# Environmental Product Declaration

for Multiple products, based on a representative product

In accordance with **ISO 14025:2006** and **EN 15804:2012+A2:2019/AC:2021** for:

## Wavin Sentio

Smart Radiator Thermostat – 4063804 & 4063805

from

An Orbia business.

**Programme:** The International EPD® System – www.environdec.com

**Programme Operator:** EPD International AB

**EPD Registration Number:** EPD-IES-0029221:002

| | |
|---|---|
| **Version date:** | 2026-03-16 |
| **Valid until:** | 2031-03-09 |

*An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com*

# General information

| Programme information | |
|---|---|
| **Programme:** | The International EPD® System |
| **Address:** | EPD International AB<br>Box 210 60, SE-100 31 Stockholm, Sweden |
| **Website:** | www.environdec.com |
| **E-mail:** | support@environdec.com |

**Accountabilities for PCR, LCA and independent, third-party verification**

## Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR) 2019:14 Construction products, version 2.0.1

PCR review was conducted by: The Technical Committee of the International EPD® System.
A full list of members available on www.environdec.com. Chair of the PCR review: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via info@environdec.com.

## Life Cycle Assessment (LCA)

**LCA accountability:** *Andrei Roșu, Jurie Potgieter and Dimitria Nunes (Ecochain Technologies) &* Lokesh Anaparthi (Wavin)

## Third-party Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by individual verifier

**Third-party verifier:** Martijn van Hövell (SGS)

**Approved by:** The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

# Information of the EPD Owner

**Owner of the EPD:** Orbia Building & Infrastructure (Wavin)

**Address:** World Trade Center Tower G5, Schiphol Boulevard 425, 1118 BK, Schiphol, the Netherlands

**Main Contact:** Lokesh Anaparthi (

*Lokesh.anaparthi@orbia.com*

**Product-related or management system-related certifications:**

Quality management systems and environmental measures are implemented at all Wavin Calefa production sites, meeting national as well as international standards such as ISO 9001 (Quality Management System) and ISO 14001 standards (Environmental Management System).

Nordic Wavin A/S, Wavinvej 1, 8450 Hammel, Denmark quality management system:

DNV Management System Certificate ISO 45001:2018
DNV Management System Certificate ISO 14001:2015
DNV Management System Certificate ISO 9001:2015
DNV ISRS8 Level 6 Statement of Performance
DNV Management System Certification – Guidelines 2021

## About Wavin

Orbia's Building & Infrastructure business – **Wavin** is an innovative solutions provider for the global building and infrastructure industry. Backed by more than 60 years of product development experience, Orbia Wavin is advancing life around the world by building healthy, sustainable environments for global citizens. Whether it's to improve the distribution of clean drinking water, to make sanitation accessible for everyone, to create climate resilient cities or to design comfortable living spaces, Orbia Wavin collaborates with municipal leaders, engineers, contractors and installers to help future-proof communities, buildings and homes. Orbia Wavin has close to 11,000 employees across approximately 50 production sites worldwide, serving over 90 countries through a global sales and distribution network.

Wavin (an Orbia business) delivers integrated solutions across four key segments:

- ***Building systems*** for safe drinking water supply and wastewater drainage, including low-noise solutions.
- ***Infrastructure systems*** supporting community water supply, sewage, wastewater and stormwater networks.
- ***Urban Climate Resilience (UCR)*** solutions for rainwater infiltration, attenuation and blue-green roofs; and
- ***Indoor Climate Solutions (ICS)*** for advanced indoor temperature and ventilation control.

Together, these offerings help create healthier buildings and more resilient, sustainable communities worldwide. The company is headquartered in **Schiphol, The Netherlands**.

The products covered in this EPD form part of Wavin's ***Indoor Climate Solutions (ICS)*** portfolio.

# Wavin Indoor Climate Solutions (ICS)

Wavin Indoor Climate Solutions is part of Orbia's Building & Infrastructure group, delivering advanced systems that combine **comfort, energy efficiency, and sustainability** for residential and commercial buildings. Our integrated portfolio ensures optimal indoor environments while aiming to optimise energy efficiency.


**Our four core Indoor Climate Solutions include:**

- **Heat Interface Units – Calefa**
  Calefa sets new benchmarks for domestic hot water and space heating in district heating networks. Calefa integrates advanced features such as adaptive learning, which predicts usage patterns after two weeks to minimize energy waste; built-in weather compensation, automatically adjusting supply temperature based on outdoor conditions; and smart connectivity, enabling remote control and monitoring. Additional benefits include domestic hot water prioritization during peak times, a wireless outdoor sensor for multi-unit buildings, and fast commissioning for simplified installation. These innovations ensure exceptional efficiency, comfort, and sustainability in modern heat networks.

- **Surface Heating & Cooling – Comfia**
  Comfia provides a complete range of components for underfloor and ceiling heating and cooling systems, delivering efficient thermal comfort for modern buildings. The solution includes high-quality pipes, precision-engineered manifolds, and insulated panels designed for quick installation and optimal performance. These elements work together to ensure uniform heat distribution, low-temperature operation, and compatibility with renewable energy sources. Comfia's modular approach supports flexible design for residential and commercial applications, while integration with smart controls enables precise regulation and energy optimization throughout the year.

- **Heat Recovery Ventilation – Ventiza**
  Ventiza delivers a complete solution for mechanical ventilation with heat recovery (MVHR), ensuring healthy indoor air quality and energy efficiency. The system includes compact ventilation units, high-performance heat exchangers, and ducting components designed for easy installation and optimal airflow. Ventiza units recover up to 90% of heat from exhaust air, reducing heating demand and supporting compliance with energy-efficiency standards. Its modular design allows integration with other Wavin Indoor Climate Solutions, while smart control options enable precise regulation for comfort and sustainability.
- **Controls – Sentio**
  Sentio is Wavin's intelligent control platform, engineered to manage several systems seamlessly. The solution comprises wired and wireless thermostats, zone controllers, and central control units that integrate with Comfia, Ventiza, and Calefa for a fully connected indoor climate system. Sentio offers advanced features such as predictive algorithms, remote access via app, and energy optimization tools, ensuring precise temperature control and improved efficiency. Its intuitive interface simplifies commissioning and enhances user experience across residential and commercial applications.

# Product information

**Product name:** Wavin Sentio Smart Radiator Thermostat

**Product identification:** The product can be identified with an individual serial number, Model and model number.

**Product description:** The Wavin Sentio Smart Radiator Thermostat is a wireless thermostatic valve that allows you to connect your radiators to Sentio, giving you the ability to manage both your underfloor heating and radiators using a single control system.

The Smart Radiator Thermostat has a fast and simple setup routine, and is packaged with either an RA connection or M28 and M30 adapter for compatible radiators.

For more information, visit: Smart Radiator Thermostat, Wirel - Related Products

**UN CPC code:** UN CPC: Division 48, Group 482, Class 4826 Subclass 48269 Measuring, checking, regulating or controlling instruments, appliances and machines n.e.c.

ETIM Classification: EC011480

**Production Location:** Nisou**,** Czech Republic

**Multiple products coverage:** This EPD covers multiple products from the Wavin Sentio Smart Radiator Thermostat range. All products included are manufactured using comparable materials, electronic components and production processes. The declared unit is 1 piece of the radiator thermostat representing a worst-case scenario within the product group.

The environmental impacts reported in this EPD therefore represent the highest impact within the covered product range. For lighter models, impacts can be considered equal or lower than the values reported.

### Wavin Sentio Smart Radiator Thermostats covered in this EPD

| Product | Description | Image | Mass (g/pc)* |
|---|---|---|---|
| **4063804 - Smart Radiator Thermostat, Wirel, RA** | Radiator thermostat with RA connection adaptor |  | **238.8** |
| **4063805 - Smart Radiator Thermostat, Wirel. M28/30** | Radiator thermostat with M28 and M30 connection adaptors |  | 230 |

*includes packaging

## Content Declaration

| Product components | Weight, g | Weight-% (versus the product) | Biogenic material, weight-% and kg C/kg |
|---|---|---|---|
| **Plastics** | 34.8 | 14.6% | 0 |
| **Electronics** | 163.3 | 68.5% | 0 |
| **TOTAL** | 198.1 | 83.1% | 0 |

All products declared share the same primary materials, housing design, and electronics. Minor variations between the products may occur due to the inclusion of specific functional components. These variations are limited and do not materially affect the overall composition or environmental performance of the product group.

| Packaging materials | Weight, g | Weight-% (versus the product) | Weight biogenic carbon, kg C/kg |
|---|---|---|---|
| **Paper/cardboard** | 40.2 | 16.9% | 0.076 |

**Dangerous substances**: The product do not contain Substances of Very High Concern (SVHC) from the candidates list in concentrations exceeding 0.1 % (w/w).

# LCA information

**Declared unit:** *1 piece of Wavin Wavin Sentio Smart Radiator Thermostat*

**Geographical scope:** Modules A1-A3: Czech Republic, Modules A4-A5, B6: DK, HU & NL, Modules C1-C4, D: Europe

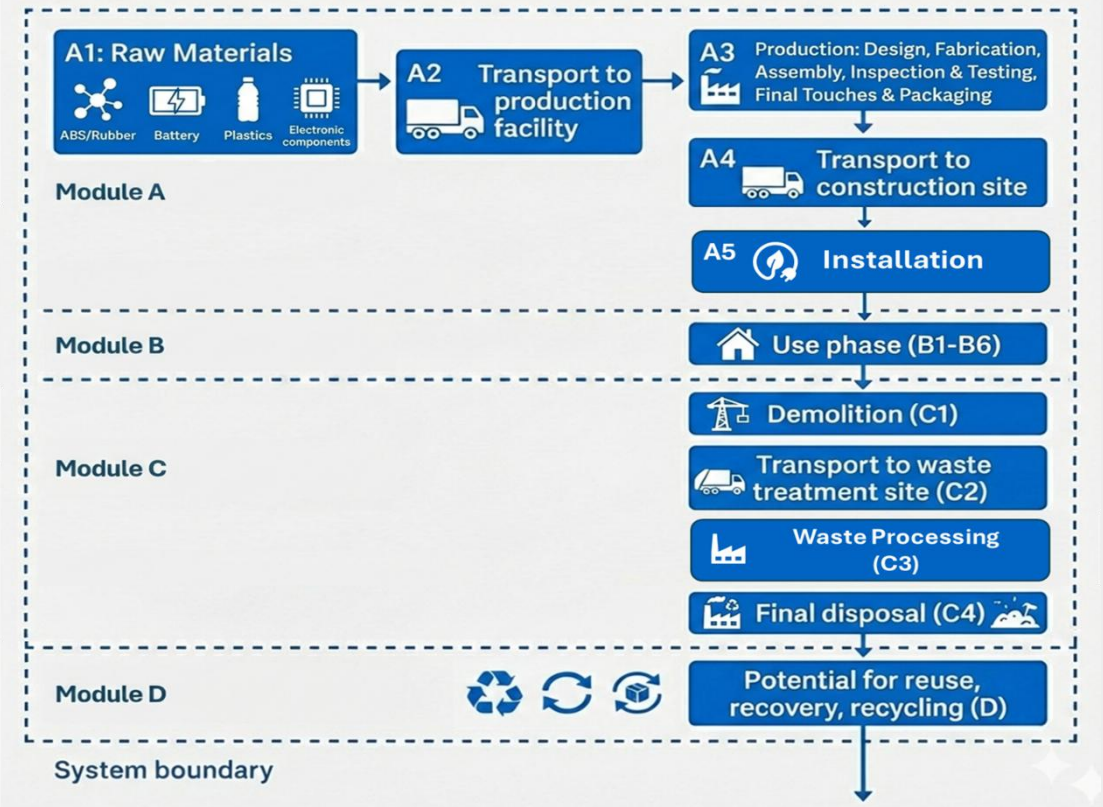
**Technical lifespan:** The technical lifespan for this product is 10 years.

**Time representativeness:** Primary data used cover the production year **2023**.

**Database(s) and LCA software used:** ***Ecoinvent database 3.9.1*** with EN 15804+A2 impact assessment method performed in ***Ecochain Helix v4.3.1***.

**Description of system boundaries:** This EPD covers a **cradle-to-gate with options system** boundary, including modules A1–A3, A4, A5, B6, C1–C4, and D. Modules B1, B2, B3, B4, B5, and B7 are not declared, as they are not relevant for this product system.

**System Diagram:** An overview of the system is presented below in the system diagram.




## Information on life cycle stages covered

**Modules (A1 – A3):** This stage starts with the production of the extracted raw materials into necessary components such as electronics, batteries and plastics (A1). The components are then transported to the production facility by truck (A2). The final production includes all energy, and material flows necessary to produce the final product (A3). The production processes are modelled using specific values from primary data collection at the production site. All relevant production processes in module A3, like packaging materials and production losses, have been included in this assessment.

**Information on Electricity used**

The electricity is modelled using the Ecoinvent v3.9.1 dataset "Electricity, low voltage, residual mix - Czech Republic". The impact of this dataset is **0.7577 kg CO2-eq / kWh**.

**Modules (A4 – A5):** This stage includes transportation to the customer installation site. An average distance was assumed based on markets where products are sold and this is modelled using "market for transport, freight, lorry, unspecified|Europe" (A4). After customer receives the product the installation is done manually and therefore no energy is needed. The waste disposal of packaging materials only is therefore considered in this scenario (A5).

## Use and End-of-Life scenarios

**Operational energy use (B6):** This stage accounts for the electricity consumed by the product during operation, including standby consumption and daily demand. This reflects the total energy use over the 10-year reference service life.

**Deconstruction/demolition (C1):** This stage includes the demolition and removal of the product, which is done manually and therefore no energy is needed.

**Transport to waste processing (C2):** This stage includes transportation of demolished products to waste treatment facilities based on actual transportation distances. See the assumptions on distance and transport mode in the table below.

**Waste processing for reuse, recovery and/or recycling (C3):** This stage includes the required waste processing for the product's region. See the assumptions on waste processing scenarios in the table below.

**Disposal (C4):** This stage includes processes for components and waste that could not be recycled in module C3. See the assumptions on waste processing scenarios in the table below.

**Reuse, recovery and/or recycling potential, expressed as net impacts and benefits (D)**: See the assumptions on waste processing scenarios in the table below.

**Applied End-of-Life scenarios for main materials & packaging**

| Material category | Landfill | Incineration | Recycling |
|---|---|---|---|
| Acrylonitrile Butadiene Styrene (ABS) | 10% | 20% | 70% |
| Battery (lithium) | 10% | 20% | 70% |
| Polypropylene (PP), black | 10% | 20% | 70% |
| RVS steel screw/nut/clasp | 10% | 20% | 70% |
| Electronic component (active) | 10% | 20% | 70% |
| PCB | 10% | 20% | 70% |
| Packaging, polyethylene (PE) | 10% | 85% | 5% |
| Packaging, paper/cardboard | 0% | 28% | 72% |
| Transport distance to waste processing facility by truck with empty return (km) | 80 | 130 | 80 |

**Cut-off Criteria:** All relevant inputs and outputs such as emissions, energy, and materials have been considered in this LCA. In accordance with EN 15804+A2:2019, the total neglected input flows per module do not exceed 5% of energy use and mass. In this LCA, waste processes are allocated to the relevant module.

When secondary materials or energy recovered from secondary fuels are used, the system boundary between the system under study and the previous system (providing the secondary materials) is set at the point where outputs of the previous system e.g. materials, products, building elements, or energy reach the end-of-waste state.

**Allocation:** The system boundaries adopted are in accordance with the modular approach specified in EN 15804+A2:2019. Since the full BOMs were taken into account, no product material flows have been excluded in A1. The only excluded emissions are from personnel processes, infrastructure and capital goods. Manufacturing energy and site emissions were allocated based on mass of finished product relative to total annual production mass.

**Data Quality:** The data quality assessment covers geographical, technological and temporal representativeness and follows the data quality criteria of Annex E, Table E.2 of EN 15804+A2:2019. The assessment identified no datasets rated as poor or very poor among those contributing at least 80% of the environmental impact results, in accordance with EN 15804+A2 and EN 15941 requirements. Overall data quality has been evaluated as **good for geographical and technological representativeness and very good for temporal representativeness**.

| Process | Source type | Source | Reference year | Data category | Share of primary data, of GWP-GHG results for A1-A3 |
|---|---|---|---|---|---|
| **Raw material supply** | Database | Ecoinvent v3.9.1 Cut-off and Plastics Europe (POM) | 2022, 2019 | Secondary data | 0,00% |
| **Manufacturing of product, including generation of electricity used in manufacturing of product** | Collected production data, Electricity data from Ecoinvent v3.9.1 | EPD Owner Ecoinvent v3.9.1 Cut-off | 2022 | Primary data | 0.42% |
| **Transport of materials & packaging to manufacturing site** | Ecoinvent v3.9.1 | Ecoinvent v3.9.1 Cut-off | 2022 | Primary data | 0.96% |
| **Total share of primary data, of GWP-GHG results for A1-A3** | | | | | **1.38%** |

**Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):**

| | Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Resource recovery stage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Raw material supply | Transport | Manufacturing | Transport | Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| **Module** | **A1** | **A2** | **A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| **Modules declared** | **X** | **X** | **X** | **X** | **X** | ND | ND | ND | ND | ND | **X** | ND | **X** | **X** | **X** | **X** | **X** |
| **Geography** | **Czech Republic** | | | **DK, HU, NL** | | **-** | **-** | **-** | **-** | **-** | **DK, HU, NL** | **-** | **Europe** | | | | **Europe** |
| **Specific data used** | **1.38%** | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Variation – products** | **< 11%** | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Variation – sites** | Not relevant | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Modules/life-cycle stages declared = “X”
Modules/life-cycle stages not declared = “ND”

**Additional information:** The LCA results presented in this EPD are based on the “EN 15804 reference package” using Environmental Footprint (EF) version 3.1. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

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# Results of the environmental performance indicators

## Mandatory impact category indicators according to EN 15804

| Results per functional or declared unit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| **GWP-Total** | kg $CO_2$ eq. | 1.86E+01 | 2.30E-02 | 6.94E-02 | ND | ND | ND | ND | ND | 1.01E-02 | ND | 0.00E+00 | 3.86E-03 | 2.53E-01 | 1.63E-03 | -1.67E-01 |
| **GWP-fossil** | kg $CO_2$ eq. | 1.86E+01 | 2.29E-02 | 2.77E-03 | ND | ND | ND | ND | ND | 9.98E-03 | ND | 0.00E+00 | 3.86E-03 | 2.53E-01 | 1.63E-03 | -1.68E-01 |
| **GWP-biogenic** | kg $CO_2$ eq. | -2.33E-03 | 6.88E-06 | 6.66E-02 | ND | ND | ND | ND | ND | 5.00E-05 | ND | 0.00E+00 | 1.11E-06 | 6.60E-06 | 5.85E-07 | -1.78E-04 |
| **GWP-luluc** | kg $CO_2$ eq. | 3.83E-02 | 1.12E-05 | 1.14E-06 | ND | ND | ND | ND | ND | 1.71E-05 | ND | 0.00E+00 | 1.87E-06 | 8.74E-06 | 8.98E-08 | 4.03E-04 |
| **ODP** | kg CFC 11 eq. | 1.00E-06 | 5.03E-10 | 1.04E-10 | ND | ND | ND | ND | ND | 2.54E-10 | ND | 0.00E+00 | 8.40E-11 | 7.53E-10 | 4.31E-12 | -1.89E-09 |
| **AP** | mol $H^+$ eq. | 1.44E-01 | 1.07E-04 | 1.53E-05 | ND | ND | ND | ND | ND | 4.14E-05 | ND | 0.00E+00 | 1.26E-05 | 8.61E-05 | 1.20E-06 | -5.41E-04 |
| **EP-freshwater** | kg P eq. | 3.64E-03 | 1.88E-07 | 3.69E-08 | ND | ND | ND | ND | ND | 8.34E-07 | ND | 0.00E+00 | 3.09E-08 | 3.45E-07 | 2.97E-09 | -3.55E-06 |
| **EP-marine** | kg N eq. | 2.49E-02 | 4.22E-05 | 6.05E-06 | ND | ND | ND | ND | ND | 6.78E-06 | ND | 0.00E+00 | 4.28E-06 | 3.55E-05 | 3.31E-06 | -1.01E-04 |
| **EP-terrestrial** | mol N eq. | 2.87E-01 | 4.55E-04 | 6.47E-05 | ND | ND | ND | ND | ND | 8.66E-05 | ND | 0.00E+00 | 4.57E-05 | 3.76E-04 | 4.98E-06 | -1.17E-03 |
| **POCP** | kg NMVOC eq. | 8.50E-02 | 1.59E-04 | 2.21E-05 | ND | ND | ND | ND | ND | 2.42E-05 | ND | 0.00E+00 | 1.88E-05 | 1.03E-04 | 2.13E-06 | -6.90E-04 |
| **ADP-minerals&metals*** | kg Sb eq. | 6.86E-03 | 7.15E-08 | 1.09E-08 | ND | ND | ND | ND | ND | 1.50E-07 | ND | 0.00E+00 | 1.24E-08 | 5.15E-08 | 3.94E-10 | -5.69E-07 |
| **ADP-fossil*** | MJ | 2.44E+02 | 3.31E-01 | 3.12E-02 | ND | ND | ND | ND | ND | 1.85E-01 | ND | 0.00E+00 | 5.47E-02 | 1.04E-01 | 3.70E-03 | -5.34E+00 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **WDP*** | $m^3$ | 7.04E+00 | 1.45E-03 | 2.90E-04 | ND | ND | ND | ND | ND | 1.93E-03 | ND | 0.00E +00 | 2.24E-04 | 2.13E-03 | 9.48E-05 | -1.37E-01 |
| **Acronyms** | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption | | | | | | | | | | | | | | |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

## Additional mandatory and voluntary impact category indicators

| Results per functional or declared unit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| **GWP-GHG[1]** | kg $CO_2$ eq. | 1.87E+01 | 2.30E-02 | 3.02E-03 | ND | ND | ND | ND | ND | 1.01E-02 | ND | 0.00E +00 | 3.86E-03 | 2.53E-01 | 1.63E-03 | -1.67E-01 |
| **Particulate matter** | disease inc. | 1.06E-06 | 2.25E-09 | 2.68E-10 | ND | ND | ND | ND | ND | 2.04E-10 | ND | 0.00E +00 | 3.06E-10 | 7.42E-10 | 2.61E-11 | -4.98E-09 |
| **Ionising radiation** | kBq U-235 eq | 9.39E-01 | 1.71E-04 | 3.64E-05 | ND | ND | ND | ND | ND | 1.41E-03 | ND | 0.00E +00 | 2.74E-05 | 1.45E-04 | 3.15E-06 | -6.18E-03 |
| **Ecotoxicity, freshwater** | CTUe | 5.28E+02 | 1.63E-01 | 4.03E-02 | ND | ND | ND | ND | ND | 3.81E-02 | ND | 0.00E +00 | 2.70E-02 | 2.32E+00 | 1.22E-02 | -1.51E-01 |
| **Human toxicity, cancer** | CTUh | 1.69E-08 | 1.23E-11 | 5.45E-12 | ND | ND | ND | ND | ND | 5.26E-12 | ND | 0.00E +00 | 1.75E-12 | 5.19E-11 | 1.31E-13 | -4.21E-11 |
| **Human toxicity, non-cancer** | CTUh | 8.36E-07 | 2.57E-10 | 3.84E-11 | ND | ND | ND | ND | ND | 2.06E-10 | ND | 0.00E +00 | 3.85E-11 | 4.45E-09 | 5.83E-12 | -6.16E-10 |
| **Land Use** | Pt | 9.00E+01 | 2.49E-01 | 1.14E-02 | ND | ND | ND | ND | ND | 1.17E-01 | ND | 0.00E +00 | 3.26E-02 | 3.63E-02 | 8.67E-03 | -2.89E+00 |

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic $CO_2$ is set to zero.

## Resource use indicators

| Results per functional or declared unit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| **PERE** | MJ | 3.69E+01 | 5.24E-03 | 1.10E-03 | ND | ND | ND | ND | ND | 8.59E-02 | ND | 0.00E+00 | 8.50E-04 | 5.52E-03 | 1.25E-04 | -6.57E-01 |
| **PERM** | MJ | 6.40E-01 | 0.00E+00 | -5.49E-01 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **PERT** | MJ | 3.76E+01 | 5.24E-03 | -5.48E-01 | ND | ND | ND | ND | ND | 8.59E-02 | ND | 0.00E+00 | 8.50E-04 | 5.52E-03 | 1.25E-04 | -6.57E-01 |
| **PENRE** | MJ | 2.58E+02 | 3.52E-01 | 3.39E-02 | ND | ND | ND | ND | ND | 1.95E-01 | ND | 0.00E+00 | 5.83E-02 | 1.11E-01 | 4.01E-03 | -5.74E+00 |
| **PENRM** | MJ | 1.08E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | -4.22E-01 | 0.00E+00 | 0.00E+00 |
| **PENRT** | MJ | 2.59E+02 | 3.52E-01 | 3.39E-02 | ND | ND | ND | ND | ND | 1.95E-01 | ND | 0.00E+00 | 5.83E-02 | -3.11E-01 | 4.01E-03 | -5.74E+00 |
| **SM** | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **RSF** | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **NRSF** | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **FW** | $m^3$ | 1.76E-01 | 4.65E-05 | 5.49E-04 | ND | ND | ND | ND | ND | 1.81E-04 | ND | 0.00E+00 | 5.71E-05 | 2.38E-04 | 5.51E-05 | -1.16E-03 |
| **Acronyms** | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water | | | | | | | | | | | | | | |

## Waste indicators

| Results per functional or declared unit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **A4** | **A5** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **C1** | **C2** | **C3** | **C4** | **D** |
| **Hazardous waste disposed** | kg | 1.36E-03 | 2.09E-06 | 1.91E-07 | ND | ND | ND | ND | ND | 4.10E-07 | ND | 0.00E+00 | 3.49E-07 | 1.47E-06 | 1.80E-08 | 2.42E-06 |
| **Non-hazardous waste disposed** | kg | 2.20E+00 | 2.09E-02 | 1.05E-03 | ND | ND | ND | ND | ND | 9.68E-04 | ND | 0.00E+00 | 2.67E-03 | 4.88E-03 | 1.52E-02 | -3.58E-03 |
| **Radioactive waste disposed** | kg | 5.99E-04 | 1.11E-07 | 2.66E-08 | ND | ND | ND | ND | ND | 9.86E-07 | ND | 0.00E+00 | 1.78E-08 | 9.40E-08 | 1.80E-09 | -4.90E-06 |

## Output flow indicators

| Results per functional or declared unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **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 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **Material for recycling** | kg | 0.00E+00 | 0.00E+00 | 2.89E-02 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 9.80E-02 | 0.00E+00 | 0.00E+00 |
| **Materials for energy recovery** | kg | 0.00E+00 | 0.00E+00 | 1.13E-02 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 8.50E-02 | 0.00E+00 | 0.00E+00 |
| **Exported energy, electricity** | MJ | 0.00E+00 | 0.00E+00 | 5.55E-02 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 2.67E-01 | 0.00E+00 | 0.00E+00 |
| **Exported energy, thermal** | MJ | 0.00E+00 | 0.00E+00 | 3.22E-02 | ND | ND | ND | ND | ND | 0.00E+00 | ND | 0.00E+00 | 0.00E+00 | 1.55E-01 | 0.00E+00 | 0.00E+00 |

# 100% Landfill scenario

## Mandatory impact category indicators according to EN 15804

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| **GWP-Total** | kg $CO_2$ eq. | 0.00E+00 | 2.99E-03 | 0.00E+00 | 2.23E-02 | 0.00E+00 |
| **GWP-fossil** | kg $CO_2$ eq. | 0.00E+00 | 2.98E-03 | 0.00E+00 | 2.23E-02 | 0.00E+00 |
| **GWP-biogenic** | kg $CO_2$ eq. | 0.00E+00 | 8.60E-07 | 0.00E+00 | 1.06E-05 | 0.00E+00 |
| **GWP-luluc** | kg $CO_2$ eq. | 0.00E+00 | 1.45E-06 | 0.00E+00 | 1.55E-06 | 0.00E+00 |
| **ODP** | kg CFC 11 eq. | 0.00E+00 | 6.49E-11 | 0.00E+00 | 5.54E-11 | 0.00E+00 |
| **AP** | mol $H^+$ eq. | 0.00E+00 | 9.73E-06 | 0.00E+00 | 1.68E-05 | 0.00E+00 |
| **EP-freshwater** | kg P eq. | 0.00E+00 | 2.39E-08 | 0.00E+00 | 5.10E-08 | 0.00E+00 |
| **EP-marine** | kg N eq. | 0.00E+00 | 3.31E-06 | 0.00E+00 | 5.09E-05 | 0.00E+00 |
| **EP-terrestrial** | mol N eq. | 0.00E+00 | 3.53E-05 | 0.00E+00 | 6.80E-05 | 0.00E+00 |
| **POCP** | kg NMVOC eq. | 0.00E+00 | 1.45E-05 | 0.00E+00 | 2.82E-05 | 0.00E+00 |
| **ADP-minerals&metals*** | kg Sb eq. | 0.00E+00 | 9.58E-09 | 0.00E+00 | 5.55E-09 | 0.00E+00 |
| **ADP-fossil*** | MJ | 0.00E+00 | 4.23E-02 | 0.00E+00 | 4.96E-02 | 0.00E+00 |
| **WDP*** | $m^3$ | 0.00E+00 | 1.73E-04 | 0.00E+00 | 1.79E-03 | 0.00E+00 |

## Additional mandatory and voluntary impact category indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| GWP-GHG | kg $CO_2$ eq. | 0.00E+00 | 2.99E-03 | 0.00E+00 | 2.23E-02 | 0.00E+00 |
| Particulate matter | disease inc. | 0.00E+00 | 2.37E-10 | 0.00E+00 | 3.52E-10 | 0.00E+00 |
| Ionising radiation | kBq U-235 eq | 0.00E+00 | 2.12E-05 | 0.00E+00 | 3.30E-05 | 0.00E+00 |
| Ecotoxicity, freshwater | CTUe | 0.00E+00 | 2.09E-02 | 0.00E+00 | 1.96E-01 | 0.00E+00 |
| Human toxicity, cancer | CTUh | 0.00E+00 | 1.35E-12 | 0.00E+00 | 2.00E-12 | 0.00E+00 |
| Human toxicity, non-cancer | CTUh | 0.00E+00 | 2.98E-11 | 0.00E+00 | 9.03E-11 | 0.00E+00 |
| Land Use | Pt | 0.00E+00 | 2.52E-02 | 0.00E+00 | 1.14E-01 | 0.00E+00 |

## Resource use indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| PERE | MJ | 0.00E+00 | 6.56E-04 | 0.00E+00 | 1.23E-03 | 0.00E+00 |
| PERM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ | 0.00E+00 | 6.56E-04 | 0.00E+00 | 1.23E-03 | 0.00E+00 |
| PENRE | MJ | 0.00E+00 | 4.50E-02 | 0.00E+00 | 5.27E-02 | 0.00E+00 |
| PENRM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | MJ | 0.00E+00 | 4.50E-02 | 0.00E+00 | 5.27E-02 | 0.00E+00 |
| SM | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | $m^3$ | 0.00E+00 | 5.62E-06 | 0.00E+00 | 5.18E-05 | 0.00E+00 |

### Waste indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| Hazardous waste disposed | kg | 0.00E+00 | 2.69E-07 | 0.00E+00 | 2.47E-07 | 0.00E+00 |
| Non-hazardous waste disposed | kg | 0.00E+00 | 2.07E-03 | 0.00E+00 | 1.99E-01 | 0.00E+00 |
| Radioactive waste disposed | kg | 0.00E+00 | 1.37E-08 | 0.00E+00 | 1.95E-08 | 0.00E+00 |

### Output flow indicators

| Indicator | Unit | 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 |
| Material for recycling | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Materials for energy recovery | kg | 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 |
| Exported energy, thermal | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

## 100% Incineration scenario

### Mandatory impact category indicators according to EN 15804

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| **GWP-Total** | kg $CO_2$ eq. | 0.00E+00 | 4.85E-03 | 5.66E-01 | 0.00E+00 | -5.36E-02 |
| GWP-fossil | kg $CO_2$ eq. | 0.00E+00 | 1.40E-06 | 6.97E-06 | 0.00E+00 | -2.86E-05 |
| GWP-biogenic | kg $CO_2$ eq. | 0.00E+00 | 2.35E-06 | 4.91E-06 | 0.00E+00 | -2.45E-05 |
| GWP-luluc | kg $CO_2$ eq. | 0.00E+00 | 1.05E-10 | 1.32E-09 | 0.00E+00 | -2.21E-09 |
| ODP | kg CFC 11 eq. | 0.00E+00 | 1.58E-05 | 1.32E-04 | 0.00E+00 | -1.15E-04 |
| AP | mol $H^+$ eq. | 0.00E+00 | 3.88E-08 | 1.77E-07 | 0.00E+00 | -4.10E-07 |
| EP-freshwater | kg P eq. | 0.00E+00 | 5.37E-06 | 6.42E-05 | 0.00E+00 | -3.52E-05 |
| EP-marine | kg N eq. | 0.00E+00 | 5.74E-05 | 6.72E-04 | 0.00E+00 | -5.14E-04 |
| EP-terrestrial | mol N eq. | 0.00E+00 | 2.36E-05 | 1.68E-04 | 0.00E+00 | -1.61E-04 |
| POCP | kg NMVOC eq. | 0.00E+00 | 1.56E-08 | 2.80E-08 | 0.00E+00 | -1.82E-08 |
| ADP-minerals&metals* | kg Sb eq. | 0.00E+00 | 6.87E-02 | 6.50E-02 | 0.00E+00 | -8.01E-01 |
| ADP-fossil* | MJ | 0.00E+00 | 2.81E-04 | 2.76E-03 | 0.00E+00 | -1.31E-03 |
| WDP* | $m^3$ | 0.00E+00 | 4.85E-03 | 5.66E-01 | 0.00E+00 | -5.36E-02 |

## Additional mandatory and voluntary impact category indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| GWP-GHG | kg $CO_2$ eq. | 0.00E+00 | 4.85E-03 | 5.66E-01 | 0.00E+00 | -5.37E-02 |
| Particulate matter | disease inc. | 0.00E+00 | 3.84E-10 | 7.75E-10 | 0.00E+00 | -1.25E-09 |
| Ionising radiation | kBq U-235 eq | 0.00E+00 | 3.45E-05 | 1.41E-04 | 0.00E+00 | -8.32E-05 |
| Ecotoxicity, freshwater | CTUe | 0.00E+00 | 3.39E-02 | 5.86E+00 | 0.00E+00 | -5.40E-02 |
| Human toxicity, cancer | CTUh | 0.00E+00 | 2.20E-12 | 1.07E-10 | 0.00E+00 | -1.31E-11 |
| Human toxicity, non-cancer | CTUh | 0.00E+00 | 4.84E-11 | 1.14E-08 | 0.00E+00 | -2.76E-10 |
| Land Use | Pt | 0.00E+00 | 4.09E-02 | 2.25E-02 | 0.00E+00 | -2.95E+00 |

## Resource use indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| PERE | MJ | 0.00E+00 | 1.07E-03 | 5.01E-03 | 0.00E+00 | -6.28E-01 |
| PERM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ | 0.00E+00 | 1.07E-03 | 5.01E-03 | 0.00E+00 | -6.28E-01 |
| PENRE | MJ | 0.00E+00 | 7.31E-02 | 6.98E-02 | 0.00E+00 | -8.86E-01 |
| PENRM | MJ | 0.00E+00 | 0.00E+00 | -5.27E-01 | 0.00E+00 | 0.00E+00 |
| PENRT | MJ | 0.00E+00 | 7.31E-02 | -4.58E-01 | 0.00E+00 | -8.86E-01 |
| SM | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | $m^3$ | 0.00E+00 | 5.77E-05 | 1.82E-04 | 0.00E+00 | 4.42E-04 |

## Waste indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| Hazardous waste disposed | kg | 0.00E+00 | 4.38E-07 | 9.39E-07 | 0.00E+00 | -3.65E-06 |
| Non-hazardous waste disposed | kg | 0.00E+00 | 3.36E-03 | 7.67E-03 | 0.00E+00 | -1.86E-03 |
| Radioactive waste disposed | kg | 0.00E+00 | 2.23E-08 | 9.62E-08 | 0.00E+00 | -5.80E-08 |

## Output flow indicators

| Indicator | Unit | 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 |
| Material for recycling | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Materials for energy recovery | kg | 0.00E+00 | 0.00E+00 | 1.98E-01 | 0.00E+00 | 0.00E+00 |
| Exported energy, electricity | MJ | 0.00E+00 | 0.00E+00 | 3.33E-01 | 0.00E+00 | 0.00E+00 |
| Exported energy, thermal | MJ | 0.00E+00 | 0.00E+00 | 1.94E-01 | 0.00E+00 | 0.00E+00 |

# 100% Recycling scenario

## Mandatory impact category indicators according to EN 15804

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| **GWP-Total** | kg $CO_2$ eq. | 0.00E+00 | 2.99E-03 | 3.89E-02 | 0.00E+00 | -3.18E-01 |
| GWP-fossil | kg $CO_2$ eq. | 0.00E+00 | 2.98E-03 | 3.88E-02 | 0.00E+00 | -3.18E-01 |
| GWP-biogenic | kg $CO_2$ eq. | 0.00E+00 | 8.60E-07 | 1.48E-05 | 0.00E+00 | -4.79E-04 |
| GWP-luluc | kg $CO_2$ eq. | 0.00E+00 | 1.45E-06 | 1.76E-05 | 0.00E+00 | 5.18E-04 |
| ODP | kg CFC 11 eq. | 0.00E+00 | 6.49E-11 | 2.34E-10 | 0.00E+00 | -4.80E-09 |
| AP | mol $H^+$ eq. | 0.00E+00 | 9.73E-06 | 7.87E-05 | 0.00E+00 | -1.22E-03 |
| EP-freshwater | kg P eq. | 0.00E+00 | 2.39E-08 | 5.95E-07 | 0.00E+00 | -7.86E-06 |
| EP-marine | kg N eq. | 0.00E+00 | 3.31E-06 | 2.32E-05 | 0.00E+00 | -2.12E-04 |
| EP-terrestrial | mol N eq. | 0.00E+00 | 3.53E-05 | 2.51E-04 | 0.00E+00 | -2.31E-03 |
| POCP | kg NMVOC eq. | 0.00E+00 | 1.45E-05 | 8.85E-05 | 0.00E+00 | -1.34E-03 |
| ADP-minerals&metals* | kg Sb eq. | 0.00E+00 | 9.58E-09 | 1.01E-07 | 0.00E+00 | -1.30E-06 |
| ADP-fossil* | MJ | 0.00E+00 | 4.23E-02 | 2.36E-01 | 0.00E+00 | -1.01E+01 |
| WDP* | $m^3$ | 0.00E+00 | 1.73E-04 | 2.73E-03 | 0.00E+00 | -2.90E-01 |

## Additional mandatory and voluntary impact category indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| GWP-GHG | kg $CO_2$ eq. | 0.00E+00 | 2.99E-03 | 3.89E-02 | 0.00E+00 | -3.18E-01 |
| Particulate matter | disease inc. | 0.00E+00 | 2.37E-10 | 1.32E-09 | 0.00E+00 | -1.25E-08 |
| Ionising radiation | kBq U-235 eq | 0.00E+00 | 2.12E-05 | 2.72E-04 | 0.00E+00 | -1.12E-02 |
| Ecotoxicity, freshwater | CTUe | 0.00E+00 | 2.09E-02 | 3.06E-01 | 0.00E+00 | -2.37E+00 |
| Human toxicity, cancer | CTUh | 0.00E+00 | 1.35E-12 | 2.39E-11 | 0.00E+00 | -1.26E-10 |
| Human toxicity, non-cancer | CTUh | 0.00E+00 | 2.98E-11 | 6.82E-10 | 0.00E+00 | -1.45E-09 |
| Land Use | Pt | 0.00E+00 | 2.52E-02 | 1.34E-01 | 0.00E+00 | -3.01E+00 |

## Resource use indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| PERE | MJ | 0.00E+00 | 6.57E-04 | 1.09E-02 | 0.00E+00 | -7.47E-01 |
| PERM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ | 0.00E+00 | 6.57E-04 | 1.09E-02 | 0.00E+00 | -7.47E-01 |
| PENRE | MJ | 0.00E+00 | 4.50E-02 | 2.52E-01 | 0.00E+00 | -1.09E+01 |
| PENRM | MJ | 0.00E+00 | 0.00E+00 | -1.08E+00 | 0.00E+00 | 0.00E+00 |
| PENRT | MJ | 0.00E+00 | 4.50E-02 | -8.24E-01 | 0.00E+00 | -1.09E+01 |
| SM | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | $m^3$ | 0.00E+00 | 5.65E-05 | 9.03E-05 | 0.00E+00 | -3.98E-03 |

### Waste indicators

| Indicator | Unit | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|
| Hazardous waste disposed | kg | 0.00E+00 | 2.69E-07 | 2.04E-06 | 0.00E+00 | 5.26E-06 |
| Non-hazardous waste disposed | kg | 0.00E+00 | 2.07E-03 | 9.20E-03 | 0.00E+00 | -1.12E-02 |
| Radioactive waste disposed | kg | 0.00E+00 | 1.37E-08 | 1.87E-07 | 0.00E+00 | -8.83E-06 |

### Output flow indicators

| Indicator | Unit | 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 |
| Material for recycling | kg | 0.00E+00 | 0.00E+00 | 1.98E-01 | 0.00E+00 | 0.00E+00 |
| Materials for energy recovery | kg | 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 |
| Exported energy, thermal | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

## Abbreviations

| Abbreviation | Definition |
|---|---|
| **EN** | European Norm (Standard) |
| **EPD** | Environmental Product Declaration |
| **EF** | Environmental Footprint |
| **GPI** | General Programme Instructions |
| **ISO** | International Organization for Standardization |
| **LCA** | Life Cycle Assessment |
| **PCR** | Product Category Rules |
| **ETIM** | European Technical Information Model |
| **CEN** | European Committee for Standardization |
| **PP** | Polypropylene |
| **ABS** | Acrylonitrile Butadiene Styrene |
| **HDPE** | High-Density Polyethylene |
| **PE** | Polyethylene |
| **Pb** | Lead *(as SVHC in brass)* |
| **SVHC** | Substances of Very High Concern (REACH) |
| **DK** | Denmark |
| **HU** | Hungary |
| **NL** | Netherlands |
| **ICS** | Indoor Climate Solutions |
| **UCR** | Urban Climate Resilience |

# References

General Programme Instructions of the International EPD® System. Version 5.0.1.

ISO 14040: Environmental management - Life cycle assessment – Principles and Framework, International Organization for Standardization, ISO14040:2006.

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LCA report Wavin Hammel – Sentio/ACH9000

# Version History

**Original Version of the EPD, 2026-03-10**

**Revision 1, 2026-03-16**
Differences versus the previously published version: Editorial Changes made

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