# ENVIRONMENTAL PRODUCT DECLARATION

## IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Precast Concrete Manholes - Nedstigningsbrunn - Norvatek


**EPD HUB, HUB-6332**
Published on 16.05.2026, last updated on 16.05.2026, valid until 16.05.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

# GENERAL INFORMATION

## MANUFACTURER

| | |
|---|---|
| Manufacturer | Nordiska VA Teknik AB |
| Address | Orrekulla Industrigata 27 SE-425 36 Hisings Kärra Sweden |
| Contact details | info@norvatek.se |
| Website | www.norvatek.se |

## 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<br>EN 16757 Product Category Rules for concrete and concrete elements. |
| Sector | Construction product |
| Category of EPD | Third party verified EPD |
| Parent EPD number | - |
| Scope of the EPD | Cradle to gate with options, A4-B1, and modules C1-C4, D |
| EPD author | Therese Löwenberg, Nordiska VA Teknik AB |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025:<br>☐ Internal verification ☑ External verification |
| EPD verifier | Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub |

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has sole ownership and liability, and EPDs from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 or if they are not compared within a building context.

## PRODUCT

| | |
|---|---|
| Product name | Precast Concrete Manholes - Nedstigningsbrunn - Norvatek |
| Additional labels | Precast concrete manhole components, including base units, shaft rings, and cover slabs used in wastewater and stormwater infrastructure. |
| Product reference | - |
| Place(s) of raw material origin | Europe |
| Place of production | Sweden - Ronneby |
| Place(s) of installation and use | Europe |
| Period for data | Calendar year 2024 |
| Averaging in EPD | Multiple products |
| Variation in GWP-fossil for A1-A3 (%) | -4% - +4% |
| GTIN (Global Trade Item Number) | - |
| NOBB (Norwegian Building Product Database) | - |
| A1-A3 Specific data (%) | 92,4% |

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| **Declared unit** | 1 ton of Concrete Manhole |
| **Declared unit mass** | 1000 kg |
| **Mass of packaging** | 1,43 kg |
| **GWP-fossil, A1-A3 ($kgCO_2e$)** | 159 |
| **GWP-total, A1-A3 ($kgCO_2e$)** | 157 |
| **Secondary material, inputs (%)** | 3,36 |
| **Secondary material, outputs (%)** | 93,7 |
| **Total energy use, A1-A3 (kWh)** | 506 |
| **Net freshwater use, A1-A3 ($m^3$)** | 1,95 |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

Norvatek is a Nordic supplier of pumping stations and water infrastructure solutions for water and wastewater applications. The company supports infrastructure projects from early design and engineering to delivery of prefabricated technical systems.

The product portfolio includes prefabricated pumping stations with concrete structures, pressure boosting stations, stormwater pumping stations and other technical installations used in municipal water infrastructure. Pumping systems are configured according to project-specific hydraulic and technical requirements. As an independent supplier, Norvatek is not tied to a specific pump manufacturer, allowing flexibility in pump selection.

Production takes place at the company's manufacturing facility in Ronneby, Sweden. Prefabrication allows controlled production conditions, consistent product quality and efficient installation at construction sites. The company's head office is located in Gothenburg. Norvatek is part of the Uniwater Group, a Nordic group of companies specializing in water and wastewater technology.

Norvatek's management system is third-party certified in accordance with ISO 9001 for quality management and ISO 14001 for environmental management.14001 (environmental management).

## PRODUCT DESCRIPTION

The declared product consists of precast concrete manhole components manufactured by Nordiska VA Teknik AB (Norvatek), including shaft rings, base units and cover slabs, used for underground water and wastewater infrastructure.

The components are manufactured in standard diameters of Ø1600, Ø2000, Ø2500 and Ø3000, which represent the most commonly applied sizes in typical installations. These diameters define the main geometric variation of the product range and are therefore central to the representativeness of the study.

The declared product is based on a representative selection of these components. For each component type, the most commonly produced variant based on sales volume has been selected within the relevant diameter range.

The primary variation within the product group is related to geometry (diameter, height and wall thickness), which influences the mass of the

components. As the components are manufactured using the same materials and production processes, the environmental impacts are mainly driven by the mass of concrete and reinforcement used.

The components are designed for municipal and industrial applications such as pump stations, wet wells, valve chambers and manholes, and are designed to withstand soil and traffic loads with a reference service life of 100 years.

They fulfil functional requirements according to VAV P45 and are type-tested in accordance with SS-EN 1917 and SS 22 70 01.

The concrete complies with EN 206:2013+A2:2021 and SS 137003:2021+T1:2024.
The components are made of C45/55 concrete (CEM II/A-V, aggregates, water and admixtures) with a density of approximately 2300 kg/m³.

The concrete is designed in accordance with EN 206:2013+A2:2021 to meet relevant exposure classes, including XC4, XD3, XS3, XF4 and XA2, depending on environmental conditions and specific application.

The components are delivered as prefabricated units ready for installation, with a modular design allowing adaptation to project-specific requirements. The products do not contain SVHC substances above 0.1% by weight.

Further information can be found at:
www.norvatek.se

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|---|---|---|
| Metals | 4,7 | EU |
| Minerals | 95,3 | EU |
| Fossil materials | 0% | - |
| Bio-based materials | 0% | - |

## 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 | 0,67 |

## FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|---|---|
| Declared unit | 1 ton of Concrete Manhole |
| Mass per declared unit | 1000 kg |
| Functional unit | - |
| Reference service life | 100 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 | x | ND | ND | ND | ND | ND | ND | 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 | Recovery | Recycling |

*Not declared = ND.*

## MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity utilized in the factory.

Raw materials such as aggregates, cement, reinforcement steel and chemical admixtures are supplied by external producers and transported primarily by road using EURO 6 lorries, with most materials sourced locally or regionally. Transport distances are based on supplier-specific data and represent actual delivery distances to the manufacturing site.

Process water is obtained from the local water supply. At the facility, materials are stored separately, dosed according to defined mix designs and mixed to achieve the required properties. Reinforcement is placed in reusable steel molds, after which concrete is cast and compacted.

Following curing, the elements are demoulded, inspected and approved through internal quality control. Minor surface finishing may be performed if required. Finished products are stored on-site prior to delivery.

Production losses are based on measured data from the manufacturing site and are estimated at approximately 1% of total production. The resulting concrete waste is modelled as recycling in accordance with the applied LCA datasets.

Production and internal logistics use electricity and diesel-powered equipment. In accordance with EN 15804 and the applied database methodology, a locatio-based electricity mix is applied in the LCA modelling.

Packaging and ancillary materials are limited. Wooden pallets are used for transport and are reused multiple times. Ancillary materials include form oil and process water.

Manufacturing waste is based on primary data and modelled as recycling of concrete waste. Transport of manufacturing waste is carried out by lorry to a nearby waste treatment facility, based on typical local waste handling practices.

## 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.

Transport of the components is carried out by truck from the production facility in Ronneby, Sweden, to the construction site. An average transport distance of 300 km (one way) is assumed based on delivery data.
Transport is modelled as freight transport by lorry with high load utilization.
At the construction site, the prefabricated elements are unloaded and installed using a mobile or truck-mounted crane. The components are delivered ready for installation and require no additional processing or materials on site.
Installation energy use is based on diesel consumption for construction machinery and is estimated at approximately 10 kWh per tonne of installed product, representing lifting and placement operations.
Wooden pallets are used for transport and are reused multiple times. At end of life, pallets are treated as wood packaging waste according to a European average scenario. The waste treatment is modelled using a generic dataset, where approximately 32% is recycled, 30% is incinerated with energy recovery and 38% is disposed of as landfill.


The packaging waste is assumed to be collected and transported to a waste treatment facility by lorry, with an average transport distance of approximately 50 km.
Installation does not include ancillary components such as sealing rings, which are installed separately and are not part of the declared product.
No significant waste or material losses are assumed during installation.

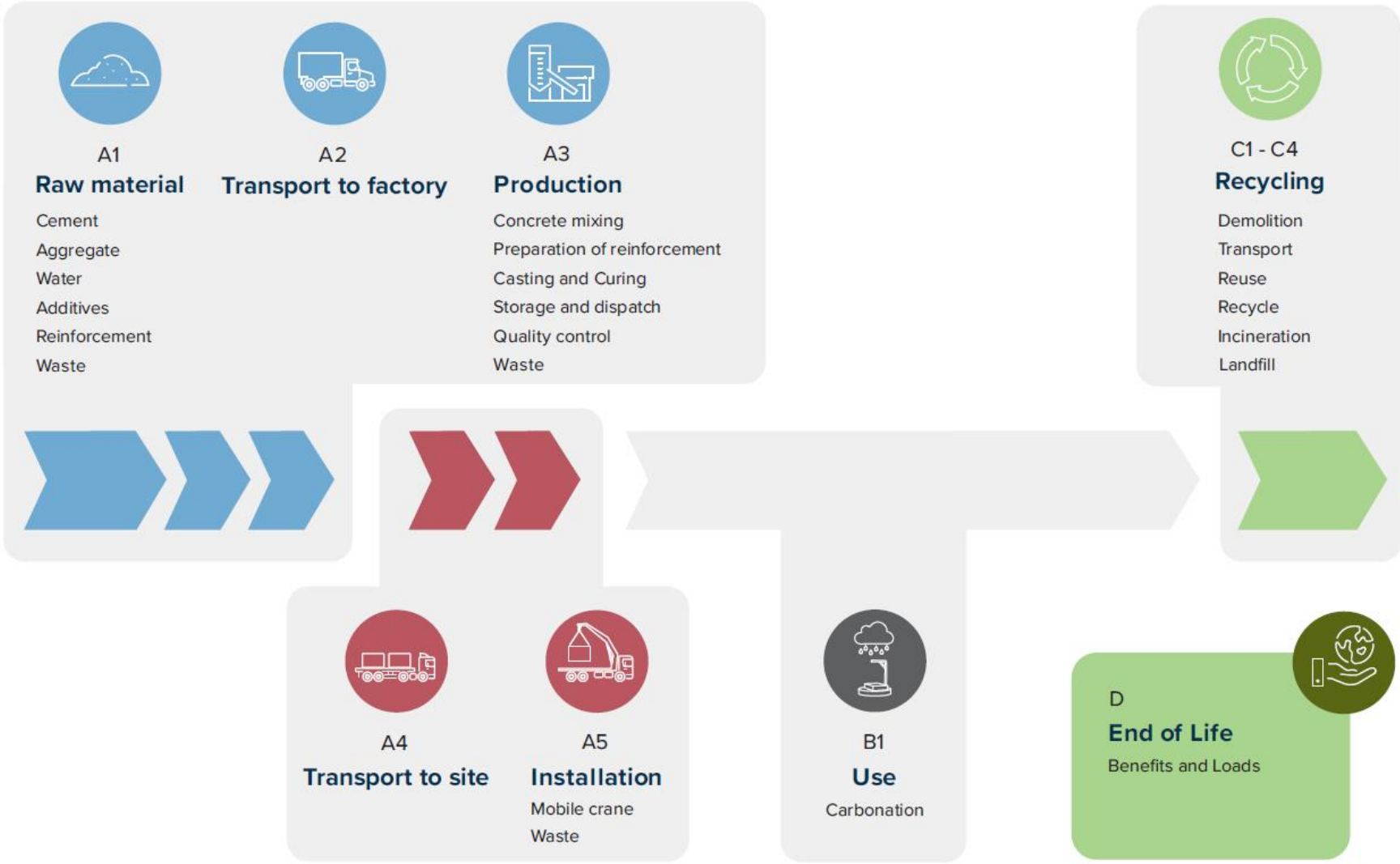
## PRODUCT USE AND MAINTENANCE (B1-B7)

Carbonation of the concrete components during the use stage (B1) is included in the assessment. The modelling is carried out in accordance with EN 16757, Annex BB.
The components are used as underground structures in water and wastewater systems and do not require maintenance, repair, replacement or refurbishment during reference service life. Therefore, modules B2–B5 are not considered. Modules B6 and B7 are not relevant, as the components do not require operational energy or water during use.
Carbonation is calculated for the declared unit over a reference service life of 100 years.
Air, soil, and water impacts during the use phase have not been studied.

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

The end-of-life stage includes demolition, transport, waste processing and disposal of the product. Concrete components are assumed to be demolished using conventional machinery, with energy use modelled as diesel consumption.
The demolished material is transported to waste treatment facilities by lorry. Transport distances are based on the assumptions applied in the LCA model, including approximately 30 km for demolition activities, 50 km for concrete waste transport and up to 250 km for steel recycling flows.
At the waste treatment stage, concrete and reinforcement steel are separated and directed to appropriate treatment routes. The mineral fraction is crushed and processed for reuse as secondary aggregate, while reinforcement steel is recovered and sent to recycling.
Based on European statistics for construction and demolition waste (European Environment Agency, 2020/2024), approximately 93.6% of the concrete is directed to recycling (C3) and 6.4% is disposed of as inert landfill (C4). Reinforcement steel is assumed to be recycled at a rate of 95%, with 5% losses sent to disposal.
The recycled concrete is assumed to substitute natural aggregates in future applications, as modelled in the applied LCA datasets.
The scenarios applied are based on European datasets and are considered representative of one of the most likely end-of-life scenarios. In accordance with the cut-off approach defined in EN 15804+A2, recycled content and recycling processes are attributed to the previous life cycle. Therefore, no additional Module D benefits are reported for reinforcement steel, in line with the applied LCA model and supplier-specific EPD data.

# MANUFACTURING PROCESS



# 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.

Minor ancillary components used in the production and installation of the concrete elements have been excluded from the LCA model. These include lifting anchors, plastic spacers and reinforcement binding wire. A screening of the product composition shows that the combined mass of these components represents well below 1% of the declared unit (1 tonne of product). The exclusions therefore comply with the cut-off criteria defined in EN 15804+A2, where individual flows below 1% may be omitted provided that the total excluded flows remain below 5%.

## 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.

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 A1–A3 has been identified.
A contribution analysis shows that the discrepancy originates from the background environmental profile of the dataset used for Portland fly ash cement, CEM II/A-V 42.5 N (Heidelberg Materials Cement Sverige AB).
These inconsistencies are inherent to the third-party verified EPDs and background databases used and cannot be adjusted by the practitioner.

## 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 | Allocated by mass or volume |
| Ancillary materials | Allocated by mass or volume |
| Manufacturing energy and waste | Allocated by mass or volume |

Where primary data was not available, conservative assumptions and representative scenarios were applied. Transport to construction site (A4) is modelled as delivery by lorry based on typical transport distances for municipal water and wastewater infrastructure projects. Installation energy (A5) is estimated based on typical crane lifting operations for precast concrete elements. End-of-life scenarios assume demolition using construction machinery, crushing of concrete and recovery of reinforcement steel. Recycling rates are based on commonly reported European statistics for construction and demolition waste.

## PRODUCT & MANUFACTURING SITES GROUPING

| | |
|---|---|
| Type of grouping | Multiple products |
| Grouping method | Based on average results of product group - by total volume |
| Variation in GWP-fossil for A1-A3, % | -4% / +4% |

Representative products were selected for each main component category (shaft rings, base units and cover slabs) and combined using a weighted average reflecting a typical manhole configuration. The variation is based on the lowest and highest results among the representative products.
The product group includes precast concrete manhole components with varying dimensions and configurations (e.g. diameter and height), but with consistent material composition, manufacturing processes and intended application. The components included in the product group serve a common functional purpose as parts of a complete manhole system.
The average product group can be technically described as precast reinforced concrete elements with a density of approximately 2300 kg/m³, manufactured using CEM II/A-V cement in accordance with EN 197-1, based on supplier-specific EPD data.
Primary data were collected directly from the manufacturing site and represent actual materials, energy use and production processes.

As the EPD covers one manufacturer and one production site in Sweden, the geographical and technological representativeness is considered high.
The results are representative for the defined product group and typical manhole configurations included in the study. The EPD is applicable to precast concrete manhole components included in the defined product

group and manufactured using comparable materials, production processes and design principles.
The results are valid for production in Sweden and comparable geographical and technological conditions. Use of the results for significantly different product designs, production technologies or geographical contexts may not be representative.

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.4. 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‘.

EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. EN 16757 Product Category Rules for concrete and concrete elements.
EPD Hub PCR for Construction Products.
EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.
EPD Hub PCR for Construction Products.
Ecoinvent database v3.10.
European Commission and Eurostat statistics for construction and demolition waste recycling.
World Steel Association – Steel recycling rates.

# ENVIRONMENTAL IMPACT DATA

*The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.*

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP – total[1)] | kg $CO_2$e | 1,39E+02 | 1,49E+01 | 2,81E+00 | 1,57E+02 | 5,61E+01 | 6,70E+00 | -7,84E+00 | ND | ND | ND | ND | ND | ND | 3,61E+00 | 1,14E+01 | 4,92E+00 | 3,96E-01 | -8,94E+00 |
| GWP – fossil | kg $CO_2$e | 1,38E+02 | 1,49E+01 | 5,28E+00 | 1,59E+02 | 5,61E+01 | 3,65E+00 | -7,84E+00 | ND | ND | ND | ND | ND | ND | 3,60E+00 | 1,14E+01 | 4,92E+00 | 3,96E-01 | -8,92E+00 |
| GWP – biogenic | kg $CO_2$e | 5,26E-01 | 3,02E-03 | -2,48E+00 | -1,95E+00 | 3,63E-02 | 3,05E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 3,68E-04 | 2,31E-03 | -2,56E-03 | -1,26E-04 | -8,51E-03 |
| GWP – LULUC | kg $CO_2$e | 1,04E-01 | 5,40E-03 | 9,53E-03 | 1,19E-01 | 1,89E-02 | 4,44E-04 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 3,69E-04 | 4,24E-03 | 1,65E-03 | 2,26E-04 | -8,07E-03 |
| Ozone depletion pot. | kg CFC-$_{11}$e | 2,94E-07 | 2,98E-07 | 1,33E-07 | 7,25E-07 | 1,22E-06 | 5,60E-08 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 5,52E-08 | 2,14E-07 | 7,34E-08 | 1,15E-08 | -6,95E-08 |
| Acidification potential | mol $H^+$e | 2,87E-01 | 3,39E-02 | 3,54E-02 | 3,56E-01 | 1,20E-01 | 3,28E-02 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 3,25E-02 | 3,62E-02 | 4,73E-02 | 2,81E-03 | -5,45E-02 |
| EP-freshwater[2)] | kg Pe | 7,35E-03 | 1,01E-03 | 6,09E-04 | 8,96E-03 | 3,89E-03 | 1,17E-04 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 1,04E-04 | 7,84E-04 | 7,68E-04 | 3,25E-05 | -2,72E-03 |
| EP-marine | kg Ne | 1,06E-01 | 8,94E-03 | 1,47E-02 | 1,30E-01 | 2,90E-02 | 1,54E-02 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 1,51E-02 | 1,21E-02 | 1,90E-02 | 1,07E-03 | -1,29E-02 |
| EP-terrestrial | mol Ne | 1,19E+00 | 9,68E-02 | 1,55E-01 | 1,44E+00 | 3,13E-01 | 1,66E-01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 1,65E-01 | 1,32E-01 | 2,09E-01 | 1,17E-02 | -1,56E-01 |
| POCP ("smog")[3)] | kg NMVOCe | 3,14E-01 | 5,62E-02 | 5,97E-02 | 4,30E-01 | 1,91E-01 | 4,96E-02 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 4,93E-02 | 5,55E-02 | 6,23E-02 | 4,18E-03 | -4,33E-02 |
| ADP-minerals & metals[4)] | kg Sbe | 3,66E-02 | 4,83E-05 | 2,02E-05 | 3,67E-02 | 1,97E-04 | 1,42E-06 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 1,29E-06 | 3,74E-05 | 7,35E-05 | 6,29E-07 | -4,78E-05 |
| ADP-fossil resources | MJ | 1,11E+03 | 2,11E+02 | 2,72E+02 | 1,60E+03 | 7,97E+02 | 4,78E+01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 4,72E+01 | 1,61E+02 | 6,47E+01 | 9,71E+00 | -1,07E+02 |
| Water use[5)] | $m^3$e depr. | 3,15E+01 | 1,05E+00 | 5,47E+00 | 3,80E+01 | 4,23E+00 | 1,36E-01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 1,18E-01 | 7,80E-01 | 3,73E-01 | 2,80E-02 | -1,34E+01 |

*1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.*

## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate matter | Incidence | 1,93E-06 | 1,16E-06 | 9,23E-07 | 4,02E-06 | 4,20E-06 | 9,29E-07 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 9,25E-07 | 9,00E-07 | 7,80E-06 | 6,39E-08 | -8,29E-07 |
| Ionizing radiation[6] | kBq U235e | 1,87E+01 | 2,69E-01 | 1,46E+01 | 3,36E+01 | 9,63E-01 | 2,27E-02 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 2,09E-02 | 1,90E-01 | 1,38E-01 | 6,11E-03 | -7,53E-01 |
| Ecotoxicity (freshwater) | CTUe | 3,82E+02 | 2,75E+01 | 1,23E+01 | 4,22E+02 | 6,77E+02 | 2,83E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 2,60E+00 | 2,19E+01 | 1,08E+01 | 8,15E-01 | -2,56E+01 |
| Human toxicity, cancer | CTUh | 2,29E-08 | 2,50E-09 | 3,52E-09 | 2,89E-08 | 9,43E-09 | 3,94E-10 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 3,71E-10 | 1,95E-09 | 1,31E-09 | 7,30E-11 | -2,39E-09 |
| Human tox. non-cancer | CTUh | 2,91E-07 | 1,34E-07 | 4,06E-08 | 4,66E-07 | 5,02E-07 | 7,17E-09 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 5,87E-09 | 1,01E-07 | 6,81E-08 | 1,68E-09 | -6,97E-08 |
| SQP[7] | - | 5,27E+02 | 1,42E+02 | 2,70E+02 | 9,39E+02 | 4,78E+02 | 3,95E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 3,30E+00 | 9,56E+01 | 3,01E+01 | 1,91E+01 | -1,00E+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[8] | MJ | 1,59E+02 | 3,65E+00 | 3,56E+01 | 1,98E+02 | 1,31E+01 | -2,07E+01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 2,99E-01 | 2,66E+00 | 2,87E+00 | 9,38E-02 | -9,75E+00 |
| Renew. PER as material | MJ | 1,77E-01 | 0,00E+00 | 2,17E+01 | 2,19E+01 | 0,00E+00 | -2,17E+01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | -5,27E-02 | -1,23E-01 | 0,00E+00 |
| Total use of renew. PER | MJ | 1,59E+02 | 3,65E+00 | 5,73E+01 | 2,20E+02 | 1,31E+01 | -4,24E+01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 2,99E-01 | 2,66E+00 | 2,81E+00 | -2,91E-02 | -9,75E+00 |
| Non-re. PER as energy | MJ | 7,93E+02 | 2,11E+02 | 2,43E+02 | 1,25E+03 | 7,97E+02 | 4,78E+01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 4,72E+01 | 1,61E+02 | 6,47E+01 | 9,71E+00 | -1,07E+02 |
| Non-re. PER as material | MJ | 8,76E+00 | 0,00E+00 | 1,35E+00 | 1,01E+01 | 0,00E+00 | -1,43E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | -2,60E+00 | -6,07E+00 | 0,00E+00 |
| Total use of non-re. PER | MJ | 8,01E+02 | 2,11E+02 | 2,45E+02 | 1,26E+03 | 7,97E+02 | 4,64E+01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 4,72E+01 | 1,61E+02 | 6,21E+01 | 3,64E+00 | -1,07E+02 |
| Secondary materials | kg | 3,36E+01 | 9,69E-02 | 1,07E-01 | 3,38E+01 | 3,61E-01 | 2,00E-02 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 1,96E-02 | 7,33E-02 | 3,79E-02 | 2,44E-03 | -1,19E-01 |
| Renew. secondary fuels | MJ | 1,53E+02 | 1,22E-03 | 7,32E-01 | 1,54E+02 | 4,74E-03 | 5,59E-05 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 5,12E-05 | 9,26E-04 | 8,29E-04 | 5,05E-05 | -8,24E-04 |
| Non-ren. secondary fuels | MJ | 2,24E+02 | 0,00E+00 | 0,00E+00 | 2,24E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of net fresh water | $m^3$ | 1,82E+00 | 2,92E-02 | 1,04E-01 | 1,95E+00 | 9,75E-02 | 1,31E-03 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 3,12E-03 | 2,15E-02 | 1,06E-02 | 1,01E-02 | -3,17E-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 | 5,72E+00 | 3,07E-01 | 1,77E-01 | 6,20E+00 | 1,16E+00 | 5,69E-02 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 5,25E-02 | 2,40E-01 | 1,46E-01 | 1,07E-02 | -8,36E-01 |
| Non-hazardous waste | kg | 4,28E+01 | 6,42E+00 | 2,85E+01 | 7,77E+01 | 2,48E+01 | 3,89E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 7,15E-01 | 4,94E+00 | 4,00E+00 | 2,45E-01 | -1,49E+01 |
| Radioactive waste | kg | 1,01E-02 | 6,69E-05 | 3,13E-03 | 1,33E-02 | 2,37E-04 | 5,58E-06 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 5,12E-06 | 4,72E-05 | 3,52E-05 | 1,49E-06 | -1,81E-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 | 0,00E+00 | 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 | 4,78E+00 | 0,00E+00 | 2,50E+01 | 2,98E+01 | 0,00E+00 | 4,58E-01 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 9,37E+02 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec | kg | 2,84E-02 | 0,00E+00 | 0,00E+00 | 2,84E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy | MJ | 9,01E-03 | 0,00E+00 | 0,00E+00 | 9,01E-03 | 0,00E+00 | 2,27E+00 | 0,00E+00 | 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 | 9,58E-01 | 0,00E+00 | 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 | 1,32E+00 | 0,00E+00 | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

## ADDITIONAL INDICATOR – GWP-GHG

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP-GHG[9)] | kg $CO_2e$ | 1,39E+02 | 1,49E+01 | 4,91E+00 | 1,58E+02 | 5,61E+01 | 3,65E+00 | -7,84E+00 | ND | ND | ND | ND | ND | ND | 3,61E+00 | 1,14E+01 | 4,92E+00 | 3,96E-01 | -8,93E+00 |

*9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero*

# SCENARIO DOCUMENTATION

# DATA SOURCES

### Manufacturing energy scenario documentation

1. Diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO2e/MJ
2. Diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO2e/MJ
3. Diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO2e/MJ
4. Electricity, medium voltage, residual mix, Sweden, Ecoinvent, 0.0512 kgCO2e/kWh
5. Electricity, medium voltage, residual mix, Sweden, Ecoinvent, 0.0512 kgCO2e/kWh
6. Electricity, medium voltage, residual mix, Sweden, Ecoinvent, 0.0512 kgCO2e/kWh

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

1. Market for transport, freight, lorry, 16-32 metric tons, diesel, EURO 6, 300 km

### Transport scenario documentation A4

1. Market for transport, freight, lorry, 16-32 metric tons, diesel, EURO 6, 300 km

| Scenario parameter | Value |
|---|---|
| Capacity utilization (including empty return) % | 50% |
| Bulk density of transported products | 2,28E+03 |
| Volume capacity utilization factor | 1 |

### Installation scenario documentation - A5

| Scenario information | Value |
|---|---|
| Energy: type and consumption (MJ or kWh) | Diesel, burned in building machine, Ecoinvent, 10.0 kWh |
| Water use / $m^3$ | - |
| Ancillary materials: type and mass (kg) | - |
| Waste materials: type and mass (kg) | 1,43 kg wood packaging material |
| Waste materials: output routes | Wood packaging waste: 32% recycling, 30% incineration with energy recovery, 38% landfill |
| Direct emissions (kg) | - |

**End-of-life scenario documentation - C1-C4**

| Scenario information | Value |
|---|---|
| Collection process – kg collected separately | Concrete: 953 kg<br>Rebar reinforcement steel: 43,7 kg |
| Collection process – kg collected with mixed construction waste | - |
| Recovery: re-use (kg) | 0 |
| Recovery: recycling (kg) | 937 kg |
| Disposal – kg | - |
| Recovery: energy recovery (kg) | - |
| Scenario assumptions e.g. transportation (mode, km) & other | Diesel, burned in building machine, Ecoinvent, 10.0 kWh Transport by lorry: - Demolition activities: 30 km - Concrete waste to recycling/landfill: 50 km - Steel waste to recycling: up to 250 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 the 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 the 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

Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub Limited
16.05.2026