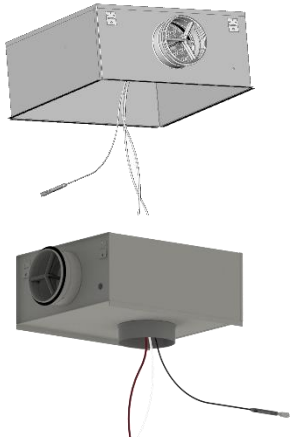
ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

FläktGroup Plenum boxes
- reference product: PSWC
- included products: SKHA, SKKA, SKKU



EPD HUB, HUB-5617
Published on 06.03.2026, last updated on 06.03.2026, valid until 05.03.2031

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	FläktGroup AB
Address	Slovanská 781, 463 12 Liberec - Vesec, Czech Republic
Contact details	info-cz@flaktgroup.com
Website	www.flaktgroup.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
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Doubravka Šimáňová, FläktGroup
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Yazan Badour 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	FläktGroup Plenum boxes - reference product: PSWC - included products: SKHA, SKKA, SKKU
Product reference	PSWC-25-60-1-1
Place(s) of raw material origin	Europe
Place of production	Czech republic
Place(s) of installation and use	Europe
Period for data	calendar year 2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	<10
A1-A3 Specific data (%)	13,1

ENVIRONMENTAL DATA SUMMARY

Declared unit	1kg of PSWC-25-60-0-1 Plenum Box
Declared unit mass	1 kg
Mass of packaging	0,34 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	4,08
GWP-total, A1-A3 ($kgCO_2e$)	3,56
Secondary material, inputs (%)	25,8
Secondary material, outputs (%)	81,1
Total energy use, A1-A3 (kWh)	16,2
Net freshwater use, A1-A3 (m^3)	0,1

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

ABOUT FLÄKTGROUP

FläktGroup designs and manufactures ventilation and air treatment products for use in commercial and industrial buildings. The company is headquartered in Germany and operates production facilities in Europe, Asia and the United States.

FOR WELLBEING, SAFETY, AND ENVIRONMENT

Today, we spend more than 90% of our time indoors, and the air we breathe has a big impact on our performance, well-being, and comfort. Our buildings need mechanical ventilation and air treatment to deliver safe and comfortable building spaces. At the same time, buildings account for up to 40% the energy consumption, where ventilation systems play a big part. With this in mind, FläktGroup aims to approach ventilation and air treatment with consideration for indoor environments, energy use, and environmental aspects throughout the building lifecycle.

PRODUCT DESCRIPTION

PSWC, SKKA, SKKU and SKHA plenum boxes form a comprehensive solution for air supply and air extract applications in commercial and public buildings such as offices, conference rooms, retail spaces, and similar environments. The range is designed for suspended ceiling installations and combines easy installation, low sound levels and accurate airflow control.

PSWC is the reference product. It is a quiet, ceiling-mounted extract plenum box with an integrated perforated air diffuser, specifically designed for installation in 600 × 600 mm suspended ceiling systems, where it replaces a standard ceiling tile. The diffuser frame is integrated with the plenum box. The perforated face panel is attached using magnet holders, allowing safe opening and easy access for cleaning and maintenance.

Thanks to the high perforation rate of the face panel, PSWC ensures very low sound levels over a wide airflow range. The diffuser is suitable for extract air applications and is available with or without internal sound attenuation lining. The plenum box is manufactured from galvanised sheet steel, while the perforated face panel is finished in RAL 9003 colour with a 70% gloss level. The sound attenuation lining, when selected, is made of polyester fibre. PSWC is available with duct connection diameters from 160 to 400 mm.

SKKA and SKKU are plenum boxes with round duct connections, suitable for various types of round diffusers (such as NWPA, NWPP and ODZA). The SKKA type is intended for diffusers without a gasket on the collar, while SKKU is designed for diffusers equipped with a gasket. Both versions can be supplied with or without sound attenuation lining and can be equipped with the ZAEF measurement and adjustment damper, which enables balanced and accurate airflow values. The damper can be easily removed without changing the setting. These plenum boxes can be used for both supply and extract air applications. They are manufactured from galvanised sheet steel and are available with duct connection diameters ranging from 100 to 630 mm.

SKHA is a plenum box with an open bottom, dedicated to square face panel diffusers (for example PWKA and PZKA). It is available with or without sound attenuation lining and can be supplied either without a regulation damper or with the patented ZAEF measurement and adjustment damper.
SKHA plenum boxes are manufactured from galvanised sheet steel and are available for four face panel sizes ranging from 400 × 400 mm up to 625 × 625 mm, with duct connection diameters from 160 to 400 mm.

All sizes and weights of the included products are listed in the table below; only plenum boxes with sound attenuation lining are included.

Further information can be found at:
www.flaktgroup.com

Table of included products and their weights.

Product Name	Duct connection Ø (mm)	Product code	Total weight (kg)
PSWC (reference product)	160	PSWC-16-60-1-1	**8,6**
	200	PSWC-20-60-1-1	**9,3**
	250	PSWC-25-60-1-1	**10,0**
	315	PSWC-31-60-1-1	**10,9**
	400	PSWC-40-60-1-1	**12,2**
SKHA (for diffusers with a square connection)	160	SKHA-16-40-1-0	**3,5**
	160	SKHA-16-60-1-0	**5,8**
	200	SKHA-20-50-1-0	**5,0**
	200	SKHA-20-60-1-0	**6,4**
	250	SKHA-25-60-1-0	**7,0**
	250	SKHA-25-62-1-0	**7,5**
	315	SKHA-31-60-1-0	**7,8**
	400	SKHA-40-60-1-0	**9,0**
SKKA/SKKU (for diffusers with a round connection)	100	SKKA-10-10-1-0	**3,0**
	100	SKKA-10-12-1-0/ SKKU-10-12-1-0	**3,1**
	120	SKKA-12-12-1-0/ SKKU-12-12-1-0	**4,1**
	120	SKKA-12-16-1-0/ SKKU-12-16-1-0	**4,2**
	160	SKKA-16-16-1-0/ SKKU-16-16-1-0	**5,7**
	160	SKKA-16-18-1-0	**5,8**
	160	SKKA-16-20-1-0/ SKKU-16-20-1-0	**5,9**
	200	SKKA-20-20-1-0/ SKKU-20-20-1-0	**8,1**
	200	SKKA-20-25-1-0/ SKKU-20-25-1-0	**8,2**
	250	SKKA-25-25-1-0/ SKKU-25-25-1-0	**10,6**
	250	SKKA-25-31-1-0/ SKKU-25-31-1-0	**10,7**
	250	SKKA-25-35-1-0	**10,8**

Table continues on the next page.

Continuation of the table.

Product Name	Duct connection Ø (mm)	Product code	Total weight (kg)
SKKA/SKKU (for diffusers with a round connection)	315	SKKA-31-31-1-0/ SKKU-31-31-1-0	**12,5**
	315	SKKA-31-40-1-0/ SKKU-31-40-1-0	**12,6**
	315	SKKA-31-50-1-0/ SKKU-31-50-1-0	**12,7**
	400	SKKU-40-40-1-0	**13,2**
	400	SKKU-40-50-1-0	**13,4**
	500	SKKU-50-50-1-0	**14,7**
	500	SKKU-50-63-1-0	**14,9**
	630	SKKU-63-63-1-0	**22,7**

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	94	Europe
Minerals	-	-
Fossil materials	6	Europe
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0,005
Biogenic carbon content in packaging, kg C	0,139

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1kg of PSWC-25-60-0-1 Plenum Box
Mass per declared unit	1 kg
Functional unit	Not applicable
Reference service life	25 years

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		
×	×	×	×	×	ND	ND	ND	ND	ND	ND	ND	×	×	×	×	×		
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

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 and other ancillary 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.

A market-based approach is used in modelling the electricity mix utilized in the factory. The energy consumption values are allocated based on the annual energy consumption of production per unit mass of product.

The PSWC plenum box is manufactured from galvanized steel sheets transported by truck from the steel supplier. The sheets are cut using either laser cutting or punching technology and subsequently mechanically formed to create the damper body. The body is assembled using rivets and bolts and insulated by bonding nonwoven polyester fibre insulation with hot-melt adhesive. Supplied components, including a pre-powder-coated perforated face panel, a frame with magnetic catches, and a safety rope, are then mounted onto the body.

The SKKA, SKKU, and SKHA dampers have the same main material composition as the PSWC but are not equipped with a painted face panel, as they are designed for connection to specific FläktGroup diffusers. Their insulation consists of flexible elastomeric foam, and they do not contain magnetic catches; instead, they are equipped with an EPDM rubber gasket. Transport assumptions for supplied components are based on supplier distances, with transport modes estimated using supplier information or statistical data from the transport provider.

Production losses consist mainly of steel scrap (approximately 20%). This waste is collected and transported to external material recycling facilities. A standard transport distance of 50 km is applied in the model, reflecting the presence of multiple recycling facilities within this range. End-of-life treatment follows standard European recycling scenarios.

After assembly, the plenum boxes are packed on custom wooden pallets for shipment, cushioned with cardboard and secured with stretch wrap. The manufacturing process uses electricity supplied from the national grid, based on the company's annual electricity invoice.

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.

The transport distance is calculated based on a weighted average of sales, ensuring a representative distribution of transportation impacts.
The product is supplied ready for installation (A5), with no raw material waste generated during the installation process. Installation is performed manually or with power tools, requiring only a negligible amount of energy. Packaging materials used for transport, such as cardboard and wooden pallets, are sent to waste treatment and managed according to the average end-of-life scenario in the EU.
Based on EUROSTAT data from 2021, 32% of wooden pallets are recycled, 30% are incinerated with energy recovery, and the remaining 38% are landfilled. For cardboard waste, 83% is recycled, 8% is incinerated, and the remaining 9% is landfilled. For plastic packaging 40% is recycled, 37% is incinirated and 23% is landfiled.

PRODUCT USE AND MAINTENANCE (B1-B7)

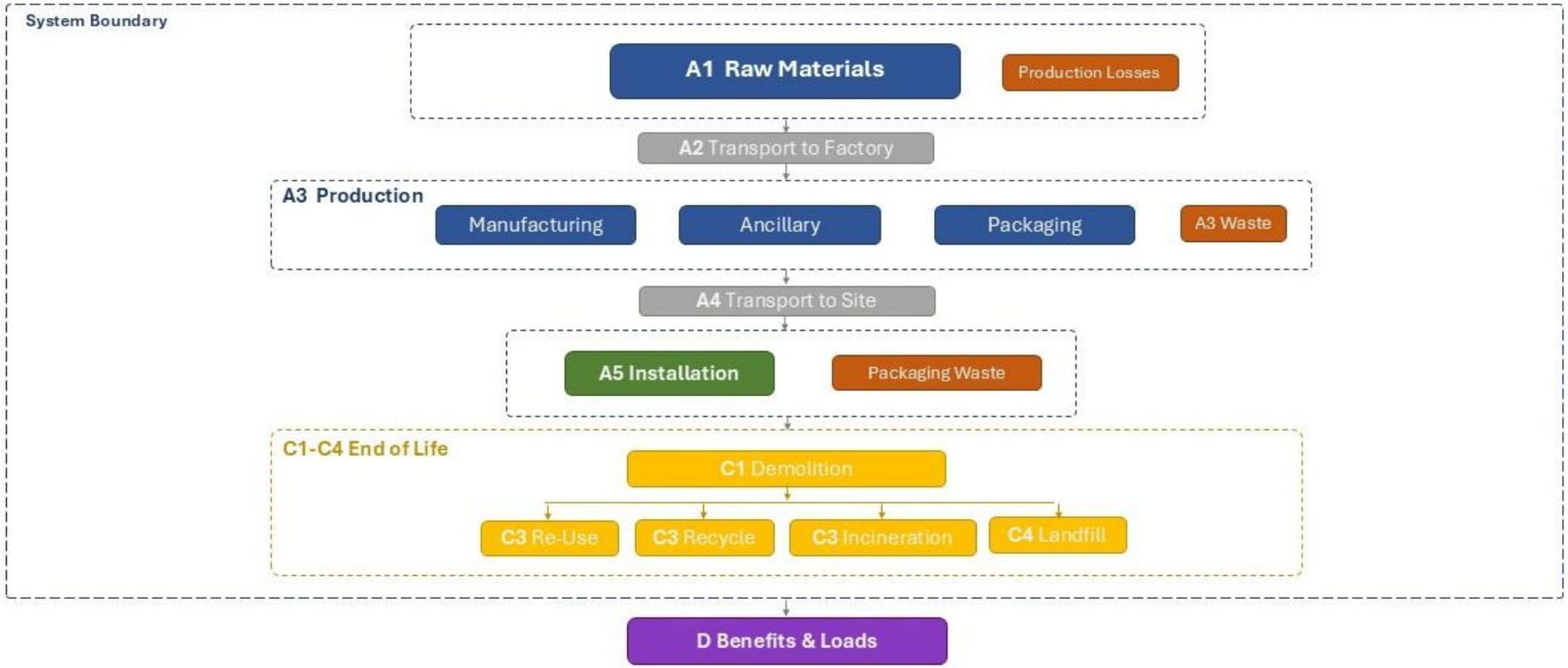
This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end of its life, the plenum box is assumed to be dismantled into separate material fractions using electrical tools (deconstruction energy is considered negligible).The separated materials are then transported 50 km to a local recycling facility. A 50 km transport distance is used because the actual end-of-life location is unknown and highly dependent on the installation site. (C2). data for steel is from the World Steel Association (85% recycling rate) Life cycle inventory (LCI) study, aluminium (90% for aluminium parts and 76% for aluminium in electronic parts) from the

International Aluminium Institute (IAI) European Aluminium, 2022, https://european-aluminium.eu/blog/enabling-the-circular-economy-with-aluminium/#:~:text=Aluminium%20recycling%20rates%20are%20already,boost%20the%20recycling%20of%20aluminium%2C. Data for PP from Plastics Europe (23% recycled; 50% incinirated). Hot melt glue and powder paint are expected to be incinerated without the use of energy.

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.

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	Multiple products
Grouping method	Based on worst-case results
Variation in GWP-fossil for A1-A3, %	<10

This EPD covers multiple products manufactured in a single factory. The products are mainly made from the same main materials and follow a similar production process. The reference product represents the worst-case results for fossil GWP. It was selected based on its material composition, specifically the use of powder coating and a higher steel content compared to other plenum boxes. The reference product size was defined using a weighted average of the products sold in 2024.

To assess potential variations in the results, two extreme product cases were modelled and analysed: one with the lowest steel content and one with the highest steel content. The results showed that the difference between these two extreme cases was less than 10%.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.3. 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'.

A4: Transport to construction is based on the 2024 statistics on the type of vehicle used by our carrier, and the weighted average of the transportation distance of the included plenum boxes (all types and sizes) in 2024.

A5: Installation energy is based on source: https://toolsadvisers.com/how-much-electricity-does-a-drill-use/?utm_source=chatgpt.com and installation manual. The installation can take less than 2 minutes (meaning the time when the drill is turned on), so the energy required is approximately less than 0.05 kWh (corded drill: 500-1000W=0.5- 1 kWh so 1 kW × 0,0333 h = 0,033 kWh).
Treatment of waste from packaging is based on:
For carboard 83% is recycled. (source: EUROSTAT, https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519259/default/table?lang=en); 8% is incinerated and 9% is landfilled.
For wooden pallet: 32% of the wooden packaging is recycled (source: EUROSTAT, https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519174/default/table?lang=en); 30% is incinerated and 38% is landfilled.
For plastic packaging: 40% of the plastic packaging is recycled, 37% is incinerated and 27% landfiled (source: EUROSTAT, https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519242/default/table?lang=en)

C1: A default value is derived from Table 4 of the Construction Products PCR 2019:14 (EN 15804+A2) for dismantling steel products: 1.1 kWh/t.
For a product mass of 1 kg, the dismantling energy is 0,0011 kWh and is therefore considered negligible.

C2: The separated materials are then assumed to be transported 50km to the local recycling site by truck. 50km is used because the real-life scenario is unknown and dependent on which city the unit is placed in.

C3-C4:
The recycling rates for each material are based on the following sources: data for steel is from the World Steel Association (85% recycling rate) Life cycle inventory (LCI) study, aluminium (90% for aluminium parts and 76% for aluminium in electronic parts) from the International Aluminium Institute (IAI) European Aluminium, 2022, https://european-aluminium.eu/blog/enabling-the-circular-economy-with-aluminium/#:~:text=Aluminium%20recycling%20rates%20are%20already,boost%20the%20recycling%20of%20aluminium%2C. Data for PP from Plastics Europe (23% recycled; 50% incinerated). Hot melt glue and powder paint are expected to be incinerated without the use of energy.

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	3,53E+00	4,27E-02	-5,05E-03	3,57E+00	2,12E-01	5,41E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,14E-02	1,02E-01	4,53E-02	-1,04E+00
GWP – fossil	kg CO_2e	3,54E+00	4,27E-02	5,01E-01	4,08E+00	2,12E-01	3,15E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,14E-02	1,02E-01	4,53E-02	-1,04E+00
GWP – biogenic	kg CO_2e	-1,75E-02	8,43E-06	-5,09E-01	-5,26E-01	4,24E-05	5,09E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,03E-06	-4,01E-05	-1,34E-06	0,00E+00
GWP – LULUC	kg CO_2e	5,05E-03	1,58E-05	2,41E-03	7,48E-03	7,67E-05	6,66E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,83E-05	2,38E-05	7,34E-07	-1,63E-04
Ozone depletion pot.	kg CFC_{-11}e	9,87E-07	8,54E-10	1,63E-08	1,00E-06	4,20E-09	4,85E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,80E-10	2,60E-10	3,77E-11	-3,44E-09
Acidification potential	mol H^+e	9,31E-02	1,10E-04	1,85E-03	9,51E-02	5,60E-04	1,59E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,38E-04	2,29E-04	1,13E-05	-4,21E-03
EP-freshwater[2)]	kg Pe	1,60E-01	2,89E-06	4,68E-04	1,60E-01	1,41E-05	1,83E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,22E-06	1,20E-05	1,57E-07	-7,51E-04
EP-marine	kg Ne	6,11E-03	3,14E-05	5,26E-04	6,67E-03	1,36E-04	8,48E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,48E-05	5,50E-05	8,88E-06	-9,35E-04
EP-terrestrial	mol Ne	3,70E-01	3,41E-04	4,35E-03	3,74E-01	1,48E-03	3,87E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,87E-04	6,03E-04	5,02E-05	-1,02E-02
POCP ("smog")[3)]	kg NMVOCe	1,61E-02	1,79E-04	1,64E-03	1,79E-02	8,16E-04	1,28E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,93E-04	1,76E-04	1,64E-05	-3,47E-03
ADP-minerals & metals[4)]	kg Sbe	1,17E-02	1,31E-07	9,27E-07	1,17E-02	6,96E-07	2,58E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,35E-07	1,29E-06	2,99E-09	-1,14E-05
ADP-fossil resources	MJ	4,55E+01	6,12E-01	8,67E+00	5,48E+01	2,98E+00	5,40E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,81E-01	2,57E-01	2,97E-02	-9,57E+00
Water use[5)]	m^3e depr.	2,33E+00	3,08E-03	1,86E-01	2,52E+00	1,47E-02	1,47E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,70E-03	6,81E-03	6,91E-04	-2,34E-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	7,44E-07	3,63E-09	1,32E-08	7,61E-07	1,54E-08	1,46E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,31E-09	3,03E-09	2,04E-10	-7,67E-08
Ionizing radiation[6)]	kBq U235e	1,59E-01	7,66E-04	1,45E-01	3,04E-01	3,79E-03	1,10E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,71E-04	2,11E-03	2,61E-05	3,89E-02
Ecotoxicity (freshwater)	CTUe	2,57E+02	7,75E-02	3,42E+00	2,60E+02	3,93E-01	2,23E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,17E-02	1,66E-01	2,51E-02	-4,77E+01
Human toxicity, cancer	CTUh	7,36E-07	7,09E-12	5,58E-10	7,36E-07	3,58E-11	1,19E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,03E-12	1,97E-11	5,24E-11	-1,54E-10
Human tox. non-cancer	CTUh	3,56E-07	3,90E-10	3,29E-09	3,60E-07	1,86E-09	6,18E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,64E-10	1,23E-09	1,82E-10	-7,14E-09
SQP[7)]	-	1,17E+01	4,86E-01	4,14E+01	5,36E+01	1,77E+00	2,31E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,53E-01	4,86E-01	5,36E-02	-3,28E+00

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	3,50E+00	1,04E-02	3,11E+00	6,62E+00	5,16E-02	-4,88E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,97E-03	4,62E-02	3,98E-04	-8,34E-01
Renew. PER as material	MJ	2,79E-01	0,00E+00	4,99E+00	5,27E+00	0,00E+00	-4,99E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1,96E-01	-8,34E-02	0,00E+00
Total use of renew. PER	MJ	3,78E+00	1,04E-02	8,10E+00	1,19E+01	5,16E-02	-9,87E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,97E-03	-1,50E-01	-8,30E-02	-8,34E-01
Non-re. PER as energy	MJ	4,29E+01	6,12E-01	8,17E+00	5,17E+01	2,98E+00	4,19E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,81E-01	-1,54E+00	-7,93E-01	-9,57E+00
Non-re. PER as material	MJ	1,59E+00	0,00E+00	4,38E-01	2,03E+00	0,00E+00	-4,23E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1,02E+00	-5,68E-01	0,00E+00
Total use of non-re. PER	MJ	4,45E+01	6,12E-01	8,61E+00	5,37E+01	2,98E+00	-4,60E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,81E-01	-2,56E+00	-1,36E+00	-9,57E+00
Secondary materials	kg	2,58E-01	2,74E-04	5,30E-02	3,11E-01	1,38E-03	1,83E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,61E-04	3,54E-04	1,51E-05	5,86E-01
Renew. secondary fuels	MJ	9,21E-03	3,42E-06	1,56E-01	1,65E-01	1,72E-05	1,63E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,32E-06	1,41E-05	1,81E-07	-9,37E-05
Non-ren. secondary fuels	MJ	1,39E-04	0,00E+00	0,00E+00	1,39E-04	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	9,03E-02	8,67E-05	5,20E-03	9,56E-02	4,02E-04	-5,94E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,73E-05	1,49E-04	-2,87E-05	-3,77E-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	6,10E-01	8,86E-04	1,75E-02	6,28E-01	4,31E-03	2,12E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,01E-03	2,41E-03	9,14E-04	-3,45E-01
Non-hazardous waste	kg	1,13E+01	1,83E-02	2,45E+00	1,37E+01	9,06E-02	7,67E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,90E-02	9,45E-02	1,00E-01	-4,16E+00
Radioactive waste	kg	1,22E-04	1,90E-07	3,51E-05	1,58E-04	9,42E-07	2,82E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,15E-07	5,40E-07	6,45E-09	1,00E-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	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,09E-03	0,00E+00	1,86E-01	1,87E-01	0,00E+00	1,27E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,11E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	1,60E-03	0,00E+00	0,00E+00	1,60E-03	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	9,28E-04	0,00E+00	0,00E+00	9,28E-04	0,00E+00	5,12E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	3,83E-01	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,13E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,63E-01	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,98E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,20E-01	0,00E+00	0,00E+00

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	3,55E+00	4,27E-02	5,04E-01	4,09E+00	2,12E-01	3,15E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,14E-02	1,02E-01	4,53E-02	-1,04E+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. Market for electricity, high voltage, Czech Republic, Ecoinvent, 0.62 kgCO2e/kWh
2. Heat production, natural gas, at industrial furnace >100kW, Albania, Ecoinvent, 0.0773 kgCO2e/MJ
3. Heat, from municipal waste incineration to generic market for heat district or industrial, other than natural gas, Czech Republic, Ecoinvent
4. Market for diesel, Albania, Ecoinvent, 0.93 kgCO2e/kg

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry 16-32 metric ton, EURO6, 818 km
2. Market for transport, freight, sea, ferry, 27 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	50
Bulk density of transported products	6,98E+01
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation resources)

1. Market group for electricity, low voltage, Ecoinvent, 0.05 kWh

Installation scenario documentation - A5 (Installation waste)

1. Treatment of waste paperboard, unsorted, sorting, Ecoinvent, Materials for recycling, 0.03 kg
2. Treatment of waste packaging paper, municipal incineration, Ecoinvent, 0.0029 kg
3. Treatment of waste packaging paper, sanitary landfill, Ecoinvent, 0.0032 kg
4. Exported Energy: Electricity, Ecoinvent, 0.0058 MJ
5. Exported Energy: Electricity, Ecoinvent, 0.2 MJ
6. Exported Energy: Electricity, Ecoinvent, 0.0075 MJ
7. Exported Energy: Thermal, Ecoinvent, 0.0083 MJ
8. Exported Energy: Thermal, Ecoinvent, 0.28 MJ
9. Exported Energy: Thermal, Ecoinvent, 0.01 MJ
10. Treatment of waste wood, post-consumer, sorting and shredding, Ecoinvent, Materials for recycling, 0.096 kg
11. Treatment of waste wood, untreated, municipal incineration, Ecoinvent, 0.09 kg
12. Treatment of waste wood, untreated, sanitary landfill, Ecoinvent, 0.114 kg
13. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.0012 kg
14. Treatment of waste polyethylene, municipal incineration, Ecoinvent, 0.0011 kg
15. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 6.9E-4 kg

End-of-life scenario documentation - C1-C4 (Data source)

1. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 0.79 kg
2. Treatment of scrap steel, inert material landfill, Ecoinvent, 0.14 kg
3. Treatment of scrap steel, inert material landfill, Ecoinvent, 0.0019 kg
4. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 0.0077 kg
5. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.0017 kg
6. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.012 kg
7. Treatment of waste polypropylene, municipal incineration, Ecoinvent, 0.0038 kg
8. Treatment of waste polypropylene, municipal incineration, Ecoinvent, 0.027 kg
9. Exported Energy: Electricity, Ecoinvent, 0.02 MJ
10. Exported Energy: Electricity, Ecoinvent, 0.0025 MJ
11. Exported Energy: Electricity, Ecoinvent, 0.14 MJ
12. Exported Energy: Thermal, Ecoinvent, 0.027 MJ
13. Exported Energy: Thermal, Ecoinvent, 0.0034 MJ
14. Exported Energy: Thermal, Ecoinvent, 0.19 MJ
15. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.002 kg
16. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.014 kg
17. Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, 5.0E-4 kg
18. Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, 2.5E-4 kg
19. Treatment of waste plastic, mixture, sanitary landfill, Ecoinvent, 2.5E-4 kg
20. Treatment of waste paint, municipal incineration, Ecoinvent, 0.0175 kg

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

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 15804+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

Yazan Badour as an authorized verifier for EPD Hub Limited 06.03.2026