Environmental Product Declaration

Programme:
The International EPD® System
www.environdec.com

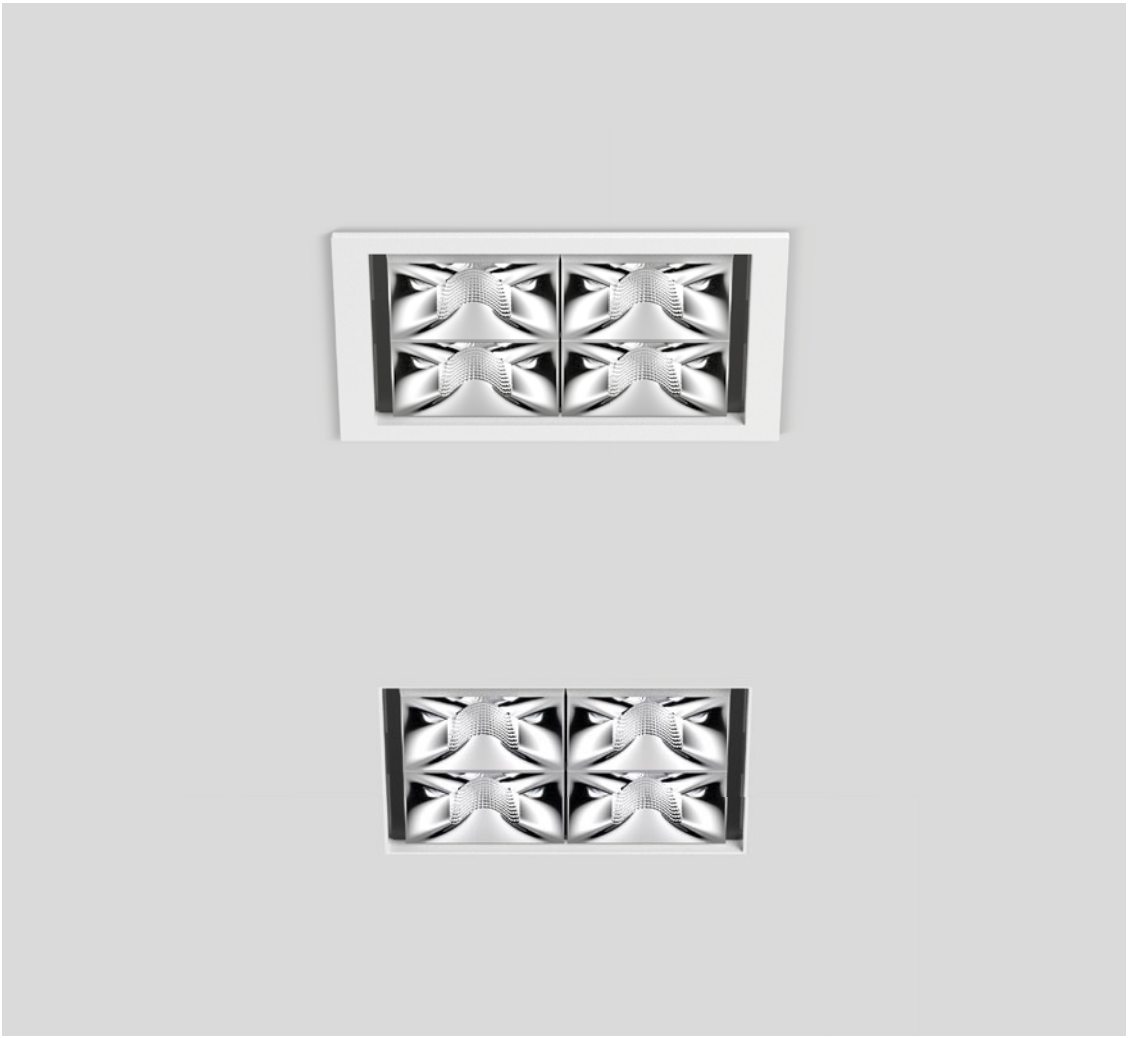
Programme operator:
EPD International AB

EPD registration number:	S-P-08246
Publication date:	2023-02-03
Valid until:	2028-02-02

In accordance with ISO 14025:2006 and
EN 15804:2012+A2:2019/AC:2021 for:

UNICO Q4 basic recessed

from XAL GmbH



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

Address: EPD International AB
Box 210 60
SE-100 31 Stockholm
Sweden

Website: www.environdec.com

E-mail: info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification

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

Product Category Rules (PCR): PCR 2019:14 v.1.2.4 Construction products, valid until 2024-12-20, 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, Chair of the PCR review: Claudia A. Peña, info@environdec.com

Life Cycle Assessment (LCA)
LCA accountability: XAL GmbH, Auer-Welsbach-Gasse 36, 8055 Graz, Austria

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

☒ EPD verification by individual verifier

Third party verifier:
Prof. Ing. Vladimír Kočí, Ph.D., MBA
LCA Studio
Šárecká 5, 16000
Prague 6 - Czech Republic
www.lcastudio.cz

Approved by: The International EPD® System

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

☐ Yes ☒ No

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

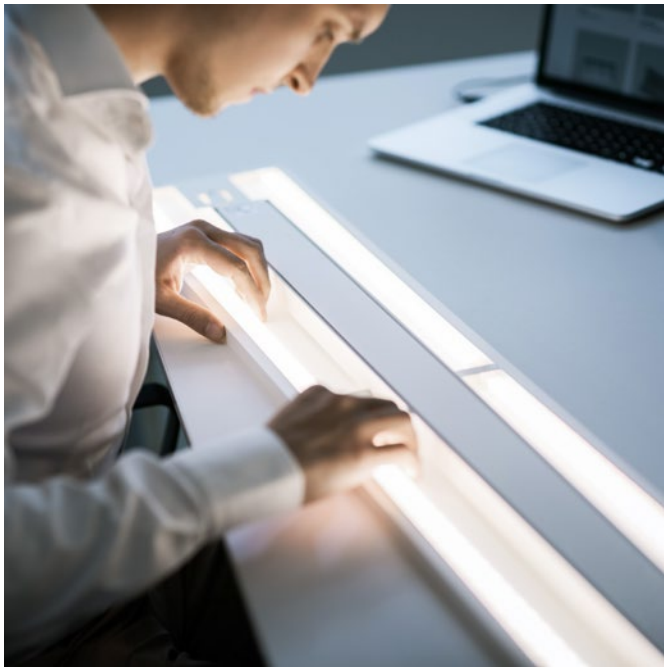
EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For further information about comparability, see EN 15804 and ISO 14025.

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. The headquarters of our company, which was founded in 1989, is located in Graz with production sites and sales subsidiaries in 15 countries and catering to projects worldwide.

It all begins with a passion for light. For 30 years, XAL has been working with lighting designers, architects and planner to develop custom luminaires of the highest technical standard, which impress with their style and aesthetics. There is always one goal: to push the boundaries of the technically feasible, enabling visionary designs. We can meet this challenge because our employees in our design labs as well as production and sales locations around the world deliver top performance. Being on-site for our customers is essential for mutual success. Thanks to organisational efficiency and high inhouse production depth, we can tailor our response to the needs of our customers and continuously expand our existing product portfolio. Meeting seemingly impossible challenges is our daily motivation and inspiration. From novel concept to luminaire innovation: a path created by crossing borders. SEE THE LIGHT.

Product-related or management system-related certifications

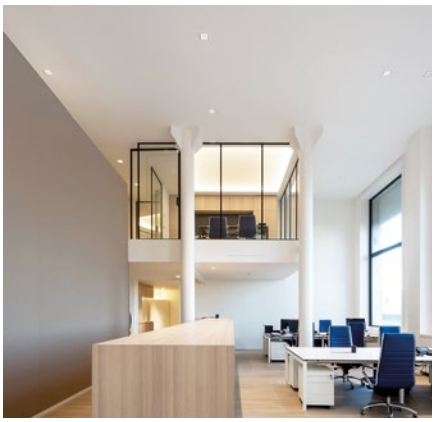
XAL is certified according to several management and CSR standards.

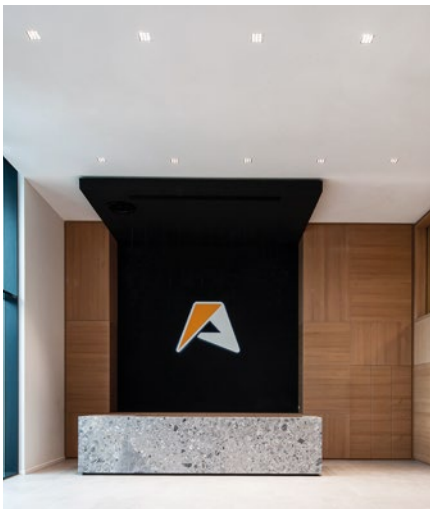
- **ISO 9001** – Quality management systems
- **ISO 14001** – Environmental management systems
- **ISO 45001** – Occupational health and safety management systems
- **Ecovadis** – regular evaluation of our corporate social responsibility based on objective criteria with a focus on the environment, labour 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), some parts are processed at Dongguan (To Be Lighting Co. Ltd.,China).
More information: xal.com

Product information





Product name

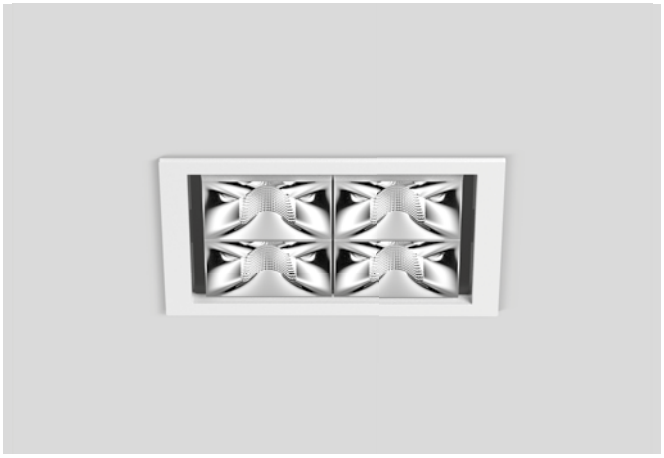
UNICO Q4
basic recessed

Product identification

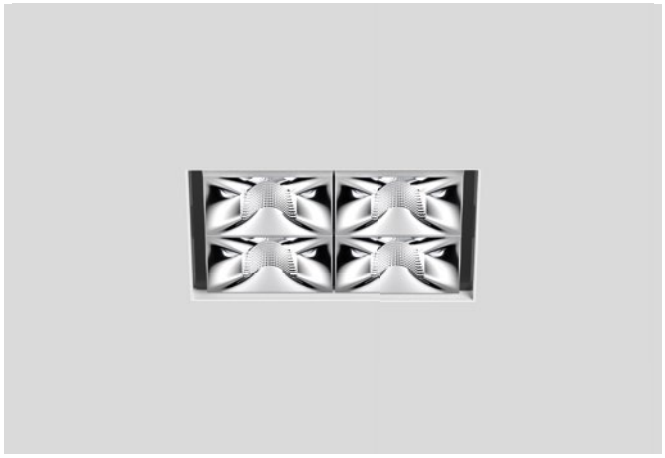
XAL's UNICO is a uniquely flexible product. The downlight offers a solution for every requirement. As a lighting planner or architect, you can customise your UNICO configuration. Choose between three mounting options, seven shapes, eleven lighting insets, two sensors, four colour temperatures (including dynamic Tunable White gradient), four product colours, and two control options. Each variant can be combined with the other versions at will. There has never been more planning freedom in professional lighting design with a single luminaire.

This EPD covers a wide range of our UNICO Q4 basic recessed versions

The EPD covers variants with all housing colours, all light colour options except for tunable white, nine out of eleven reflector shapes and both control options (non-dim and DALI2).



UNICO Q4 basic
trim (traffic white)



UNICO Q4 basic
trimless

Product information

Product description

Square recessed multi-downlight made of die-cast aluminium; equipped with four (Q4) individually selectable or pre-specified, customised light element(s); or with a sensor; after mounting set is installed, installation of luminaire without tools with ball catch system; easy electrical installation by means of reverse polarity protected plug-in connections; suitable for ceiling thickness of 2-25 mm; E-coated; installation possible in different housings; high-quality reflector with micro-faceted, aluminum-vaporised surface; precise radiation characteristic with different symmetrical light distributions; or with asymmetric light distribution; energy-efficient high power LEDs with very good colour rendering; clank-free

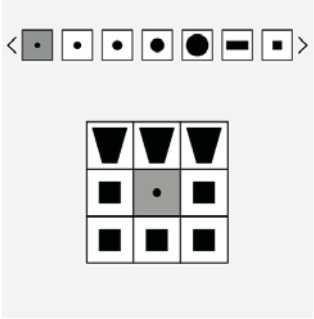
CB

The products covered by this EPD are not only thoroughly tested in our externally accredited in-house facilities but are also third-party tested: CB is available.

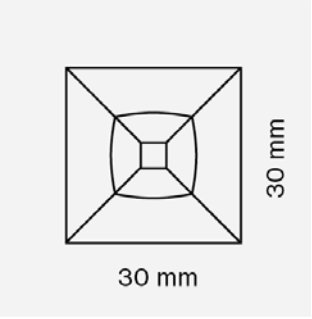
UN CPC code:

- UN CPC Version 2.1
- 46539

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



Intuitive configurator
Flexible configuration of the luminaire



Small and compact
Small dimensions, powerful technology

Simple installation
Installation and assembly are quick and straightforward, even in concrete ceilings

LCA information

Functional unit / declared unit

1 sales unit (UNICO Q4 Basic recessed luminaire plus mounting accessory). The reflectors of the UNICO Q4 basic recessed can be individually chosen out of 11 different inset types. The declared unit covers 9 (spot round, narrow medium round, medium round, flood round, wide flood round, medium square, flood square, wide flood square and rectangular) out of 11 available reflectors. The wallwasher and the wallwasher floor inset are not included, due to larger differences in the final luminaire. The functional unit is a mean average of two types of mounting accessories (trim and trimless) with variations of <10 %.

Results can be scaled for UNICO Q9 Basic recessed. The conversion factor for the UNICO Q9 Basic recessed model is available in the Annex.

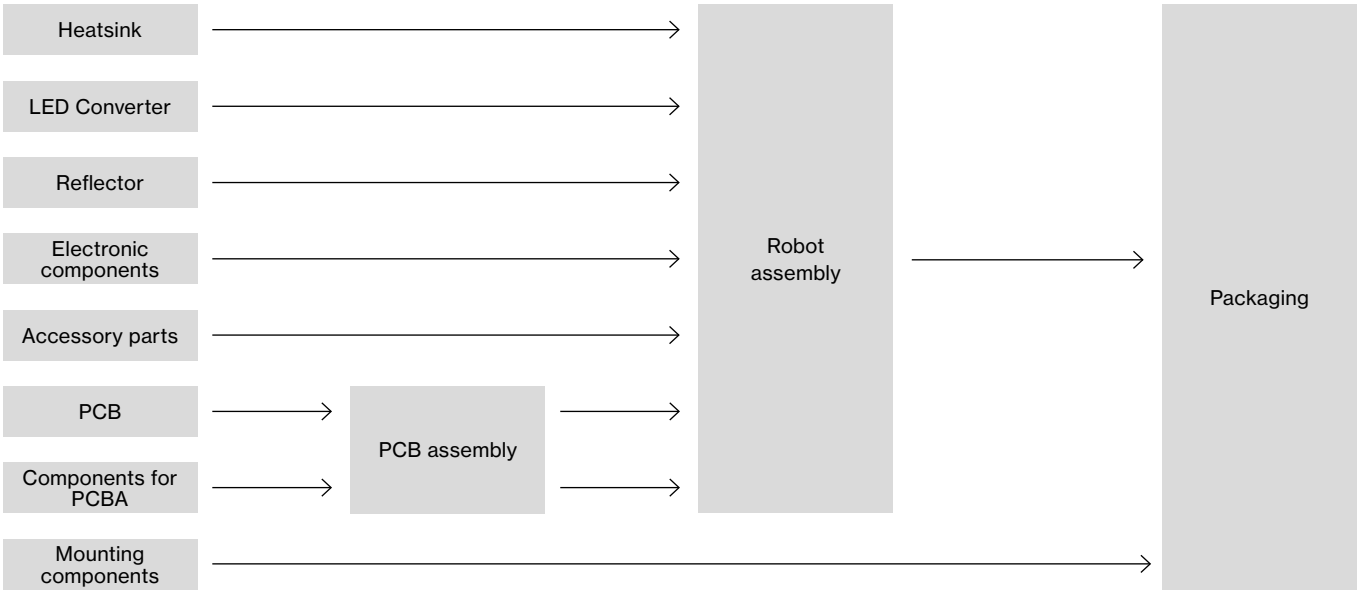
Reference service life:
10-25 years depending on application (14 years as weighted average is used to calculate module B6)

Time representativeness: 2022

Database(s) and LCA software used:
GaBi 10.6.2.9

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

System boundaries



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 GaBi. The components are delivered by external vendors to Graz, where the luminaire is assembled. For the assembly electricity is needed for which the corresponding electricity mix, which is used in Graz, has been simulated in the model. 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 is been accounted for using a worst-case approach.

LCA information

Transport to building (A4)

Transport is modelled for countries where the sales share is more than >4 % and modelled to the capital cities (Vienna, Berlin, London, Zurich, Rome and Paris).

Installation into building (A5)

No emissions occur during the installation. This module includes the waste treatment of the packaging.

Use phase (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 (40 %), hospital (10 %), hotel (20 %), restaurant (20 %), and retail (10 %). Geography of the electricity mix is modelled by sales shares and is representative for European countries (92.03 % – EU-28) and rest of world countries (7.97 %). For the rest of world countries, an electricity mix for China is used following a worst-case approach.

End-of-life stage (C1-C4)

- 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.

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.

Cut-off rule

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).

Data quality

Based on site specific information, this LCA study reflects the production for 2022. Components are supplied by external vendors, therefore manufacturing processes are modelled using GaBi, 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 %). Since only renewable energy is used, the climate impact for CO_2 emissions is 0.

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 stagered
	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
Geography	GLO	GLO	AT	RER	RER-RoW						RER CHN		RER-RoW	RER-RoW	RER-RoW	RER-RoW	RER-RoW
Specific data used	>90 % GWP-GHG					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10 % GWP-GHG difference between product versions					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-
Acronyms	GLO = global, AT = Austria, CHN = China, RER = Europe, RoW = Rest of the world																

Content information

Product components	Weight, kg	Weight-% (versus total weight)	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Aluminium	2.58E-01	53.65%	20%	0%
Polycarbonate	6.73E-02	14.00%	0%	0%
Steel	4.50E-02	7.71%	25%	0%
Copper	3.70E-02	9.37%	0%	0%
Ferrites	1.38E-02	2.87%	0%	0%
PVC	1.30E-02	2.71%	0%	0%
Glass fibers	1.23E-02	2.55%	0%	0%
Nylon66	8.02E-03	1.67%	0%	0%
Epoxy resin	5.68E-03	1.18%	0%	0%
Tin	3.68E-03	0.77%	0%	0%
Electrolyte	2.41E-03	0.50%	0%	0%
Zincoxide	2.05E-03	0.43%	0%	0%
Natural rubber (NR)	1.97E-03	0.41%	0%	0%
Polyphenylene sulfide (PPS)	1.84E-03	0.38%	0%	0%
Polyamide	1.45E-03	0.30%	0%	0%
Ethylene-propylene-diene terpolymer (EPDM)	1.31E-03	0.27%	0%	0%
Silicon dioxide (SiO2)	1.30E-03	0.27%	0%	0%
Paper	8.62E-04	0.18%	0%	55.04% / 4.74E-04
Adhesive based on silane modified polymers	5.50E-04	0.11%	0%	0%
Unsaturated polyester (UP)	5.04E-04	0.10%	0%	0%
Tin in alloy	4.95E-04	0.10%	0%	0%
Unalloyed steel (Fe-C)	4.20E-04	0.09%	0%	0%
Zinc in alloy	3.55E-04	0.07%	0%	0%
Aluminum oxide (Al2O3)	2.06E-04	0.04%	0%	0%
Nickel in alloy	1.79E-04	0.04%	0%	0%
Tetrabromobisphenol A (TBBA)	1.56E-04	0.03%	0%	0%
Silver in alloy	1.27E-04	0.03%	0%	0%
Bismuth oxide (Bi2O3)	1.04E-04	0.02%	0%	0%
Antimony oxide (Diantimony trioxide) (Sb2O3)	9.47E-05	0.02%	0%	0%
Silicon	8.01E-05	0.02%	0%	0%
Dotand	4.87E-05	0.01%	0%	0%
Hausmannite ((Mn+2)(Mn+3)2O 4)	4.13E-05	0.01%	0%	0%
Nickeloxide	3.40E-05	0.01%	0%	0%
Cobaltoxide (Co3O4)	3.27E-05	0.01%	0%	0%
Silver	3.21E-05	0.01%	0%	0%
Inorganic flame retardants	1.24E-05	0.00%	0%	0%
Glass	8.89E-06	0.00%	0%	0%
Colophony	8.40E-06	0.00%	0%	0%
Nickel	6.94E-06	0.00%	0%	0%
Zinc	6.33E-06	0.00%	0%	0%
Lead	4.90E-06	0.00%	0%	0%
Gold	2.35E-06	0.00%	0%	0%
Carbon black	1.51E-06	0.00%	0%	0%
Iron in alloy	1.28E-06	0.00%	0%	0%
Polytetrafluorethylene (PTFE)	1.28E-06	0.00%	0%	0%
Palladium in alloy	4.35E-07	0.00%	0%	0%
Chromium in alloy	3.73E-07	0.00%	0%	0%
Titanium	6.51E-08	0.00%	0%	0%
Lead glas (PbO)	2.69E-08	0.00%	0%	0%
TOTAL	4.81E-01	100%	13,07%	0%

Packaging materials	Weight, kg	Weight-% (versus total weight)	Biogenic material, weight-% and kg C/kg
Corrugated paper	2.03E-01	42.3%	3.08E-02
Paper	3.19E-02	6.6%	1.12E-01
Plastic (PET, PE, PP)	8.41E-03	1.6%	0.00E-00
TOTAL	2.25E-01	50.5%	1.43E-01

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

Potential environmental impact – mandatory indicators according to EN 15804

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq.	1.74E+01	1.10E+00	3.62E-02	1.85E+01	7.43E-02	1.71E-02	2.81E+02	0.00E+00	7.93E-03	1.51E-01	2.39E-03	-8.07E+00
GWP-biogenic	kg CO_2 eq.	-2.53E+00	1.96E-04	4.78E-04	-2.53E+00	-8.84E-02	1.69E-01	2.12E+00	0.00E+00	-1.10E-05	8.71E-04	-2.49E-05	-4.11E-01
GWP-luluc	kg CO_2 eq.	7.34E-03	3.46E-04	2.13E-05	7.71E-03	3.66E-04	3.24E-05	7.32E-02	0.00E+00	4.42E-05	1.37E-04	1.44E-06	-9.97E-03
GWP-total	kg CO_2 eq.	1.49E+01	1.10E+00	3.67E-02	1.60E+01	-1.38E-02	1.86E-01	2.83E+02	0.00E+00	7.96E-03	1.52E-01	2.37E-03	-8.49E+00
ODP	kg CFC 11 eq.	2.30E-08	1.27E-13	6.65E-12	2.30E-08	7.45E-15	2.56E-14	3.62E-09	0.00E+00	4.75E-16	9.60E-13	3.14E-15	-1.60E-11
AP	mol H+ eq.	8.69E-02	6.30E-03	9.05E-05	9.33E-02	2.04E-04	3.56E-05	6.74E-01	0.00E+00	8.17E-06	3.65E-04	7.54E-06	-1.37E-01
EP-freshwater	kg P eq.	6.50E-04	3.33E-07	5.23E-07	6.51E-04	2.08E-07	3.20E-07	7.06E-04	0.00E+00	2.37E-08	3.36E-07	1.83E-09	-6.66E-06
EP-marine	kg N eq.	1.61E-02	2.46E-03	2.67E-05	1.86E-02	8.16E-05	1.55E-05	1.50E-01	0.00E+00	2.67E-06	9.71E-05	1.84E-06	-1.02E-02
EP-terrestrial	mol N eq.	1.66E-01	2.70E-02	2.45E-04	1.93E-01	7.59E-04	1.44E-04	1.58E+00	0.00E+00	3.18E-05	1.03E-03	2.01E-05	-1.10E-01
POCP	kg NMVOC eq.	4.28E-02	6.73E-03	6.03E-05	4.96E-02	3.20E-04	4.75E-05	4.13E-01	0.00E+00	7.20E-06	3.07E-04	5.81E-06	-3.37E-02
ADP-minerals&metals*	kg Sb eq.	8.99E-04	3.18E-08	9.91E-08	8.99E-04	1.18E-08	1.10E-09	6.68E-05	0.00E+00	6.63E-10	3.90E-08	1.66E-10	-5.38E-03
ADP-fossil*	MJ	2.07E+02	1.53E+01	3.47E-01	2.23E+02	1.06E+00	1.44E-01	4.75E+03	0.00E+00	1.06E-01	4.87E+00	3.39E-02	-9.39E+01
WDP*	m^3	8.96E+00	1.44E-03	1.59E-02	8.98E+00	9.82E-03	5.44E-03	6.77E+01	0.00E+00	7.11E-05	-1.35E-02	-2.25E-05	-2.51E+00

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* 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.

Potential environmental impact – additional mandatory and voluntary indicators

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	1.74E+01	1.10E+00	3.62E-02	1.86E+01	7.46E-02	1.70E-02	2.81E+02	0.00E+00	7.97E-03	1.51E-01	2.39E-03	-8.08E+00
PM	disease inc.	1.39E-06	5.07E-08	1.01E-09	1.44E-06	2.21E-09	3.54E-10	6.45E-06	0.00E+00	4.72E-11	2.38E-09	8.06E-11	-1.04E-06
IRP-HE**	kg U235-Eq	1.55E+00	1.09E-03	4.81E-03	1.56E+00	2.26E-04	7.46E-04	1.17E+02	0.00E+00	1.92E-05	2.58E-02	6.03E-05	-4.31E-01
ETP-fw*	CTUe	3.12E+02	8.24E+00	1.38E-01	3.20E+02	5.37E-01	9.54E-02	1.97E+03	0.00E+00	7.36E-02	9.41E-01	1.00E-02	-4.23E+01
HTP-c*	CTUh	1.48E-07	1.40E-10	3.68E-10	1.49E-07	3.30E-11	3.48E-12	6.22E-08	0.00E+00	1.48E-12	6.25E-11	1.19E-12	-3.89E-09
HTP-nc*	CTUh	1.62E-05	5.62E-09	1.02E-09	1.62E-05	1.95E-09	2.68E-10	2.19E-06	0.00E+00	7.69E-11	1.14E-08	1.20E-10	-2.83E-07
Soil quality index*	dimensionless	3.76E+01	3.14E-01	1.61E+00	3.95E+01	3.03E-01	3.89E-02	1.60E+03	0.00E+00	3.65E-02	5.08E-01	2.63E-03	3.26E+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

[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.

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Use of resources

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	MJ	4.24E+01	9.77E-02	1.29E+01	5.54E+01	3.04E-01	2.17E-02	2.50E+03	0.00E+00	6.02E-03	6.73E-01	2.77E-03	-1.11E+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	0.00E+00
PERT	MJ	4.24E+01	9.77E-02	1.29E+01	5.54E+01	3.04E-01	2.17E-02	2.50E+03	0.00E+00	6.02E-03	6.73E-01	2.77E-03	-1.11E+01
PENRE	MJ	2.07E+02	1.53E+01	3.48E-01	2.23E+02	1.06E+00	1.44E-01	4.75E+03	0.00E+00	1.06E-01	4.88E+00	3.39E-02	-9.39E+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	0.00E+00
PENRT	MJ	2.07E+02	1.53E+01	3.48E-01	2.23E+02	1.06E+00	1.44E-01	4.75E+03	0.00E+00	1.06E-01	4.88E+00	3.39E-02	-9.39E+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	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	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	0.00E+00
FW	m^3	1.14E-04	8.44E-03	2.32E-01	2.42E-04	1.38E-04	2.60E+00	0.00E+00	6.81E-06	5.69E-05	4.75E-07	-6.66E-02	1.14E-04

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 production and output flows

Waste production

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B6	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3.15E-06	2.28E-11	2.47E-10	3.15E-06	1.10E-10	2.23E-11	4.15E-07	0.00E+00	5.09E-13	4.24E-09	5.12E-12	-3.09E-08
Non-hazardous waste disposed	kg	1.46E+00	7.38E-04	7.91E-03	1.47E+00	1.88E-03	2.78E-02	3.44E+00	0.00E+00	1.52E-05	1.67E-01	4.95E-02	-1.56E+00
Radioactive waste disposed	kg	4.12E-03	7.49E-06	2.95E-05	4.16E-03	1.54E-06	4.52E-06	6.95E-01	0.00E+00	1.31E-07	1.66E-04	4.08E-07	-2.31E-03

Output flows

Results per functional or declared unit

Indicator	Unit	A1	A2	A3	Tot. 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	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	1.20E-01	1.20E-01	0.00E+00	2.39E-01	0.00E+00	0.00E+00	0.00E+00	9.18E-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	2.70E-02	0.00E+00	0.00E+00	0.00E+00	9.87E-02	0.00E+00	0.00E+00
Exported energy, electricity	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	0.00E+00
Exported energy, thermal	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	0.00E+00

Additional information

Reference service life (per application)

	Office	Hospital	Hotel	Restaurant	Retail
RSL, years	15	25	15	10	5

Use phase (B6)

Scenario	UNICO Q4 basic recessed	Unit
Electricity use (14.25 years)	696	kWh
Active power	13.7	W
Passive power	0.2	W
Total active time	49000	hours
Total passive time	73640	hours
Dimmable	Non-dimmable, DALI-2 control	-
Presence control	No	-

End-of-Life (C1-C4)

Scenario (light engine + mounting accessory)	UNICO Q4 basic recessed	Unit
Collected separately	0.481	kg
Collected with mixed (construction) waste	0	kg
For reuse	0	kg
For recycling	0.280	kg
For energy recovery	0.091	kg
For final disposal	0.110	kg

Module D

Scenario (contributing materials, incl. packaging)	UNICO Q4 basic recessed	Unit
Materials for recycling	0.546	kg
Materials for export of secondary fuels	0	kg
Materials for incineration	0.118	kg
Materials for landfilling	0	kg

Annex

The conversion factor can be used for the bigger Q9 version thanks to the modular system of this series. The Q9 uses the same materials and components as the Q4 version. For this reason, the increase of environmental impact is linear when using nine modules (Q9) instead of four (Q4).

UNICO Basic recessed	Q4	Q9
Conversion factor	1	2.26

References

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

Product category rules (PCR) 2019:14 Construction products version 1.2.4, 2022, The EPD International, 2022

EN 15804:2012+A2:2029 Sustainability of construction works – Environmental product declarations - Core rules for the product category of construction products

EN 15193:2007 Energy performance of buildings – Energy requirements for lighting

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

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

GaBi 10.6.2.9

Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

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

Photos

p. 2 **West Tower**
Manchester, UK – by SimpsonHaugh with
lighting design by Troup, By waters & Anders

p. 4 **Aertssen Group** Beveren, BE –
by Mertens Architecten with
lighting design by Eef Debeuf

Fortuna Financial Group
Antwerp, BE – by Kris Rymenants
Architectenbureau