

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

XOOLINE IP40

LED Linear™



EPD HUB, HUB-3672

Published on 27.07.2025, last updated on 27.07.2025, valid until 26.07.2030

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.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	LED Linear GmbH
Address	Dr.-Alfred-Herrhausen-Allee 20-22 47228 Duisburg, Germany
Contact details	info@led-linear.com
Website	www.led-linear.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15084+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Electrical product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, B6, and modules C1-C4, D
EPD author	Anne Krause, LED Linear GmbH
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
EPD verifier	Abderazak Guiz, as an authorized verifier acting for EPD Hub Limited

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	XOOLINE IP40
Place of production	Duisburg, Germany
Place(s) of installation and use	Global
Period for data	Jan-Dec 2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	4.83 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of 1005 mm
Declared unit mass	0.504 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	4.38E+00
GWP-total, A1-A3 (kgCO ₂ e)	4.14E+00
Secondary material, inputs (%)	37.5
Secondary material, outputs (%)	36.0
Total energy use, A1-A3 (kWh)	22.8
Net freshwater use, A1-A3 (m ³)	0.1

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

LED Linear™ was founded in 2006 and supplies high quality linear LED lighting solutions based on flexible printed circuit boards worldwide. LED Linear™ offers a cost effective, unique modular LED tool kit for interior or exterior linear lighting solutions - from accent and architectural to general lighting - with an ingress protection of up to IP68. Internationally recognized awards and reference projects, including innovative lighting solutions for decorative or architectural applications, prove the high-quality manufacturing philosophy.

LED Linear™ is part of the Fagerhult Group, one of Europe's leading lighting companies, with 12 different brands and 4,100 employees in 27 countries around the world.

PRODUCT DESCRIPTION

The EPD covers the complete XOOLINE IP40 family and the data accounts for the worst-case article within the family, representing all variants of the product.

The miniature luminaire XOOLINE™ convinces with its immense versatility thanks to 10 high quality optics to choose from: clear, diffuse or opal optics for soft light settings as well as linear lenses like the 10° optic for wall grazing or 30° and 60° for wide flood with precise light control.

The luminaire is made of an aluminium profile with optional cable feed(s) and translucent end caps for an optimal gapless installation and light overlap. Each luminaire comes with its own mounting accessories of which there are 8 to choose from. Mounting profiles or clips allow for an easy and reliable installation while the recessed version lets architecture take precedence. Thanks to its versatility, the luminaire is a suitable tool for a very wide variety of applications both direct and indirect, such as general lighting, coves, counters, walls, corridors, retail, hospitality, indoor facades and architectural details.

Further information can be found at www.led-linear.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	79.13	Europe
Minerals	0.07	Asia
Fossil materials	20.81	Europe
Bio-based materials	0.00	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0.00
Biogenic carbon content in packaging, kg C	0.08

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of 1005 mm
Mass per declared unit	0.504 kg
Functional unit	Provide lighting that delivers an outgoing artificial luminous flux of 1830 lumens during a reference life of 58,400 hours
Reference service life	20 years with 8 hours/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	MNR	MNR	MNR	MNR	MNR	x	MNR	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials. Also, fuels used by machines and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission. Waste formed in the production processes at LED Linear's manufacturing facilities are also included in this stage.

The product is made of metals, plastics and electronic components. The materials are transported to LED Linear's production facility in Duisburg. The aluminium profile is cut to size and the LED tape with the corresponding connectors and plugs is glued in. The luminaire is further assembled by inserting the pre-fitted optical components and endcaps.

The finished product is packaged in polyethylene and cardboard before being sent to the installation site. Manufacturing losses and wastes are calculated accordingly and the total amount of waste in kg is allocated to the total annual production in kg. Thus, it is possible to allocate the data according to the weight of the product analysed in this study.

The use of green energy in manufacturing 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 in Europe is assumed as 3,500 km and the transportation method is assumed to be lorry. For transportation from production plant to building site outside of Europe, the average distance is assumed to be 19,000 km with assumed transportation method by ship plus 1,000 km by lorry. 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 the 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) and release of biogenic carbon dioxide from

cardboard. 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. The calculations are based on the electricity grid mixes (B6) of the averaged locations of operation. Impacts due to electricity production include direct emissions to air, transformation and transmission losses. The service life is assumed to be 20 years with 8 daily operational hours. The representative model of XOOLINE IP40 regarded in this study has a power consumption of 15 W/m. Possibly variants have power consumptions ranging from 4 W/m to 36 W/m, which impacts the energy use in B6.

On average, five of this 24 VDC luminaire are operated by one power supply unit. This assumption was considered as the generic case in this study.

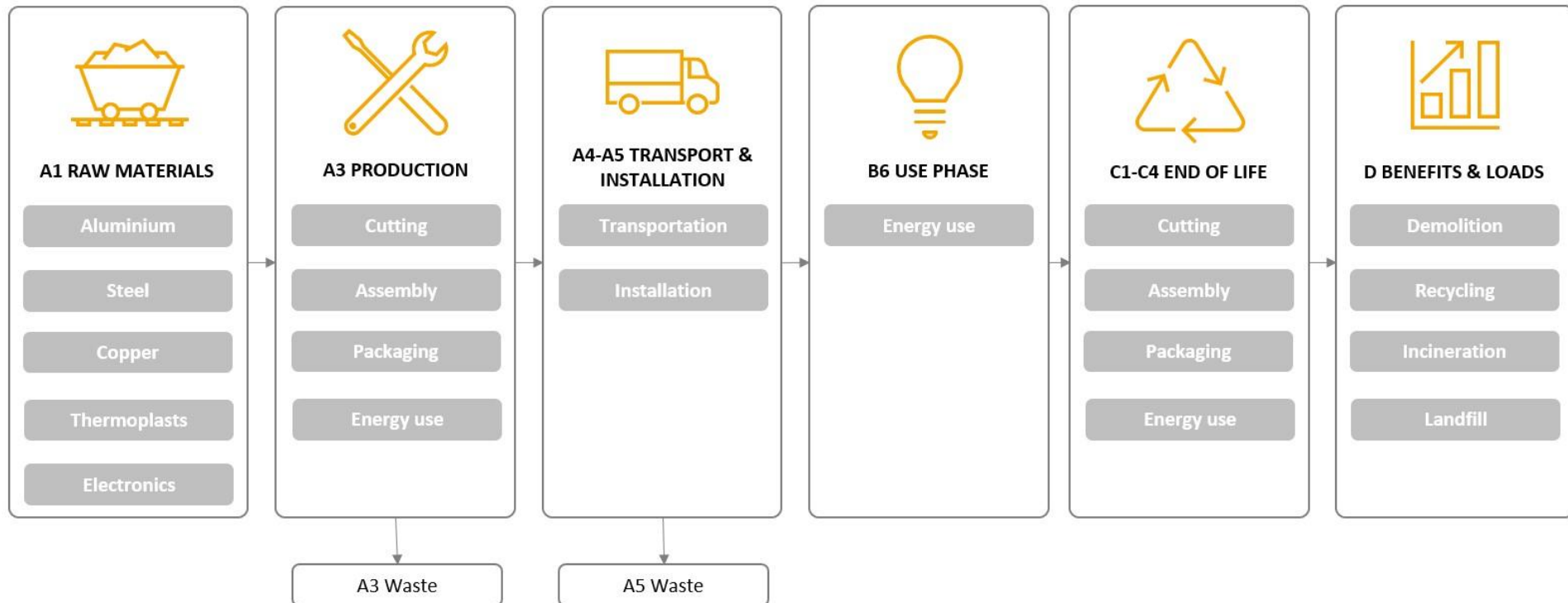
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy and natural resources in demolition process are 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 are used for treating materials in different waste treatment methods. 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). Plastic packaging used during transportation is also incinerated for energy recovery and/or recycled. The benefits and loads of incineration and recycling are included in module D.



MANUFACTURING PROCESS



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.

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/AC2021 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 as following:

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

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	4.83 %

As representative, a XOOLINE IP40 in 1,005 mm length with a diffuse high square cover and a 15 W/m LED tape was chosen. All products represented are manufactured by LED Linear GmbH in Duisburg. The range of products includes IP10 and IP40 luminaires of the XOOLINE family with either a 10°, 30°, or 60° linear lens or round, low square, or high square cover with a clear, diffuse, or opal finish. Mounting variations are either surface or wall mounted or recessed. These constructional differences affect the GWP impact of the raw materials (A1-A3). Maximum deviation from the representative is 4.83 % (recessed version) due to the difference in mounting and a reduced use of aluminium. Different light engines are represented with power classes from 4 W/m to 36 W/m and light colors in the ranges of static white (with variants of e.g. high efficiency, or (ultra) high CRI light engines), tunable white (TW), RGB, and RGBW. These differences do not affect the raw material composition. The choice of power class affects the energy consumption of the use phase (B6). Regardless of the power class, on average, five of this 24 VDC luminaire are operated by one power supply unit. This assumption was considered as the generic case in this study.

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 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

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 ₂ e	3,84E+00	1,39E-01	1,58E-01	4,14E+00	4,11E-01	3,36E-01	MND	MND	MND	MND	MND	3,54E+02	MND	0,00E+00	1,44E-02	1,14E-01	1,03E-02	-2,77E+00
GWP – fossil	kg CO ₂ e	3,80E+00	1,39E-01	4,45E-01	4,38E+00	4,11E-01	4,73E-02	MND	MND	MND	MND	MND	3,54E+02	MND	0,00E+00	1,44E-02	1,14E-01	1,03E-02	-2,71E+00
GWP – biogenic	kg CO ₂ e	0,00E+00	0,00E+00	-2,89E-01	-2,89E-01	0,00E+00	2,89E-01	MND	MND	MND	MND	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO ₂ e	4,36E-02	5,30E-05	1,53E-03	4,52E-02	1,85E-04	8,16E-06	MND	MND	MND	MND	MND	3,15E-02	MND	0,00E+00	5,80E-06	1,84E-05	7,54E-06	-6,03E-02
Ozone depletion pot.	kg CFC-11E	9,27E-08	2,64E-09	8,21E-09	1,04E-07	6,06E-09	1,58E-10	MND	MND	MND	MND	MND	2,38E-05	MND	0,00E+00	2,84E-10	3,48E-10	1,14E-10	-1,99E-08
Acidification potential	mol H ⁺ e	3,02E-02	4,32E-04	1,21E-03	3,18E-02	1,83E-03	4,94E-05	MND	MND	MND	MND	MND	2,59E+00	MND	0,00E+00	4,21E-05	1,41E-04	3,52E-05	-3,36E-02
EP-freshwater ²⁾	kg Pe	2,56E-03	9,96E-06	1,05E-04	2,67E-03	3,12E-05	2,47E-06	MND	MND	MND	MND	MND	8,58E-02	MND	0,00E+00	1,14E-06	9,55E-06	8,70E-07	-1,46E-03
EP-marine	kg Ne	3,86E-03	1,43E-04	4,12E-04	4,41E-03	5,63E-04	4,16E-05	MND	MND	MND	MND	MND	3,96E-01	MND	0,00E+00	1,33E-05	2,60E-05	1,28E-04	-3,79E-03
EP-terrestrial	mol Ne	3,89E-02	1,55E-03	3,89E-03	4,44E-02	6,15E-03	1,64E-04	MND	MND	MND	MND	MND	5,49E+00	MND	0,00E+00	1,44E-04	2,64E-04	1,35E-04	-4,37E-02
POCP ("smog") ³⁾	kg NMVOCe	1,49E-02	6,65E-04	1,72E-03	1,72E-02	2,35E-03	6,53E-05	MND	MND	MND	MND	MND	1,19E+00	MND	0,00E+00	6,41E-05	8,12E-05	4,42E-05	-1,34E-02
ADP-minerals & metals ⁴⁾	kg Sbe	2,44E-04	4,87E-07	1,33E-06	2,45E-04	1,12E-06	7,06E-08	MND	MND	MND	MND	MND	1,37E-03	MND	0,00E+00	6,40E-08	9,08E-07	1,52E-08	-3,50E-05
ADP-fossil resources	MJ	5,80E+01	1,95E+00	7,17E+00	6,71E+01	5,92E+00	1,29E-01	MND	MND	MND	MND	MND	8,70E+03	MND	0,00E+00	2,00E-01	2,35E-01	1,04E-01	-2,94E+01
Water use ⁵⁾	m ³ e depr.	4,18E+00	1,00E-02	1,06E-01	4,30E+00	2,88E-02	3,16E-03	MND	MND	MND	MND	MND	6,64E+02	MND	0,00E+00	1,14E-03	1,02E-02	2,14E-03	-2,26E+00

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

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	2,57E-07	1,05E-08	1,21E-08	2,80E-07	3,99E-08	1,60E-09	MND	MND	MND	MND	MND	7,36E-06	MND	0,00E+00	8,30E-10	2,21E-09	6,70E-10	-1,99E-07
Ionizing radiation ⁶⁾	kBq U235e	6,95E-01	2,70E-03	2,41E-02	7,22E-01	5,07E-03	3,56E-04	MND	MND	MND	MND	MND	2,17E+02	MND	0,00E+00	3,75E-04	2,16E-03	2,02E-04	-2,65E-02
Ecotoxicity (freshwater)	CTUe	3,21E+01	2,86E-01	6,41E+00	3,88E+01	8,24E-01	1,43E-01	MND	MND	MND	MND	MND	4,00E+03	MND	0,00E+00	3,56E-02	2,89E-01	3,49E+01	-6,39E+00
Human toxicity, cancer	CTUh	5,72E-09	2,40E-11	8,90E-11	5,83E-09	6,86E-11	1,41E-11	MND	MND	MND	MND	MND	6,40E-08	MND	0,00E+00	2,65E-12	1,85E-11	5,73E-12	-1,35E-09
Human tox. non-cancer	CTUh	1,29E-07	1,22E-09	2,82E-09	1,33E-07	3,75E-09	5,24E-10	MND	MND	MND	MND	MND	2,08E-06	MND	0,00E+00	1,21E-10	1,03E-09	9,74E-10	-5,66E-08
SQP7)	-	1,15E+01	1,20E+00	2,39E+01	3,66E+01	5,77E+00	8,10E-02	MND	MND	MND	MND	MND	3,37E+02	MND	0,00E+00	8,39E-02	2,22E-01	1,75E-01	-2,35E+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	1,41E+01	3,64E-02	1,81E+00	1,60E+01	7,99E-02	-2,88E+00	MND	MND	MND	MND	MND	1,43E+03	MND	0,00E+00	4,85E-03	3,61E-02	2,93E-03	-1,02E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	2,98E+00	2,98E+00	0,00E+00	-2,98E+00	MND	MND	MND	MND	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,41E+01	3,64E-02	4,79E+00	1,90E+01	7,99E-02	-5,86E+00	MND	MND	MND	MND	MND	1,43E+03	MND	0,00E+00	4,85E-03	3,61E-02	2,93E-03	-1,02E+01
Non-re. PER as energy	MJ	5,59E+01	1,95E+00	8,19E+00	6,61E+01	5,92E+00	-9,47E-01	MND	MND	MND	MND	MND	8,70E+03	MND	0,00E+00	2,00E-01	-9,73E-01	-1,87E+00	-2,94E+01
Non-re. PER as material	MJ	2,08E+00	0,00E+00	7,95E-01	2,88E+00	0,00E+00	-1,02E+00	MND	MND	MND	MND	MND	0,00E+00	MND	0,00E+00	0,00E+00	-9,30E-01	-9,22E-01	0,00E+00
Total use of non-re. PER	MJ	5,80E+01	1,95E+00	8,98E+00	6,89E+01	5,92E+00	-1,97E+00	MND	MND	MND	MND	MND	8,70E+03	MND	0,00E+00	2,00E-01	-1,90E+00	-2,79E+00	-2,94E+01
Secondary materials	kg	1,89E-01	9,29E-04	5,25E-02	2,42E-01	2,53E-03	1,70E-04	MND	MND	MND	MND	MND	0,00E+00	MND	0,00E+00	1,10E-04	5,33E-04	4,02E-05	3,53E-01
Renew. secondary fuels	MJ	1,63E-03	1,11E-05	1,97E-03	3,61E-03	3,11E-05	1,25E-06	MND	MND	MND	MND	MND	0,00E+00	MND	0,00E+00	1,18E-06	5,91E-06	5,91E-07	1,46E-02
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m ³	9,59E-02	2,80E-04	2,52E-03	9,87E-02	8,59E-04	-4,06E-05	MND	MND	MND	MND	MND	5,78E+00	MND	0,00E+00	3,16E-05	2,35E-04	-9,47E-04	-5,17E-02

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	7,17E-01	2,94E-03	1,43E-02	7,34E-01	9,96E-03	1,54E-03	MND	MND	MND	MND	MND	1,16E+01	MND	0,00E+00	3,12E-04	4,75E-03	4,30E-03	-6,80E-01
Non-hazardous waste	kg	1,05E+01	6,35E-02	9,18E-01	1,15E+01	1,83E-01	1,70E-01	MND	MND	MND	MND	MND	4,55E+02	MND	0,00E+00	7,57E-03	1,29E-01	1,35E+00	-6,64E+00
Radioactive waste	kg	1,82E-04	6,71E-07	6,14E-06	1,88E-04	1,24E-06	8,76E-08	MND	MND	MND	MND	MND	8,45E-02	MND	0,00E+00	9,39E-08	5,52E-07	4,93E-08	-5,77E-06

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	MND	MND	MND	MND	MND	0,00E+00	MND	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	2,45E-02	2,45E-02	0,00E+00	1,64E-01	MND	MND	MND	MND	MND	0,00E+00	MND	0,00E+00	0,00E+00	1,82E-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	MND	MND	MND	MND	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	4,63E-02	4,63E-02	0,00E+00	2,45E-01	MND	MND	MND	MND	MND	0,00E+00	MND	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 ₂ e	3,83E+00	1,38E-01	4,87E-01	4,45E+00	4,08E-01	7,28E-02	MND	MND	MND	MND	MND	3,54E+02	MND	0,00E+00	1,43E-02	1,14E-01	1,01E-02	-2,74E+00
Ozone depletion Pot.	kg CFC ₁₁ e	7,84E-08	2,10E-09	2,16E-08	1,02E-07	4,83E-09	1,28E-10	MND	MND	MND	MND	MND	1,88E-05	MND	0,00E+00	2,26E-10	2,88E-10	9,16E-11	-1,67E-08
Acidification	kg SO ₂ e	2,58E-02	3,30E-04	9,56E-04	2,71E-02	1,42E-03	3,80E-05	MND	MND	MND	MND	MND	2,09E+00	MND	0,00E+00	3,24E-05	1,18E-04	2,61E-05	-2,89E-02
Eutrophication	kg PO ₄ ³ e	4,31E-03	8,36E-05	1,48E-03	5,87E-03	2,93E-04	2,04E-05	MND	MND	MND	MND	MND	4,72E-01	MND	0,00E+00	8,47E-06	1,57E-05	2,07E-05	-2,07E-03
POCP (“smog”)	kg C ₂ H ₄ e	2,01E-03	3,11E-05	1,34E-04	2,18E-03	1,11E-04	9,98E-06	MND	MND	MND	MND	MND	7,82E-02	MND	0,00E+00	3,09E-06	6,91E-06	2,72E-06	-1,82E-03
ADP-elements	kg Sbe	2,43E-04	4,75E-07	1,28E-06	2,44E-04	1,09E-06	6,89E-08	MND	MND	MND	MND	MND	1,37E-03	MND	0,00E+00	6,22E-08	9,03E-07	1,47E-08	-3,45E-05
ADP-fossil	MJ	4,55E+01	1,91E+00	6,76E+00	5,42E+01	5,84E+00	1,24E-01	MND	MND	MND	MND	MND	8,70E+03	MND	0,00E+00	1,93E-01	1,98E-01	1,01E-01	-2,91E+01

ENVIRONMENTAL IMPACTS – 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 ₂ e	3,84E+00	1,39E-01	4,47E-01	4,43E+00	4,11E-01	4,73E-02	MND	MND	MND	MND	MND	3,54E+02	MND	0,00E+00	1,44E-02	1,14E-01	1,03E-02	-2,77E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

SCENARIO DOCUMENTATION

MANUFACTURING ENERGY SCENARIO DOCUMENTATION

Scenario parameter	Value
Electricity data source and quality	Green electricity, origin certified; OneClick LCA
Electricity CO2e / kWh	0.01
District heating data source and quality	Heat and power co-generation, natural gas, 1MW electrical, lean burn (Reference product: heat, district or industrial, natural gas); Ecoinvent 3.10.1
District heating CO2e / kWh	0.008

TRANSPORT SCENARIO DOCUMENTATION A4

Scenario parameter	Value
Fuel and vehicle type. E.g. electric truck, diesel powered truck	Market for transport, freight, sea, container ship (Reference product: transport, freight, sea, container ship); Ecoinvent 3.10.1 + Market for transport, freight, lorry 3.5-7.5 metric ton, EURO5 (Reference product: transport, freight, lorry 3.5-7.5 metric ton, EURO5); Ecoinvent 3.10.1
Average transport distance, km	7,000 + 2,275
Capacity utilization (including empty return) %	100
Bulk density of transported products	-
Volume capacity utilization factor	1

INSTALLATION SCENARIO DOCUMENTATION A5

Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	-
Water use / m ³	-
Other resource use / kg	-
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	-
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Cardboard: 0.187 kg; Plastic: 0.024 kg
Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg	Recycling: 0.164 kg; Energy recovery: 0.026 kg; Disposal: 0.021 kg
Direct emissions to ambient air, soil and water / kg	-

END OF LIFE SCENARIO DOCUMENTATION

Scenario information	Value
Collection process – kg collected separately	-
Collection process – kg collected with mixed construction waste	0.504
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0.1812
Recovery process – kg for energy recovery	0.0336
Disposal (total) – kg for final deposition	0.2897
Scenario assumptions e.g. transportation	50 km by lorry

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

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.

Tool verifier: Magaly Gonzalez Vazquez

Tool verification validity: 27 March 2025 - 26 March 2028

Abderazak Guiz, as an authorized verifier acting for EPD Hub Limited
27.07.2025

