

# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Geosynthetics - Tipptex  
BontexGeo Kft



## EPD HUB, HUB-7318

Published on 26.08.2026, last updated on 26.08.2026, valid until 25.08.2031  
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.

## GENERAL INFORMATION

### MANUFACTURER

|                 |                                                             |
|-----------------|-------------------------------------------------------------|
| Manufacturer    | BontexGeo Kft                                               |
| Address         | Huszár Andor street 5, Tiszaújváros, 3580 Hungary           |
| Contact details | info@bontexgeo.com                                          |
| Website         | <a href="https://bontexgeo.com/">https://bontexgeo.com/</a> |

### 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    | Sister EPD                                                                                                                                                                             |
| Parent EPD number  | HUB-6059                                                                                                                                                                               |
| Scope of the EPD   | Cradle to gate with options, A4-A5, and modules C1-C4, D                                                                                                                               |
| EPD author         | Veronique Brosse from BontexGeo NV                                                                                                                                                     |
| EPD verification   | Independent verification of this EPD and data, according to ISO 14025:<br><br><input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification |
| EPD verifier       | Haiha Nguyen 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                               | Geosynthetics - Tipptex   |
| Additional labels                          | "Geosynthetics - Tipptex" |
| Product reference                          | Polypropylene geotextiles |
| Place(s) of raw material origin            | Europe                    |
| Place of production                        | Tiszaújváros, Hungary     |
| Place(s) of installation and use           | Worldwide                 |
| Period for data                            | calendar year 2025        |
| Averaging in EPD                           | No grouping               |
| Variation in GWP-fossil for A1-A3 (%)      | 0                         |
| GTIN (Global Trade Item Number)            | -                         |
| NOBB (Norwegian Building Product Database) | -                         |
| A1-A3 Specific data (%)                    | 97,5                      |

## ENVIRONMENTAL DATA SUMMARY

|                                             |          |
|---------------------------------------------|----------|
| Declared unit                               | 1 kg     |
| Declared unit mass                          | 1 kg     |
| Mass of packaging                           | 0,023 kg |
| GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)     | 2,05     |
| GWP-total, A1-A3 (kgCO <sub>2</sub> e)      | 2,04     |
| Secondary material, inputs (%)              | 0        |
| Total energy use, A1-A3 (kWh)               | 25,7     |
| Net freshwater use, A1-A3 (m <sup>3</sup> ) | 0,01     |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

Bontexgeo Kft, based in Hungary, is the regional production and distribution site of Bontexgeo Group. The company specializes in the manufacturing of needle-punched nonwoven geotextiles used in civil engineering, infrastructure, and environmental applications, including separation, filtration, drainage, and protection.

In addition, Bontexgeo Kft supports the Group's commercial activities in Central and Eastern Europe by providing local customer support, efficient logistics, and technical expertise for project-specific solutions.

## PRODUCT DESCRIPTION

This Tiptex geosynthetic is made up of polypropylene (PP), which is the main raw material, and additives for UV stabilization and performance improvements.

Bontexgeo Kft geosynthetics are available in various brands and versions which are all presented on Bontexgeo's website.

The Tiptex range is offered in 2 different product categories : Tiptex BS and Tiptex NS. The weight of the products varies between 85 g/m<sup>2</sup> and 1500 g/m<sup>2</sup>.

The product's performance values comply with the declaration of performance in relation to its main features in accordance with the following European standards :

EN 13249:2016 : Road construction

EN 13250:2016 : Railway applications

EN 13251:2016 : Earthworks, foundations, retaining structures

EN 13252:2016 : Drainage systems

EN 13253:2016 : Protection of membranes

EN 13254:2016 : Reservoirs and dams

EN 13255:2016 : Tunnels and underground structures

EN 13256:2016 : Landfills & waste disposal

EN 13257:2016 : Coastal & river works

EN 13265:2016 : Liquid waste containment projects

EN 15381:2008 : Reinforcement, stress relief, sealing

The geosynthetics do not contain substances listed in the "Candidate List of Substances of Very High Concern for Authorisation".

Further information can be found at:

<https://bontexgeo.com/>

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin                                 |
|-----------------------|----------------|-------------------------------------------------|
| Metals                | 0              | Not applicable                                  |
| Minerals              | 0              | Not applicable                                  |
| Fossil materials      | 100            | 47 % supply from Europe/ 53 % supply from World |
| Bio-based materials   | 0              | Not applicable                                  |

## 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 | 0,0052 |

## FUNCTIONAL UNIT AND SERVICE LIFE

|                        |           |
|------------------------|-----------|
| Declared unit          | 1 kg      |
| Mass per declared unit | 1 kg      |
| Functional unit        | -         |
| Reference service life | 100 years |

## SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVH 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                            | x         |
| Raw materials | Transport | Manufacturing | Transport      | Assembly | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction/ demolition | Transport | Waste processing | Disposal | Reuse                        | 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 geosynthetics is made from polypropylene staple fibers. The staple fibers are sourced from various suppliers. The geosynthetics is produced using these purchased staple fibers on the production lines at Bontexgeo Kft. The geosynthetics are delivered worldwide to customers. Manufacturing of geosynthetics including use of energy, water and auxiliary materials at the factory as well as internal waste generation and packaging. The inputs for the production process are raw materials and energy in form of electricity, natural gas, water, auxiliary materials (spinfinit oil) and liquified petroleum gas for forklifts.

Waste from production is sent to waste treatment (recycling). The transportation to the recycling facility is included but not the activities at the recycling facility.

Product specific data are based on annual company data for the period January 2025 to December 2025.

The electricity, gas and water are based on a one-year cycle (year 2025). The energy, natural gas and water inputs are then divided by the production output for one year to allocate the consumption per kg of the product.

Bontexgeo purchases packaging materials used to transport the geosynthetics to the installation site. Packaging materials are polyethylene foil (PE), HDPE end caps and cardboard cores. A small amount of adhesive is applied to bond the non-woven fabric to the cardboard tube when winding it into a 50-metre roll.

### **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 distance of transportation from production plant to the customer site is 1875 km and the transportation method is assumed to be lorry. Vehicle

capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. (Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. (Empty returns are considered in the Ecoinvent database). Transportation does not cause losses as product is packaged properly. Environmental impacts from installation into the civil infrastructure include. Installation of the product at the construction site is done manually.

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

Module C1 : The geosynthetics is dismantled together with the application (road, landfills, ...) and the geosynthetics are removed. It is assumed that the dismantling equipment requires fuel, which is modelled by use of 0.17 kg diesel/ton excavated material.

Module C2 : Transportation of the discarded products from the construction site to waste treatment. The scenario used a truck transporting the geosynthetics at a conservatively estimated average distance of 100 km.

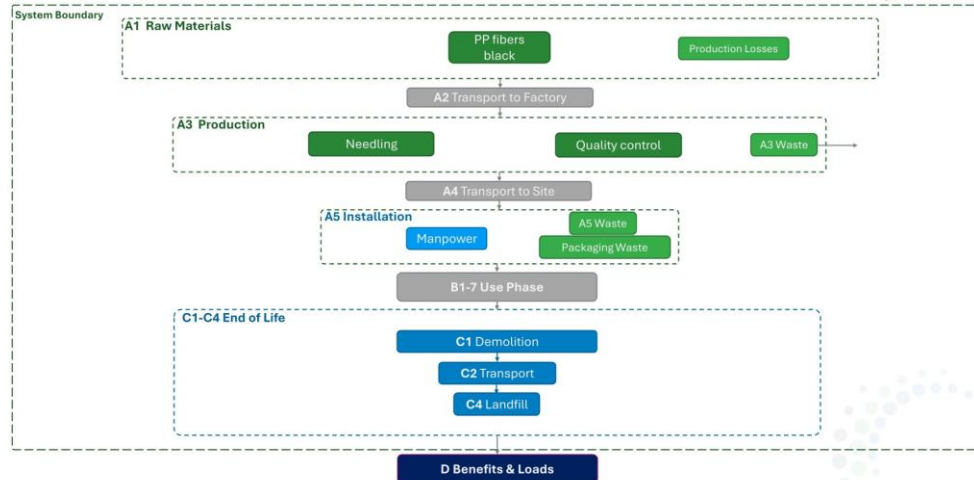
Module C3 : Nothing

Module C4 : We assume that 100% is landfilled at the end-of-life. PP geosynthetics waste : 1 kg - 100 % landfill.

Module D : No reuse, recycling or recovery of the geosynthetics product is considered for the product at the end-of-life. Crediting of heat from incineration and recycling of packaging material A5 is included in module D.

## LIFE CYCLE FLOW DIAGRAM

Life-cycle diagram Nonwoven Bontexgeo Kft, Hungary



## 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             | Physical Properties |
| Ancillary materials            | Physical Properties |
| Manufacturing energy and waste | Physical Properties |

Note on indicator consistency:

A technical inconsistency between PENRT (Total use of non-renewable primary energy) and ADP fossil (Abiotic depletion potential for fossil resources) results in modules C1-C4 has been identified. This originates from the polypropylene treatment datapoint. These inconsistencies are inherent to the background databases used and cannot be adjusted by the practitioner.

### PRODUCT & MANUFACTURING SITES GROUPING

|                                      |                |
|--------------------------------------|----------------|
| Type of grouping                     | No grouping    |
| Grouping method                      | Not applicable |
| Variation in GWP-fossil for A1-A3, % | 0              |

## 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'.

The EPDs state that the geosynthetics do not contain substances listed in the "Candidate List of Substances of Very High Concern for Authorisation.

This is documented in the company declaration entitled "Reach statement-version 04-2019". Further information can be found at the Bontexgeo webpage : <https://bontexgeo.com/>.

## 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 <sup>1)</sup>           | kg CO <sub>2</sub> e   | 1,50E+00 | 1,82E-01 | 3,60E-01  | 2,04E+00  | 3,94E-01 | 2,63E-02 | ND | ND | ND | ND | ND | ND | ND | 3,86E-03 | 0,00E+00 | 0,00E+00 | 1,03E-01  | -9,25E-03 |
| GWP – fossil                        | kg CO <sub>2</sub> e   | 1,49E+00 | 1,80E-01 | 3,75E-01  | 2,05E+00  | 3,93E-01 | 8,09E-03 | ND | ND | ND | ND | ND | ND | ND | 3,86E-03 | 0,00E+00 | 0,00E+00 | 1,03E-01  | -9,25E-03 |
| GWP – biogenic                      | kg CO <sub>2</sub> e   | 9,80E-03 | 6,42E-04 | -1,58E-02 | -5,38E-03 | 1,87E-04 | 1,82E-02 | ND | ND | ND | ND | ND | ND | ND | 1,03E-06 | 0,00E+00 | 0,00E+00 | -6,30E-05 | 0,00E+00  |
| GWP – LULUC                         | kg CO <sub>2</sub> e   | 1,90E-04 | 1,30E-03 | 2,20E-04  | 1,71E-03  | 1,75E-04 | 5,59E-07 | ND | ND | ND | ND | ND | ND | ND | 4,94E-07 | 0,00E+00 | 0,00E+00 | 7,19E-06  | -6,42E-06 |
| Ozone depletion pot.                | kg CFC-11e             | 5,65E-11 | 4,25E-09 | 2,14E-08  | 2,57E-08  | 6,89E-09 | 7,82E-12 | ND | ND | ND | ND | ND | ND | ND | 6,16E-11 | 0,00E+00 | 0,00E+00 | 2,89E-10  | -3,71E-10 |
| Acidification potential             | mol H <sup>+</sup> e   | 3,20E-03 | 1,37E-03 | 1,18E-03  | 5,75E-03  | 4,38E-03 | 4,34E-06 | ND | ND | ND | ND | ND | ND | ND | 3,38E-05 | 0,00E+00 | 0,00E+00 | 7,91E-05  | -3,60E-05 |
| EP-freshwater <sup>2)</sup>         | kg Pe                  | 2,26E-06 | 1,22E-05 | 2,37E-03  | 2,38E-03  | 2,66E-05 | 2,09E-07 | ND | ND | ND | ND | ND | ND | ND | 1,84E-07 | 0,00E+00 | 0,00E+00 | 1,16E-06  | -2,97E-06 |
| EP-marine                           | kg Ne                  | 8,82E-04 | 3,99E-04 | 2,52E-04  | 1,53E-03  | 1,37E-03 | 3,86E-06 | ND | ND | ND | ND | ND | ND | ND | 1,56E-05 | 0,00E+00 | 0,00E+00 | 2,28E-04  | -6,10E-06 |
| EP-terrestrial                      | mol Ne                 | 9,38E-03 | 4,28E-03 | 2,50E-03  | 1,62E-02  | 1,51E-02 | 1,59E-05 | ND | ND | ND | ND | ND | ND | ND | 1,71E-04 | 0,00E+00 | 0,00E+00 | 3,23E-04  | -6,25E-05 |
| POCP (“smog”) <sup>3)</sup>         | kg NMVOCe              | 3,50E-03 | 1,44E-03 | 1,08E-03  | 6,02E-03  | 4,51E-03 | 5,47E-06 | ND | ND | ND | ND | ND | ND | ND | 5,12E-05 | 0,00E+00 | 0,00E+00 | 1,36E-04  | -4,36E-05 |
| ADP-minerals & metals <sup>4)</sup> | kg Sbe                 | 9,10E-07 | 4,78E-07 | 1,31E-06  | 2,70E-06  | 1,24E-06 | 5,45E-09 | ND | ND | ND | ND | ND | ND | ND | 1,80E-09 | 0,00E+00 | 0,00E+00 | 2,51E-08  | -3,35E-08 |
| ADP-fossil resources                | MJ                     | 7,16E+01 | 2,58E+00 | 8,06E+00  | 8,22E+01  | 5,31E+00 | 7,82E-03 | ND | ND | ND | ND | ND | ND | ND | 5,02E-02 | 0,00E+00 | 0,00E+00 | 2,48E-01  | -2,67E-01 |
| Water use <sup>5)</sup>             | m <sup>3</sup> e depr. | 2,29E-01 | 1,49E-02 | 6,77E-02  | 3,12E-01  | 2,38E-02 | 3,61E-04 | ND | ND | ND | ND | ND | ND | ND | 1,82E-04 | 0,00E+00 | 0,00E+00 | 1,19E-03  | -2,72E-03 |

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     | 0,00E+00 | 1,68E-08 | 9,72E-09 | 2,65E-08 | 2,57E-08 | 1,96E-10 | ND | ND | ND | ND | ND | ND | ND | 9,59E-10 | 0,00E+00 | 0,00E+00 | 1,80E-09 | -1,81E-10 |
| Ionizing radiation <sup>6)</sup> | kBq<br>11235e | 0,00E+00 | 2,52E-03 | 1,48E-01 | 1,51E-01 | 3,92E-03 | 2,58E-05 | ND | ND | ND | ND | ND | ND | ND | 3,04E-05 | 0,00E+00 | 0,00E+00 | 2,42E-04 | -1,58E-03 |
| Ecotoxicity (freshwater)         | CTUe          | 0,00E+00 | 2,28E+00 | 2,68E+00 | 4,95E+00 | 2,55E+00 | 3,53E-01 | ND | ND | ND | ND | ND | ND | ND | 3,18E-02 | 0,00E+00 | 0,00E+00 | 3,16E-01 | -6,14E-02 |
| Human toxicity, cancer           | CTUh          | 0,00E+00 | 3,31E-11 | 5,46E-11 | 8,77E-11 | 6,91E-11 | 1,68E-12 | ND | ND | ND | ND | ND | ND | ND | 5,20E-13 | 0,00E+00 | 0,00E+00 | 5,32E-12 | -1,04E-12 |
| Human tox. non-cancer            | CTUh          | 0,00E+00 | 1,60E-09 | 1,89E-09 | 3,50E-09 | 2,65E-09 | 5,23E-11 | ND | ND | ND | ND | ND | ND | ND | 7,41E-12 | 0,00E+00 | 0,00E+00 | 9,82E-10 | -5,06E-11 |
| SQP <sup>7)</sup>                | -             | 0,00E+00 | 2,45E+00 | 2,54E+00 | 4,99E+00 | 3,20E+00 | 7,82E-03 | ND | ND | ND | ND | ND | ND | ND | 3,52E-03 | 0,00E+00 | 0,00E+00 | 5,79E-01 | -2,68E-02 |

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             | 1,11E+01 | 3,95E-02 | 1,74E-01 | 1,13E+01 | 6,82E-02 | -2,49E-01 | ND | ND | ND | ND | ND | ND | ND | 4,55E-04 | 0,00E+00 | 0,00E+00 | 3,82E-03  | -1,47E-02 |
| Renew. PER as material             | MJ             | 0,00E+00 | 0,00E+00 | 2,50E-01 | 2,50E-01 | 0,00E+00 | -2,50E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 2,00E-03  |
| Total use of renew. PER            | MJ             | 1,11E+01 | 3,95E-02 | 4,24E-01 | 1,15E+01 | 6,82E-02 | -4,99E-01 | ND | ND | ND | ND | ND | ND | ND | 4,55E-04 | 0,00E+00 | 0,00E+00 | 3,82E-03  | -1,27E-02 |
| Non-re. PER as energy              | MJ             | 7,17E+01 | 2,59E+00 | 7,03E+00 | 8,13E+01 | 5,31E+00 | -2,48E-01 | ND | ND | ND | ND | ND | ND | ND | 5,02E-02 | 0,00E+00 | 0,00E+00 | -3,85E+01 | -2,67E-01 |
| Non-re. PER as material            | MJ             | 0,00E+00 | 0,00E+00 | 1,18E-02 | 1,18E-02 | 0,00E+00 | -1,18E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  | 1,08E-01  |
| Total use of non-re. PER           | MJ             | 7,17E+01 | 2,59E+00 | 7,04E+00 | 8,13E+01 | 5,31E+00 | -2,60E-01 | ND | ND | ND | ND | ND | ND | ND | 5,02E-02 | 0,00E+00 | 0,00E+00 | -3,85E+01 | -1,59E-01 |
| Secondary materials                | kg             | 0,00E+00 | 1,12E-03 | 4,98E-03 | 6,10E-03 | 2,39E-03 | 1,61E-05  | ND | ND | ND | ND | ND | ND | ND | 3,58E-05 | 0,00E+00 | 0,00E+00 | 8,97E-05  | 3,15E-03  |
| Renew. secondary fuels             | MJ             | 0,00E+00 | 1,29E-05 | 1,10E-04 | 1,23E-04 | 2,03E-05 | 1,26E-07  | ND | ND | ND | ND | ND | ND | ND | 5,89E-08 | 0,00E+00 | 0,00E+00 | 1,68E-06  | -1,04E-07 |
| 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 | 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> | 9,84E-03 | 3,86E-04 | 1,62E-03 | 1,18E-02 | 6,46E-04 | -6,59E-06 | ND | ND | ND | ND | ND | ND | ND | 3,96E-06 | 0,00E+00 | 0,00E+00 | -3,70E-03 | -6,30E-05 |

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   | 5,92E-09 | 4,23E-03 | 2,24E-02 | 2,66E-02 | 9,78E-03 | 1,67E-04 | ND | ND | ND | ND | ND | ND | ND | 8,88E-05 | 0,00E+00 | 0,00E+00 | 4,33E-04 | -3,31E-04 |
| Non-hazardous waste | kg   | 2,45E-02 | 7,76E-02 | 3,53E-01 | 4,55E-01 | 1,68E-01 | 1,30E-02 | ND | ND | ND | ND | ND | ND | ND | 1,27E-03 | 0,00E+00 | 0,00E+00 | 4,97E+00 | -7,21E-02 |
| Radioactive waste   | kg   | 7,60E-04 | 6,18E-07 | 3,96E-05 | 8,00E-04 | 9,62E-07 | 6,20E-09 | ND | ND | ND | ND | ND | ND | ND | 7,51E-09 | 0,00E+00 | 0,00E+00 | 5,92E-08 | -4,05E-07 |

## 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   | 8,87E-03 | 0,00E+00 | 0,00E+00 | 8,87E-03 | 0,00E+00 | 1,55E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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 | ND | 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 | 4,39E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| Exported energy – Electricity | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,84E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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 | 2,55E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| ADP-fossil                    | MJ   | 0,00E+00 | 2,54E+00 | 5,43E+00 | 7,97E+00 | 5,25E+00 | 7,41E-03 | ND | ND | ND | ND | ND | ND | ND | 4,97E-02 | 0,00E+00 | 0,00E+00 | 2,44E-01 | -2,39E-01 |

## ADDITIONAL INDICATOR – GWP-GHG

| Impact category       | Unit                 | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|-----------------------|----------------------|----------|----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| GWP-GHG <sup>9)</sup> | kg CO <sub>2</sub> e | 1,49E+00 | 1,82E-01 | 3,75E-01 | 2,05E+00 | 3,93E-01 | 8,09E-03 | ND | ND | ND | ND | ND | ND | ND | 3,86E-03 | 0,00E+00 | 0,00E+00 | 1,03E-01 | -9,25E-03 |

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. Refinery gas, burned in furnace, EU, Ecoinvent, 0.0769 kgCO<sub>2</sub>e/MJ
2. CNG (compressed natural gas) for transport, including combustion CO<sub>2</sub>, Europe, Ecoinvent, 3.91 kgCO<sub>2</sub>e/kg
3. Electricity, medium voltage, residual mix, Hungary, Ecoinvent, 0.41 kgCO<sub>2</sub>e/kWh

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

1. Market for transport, freight, lorry >32 metric ton, EURO5, 1875.0 km
2. Market for transport, freight, sea, container ship with reefer, heavy fuel oil, cooling, 8134.0 km

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

| Scenario parameter                              | Value |
|-------------------------------------------------|-------|
| Capacity utilization (including empty return) % | 100   |
| Bulk density of transported products            | 112   |
| Volume capacity utilization factor              | <1    |

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

| Scenario parameter                       | Value                                                                                                                                                                                                                                                                                                              |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Energy: type and consumption (MJ or kWh) | Not applicable                                                                                                                                                                                                                                                                                                     |
| Water use (m <sup>3</sup> )              | Not applicable                                                                                                                                                                                                                                                                                                     |
| Ancillary materials: type and mass (kg)  | Not applicable                                                                                                                                                                                                                                                                                                     |
| Waste materials: type and mass (kg)      | plastic waste (PE foil) :<br>0.00615 kg cardboard waste<br>(Cardboard core) : 0.01666 kg<br>end cap : 0.00018 kg                                                                                                                                                                                                   |
| Waste materials: output routes           | Packaging waste : cardboard<br>: 0.01666 kg plastic foil :<br>0,00615 kg end cap : 0.00018<br>kg: Total packaging waste =<br>0.02299 kg -> landfilled,<br>incinerated and recycled.<br>Plastic : 23% landfilled, 37%<br>incinerated and 40% recycled<br>Cardboard : 9% landfilled, 8%<br>incinerated, 83% recycled |
| Direct emissions (kg)                    | No direct emissions are<br>expected to occur during the<br>installation of the product.                                                                                                                                                                                                                            |

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

| Scenario information                                        | Value                                                          |
|-------------------------------------------------------------|----------------------------------------------------------------|
| Collection process: collected separately (kg)               | 1 kg geosynthetics, landfill                                   |
| Collection process: Mixed waste (kg)                        | Excavation, hydraulic digger :<br>1 kg = 0.0066 m <sup>3</sup> |
| Recovery: re-use (kg)                                       | 0                                                              |
| Recovery: recycling (kg)                                    | 0                                                              |
| Recovery: energy recovery (kg)                              | 0                                                              |
| Disposal (kg)                                               | 1                                                              |
| Scenario assumptions e.g. transportation (mode, km) & other | Landfill, 100 km                                               |

## 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

Haiha Nguyen as an authorized verifier for EPD Hub Limited 26.08.2026

