Environmental Product Declaration

EPD of multiple products based on a representative product in accordance with ISO 14025:2006, ISO 14025:2026 and EN 15804:2012+A2:2019/AC:2021:

SASSO 60 / 100 recessed

from XAL GmbH

Including multiple variants of SASSO 60/100 recessed
Included products are specified on page 4

Programme
The International EPD® System
www.environdec.com

Programme operator
EPD International AB

EPD registration number	EPD-IES-0014564:004
Publication date	2026-11-16
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This EPD follows additional requirements for construction products considered as Electronic or Electric Equipment. 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 INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

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

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

Product Category Rules (PCR)
PCR 2019:14 Construction products version 2.0.1, 2025-06-05
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

Individual EPD verification without a pre-verified LCA/EPD tool
Third-party verifier:

Itxaso Trabudua
IK Ingeniería
i.trabudua@ik-ingenieria.com

Procedure for follow-up of data during EPD validity involves third-party verifier:
☐Yes ☒No

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 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 and ISO 14025.

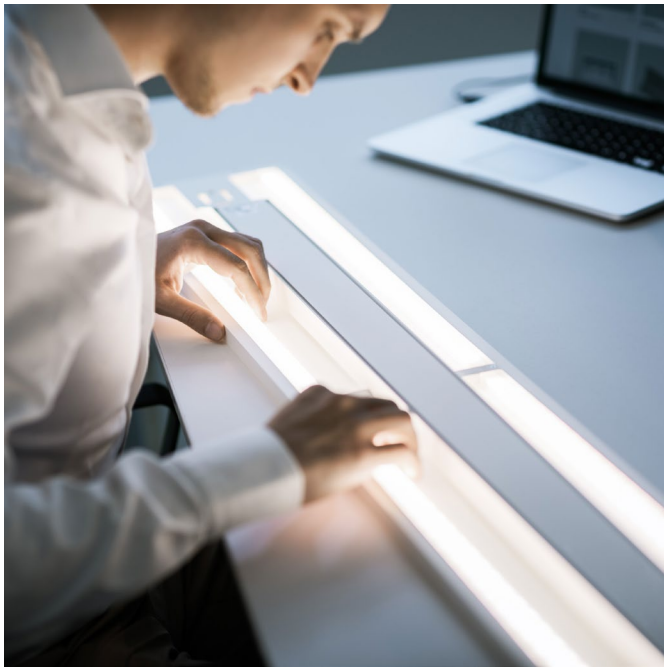
Company information

Owner of the EPD

XAL GmbH
Auer-Welsbach-Gasse 36
8055 Graz
AUSTRIA

epd@xal.com





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 improving our products in terms of durability, energy efficiency and carbon footprint, as well as the replaceability and reusability of components and materials. Improvements are assessed based on technical product specifications, product development documentation and, where applicable, life cycle assessments and Environmental Product Declarations (EPDs), allowing relevant environmental and product-related performance aspects to be substantiated and verified.

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).

The production facilities operate in a complementary manner, with each product passing through both facilities.

More information
xal.com







Product name

SASSO 60/100 recessed

Product identification

Square/Round recessed spotlight available in multiple sizes and options:

This EPD covers multiple products:

- **SASSO 60** square downlight recessed 1,2 lamps
- **SASSO 60** square wallwasher recessed 1,2 lamps
- **SASSO 60** square wallwasher/floor recessed 1,2 lamps
- **SASSO 60** round adjustable recessed 1,2 lamps
- **SASSO 60** round downlight recessed 1,2 lamps
- **SASSO 60** round wallwasher recessed 1,2 lamps
- **SASSO 60** round wallwasher/floor recessed 1,2 lamps
- **SASSO 100** square adjustable recessed 1,2 lamps
- **SASSO 100** square downlight recessed 1,2 lamps
- **SASSO 100** square wallwasher recessed 1 lamp
- **SASSO 100** square wallwasher/floor recessed 1,2 lamps
- **SASSO 100** round adjustable recessed 1,2 lamps
- **SASSO 100** round downlight recessed 1,2 lamps
- **SASSO 100** round wallwasher recessed 1 lamps
- **SASSO 100** round wallwasher/floor recessed 1,2 lamps

The results are valid for all available optics: spot, medium, flood, wide flood, super wide flood and mounting options.

The mounting set can be chosen with visible trim or trimless and available for different ceiling systems; Intermediate ceilings, plasterboard ceilings and soft acoustic ceilings.

Conversion factors are given in the Annex.

Product information

Technical specifications

	SASSO 60 square/round recessed 1 lamp		
Specification	**SASSO 60** downlight/adjustable (reference product)	**SASSO 60** wallwasher/ wallwasher floor	**SASSO 60** high efficient downlight
System power	12 W - 12.8 W	10.4 W	11.8 W - 13.1 W
Luminous efficacy	up to 111 lm/W	up to 120 lm/W	up to 143 lm/W
Colour temperature	2700 K, 3000 K, 3500 K, 4000 K, colour warm dimming	2700 K, 3000 K, 3500 K, 4000 K	2700 K, 3000 K, 3500 K, 4000 K
Electrical	DALI-2, nonDIM	DALI-2, nonDIM	DALI-2, nonDIM
Physical	**square**: Length 80 mm, Width 80 mm, Height 48 mm **round**: Diameter 80 mm, Height 48 mm	**square**: Length 80 mm, Width 80 mm, Height 48 mm **round**: Diameter 80 mm, Height 48 mm	**square**: Length 80 mm, Width 80 mm, Height 48 mm **round**: Diameter 80 mm, Height 48 mm

	SASSO 60 square/round recessed 2 lamps		
Specification	**SASSO 60** downlight/adjustable	**SASSO 60** wallwasher/ wallwasher floor	**SASSO 60** high efficient downlight
System power	24 W - 25.5 W	20.9 W	23.5 W - 26.2 W
Luminous efficacy	up to 109 lm/W	up to 120 lm/W	up to 144 lm/W
Colour temperature	2700 K, 3000 K, 3500 K, 4000 K, colour warm dimming	2700 K, 3000 K, 3500 K, 4000 K	2700 K, 3000 K, 3500 K, 4000 K
Electrical	DALI-2, nonDIM	DALI-2, nonDIM	DALI-2, nonDIM
Physical	Length 147 mm, Width 81 mm, Height 48 mm	Length 147 mm, Width 81 mm, Height 48 mm	Length 147 mm, Width 81 mm, Height 48 mm

	SASSO 100 square/round recessed 1 lamp		
Specification	**SASSO 100** adjustable/downlight	**SASSO 100** wallwasher/ wallwasher floor	**SASSO 100** high efficient adjustable/downlight
System power	17.9 W - 28 W	10.1 W - 27.8 W	18.2 W - 29.6 W
Luminous efficacy	up to 127 lm/W	up to 143 lm/W	up to 144 lm/W
Colour temperature	2700 K, 3000 K, 3500 K, 4000 K, colour warm dimming, tunable white	2700 K, 3000 K, 3500 K, 4000 K, tunable white	2700 K, 3000 K, 3500 K, 4000 K
Electrical	DALI-2, nonDIM	DALI-2, nonDIM	DALI-2, nonDIM
Physical	**square**: Length 118 mm, Width 118 mm, Height 95 mm **round**: Diameter 118 mm, Height 95 mm	**square**: Length 118 mm, Width 118 mm, Height 95 mm **round**: Diameter 118 mm, Height 95 mm	**square**: Length 118 mm, Width 118 mm, Height 95 mm **round**: Diameter 118 mm, Height 95 mm

Product information

Technical specifications

	SASSO 100 square/round recessed 2 lamps		
Specification	**SASSO 100** adjustable/downlight	**SASSO 100** wallwasher floor	**SASSO 100** high efficient adjustable/downlight
System power	35 W - 54.1 W	33.5 W - 49.3 W	35.6 W - 58.6 W
Luminous efficacy	up to 127 lm/W	up to 143 lm/W	up to 144 lm/W
Colour temperature	2700 K, 3000 K, 3500 K, 4000 K, colour warm dimming, tunable white	2700 K, 3000 K, 3500 K, 4000 K, tunable white	2700 K, 3000 K, 3500 K, 4000 K
Electrical	DALI-2, nonDIM	DALI-2, nonDIM	DALI-2, nonDIM
Physical	Length 218 mm, Width 118 mm, Height 95 mm	Length 218 mm, Width 118 mm, Height 95 mm	Length 218 mm, Width 118 mm, Height 95 mm

Product description

SASSO 60/100 recessed

adjustable

Round or square recessed spotlight; installation without tools in mounting set (trimless or with trim) with ball catch system; surface lacquered; single or double lamp; installation possible in different housings; light inset rotatable and tiltable; precise radiation characteristic due to high quality lens system; COB (Chip on Board) technology for maximum efficiency; no multiple shadows; efficient LEDs with very good colour rendering

downlight

Round or square recessed spotlight; installation without tools in mounting set (trimless or with trim) with ball catch system; surface lacquered; single or double lamp; installation possible in different housings; precise radiation characteristic due to high quality lens system; COB (Chip on Board) technology for maximum efficiency; no multiple shadows; efficient LEDs with very good colour rendering

wallwasher

Round or square recessed spotlight; installation without tools in mounting set (trimless or with trim) with ball catch system; surface lacquered; single or double lamp; installation possible in different housings; asymmetric radiation characteristic; with specially computed, asymmetrical reflector for homogeneous lighting intensity; high quality reflector with micro-faceted, aluminum-vaporised surface; no multiple shadows; efficient LEDs with very good colour rendering

wallwasher floor

Round or square recessed spotlight; installation without tools in mounting set (trimless or with trim) with ball catch system; surface lacquered; single or double lamp; installation possible in different housings; asymmetric radiation characteristic; with specially computed, asymmetrical reflector for homogeneous lighting intensity; high quality reflector with micro-faceted, aluminum-vaporised surface; no multiple shadows; efficient LEDs with very good colour rendering

Technical data was tested in house according to following standards:
- EN 13032-1: 2004 +A1: 2012
- EN 13032-4: 2015 +A1: 2019
- CIE S 025/E: 2015
- IES LM-79-19: 2019

UN CPC code(s):
- 4653 (Ver. 2.1) Lighting Equipment

Content declaration

The content declaration refers to the reference product.

Product content	Mass, kg	Mass-%	Post-consumer recycled material, mass-%	Biogenic material, mass-%	Biogenic material, kg C/product or declared unit
Metals	**0.13**	**52.50**	**0.00**	**0.00**	**0.00**
Aluminium	0.13	51.7	68.22	0.00	0.00
Steel	0.002	0.81	0.00	0.00	0.00
Plastics	**0.04**	**16.40**	**0.00**	**0.00**	**0.00**
PA6	0.01	4.09	0.00	0.00	0.00
PC	0.02	8.17	0.00	0.00	0.00
PET	0.003	1.24	0.00	0.00	0.00
PMMA	0.01	2.86	0.00	0.00	0.00
Electronics	**0.07**	**27.00**	**0.00**	**0.00**	**0.00**
Cables	**0.01**	**4.09**	**0.00**	**0.00**	**0.00**
TOTAL	**0.245**	**100.00**	**35.26**	**0.00**	**0.00**

Packaging materials*	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/declared unit
Cardboard	0.018	7.35	0.009
Paper	0.01	3.81	0.005
Plastic	0.01	4.09	0.00
TOTAL	**0.038**	**15.25**	**0.014**

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 is also included in the LCA.

LCA information

Declared unit

The declared unit is one piece of **SASSO 60** square downlight recessed (1 lamp) trimless with colour warm dimming option, including LED-Driver and Mounting Set. The weight of the product per declared unit is 0.245 kg.

The reference product was selected to cover all possible variants of the smallest product size and to provide the most representative basis for scaling to the larger variants.

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

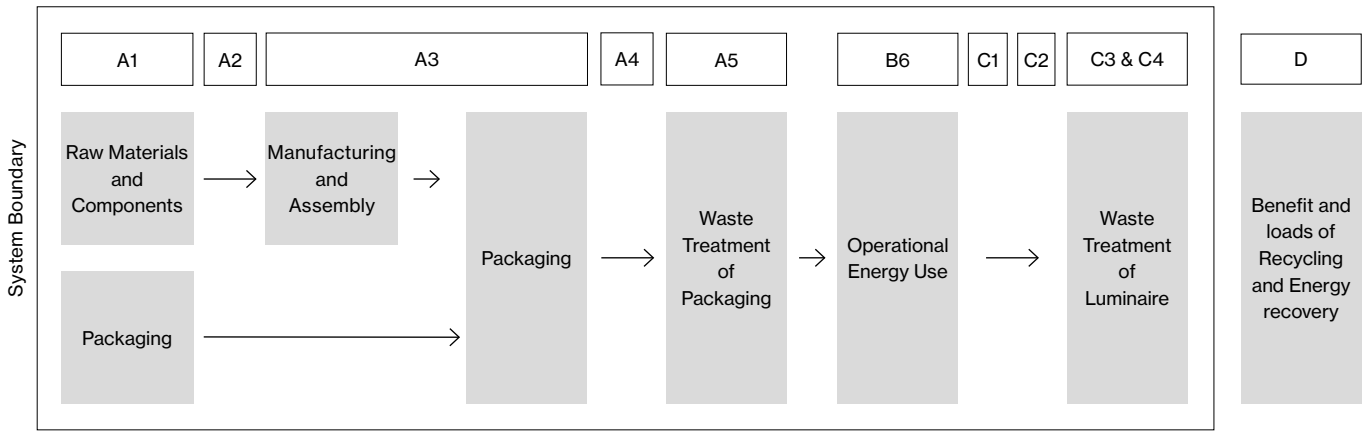
Reference service life
13.25 years

Time representativeness
2025

Database(s) and LCA software used
LCA for Experts 10.9.6.1

Description of system boundaries
Cradle to gate with options, modules C1-C4, module D and with optional modules A4, A5, B6.

System Diagram



Allocation

Raw materials are assigned directly based on the specific Bill of Materials. Factory-wide shared inputs such as electricity are allocated to products using internal sales data. Transport packaging is modelled using average packaging data.

Product stage (A1 – A3)

The raw materials and the corresponding manufacturing processes have been modelled using LCA for Experts. Transportation of raw materials, components and packaging materials to the production sites is included in the assessment. Average transport distances and appropriate transport modes have been applied. For components supplied from China, aggregated transport data has been used, as the supply chain involves various transport routes and vehicles.
The population of the PCB is carried out in Graz, Austria. Other manufacturing operations are mainly carried out in Murska Sobota, Slovenia. Electricity consumption for all manufacturing processes is modelled using the corresponding regional electricity mixes.
Following the EN 15804 cut-off approach, post-consumer recycled materials enters the system burden-free, with only recycling process impacts considered.

Transport to building (A4)

The transport is calculated from Graz, Austria to the capitals of the countries with sales shares >4%

Weighted distance	740.4 km
Truck used	Class EURO 6, 26-28 t
Fuel type	Diesel (0.00287 l/100 kgkm)

Installation into building (A5)

No emissions occur during the installation. This module includes the waste treatment of the packaging. Based on official statistics of Smart EPD Part A PCR, Standard 1000, version 1.2, waste treatment options are taken into account for Europe:

Material Type	Recycling Rate (%)	Landfill Rate (%)	Incineration Rate (%)
Cardboard/Paper	81.5	15.2	3.3
Plastics	37.6	51.1	11.3
Wood	31.9	55.8	12.3

Packaging waste incl. transport packaging:

Material	Weight (kg)
Cardboard	0.043
Paper	0.01
Wooden Pallet	0.0005
Plastics	0.01

Operational Energy Use (B6)

Electricity consumption during the use stage is modelled based on the technical parameters and reference service life of 13.25 years. The operating hours are based on the average application areas in accordance with EN 15193-1:2017+A1:2021. The products are mainly installed in shops, offices and other commercial premises. An average European Electricity grid mix has been used to calculate B6.

The electricity consumption per product unit is calculated using the formula: **Energy consumption [kWh] = {Pa × 1 kW / 1000 W x operating hours p/a [h] x reference service lifetime [y]}**

The results and additional Use Phase Information is presented in the table below:

Scenario	**SASSO 60** square down-light recessed trimless	Unit
Electricity use (13.25 years)	508	kWh
Power	12	W
Operating hours (h/y)	3190	hours
Dimmable	DALI-2	-
Presence control	No	-

End-of-life stage (C1 – C4)

The product is presumed to be decomposed manually; therefore, no emissions occur in C1. In accordance with PCR 2.0.1, the following transport distances are used for end-of-life waste treatment:

- Waste not destined for incineration: 80 km
- Waste destined for incineration: 130 km

Based on official statistics of Smart EPD Part A PCR, Standard 1000, version 1.2, waste treatment options are taken into account for Europe: Recycling (50%), Landfill (37%), Incineration (13%).

Scenario (luminaire + mounting set)	**SASSO 60** square down-light recessed trimless	Unit
Collected separately	0.245	kg
Collected with mixed (construction) waste	-	kg
For reuse	-	kg
For recycling	0.122	kg
For energy recovery	0.032	kg
For final disposal	0.09	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 60** square down-light recessed trimless	Unit
Materials for recycling	0.170	kg
Materials for export of secondary fuels	-	kg
Materials for incineration	0.035	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.

The following modules have been excluded:
- B1: For the use stage (B1), no energy and material inputs, or emissions are involved.
- B2-B5: During the reference service life no maintenance (B2), repair (B3), replacement (B4) or refurbishment (B5) is expected.
- B7: The use of the product does not require water consumption (B7).

Data quality

Based on site specific information, this LCA study reflects the production for 2025. Components are supplied by external vendors, therefore manufacturing processes are modelled using LCA for Experts, with the best fitting representative geographical conditions and applications.

Assumptions

The **SASSO** variants are highly similar and differ only in a limited number of components. Representative configurations containing the highest component content were selected to model the respective product groups.

For adjustable and downlight versions, as a worst-case approach, **SASSO** downlight has been chosen as the reference product for both versions. For **SASSO** wallwasher and wallwasher/floor, as a worst-case approach, **SASSO** wallwasher has been chosen as the reference product for both versions. For single-lamp versions, the trimless variants have been selected as the worst-case configuration, while for two-lamp versions, the variants with trim have been selected. Also for the Mounting sets, worst case of ceiling system has been chosen, according to each version.

Electricity grid

Electricity mix in manufacturing sites is modelled based on market-based approach. For the manufacturing in Graz, Austria, the corresponding supplier's residual electricity grid mix is used: Photovoltaic (84.08%), Hydro Power (10.07%) other RE (5.85%).

For Murska Sobota, Slovenia, the corresponding electricity grid mix is: Hydro Power (47.31%), Photovoltaic (51.51%) other RE (1.18%).

Environmental impact of the electricity used in	AUT	SLO
CO_2 eq. [kg/kWh]	0.022	0.019

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

	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	ND	ND	ND	ND	ND	x	ND	x	x	x	x	x
Geography	GLO	GLO	AUT, SLO	EUR	EUR	-	-	-	-	-	EUR	-	EUR	EUR	EUR	EUR	EUR
Primary data used	13.18 %			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	+123%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acronyms	GLO = Global, AUT = Austria, SLO = Slovenia, EUR = Europe																

Primary data used

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.

Calculation of primary data used for module A1-A3:

Process	Source Type	Source	Reference Year	Data Category	Share of primary data of GWP-GHG results for A1-A3
Transport of materials to manufacturing site	Collected data	EPD Owner, Suppliers	2025	Primary data	11.20%
Electricity of in-house manufacturing	Collected data	EPD Owner	2025	Primary data	1.98%
Total share of primary data of GWP-GHG results for A1-A3					**13.18%**

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.

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).

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

		Results per declared unit								
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP – total	kg CO_2 eq.	4.18E+00	3.60E-03	1.33E-01	1.71E+02	0.00E+00	2.26E-03	7.79E-02	1.88E-03	-5.59E-01
GWP – fossil	kg CO_2 eq.	4.27E+00	3.56E-03	2.98E-02	1.69E+02	0.00E+00	2.23E-03	7.77E-02	1.87E-03	-5.55E-01
GWP – biogenic	kg CO_2 eq.	-9.34E-02	2.80E-05	1.03E-01	1.73E+00	0.00E+00	1.75E-05	9.90E-05	7.40E-06	-2.93E-03
GWP – luluc	kg CO_2 eq.	5.29E-03	1.54E-05	7.93E-05	5.01E-01	0.00E+00	9.65E-06	2.84E-05	2.84E-06	-1.16E-03
ODP	kg CFC 11 eq.	5.03E-08	1.70E-15	1.67E-13	7.39E-09	0.00E+00	1.07E-15	3.82E-13	1.01E-14	-1.05E-11
AP	mol H+ eq.	3.19E-02	6.29E-06	6.36E-05	4.01E-01	0.00E+00	3.94E-06	5.79E-05	1.21E-05	-2.31E-03
EP – freshwater	kg P eq.	1.59E-03	9.14E-09	6.93E-07	1.78E-04	0.00E+00	5.72E-09	6.38E-08	2.95E-07	-7.39E-06
EP – marine	kg N eq.	5.72E-03	2.54E-06	3.23E-05	9.84E-02	0.00E+00	1.59E-06	2.09E-05	2.90E-06	-5.11E-04
EP – terrestrial	mol N eq.	6.20E-02	2.74E-05	2.69E-04	1.16E+00	0.00E+00	1.72E-05	2.49E-04	3.18E-05	-5.55E-03
POCP	kg NMVOC eq.	2.17E-02	5.72E-06	5.15E-05	2.30E-01	0.00E+00	3.58E-06	5.30E-05	8.95E-06	-1.46E-03
ADP – minerals & metals*	kg Sb eq.	1.61E-05	2.61E-10	2.04E-08	4.19E-05	0.00E+00	1.63E-10	3.11E-09	1.58E-10	-4.55E-06
ADP – fossil*	MJ	2.90E+01	4.70E-02	3.63E-01	3.16E+03	0.00E+00	2.95E-02	2.04E-01	2.94E-02	-8.11E+00
WDP*	m^3	3.30E-01	1.46E-05	3.22E-03	3.28E+01	0.00E+00	9.16E-06	1.25E-02	2.22E-04	-1.01E-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 declared unit								
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP – GHG[1]	kg CO_2 eq.	4.28E+00	3.57E-03	2.99E-02	1.70E+02	0.00E+00	2.24E-03	7.78E-02	1.87E-03	-5.56E-01
PM	disease inc.	1.44E-07	6.47E-11	4.82E-10	3.29E-06	0.00E+00	4.05E-11	5.61E-10	1.39E-10	-3.44E-08
IRP – HE**	kg U235-eq	3.50E-02	9.66E-06	1.44E-03	6.65E+01	0.00E+00	6.05E-06	3.23E-03	3.95E-05	-2.92E-02
ETP – fw*	CTUe	1.41E+01	4.05E-02	1.12E-01	7.40E+02	0.00E+00	2.53E-02	6.42E-02	3.28E-02	-2.70E+00
HTP – c*	CTUh	1.28E-09	8.02E-13	5.14E-12	5.00E-08	0.00E+00	5.02E-13	4.95E-12	8.87E-13	-3.54E-10
HTP – nc*	CTUh	2.06E-08	4.16E-11	4.33E-10	1.56E-06	0.00E+00	2.61E-11	2.52E-10	5.48E-11	-3.96E-09
SQP	dimensionless	1.18E+02	1.26E-02	3.91E-01	1.32E+03	0.00E+00	7.90E-03	7.36E-02	6.62E-03	-2.99E+00

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

For the indicators of renewable or non-renewable energy resource of PERM, PERT, PENRM and PENRT, option A is chosen for how to separate the use of primary energy into energy used as raw material and energy used as energy carrier based on Annex 3 of PCR 2019:14.

		Results per declared unit								
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	5.95E+01	3.35E-03	9.81E-01	2.42E+03	0.00E+00	2.10E-03	1.28E-01	5.09E-03	-4.95E+00
PERM	MJ	8.66E-01	0.00E+00	-8.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	6.03E+01	3.35E-03	1.15E-01	2.42E+03	0.00E+00	2.10E-03	1.28E-01	5.09E-03	-4.95E+00
PENRE	MJ	2.72E+01	4.70E-02	8.14E-01	3.16E+03	0.00E+00	2.95E-02	8.58E-01	2.94E-02	-8.11E+00
PENRM	MJ	1.82E+00	0.00E+00	-4.51E-01	0.00E+00	0.00E+00	0.00E+00	-6.55E-01	0.00E+00	0.00E+00
PENRT	MJ	2.90E+01	4.70E-02	3.63E-01	3.16E+03	0.00E+00	2.95E-02	2.04E-01	2.94E-02	-8.11E+00
SM	kg	8.79E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
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
FW	m^3	1.24E-02	1.05E-06	2.28E-04	1.52E+00	0.00E+00	6.55E-07	3.32E-04	6.49E-06	-3.48E-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 declared unit								
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2.46E-08	2.17E-12	6.20E-09	4.75E-06	0.00E+00	1.36E-12	3.00E-09	6.38E-12	-5.34E-09
Non-hazardous waste disposed	kg	3.28E-01	9.06E-06	1.29E-02	2.74E+00	0.00E+00	5.68E-06	1.50E-02	9.06E-02	-1.49E-01
Radioactive waste disposed	kg	3.02E-04	7.41E-08	9.49E-06	4.36E-01	0.00E+00	4.64E-08	2.14E-05	3.12E-07	-2.91E-04

Output flow indicators

		Results per declared unit								
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B6**	**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
Material for recycling	kg	3.22E-02	0.00E+00	4.62E-02	0.00E+00	0.00E+00	0.00E+00	1.22E-01	0.00E+00	0.00E+00
Materials for energy recovery	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
Exported energy. electricity	MJ	0.00E+00	0.00E+00	8.92E-03	0.00E+00	0.00E+00	0.00E+00	8.00E-02	0.00E+00	0.00E+00
Exported energy. thermal	MJ	0.00E+00	0.00E+00	1.60E-02	0.00E+00	0.00E+00	0.00E+00	1.77E-01	0.00E+00	0.00E+00

Additional LCA results

Results for additional 100% scenarios for End-of-Life modules per declared unit

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

		100% Recycling			100% Incineration			100% Landfill		
Indicator	**Unit**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**
GWP – total	kg CO_2 eq.	2.09E-03	6.92E-02	0.00E+00	3.39E-03	3.33E-01	0.00E+00	2.09E-03	0.00E+00	5.09E-03
GWP – fossil	kg CO_2 eq.	2.06E-03	6.90E-02	0.00E+00	3.35E-03	3.33E-01	0.00E+00	2.06E-03	0.00E+00	5.06E-03
GWP – biogenic	kg CO_2 eq.	1.62E-05	1.89E-04	0.00E+00	2.64E-05	3.42E-05	0.00E+00	1.62E-05	0.00E+00	2.00E-05
GWP – luluc	kg CO_2 eq.	8.92E-06	5.24E-05	0.00E+00	1.45E-05	1.70E-05	0.00E+00	8.92E-06	0.00E+00	7.67E-06
ODP	kg CFC 11 eq.	9.86E-16	7.32E-13	0.00E+00	1.60E-15	1.25E-13	0.00E+00	9.86E-16	0.00E+00	2.73E-14
AP	mol H+ eq.	3.64E-06	7.84E-05	0.00E+00	5.92E-06	1.44E-04	0.00E+00	3.64E-06	0.00E+00	3.27E-05
EP – freshwater	kg P eq.	5.29E-09	1.21E-07	0.00E+00	8.60E-09	2.63E-08	0.00E+00	5.29E-09	0.00E+00	7.99E-07
EP – marine	kg N eq.	1.47E-06	2.75E-05	0.00E+00	2.39E-06	5.53E-05	0.00E+00	1.47E-06	0.00E+00	7.84E-06
EP – terrestrial	mol N eq.	1.59E-05	3.24E-04	0.00E+00	2.58E-05	6.71E-04	0.00E+00	1.59E-05	0.00E+00	8.60E-05
POCP	kg NMVOC eq.	3.31E-06	6.84E-05	0.00E+00	5.38E-06	1.44E-04	0.00E+00	3.31E-06	0.00E+00	2.42E-05
ADP – minerals & metals*	kg Sb eq.	1.51E-10	5.81E-09	0.00E+00	2.46E-10	1.60E-09	0.00E+00	1.51E-10	0.00E+00	4.27E-10
ADP – fossil*	MJ	2.73E-02	3.60E-01	0.00E+00	4.43E-02	1.81E-01	0.00E+00	2.73E-02	0.00E+00	7.95E-02
WDP*	m^3	8.47E-06	1.40E-02	0.00E+00	1.38E-05	4.26E-02	0.00E+00	8.47E-06	0.00E+00	6.01E-04

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

		100% Recycling			100% Incineration			100% Landfill		
Indicator	**Unit**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**
GWP – GHG[1]	kg CO_2 eq.	2.07E-03	6.90E-02	0.00E+00	3.36E-03	3.33E-01	0.00E+00	2.07E-03	0.00E+00	5.07E-03
PM	disease inc.	3.75E-11	7.84E-10	0.00E+00	6.09E-11	1.30E-09	0.00E+00	3.75E-11	0.00E+00	3.75E-10
IRP – HE**	kg U235-eq	5.60E-06	6.25E-03	0.00E+00	9.09E-06	7.61E-04	0.00E+00	5.60E-06	0.00E+00	1.07E-04
ETP – fw*	CTUe	2.34E-02	1.01E-01	0.00E+00	3.81E-02	1.05E-01	0.00E+00	2.34E-02	0.00E+00	8.88E-02
HTP – c*	CTUh	4.65E-13	7.87E-12	0.00E+00	7.55E-13	7.76E-12	0.00E+00	4.65E-13	0.00E+00	2.40E-12
HTP – nc*	CTUh	2.41E-11	3.37E-10	0.00E+00	3.92E-11	6.37E-10	0.00E+00	2.41E-11	0.00E+00	1.48E-10
SQP	dimensionless	7.31E-03	1.35E-01	0.00E+00	1.19E-02	4.63E-02	0.00E+00	7.31E-03	0.00E+00	1.79E-02

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.

Additional LCA results

Resource use indicators

For the indicators of renewable or non-renewable energy resource of PERM, PERT, PENRM and PENRT, option A is chosen for how to separate the use of primary energy into energy used as raw material and energy used as energy carrier based on Annex 3 of PCR 2019:14.

		100% Recycling			100% Incineration			100% Landfill		
Indicator	**Unit**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**
PERE	MJ	1.94E-03	2.43E-01	0.00E+00	3.15E-03	5.17E-02	0.00E+00	1.94E-03	0.00E+00	1.38E-02
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
PERT	MJ	1.94E-03	2.43E-01	0.00E+00	3.15E-03	5.17E-02	0.00E+00	1.94E-03	0.00E+00	1.38E-02
PENRE	MJ	2.73E-02	1.09E+00	0.00E+00	4.43E-02	2.42E+00	0.00E+00	2.73E-02	0.00E+00	7.95E-02
PENRM	MJ	0.00E+00	-7.26E-01	0.00E+00	0.00E+00	-2.24E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.73E-02	3.60E-01	0.00E+00	4.43E-02	1.81E-01	0.00E+00	2.73E-02	0.00E+00	7.95E-02
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
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
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
FW	m^3	6.06E-07	4.01E-04	0.00E+00	9.84E-07	1.01E-03	0.00E+00	6.06E-07	0.00E+00	1.75E-05

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

		100% Recycling			100% Incineration			100% Landfill		
Indicator	**Unit**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**
Hazardous waste disposed	kg	1.26E-12	5.97E-09	0.00E+00	2.05E-12	7.96E-11	0.00E+00	1.26E-12	0.00E+00	1.72E-11
Non-hazardous waste disposed	kg	5.25E-06	1.60E-02	0.00E+00	8.53E-06	5.41E-02	0.00E+00	5.25E-06	0.00E+00	2.45E-01
Radioactive waste disposed	kg	4.29E-08	4.13E-05	0.00E+00	6.97E-08	5.87E-06	0.00E+00	4.29E-08	0.00E+00	8.44E-07

Output flow indicators

		100% Recycling			100% Incineration			100% Landfill		
Indicator	**Unit**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**	**C2**	**C3**	**C4**
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
Material for recycling	kg	0.00E+00	2.45E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	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
Exported energy, electricity	MJ	0.00E+00	8.20E-02	0.00E+00	0.00E+00	3.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	1.91E-01	0.00E+00	0.00E+00	6.29E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Additional environmental information

Scaling Factors for other variants

The scaling factors were determined using the GWP-GHG indicator and are only valid for this indicator.

Scaling Factors for SASSO 60 round recessed

Variant	System Power [W]	Inset Power [W]	CCT	A1 – A3	A4	A5	B6	C1 – C4	D
SASSO 60 round adjustable	12.5	10.6	single color	1.00	1.00	1.00	1.04	1.00	1.00
	12.8	10.9	single color	1.00	1.00	1.00	1.06	1.00	1.00
	12.0	10.2	CWD	1.00	1.00	1.00	1.00	1.00	1.00
SASSO 60 round adjustable soft acoustic ceiling	10.2	8.7	single color	1.00	1.00	1.00	0.85	1.00	1.00
	10.4	8.8	single color	1.00	1.00	1.00	0.87	1.00	1.00
SASSO 60 round adjustable 2 lamps	25.0	21.3	single color	1.39	1.57	1.62	2.08	1.45	1.78
	25.5	21.7	single color	1.39	1.57	1.62	2.13	1.45	1.78
	24.0	20.4	CWD	1.39	1.57	1.62	2.00	1.45	1.78
SASSO 60 round downlight	12.5	10.6	single color	1.00	1.00	1.00	1.04	1.00	1.00
	12.8	10.9	single color	1.00	1.00	1.00	1.06	1.00	1.00
	12.0	10.2	CWD	1.00	1.00	1.00	1.00	1.00	1.00
SASSO 60 round downlight soft acoustic ceiling	10.2	8.7	single color	1.00	1.00	1.00	0.85	1.00	1.00
	10.4	8.8	single color	1.00	1.00	1.00	0.87	1.00	1.00
SASSO 60 round downlight 2 lamps	25.0	21.3	single color	1.39	1.57	1.62	2.08	1.45	1.78
	25.5	21.7	single color	1.39	1.57	1.62	2.13	1.45	1.78
	24.0	20.4	CWD	1.39	1.57	1.62	2.00	1.45	1.78
SASSO 60 round wallwasher	10.4	8.9	single color	1.20	1.08	1.00	0.87	1.01	1.26
SASSO 60 round wallwasher soft acoustic ceiling	10.4	8.9	single color	1.20	1.08	1.00	0.87	1.01	1.26
SASSO 60 round wallwasher 2 lamps	20.9	17.7	single color	1.78	1.72	1.62	1.74	1.48	2.30
SASSO 60 round wallwasher/floor	10.4	8.9	single color	1.20	1.08	1.00	0.87	1.01	1.26
SASSO 60 round wallwasher/floor soft acoustic ceiling	10.4	8.9	single color	1.20	1.08	1.00	0.87	1.01	1.26
SASSO 60 round wallwasher/floor 2 lamps	20.9	17.7	single color	1.78	1.72	1.62	1.73	1.48	2.30
SASSO 60 round high efficient adjustable	11.8	10.0	single color	1.00	1.00	1.00	0.98	1.00	1.00
	13.1	11.1	single color	1.00	1.00	1.00	1.09	1.00	1.00
SASSO 60 round high efficient adjustable soft acoustic ceiling	11.8	10.0	single color	1.00	1.00	1.00	0.98	1.00	1.00
	13.1	11.1	single color	1.00	1.00	1.00	1.09	1.00	1.00
SASSO 60 round high efficient adjustable 2 lamps	23.5	20.0	single color	1.39	1.57	1.62	1.96	1.45	1.78
	26.2	22.3	single color	1.39	1.57	1.62	2.18	1.45	1.78
SASSO 60 round high efficient downlight	11.8	10.0	single colour	1.00	1.00	1.00	0.98	1.00	1.00
	13.1	11.1	single colour	1.00	1.00	1.00	1.09	1.00	1.00
SASSO 60 round high efficient downlight soft acoustic ceiling	11.8	10.0	single colour	1.00	1.00	1.00	0.98	1.00	1.00
	13.1	11.1	single colour	1.00	1.00	1.00	1.09	1.00	1.00
SASSO 60 round high efficient downlight 2 lamps	23.5	20.0	single colour	1.39	1.57	1.62	1.96	1.45	1.78
	26.2	22.3	single colour	1.39	1.57	1.62	2.18	1.45	1.78

Additional environmental information

Scaling Factors for SASSO 60 square recessed

Variant	System Power [W]	Inset Power [W]	CCT	A1 – A3	A4	A5	B6	C1 – C4	D
SASSO 60 square downlight **(reference product)**	12.5	10.6	single colour	1.00	1.00	1.00	1.04	1.00	1.00
	12.8	10.9	single colour	1.00	1.00	1.00	1.06	1.00	1.00
	12.0	**10.2**	**CWD**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
SASSO 60 square downlight 2 lamps	25.0	21.3	single colour	1.39	1.57	1.62	2.08	1.45	1.78
	25.5	21.7	single colour	1.39	1.57	1.62	2.13	1.45	1.78
	24.0	20.4	CWD	1.39	1.57	1.62	2.00	1.45	1.78
SASSO 60 square wallwasher	10.4	8.9	single colour	1.20	1.08	1.00	0.87	1.01	1.26
SASSO 60 square wallwasher 2 lamps	20.9	17.7	single colour	1.78	1.72	1.62	1.74	1.48	2.30
SASSO 60 square wallwasher/floor	10.4	8.9	single colour	1.20	1.08	1.00	0.87	1.01	1.26
SASSO 60 square wallwasher/floor 2 lamps	20.8	17.7	single colour	1.78	1.72	1.62	1.74	1.48	2.30
SASSO 60 square high efficient downlight	11.8	10.0	single colour	1.00	1.00	1.00	0.98	1.00	1.00
	13.1	11.1	single colour	1.00	1.00	1.00	1.09	1.00	1.00
SASSO 60 square high efficient downlight 2 lamps	23.5	20.0	single colour	1.39	1.57	1.62	1.96	1.45	1.78
	26.2	22.3	single colour	1.39	1.57	1.62	2.18	1.45	1.78

Scaling Factors for SASSO 100 round recessed

Variant	System Power [W]	Inset Power [W]	CCT	A1 – A3	A4	A5	B6	C1 – C4	D
SASSO 100 round adjustable	17.9	15.2	single color	2.32	2.15	1.82	1.49	2.07	2.62
	26.7	22.7	single color	2.32	2.15	1.82	2.22	2.07	2.62
	21.0	-	TW	2.32	2.15	1.82	1.75	2.07	2.62
	28.0	23.8	CWD	2.32	2.15	1.82	2.33	2.07	2.62
SASSO 100 round adjustable soft acoustic ceiling	17.9	15.2	single color	2.32	2.15	1.82	1.49	2.07	2.62
	26.7	22.7	single color	2.32	2.15	1.82	2.22	2.07	2.62
	21.0	-	TW	2.32	2.15	1.82	1.75	2.07	2.62
SASSO 100 round adjustable 2 lamps	35.0	30.5	single color	4.22	4.29	3.76	2.91	3.87	5.59
	51.6	45.4	single color	4.22	4.29	3.76	4.29	3.87	5.59
	41.0	-	TW	4.22	4.29	3.76	3.41	3.87	5.59
	54.1	47.6	CWD	4.22	4.29	3.76	4.50	3.87	5.59
SASSO 100 round downlight	17.9	15.2	single color	2.32	2.15	1.82	1.49	2.07	2.62
	26.7	22.7	single color	2.32	2.15	1.82	2.22	2.07	2.62
	21.0	-	TW	2.32	2.15	1.82	1.75	2.07	2.62
	28.0	23.8	CWD	2.32	2.15	1.82	2.33	2.07	2.62
SASSO 100 round downlight soft acoustic ceiling	17.9	15.2	single color	2.32	2.15	1.82	1.49	2.07	2.62
	26.7	22.7	single color	2.32	2.15	1.82	2.22	2.07	2.62
	21.0	-	TW	2.32	2.15	1.82	1.75	2.07	2.62

Additional environmental information

Variant	System Power [W]	Inset Power [W]	CCT	A1 – A3	A4	A5	B6	C1 – C4	D
SASSO 100 round downlight 2 lamps	35.0	30.5	single color	4.22	4.29	3.76	2.91	3.87	5.59
	51.6	45.4	single color	4.22	4.29	3.76	4.29	3.87	5.59
	41.0	-	TW	4.22	4.29	3.76	3.41	3.87	5.59
	54.1	47.6	CWD	4.22	4.29	3.76	4.50	3.87	5.59
SASSO 100 round wallwasher	18.6	15.8	single color	2.97	2.95	2.22	1.55	2.88	3.72
	27.8	23.7	single color	2.97	2.95	2.22	2.32	2.88	3.72
	10.1	-	TW	2.97	2.95	2.22	0.84	2.88	3.72
SASSO 100 round wallwasher soft acoustic ceiling	18.6	15.8	single color	2.97	2.95	2.22	1.55	2.88	3.72
	27.8	23.7	single color	2.97	2.95	2.22	2.32	2.88	3.72
	10.1	-	TW	2.97	2.95	2.22	0.84	2.88	3.72
SASSO 100 round wallwasher/floor	17.2	14.6	single color	2.97	2.95	2.22	1.43	2.88	3.72
	25.2	21.5	single color	2.97	2.95	2.22	2.10	2.88	3.72
	21.0	-	TW	2.97	2.95	2.22	1.75	2.88	3.72
SASSO 100 round wallwasher/floor soft acoustic ceiling	17.2	-	single color	2.97	2.95	2.22	1.43	2.88	3.72
	25.2	-	single color	2.97	2.95	2.22	2.10	2.88	3.72
	21.0	-	TW	2.97	2.95	2.22	1.75	2.88	3.72
SASSO 100 round wallwasher/floor 2 lamps	33.5	29.2	single color	4.22	4.29	3.76	2.79	3.87	5.59
	49.3	42.9	single color	4.22	4.29	3.76	4.10	3.87	5.59
	41.0	-	TW	4.22	4.29	3.76	3.41	3.87	5.59
SASSO 100 round high efficient adjustable	18.2	15.5	single color	2.32	2.15	1.82	1.52	2.07	2.62
	27.3	23.2	single color	2.32	2.15	1.82	2.27	2.07	2.62
	20.3	17.3	single color	2.32	2.15	1.82	1.69	2.07	2.62
	29.6	25.8	single color	2.32	2.15	1.82	2.47	2.07	2.62
SASSO 100 round high efficient adjustable soft acoustic ceiling	18.2	15.5	single color	2.32	2.15	1.82	1.52	2.07	2.62
	27.3	23.2	single color	2.32	2.15	1.82	2.27	2.07	2.62
	20.3	17.3	single color	2.32	2.15	1.82	1.69	2.07	2.62
	29.6	25.8	single color	2.32	2.15	1.82	2.47	2.07	2.62
SASSO 100 round high efficient adjustable 2 lamps	35.6	31.0	single color	4.22	4.29	3.76	2.97	3.87	5.59
	52.7	46.3	single color	4.22	4.29	3.76	4.38	3.87	5.59
	39.7	34.5	single color	4.22	4.29	3.76	3.30	3.87	5.59
	58.6	51.6	single color	4.22	4.29	3.76	4.88	3.87	5.59
SASSO 100 round high efficient downlight	18.2	15.5	single color	2.32	2.15	1.82	1.52	2.07	2.62
	27.3	23.2	single color	2.32	2.15	1.82	2.27	2.07	2.62
	20.3	17.3	single color	2.32	2.15	1.82	1.69	2.07	2.62
	29.6	25.8	single color	2.32	2.15	1.82	2.47	2.07	2.62
SASSO 100 round high efficient downlight soft acoustic ceiling	18.2	15.5	single color	2.32	2.15	1.82	1.52	2.07	2.62
	27.3	23.2	single color	2.32	2.15	1.82	2.27	2.07	2.62
	20.3	17.3	single color	2.32	2.15	1.82	1.69	2.07	2.62
	29.6	25.8	single color	2.32	2.15	1.82	2.47	2.07	2.62

Additional environmental information

Variant	System Power [W]	Inset Power [W]	CCT	A1 – A3	A4	A5	B6	C1 – C4	D
SASSO 100 round high efficient downlight 2 lamps	35.6	31.0	single color	4.22	4.29	3.76	2.97	3.87	5.59
	52.7	46.3	single color	4.22	4.29	3.76	4.38	3.87	5.59
	39.7	34.5	single color	4.22	4.29	3.76	3.30	3.87	5.59
	58.6	51.6	single color	4.22	4.29	3.76	4.88	3.87	5.59

Scaling Factors for SASSO 100 square recessed

Variant	System Power [W]	Inset Power [W]	CCT	A1 – A3	A4	A5	B6	C1 – C4	D
SASSO 100 square adjustable	17.9	15.2	single color	2.32	2.15	1.82	1.49	2.07	2.62
	26.7	22.7	single color	2.32	2.15	1.82	2.22	2.07	2.62
	21.0	-	TW	2.32	2.15	1.82	1.75	2.07	2.62
	28.0	23.8	CWD	2.32	2.15	1.82	2.33	2.07	2.62
SASSO 100 square adjustable 2 lamps	35.0	30.5	single color	4.22	4.29	3.76	2.91	3.87	5.59
	51.6	45.4	single color	4.22	4.29	3.76	4.29	3.87	5.59
	41.0	-	TW	4.22	4.29	3.76	3.41	3.87	5.59
	54.1	47.6	CWD	4.22	4.29	3.76	4.50	3.87	5.59
SASSO 100 square downlight	17.9	15.2	single color	2.32	2.15	1.82	1.49	2.07	2.62
	26.7	22.7	single color	2.32	2.15	1.82	2.22	2.07	2.62
	21.0	-	TW	2.32	2.15	1.82	1.75	2.07	2.62
	28.0	23.8	CWD	2.32	2.15	1.82	2.33	2.07	2.62
SASSO 100 square downlight 2 lamps	35.0	30.5	single color	4.22	4.29	3.76	2.91	3.87	5.59
	51.6	45.4	single color	4.22	4.29	3.76	4.29	3.87	5.59
	41.0	-	TW	4.22	4.29	3.76	3.41	3.87	5.59
SASSO 100 square wallwasher	18.6	15.8	single color	2.97	2.95	2.22	1.55	2.88	3.72
	27.8	23.7	single color	2.97	2.95	2.22	2.32	2.88	3.72
	10.1	-	TW	2.97	2.95	2.22	0.85	2.88	3.72
SASSO 100 square wallwasher/floor	17.2	14.6	single color	2.97	2.95	2.22	1.43	2.88	3.72
	25.2	21.5	single color	2.97	2.95	2.22	2.10	2.88	3.72
	21.0	-	TW	2.97	2.95	2.22	1.75	2.88	3.72
SASSO 100 square wallwasher/floor 2 lamps	33.5	29.2	single color	4.22	4.29	3.76	2.79	3.87	5.59
	49.3	42.9	single color	4.22	4.29	3.76	4.10	3.87	5.59
SASSO 100 square high efficient adjustable	18.2	15.5	single color	2.32	2.15	1.82	1.52	2.07	2.62
	27.3	23.2	single color	2.32	2.15	1.82	2.27	2.07	2.62
	20.3	17.3	single color	2.32	2.15	1.82	1.69	2.07	2.62
	29.6	25.8	single color	2.32	2.15	1.82	2.47	2.07	2.62
SASSO 100 square high efficient adjustable 2 lamps	35.6	31.0	single color	4.22	4.29	3.76	2.97	3.87	5.59
	52.7	46.3	single color	4.22	4.29	3.76	4.38	3.87	5.59
	39.7	34.5	single color	4.22	4.29	3.76	3.30	3.87	5.59
	58.6	51.6	single color	4.22	4.29	3.76	4.88	3.87	5.59

Additional environmental information

Variant	System Power [W]	Inset Power [W]	CCT	A1 – A3	A4	A5	B6	C1 – C4	D
SASSO 100 square high efficient downlight	18.2	15.5	single color	2.32	2.15	1.82	1.52	2.07	2.62
	27.3	23.2	single color	2.32	2.15	1.82	2.27	2.07	2.62
	20.3	17.3	single color	2.32	2.15	1.82	1.69	2.07	2.62
	29.6	25.8	single color	2.32	2.15	1.82	2.47	2.07	2.62
SASSO 100 square high efficient downlight 2 lamps	35.6	31.0	single color	4.22	4.29	3.76	2.97	3.87	5.59
	52.7	46.3	single color	4.22	4.29	3.76	4.38	3.87	5.59
	39.7	34.5	single color	4.22	4.29	3.76	3.30	3.87	5.59
	58.6	51.6	single color	4.22	4.29	3.76	4.88	3.87	5.59

Additional environmental information

Information related to the sectorial EPD

This EPD is not sectoral.

Version History

1st version published 2024-07-23
2nd version published 2024-08-30
- editorial update

3rd version published 2026-11-16
- update to PCR 2019:14 Construction products version 2.0.1, 2025-06-05
- new calculations done for efficiency updates of existing variants
- addition of new product variants: SASSO 60/100 square/round high efficient recessed variants
- addition of 2 lamp - variants
- calculations based on new reference product

Abbreviations

ADPE – Abiotic depletion potential non-fossil resources
ADPF – Abiotic depletion potential fossil resources
AP – Acidification potential. accumulated exceedance
AUT – Austria
CB – Certification Body
CRU – Components for re-use
CWD – Colour warm dimming
d/i – direct / indirect
DALI – Digital Adressable Lighting Interface
EEE – Exported electrical energy
EET – Exported thermal energy
EPD – Environmental Product Declaration
EP-freshwater – Eutrophication potential freshwater
EP-marine – Eutrophication potential marine
EP-terrestrial – Eutrophication potential terrestrial
ETP-fw – Eco toxicity freshwater
FW – Net use of fresh water
GLO – Global
GWP-biogenic – Global warming potential biogenic
GWP-fossil – Global warming potential fossil fuels
GWP-GHG – Global warming potential
GWP-luluc – Global warming potential land use and land use change
GWP-total – Global warming potential total
HTTP-c – Human toxicity. cancer effect
HTTP-nc – Human toxicity. non-cancer effects
HWD – Hazardous waste disposed
IRP – Ionizing radiation. human health
LCA – Life Cycle Assessment
MER – Materials for energy recovery
MFR – Materials for recycling
NHWD – Non–harzardous waste disposed
NRSF – Use of non–renewable secondary fuels
ODP – Depletion potential of the stratospheric ozone layer
PCR – Product Category Rules
PENRE – Use of non renewable primary energy as energy carrier
PENRM – Use of non renewable primary energy resources used as raw materials
PENRT – Total use of non renewable primary energy resource
PERE – Use of renewable primary energy as energy carrier
PERM – Use of renewable primary energy resources used as raw materials
PERT – Total use of renewable primary energy
PM – Particulate matter emissions
PMMA – Polymethylmetacrylate
POCP – Photochemical ozone creation potential
PSR – Product Specific Rules
RE – Renewable Energy
RSF – Use of renewable secondary fuels
RWD – Radioactive waste disposed
SLO – Slovenia
SM – Use of secondary material
SQP – Land use related impacts/Soil quality
TW – Tunable White
UN CPC – United Nations Central Product Classification
WDP – Water (user) deprivation potential

References

CuPower LED-Driver – data – EPD : https://www.cupower.com/theproducts_7/ID_CCCB_44_230_500-1050_DT8_NFC_FV1.html

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

EN 15193-1:2021 Energy performance of buildings - Energy requirements for lighting

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 5.1.0

ISO 14020:2000 – Environmental labels and declarations – General principles

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

ISO 14025:2026 - Environmental statements and programmes for products — Environmental product declarations (EPDs)

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, SASSO 60/100 recessed 2026-11-16

LCA for Experts 10.9.6.1

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 2.0.1, 2025-06-05. The EPD International, 2025

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

Smart EPD Part A Product Category Rules For Building And Construction Products and Services, Standard 1000, version 1.2 @Smart EPD, March 14, 2025

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