Environmental Product Declaration

EPD of multiple products based on a representative product in accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/ AC:2021 for:

SASSO 60 / 100 recessed

from XAL GmbH

Included products
adjustable round (reference product) | adjustable square | downlight round | downlight square | wallwasher round | wallwasher square | wallwasher flush round | wallwasher flush square

Programme
The International EPD® System
www.environdec.com

Programme operator
EPD International AB

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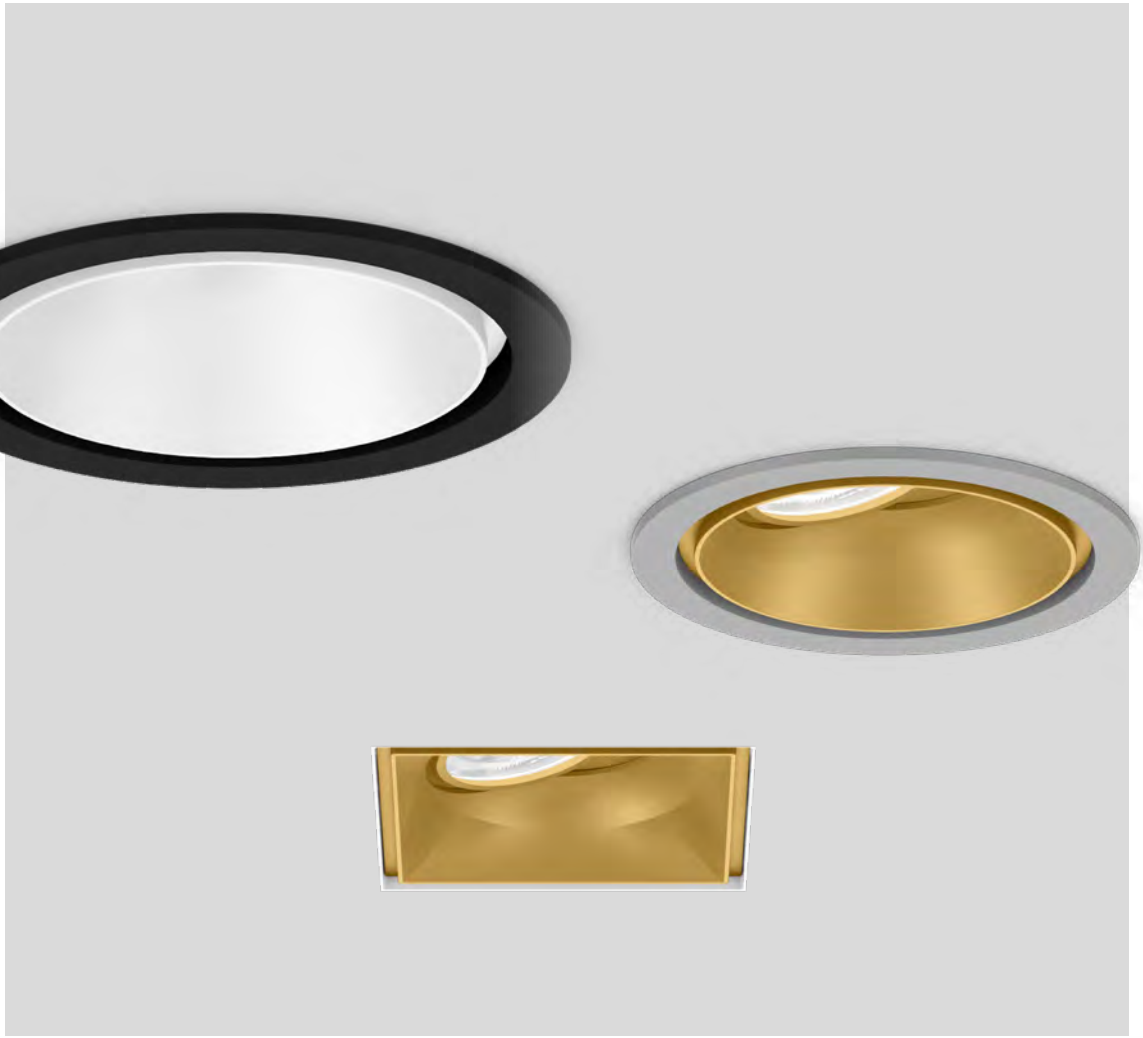

This EPD follows additional requirements for construction products considered as Electronic or Electric Equipment. An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

EPD® THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

General information

Programme information

Programme	The International EPD® System
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products version 1.3.4, 2024-04-30.
UN CPC code(s): 46539 Other electric lamps and lighting fittings (including lamps and lighting fittings of a kind used for lighting public open spaces or thorough fares)

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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Approved by
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.

Company information

Owner of the EPD

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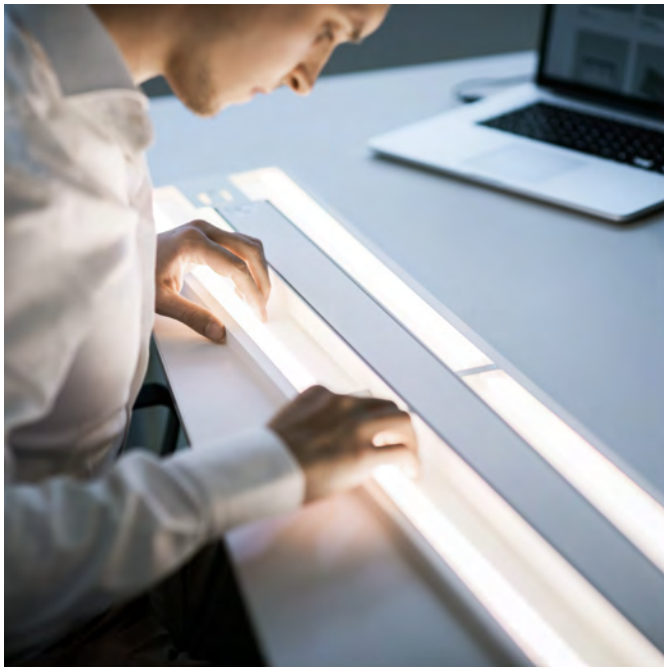


Description of the organisation

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 costumers, we also provide our standard portfolio to B2C costumers.

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 site is located in Graz (XAL GmbH, Austria) and in Murska Sobota (XAL Svetila d.o.o., Slovenia).

More information
xal.com

Product information

Product name

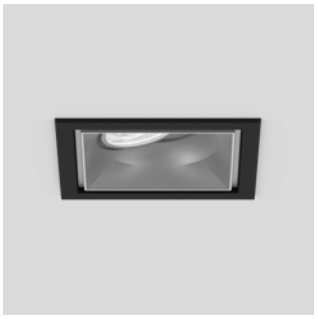
SASSO 60/100 recessed

Product identification

SASSO is a glamorous lighting solution for extravagant interior concepts regardless of how it is used. The versatile spotlight series is available as a recessed, semi-recessed, ceiling- or wall-mounted, or suspended version. Choose between round or square versions, as well as single or double-lamp spotlights in some versions. To ensure the spot fits harmoniously into the overall design, it is available in many colours. The housing colours white, black, and silver can be optimally combined with a selection of differently coloured insets. SASSO is available with different light distribution characteristics – either as spotlight, downlight, wallwasher, or wallwasher floor. In addition, sensors or emergency insets are optionally available. The series is characterized by an excellent colour rendering up to CRI ≥ 95 (2-SDCM) in all light colours: 2700 K, 3000 K, 4000 K, or Colour Warm Dimming.

This EPD covers several variations of the SASSO 60/100 recessed

SASSO 60/100 recessed
adjustable round
(reference product)



SASSO 100 recessed
adjustable square

SASSO 60/100 recessed
downlight round

SASSO 60/100 recessed
downlight square

Product information

SASSO 60 / 100 recessed wallwasher round

SASSO 60 / 100 recessed wallwasher square

SASSO 60 / 100 recessed wallwasher flush round

SASSO 60 / 100 recessed wallwasher flush square

Conversion factors for all variants are given in the Annex.

The results are valid for all available optics
- spot
- medium
- flood
- wide flood
- super wide flood

The luminaires are available with different inset power [W]. Conversion factors for the difference in the use stage are given in the Annex.

The mounting set can be chosen with visible trim or trimless. Conversion factors are given in the Annex.

Product description

Recessed spotlight in die-cast aluminium; square or round; 1 lamp; surface white; adjustable version 30° tiltable; installation without tools in mounting set due to patented ball catch system; installation housing with or without trim; suitable for ceiling thickness of 2 – 25 mm; passive cooling of the LEDs through improved heat sink geometry; no appearance of multiple shadows; efficient LEDs with very good colour rendering.

Product features

Different light colors
CWD, 2700 K, 3000 K & 4000 K

Glare control
despite direct lighting (UGR ≤ 16)

Flexible design
due to quick and easy mounting

CB

The products covered by this EPD are thoroughly tested in our externally accredited in-house facilities. For the SASSO 60 CB is available.

UN CPC code
- 46539 (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)

LCA information

Declared unit

The declared unit is one piece of SASSO 100 adjustable round with trim including the LED-Converter and Mounting Set. The SASSO 100 adjustable round with trim has been chosen as the reference product due to the highest share of sales. The weight of the product per declared unit is 0.467 kg.

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
12.5 years

Time representativeness
2023

Database(s) and LCA software used
LCA for Experts 10.7.1.28

Description of system boundaries
Cradle to gate with options: modules A1 – A3, C1 – C4, D and optional modules A4, A5 and B6.

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 assembly of the LED engine 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 ½ of the weight is taken into account for the production and the recycling. Since connectors typically consist of various material compositions, the EPDs of XAL GmbH assume plastic/metal connectors with a ratio of 50/50.

Transport to building (A4)

The transport is calculated to the capitals of the countries with sales shares >4% (Berlin, Vienna, Zurich, Rome, Paris, Stockholm).

Weighted distance	**736.6 km**
Truck used	Class EURO 6, 26-28 t
Fuel type	Diesel (0.00287 l/100 km)

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 36 times, therefore only 1/36 of the weight is taken into account for the production and the end of life of the pallet.

Material	**Weight (kg)**
Cardboard	0,143
Polyethylene film	0,0026
Wooden pallet	0,0019

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 product’s 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 (20%), hospital (5%), hotel (40%), restaurant (10%), and retail (25%) with an average lifetime of 12.5 years. Geography of the electricity mix is modelled by sales shares and is representative for European countries (88% - EU-28) and rest of world countries (12%). 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 x FCP x FO x (FD x tD + FN x tN) + Pp x ty} x 1/1.000 x a**

The results are presented in the additional information chapter.

Scenario	**SASSO 100 adj. RD trim**	**Unit**
Electricity use (13.25 years)	1606	kWh
Active power	29	W
Passive power	0.50	W
Total active time	53125	hours
Total passive time	56375	hours
Dimmable	non-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 product’s 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.

LCA information

Scenario (luminaire + mounting accessory)	SASSO 100 adj. RD trim	Unit
Collected separately	0.47	kg
Collected with mixed (construction) waste	-	kg
For reuse	-	kg
For recycling	0.28	kg
For energy recovery	0.05	kg
For final disposal	0.14	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 from the product packaging waste are included.

Scenario (contributing materials, incl. packaging)	SASSO 100 adj. RD trim	Unit
Materials for recycling	0.39	kg
Materials for export of secondary fuels	-	kg
Materials for incineration	0.07	kg
Materials for land filling	0.15	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 and SLO	
CO_2 emissions [g/kWh]	0,00
Radioactive waste [mg/kWh]	0,00

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

	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-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	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	>90%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	+48%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%				-	-	-	-	-	-	-	-	-	-	-	-	-
Acronyms	GLO = Global, AUT = Austria, SLO = Slovenia																

Content information

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
Aluminium	0.34	72.98	0.00	0.00	0.00
Polycarbonate	0.06	13.47	0.00	0.00	0.00
Steel	0.02	4.07	0.00	0.00	0.00
Copper	0.01	2.62	0.00	0.00	0.00
Ferrites	0.01	1.59	0.00	0.00	0.00
Thermoplastics	0.003	0.62	0.00	0.00	0.00
TOTAL	**0.7**	**100.00**	**0.00**	**0.00**	**0.00**

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C / declared unit
Paper	0.011	1.61	0.005
Cardboard	0.036	5.30	0.017
TOTAL	**0.047**	**6.91**	**0.022**

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

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

		Results per piece of SASSO 100 adjustable round with trim									
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B1 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP – fossil	kg CO_2 eq.	1.15E+01	5.11E-02	5.45E-03	0.00E+00	5.80E+02	0.00E+00	0.00E+00	4.76E-03	1.89E-01	1.90E-03	-2.44E+00
GWP – biogenic	kg CO_2 eq.	-3.42E-01	0.00E+00	3.41E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.53E-04
GWP – luluc	kg CO_2 eq.	5.41E-03	8.72E-04	2.77E-05	0.00E+00	2.17E-01	0.00E+00	0.00E+00	8.13E-05	1.14E-05	3.57E-06	-1.73E-04
GWP – total	**kg CO_2 eq.**	**1.11E+01**	**5.11E-02**	**3.46E-01**	**0.00E+00**	**5.80E+02**	**0.00E+00**	**0.00E+00**	**4.76E-03**	**1.89E-01**	**1.90E-03**	**-2.44E+00**
ODP	kg CFC 11 eq.	4.25E-10	5.23E-15	8.93E-15	0.00E+00	9.26E-09	0.00E+00	0.00E+00	4.88E-16	1.32E-13	4.55E-15	-1.50E-11
AP	mol H+ eq.	6.48E-02	7.42E-05	1.44E-05	0.00E+00	1.83E+00	0.00E+00	0.00E+00	6.92E-06	5.45E-05	1.37E-05	-9.11E-03
EP – freshwater	kg P eq.	6.29E-05	2.21E-07	1.33E-07	0.00E+00	1.86E-03	0.00E+00	0.00E+00	2.07E-08	3.06E-08	3.28E-09	-3.32E-06
EP – marine	kg N eq.	1.11E-02	2.75E-05	6.51E-06	0.00E+00	3.31E-01	0.00E+00	0.00E+00	2.56E-06	1.56E-05	3.51E-06	-1.98E-03
EP – terrestrial	mol N eq.	1.20E-01	3.26E-04	6.14E-05	0.00E+00	3.53E+00	0.00E+00	0.00E+00	3.04E-05	2.38E-04	3.85E-05	-2.14E-02
POCP	kg NMVOC eq.	3.34E-02	7.02E-05	1.99E-05	0.00E+00	9.39E-01	0.00E+00	0.00E+00	6.55E-06	4.27E-05	1.07E-05	-5.66E-03
ADP – minerals & metals*	kg Sb eq.	3.25E-04	4.42E-09	2.67E-10	0.00E+00	9.35E-05	0.00E+00	0.00E+00	4.12E-10	1.89E-09	1.99E-10	-2.04E-05
ADP – fossil*	MJ	1.23E+02	6.77E-01	4.57E-02	0.00E+00	1.04E+04	0.00E+00	0.00E+00	6.32E-02	1.65E-01	2.53E-02	-3.06E+01
WDP*	m^3	2.15E+00	7.73E-04	2.94E-03	0.00E+00	1.32E+02	0.00E+00	0.00E+00	7.21E-05	2.04E-02	2.12E-04	-3.60E-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 SASSO 100 adjustable round with trim									
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B1 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP – GHG[1]	kg CO_2 eq.	1.08E+01	5.11E-02	5.45E-03	0.00E+00	5.80E+02	0.00E+00	0.00E+00	4.76E-03	1.89E-01	1.90E-03	-2.44E+00
PM	disease inc.	1.48E-06	7.51E-10	1.09E-10	0.00E+00	1.82E-05	0.00E+00	0.00E+00	7.01E-11	6.13E-10	1.69E-10	-1.64E-07
IRP – HE**	kg U235-eq	1.80E-01	1.22E-04	1.71E-04	0.00E+00	1.32E+02	0.00E+00	0.00E+00	1.14E-05	1.86E-03	3.14E-05	-1.64E-01
ETP – fw*	CTUe	4.72E+01	4.98E-01	3.04E-02	0.00E+00	2.49E+03	0.00E+00	0.00E+00	4.65E-02	6.46E-02	1.41E-02	-9.77E+00
HTP – c*	CTUh	1.35E-08	9.99E-12	8.06E-13	0.00E+00	1.82E-07	0.00E+00	0.00E+00	9.32E-13	4.72E-12	2.17E-12	-1.73E-09
HTP – nc*	CTUh	1.32E-07	4.45E-10	4.77E-11	0.00E+00	2.66E-06	0.00E+00	0.00E+00	4.15E-11	2.88E-10	2.30E-10	-2.31E-08
SQP	dimension-less	2.09E+01	3.35E-01	1.49E-02	0.00E+00	4.41E+03	0.00E+00	0.00E+00	3.13E-02	5.64E-02	5.27E-03	2.63E+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.										

[1] 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.

Results of the environmental performance indicators

Resource use indicators

		Results per piece of SASSO 100 adjustable round with trim										
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B1 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2.37E+01	5.73E-02	7.56E-03	0.00E+00	6.74E+03	0.00E+00	0.00E+00	5.34E-03	7.55E-02	3.80E-03	-1.16E+01
PERM	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
PERT	MJ	2.37E+01	5.73E-02	7.56E-03	0.00E+00	6.74E+03	0.00E+00	0.00E+00	5.34E-03	7.55E-02	3.80E-03	-1.16E+01
PENRE	MJ	1.24E+02	6.77E-01	4.57E-02	0.00E+00	1.04E+04	0.00E+00	0.00E+00	6.32E-02	1.65E-01	2.54E-02	-3.06E+01
PENRM	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
PENRT	MJ	1.24E+02	6.77E-01	4.57E-02	0.00E+00	1.04E+04	0.00E+00	0.00E+00	6.32E-02	1.65E-01	2.54E-02	-3.06E+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	0.00E+00
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	m^3	5.53E-02	6.43E-05	7.19E-05	0.00E+00	4.05E+00	0.00E+00	0.00E+00	6.00E-06	5.02E-04	6.44E-06	-1.20E-02

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 SASSO 100 adjustable round with trim										
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B1 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1.54E-06	2.19E-11	1.26E-10	0.00E+00	1.42E-05	0.00E+00	0.00E+00	2.04E-12	1.09E-10	1.30E-12	-5.18E-09
Non-hazardous waste disposed	kg	1.52E+00	1.05E-04	1.18E-02	0.00E+00	8.76E+00	0.00E+00	0.00E+00	9.83E-06	7.70E-02	1.30E-01	-9.02E-01
Radioactive waste disposed	kg	1.48E-03	8.75E-07	1.08E-06	0.00E+00	1.43E+00	0.00E+00	0.00E+00	8.17E-08	1.26E-05	2.82E-07	-1.61E-03

Output flow indicators

		Results per piece of SASSO 100 adjustable round with trim										
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B1 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	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
Material for recycling	kg	8.68E-02	0.00E+00	1.17E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-01
Materials for energy recovery	kg	0.00E+00	0.00E+00	1.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.09E-02	0.00E+00	0.00E+00
Exported energy, electricity	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
Exported energy, thermal	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

Additional environmental information

SASSO 60 and SASSO 100 belong to an environmental homogeneous family as described in chapter 3.6.1. of the PEP-PCR-ed4-EN-2021 09 06: The materials and manufacturing processes of the luminaires are identical and only differ in mass

- the packaging materials and manufacturing processes are identical
- the products use the same logistic circuit
- installation and use conditions are the same
- the technology of the light source is the same
- the luminaires are recycled according to the same regulatory requirements

The results of the SASSO 100 can therefore be scaled to SASSO 60. The calculations of the scaling factors are based on the extrapolation rules of PeP described in chapter 3.6.2. – 3.6.8. (P.E.P., 2021).

The SASSO recessed luminaires are available with trim or trimless mounting and with various inset power [W]. The results of the environmental performance indicators above can be scaled to the corresponding variant with the following conversion factors:

Scaling Factors for SASSO 60

Variant	Mounting	Inset Power [W]	A1 – A3	A4	A5	B6	C1 – C4	D
adjustable	trim	12.6	0.38	0.31	0.50	0.43	0.33	0.38
adjustable	trim	13.1	0.38	0.31	0.50	0.45	0.33	0.38
adjustable	trimless	12.6	0.38	0.32	0.50	0.43	0.34	0.40
adjustable	trimless	13.1	0.38	0.32	0.50	0.45	0.34	0.40
downlight	trim	12.6	0.38	0.31	0.50	0.43	0.33	0.38
downlight	trim	13.1	0.38	0.31	0.50	0.45	0.33	0.38
downlight	trimless	12.6	0.38	0.32	0.50	0.43	0.34	0.40
downlight	trimless	13.1	0.38	0.32	0.50	0.45	0.34	0.40
wallwasher	trim	9.7	0.53	0.39	0.50	0.33	0.26	0.67
wallwasher	trimless	9.7	0.54	0.40	0.50	0.33	0.27	0.70
WW floor	trim	9.7	0.53	0.39	0.50	0.33	0.26	0.67
WW floor	trimless	9.7	0.54	0.40	0.50	0.33	0.27	0.70

Scaling Factors for SASSO 100

Variant	Mounting	Inset Power [W]	A1 – A3	A4	A5	B6	C1 – C4	D
adjustable	trim	29.2	1	1	1	1	1	1
adjustable	trim	20.2	1	1	1	0.69	1	1
adjustable	trimless	29.2	1.01	1.04	1	1	1.04	1.06
adjustable	trimless	20.2	1.01	1.04	1	0.69	1.04	1.06
downlight	trim	29.2	1	1	1	1	1	1
downlight	trim	20.2	1	1	1	0.69	1	1
downlight	trimless	29.2	1.01	1.03	1	1	1.04	1.04
downlight	trimless	20.2	1.01	1.03	1	0.69	1.04	1.04
wallwasher	trim	29.4	1.46	1.26	1.00	1.01	0.82	1.56
wallwasher	trim	20.3	1.46	1.26	1.00	0.70	0.82	1.56
wallwasher	trimless	29.4	1.48	1.30	1.00	1.01	0.85	1.62
wallwasher	trimless	20.3	1.48	1.30	1.00	0.70	0.85	1.62
WW floor	trim	27.5	1.46	1.26	1.00	0.94	0.82	1.56
WW floor	trim	19.2	1.46	1.26	1.00	0.66	0.82	1.56
WW floor	trimless	27.5	1.48	1.30	1.00	0.94	0.85	1.62
WW floor	trimless	19.2	1.48	1.30	1.00	0.66	0.85	1.62

Additional environmental information

Results for 1,000 lumens during a reference life of 35,000 hours produced by 1 BETO suspended luminaire (as per reference of PEP-ECO Passport 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					
Diameter	**Variant**	**Inset Power [W]**	**A1–A3**	**A4**	**A5**	**B6**	**C1–C4**	**D**
100	adjustable	29.2	0.46	0.46	0.46	0.39	0.46	0.46
100	adjustable	20.2	0.6	0.6	0.6	0.51	0.6	0.6
100	downlight	29.2	0.46	0.46	0.46	0.39	0.46	0.46
100	downlight	20.2	0.6	0.6	0.6	0.51	0.6	0.6
100	wallwasher	29.4	0.49	0.49	0.49	0.41	0.49	0.49
100	wallwasher	20.3	0.65	0.65	0.65	0.55	0.65	0.65
100	WW floor	27.5	0.38	0.38	0.38	0.32	0.38	0.38
100	WW floor	19.2	0.51	0.51	0.51	0.43	0.51	0.51
60	adjustable	12.6	1.07	1.07	1.07	0.91	1.07	1.07
60	downlight	12.6	1.03	1.03	1.03	0.87	1.03	1.03
60	wallwasher	9.7	1.41	1.41	1.41	1.19	1.41	1.41
60	WWF	9.7	1.34	1.34	1.34	1.13	1.34	1.34

Information related to the sectorial EPD

This EPD is not sectoral.

Differences from previous versions

This is the first version of the EPD.

References

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

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

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

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