



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

FUSION IP67

LED Linear™



EPD HUB, EPD number HUB-5087

Published on 23.01.2026, last updated on 23.01.2026, valid until 22.01.2031

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.



Created with One Click LCA



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 VP-055	Sarah Curpen, as an authorised 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	FUSION IP67
Place of production	Duisburg, Germany
Place(s) of raw material origin	Europe, Asia
Place(s) of installation and use	Global
Place(s) of End-of-Life	Global
Period for data	Jan-Dec 2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	12.9
A1-A3 Specific data (%)	8.44

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of 1033 mm
Declared unit mass	1.24 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	11.5
GWP-total, A1-A3 (kgCO ₂ e)	10.9
Secondary material, inputs (%)	19.5
Secondary material, outputs (%)	35.0
Total energy use, A1-A3 (kWh)	53.6
Net freshwater use, A1-A3 (m ³)	0.15

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

With the highest level of precision in design and manufacturing, FUSION redefines the boundaries of what is possible in outdoor lighting.

FUSION delivers top-tier performance in an ultra-slim design. With a total height of just 28 mm, it blends effortlessly into architectural lines – no compromise on efficiency or control.

Built to endure impact and extreme outdoor conditions: Rated IK10 and IP67, FUSION resists mechanical stress, dust, and water – even in harsh environments. Encapsulated in high-grade PU, FUSION protects against UV, salt, and chemicals. Designed for decades of use with minimal degradation and reduced environmental impact.

Seven high-performance nano-optics ensure pinpoint light distribution. Optimized for visual comfort, they eliminate spill light and support versatile applications. FUSION achieves industry-leading efficiency in its class – up to 52 % higher application efficiency including anti-glare than comparable systems. Every lumen is directed with purpose, not wasted.

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	65.16	Europe, Asia
Minerals	0.02	Asia
Fossil materials	34.82	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	0.19

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of 1033 mm
Mass per declared unit	1.24 kg
Functional unit	Provide lighting that delivers an outgoing artificial luminous flux of 1090 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	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	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling	

Modules not declared = ND.

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 followed by encapsulation with polyurethane.

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 analyzed in this study.

A market-based approach is used in modelling the electricity mix utilized in the factory. 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 FUSION IP67 regarded in this study has a power consumption of 15 W/m. Possible variants have power consumptions ranging from 5 W/m to 40 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.

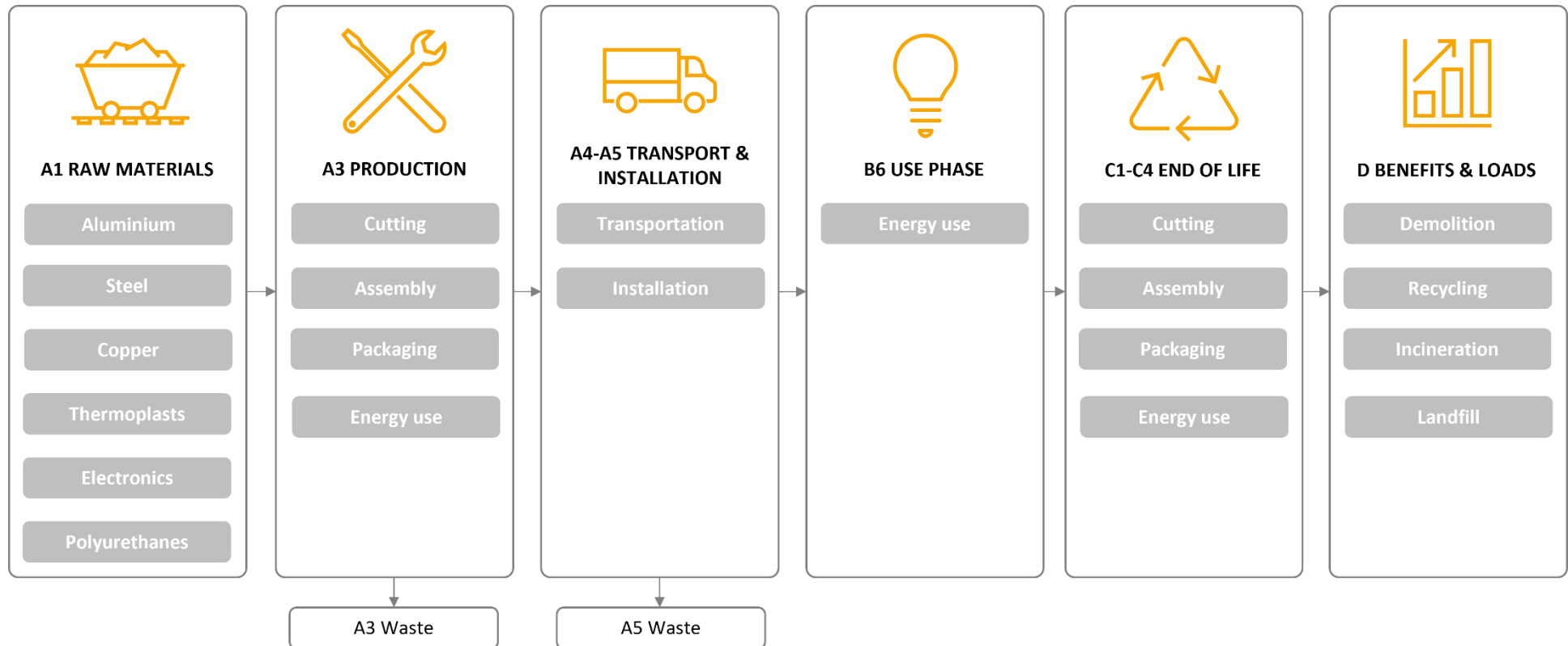
Air, soil, and water impacts during the use phase have not been studied.

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.



SYSTEM DIAGRAM



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	12.9 %

As representative, FUSION ASYM IP67 in 1,033 mm length with a 15 W/m LED tape was chosen. All products represented are manufactured by LED Linear GmbH in Duisburg. The range of products includes all luminaires of the FUSION IP67 family with either a symmetrical (15x15, 15x40, 20x20, 30x50, 40x40, and 50x50) or asymmetrical (ASYM) light distribution. Mounting variations are surface mounting with either clips, an adjustable arm or an additional glare shield. These constructional differences affect the GWP impact of the raw materials (A1-A3). Maximum deviation from the representative is 12.9 %. Different light engines are represented with power classes from 5 W/m to 40 W/m and light colors in the ranges of static white (2,200-5,000 K) or tunable white (TW). 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, EN 50693 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, PEF

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	1,02E+01	2,62E-01	1,11E+00	1,16E+01	1,29E+00	1,07E-01	ND	ND	ND	ND	ND	3,54E+02	ND	0,00E+00	2,67E-02	6,19E-01	2,98E-02	-4,15E+00
GWP – fossil	kg CO ₂ e	1,01E+01	2,62E-01	1,11E+00	1,15E+01	1,29E+00	1,07E-01	ND	ND	ND	ND	ND	3,54E+02	ND	0,00E+00	2,66E-02	6,19E-01	2,98E-02	-3,50E+00
GWP – biogenic	kg CO ₂ e	0,00E+00	0,00E+00	-7,09E-01	-7,09E-01	0,00E+00	7,09E-01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-5,89E-01
GWP – LULUC	kg CO ₂ e	1,22E-01	1,12E-04	3,77E-03	1,26E-01	5,76E-04	1,79E-05	ND	ND	ND	ND	ND	3,15E-02	ND	0,00E+00	1,40E-05	6,18E-05	1,59E-05	-6,27E-02
Ozone depletion pot.	kg CFC-11e	1,71E-07	4,47E-09	3,49E-08	2,10E-07	1,90E-08	1,73E-10	ND	ND	ND	ND	ND	2,38E-05	ND	0,00E+00	3,58E-10	7,36E-10	2,42E-10	-3,18E-08
Acidification potential	mol H ⁺ e	7,32E-02	8,38E-04	3,18E-03	7,72E-02	4,39E-03	9,95E-05	ND	ND	ND	ND	ND	2,59E+00	ND	0,00E+00	8,62E-05	6,57E-04	7,85E-05	-3,14E-02
EP-freshwater ²⁾	kg Pe	4,11E-03	2,06E-05	2,55E-04	4,39E-03	1,00E-04	5,51E-06	ND	ND	ND	ND	ND	8,58E-02	ND	0,00E+00	2,41E-06	2,54E-05	1,92E-06	-1,32E-03
EP-marine	kg Ne	1,02E-02	2,71E-04	1,11E-03	1,15E-02	1,44E-03	9,90E-05	ND	ND	ND	ND	ND	3,96E-01	ND	0,00E+00	2,58E-05	2,86E-04	2,60E-03	-3,53E-03
EP-terrestrial	mol Ne	1,05E-01	2,94E-03	1,08E-02	1,19E-01	1,57E-02	3,24E-04	ND	ND	ND	ND	ND	5,49E+00	ND	0,00E+00	2,81E-04	2,22E-03	3,02E-04	-3,97E-02
POCP (“smog”) ³⁾	kg NMVOCe	3,98E-02	1,25E-03	4,34E-03	4,54E-02	6,47E-03	1,20E-04	ND	ND	ND	ND	ND	1,19E+00	ND	0,00E+00	1,13E-04	5,83E-04	9,71E-05	-1,46E-02
ADP-minerals & metals ⁴⁾	kg Sbe	2,35E-04	9,28E-07	3,09E-06	2,39E-04	3,59E-06	1,29E-07	ND	ND	ND	ND	ND	1,37E-03	ND	0,00E+00	1,12E-07	2,17E-06	3,19E-08	-4,33E-05
ADP-fossil resources	MJ	1,29E+02	3,73E+00	1,77E+01	1,50E+02	1,87E+01	1,94E-01	ND	ND	ND	ND	ND	8,70E+03	ND	0,00E+00	3,65E-01	7,18E-01	2,22E-01	-3,59E+01
Water use ⁵⁾	m ³ e depr.	6,41E+00	1,97E-02	2,55E-01	6,68E+00	9,23E-02	6,91E-03	ND	ND	ND	ND	ND	6,64E+02	ND	0,00E+00	1,88E-03	4,84E-02	4,37E-03	-2,72E+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, PEF

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	8,58E-07	2,13E-08	3,09E-08	9,10E-07	1,29E-07	3,54E-09	ND	ND	ND	ND	ND	7,36E-06	ND	0,00E+00	1,70E-09	7,68E-09	1,45E-09	-3,88E-07
Ionizing radiation ⁶⁾	kBq U235e	9,71E-01	4,91E-03	5,48E-02	1,03E+00	1,63E-02	5,27E-04	ND	ND	ND	ND	ND	2,17E+02	ND	0,00E+00	3,47E-04	2,52E-03	4,56E-04	-3,39E-01
Ecotoxicity (freshwater)	CTUe	1,23E+02	5,88E-01	1,23E+01	1,35E+02	2,64E+00	1,88E+00	ND	ND	ND	ND	ND	4,00E+03	ND	0,00E+00	7,39E-02	1,53E+00	6,78E+01	-5,97E+00
Human toxicity, cancer	CTUh	1,42E-08	4,56E-11	2,15E-10	1,45E-08	2,12E-10	3,39E-11	ND	ND	ND	ND	ND	6,40E-08	ND	0,00E+00	4,81E-12	7,93E-11	1,09E-11	-4,31E-09
Human tox. non-cancer	CTUh	2,02E-07	2,35E-09	6,57E-09	2,11E-07	1,21E-08	1,32E-09	ND	ND	ND	ND	ND	2,08E-06	ND	0,00E+00	2,24E-10	3,51E-09	2,08E-09	-2,74E-08
SQP7)	-	2,75E+01	2,80E+00	5,87E+01	8,90E+01	1,88E+01	1,66E-01	ND	ND	ND	ND	ND	3,37E+02	ND	0,00E+00	1,73E-01	5,92E-01	3,77E-01	-5,34E+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	4,76E+01	6,85E-02	4,43E+00	5,21E+01	2,56E-01	-7,09E+00	ND	ND	ND	ND	ND	1,43E+03	ND	0,00E+00	6,30E-03	7,90E-02	6,57E-03	-3,47E+01
Renew. PER as material	MJ	1,09E-01	0,00E+00	0,00E+00	1,09E-01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-5,46E-02	-5,46E-02	6,03E+00
Total use of renew. PER	MJ	4,77E+01	6,85E-02	4,43E+00	5,22E+01	2,56E-01	-7,09E+00	ND	ND	ND	ND	ND	1,43E+03	ND	0,00E+00	6,30E-03	2,44E-02	-4,80E-02	-2,87E+01
Non-re. PER as energy	MJ	1,16E+02	3,73E+00	2,09E+01	1,41E+02	1,87E+01	-2,45E+00	ND	ND	ND	ND	ND	8,70E+03	ND	0,00E+00	3,65E-01	-6,56E+00	-6,66E+00	-3,59E+01
Non-re. PER as material	MJ	5,64E+00	0,00E+00	2,51E+00	8,15E+00	0,00E+00	-2,51E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-3,11E+00	-2,53E+00	1,71E+00
Total use of non-re. PER	MJ	1,22E+02	3,73E+00	2,34E+01	1,49E+02	1,87E+01	-4,97E+00	ND	ND	ND	ND	ND	8,70E+03	ND	0,00E+00	3,65E-01	-9,67E+00	-9,19E+00	-3,42E+01
Secondary materials	kg	2,41E-01	1,79E-03	1,29E-01	3,72E-01	7,95E-03	3,44E-04	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	1,92E-04	1,08E-03	8,53E-05	6,74E-01
Renew. secondary fuels	MJ	4,36E-03	2,10E-05	4,53E-03	8,90E-03	1,01E-04	2,36E-06	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	2,46E-06	1,86E-05	1,27E-06	3,80E-02
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	1,40E-01	5,69E-04	6,16E-03	1,46E-01	2,76E-03	-8,39E-05	ND	ND	ND	ND	ND	5,78E+00	ND	0,00E+00	5,18E-05	1,01E-03	-2,21E-03	-7,45E-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	2,46E+00	6,10E-03	3,46E-02	2,51E+00	3,17E-02	3,63E-03	ND	ND	ND	ND	ND	1,16E+01	ND	0,00E+00	7,38E-04	1,63E-02	4,83E-03	-1,11E+00
Non-hazardous waste	kg	2,51E+01	1,28E-01	2,07E+00	2,73E+01	5,86E-01	3,74E-01	ND	ND	ND	ND	ND	4,55E+02	ND	0,00E+00	1,43E-02	4,27E-01	3,11E+00	1,08E+00
Radioactive waste	kg	2,30E-04	1,22E-06	1,39E-05	2,45E-04	3,98E-06	1,29E-07	ND	ND	ND	ND	ND	8,45E-02	ND	0,00E+00	8,52E-08	6,18E-07	1,12E-07	-7,57E-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	5,27E-02	5,27E-02	0,00E+00	4,02E-01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	4,35E-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	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	6,04E-01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	2,46E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

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	1,01E+01	2,61E-01	1,21E+00	1,16E+01	1,28E+00	1,70E-01	ND	ND	ND	ND	ND	3,54E+02	ND	0,00E+00	2,65E-02	6,19E-01	2,89E-02	-3,51E+00
Ozone depletion Pot.	kg CFC ₁₁ e	1,45E-07	3,56E-09	6,53E-08	2,14E-07	1,52E-08	1,44E-10	ND	ND	ND	ND	ND	1,88E-05	ND	0,00E+00	2,86E-10	6,21E-10	1,94E-10	-2,61E-08
Acidification	kg SO ₂ e	6,23E-02	6,42E-04	2,49E-03	6,54E-02	3,35E-03	7,64E-05	ND	ND	ND	ND	ND	2,09E+00	ND	0,00E+00	6,69E-05	5,06E-04	5,77E-05	-2,71E-02
Eutrophication	kg PO ₄ ³ e	1,39E-02	1,61E-04	3,64E-03	1,77E-02	8,17E-04	7,06E-05	ND	ND	ND	ND	ND	4,72E-01	ND	0,00E+00	1,63E-05	1,31E-04	1,26E-04	-2,91E-03
POCP ("smog")	kg C ₂ H ₄ e	5,35E-03	5,89E-05	3,31E-04	5,74E-03	2,99E-04	2,27E-05	ND	ND	ND	ND	ND	7,82E-02	ND	0,00E+00	5,87E-06	3,10E-05	7,02E-06	-2,35E-03
ADP-elements	kg Sbe	2,27E-04	9,03E-07	2,96E-06	2,31E-04	3,50E-06	1,26E-07	ND	ND	ND	ND	ND	1,37E-03	ND	0,00E+00	1,09E-07	2,15E-06	3,09E-08	-4,23E-05
ADP-fossil	MJ	1,13E+02	3,65E+00	1,67E+01	1,33E+02	1,84E+01	1,86E-01	ND	ND	ND	ND	ND	8,70E+03	ND	0,00E+00	3,60E-01	6,78E-01	2,15E-01	-3,08E+01

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

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	1,02E+01	2,62E-01	1,11E+00	1,16E+01	1,29E+00	1,07E-01	ND	ND	ND	ND	ND	3,54E+02	ND	0,00E+00	2,67E-02	6,19E-01	2,98E-02	-3,56E+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

DATA SOURCES

Manufacturing energy scenario documentation A3

1. Green electricity, origin certified; One Click LCA, 0.01 kgCO₂e/kWh
2. Heat and power co-generation, natural gas, 1 MW electrical, lean burn (Reference product: heat, district or industrial, natural gas), Ecoinvent 3.10.1, 0.008 kgCo₂e/kWh

Transport scenario documentation A4

1. Market for transport, freight, lorry >32 metric ton, EURO5, 3,500 km
2. Market for transport, freight, lorry >32 metric ton, EURO5, 19,000 km
3. Market for transport, freight, lorry >32 metric ton, EURO5, 1,000 km

Installation scenario documentation A5 (Waste materials data source)

1. Containerboard production, linerboard, 0.459 kg
2. Packaging film production, low density polyethylene, 0.0595 kg

Use stage scenario documentation B6 (Energy data source)

1. Electricity, European Union - 27, 2020, One Click LCA, 0.4 kgCo₂e/kWh

Transport scenario documentation A4

Scenario parameter	Value
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	-
Direct emissions to ambient air, soil and water / kg	-

USE STAGE SCENARIO DOCUMENTATION B6

Scenario information	Value
Ancillary materials specified by material / kg or units as appropriate	-
Power output of equipment / kW	-
Characteristic performance, e.g. energy efficiency, emissions, variation of performance with capacity utilization, etc. / units as appropriate	-
Further assumptions for scenario development / units as appropriate	20 years with 8 hours/day

END OF LIFE SCENARIO DOCUMENTATION

Scenario information	Value
Collection process – kg collected separately	-
Collection process – kg collected with mixed construction waste	1.24
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0.435
Recovery process – kg for energy recovery	0.207
Disposal (total) – kg for final deposition	0.598
Scenario assumptions, e.g. transportation	50 km by lorry

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

Sarah Curpen, as an authorised verifier acting for EPD Hub Limited

23.01.2026

