO 5 long-distance truck
Distance	Italy: 1.703 km France: 1.389 km Spain: 348 km
Apparent density of the product	0,3618 g/cm^3

A5- Installation

During the installation of the luminaire, waste is generated from the product packaging. The packaging materials in A1 are generated as facility waste. These materials are not burned or generate energy, and are managed as solid waste. No biogenic carbon output or recovered energy has been considered in this module, so no offset has been made with respect to modules A1-A3.

PRODUCT INSTALLATION	
Auxiliary materials for installation	NA
Water use	NA
Use of other resources	NA
Energy consumption during installation	NA
Waste generated by the installation of the product	Cardboard: 0,08883 kg Paper: 0,00491 kg Plastic: 0,01059 kg
Output of materials as a result of waste treatment in the building	Cardboard: 0,05507 kg Paper: 0,00304 kg Plastic: 0,00305 kg
Direct emissions to air, soil and water	NA

B1-B7 USE STAGE

The use stage for the luminaire refers to the operation of the product during the lifespan defined by the LCA.

B1- Use

The impact of the product at this stage is zero.

B2- Maintenance

No maintenance is required during the product's lifespan.

B3- Repair

No repair is required.

B4- Replacement

No replacement is required during the product's lifespan.

B5- Rehabilitation

No rehabilitation is required during the product's lifespan.

B6- Energy Use in Service

The total electricity consumption during the lifespan has been estimated for a power of 8,36 W, for 50.000 hours. The result of the use stage is equivalent to a lifetime consumption of 418 kWh.

The electricity used during the use phase has been modeled using the electricity mix of France, Spain and Italy for the year 2025.

PRODUCT INSTALLATION	
Auxiliary materials	NA
Freshwater consumption	NA
Type of energy vector	France: 171 kWh Spain: 167 kWh Italy: 80,6 kWh
Output power of the equipment	8,36 W
Characteristic features	Color temperature 3000 K Luminous flux 630 lm
Other scenario development assumptions	12 h/day for 365 days/year

More information available at https://www.arkoslight.com/

RSL INFORMATION	
Reference service life	11,5 years
Declared product properties	Luminous flux ≥ 90% of initial value (L90B10) CRI ≥ 90 Efficacy ≥ 100 lm/W
Design parameters for the application	Ceiling installation, in dry indoor environments; use with compatible drivers. According to the manufacturer's technical manual.
Estimated quality of execution	Installation carried out by qualified personnel, in accordance with the installation manual.
Indoor environment	Dry indoor environments, with temperatures between -20°C y 30 °C, relative humidity < 60 %, without direct exposure to chemicals.
Use conditions	Estimated daily use of 12 hours/day
Maintenance	Annual cleaning with a dry cloth. Contact the manufacturer in case of electrical failure.

ELECTRICITY CONSUMPTION MIX	
France	Nuclear: 70,8% Renewables: 2,31% Fossil: 12,49% RER Mix:14,39%
Spain	Nuclear: 33,78% Renewables: 1,8% Fossil: 60,33% RER Mix: 4,06%
Italy	Renewables: 2,45% Fossil: 82,33% RER Mix: 15,22%

B7 - Water Use in Service

No water consumption is required during the product's lifetime.

C1-C4 END-OF-LIFE STAGE

As a luminaire, the product must be collected and recycled in accordance with the requirements established in EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE). ARKOSLIGHT fulfills this responsibility through its participation in the “Reinicia” SCRAP (Recycle Waste) program for the management of waste electrical and electronic equipment.

PARAMETER	
Collection process	0,297855 kg collected separately 0 kg collected with a mixture of construction waste
Recovery system	0 kg for reuse 0,141803 kg for recycling 0,133328 kg for energy recovery
Elimination	0,022723 kg for final disposal
Assumptions for scenario development	100 km in 21 metric ton waste collection lorry

C1 - De-construction/Demolition

The impact of the product at this stage is zero.

C2 - Transport to the waste management facility

During the final stage of transporting the product to the waste treatment plant, due to the lack of specific data, an average transport distance of 100 km was considered for each of the sales countries, as well as a 21 metric ton waste collection lorry, as it is the most common means of transport.

C3 - Waste treatment

At this stage, the recycling rate for each of the product’s materials is used. In each case, the recycling percentages defined by Annex C of the EU Product Environmental Footprint (PEF) Methodology and by the European Environment Agency were considered.

C4 - Final disposal

The remainder of each material that could not be adequately recycled is sent to a landfill.

Material	Recycling	Non-recyclable treatment
COPPER	95%	5%
ALUMINIUM	85%	15%
PLASTIC	28,84%	71,17%
ELECTRONIC COMPONENTS	40,6%	59,40%
STEEL	85%	15%

* The following information comes from Annex C of the EU Product Environmental Footprint (PEF) Methodology and by the European Environment Agency

D - REUSE, RECOVERY, AND RECYCLING POTENTIAL STAGE

This product claims environmental benefits due to recycling and reuse under WEEE Directive 2012/19/EU.

CUT-OFF RULES

To perform the LCA, a 1% cut-off rule has been established. Any flow that represents less than 1% of the total system and does not exceed 5% of the cumulative exclusions may be omitted from the inventory.

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	0	0	0	0	0	X	0	0	X	X	X	X
Geography	GLO	GLO	ES	GLO	GLO	0	0	0	0	0	GLO	0	0	GLO	GLO	GLO	GLO
Share of primary data	>90%			>90%	>90%	0	0	0	0	0	0	0	0	0	0	0	0
Variation – products	-45,42% / 97,29%			0%	0%	0	0	0	0	0	0	0	0	0	0	0	0
Variation – sites	0%			0%	0%	0	0	0	0	0	0	0	0	0	0	0	0

Process	Source type	Source	Reference year	Data category	Share of primary and secondary data, of gwp-ghg results for A1-A3
Raw materials supply (A1)	Collected data	EPD owner	2025	Primary data	95,73%
Transport (A2)	Database	Ecoinvent v3.10	2025	Secondary data	2,23%
Manufacturing (A3)	Collected data	EPD owner	2025	Primary data	2,04%
Total share of primary data, of GWP-GHG results for A1-A3					97,77%

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

LIFE CYCLE STAGE	GEOGRAPHICAL REPRESENTATIVENESS	TECHNICAL REPRESENTATIVENESS	TEMPORAL REPRESENTATIVENESS	OVERALL DATA QUALITY
Product stage (A1–A3)	Very good. Representative of raw material supply and ARKOSLIGHT manufacturing location.	Medium to very good. Based on primary data for materials and manufacturing processes.	Very good. Refers to the year of calculation.	High
Distribution / Installation stage (A4–A5)	Good to very good. Based on primary transport distances and representative market conditions.	Medium to very good. Some assumptions for transport and installation scenarios.	Very good. Refers to the year of calculation.	Medium-High
Use stage (B6)	Good. Based on estimated countries of use.	Very good. Based on product technical documentation.	Very good. Refers to the year of calculation.	High
End-of-life stage (C2–C4)	Poor to good. Based on generic assumptions and European datasets.	Poor to good. Based on secondary data and assumptions.	Poor to good. Not always time-specific.	Low- Medium
Beyond product life cycle (D)	Good. Based on European datasets.	Good. Based on European datasets.	Good. Based on European datasets.	Medium-High

A data quality assessment was carried out for datasets contributing to at least 80% of the results of each declared environmental impact indicator, in accordance with Section 4.6 of EN 15941. The product stage (A1–A3), which represents the majority of the environmental impacts, is based on primary data and shows high geographical, technical, and temporal representativeness. Secondary data used in other life cycle stages are based on recognized databases and are considered of good quality, except for certain end-of-life processes where generic assumptions are applied. Overall, the data quality is considered appropriate and sufficient for the purpose of the study.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ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category 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-total	kg CO_2 eq.	4,50 E+00	4,79 E-02	2,08 E-01	0	0	0	0	0	1,50 E+02	0	0	3,99 E-02	3,24 E-02	1,54 E-02	-9,08 E+00
GWP-fossil	kg CO_2 eq.	4,56 E+00	4,78 E-02	1,75 E-02	0	0	0	0	0	1,49 E+02	0	0	3,99 E-02	2,80 E-02	1,54 E-02	-9,03 E+00
GWP-biogenic	kg CO_2 eq.	-2,00 E-01	1,57 E-05	3,24 E-01	0	0	0	0	0	1,10 E+00	0	0	5,59 E-06	4,29 E-03	2,24 E-06	-4,08 E-02
GWP-luluc	kg CO_2 eq.	2,01 E-03	1,17 E-06	8,61 E-07	0	0	0	0	0	7,02 E-03	0	0	1,20 E-06	1,98 E-05	5,50 E-07	-9,67 E-03
ODP	kg CFC 11 eq.	4,40 E-08	9,75 E-10	5,54 E-11	0	0	0	0	0	3,08 E-06	0	0	6,17 E-10	3,14 E-10	9,62 E-12	-1,20 E-06
AP	mol H^+ eq.	3,78 E-02	1,19 E-04	3,80 E-05	0	0	0	0	0	3,95 E-01	0	0	2,10 E-04	8,68 E-05	4,65 E-06	-5,95 E-02
EP-freshwater	kg P eq.	2,25 E-04	4,01 E-08	1,50 E-07	0	0	0	0	0	2,14 E-03	0	0	2,98 E-08	4,39 E-07	1,98 E-08	-1,58 E-03
EP-marine	kg N eq.	5,06 E-03	4,57 E-05	6,67 E-05	0	0	0	0	0	8,14 E-02	0	0	9,27 E-05	2,45 E-05	7,83 E-06	-1,08 E-02
EP-terrestrial	mol N eq.	5,50 E-02	5,00 E-04	1,62 E-04	0	0	0	0	0	8,80 E-01	0	0	1,02 E-03	2,51 E-04	1,63 E-05	-1,22 E-01
POCP	kg NMVOC eq.	1,83 E-02	2,08 E-04	7,55 E-05	0	0	0	0	0	3,79 E-01	0	0	4,05 E-04	8,36 E-05	9,10 E-06	-3,49 E-02
ADP-minerals&metals*	kg Sb eq.	5,90 E-07	1,58 E-09	1,10 E-09	0	0	0	0	0	9,77 E-06	0	0	1,34 E-09	2,48 E-07	2,53 E-11	-2,46 E-03
ADP-fossil*	MJ	5,69 E+01	6,31 E-01	3,46 E-02	0	0	0	0	0	4,94 E+03	0	0	5,15 E-01	2,24 E-01	9,59 E-03	-1,12 E+02
WDP*	m^3	5,20 E-01	2,68 E-04	-2,75 E-03	0	0	0	0	0	3,83 E+01	0	0	3,37 E-04	1,41 E-03	7,14 E-05	-1,67 E+00

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

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.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

If biogenic carbon leaving the product system in module A5 (see Annex 2 of PCR) or recovered energy leaving the product system in modules A5 or C (see Annex 3 of PCR) have been balanced out already in modules A1-A3, a statement in this regard shall be included.

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

Additional mandatory and voluntary impact category indicators

RESULTS PER DECLARED UNIT

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG*	kg CO_2 eq.	4,50 E+00	4,79 E-02	2,08 E-01	0	0	0	0	0	1,50 E+02	0	0	3,99 E-02	3,24 E-02	1,54 E-02	-9,08 E+00
Ionizing radiation – effects on human health	kBq U-235 eq	1,02 E-01	8,60 E-05	2,09 E-05	0	0	0	0	0	4,11 E+01	0	0	4,11 E-05	4,56 E-04	2,19 E-05	-3,66 E-01
Ecotoxicity, freshwater - part 1	CTUe	2,95 E+01	7,91 E-03	1,32 E+00	0	0	0	0	0	7,34 E+01	0	0	4,73 E-03	1,12 E-01	6,90 E-02	-2,50 E+01
Ecotoxicity, freshwater - part 2	CTUe	3,07 E+01	1,35 E-02	2,66 E-02	0	0	0	0	0	4,36 E+01	0	0	1,30 E-02	2,98 E-02	5,60 E-03	-1,62 E+02
Ecotoxicity, freshwater - inorganics	CTUe	2,78 E+01	1,95 E-02	1,35 E+00	0	0	0	0	0	1,08 E+02	0	0	1,46 E-02	9,42 E-02	7,44 E-02	-1,85 E+02
Ecotoxicity, freshwater - organics - p.1	CTUe	5,17 E+00	1,45 E-04	9,06 E-04	0	0	0	0	0	2,81 E+00	0	0	2,65 E-04	4,63 E-02	2,15 E-05	-1,41 E+00
Ecotoxicity, freshwater - organics - p.2	CTUe	2,73 E+01	1,80 E-03	1,48 E-03	0	0	0	0	0	5,93 E+00	0	0	2,82 E-03	1,15 E-03	1,56 E-04	-9,55 E-01
Human toxicity, cancer	CTUh	1,74 E-08	3,59 E-12	4,91 E-11	0	0	0	0	0	2,43 E-08	0	0	2,06 E-12	1,73 E-10	3,38 E-13	-8,67 E-09
Human toxicity, cancer - inorganics	CTUh	3,20 E-10	1,44 E-12	3,99 E-11	0	0	0	0	0	4,81 E-09	0	0	5,94 E-13	3,81 E-12	1,85 E-13	-3,14 E-09
Human toxicity, cancer - organics	CTUh	1,71 E-08	2,15 E-12	9,21 E-12	0	0	0	0	0	1,95 E-08	0	0	1,46 E-12	1,69 E-10	1,52 E-13	-5,54 E-09
Human toxicity, non-cancer	CTUh	2,35 E-08	3,15 E-10	4,56 E-09	0	0	0	0	0	4,36 E-07	0	0	5,17 E-11	3,30 E-10	4,53 E-11	-2,33 E-07
Human toxicity, non-cancer - inorganics	CTUh	2,20 E-08	2,89 E-10	4,42 E-09	0	0	0	0	0	4,09 E-07	0	0	3,33 E-11	3,06 E-10	2,45 E-11	-2,26 E-07
Human toxicity, non-cancer - organics	CTUh	1,55 E-09	2,61 E-11	1,45 E-10	0	0	0	0	0	2,72 E-08	0	0	1,84 E-11	2,45 E-11	2,08 E-11	-7,01 E-09
Impacts related to land use and quality	Pt	1,44 E+01	1,41 E-03	2,75 E-02	0	0	0	0	0	1,18 E+02	0	0	8,26 E-04	2,72 E-02	1,27 E-01	-1,59 E+01

* This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

RESULTS PER DECLARED UNIT

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	5,20 E+00	2,23 E-03	7,85 E-04	0	0	0	0	0	1,32 E+02	0	0	9,87 E-04	1,66 E-02	2,11 E-06	-1,03 E+01
PERM	MJ	1,43 E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	5,20 E+00	2,23 E-03	7,85 E-04	0	0	0	0	0	1,32 E+02	0	0	9,87 E-04	1,66 E-02	2,11 E-06	-1,03 E+01
PENRE	MJ	5,57 E+01	6,71 E-01	3,71 E-02	0	0	0	0	0	5,15 E+03	0	0	5,48 E-01	2,39 E-01	3,43 E-05	-1,20 E+02
PENRM	MJ	5,76 E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	5,57 E+01	6,71 E-01	3,71 E-02	0	0	0	0	0	5,15 E+03	0	0	5,48 E-01	2,39 E-01	3,43 E-05	-1,20 E+02
SM	kg	8,84 E-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	5,15 E-01	2,68 E-04	-2,75 E-03	0	0	0	0	0	3,83 E+01	0	0	3,37 E-04	1,41 E-03	7,14 E-05	-1,67 E+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 indicators

RESULTS PER DECLARED UNIT

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,80 E-03	4,65 E-06	9,03 E-04	0	0	0	0	0	1,77 E-02	0	0	3,79 E-06	8,73 E-03	1,18 E-02	4,66 E-03
Non-hazardous waste disposed	kg	4,52 E-02	1,88 E-05	3,01 E-02	0	0	0	0	0	3,43 E-01	0	0	1,24 E-05	2,97 E-03	9,26 E-04	-5,50 E-02
Radioactive waste disposed	kg	6,56 E-05	5,93 E-08	1,37 E-08	0	0	0	0	0	3,97 E-02	0	0	2,30 E-08	3,58 E-07	1,41 E-08	-2,35 E-04

Output flow indicators

RESULTS PER DECLARED UNIT

Indicator	Unit	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	2,73 E-02	0	1,04 E-01	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0

Since the declared end-of-life scenario is a combination of recycling and landfill.
The corresponding 100% results scenarios are reported for modules C1-C4 and D.

RESULTS PER DECLARED UNIT

Indicator	Unit	100% RECYCLING SCENARIO		100% LANDFILL SCENARIO	
		MODULES C1-C4	MODULE D	MODULES C1-C4	MODULE D
GWP-total	kg CO_2 eq.	1,06 E-01	-2,05 E+01	6,34 E-02	0,00 E+00
GWP-fossil	kg CO_2 eq.	9,14 E-02	-2,04 E+01	6,33 E-02	0,00 E+00
GWP-biogenic	kg CO_2 eq.	1,45 E-02	-9,69 E-02	1,11 E-05	0,00 E+00
GWP-luluc	kg CO_2 eq.	3,61 E-05	-2,37 E-02	2,17 E-06	0,00 E+00
ODP	kg CFC 11 eq.	1,25 E-09	-3,70 E-06	6,70 E-10	0,00 E+00
AP	mol H^+ eq.	3,74 E-04	-1,27 E-01	2,30 E-04	0,00 E+00
EP-freshwater	kg P eq.	9,19 E-07	-3,77 E-03	6,54 E-08	0,00 E+00
EP-marine	kg N eq.	1,49 E-04	-2,44 E-02	1,10 E-04	0,00 E+00
EP-terrestrial	mol N eq.	1,57 E-03	-2,75 E-01	1,11 E-03	0,00 E+00
POCP	kg NMVOC eq.	5,91 E-04	-7,88 E-02	4,37 E-04	0,00 E+00
ADP-minerals&metals*	kg Sb eq.	3,08 E-07	-6,04 E-03	1,45 E-09	0,00 E+00
ADP-fossil*	MJ	9,78 E-01	-2,60 E+02	5,54 E-01	0,00 E+00
WDP*	m^3	2,93 E-03	-4,01 E+00	5,06 E-04	0,00 E+00

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

Additional LCA results (other environmental performance results) of the product(s)

RESULTS PER DECLARED UNIT

LCA result of one declared unit product (A-C)	Unit	Min	Representative	Max
GWP-total	kg CO_2 eq.	-49,86%	1,54 E+01	70,15%
GWP-fossil	kg CO_2 eq.	-49,89%	1,53 E+01	70,04%
GWP-biogenic	kg CO_2 eq.	-46,32%	1,22 E-01	84,75%
GWP-luluc	kg CO_2 eq.	-44,08%	9,06 E-04	74,50%
ODP	kg CFC 11 eq.	-49,34%	3,13 E-07	70,56%
AP	mol H^+ eq.	-50,98%	4,34 E-02	69,42%
EP-freshwater	kg P eq.	-51,07%	2,37 E-04	73,19%
EP-marine	kg N eq.	-50,09%	8,67 E-03	70,47%
EP-terrestrial	mol N eq.	-50,16%	9,37 E-02	70,55%
POCP	kg NMVOC eq.	-49,84%	3,98 E-02	70,26%
ADP-minerals&metals*	kg Sb eq.	-47,81%	1,06 E-06	352,83%
ADP-fossil*	MJ	-49,67%	4,99 E+02	70,23%
WDP*	m^3	-49,53%	3,88 E+00	70,55%

CONVERSION FACTORS

The extrapolation coefficients at the functional unit level will be calculated using the following formula:

$$\frac{1.000\ (lm)}{\text{outgoig luminous flux of reference product (lm)}} \times \frac{35.000\ h}{\text{declared product lifetime of reference product (h)}}$$

Using the conversion factor, the results for each impact category are obtained for 1.000 lumens over 35.000 operating hours.

$$\frac{1.000}{630} \times \frac{35.000}{1.000} = 1{,}11$$

ESULTS PER FUNCTIONAL UNIT

Indicator	Unit	A1	A4	A5	B6	C2	C3	C4	D
Climate change - Fossil	**kg CO_2 eq**	5,00 E+00	5,32 E-02	2,31 E-01	1,66 E+02	4,43 E-02	3,59 E-02	1,71 E-02	-1,01 E+01
Climate change - Biogenic	**kg CO_2 eq**	5,07 E+00	5,32 E-02	1,94 E-02	1,65 E+02	4,43 E-02	3,12 E-02	1,71 E-02	-1,00 E+01
Climate change - Land use and LU change	**kg CO_2 eq**	-2,23 E-01	1,74 E-05	3,60 E-01	1,22 E+00	6,21 E-06	4,77 E-03	2,49 E-06	-4,53 E-02
Climate change	**kg CO_2 eq**	2,24 E-03	1,30 E-06	9,56 E-07	7,80 E-03	1,33 E-06	2,20 E-05	6,11 E-07	-1,07 E-02
Ozone depletion	**kg CFC11 eq**	4,89 E-08	1,08 E-09	6,15 E-11	3,43 E-06	6,85 E-10	3,49 E-10	1,07 E-11	-1,34 E-06
Acidification	**mol H^+ eq**	4,20 E-02	1,32 E-04	4,23 E-05	4,39 E-01	2,33 E-04	9,64 E-05	5,17 E-06	-6,62 E-02
Eutrophication, freshwater	**kg P eq**	2,50 E-04	4,45 E-08	1,67 E-07	2,38 E-03	3,31 E-08	4,88 E-07	2,21 E-08	-1,75 E-03
Eutrophication, marine	**kg N eq**	5,62 E-03	5,07 E-05	7,41 E-05	9,04 E-02	1,03 E-04	2,72 E-05	8,70 E-06	-1,20 E-02
Eutrophication, terrestrial	**mol N eq**	6,11 E-02	5,55 E-04	1,80 E-04	9,78 E-01	1,13 E-03	2,79 E-04	1,81 E-05	-1,35 E-01
Photochemical ozone formation	**kg NMVOC eq**	2,03 E-02	2,31 E-04	8,39 E-05	4,22 E-01	4,49 E-04	9,29 E-05	1,01 E-05	-3,88 E-02
Resource use, minerals and metals	**kg Sb eq**	6,55 E-07	1,75 E-09	1,22 E-09	1,09 E-05	1,49 E-09	2,76 E-07	2,81 E-11	-2,73 E-03
Resource use, fossils	**MJ**	6,32 E+01	7,02 E-01	3,84 E-02	5,48 E+03	5,72 E-01	2,49 E-01	1,07 E-02	-1,25 E+02
Water use	**m^3 depriv.**	5,78 E-01	2,98 E-04	-3,05 E-03	4,26 E+01	3,74 E-04	1,57 E-03	7,94 E-05	-1,86 E+00

ABBREVIATIONS

ABBREVIATION	DEFINITION
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification
SVHC	Substances of Very High Concern
ND	Not Declared
LCA	Life Cycle Assessment
PCR	Product Category Rules
WAEE	Waste Electrical and Electronic Equipment
PEF	Product Environmental Footprint
GWP-GHG	Global Warming Potential - Greenhouse Gas

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- ILCD Handbook. General guide for Life Cycle Assessment – Detailed guidance
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VERSION HISTORY

Original Version of the EPD	2026-04-23

ARKOSLIGHT