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:

TUBO | TUBIN 60

from XAL GmbH

Including all variants of TUBO | TUBIN 60 single luminaire
Included products are specified on page 4

Programme
The International EPD® System
www.environdec.com

Programme operator
EPD International AB

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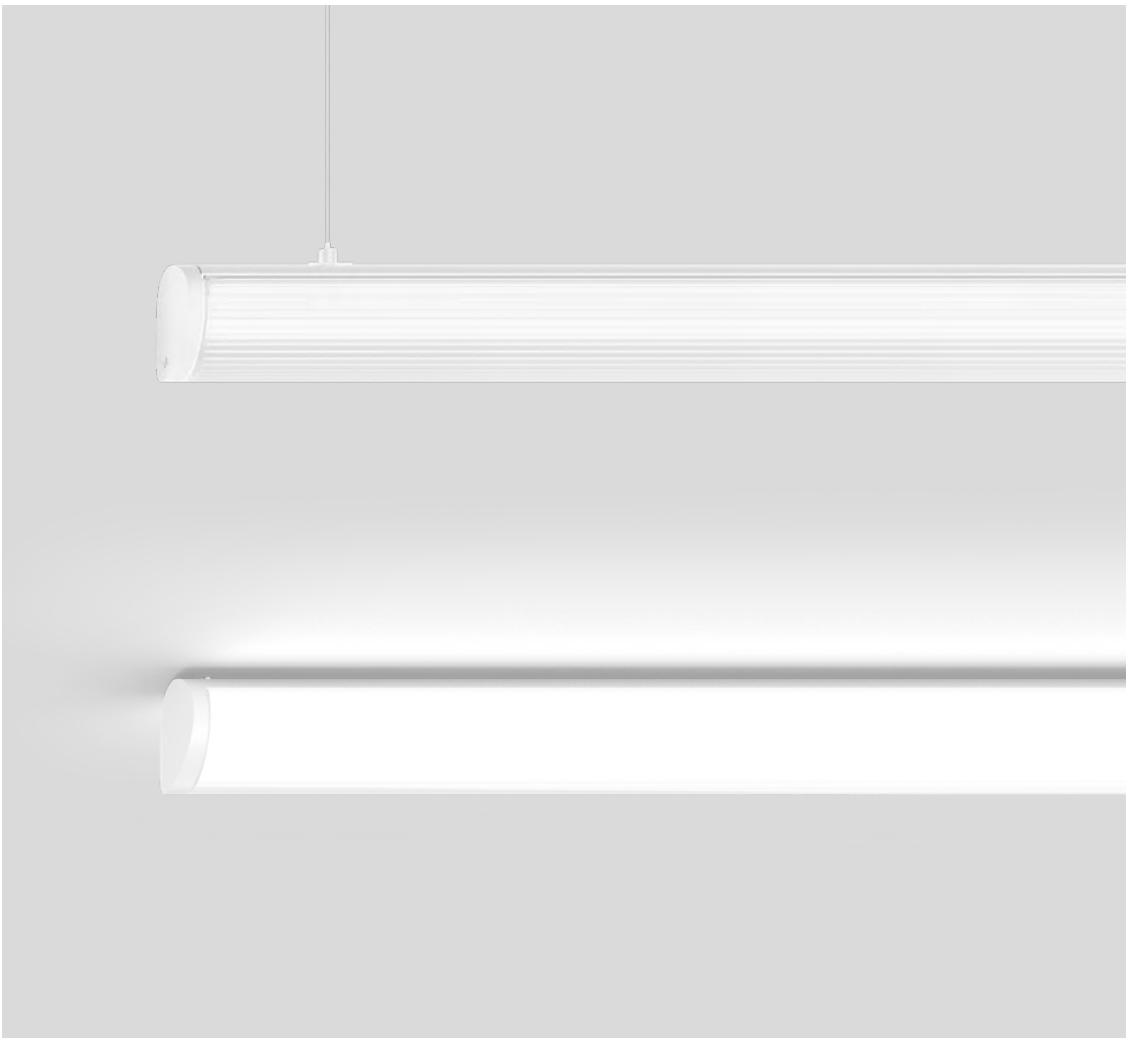

This EPD follows additional requirements for construction products considered as Electronic or Electric Equipment. An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com.

EPD® THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

General information

Programme information

Programme System	The International EPD®
Address	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website	www.environdec.com
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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 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
Review Chair: Rob Rouwette (chair), Noa Meron (co-chair)
The review panel may be contacted via support@environdec.com.

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:

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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.

Company information

Owner of the EPD

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AUSTRIA

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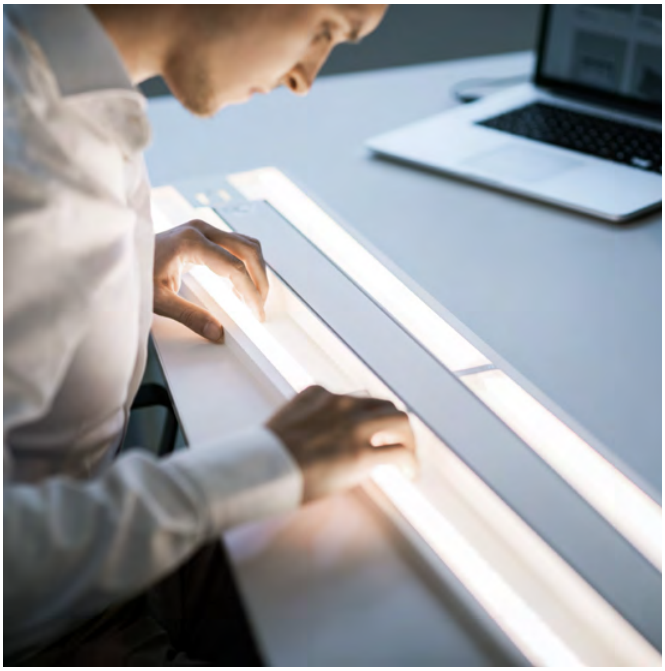


Description of the organisation

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 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 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 information

Product name

TUBO | TUBIN 60

Product identification

Surface mounted or suspended linear luminaire. Available in different sizes. This EPD covers multiple products:

- TUBO surface 625 mm
- TUBO surface 1210 mm (reference product)
- TUBO surface 1500 mm
- TUBO surface 2375 mm
- TUBO suspended 625 mm
- TUBO suspended 1210 mm
- TUBO suspended 1500 mm
- TUBO suspended 2375 mm
- TUBIN surface 625 mm
- TUBIN surface 1210 mm
- TUBIN surface 1500 mm
- TUBIN surface 2375 mm
- TUBIN suspended 625 mm
- TUBIN suspended 1210 mm
- TUBIN suspended 1500 mm
- TUBIN suspended 2375 mm

All variants are available in CRI ≥ 80 and CRI ≥ 90.
Scaling factors for all variants can be found in the Annex of the EPD.

Product description

Luminaire with supporting profile in extruded aluminium and aluminium end caps; surface powder coated. Available as surface-mounted version for wall or ceiling installation, or as suspended version with cable suspension and tool-free height adjustment including feeder cable. Light control via high-quality lens system for maximum, homogeneous illumination. Choice of completely homogeneously illuminated, cylindrical HPO (High Performance Opal) cover (TUBO) or clear cylindrical cover with linear prismatic optic (TUBIN). Equipped with energy-efficient LEDs featuring 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

Technical specifications

Specification	**TUBO 60 surface 1210 mm** (reference product)
Inset power	27.9 W
Luminous efficacy	up to 130 lm/W
Colour temperature	3000 K, 4000 K
Electrical	DALI-2
Physical	Length 1210 mm Witdh 60 mm Height 60 mm

LCA information

Declared unit

The declared unit is one piece of TUBO 60 surface 1210 mm. This product has been chosen as the reference due to the highest share of sales. The weight of the product per declared unit is 1.5 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.

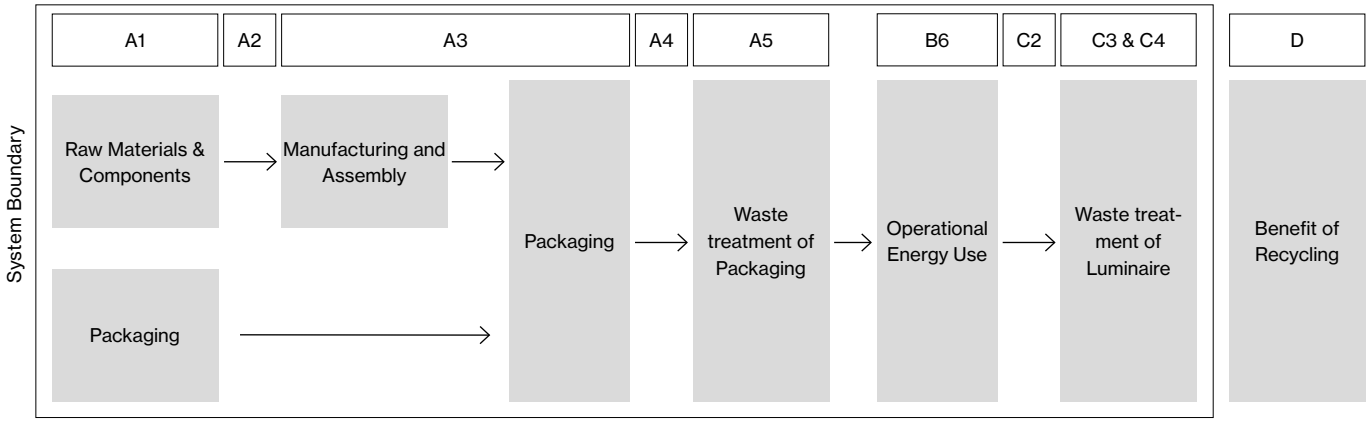
Reference service life
14.8 years

Time representativeness
2024

Database(s) and LCA software used
LCA for Experts 10.9.1.17

Description of system boundaries
Cradle-to-grave and module D

System Diagram



Allocation

Allocation was performed to determine the quantities of flows commonly associated with the factory, including electricity for general operations and packaging, the use of packaging materials (such as wooden pallets and polyethylene film), and packaging waste from purchased components.

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. Population of the PCB is done in Graz, Austria. Milling and powder coating of the channel as well as 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.

Transport to building (A4)

The transport is calculated from Graz, Austria to the capitals of the countries with sales shares >4% (Berlin, Zurich, Vienna, Paris). The product market includes countries all over the world.

Weighted distance	747.9 km
Truck used	Class EURO 6, 26-28 t
Fuel type	Diesel (0.00287 l/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. This is an assumption derived from the PEP Eco Passport rules (PSR-0014-ed2.0-EN-2023 07 13). Packaging waste incl. transport packaging:

Material	Weight (kg)
Cardboard	1.226
Wooden Pallet	0.031
Paper	0.007

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 (95%), hotel (3%) and retail (2%) with an average lifetime of 14.8 years. Geography of the electricity mix is modelled by sales shares and is representative for European countries (95% - EU-28) and rest of world countries (5%). 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**

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

Scenario	TUBO 60 surface 1210 mm	Unit
Electricity use (14.8 years)	1148.7	kWh
Active power	27.9	W
Total active time	38850	hours
Total passive time	90798	hours
Dimmable	DALI-2	-
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	TUBO 60 surface 1210 mm	Unit
Collected separately	1.51	kg
Collected with mixed (construction) waste	-	kg
For reuse	-	kg
For recycling	0.63	kg
For energy recovery	0.64	kg
For final disposal	0.25	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)	TUBO 60 surface 1210 mm	Unit
Materials for recycling	1.66	kg
Materials for export of secondary fuels	-	kg
Materials for incineration	0.79	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 2024. 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: Biomass (65.64%), Solar (25.28%) other RE (9.08%).

For Murska Sobota, Slovenia, the corresponding electricity grid mix is: Hydro Power (57.86%), Solar (42.14%).

Environmental impact of the electricity used in	AUT	SLO
CO_2 eq. [kg/kWh]	0.031	0.015

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	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	46%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-5%/+7%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acronyms	GLO = Global, AUT = Austria, SLO = Slovenia																

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.

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	0.65	42.90	0.00	0.00	0.00
Polycarbonate	0.34	22.40	0.00	0.00	0.00
Polymethylmethacrylate (PMMA)	0.29	19.26	0.00	0.00	0.00
Steel	0.06	3.78	0.00	0.00	0.00
Epoxy resin	0.03	2.12	0.00	0.00	0.00
Copper	0.03	1.82	0.00	0.00	0.00
Glass fibers	0.02	1.53	0.00	0.00	0.00
Polyamide 6 (PA6)	0.02	1.45	0.00	0.00	0.00
Others (<1%)	0.07	4.76	0.00	0.00	0.00
TOTAL	**1.51**	**100.00**	**0.00**	**0.00**	**0.00**

Packaging materials*	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C / declared unit
Paper	0.007	0.49	0.004
Cardboard	0.528	35.08	0.267
TOTAL	**0.536**	**35.57**	**0.271**

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.

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 piece of TUBO 60 surface 1210 mm										
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B1 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP – fossil	kg CO_2 eq.	2.02E+01	2.81E-01	7.18E-02	0.00E+00	3.88E+02	0.00E+00	0.00E+00	2.38E-02	1.73E+00	5.01E-03	-7.72E+00
GWP – biogenic	kg CO_2 eq.	-3.98E+00	0.00E+00	3.98E+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
GWP – luluc	kg CO_2 eq.	7.78E-02	3.00E-03	3.17E-04	0.00E+00	1.27E+00	0.00E+00	0.00E+00	2.54E-04	5.34E-05	1.28E-05	-1.40E-02
GWP – total	**kg CO_2 eq.**	**1.63E+01**	**2.84E-01**	**4.05E+00**	**0.00E+00**	**3.89E+02**	**0.00E+00**	**0.00E+00**	**2.41E-02**	**1.73E+00**	**5.03E-03**	**-7.73E+00**
ODP	kg CFC 11 eq.	4.04E-09	3.43E-14	1.04E-13	0.00E+00	8.11E-09	0.00E+00	0.00E+00	2.91E-15	6.64E-13	1.43E-14	-1.02E-10
AP	mol H+ eq.	9.67E-02	4.55E-04	1.69E-04	0.00E+00	9.07E-01	0.00E+00	0.00E+00	3.86E-05	3.21E-04	3.35E-05	-3.08E-02
EP – freshwater	kg P eq.	2.54E-04	7.86E-07	1.22E-06	0.00E+00	7.61E-04	0.00E+00	0.00E+00	6.67E-08	1.41E-07	7.79E-09	-2.01E-06
EP – marine	kg N eq.	1.87E-02	1.86E-04	7.53E-05	0.00E+00	2.14E-01	0.00E+00	0.00E+00	1.58E-05	7.68E-05	8.35E-06	-5.70E-03
EP – terrestrial	mol N eq.	2.01E-01	1.98E-03	7.33E-04	0.00E+00	2.39E+00	0.00E+00	0.00E+00	1.68E-04	1.48E-03	9.15E-05	-6.15E-02
POCP	kg NMVOC eq.	5.48E-02	3.94E-04	2.13E-04	0.00E+00	5.46E-01	0.00E+00	0.00E+00	3.34E-05	2.10E-04	2.56E-05	-1.58E-02
ADP – minerals & metals*	kg Sb eq.	5.28E-04	1.93E-08	3.49E-09	0.00E+00	7.46E-05	0.00E+00	0.00E+00	1.64E-09	1.37E-08	4.24E-10	-7.31E-05
ADP – fossil*	MJ	2.97E+02	3.71E+00	6.15E-01	0.00E+00	7.50E+03	0.00E+00	0.00E+00	3.15E-01	8.78E-01	7.50E-02	-1.06E+02
WDP*	m^3	4.70E+00	1.17E-03	2.99E-02	0.00E+00	9.95E+01	0.00E+00	0.00E+00	9.89E-05	1.66E-01	5.73E-04	-6.88E-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 TUBO 60 surface 1210 mm										
Indicator	**Unit**	**A1 – A3**	**A4**	**A5**	**B1 – B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP – GHG[1]	kg CO_2 eq.	2.03E+01	2.84E-01	7.21E-02	0.00E+00	3.89E+02	0.00E+00	0.00E+00	2.41E-02	1.73E+00	5.03E-03	-7.73E+00
PM	disease inc.	1.21E-06	4.34E-09	1.27E-09	0.00E+00	8.31E-06	0.00E+00	0.00E+00	3.68E-10	3.63E-09	3.98E-10	-4.00E-07
IRP – HE**	kg U235-eq	9.84E-01	6.76E-04	1.97E-03	0.00E+00	1.84E+02	0.00E+00	0.00E+00	5.74E-05	5.68E-03	1.21E-04	-5.00E-01
ETP – fw*	CTUe	1.61E+02	4.81E+00	6.17E-01	0.00E+00	1.25E+03	0.00E+00	0.00E+00	4.08E-01	3.24E-01	5.08E-02	-3.22E+01
HTP – c*	CTUh	1.35E-08	6.47E-11	1.11E-11	0.00E+00	1.21E-07	0.00E+00	0.00E+00	5.49E-12	2.85E-11	3.18E-12	-4.59E-09
HTP – nc*	CTUh	1.28E-07	3.65E-09	6.46E-10	0.00E+00	2.50E-06	0.00E+00	0.00E+00	3.10E-10	2.18E-09	2.94E-10	-5.38E-08
SQP	dimension-less	1.12E+02	1.65E+00	2.10E-01	0.00E+00	2.89E+03	0.00E+00	0.00E+00	1.40E-01	2.78E-01	1.38E-02	2.17E+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.

Results of the environmental performance indicators

Resource use indicators

Results per piece of TUBO 60 surface 1210 mm

Indicator	Unit	A1 – A3	A4	A5	B1 – B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.71E+02	2.73E-01	8.94E-02	0.00E+00	4.96E+03	0.00E+00	0.00E+00	2.32E-02	3.35E-01	1.18E-02	-1.95E+01
PERM	MJ	3.86E+01	0.00E+00	-3.86E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.97E-03	0.00E+00	0.00E+00
PERT	MJ	2.10E+02	2.73E-01	-3.85E+01	0.00E+00	4.96E+03	0.00E+00	0.00E+00	2.32E-02	3.27E-01	1.18E-02	-1.95E+01
PENRE	MJ	2.97E+02	3.71E+00	6.15E-01	0.00E+00	7.50E+03	0.00E+00	0.00E+00	3.15E-01	8.78E-01	7.50E-02	-1.06E+02
PENRM	MJ	2.24E+01	0.00E+00	-2.65E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.97E+01	0.00E+00	0.00E+00
PENRT	MJ	3.19E+02	3.71E+00	-2.03E+00	0.00E+00	7.50E+03	0.00E+00	0.00E+00	3.15E-01	-1.89E+01	7.50E-02	-1.06E+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	0.00E+00	7.05E-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	m^3	1.71E-01	1.31E-04	7.28E-04	0.00E+00	4.05E+00	0.00E+00	0.00E+00	1.12E-05	3.99E-03	1.71E-05	-3.81E-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 TUBO 60 surface 1210 mm

Indicator	Unit	A1 – A3	A4	A5	B1 – B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1.94E-07	1.34E-10	1.56E-09	0.00E+00	9.57E-06	0.00E+00	0.00E+00	1.14E-11	2.32E-10	1.12E-11	-7.19E-09
Non-hazardous waste disposed	kg	3.23E+00	4.88E-04	1.07E-01	0.00E+00	5.68E+00	0.00E+00	0.00E+00	4.14E-05	1.74E-01	2.84E-01	-1.85E+00
Radioactive waste disposed	kg	8.50E-03	4.88E-06	1.24E-05	0.00E+00	1.12E+00	0.00E+00	0.00E+00	4.14E-07	4.56E-05	9.57E-07	-4.70E-03

Output flow indicators

Results per piece of TUBO 60 surface 1210 mm

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	3.77E-01	0.00E+00	1.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.74E-01	0.00E+00	1.00E-03
Materials for energy recovery	kg	0.00E+00	0.00E+00	1.04E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.10E-01	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

Scaling Factors for other variants

The products of TUBO and TUBIN are very similar but show some differences in their construction and size. Those differences are accounted for in the LCA model. Scaling factors:

Variant	Length [mm]	A1-A3	A4	A5	B6	C1-C4	D
TUBO surface	625	0.68	0.65	0.68	0.53	0.56	0.58
	1210	1.00	1.00	1.00	1.00	1.00	1.00
	1500	1.14	1.04	0.93	1.21	1.22	1.20
	2375	1.67	1.81	1.82	1.88	1.92	1.87
TUBO suspended	625	0.75	0.72	0.68	0.53	0.73	0.69
	1210	1.07	1.07	1.01	1.00	1.18	1.12
	1500	1.22	1.12	0.94	1.21	1.41	1.35
	2375	1.73	1.88	1.83	1.88	2.10	2.02
TUBIN surface	625	0.64	0.62	0.68	0.53	0.43	0.57
	1210	0.95	0.95	1.00	1.00	0.77	0.98
	1500	1.08	0.99	0.93	1.21	0.94	1.17
	2375	1.58	1.72	1.82	1.88	1.48	1.82
TUBIN suspended	625	0.71	0.68	0.68	0.53	0.56	0.67
	1210	1.02	1.01	1.01	1.00	0.91	1.10
	1500	1.16	1.06	0.94	1.21	1.08	1.32
	2375	1.63	1.78	1.83	1.88	1.61	1.97

Results for 1000 lumens during a reference life of 35000 hours

(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 35000 hours.

Variant	Length [mm]	CRI	A1-A3	A4	A5	B6	C1-C4	D
TUBO surface	625	≥90	0.73	0.73	0.73	0.55	0.73	0.73
	625	≥80	0.63	0.63	0.63	0.48	0.63	0.63
	1210	≥90	0.37	0.37	0.37	0.28	0.37	0.37
	1210	≥80	0.31	0.31	0.31	0.24	0.31	0.31
	1500	≥90	0.29	0.29	0.29	0.22	0.29	0.29
	1500	≥80	0.25	0. 25	0.25	0.19	0.25	0.25
	2375	≥90	0.18	0.18	0.18	0.14	0.18	0.18
	2375	≥80	0.16	0.16	0.16	0.12	0.16	0.16
TUBO suspended	625	≥90	0.73	0.73	0.73	0.55	0.73	0.73
	625	≥80	0.63	0.63	0.63	0.48	0.63	0.63
	1210	≥90	0.37	0.37	0.37	0.28	0.37	0.37
	1210	≥80	0.31	0.31	0.31	0.24	0.31	0.31
	1500	≥90	0.29	0.29	0.29	0.22	0.29	0.29
	1500	≥80	0.25	0.25	0.25	0.19	0.25	0.25
	2375	≥90	0.18	0.18	0.18	0.14	0.18	0.18
	2375	≥80	0.16	0.16	0.16	0.12	0.16	0.16

Additional environmental information

Variant	Length [mm]	CRI	A1-A3	A4	A5	B6	C1-C4	D
TUBIN surface	625	≥90	0.68	0. 68	0.68	0.51	0.68	0.68
	625	≥80	0.59	0.59	0.59	0.45	0.59	0.59
	1210	≥90	0.34	0.34	0.34	0.26	0.34	0.34
	1210	≥80	0.29	0.29	0.29	0.22	0.29	0.29
	1500	≥90	0.27	0.27	0.27	0.21	0.27	0.27
	1500	≥80	0.24	0.24	0.24	0.18	0.24	0.24
	2375	≥90	0.17	0.17	0.17	0.13	0.17	0.17
	2375	≥80	0.15	0.15	0.15	0.11	0.15	0.15
TUBIN suspended	625	≥90	0.68	0.68	0.68	0.51	0.68	0.68
	625	≥80	0.59	0.59	0.59	0.45	0.59	0.59
	1210	≥90	0.34	0.34	0.34	0.26	0.34	0.34
	1210	≥80	0.29	0.29	0.29	0.22	0.29	0.29
	1500	≥90	0.27	0.27	0.27	0.21	0.27	0.27
	1500	≥80	0.24	0.24	0.24	0.18	0.24	0.24
	2375	≥90	0.17	0.17	0.17	0.13	0.17	0.17
	2375	≥80	0.15	0.15	0.15	0.11	0.15	0.15

Information related to the sectorial EPD
This EPD is not sectoral.

Differences from previous versions
This is the first version of the EPD.

Abbreviations

EPD – Environmental Product Declaration
LCA – Life Cycle Assessment
PCR – Product Category Rules
PSR – Product Specific Rules
CB – Certification Body
AUT – Austria
GLO – Global
DALI – Digital Adressable Lighting Interface
non DIM – non dimmable
UN CPC – United Nations Central Product Classification
PMMA – Polymethylmetacrylate
RE – Renewable Energy

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