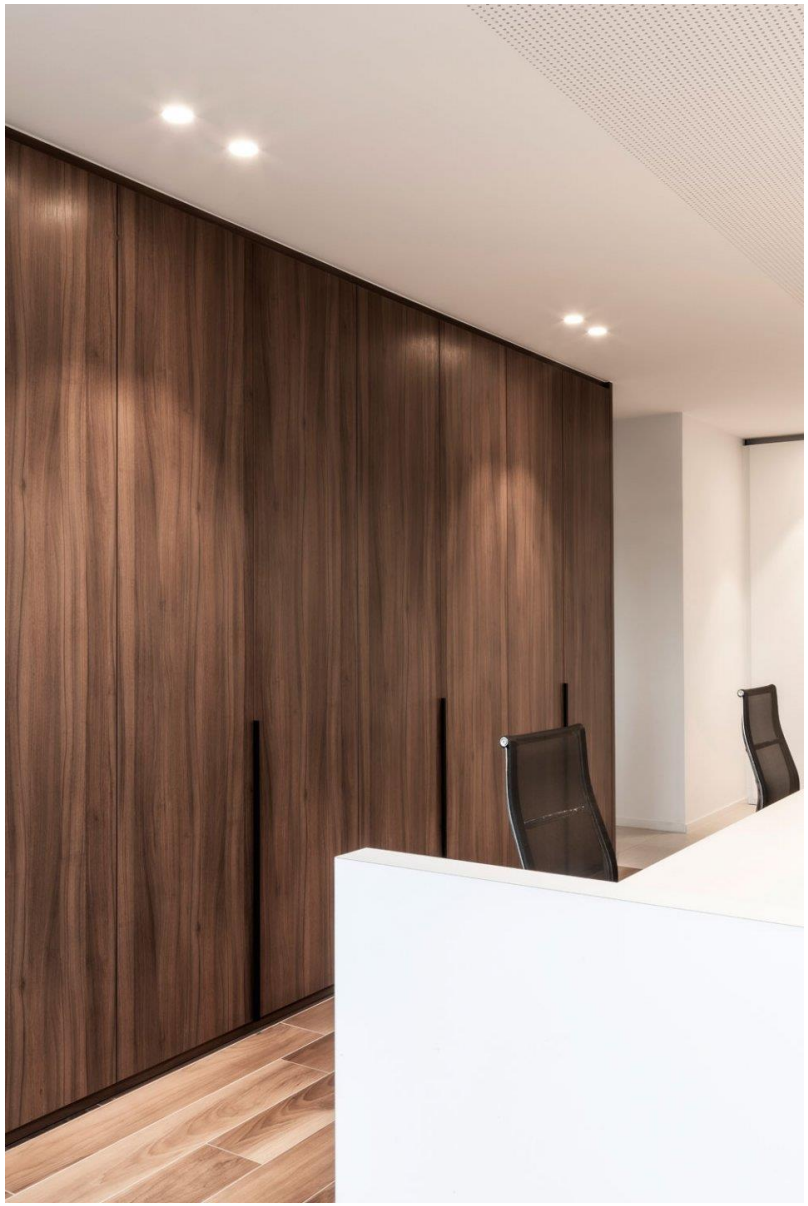


Interior design: Sur Mesure Interieur
Photography: Thomas De Bruyne

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

202 272 811 XXX
DEEP RINGO LED
Delta Light nv

EPD HUB, HUB-4681
Published on 14.12.2025, last updated on 14.12.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

DELTALIGHT

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Delta Light nv
Address	Muizelstraat 2, 8560 Wevelgem, Belgium
Contact details	sustainability@deltalight.com
Website	http://deltalight.com/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025 EN 50693 for electronic and electrical products and systems
Sector	Electrical product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-B7, and modules C1-C4, D
EPD author	Tim Blomme
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	DEEP RINGO LED
Additional labels	-
Product reference	202 272 811 XXX
Place(s) of raw material origin	EU, Asia
Place of production	Delta Light N.V., Muizelstraat 2, 8560 Belgium
Place(s) of installation and use	Worldwide
Period for data	FY2024
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3 (%)	-
A1-A3 Specific data (%)	5,12

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of luminaire
Declared unit mass	0,233 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	7,23
GWP-total, A1-A3 ($kgCO_2e$)	7,16
Secondary material, inputs (%)	10,2
Secondary material, outputs (%)	70,6
Total energy use, A1-A3 (kWh)	24,1
Net freshwater use, A1-A3 (m^3)	0,03

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Belgian and family-run since 1989, Delta Light provides premium lighting solutions for architecture. Quality products, designed for comfort and developed to last, that stand for simplicity and consistency but also show unexpected detail, from a visible screw to an ingenious touch. Because in everything Delta Light does, at project start or follow-up, we always seek to add a little extra care — and work with our partners, to guarantee we can bring their visions to completion.

PRODUCT DESCRIPTION

General description: The conical shaped design of the Deep Ringo fixtures and its deeper placed LED source make sure that glare is reduced to a minimum when Deep Ringo is installed in the ceiling. The small trim gives a refined touch to this elegant luminaire. Available in 3 sizes, with trim or trimless, fix or adjustable, a range of beam angles and multiple finishing colours, Deep Ringo is an easy-to-use downlight throughout the project. Its golden or bronze finish is perfect to add a sniff of luxury to the room.

Specifications about the representative product: architectural recessed tube luminaire, class III with IP20 classification, non-adjustable. Luminaire power up to 10W with LED COB. Diameter 81mm with length of luminaire 86. Materials used are aluminum for the body and reflector. Polycarbonate is used for the strain relief and PC in front of the LED, and stainless steel is used for connection parts and springs.

This EPD relates strictly to the specific product reference. No averaging is used, but differences within the broader product family produced in the same plant are addressed separately through extrapolation factors in accordance with PEP PSR-0014, as provided in Annex 1 of this EPD

Further information can be found at http://deltalight.com/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals (% of aluminum and stainless steel used in luminaire)	92	Asia
Minerals	-	-
Fossil materials (% of all plastics used in luminaire)	1	Asia
Bio-based materials	-	-
Electronics (% of wiring, connectors, LED,... used in luminaire)	7	Asia, EU

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0,027

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of luminaire
Mass per declared unit	0,233 kg
Functional unit	803 lumen during a reference lifetime of 55 000 hours
Reference service life	19 years when the luminaire is operated for 8 hours a day

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	ND	ND	x	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = ND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The product is made of metals, plastics and electronic components. The component manufacturing happens outside of Delta Light with subcontractors (aluminum production, moulding, pcb production,...) and are then transported to Delta Light N.V. where they are assembled together. For each individual material, the transport distance to Delta Light is based on the supplier's country of origin. Vehicle capacity utilization volume factor is assumed to be 100%, representing a full load. In practice, utilization may vary but since transportation emissions contribute only a small share of the total, this variation is considered negligible. The environmental impacts considered for the product stage cover the manufacturing of raw materials and components used in the production as well as packaging materials and other ancillary materials. It is assumed that there are no production losses during the production processes at the manufacturing site. The finished product is packed in cardboard packaging before being shipped to the installation site. Ancillary materials include tap water and rain water, with quantities determined based on factory level data. Energy sources are natural gas and electricity. Electricity is supplied to the factory through a combination of on-site photovoltaic generation and purchased grid power. A market-based approach is applied to model the purchased electricity grid mix, which is fully sourced from renewable energy. The use of green electricity is demonstrated through contractual instruments (GOs, RECs, etc), and its use is ensured throughout the validity period of this EPD.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Transportation distance is defined according to the PCR. Average distance of transportation from production plant to building site is assumed as average 1340km, 592km, 179km for respectively boat, road and air transport. Vehicle capacity utilization volume factor is assumed to be 100% which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as products are packaged properly. Also, volume capacity utilisation factor is assumed to be 100% for the nested packaged products. Transportation impacts that occur from delivery of the product cover direct exhaust emissions of fuel, environmental impacts of fuel production, as well as related infrastructure emissions.

Environmental impacts from installation into the building include waste packaging materials (A5), calculations based on EUROSTAT (83% of the paper/cardboard packaging is recycled, 8% of the paper/cardboard packaging is incinerated and 9% of the paper/cardboard packaging is landfilled. The incineration results in exported electric and thermal energy). Transportation distance to treatment is assumed as 50 km and the transportation method is assumed to be lorry (C2). The impacts of energy consumption and the used ancillary materials during installation are considered negligible.

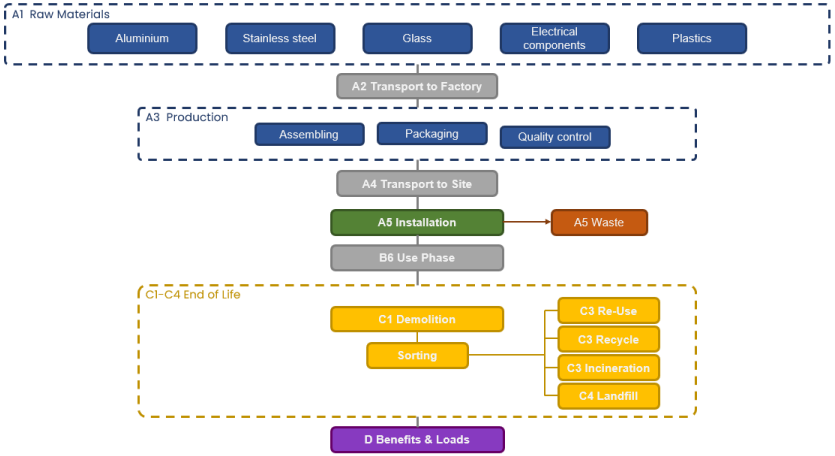
PRODUCT USE AND MAINTENANCE (B1-B7)

During the use phase, the product consumes electricity from regional (EU, North America, Asia and rest of the world) electricity grid mix (B6). Impacts due to electricity production include direct emissions to air, transformation and transmission losses. The reference service life is based on the LM80 report of the LED which is 55000 hours. When the luminaire is operated 8 hours a day, this will result in an RSL of approximately 19 years. Air, soil, and water impacts during the use phase have not been studied. The product is assumed to undergo replacement of selected components in intervals of time (40 years when the luminaire is operated for 8 hours a day) based on the lifespan of parts and components. This is to ensure that the product is fully functional throughout its lifetime. This is why B1-B5 is excluded. B7 is not applicable. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy and natural resources in demolition process is assumed to be negligible. It is assumed that the waste is collected separately and transported to the waste treatment center. Transportation distance to treatment is assumed as 50 km and the transportation method is assumed to be lorry (C2). According to EN 50693:2019, the sequence of treatment operations occurring to the product shall include de-pollution, fractions separation and preparation (dismantling, crushing, shredding, sorting), recycling, other material recovery, energy recovery and disposal. In this study, the default values from table G.4 of EN 50693 is used for treating materials in different waste treatment methods. For aluminum 70% recovery rate and 30% disposal rate. For copper 60% disposal rate and 40% disposal rate. Other plastics 50% energy recovery rate and 50% disposal rate. For glass 60% recovery rate and 40% disposal rate. Packaging waste is not included in the End of Life stages (C3–C4). All impacts related to packaging disposal are instead accounted for in stage A5 (installation). Due to the material and energy recovery potential of parts in the lighting system, the end-of-life product is converted into recycled raw materials, while the energy recovered from incineration displaces electricity and heat production (D). Module D includes the environmental benefits from energy recovery (electricity and heat) from incineration of plastics at end-of-life, as well as the benefits and burdens associated with avoided production of aluminum, steel, and packaging materials. For packaging, the incineration and recycling impacts are aligned with the A5 stage (installation) end-of-life, and the transfer of PERM and GWPbiogenic is also accounted for.

MANUFACTURING PROCESS



All estimations and assumptions regarding the cut off criteria and the allocation are declared in the part “Cut-off Criteria except the estimations/assumptions below:

- Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. It may vary but as the role of transportation emission in total results is small, the variety in load is assumed to be negligible. Empty returns are not considered as it is assumed that return trip is used by transportation companies to serve the needs of other clients.
- Module A4: Transportation does not cause losses as products are packaged properly. Also, volume capacity utilisation factor is assumed to be 1 for the nested packaged products. Additionally, transportation distances are based on a sales volume-based weighted average and a lorry is the assumed vehicle type used.
- Module B4 & B6: The product is assumed to undergo replacement of selected components in intervals of time (19 years when the luminaire is operated for 8 hours a day) based on the lifespan of parts and components. This is to ensure that the product is fully functional throughout its lifetime.
- Module C2: Transportation distance to e-waste handling facility is estimated as 50 km and the transportation method is assumed as lorry.
- Module C3, C4, D: The product undergoes dismantling, and the parts are sorted into metals, plastics, paint and electronics. The waste treatment percentages based on EN 50693 are assumed to be applicable. Module C3 accounts for energy and resource inputs for sorting and treating these waste streams for recycling and incineration with energy recovery. Ash from recycling processes is negligible. The recycled end-of-life materials are assumed to serve as secondary raw materials in manufacturing, while incinerated materials displace the need for electricity and heat production.

LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	-

No averaging is used

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.
Next to the standards already quoted, no other sources were used in the modelling of this EPD

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	6,81E+00	7,43E-02	2,75E-01	7,16E+00	6,85E-02	1,02E-01	ND	ND	ND	ND	ND	2,41E+02	ND	0,00E+00	1,24E-03	4,13E-02	1,89E-03	-3,05E+00
GWP – fossil	kg CO_2e	6,78E+00	7,43E-02	3,72E-01	7,23E+00	6,85E-02	2,48E-03	ND	ND	ND	ND	ND	2,40E+02	ND	0,00E+00	1,24E-03	4,14E-02	1,89E-03	-3,04E+00
GWP – biogenic	kg CO_2e	2,11E-02	1,22E-05	-9,97E-02	-7,86E-02	8,03E-06	9,98E-02	ND	ND	ND	ND	ND	3,82E-01	ND	0,00E+00	2,81E-07	-1,66E-04	-4,60E-06	-8,61E-03
GWP – LULUC	kg CO_2e	5,42E-03	3,69E-05	2,29E-03	7,75E-03	1,26E-05	1,36E-06	ND	ND	ND	ND	ND	5,74E-01	ND	0,00E+00	5,54E-07	2,09E-05	2,16E-06	-6,56E-04
Ozone depletion pot.	kg CFC-$_{11}$e	1,00E-07	1,18E-09	9,89E-09	1,11E-07	1,14E-09	2,51E-11	ND	ND	ND	ND	ND	2,94E-06	ND	0,00E+00	1,83E-11	1,45E-10	2,92E-11	-1,12E-08
Acidification potential	mol H^+e	6,11E-02	1,67E-03	8,73E-04	6,37E-02	3,72E-04	1,00E-05	ND	ND	ND	ND	ND	1,30E+00	ND	0,00E+00	4,22E-06	1,28E-04	9,18E-06	-2,99E-02
EP-freshwater[2)]	kg Pe	4,84E-03	3,04E-06	6,05E-05	4,90E-03	2,06E-06	5,53E-07	ND	ND	ND	ND	ND	1,65E-01	ND	0,00E+00	9,64E-08	8,43E-06	2,43E-07	-1,63E-03
EP-marine	kg Ne	8,68E-03	4,21E-04	3,40E-04	9,44E-03	1,27E-04	1,62E-05	ND	ND	ND	ND	ND	2,24E-01	ND	0,00E+00	1,39E-06	2,03E-05	7,06E-06	-3,93E-03
EP-terrestrial	mol Ne	9,00E-02	4,68E-03	2,32E-03	9,70E-02	1,40E-03	3,17E-05	ND	ND	ND	ND	ND	2,14E+00	ND	0,00E+00	1,51E-05	2,24E-04	3,48E-05	-3,98E-02
POCP ("smog")[3)]	kg NMVOCe	2,70E-02	1,31E-03	9,94E-04	2,93E-02	4,59E-04	1,21E-05	ND	ND	ND	ND	ND	6,68E-01	ND	0,00E+00	6,22E-06	6,94E-05	1,10E-05	-1,21E-02
ADP-minerals & metals[4)]	kg Sbe	6,17E-04	1,07E-07	1,39E-06	6,19E-04	6,65E-08	1,60E-08	ND	ND	ND	ND	ND	2,37E-03	ND	0,00E+00	3,46E-09	7,54E-07	4,18E-09	-2,20E-06
ADP-fossil resources	MJ	7,31E+01	9,53E-01	7,99E+00	8,21E+01	9,28E-01	2,26E-02	ND	ND	ND	ND	ND	4,42E+03	ND	0,00E+00	1,80E-02	1,91E-01	2,69E-02	-3,04E+01
Water use[5)]	m^3e depr.	1,26E+00	3,32E-03	7,84E-02	1,34E+00	2,38E-03	6,21E-04	ND	ND	ND	ND	ND	1,09E+02	ND	0,00E+00	8,88E-05	4,57E-03	6,30E-04	-2,91E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	3,91E-07	3,57E-09	1,09E-08	4,05E-07	2,45E-09	1,35E-10	ND	ND	ND	ND	ND	8,15E-06	ND	0,00E+00	1,24E-10	2,32E-09	1,70E-10	-1,62E-07
Ionizing radiation[6]	kBq U235e	4,36E-01	6,44E-04	1,39E-01	5,76E-01	5,30E-04	1,48E-04	ND	ND	ND	ND	ND	1,00E+02	ND	0,00E+00	1,57E-05	8,76E-04	5,68E-05	-1,51E-01
Ecotoxicity (freshwater)	CTUe	6,00E+01	8,28E-02	8,69E-01	6,10E+01	6,38E-02	8,09E-02	ND	ND	ND	ND	ND	7,60E+02	ND	0,00E+00	2,54E-03	1,33E-01	1,06E+01	-6,96E+00
Human toxicity, cancer	CTUh	3,65E-09	1,48E-11	9,04E-11	3,76E-09	6,82E-12	1,80E-12	ND	ND	ND	ND	ND	6,17E-08	ND	0,00E+00	2,04E-13	1,12E-11	1,16E-12	-9,28E-10
Human tox. non-cancer	CTUh	1,21E-07	3,47E-10	2,47E-09	1,24E-07	6,51E-10	9,56E-11	ND	ND	ND	ND	ND	3,28E-06	ND	0,00E+00	1,16E-11	7,08E-10	2,48E-10	-2,06E-08
SQP[7]	-	1,78E+01	3,38E-01	5,50E+00	2,36E+01	3,23E-01	1,67E-02	ND	ND	ND	ND	ND	9,34E+02	ND	0,00E+00	1,81E-02	1,93E-01	4,22E-02	-1,52E+01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8]	MJ	4,15E+00	9,74E-03	7,58E-01	4,92E+00	7,14E-03	-1,09E+00	ND	ND	ND	ND	ND	1,02E+03	ND	0,00E+00	2,46E-04	2,70E-02	8,23E-04	-1,59E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	8,80E-01	8,80E-01	0,00E+00	-8,80E-01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,72E-01
Total use of renew. PER	MJ	4,15E+00	9,74E-03	1,64E+00	5,80E+00	7,14E-03	-1,97E+00	ND	ND	ND	ND	ND	1,02E+03	ND	0,00E+00	2,46E-04	2,70E-02	8,23E-04	-2,36E+00
Non-re. PER as energy	MJ	7,30E+01	9,53E-01	8,00E+00	8,19E+01	9,28E-01	2,26E-02	ND	ND	ND	ND	ND	4,42E+03	ND	0,00E+00	1,80E-02	6,59E-02	-9,71E-02	-3,04E+01
Non-re. PER as material	MJ	7,68E-02	0,00E+00	7,14E-03	8,40E-02	0,00E+00	-7,14E-03	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-3,84E-02	-3,84E-02	-3,75E-03
Total use of non-re. PER	MJ	7,31E+01	9,53E-01	8,01E+00	8,20E+01	9,28E-01	1,55E-02	ND	ND	ND	ND	ND	4,42E+03	ND	0,00E+00	1,80E-02	2,75E-02	-1,35E-01	-3,04E+01
Secondary materials	kg	2,38E-02	4,42E-04	5,28E-02	7,70E-02	1,97E-04	3,73E-05	ND	ND	ND	ND	ND	7,05E-01	ND	0,00E+00	7,65E-06	1,78E-04	1,06E-05	1,55E-01
Renew. secondary fuels	MJ	5,05E-04	2,24E-06	7,58E-03	8,09E-03	1,83E-06	2,11E-07	ND	ND	ND	ND	ND	5,17E-03	ND	0,00E+00	9,72E-08	5,46E-06	1,50E-07	-5,73E-05
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	3,01E-02	8,74E-05	1,82E-03	3,20E-02	7,19E-05	-1,28E-05	ND	ND	ND	ND	ND	3,31E+00	ND	0,00E+00	2,66E-06	1,19E-04	-2,41E-04	-5,71E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,25E+00	1,30E-03	1,11E-02	1,26E+00	7,06E-04	3,83E-04	ND	ND	ND	ND	ND	1,82E+01	ND	0,00E+00	3,05E-05	2,58E-03	1,97E-04	-5,96E-01
Non-hazardous waste	kg	1,94E+01	2,02E-02	1,22E+00	2,07E+01	1,39E-02	4,34E-02	ND	ND	ND	ND	ND	8,03E+02	ND	0,00E+00	5,64E-04	7,19E-02	3,44E-01	-7,44E+00
Radioactive waste	kg	1,06E-04	1,58E-07	3,31E-05	1,39E-04	1,30E-07	3,78E-08	ND	ND	ND	ND	ND	2,55E-02	ND	0,00E+00	3,83E-09	2,14E-07	1,39E-08	-3,61E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	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	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,70E-02	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	1,61E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	3,30E-03	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,70E-02	ND	ND	ND	ND	ND	0,00E+00	ND	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	0,00E+00	0,00E+00	0,00E+00	1,10E-02	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy –	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,60E-02	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	6,76E+00	7,39E-02	3,80E-01	7,21E+00	6,81E-02	9,42E-03	ND	ND	ND	ND	ND	2,39E+02	ND	0,00E+00	1,23E-03	4,15E-02	1,87E-03	-3,02E+00
Ozone depletion Pot.	kg CFC_{-11}e	1,07E-07	9,37E-10	8,64E-09	1,16E-07	9,05E-10	2,05E-11	ND	ND	ND	ND	ND	2,48E-06	ND	0,00E+00	1,46E-11	1,21E-10	2,35E-11	-1,04E-08
Acidification	kg SO_2e	5,19E-02	1,33E-03	6,45E-04	5,39E-02	2,82E-04	7,65E-06	ND	ND	ND	ND	ND	1,09E+00	ND	0,00E+00	3,23E-06	1,07E-04	6,80E-06	-2,56E-02
Eutrophication	kg PO_4^3e	7,00E-03	1,53E-04	3,07E-04	7,46E-03	5,01E-05	1,15E-05	ND	ND	ND	ND	ND	1,36E-01	ND	0,00E+00	7,86E-07	1,27E-05	4,66E-06	-1,87E-03
POCP (“smog”)	kg C_2H_4e	3,14E-03	6,81E-05	6,61E-05	3,27E-03	1,96E-05	2,26E-06	ND	ND	ND	ND	ND	6,00E-02	ND	0,00E+00	2,87E-07	6,28E-06	5,68E-07	-1,56E-03
ADP-elements	kg Sbe	6,17E-04	1,05E-07	1,37E-06	6,18E-04	6,48E-08	1,57E-08	ND	ND	ND	ND	ND	2,36E-03	ND	0,00E+00	3,37E-09	7,51E-07	4,05E-09	-1,90E-06
ADP-fossil	MJ	6,61E+01	9,43E-01	5,46E+00	7,25E+01	9,19E-01	2,01E-02	ND	ND	ND	ND	ND	2,70E+03	ND	0,00E+00	1,77E-02	1,77E-01	2,60E-02	-2,80E+01

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	6,79E+00	7,43E-02	3,74E-01	7,24E+00	6,85E-02	2,48E-03	ND	ND	ND	ND	ND	2,40E+02	ND	0,00E+00	1,24E-03	4,14E-02	1,90E-03	-3,04E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Heat production, natural gas, at industrial furnace >100kW, World, Ecoinvent, 0.0753 kgCO2e/MJ
2. Electricity production, photovoltaic, 3kWp slanted-roof installation, single-Si, panel, mounted, World, Ecoinvent, 0.0925 kgCO2e/kWh
3. Electricity, medium voltage, residual mix, Belgium, Ecoinvent, 0.21 kgCO2e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Transport, freight, aircraft, all distances to generic market for transport, freight, aircraft, unspecified, 179 km
2. Transport, freight, lorry >32 metric ton, EURO5, 592 km
3. Transport, freight, sea, container ship, 1340 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	100
Bulk density of transported products	0,00E+00
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation waste)

1. Treatment of waste paperboard, unsorted, sorting, Ecoinvent, Materials for recycling, 0.057 kg
2. Treatment of waste packaging paper, municipal incineration, Ecoinvent, 0.0055 kg
3. Treatment of waste packaging paper, sanitary landfill, Ecoinvent, 0.0062 kg
4. Exported Energy: Electricity, Ecoinvent, 0.011 MJ
5. Exported Energy: Thermal, Ecoinvent, 0.016 MJ

Use stages scenario documentation - B2 Maintenance

Scenario information	Value
Maintenance process / Description or source where description can be found	-
Maintenance cycle / Number per RSL or year *(Not applicable if only B2 is declared)*	-

Use stages scenario documentation - B3 Repair

Scenario information	Value
Repair process / Description or source where description can be found	-
Inspection Process / Description or source where description can be found	-
Repair cycle / Number per RSL or year	-

Use stages scenario documentation - B4 Replacement

Scenario information	Value
Replacement cycle / Number per RSL or year	-

Use stages scenario documentation - B5 Refurbishment

Scenario information	Value
Refurbishment process / Description or source where description can be found	-
Refurbishment cycle / Number per RSL or year	-
Further assumptions for scenario development, e.g., frequency and time period of use, number of occupants / Units as appropriate	-

Use stages scenario documentation - B6 (Energy data source)

1. Market group for electricity, low voltage, World, Ecoinvent, 65.45 kWh
2. Market group for electricity, low voltage, Europe, Ecoinvent, 390.5 kWh
3. Market group for electricity, low voltage, North America, Ecoinvent, 55.0 kWh
4. Market group for electricity, low voltage, China, Ecoinvent, 39.05 kWh

Use stages scenario documentation - B7 (Water data source)

Use stages scenario documentation - B6-B7 Use of energy and use of water

Scenario information	Value
Ancillary materials specified by material / kg or units as appropriate	-
Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc.	803 lumen during a reference lifetime of 55 000 hours
Further assumptions for scenario development, e.g., frequency and period of use, number of occupants	19 years when the luminaire is operated for 8 hours a day

Use stages scenario documentation - C1-C4 (Data source)

1. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.00196 kg
2. Treatment of waste plastic, mixture, sanitary landfill, Ecoinvent, 0.0013 kg
3. Treatment of waste electric and electronic equipment, shredding, Ecoinvent, Materials for recycling, 0.00449 kg
4. Treatment of waste electric and electronic equipment, shredding, Ecoinvent, Materials for recycling, 0.0078 kg
5. Treatment of waste polyethylene, municipal incineration, Ecoinvent, Materials for energy recovery, 0.002 kg
6. Exported Energy: Thermal, Ecoinvent, 0.052 MJ
7. Exported Energy: Thermal, Ecoinvent, 0.025 MJ
8. Exported Energy: Electricity, Ecoinvent, 0.0091 MJ
9. Exported Energy: Electricity, Ecoinvent, 0.0044 MJ
10. Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, Materials for energy recovery, 0.0013 kg
11. Treatment of waste reinforcement steel, sorting plant, Ecoinvent, Materials for recycling, 0.009 kg
12. Treatment of scrap steel, inert material landfill, Ecoinvent, 0.0023 kg
13. Treatment of aluminium scrap, post-consumer, by collecting, sorting, cleaning, pressing, Ecoinvent, Materials for recycling, 0.14 kg
14. Treatment of waste aluminium, sanitary landfill, Ecoinvent, 0.06 kg

Scenario information	Value
Scenario assumptions e.g. transportation	50km

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15802+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub Limited
14.12.2025

VERIFIED ISO 14025

ANNEX 1: PEP EXTRAPOLATION COEFFICIENTS OF TOTAL DEEP RINGO FAMILY

Extrapolation rules have been calculated according to PSR-0014-ED2-EN-2023 07 13.
The extrapolation coefficients are calculated at product level. The functional unit coefficient is also available.

$$Extrapolation\ coefficient\ at\ the\ product\ level\ x\ \left(\frac{Lighting\ output\ of\ reference\ product\ (lumen)}{Lighting\ output\ of\ product\ concerned\ (lumen)}\right)$$

Table with information to calculate the extrapolation coefficients

Mass code	Description	product weight (kg)	packaging weight (kg)	Total weight (kg)	Class	IP	Luminaire lumen (lm)	Luminaire power (W)
202 272 811 XXX	DEEP RINGO LED	0,233	0,069	0,302	III	20	803	10
19423 XXX0	MINI DEEP RINGO II	0,180	0,07	0,25	III	20	678	10
19425 XXX0	MINI DEEP RINGO II OK	0,222	0,069	0,291	III	20	724	10
19435 XXX0	DEEP RINGO OK LED	0,257	0,077	0,334	III	20	723	10
19436 XXX0	DEEP RINGO TRIMLESS LED SOFT	0,225	0,062	0,287	III	20	792	12
19437 XXX0	DEEP RINGO SOFT	0,200	0,100	0,300	III	20	814	12
19439 XXX0	MINI DEEP RINGO II TRIMLESS	0,200	0,100	0,300	III	20	726	10
19440 XXX0	DEEP RINGO HE	0,244	0,054	0,298	III	20	834	7
19441 XXX0	DEEP RINGO TRIMLESS HE	0,227	0,054	0,281	III	20	834	7
202 144 811 XXX	DEEP RINGO TRIMLESS LED	0,300	0,120	0,420	III	20	828	10
202 145 811 XXX	DEEP RINGO TRIMLESS OK LED	0,300	0,120	0,420	III	20	828	10
202 274 811 XXX	DEEP RINGO RIBS	0,215	0,071	0,286	III	20	803	10
19424 XXX0	MINI DEEP RINGO II X	0,184	0,075	0,259	III	65	678	10
19434 XXX0	DEEP RINGO X	0,221	0,074	0,295	III	65	803	10
202 146 811 XXX	DEEP RINGO TRIMLESS LED IP	0,200	0,069	0,269	III	44/20	828	10
202 273 811 XXX	DEEP RINGO LED IP	0,223	0,07	0,293	III	44/20	803	10

Applicable extrapolation coefficients:

			A1-A3	A4	A5	B6	C1-C4	D
Mass code	**Description**	**Extrapol. FU**	**MAXIMUM A1-A3**	**Distribution stage**	**Installation stage**	**Use stage**	**EOL stage**	**MAXIMUM D**
202 272 811 XXX	DEEP RINGO LED	1,000	1,000	1,000	1,000	1,000	1,000	1,000
19423 XXX0	MINI DEEP RINGO II	1,184	1,014	0,834	1,014	1,000	0,781	1,014
19425 XXX0	MINI DEEP RINGO II OK	1,109	1,000	0,964	1,000	1,000	0,953	1,000
19435 XXX0	DEEP RINGO OK LED	1,111	1,116	1,106	1,116	1,000	1,103	1,116
19436 XXX0	DEEP RINGO TRIMLESS LED SOFT	1,014	0,966	0,950	0,899	1,200	0,966	0,966
19437 XXX0	DEEP RINGO SOFT	0,986	1,449	0,993	1,449	1,200	0,858	1,449
19439 XXX0	MINI DEEP RINGO II TRIMLESS	1,106	1,449	0,993	1,449	1,000	0,858	1,449
19440 XXX0	DEEP RINGO HE	0,963	1,047	0,987	0,783	0,700	1,047	1,047
19441 XXX0	DEEP RINGO TRIMLESS HE	0,963	0,974	0,930	0,783	0,700	0,974	0,974
202 144 811 XXX	DEEP RINGO TRIMLESS LED	0,970	1,739	1,391	1,739	1,000	1,288	1,739
202 145 811 XXX	DEEP RINGO TRIMLESS OK LED	0,970	1,739	1,391	1,739	1,000	1,288	1,739
202 274 811 XXX	DEEP RINGO RIBS	1,000	1,029	0,947	1,029	1,000	0,923	1,029
19424 XXX0	MINI DEEP RINGO II X	1,184	1,087	0,858	1,087	1,000	0,790	1,087
19434 XXX0	DEEP RINGO X	1,000	1,072	0,977	1,072	1,000	0,948	1,072
202 146 811 XXX	DEEP RINGO TRIMLESS LED IP	0,970	1,000	0,891	1,000	1,000	0,858	1,000
202 273 811 XXX	DEEP RINGO LED IP	1,000	1,014	0,970	1,014	1,000	0,957	1,014

Explanation used coefficients from PSR-0014-ED2-EN-2023 07 13:

Fabrication stage (A1-A3) extrapolation coefficient:
Maximum value out of formulas described in 3.6.3 Extrapolation rules applied to fabrication stage (A1-A3)

Distribution stage (A4) extrapolation coefficient:
Value out of formula described in 3.6.4 Extrapolation rules applied to distribution stage (A4)

Installation stage (A5) extrapolation coefficient:
Value out of formula described in 3.6.5 Extrapolation rules applied to installation stage (A5)

Use stage (B1 – B7) extrapolation coefficient:
Maximum value out of formulas described in 3.6.6. Extrapolation rules applied to use stage (B1 to B7)
(B2 is not declared in our case, so the formula of B6 applies)

End of life stage (C1 to C4) extrapolation coefficient:
Value out of formula described in 3.6.7. Extrapolation rules applied to end-of-life stage (C1 to C4)

Benefits (D) extrapolation coefficient:
Maximum value out of formulas described in 3.6.8. Extrapolation rules applied to net benefits beyond the system boundaries stage (D) (optional)