



# Environmental Product Declaration

EPD of multiple products, based on a representative product in accordance with ISO 14025:2017 and EN 15804:2012+A2:2019/AC:2021 for:

## **BO 32 / 45 / 55 intrack** 1 | 2 | 3 lamps

from XAL GmbH

### **Programme**

The International EPD® System  
[www.environdec.com](http://www.environdec.com)

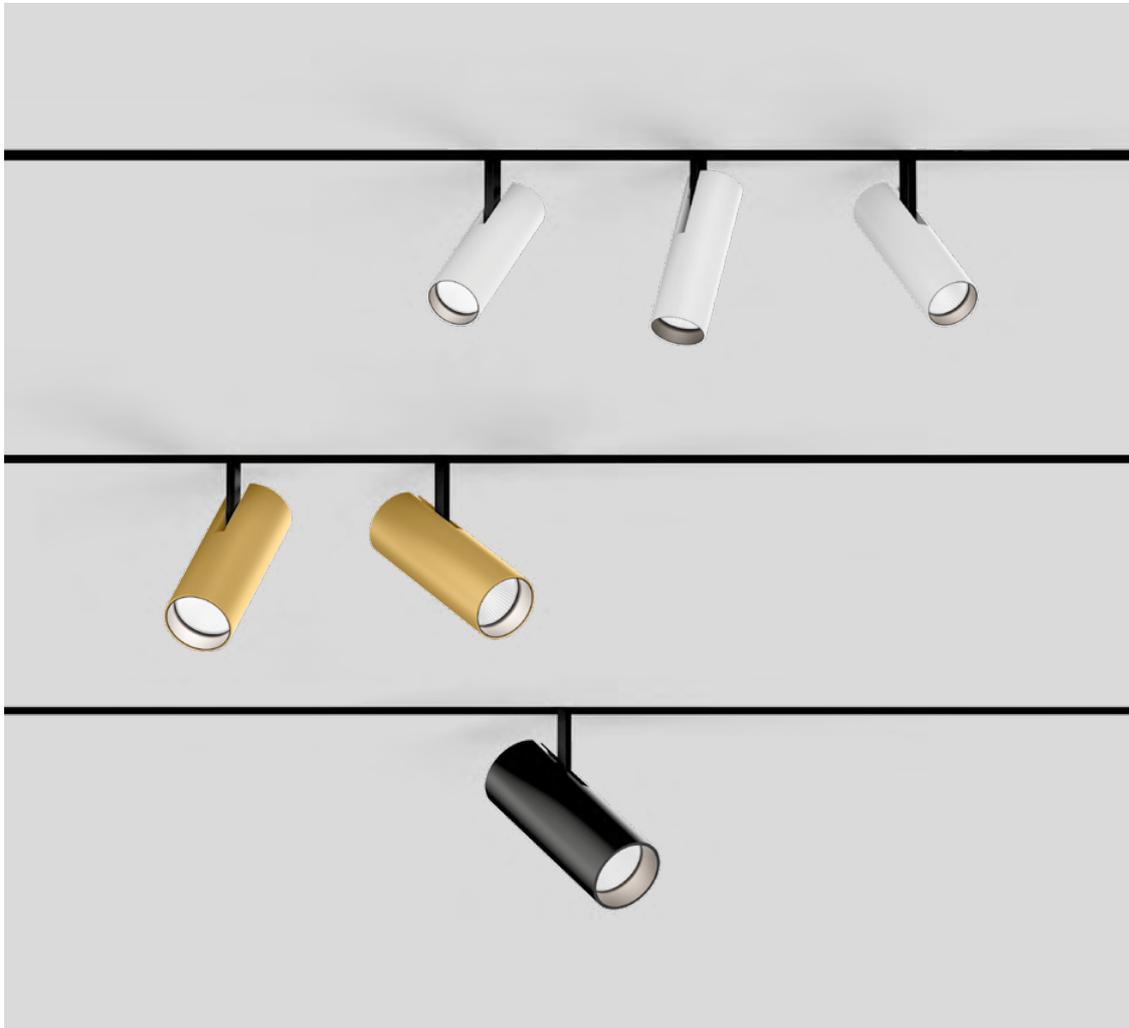
### **Programme operator**

EPD International AB

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**Valid until** 2030-02-09



This EPD follows additional requirements for construction products considered as Electronic or Electric Equipment. 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](http://www.environdec.com)

**EPD**®  
THE INTERNATIONAL EPD® SYSTEM



## Programme information

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

### Product Category Rules (PCR)

PCR 2019:14 Construction products version 1.3.4, 2024-04-30  
UN CPC code(s): 4653 (Ver. 2.1) Lighting Equipment

### PCR review was conducted by

The Technical Committee of the International EPD® System

### Life Cycle Assessment (LCA) accountability

XAL GmbH, Auer-Welsbach-Gasse 36, 8055 Graz, Austria

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

EPD verification by individual verifier

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The International EPD® System

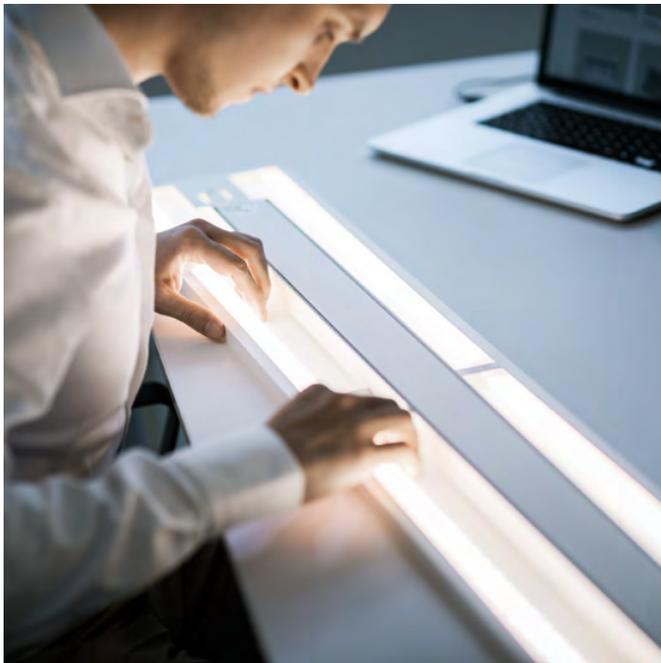
The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programs, or not compliant with EN 15804:2012+A2:2019/AC:2021, 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/declared 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 15804:2012+A2:2019/AC:2021 and ISO 14025:2006.

## Owner of the EPD

XAL GmbH  
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AUSTRIA

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## Description of the organisation

XAL is an internationally operating manufacturer of high-end luminaires and lighting solutions for shop, office, hotel and residential lighting. For 30 years, XAL has been working with lighting designers, architects and planners to develop custom luminaires of the highest technical standard, with a focus on style and aesthetics. While XAL mainly targets B2B customers, we also provide our standard portfolio to B2C customers.

With its headquarters in Graz, Austria, the XAL Group currently employs 1300 people worldwide and has 30 international subsidiaries. We are continuously working on further improving our products – whether in terms of durability, efficiency, the carbon footprint, or also with regard to the replaceability and reusability of components and materials.

## Product-related or management system-related certifications

**XAL is certified according to several management and CSR standards.**

- **ISO 9001** – Quality management systems
- **ISO 14001** – Environmental management systems
- **ISO 45001** – Occupational health and safety management systems
- **Ecovadis** – regular evaluation of our corporate social responsibility based on objective criteria with a focus on the environment, labour and human rights, ethics and responsible procurement.
- **UN Global Compact initiative** – our interactions with each other and our stakeholders, our supply chain management and our resource strategies are guided by the principles of the UN Global compact.

### Name and location of production site(s)

The production sites are located in Murska Sobota (XAL Svetila d.o.o., Slovenia) and in Graz (XAL GmbH, Austria).

More information  
[xal.com](http://xal.com)



Product name

## BO 32/45/55 intrack

### Product identification

Track light with 1, 2 or 3 lamps.

This EPD covers multiple products of the BO intrack:

- BO intrack 1 lamp
- BO intrack 2 lamps
- BO intrack 3 lamps

All available sizes are covered: 32 / 45 / 55 (mm of diameter)

The results are valid for all available radiation patterns:

- Spot
- Medium
- Flood
- Super Spot

Conversion factors for all variants are given in the Annex.



## Product description

Track light made of die-cast aluminium; powder coated; spotlight head rotates 360° and tilts 90°; choice of single lamp, double lamps or triple lamp; converter in the adapter; with optional high quality lens system with precise radiation characteristic; or high quality, aluminium, vapour deposition coated reflector with faceted design; precise radiation characteristics with different beam angles; good glare reduction due to recessed light point plane; optical attachments as accessories; COB (Chip on Board) technology or high power LEDs - maximum efficiency;

no multiple shadows; energy-eff. LEDs - very good colour rendering; adapter for toolless insertion or movement on a variety of 3-phase power tracks; adapter flush with the power track.

### UN CPC code(s):

- 4653 (Ver. 2.1) Other electric lamps and lighting fittings (including lamps and lighting fittings of a kind used for lighting public open spaces or thorough-fares)

## Technical specifications

Specification	BO 32 intrack	BO 45 intrack	BO 55 intrack
Inset power	10.7W - 32W	8.5W - 45W	24.7W, 43W
Luminous efficacy	Up to 83 lm/W	Up to 89 lm/W	Up to 84 lm/W
Colour temperature	2700 K, 3000 K, 3500 K, 4000 K	2700 K, 3000 K, 3500 K, 4000 K	2700 K, 3000 K, 3500 K, 4000 K
Radiation pattern	flood, medium, spot	flood, medium, spot, superspot	flood, medium, spot
Electrical	DALI-2	DALI-2	DALI-2
Physical	Diameter: 32mm Height: 100mm	Diameter: 45mm Height: 120mm	Diameter: 55mm Height: 140mm

## Declared unit

The declared unit is one piece of BO 45 flood with 1 lamp including the LED-Converter. This product has been chosen as the reference due to the highest share of sales.

The weight of the product per declared unit is 0.336 kg. Luminous flux: 1400lm

For better comparison with other types of luminaires, conversion factors are also available to convert the results to 1000 lumens during a reference lifetime of 35000 hours. This reference value is proposed by the PEP Category rules (PSR-0014-ed2.0-EN-2023 07 13). The conversion factors are available under “Additional environmental information“.

The principles of “Modularity” and “polluter pay” have been followed.

### Reference service life

12.35 years

### Time representativeness

2023-2024\*

### Database(s) and LCA software used

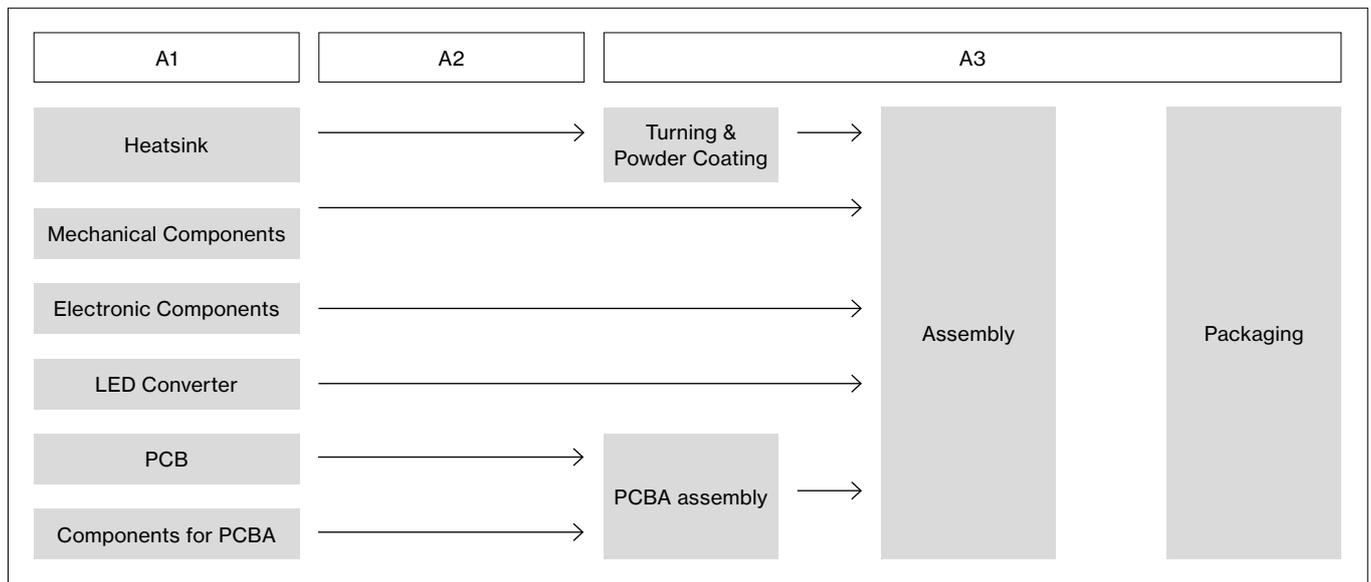
LCA for Experts 10.9.0.20 (Sphera)

### Description of system boundaries

Cradle to grave and module D.

\* Some primary data (BoM and supplier data) is from a period < 12 months. It will be reviewed once one year of production is effective to confirm that the data is still representative.

## System diagram (A1 – A3)



## Product stage (A1 – A3)

Raw materials are found in the components used for the luminaire production. The raw materials and the necessary process steps have been modelled using LCA for Experts. The PCB is assembled in Graz, Austria and the final assembly of the luminaire is done in Murska Sobota, Slovenia. The corresponding electricity mix has been used for all manufacturing steps. Transportation of all the components is incorporated. For the components which are delivered from China, aggregated data has been used, since transportation involved various routes and transport vehicles. Packaging for the components has been accounted for using a worst-case approach. The ESD-packaging is reused one time within the company, therefore only 1/2 of the weight is taken into account for the production and the recycling.

## Transport to building (A4)

The transport is calculated from Graz, Austria to the capitals of the countries with predicted sales shares >4% (Vienna, Berlin, London, Zurich, Stockholm, Copenhagen).

The product market includes countries all over the world.

Weighted distance:	846.5 km
Truck used:	Class EURO 6, 26-28 t
Fuel type:	Diesel (0.00287 kg/100 kkm)

## Installation into building (A5)

No emissions occur during the installation. This module includes the waste treatment of the packaging. For the transport-packaging, the euro pallet is reused 28 times, therefore only 1/28 of the weight is taken into account for the production and the end of life of the pallet.

Packaging waste including transport packaging:

Material	Weight (kg)
Cardboard	0.186
Paper	0.005
Polyethylene film	0.003
Wooden Pallet	0.003

## Use, maintenance, repair, replacement and refurbishment (B1, B2, B3, B4, B5)

These stages include the use, maintenance, repair, replacement and refurbishment of the product, which do not contribute to the environmental impacts of the products functional unit.

## Operational Energy Use (B6)

Electricity consumption during the use stage is modelled based on the technical parameters of the luminaires and is representative for a weighted average of the following applications – office (60%), hospital (2%), hotel (6%), restaurant (7%), and retail (25%) with an average lifetime of 12.35 years. Geography of the electricity mix is modelled by predicted sales shares and is representative for European countries (92% - EU-28) and rest of world countries (8%). For the rest of world countries, an electricity mix for China is used following a worst-case approach.

The energy consumption is calculated using the formula from EN 15193:2007: **Energy consumption [kWh] = {Pa × FCP × FO × (FD × tD + FN × tN) + Pp × ty} × 1/1.000 × a 0 × a**

The results are presented in the additional information chapter.

Scenario	BO intrack 45 flood 1 lamp	Unit
Electricity use (12.35 years)	707.01	kWh
Active power	15.9	W
Passive power	0.50	W
Total active time	410 64	h
Total passive time	67 122	h
Dimmable	DALI-2 control	-
Presence control	No	-

## Operational water use (B7)

No water is consumed during the use stage. Therefore this stage does not contribute to the environmental impacts of the products functional unit.

## End-of-life stage (C1 – C4)

The product is presumed to be decomposed manually; therefore no emissions should occur. For the corresponding waste destinations, the following distances are used:

- To recycling facility – 250 km
- To incineration facility – 50 km
- To landfill – 100 km for metal and electronic parts, 20 km for plastic parts and packaging waste

Based on official statistics and literature, waste treatment options are taken into account for Europe and rest of the world countries.

Scenario (luminaire + mounting accessory)	BO intrack 45 flood 1 lamp	Unit
Collected separately	0.336	kg
Collected with mixed (construction) waste	-	kg
For reuse	-	kg
For recycling	0.185	kg
For energy recovery	0.014	kg
For final disposal	0.138	kg

## Module D

According to the guidelines of EN 15804+A2 and the PCR from EPD International, calculations are made for Module D. The loads and benefits result from the export of secondary materials and the energy which comes from incineration and landfilling. In Module D also the benefits and loads from the product packaging waste are included.

Scenario (contributing materials, incl. packaging)	BO intrack 45 flood 1 lamp	Unit
Materials for recycling	0.339	kg
Materials for export of secondary fuels	-	kg
Materials for incineration	0.037	kg

## Cut-off rules

Consistent with the PCR, a minimum of 95% of total inflows (mass and energy) are included. In addition, materials and processes with insignificant contributions of less than 1% are also included. For the use and end-of-life stage, scenarios are used, factoring in geographical conditions (such as electricity mix) and applications (waste treatment practices).

The following processes have been excluded:

- Manufacture of equipment used in production, buildings or any other capital goods;
- The transportation of personnel to the plant;
- Transportation of personnel within the plant;
- Research and development activities;
- Long-term emissions.

## Data quality

Based on site specific information, this LCA study reflects the production for 2023. Components are supplied by external vendors, therefore manufacturing processes are modelled using LCA for Experts, with the best fitting representative geographical conditions and applications.

## Electricity grid

For the manufacturing in Graz, Austria, the corresponding electricity grid mix as stated on the invoice is used: Hydro (87.3%), Wind (8.4%), Solar (2%), Biomass (1.4%), other RE (0.9%).

For Murska Sobota, Slovenia, the electricity used is 100% from Hydro Power.

Environmental impact of the electricity used in	AUT	SLO
CO <sub>2</sub> eq. [kg/kWh]	0.008	0.005

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

Module	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	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-Recov-ery-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	x	x	x	x	x	x	x	x	x	x	x	x
Geography	GLO	GLO	AUT, SLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	73%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	+37%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acronyms	GLO = Global, AUT = Austria, SLO = Slovenia																

## Content information

Product components	Weight, kg	Weight-% (versus total weight)	Post-consumer material, weight-%	Biogenic material, weight-% / declared unit	Biogenic material, kg C / declared unit
Aluminum	0.128	38.01	0.00	0.00	0.00
Polycarbonate	0.064	18.97	0.00	0.00	0.00
Glass fibers	0.030	8.77	0.00	0.00	0.00
Copper	0.017	5.18	0.00	0.00	0.00
Zinc	0.017	5.06	0.00	0.00	0.00
Zinc in alloy	0.015	4.36	0.00	0.00	0.00
Epoxy-Resin	0.015	4.35	0.00	0.00	0.00
Copper in alloy	0.014	4.07	0.00	0.00	0.00
Polyetherimide (PEI)	0.007	2.08	0.00	0.00	0.00
Steel	0.006	1.76	0.00	0.00	0.00
Others (<1%)	0.024	7.39	0.00	0.00	0.00
<b>TOTAL</b>	<b>0.336</b>	<b>100.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Packaging materials*	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C / declared unit
Paper	0.005	0.015	0.003
Cardboard	0.084	0.251	0.043
<b>TOTAL</b>	<b>0.089</b>	<b>0.266</b>	<b>0.045</b>

The products do not contain any REACH and RoHS SVHC substances in amounts greater than 0.1 % (1000 ppm).

\*Disclaimer: The packaging material table includes only product packaging. Transport packaging also included in the LCA.

# Results of the environmental performance indicators



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.

Usage of results from A1-A3 without considering the results of module C is not encouraged.

## Mandatory impact category indicators according to EN 15804+A2 (based on EF 3.1)

Results per piece of BO 45 flood 1 lamp

Indicator	Unit	A1 – A3	A4	A5	B1 – B5	B6	B7	C1	C2	C3	C4	D
GWP – fossil	kg CO <sub>2</sub> eq.	8.00E+00	6.24E-02	9.25E-03	0.00E+00	2.27E+02	0.00E+00	0.00E+00	7.69E-03	1.42E-01	2.43E-03	-1.24E+00
GWP – biogenic	kg CO <sub>2</sub> eq.	-5.04E-01	0.00E+00	5.04E-01	0.00E+00							
GWP – luluc	kg CO <sub>2</sub> eq.	5.64E-03	1.07E-03	7.27E-05	0.00E+00	5.28E-02	0.00E+00	0.00E+00	1.31E-04	5.89E-06	6.54E-06	-4.53E-05
<b>GWP – total</b>	<b>kg CO<sub>2</sub> eq.</b>	<b>7.50E+00</b>	<b>6.34E-02</b>	<b>5.13E-01</b>	<b>0.00E+00</b>	<b>2.27E+02</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>7.83E-03</b>	<b>1.42E-01</b>	<b>2.43E-03</b>	<b>-1.24E+00</b>
ODP	kg CFC 11 eq.	4.71E-09	6.39E-15	1.22E-14	0.00E+00	4.20E-09	0.00E+00	0.00E+00	7.88E-16	1.27E-13	6.38E-15	-7.09E-12
AP	mol H+ eq.	3.99E-02	9.07E-05	2.32E-05	0.00E+00	6.96E-01	0.00E+00	0.00E+00	1.12E-05	4.14E-05	1.67E-05	-5.34E-03
EP – freshwater	kg P eq.	6.34E-05	2.71E-07	1.87E-07	0.00E+00	8.71E-04	0.00E+00	0.00E+00	3.34E-08	2.76E-08	4.42E-09	-1.56E-06
EP – marine	kg N eq.	7.44E-03	3.35E-05	1.03E-05	0.00E+00	1.19E-01	0.00E+00	0.00E+00	4.14E-06	1.29E-05	4.21E-06	-9.75E-04
EP – terrestrial	mol N eq.	8.02E-02	3.98E-04	1.00E-04	0.00E+00	1.26E+00	0.00E+00	0.00E+00	4.91E-05	1.91E-04	4.62E-05	-1.05E-02
POCP	kg NMVOC eq.	2.22E-02	8.58E-05	3.06E-05	0.00E+00	3.34E-01	0.00E+00	0.00E+00	1.06E-05	3.42E-05	1.29E-05	-2.70E-03
ADP – minerals & metals*	kg Sb eq.	6.99E-04	5.40E-09	5.38E-10	0.00E+00	4.26E-05	0.00E+00	0.00E+00	6.66E-10	1.58E-09	2.23E-10	-4.99E-05
ADP – fossil*	MJ	9.86E+01	8.27E-01	8.95E-02	0.00E+00	4.47E+03	0.00E+00	0.00E+00	1.02E-01	1.38E-01	3.50E-02	-1.56E+01
WDP*	m <sup>3</sup>	1.84E+00	9.44E-04	4.23E-03	0.00E+00	4.67E+01	0.00E+00	0.00E+00	1.16E-04	1.64E-02	2.79E-04	-1.80E-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

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

## Additional mandatory and voluntary impact category indicators

Results per piece of BO 45 flood 1 lamp

Indicator	Unit	A1 – A3	A4	A5	B1 – B5	B6	B7	C1	C2	C3	C4	D
GWP – GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	8.00E+00	6.34E-02	9.32E-03	0.00E+00	2.27E+02	0.00E+00	0.00E+00	7.83E-03	1.42E-01	2.43E-03	-1.24E+00
PM	disease inc.	4.99E-07	9.18E-10	1.81E-10	0.00E+00	6.25E-06	0.00E+00	0.00E+00	1.13E-10	4.60E-10	2.02E-10	-8.18E-08
IRP – HE**	kg U235-eq	2.77E-01	1.49E-04	2.35E-04	0.00E+00	6.26E+01	0.00E+00	0.00E+00	1.84E-05	2.07E-03	5.16E-05	-7.79E-02
ETP – fw*	CTUe	5.19E+01	6.09E-01	6.12E-02	0.00E+00	1.12E+03	0.00E+00	0.00E+00	7.51E-02	4.87E-02	2.02E-02	-5.14E+00
HTP – c*	CTUh	1.17E-08	1.22E-11	1.50E-12	0.00E+00	7.72E-08	0.00E+00	0.00E+00	1.51E-12	4.05E-12	2.02E-12	-8.37E-10
HTP – nc*	CTUh	7.56E-08	5.44E-10	8.27E-11	0.00E+00	1.10E-06	0.00E+00	0.00E+00	6.71E-11	2.30E-10	2.03E-10	-1.42E-08
SQP	dimension-less	2.59E+01	4.10E-01	3.38E-02	0.00E+00	2.05E+03	0.00E+00	0.00E+00	5.05E-02	5.22E-02	6.94E-03	3.27E+01

Acronyms

PM = particulate matter emissions. IRP-HE = ionizing radiation potential-human exposure. ETP-fw = ecotoxicity (freshwater). HTP-c = human toxicity potential. cancer effects. HTP-nc = human toxicity potential. non-cancer effects. SQP = land use related impacts.

<sup>1</sup> The indicator 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Resource use indicators

Results per piece of BO 45 flood 1 lamp

Indicator	Unit	A1 – A3	A4	A5	B1 – B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	3.35E+01	7.00E-02	1.25E-02	0.00E+00	3.08E+03	0.00E+00	0.00E+00	8.63E-03	7.49E-02	5.22E-03	-2.67E+00
PERM	MJ	5.01E+00	0.00E+00	-5.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.02E-02	0.00E+00	0.00E+00
PERT	MJ	3.85E+01	7.00E-02	-4.99E+00	0.00E+00	3.08E+03	0.00E+00	0.00E+00	8.63E-03	6.47E-02	5.22E-03	-2.67E+00
PENRE	MJ	9.86E+01	8.27E-01	8.95E-02	0.00E+00	4.47E+03	0.00E+00	0.00E+00	1.02E-01	1.38E-01	3.50E-02	-1.56E+01
PENRM	MJ	2.60E+00	0.00E+00	-1.34E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.46E+00	0.00E+00	0.00E+00
PENRT	MJ	1.01E+02	8.27E-01	-4.43E-02	0.00E+00	4.47E+03	0.00E+00	0.00E+00	1.02E-01	-2.32E+00	3.50E-02	-1.56E+01
SM	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	1.52E-01
RSF	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
NRSF	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
FW	m³	5.15E-02	7.86E-05	1.05E-04	0.00E+00	1.55E+00	0.00E+00	0.00E+00	9.69E-06	4.06E-04	8.47E-06	-6.69E-03

### 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 piece of BO 45 flood 1 lamp

Indicator	Unit	A1 – A3	A4	A5	B1 – B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1.75E-06	2.68E-11	1.63E-10	0.00E+00	6.51E-06	0.00E+00	0.00E+00	3.30E-12	1.21E-10	4.29E-12	2.51E-09
Non-hazardous waste disposed	kg	7.45E-01	1.29E-04	1.59E-02	0.00E+00	3.96E+00	0.00E+00	0.00E+00	1.59E-05	1.63E-02	1.49E-01	-4.25E-01
Radioactive waste disposed	kg	2.51E-03	1.07E-06	1.49E-06	0.00E+00	6.74E-01	0.00E+00	0.00E+00	1.32E-07	1.36E-05	4.22E-07	-7.56E-04

## Output flow indicators

Results per piece of BO 45 flood 1 lamp

Indicator	Unit	A1 – A3	A4	A5	B1 – B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00										
Material for recycling	kg	4.41E-02	0.00E+00	1.96E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-01	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	1.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.42E-02	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00										
Exported energy, thermal	MJ	0.00E+00										

## Scaling Factors for other variants

Flood, medium and spot have the same construction, superspot is very similar but shows some differences in the construction. Those differences have been accounted for in the LCA.

The different size variants (BO 32, 45, 55) use the same material and production technology, but there are differences in the dimension/weight of the components. This also corresponds to the variants with 1, 2 or 3 lamps. The results of the environmental performance indicators above can be scaled to the corresponding variants using the following conversion factors:

## Scaling Factors for BO 32/ 45/ 55

Size [mm]	Lamps	Optic	A1–A3	A4	A5	B6	C1–C4	D
32	1	flood, medium, spot	0.88	0.86	0.83	0.67	0.90	0.88
<b>45</b>	<b>1</b>	<b>flood, medium</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>
45	1	spot	1.00	1.00	1.00	0.95	1.00	1.00
45	1	superspot	1.37	1.04	1.00	0.53	1.28	2.64
55	1	flood, medium, spot	1.30	1.30	1.25	1.55	1.34	1.30
32	2	flood, medium, spot	1.48	1.36	0.83	1.30	1.79	1.48
45	2	flood, medium	1.67	1.55	1.00	2.01	2.00	1.67
45	2	spot	1.67	1.55	1.00	1.89	2.00	1.67
45	2	superspot	2.28	1.61	1.00	0.53	2.56	4.41
55	2	flood, medium, spot	1.85	2.26	1.25	2.70	2.68	1.85
32	3	flood, medium, spot	2.08	1.36	0.83	2.01	2.69	2.08
45	3	flood, medium	2.45	1.55	1.36	2.58	3.00	2.45
45	3	spot	2.45	1.55	1.36	2.83	3.00	2.45

## Results for 1000 lumens during a reference life of 35 000 hours (PSR-0014-ed2.0-EN-2023 07 13).

A conversion factor can be used for converting the results to 1000 lumens during a reference life of 35 000 hours.

			Conversion factors					
Size [mm]	Lamps	Optic	A1–A3	A4	A5	B6	C1–C4	D
32	1	flood, medium, spot	1.32	1.32	1.32	1.19	1.32	1.32
32	2	flood, medium, spot	0.60	0.60	0.60	0.54	0.60	0.60
32	3	flood, medium, spot	0.40	0.40	0.40	0.36	0.40	0.40
45	1	flood, medium	0.76	0.76	0.76	0.69	0.76	0.76
45	1	spot	0.89	0.89	0.89	0.81	0.89	0.89
45	1	superspot	2.87	2.87	2.87	2.60	2.87	2.87
45	2	flood, medium	0.38	0.38	0.38	0.34	0.38	0.38
45	2	spot	0.45	0.45	0.45	0.41	0.45	0.45
45	2	superspot	1.72	1.72	1.72	1.56	1.72	1.72
45	3	flood, medium	0.28	0.28	0.28	0.26	0.28	0.28
45	3	spot	0.30	0.30	0.30	0.27	0.30	0.30
55	1	flood, medium, spot	0.53	0.53	0.53	0.48	0.53	0.53
55	2	flood, medium, spot	0.29	0.29	0.29	0.26	0.29	0.29

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**Information related to the sectorial EPD**

This EPD is not sectoral.

**Differences from previous versions**

This is the first version of the EPD.

EN 15193-1:2017+A1:2021 Energy performance of building – Energy requirements for lighting

EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.

European court of auditors, EU actions and existing challenges on electronic waste, Review No. 4, 2021

General Programme Instructions of the International EPD® System. Version 4.0.

ISO 14025:2006 - Environmental labels and declarations - Type III environmental declarations -Principles and procedures

ISO 14040:2021 Environmental management – Life cycle assessment – Principles and framework

ISO 14044:2021 Environmental management – Life cycle assessment – Requirements and guidelines

LCA Background Report, BO, XAL GmbH, 2024-12-20

LCA for Experts 10.9.0.20 (Sphera)

[PCR-ed4-EN-2021 09 062021. P.E.P. Association. Product Category Rules for Electrical, Electronic and HVAC-R Products.](#)

Product category rules (PCR) 2019:14 Construction products version 1.3.4., 2024-04-30, The EPD International, 2024

[PSR-0014-ed2.0-EN-2023 07 13. PSR SPECIFIC RULES FOR LUMINAIRES. According to PSRmodele-ed2-EN-2021 11 18.](#)

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