



# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

FläktGroup ODZA Swirl diffuser

-reference product: ODZA-63-1-1

-included products: ODZA size 25, 31, 40, 50, 63



## EPD HUB, HUB-7605

Published on 22.09.2026, last updated on 22.09.2026, valid until 21.09.2031

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

**FläktGroup**

## GENERAL INFORMATION

### MANUFACTURER

|                 |                                                       |
|-----------------|-------------------------------------------------------|
| Manufacturer    | FläktGroup                                            |
| 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         | Doubavka Šimánová                                                                                                                                                                  |
| EPD verification   | Independent verification of this EPD and data, according to ISO 14025:<br><input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification |
| EPD verifier       | Yazan Badour as an authorized verifier for EPD Hub                                                                                                                                 |

This EPD is intended for business-to-business 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                          | ODZA Swirl diffuser     |
| Product reference                     | ODZA-63-1-1             |
| Place(s) of raw material origin       | Europe                  |
| Place of production                   | Liberec, Czech republic |
| Place(s) of installation and use      | Europe                  |
| Period for data                       | calendar year 2025      |
| Averaging in EPD                      | Multiple products       |
| Variation in GWP-fossil for A1-A3 (%) | 0 - 38%                 |
| A1-A3 Specific data (%)               | 5,14                    |

### ENVIRONMENTAL DATA SUMMARY

|                                             |                                   |
|---------------------------------------------|-----------------------------------|
| Declared unit                               | 1kg of ODZA-63-1-1 Swirl diffuser |
| Declared unit mass                          | 1 kg                              |
| Mass of packaging                           | 0,96 kg                           |
| GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)     | 7,29                              |
| GWP-total, A1-A3 (kgCO <sub>2</sub> e)      | 6,21                              |
| Secondary material, inputs (%)              | 10                                |
| Total energy use, A1-A3 (kWh)               | 41,3                              |
| Net freshwater use, A1-A3 (m <sup>3</sup> ) | 0,28                              |

# 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

The diffuser included in this EPD is designed to be used as a terminal of the ventilation ductwork.

ODZA is an adjustable ceiling swirl diffuser designed for air distribution in commercial and industrial buildings with large room volumes and high ceilings. It is suitable for applications such as market halls, warehouses and production facilities.

The diffuser enables continuous adjustment of the air throw direction from horizontal to vertical, allowing the air distribution pattern to be adapted to different operating conditions, including summer and winter operation. The diffusion pattern is controlled by a combination of fixed and movable blades. By changing the position of the movable blades, openings are formed between the blades, creating a nozzle effect that enables a long vertical air throw.

ODZA is available in five sizes with duct connections from 250 to 630 mm. Its airflow range is 39–2,500 l/s (140–9,000 m<sup>3</sup>/h), with a recommended

installation height of 3–28 m. The diffuser can be installed directly to the duct or via an SKKU connection box; the environmental data for the plenum box are available in a separate EPD. Adjustment can be performed manually or automatically using an electric actuator or thermal element. The standard colour is RAL 9003; other RAL colours are available upon request. The reference unit for this EPD is an ODZA diffuser in size 63 with manual adjustment.

Further information can be found at:

[www.flaktgroup.com](http://www.flaktgroup.com)

All sizes and weights of the included products are listed in the table below.

| Product Code                              | Connection size ø (mm) | Total weight (kg) |
|-------------------------------------------|------------------------|-------------------|
| ODZA-25-1-1                               | 250                    | 1                 |
| ODZA-31-1-1                               | 310                    | 1,6               |
| ODZA-40-1-1                               | 400                    | 1,9               |
| ODZA-50-1-1                               | 500                    | 2,7               |
| <b>ODZA-63-1-1</b><br>(reference product) | 630                    | <b>5,3</b>        |

The A1–A3 environmental impacts (fossil and total) for each product size can be calculated by multiplying the EPD result by the respective product weight.

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|-----------------------|----------------|-----------------|
| Metals                | 93             | Europe          |
| Minerals              | -              | -               |
| Fossil materials      | 7              | Europe          |
| Bio-based materials   | -              | -               |

## 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 | 0,338 |

## FUNCTIONAL UNIT AND SERVICE LIFE

|                        |                                   |
|------------------------|-----------------------------------|
| Declared unit          | 1kg of ODZA-63-1-1 Swirl diffuser |
| 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 |                              |          |       |
| x             | x         | x             | x              | x        | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | x                          | x                 | x                | x        | x | Recycling                    | Recovery | Reuse |
| Raw materials | Transport | Manufacturing | Transport      | Assembly | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction/ demolition | Transport         | Waste processing | Disposal |   |                              |          |       |

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 manual air diffuser is manufactured from steel or aluminium sheets that are cut and processed to form the body components. These components are then welded or assembled with supplied parts and subsequently coated with white powder paint (RAL 9003).

Waste generated during production includes steel (20%) and aluminium (20%) scrap, which is sent for material recycling. A transport distance of 50 km to waste treatment facilities is assumed.

After production, the diffuser is carefully packaged in a cardboard box and placed on a custom-made wooden pallet for shipping.

Transport distances for supplied components are based on the locations of suppliers. Transport modes have been estimated using supplier information and transport provider statistics.

Electricity used in the manufacturing process is supplied from the national grid. Consumption data are based on the manufacturer's annual electricity records, and the corresponding electricity dataset was selected according to the production site location and voltage level.

Ancillary materials used during manufacturing include water, nitrogen, oxygen, and argon for cutting and welding operations, as well as organic solvents for equipment cleaning. Consumption of ancillary materials has been allocated to the product based on mass (1kg of a product), using annual factory consumption data and total annual production output.

## 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 product is supplied ready for installation (A5), with no raw material waste generated during installation. The ODZA diffuser is installed onto the SKKU plenum box manually with a screwdriver, without using electrical

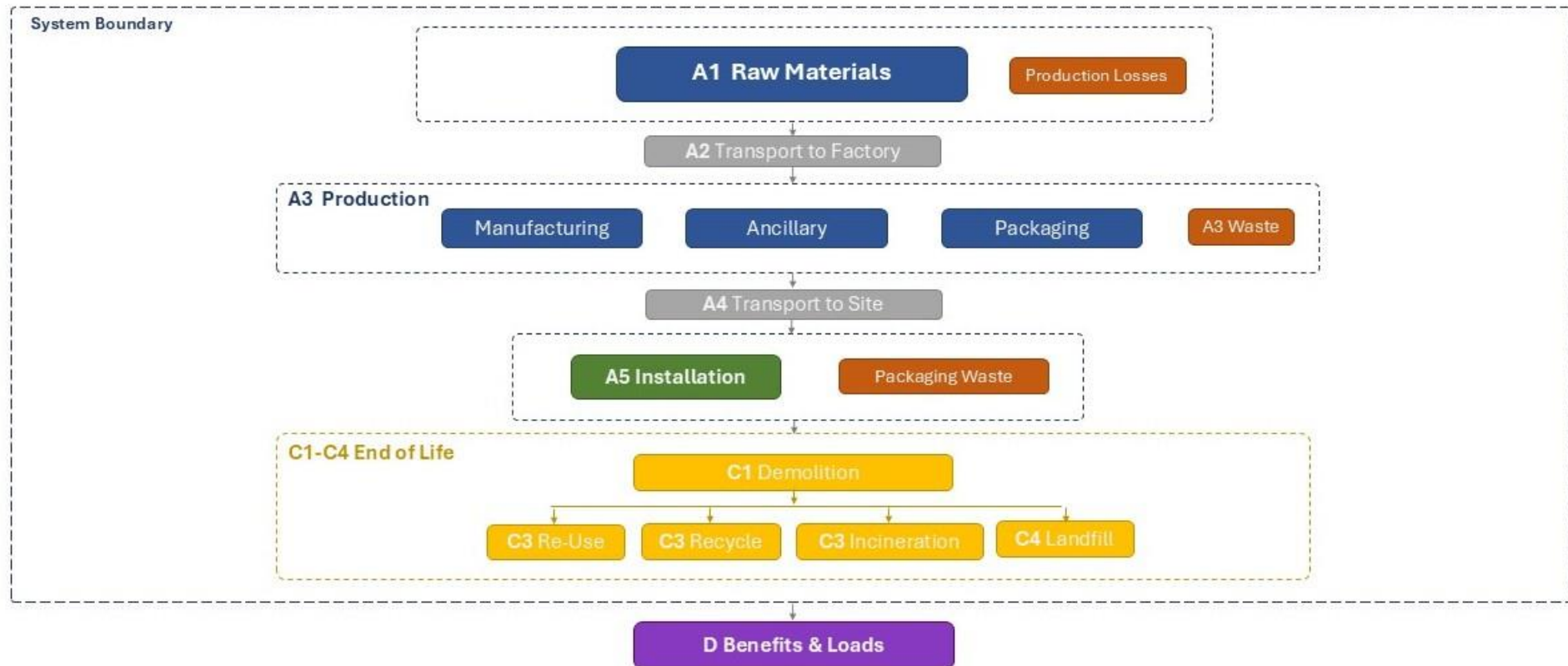
energy.

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. The assumptions are based on EUROSTAT waste treatment statistics. Environmental benefits associated with material recycling and energy recovery are reported in Module D.

## PRODUCT END OF LIFE (C1-C4, D)

At the end of its life, the diffuser is assumed to be manually dismantled and then transported 50 km to a local recycling facility. 50km is used because the real-life scenario is unknown and highly dependent on the location in which the unit is placed (C2). Waste processing (C3) and disposal (C4) are modelled with pre-made groups for EOL by OneClickEPD. The paint is assumed to be incinerated. The rest is assumed to be landfilled. The recycling rate for steel is based on the World Steel Association (85% recycling rate), for aluminium 81% recycling rate (for Europe) is based on International Aluminium Institute. Materials suitable for recycling are then credited in module D after subtracting the recycled content in aim to avoid double counting.

## LIFE CYCLE FLOW 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            | Physical Properties |
| Manufacturing energy and waste | Physical Properties |

### PRODUCT & MANUFACTURING SITES GROUPING

|                                      |                             |
|--------------------------------------|-----------------------------|
| Type of grouping                     | Multiple products           |
| Grouping method                      | Based on worst-case results |
| Variation in GWP-fossil for A1-A3, % | 0 – 38%                     |

This EPD covers multiple product variants (sizes) manufactured in a single factory. Differences in the environmental impacts between product sizes are primarily due to the use of different sheet materials: sizes 50 and 63 are made from aluminium sheets, while the other sizes are made from steel sheets. All product variants follow the same or a similar production process.

To assess the potential variation in environmental impacts across the product range, two extreme product cases were modelled and analysed: size 25, made mainly of steel, and size 63, made mainly of aluminium. The representative product was selected as the worst-case scenario, with the higher environmental impact in modules A1–A3: ODZA-63-1-1.

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data.

Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

World Steel Association, n.d. Life cycle inventory (LCI) study – steel recycling rates. [online] Available at: <https://www.worldsteel.org> [Accessed 5 Mar. 2026].

International Aluminium Institute (IAI) / European Aluminium, 2022. Enabling the circular economy with aluminium. [online] Available at: <https://european-aluminium.eu/blog/enabling-the-circular-economy-with-aluminium/> [Accessed 5 Mar. 2026].

EUROSTAT, 2024. env\_waspac custom table 8519259. [online] Available at: [https://ec.europa.eu/eurostat/databrowser/view/env\\_waspac\\_\\_custom\\_8519259/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519259/default/table?lang=en) [Accessed 5 Mar. 2026].

EUROSTAT, 2024. env\_waspac custom table 8519174. [online] Available at: [https://ec.europa.eu/eurostat/databrowser/view/env\\_waspac\\_\\_custom\\_8519174/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519174/default/table?lang=en) [Accessed 5 Mar. 2026].

## 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. The results are based on the declared unit.

### 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 <sup>1)</sup>           | kg CO <sub>2</sub> e   | 6,61E+00 | 3,12E-02 | -4,30E-01 | 6,21E+00  | 5,75E-01 | 1,27E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,24E-02 | 3,13E-02  | 1,41E-01 | -3,57E+00 |
| GWP – fossil                        | kg CO <sub>2</sub> e   | 6,46E+00 | 3,12E-02 | 7,94E-01  | 7,29E+00  | 5,75E-01 | 3,27E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,24E-02 | 3,14E-02  | 1,41E-01 | -3,40E+00 |
| GWP – biogenic                      | kg CO <sub>2</sub> e   | 2,79E-02 | 1,55E-05 | -1,24E+00 | -1,21E+00 | 1,11E-04 | 1,24E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,05E-06 | -1,32E-04 | 1,02E-05 | -9,21E-02 |
| GWP – LULUC                         | kg CO <sub>2</sub> e   | 1,17E-01 | 1,10E-05 | 1,42E-02  | 1,32E-01  | 1,95E-04 | 4,19E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,00E-05 | 2,43E-05  | 1,59E-06 | -7,66E-02 |
| Ozone depletion pot.                | kg CFC-11e             | 2,83E-07 | 6,73E-10 | 2,92E-08  | 3,13E-07  | 1,14E-08 | 4,70E-10 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,30E-10 | 2,37E-10  | 5,35E-11 | -5,59E-08 |
| Acidification potential             | mol H <sup>+</sup> e   | 6,34E-02 | 9,00E-05 | 3,41E-03  | 6,69E-02  | 1,49E-03 | 1,77E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,64E-05 | 2,26E-04  | 2,03E-05 | -2,15E-02 |
| EP-freshwater <sup>2)</sup>         | kg Pe                  | 2,83E-03 | 2,26E-06 | 5,67E-04  | 3,40E-03  | 3,71E-05 | 9,07E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,76E-06 | 1,18E-05  | 3,85E-07 | -2,00E-03 |
| EP-marine                           | kg Ne                  | 6,61E-03 | 2,77E-05 | 1,30E-03  | 7,94E-03  | 3,58E-04 | 1,84E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,51E-05 | 5,07E-05  | 1,17E-05 | -3,05E-03 |
| EP-terrestrial                      | mol Ne                 | 1,65E-01 | 3,01E-04 | 9,99E-03  | 1,75E-01  | 3,90E-03 | 6,74E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,73E-04 | 5,70E-04  | 9,43E-05 | -2,82E-02 |
| POCP (“smog”) <sup>3)</sup>         | kg NMVOCe              | 2,39E-02 | 1,40E-04 | 3,25E-03  | 2,73E-02  | 2,16E-03 | 2,32E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,13E-04 | 1,68E-04  | 2,68E-05 | -1,20E-02 |
| ADP-minerals & metals <sup>4)</sup> | kg Sbe                 | 4,85E-03 | 1,00E-07 | 2,43E-06  | 4,85E-03  | 1,86E-06 | 1,35E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,26E-08 | 1,27E-06  | 6,59E-09 | -1,00E-05 |
| ADP-fossil resources                | MJ                     | 9,82E+01 | 4,53E-01 | 1,28E+01  | 1,11E+02  | 8,01E+00 | 4,27E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,25E-01 | 2,52E-01  | 3,91E-02 | -5,13E+01 |
| Water use <sup>5)</sup>             | m <sup>3</sup> e depr. | 1,20E+01 | 2,50E-03 | 3,79E-01  | 1,23E+01  | 3,86E-02 | 1,42E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,61E-03 | 4,77E-03  | 3,22E-03 | -6,33E+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 PO<sub>4</sub>e; 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     | 6,16E-07 | 2,75E-09 | 3,32E-08 | 6,52E-07 | 3,53E-08 | 4,37E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,24E-09 | 3,12E-09 | 2,78E-10 | -2,52E-07 |
| Ionizing radiation <sup>6)</sup> | kBq<br>11235e | 1,40E+00 | 5,17E-04 | 1,47E-01 | 1,55E+00 | 1,21E-02 | 1,14E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,83E-04 | 1,33E-03 | 5,85E-05 | -8,08E-01 |
| Ecotoxicity (freshwater)         | CTUe          | 6,09E+01 | 3,68E-01 | 1,22E+02 | 1,84E+02 | 1,14E+00 | 4,26E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,80E-02 | 5,26E-01 | 5,14E+02 | -9,70E+01 |
| Human toxicity, cancer           | CTUh          | 1,52E-08 | 5,23E-12 | 1,23E-09 | 1,64E-08 | 9,01E-11 | 2,60E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,70E-12 | 1,70E-11 | 1,70E-10 | -5,53E-09 |
| Human tox. non-cancer            | CTUh          | 1,33E-07 | 2,87E-10 | 5,77E-09 | 1,39E-07 | 4,63E-09 | 1,29E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,10E-10 | 1,10E-09 | 6,15E-10 | -3,96E-08 |
| SQP <sup>7)</sup>                | -             | 8,73E+00 | 3,58E-01 | 1,05E+02 | 1,14E+02 | 4,06E+00 | 3,80E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,27E-01 | 4,76E-01 | 5,53E-02 | -3,89E+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 <sup>8)</sup> | MJ             | 3,22E+01 | 7,15E-03 | 5,52E+00 | 3,77E+01 | 1,55E-01 | -1,47E+01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,46E-03 | 4,13E-02  | 9,11E-04  | -1,95E+01 |
| Renew. PER as material             | MJ             | 3,57E-02 | 0,00E+00 | 1,41E+01 | 1,41E+01 | 0,00E+00 | -1,41E+01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00  | -3,57E-02 | 8,85E-01  |
| Total use of renew. PER            | MJ             | 3,22E+01 | 7,15E-03 | 1,96E+01 | 5,18E+01 | 1,55E-01 | -2,88E+01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,46E-03 | 4,13E-02  | -3,47E-02 | -1,86E+01 |
| Non-re. PER as energy              | MJ             | 9,81E+01 | 4,53E-01 | 1,22E+01 | 1,11E+02 | 8,01E+00 | 4,28E-01  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,25E-01 | 1,08E-01  | -6,41E-01 | -5,13E+01 |
| Non-re. PER as material            | MJ             | 1,02E+00 | 0,00E+00 | 6,79E-01 | 1,70E+00 | 0,00E+00 | -6,79E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | -3,22E-01 | -7,02E-01 | 5,77E-02  |
| Total use of non-re. PER           | MJ             | 9,91E+01 | 4,53E-01 | 1,28E+01 | 1,12E+02 | 8,01E+00 | -2,52E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,25E-01 | -2,14E-01 | -1,34E+00 | -5,12E+01 |
| Secondary materials                | kg             | 1,00E-01 | 1,97E-04 | 3,45E-01 | 4,45E-01 | 3,51E-03 | 3,81E-04  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,38E-04 | 2,98E-04  | 3,55E-05  | 7,15E-01  |
| Renew. secondary fuels             | MJ             | 1,12E-03 | 2,59E-06 | 3,69E-01 | 3,71E-01 | 3,51E-05 | 3,23E-06  | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,76E-06 | 1,36E-05  | 2,94E-07  | -9,82E-05 |
| Non-ren. secondary fuels           | MJ             | 4,50E-04 | 0,00E+00 | 0,00E+00 | 4,50E-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 <sup>3</sup> | 2,76E-01 | 5,81E-05 | 8,70E-03 | 2,85E-01 | 1,09E-03 | -9,12E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,80E-05 | 1,18E-04  | -1,85E-04 | -1,36E-01 |

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   | 1,50E+00 | 7,84E-04 | 3,89E-02 | 1,54E+00 | 1,04E-02 | 3,86E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,73E-04 | 2,12E-03 | 3,16E-03 | -7,79E-01 |
| Non-hazardous waste | kg   | 1,66E+01 | 1,62E-02 | 4,01E+00 | 2,06E+01 | 2,43E-01 | 1,02E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,06E-02 | 6,26E-02 | 2,33E-01 | -9,57E+00 |
| Radioactive waste   | kg   | 4,34E-04 | 1,27E-07 | 3,63E-05 | 4,70E-04 | 3,01E-06 | 2,83E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,92E-08 | 3,34E-07 | 1,45E-08 | -2,15E-04 |

## 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   | 3,62E-03 | 0,00E+00 | 1,76E-01 | 1,80E-01 | 0,00E+00 | 4,72E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 7,94E-01 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec      | kg   | 4,30E-05 | 0,00E+00 | 0,00E+00 | 4,30E-05 | 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   | 3,01E-03 | 0,00E+00 | 0,00E+00 | 3,01E-03 | 0,00E+00 | 1,18E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 4,07E-02 | 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 | 4,97E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 1,72E-02 | 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 | 6,85E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 2,36E-02 | 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 <sup>9)</sup> | kg CO <sub>2</sub> e | 6,58E+00 | 3,12E-02 | 8,08E-01 | 7,42E+00 | 5,75E-01 | 3,27E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,24E-02 | 3,15E-02 | 1,41E-01 | -3,48E+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 – CH<sub>4</sub> fossil, CH<sub>4</sub> 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 CO<sub>2</sub> is set to zero

## SCENARIO DOCUMENTATION

### DATA SOURCES

#### Manufacturing energy scenario documentation

1. Market for electricity, high voltage, Czech Republic, Ecoinvent, 0.66 kgCO<sub>2</sub>e/kWh
2. Heat production, natural gas, at industrial furnace >100kW, Albania, Ecoinvent, 0.0773 kgCO<sub>2</sub>e/MJ
3. Heat, from municipal waste incineration to generic market for heat, district or industrial, other than natural gas, Czech Republic, Ecoinvent

#### Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry 7.5-16 metric ton, EURO6, 1198.0 km
2. Transport, freight, sea, ferry, 56.0 km

#### Transport to the building site (A4) - Scenario documentation

| Scenario parameter                              | Value |
|-------------------------------------------------|-------|
| Capacity utilization (including empty return) % | 50    |
| Bulk density of transported products            | 36,8  |
| Volume capacity utilization factor              | 1     |

#### Installation at the building site (A5) - Scenario documentation

| Scenario parameter                       | Value                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Energy: type and consumption (MJ or kWh) | 0                                                                                                                                                                                                                                                                                                                                                                             |
| Water use (m <sup>3</sup> )              | 0                                                                                                                                                                                                                                                                                                                                                                             |
| Ancillary materials: type and mass (kg)  | 0                                                                                                                                                                                                                                                                                                                                                                             |
| Waste materials: type and mass (kg)      | 0,31kg of cardboard;<br>0,67kg of wooden pallet                                                                                                                                                                                                                                                                                                                               |
| Waste materials: output routes           | Based on EUROSTAT waste treatment statistics (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. Environmental benefits associated with material recycling and energy recovery are reported in Module D. |
| Direct emissions (kg)                    | 0                                                                                                                                                                                                                                                                                                                                                                             |

## End of life (C1-C4) - Scenario documentation

| Scenario information                                        | Value                                              |
|-------------------------------------------------------------|----------------------------------------------------|
| Collection process: collected separately (kg)               | -                                                  |
| Collection process: Mixed waste (kg)                        | 1                                                  |
| Recovery: re-use (kg)                                       | 0                                                  |
| Recovery: recycling (kg)                                    | 0,79                                               |
| Recovery: energy recovery (kg)                              | 0                                                  |
| Disposal (kg)                                               | 0,17                                               |
| Scenario assumptions e.g. transportation (mode, km) & other | recycling 50km by lorry;<br>landfill 50km 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 22.09.2026



