# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH
EN 15804+A2+AC,
ISO 14025

## GEBERIT MAPRESS STAINLESS STEEL FITTING

Geberit International AG




**EPD HUB, HUB-6984**

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Created with One Click LCA

The Life Cycle Assessment has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24.03.2025) and JRC characterisation factors EF 3.1.

KNOW HOW INSTALLED

# GENERAL INFORMATION

## MANUFACTURER

| | |
|---|---|
| Manufacturer | Geberit International AG |
| Address | Schachenstrasse 77, 8645 Jona, Switzerland |
| Contact details | sustainability@geberit.com |
| Website | www.geberit.com |

## EPD STANDARDS, SCOPE AND VERIFICATION

| | |
|---|---|
| Programme operator | EPD Hub, hub@epdhub.com |
| Reference standards | EN 15804:2012+A2:2019/AC:2021<br>ISO 14025 |
| PCR | EPD Hub Core PCR Version 1.2, 24 March 2025 |
| Sector | Construction product |
| Category of EPD | Third-party-verified EPD |
| Scope of the EPD | Cradle to gate with options, A4-A5, and modules C1-C4 and D |
| EPD author | Geberit International AG, Corporate Sustainability |
| EPD verification | Independent verification of this EPD and data according to ISO 14025<br>☐ Internal certification ☑ External verification |
| EPD verifier | Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited |

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer retains the sole ownership of, liability and responsibility for the EPD. EPDs within the same product category but from different programmes 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 | Geberit Mapress Stainless Steel fitting |
| Additional labels | - |
| Product reference | 30104 |
| Place(s) of raw material origin | Europe |
| Place of production | Langenfeld, Germany |
| Place(s) of installation and use | Europe |
| Period for data | 01.01.2024 – 31.12.2024 |
| Averaging in EPD | Multiple products |
| Variation in GWP-fossil for A1-A3 (%) | 9 |
| A1-A3 Specific data (%) | 98,4 |

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| Declared unit | 1 kg Geberit Mapress Stainless Steel fitting |
| Declared unit mass (kg) | 1 |
| Mass of packaging (kg) | 0,028 |
| GWP-fossil, A1-A3 ($kgCO_2e$) | 11,2 |
| GWP-total, A1-A3 ($kgCO_2e$) | 11,3 |
| Secondary material, inputs (%) | 78,9 |
| Total energy use, A1-A3 (kWh) | 44,9 |
| Total water use, A1-A3 ($m^3$) | 0,11 |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

Geberit aims to play a leading role in the transition towards a sustainable sanitary industry. Sustainability has formed an integral component of the corporate strategy for more than 30 years. The Geberit Group has a group ISO certificate in accordance with ISO 9001 (quality), ISO 14001 (environment) and ISO 45001 (occupational health and safety). The company has prepared life cycle assessments for key products from an early stage, and eco-design has been an integral part of the product development process since 2007.

You can find comprehensive information on sustainability in the current annual report or at www.geberit.com/company/sustainability

## PRODUCT DESCRIPTION

Geberit Mapress stainless steel fittings are components of the Geberit Mapress supply system used for building services and industrial installations. The declaration covers Geberit Mapress stainless steel fittings made of austenitic or ferritic stainless steel with elastomer sealing rings. The fittings are available in different geometries, connection types, and nominal diameters.

Geberit Mapress stainless steel fittings are used in combination with Mapress stainless steel pipes, where pipes and fittings are connected by pressing to form permanent, leakproof joints. The system is characterised by high mechanical strength, reliability and excellent corrosion resistance. Geberit Mapress stainless steel fittings are available in nominal diameters DN 10-100. The product range includes different geometries such as straight connectors, bends, reducers, tees and adapters to other system components. Fittings with threaded and/or pressing ends are used to connect to various connections.

Geberit Mapress stainless steel is suitable for a wide range of applications in building services, industry and technical installations, including cooling water (with and without antifreeze agents), treated water, compressed air, industrial gases, negative pressure systems, remote heating up to 120 °C, natural gases, liquefied gases, biogases, thermal media and mineral and lubricating oils. The fittings are designed for long-term use under typical operating conditions in building installations. With proper use, a service life of 50 years can be assumed.

Geberit Mapress stainless steel fittings are intended for use in residential, commercial, industrial, and public buildings as well as in industrial and technical applications. Installation is carried out using pressing tools specifically matched to the Mapress system, ensuring safe and reproducible connections. To ensure system performance and compatibility, Geberit offers a complete system of pipes, fittings, valves and installation components as well as dedicated tools for cutting, deburring and pressing. Planning support is provided by digital design tools that allow consideration of applicable standards and regulations.

A Geberit Mapress stainless steel fitting (art. no. 30104) is used as the reference product. The environmental impacts declared in this EPD are based on this reference product and are considered representative for all product variants within the defined scope. This EPD applies a reference product–based grouping approach. The product variants included differ primarily in geometry, including diameter, connection types, number of connections and angles. These geometric differences lead to variations in the relative share of the constituting materials (stainless steel and elastomer sealing rings) as well as packaging materials, resulting in differences in material composition per declared unit. All products included fulfil the same function and are manufactured using comparable materials, production technology, and the same manufacturing site. The declared results are therefore considered representative of the defined product group within this variation range. The product description is consistent with the underlying LCA project report.

Further information is available in the local online product catalogue.

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|---|---|---|
| Metals | 98 | Europe |
| Minerals | 0 | - |
| Fossil materials | 2 | Europe |
| 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 |

## FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|---|---|
| Declared unit | 1 kg Geberit Mapress Stainless Steel fitting |
| Mass per declared unit | 1 kg |
| Functional unit | - |
| Reference service life | 50 years |

## REACH – SUBSTANCES OF VERY HIGH CONCERN (SVHC)

The product does not contain any REACH SVHC substances in amounts greater than 0.1 % (1,000 ppm).

# PRODUCT LIFE CYCLE

## SYSTEM BOUNDARY

This EPD covers the life cycle modules listed in the following table.

| Product stage | | | Construction stage | | Use stage | | | | | | | End-of-life stage | | | | Beyond 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 | | |
| Raw materials | Transport | Manufacturing | Transport | Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstr./demol. | Transport | Waste processing | Disposal | Reuse | Recovery | Recycling |

*ND = Not declared.*

## MANUFACTURING AND PACKAGING (A1-A3)

The environmental impact taken into consideration for the product stage covers the manufacturing of raw materials used in production as well as packaging materials and other ancillary materials. The energy used by machines, and handling of waste formed in the production processes at the manufacturing facilities are also included in this stage. Furthermore, the study takes into consideration 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 utilised in the factory.

The Geberit Mapress Stainless Steel fitting is made of stainless steel and O-rings. Further information on supply chain sustainability and material procurement can be found in the Geberit Annual Report.

Transport from suppliers to Geberit is modelled based on material-specific transport distances. The individual transport distances of each supplier are averaged according to the corresponding purchased amounts. All A2 transports are carried out by lorry. Transport by rail, air and sea freight is not taken into consideration due to lack of relevance.

Production takes place at the production site in Langenfeld, Germany. The Geberit plant is certified according to ISO 9001, ISO 14001 and ISO 45001. The current Group ISO certificate can be downloaded from https://www.geberit.com.

Material- and production-related losses are included. Manufacturing waste is collected and recycled externally. Manufacturing waste is transported to the closest waste disposal facilities by lorry, estimated to be 50 km away.

The production and provision of packaging material are modelled in A3. The finished product is packaged with protection plugs, plastic bag and cardboard. Protection plugs are produced in Geberit plant Pottenbrunn, Austria. Other packaging materials fall under the cut-off rules.

## TRANSPORT AND INSTALLATION (A4-A5)

Transportation impact resulting from final product delivery to construction site (A4) covers direct fuel exhaust emissions and environmental impacts of fuel production, as well as related infrastructure emissions.

Transport from Geberit to customers within Europe is carried out by logistics partners via the modern, efficient Logistics Centre in Pfullendorf, Germany, which is certified according to ISO 9001, ISO 14001 and ISO 45001. Distribution to countries outside Europe is not taken into consideration due to lack of relevance.

The following information has been taken into consideration:

- Most transport within Europe is carried out by lorry, so intercontinental transport by sea and air is not taken into consideration.
- Most of the vehicles in use are > 32 t, Euro 6 class (> 85 %).
- The average transport distance in Europe from the production site to the Logistics Centre and to the customer is approximately 600 km.

Further information on logistics can be found in the Geberit Annual Report.

In A5, there is no relevant environmental impact during installation. Installation is carried out by a professional plumber. Detailed installation information is available. Therefore, only the preparation for waste treatment of packaging materials is included in A5. Plastic, cardboard and paper are assumed to be partly incinerated, recycled and landfilled, according to Eurostat.

## PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impact during the use phase has not been studied.
The product does not consume any electricity in use. Periodic maintenance is not necessary. Under conditions normally encountered in water supply pipes and fittings in buildings, Geberit Mapress Stainless Steel fittings have a service life of at least 50 years (in accordance with EN 806-2).

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

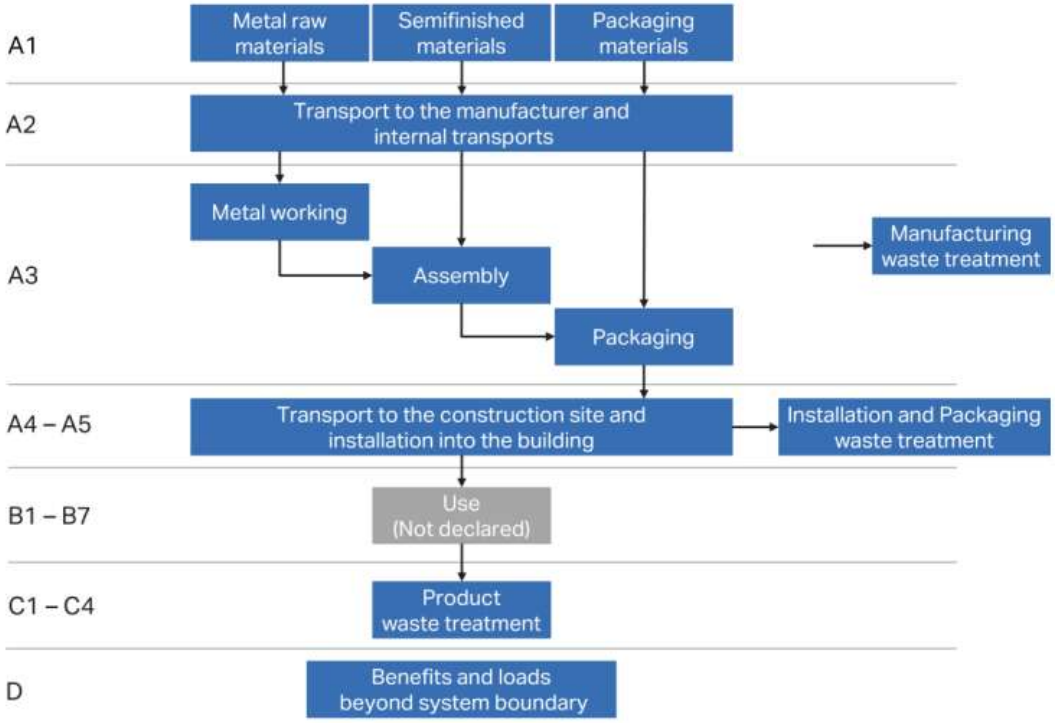
As the consumption of energy and natural resources for disassembling the product at its end-of-life is negligible, the impact of demolition is assumed to be zero (C1). The product reaches its end-of-life when the building is demolished or the installation dismantled. The place of end-of-life is assumed to be the same as the place of installation (Europe).

It is assumed that all waste is collected and professionally separated after demolition at the construction site. The end-of-life product is transported by lorry to the closest waste disposal facilities, which is assumed to be 500 km for recycling, 150 km for incineration and 50 km for disposal (C2).

The type of waste treatment is determined based on the material class. Plastics are disposed of in a municipal waste incineration plant. Although these components are in principle suitable for recycling due to their material properties, they are conservatively modelled with thermal energy recovery (C3). Metals are assumed to be 95 % recycled (C3), with the remaining 5 % going to landfill (C4). The product is not biodegradable.

In Module D, benefits and loads beyond the system boundary are considered for material recycling and energy recovery at the end-of-life of the product (Modules C1–C4) and of packaging waste generated in Module A5. Energy recovery from incineration of plastic components is modelled based on their lower heating value and an energy recovery rate as implemented in the applied waste treatment background datasets. The recovered electricity and heat are assumed to substitute average European electricity (medium voltage) and European district or industrial heat production other than natural gas. Recycled metal components are assumed to substitute primary metal production. Substitution is modelled on a mass-based equivalence using European reference datasets representing a contemporary European reference situation.

# MANUFACTURING PROCESS



# LIFE CYCLE ASSESSMENT

## CUT-OFF CRITERIA

The study does not exclude any modules or processes that are stated as 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 are included in the calculation. There is no neglected unit process with 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 use 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 characterisation 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 made as per the reference standards and the applied PCR. In this study, allocations have been made in the following ways:

| Data type | Allocation |
|---|---|
| Raw materials | No allocation |
| Packaging materials | No allocation |
| Ancillary materials | Not applicable |
| Manufacturing energy and waste | Physical Properties |

A4: Transport distance represents a conservative average. The transport distance for distribution was calculated as a sales-volume based weighted average according to the percentage ratios for each destination point.

C2: Transport distance to waste handling facility is estimated for Recycling 500km, Incineration 150km, Landfill 50km and the transport method is assumed as lorry.

C3, C4, D: The recycled end-of-life materials are assumed to serve as secondary raw materials in manufacturing, while the incinerated materials partly displace electricity and heat production.

## PRODUCT & MANUFACTURING SITES GROUPING

| | |
|---|---|
| Type of grouping | Multiple products |
| Grouping method | Based on a representative product |
| Variation in GWP-fossil for A1-A3, % | 9 |

This EPD applies a grouping type “Multiple products”, as several highly similar articles are included. The applied grouping method is a reference product–based functional grouping. A Geberit Mapress stainless steel fitting (art. no. 30104), a 90° bend with a diameter of 22 mm, is defined as the reference product.

The reference product represents all Geberit Mapress stainless steel fittings with:

- the same technical function (connection of Mapress stainless steel pipes and adaptation to other system components),
- comparable material composition based on stainless steel (austenitic or ferritic) with additional elastomer sealing rings and packaging materials,
- identical manufacturing process at a single manufacturing site.

Product variants within the group differ primarily in geometry, including nominal diameter, connection types, number of connections and angles. These variations result in differences in material composition per declared unit. Environmental impacts for other product variants are calculated using product-specific material composition data.

The average product group is technically characterised by stainless steel press fittings with high mechanical strength, reliability and corrosion resistance; environmental impacts are primarily driven by material composition per declared unit, while technical and functional properties remain identical across the product range.

Due to the applied grouping and averaging approach, this EPD is valid only for Geberit Mapress stainless steel fittings within the defined product group and configuration boundaries and shall not be used for products made of different materials, production technologies, or manufacturing sites. The declared results are considered representative for the product group, as all included products fulfil the same technical function and are manufactured using similar materials and processes at the same site. The declared results are valid for products manufactured at the declared production site in Europe and are not representative for products manufactured outside this geographical scope or under different energy supply and production conditions.

A calculation was performed for minimum and maximum product variants. The resulting GWP-fossil values for A1–A3 show a maximum variation of 9 % compared to the reference product, caused by differences in the shares of constituent materials resulting from geometric variation.

To calculate results for the reference product per item, the following scaling applies:

Article GWP-fossil per item = GWP-fossil/kg * specific weight per item

The specific weight per item can be found in technical datasheets available in local online product catalogues. To calculate results for other product variants per item, scaling can be performed similarly.

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.3. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'. EN 806-2 was used as an additional reference for the reference service life. Eurostat statistics have been applied to some waste treatment scenarios.

# 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[1]–total | kg $CO_2$e | 8,59E+00 | 1,65E-02 | 2,70E+00 | 1,13E+01 | 6,40E-02 | 4,00E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,98E-02 | 1,15E-01 | 3,07E-04 | -3,53E-01 |
| GWP–fossil | kg $CO_2$e | 8,52E+00 | 1,65E-02 | 2,70E+00 | 1,12E+01 | 6,39E-02 | 3,85E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,97E-02 | 1,15E-01 | 3,06E-04 | -3,52E-01 |
| GWP–biogenic | kg $CO_2$e | 6,11E-02 | 3,61E-06 | -1,03E-03 | 6,01E-02 | 1,40E-05 | 1,50E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,74E-05 | -6,39E-06 | -9,75E-08 | -3,98E-04 |
| GWP–luluc[2] | kg $CO_2$e | 8,89E-03 | 6,44E-06 | 3,96E-04 | 9,29E-03 | 2,49E-05 | 1,79E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,98E-05 | 6,26E-06 | 1,75E-07 | -3,93E-04 |
| Ozone depletion pot. | kg $CFC_{-11}$e | 8,05E-08 | 3,45E-10 | 3,58E-08 | 1,17E-07 | 1,33E-09 | 4,70E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,96E-09 | 9,13E-10 | 8,88E-12 | -2,91E-10 |
| Acidification potential | mol $H^+$e | 4,42E-02 | 3,90E-05 | 6,14E-03 | 5,04E-02 | 1,51E-04 | 1,33E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,88E-04 | 5,36E-04 | 2,17E-06 | -1,97E-03 |
| EP[3]-freshwater | kg Pe | 8,13E-03 | 1,16E-06 | 9,55E-04 | 9,09E-03 | 4,47E-06 | 3,72E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,12E-06 | 1,84E-06 | 2,52E-08 | -4,79E-05 |
| EP-marine | kg Ne | 8,34E-03 | 1,02E-05 | 1,55E-03 | 9,90E-03 | 3,96E-05 | 7,83E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 9,70E-05 | 2,48E-04 | 8,28E-07 | -4,31E-04 |
| EP-terrestrial | mol Ne | 8,58E-02 | 1,11E-04 | 1,54E-02 | 1,01E-01 | 4,28E-04 | 5,35E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,05E-03 | 2,72E-03 | 9,05E-06 | -4,70E-03 |
| POCP[4] ('smog') | kg NMVOCe | 2,82E-02 | 6,78E-05 | 5,26E-03 | 3,35E-02 | 2,62E-04 | 1,73E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 4,37E-04 | 8,08E-04 | 3,24E-06 | -1,35E-03 |
| ADP-minerals & metals | kg Sbe | 1,81E-04 | 4,73E-08 | 2,57E-06 | 1,83E-04 | 1,83E-07 | 1,39E-08 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,09E-07 | 2,47E-08 | 4,87E-10 | -1,61E-07 |
| ADP[5]-fossil resources | MJ | 1,03E+02 | 2,48E-01 | 3,77E+01 | 1,40E+02 | 9,60E-01 | 3,39E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,27E+00 | 7,73E-01 | 7,52E-03 | -2,39E+00 |
| Water use[6] | $m^3$e depr. | 3,02E+00 | 1,27E-03 | 2,81E-01 | 3,30E+00 | 4,91E-03 | 1,20E-03 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 6,67E-03 | 4,87E-03 | 2,17E-05 | 2,40E-03 |

1) GWP = Global warming potential; 2) luluc = land use and land use change; 3) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get $PO_4$e; 4) POCP = Photochemical ozone creation potential; 5) ADP = Abiotic depletion potential; 6) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionising radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

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

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate matter | Incidence | 6,32E-07 | 1,61E-09 | 2,64E-08 | 6,60E-07 | 6,23E-09 | 2,11E-10 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,17E-09 | 1,50E-08 | 4,95E-11 | -2,62E-08 |
| Ionizing radiation[7] | kBq U235e | 7,65E-01 | 2,99E-04 | 2,27E-01 | 9,92E-01 | 1,16E-03 | 8,64E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,52E-03 | 3,71E-04 | 4,73E-06 | 6,16E-02 |
| Ecotoxicity, freshwater | CTUe | 2,68E+01 | 2,93E-02 | 4,84E+00 | 3,16E+01 | 1,13E-01 | 3,58E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,07E+00 | 1,36E-01 | 6,31E-04 | -8,29E-01 |
| Human toxicity, cancer | CTUh | 9,94E-09 | 2,75E-12 | 3,79E-10 | 1,03E-08 | 1,06E-11 | 2,26E-12 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,53E-11 | 6,65E-12 | 5,65E-14 | 3,91E-11 |
| Human tox. non-cancer | CTUh | 1,54E-07 | 1,61E-10 | 2,35E-08 | 1,77E-07 | 6,20E-10 | 8,78E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,96E-10 | 1,11E-10 | 1,30E-12 | -1,81E-09 |
| SQP[8] | - | 4,63E+01 | 2,50E-01 | 3,32E+00 | 4,99E+01 | 9,66E-01 | 2,98E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,52E-01 | 5,63E-02 | 1,48E-02 | -1,10E+00 |

7) EN 15804+A2 disclaimer for Ionising radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionising 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 ionising radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 8) SQP = Potential soil quality index

## 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[9] as energy | MJ | 2,24E+01 | 4,04E-03 | 4,66E-01 | 2,29E+01 | 1,56E-02 | -1,46E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,07E-02 | 5,32E-03 | 7,26E-05 | 1,49E-01 |
| Renew. PER as material | MJ | 0,00E+00 | 0,00E+00 | 1,28E-02 | 1,28E-02 | 0,00E+00 | -1,28E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total use of renew. PER | MJ | 2,24E+01 | 4,04E-03 | 4,79E-01 | 2,29E+01 | 1,56E-02 | -2,74E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,07E-02 | 5,32E-03 | 7,26E-05 | 1,49E-01 |
| Non-ren. PER as energy | MJ | 1,02E+02 | 2,48E-01 | 3,65E+01 | 1,39E+02 | 9,60E-01 | -1,17E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,27E+00 | 2,83E-01 | 7,52E-03 | -2,39E+00 |
| Non-ren. PER as material | MJ | 4,76E-01 | 0,00E+00 | 1,23E+00 | 1,71E+00 | 0,00E+00 | -1,23E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | -4,76E-01 | 0,00E+00 | 0,00E+00 |
| Total use of non-ren. PER | MJ | 1,03E+02 | 2,48E-01 | 3,77E+01 | 1,40E+02 | 9,60E-01 | -2,40E+00 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,27E+00 | -1,92E-01 | 7,52E-03 | -2,39E+00 |
| Secondary materials | kg | 7,89E-01 | 1,07E-04 | 5,19E-03 | 7,95E-01 | 4,15E-04 | 5,63E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,68E-04 | 3,26E-04 | 1,89E-06 | -2,33E-04 |
| Renew. secondary fuels | MJ | 3,47E-03 | 1,35E-06 | 9,62E-04 | 4,44E-03 | 5,24E-06 | 4,94E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,46E-06 | 1,11E-06 | 3,91E-08 | -1,35E-05 |
| 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 | $m^3$ | 8,68E-02 | 3,67E-05 | 2,48E-02 | 1,12E-01 | 1,42E-04 | -1,18E-05 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,54E-04 | 1,05E-04 | 7,82E-06 | 3,74E-04 |

9) PER = Primary energy resources

## END-OF-LIFE – WASTE

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste | kg | 6,96E+00 | 3,59E-04 | 2,59E-01 | 7,22E+00 | 1,39E-03 | 4,46E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,82E-03 | 2,61E-03 | 8,31E-06 | -3,86E-02 |
| Non-hazardous waste | kg | 2,97E+01 | 7,19E-03 | 5,43E+00 | 3,51E+01 | 2,78E-02 | 5,02E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,91E-02 | 3,21E-02 | 1,90E-04 | -2,32E-01 |
| Radioactive waste | kg | 1,94E-04 | 7,41E-08 | 6,83E-05 | 2,62E-04 | 2,86E-07 | 2,18E-08 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,74E-07 | 9,15E-08 | 1,15E-09 | 1,64E-05 |

## END-OF-LIFE – OUTPUT FLOWS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Components for reuse | 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 | 0,00E+00 | 0,00E+00 | 1,28E-01 | 1,28E-01 | 0,00E+00 | 1,28E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 9,33E-01 | 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 | 1,11E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 1,80E-02 | 0,00E+00 | 0,00E+00 |
| Exported energy | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,73E-01 | 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 | 7,32E-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 | 1,00E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

## ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Global warming pot. | kg $CO_2$e | 8,54E+00 | 1,64E-02 | 2,69E+00 | 1,12E+01 | 6,35E-02 | 3,86E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,92E-02 | 1,15E-01 | 3,04E-04 | -3,50E-01 |
| Ozone depletion pot. | kg $CFC_{-11}$e | 6,73E-08 | 2,74E-10 | 2,91E-08 | 9,67E-08 | 1,06E-09 | 3,80E-11 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,56E-09 | 7,24E-10 | 7,05E-12 | -3,20E-10 |
| Acidification | kg $SO_2$e | 3,66E-02 | 3,10E-05 | 4,93E-03 | 4,16E-02 | 1,20E-04 | 9,84E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,19E-04 | 3,77E-04 | 1,61E-06 | -1,60E-03 |
| Eutrophication | kg $PO_4^3$e | 5,90E-03 | 7,73E-06 | 1,92E-03 | 7,83E-03 | 2,99E-05 | 3,05E-06 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 5,72E-05 | 8,83E-05 | 5,11E-07 | -1,87E-04 |
| POCP ('smog') | kg $C_2H_4$e | 2,31E-03 | 3,16E-06 | 3,74E-04 | 2,68E-03 | 1,22E-05 | 9,85E-07 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 2,05E-05 | 2,82E-05 | 1,52E-07 | -9,11E-05 |
| ADP-elements | kg Sbe | 1,79E-04 | 4,62E-08 | 2,52E-06 | 1,82E-04 | 1,79E-07 | 1,35E-08 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,02E-07 | 2,26E-08 | 4,77E-10 | -1,53E-07 |
| ADP-fossil | MJ | 8,99E+01 | 2,43E-01 | 3,32E+01 | 1,23E+02 | 9,41E-01 | 3,24E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,25E+00 | 7,67E-01 | 7,45E-03 | -3,56E+00 |

## ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADP-elements | kg Sbe | 8,28E-07 | 4,62E-08 | 2,52E-06 | 3,39E-06 | 1,79E-07 | 8,12E-09 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 0,00E+00 | 2,26E-08 | 4,77E-10 | -1,54E-07 |
| Hazardous waste disposed | kg | 3,32E-03 | 3,59E-04 | 2,59E-01 | 2,62E-01 | 1,39E-03 | 4,46E-04 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,82E-03 | 2,61E-03 | 8,31E-06 | -3,86E-02 |
| Non-haz. waste disposed | kg | 1,76E-01 | 7,19E-03 | 5,43E+00 | 5,61E+00 | 2,78E-02 | 5,02E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 3,91E-02 | 3,21E-02 | 1,90E-04 | -2,32E-01 |
| Air pollution | $m^3$ | 1,82E+01 | 3,80E+00 | 3,41E+02 | 3,63E+02 | 1,47E+01 | 6,88E-01 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 1,67E+01 | 8,53E+00 | 6,99E-02 | -2,29E+02 |
| Water pollution | $m^3$ | 1,04E+00 | 1,36E-01 | 8,14E+01 | 8,26E+01 | 5,25E-01 | 2,03E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 7,91E-01 | 3,92E-01 | 3,82E-03 | 1,53E+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[10] | kg $CO_2$e | 8,53E+00 | 1,65E-02 | 2,70E+00 | 1,13E+01 | 6,39E-02 | 3,85E-02 | ND | ND | ND | ND | ND | ND | ND | 0,00E+00 | 8,97E-02 | 1,15E-01 | 3,07E-04 | -3,52E-01 |

10) 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 – $CH_4$ fossil, $CH_4$ 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 $CO_2$ is set to zero.

# SCENARIO DOCUMENTATION

## DATA SOURCES

**Manufacturing energy scenario documentation**

1. Electricity production, hydro, reservoir, alpine region, renewable energy products, Switzerland, Ecoinvent
2. electricity, medium voltage, residual mix, Germany, Ecoinvent
3. Heat production, natural gas, at industrial furnace >100 kW, Europe without Switzerland, Ecoinvent

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

1. Market for transport, freight, lorry >32 metric ton, EURO6, 600.0 km

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

| Scenario parameter | Value |
|---|---|
| Capacity utilization (including empty return) % | - |
| Bulk density of transported products | 514 |
| Volume capacity utilization factor | - |

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

| Scenario parameter | Value |
|---|---|
| Energy: type and consumption (MJ or kWh) | - |
| Water use ($m^3$) | - |
| Ancillary materials: type and mass (kg) | - |
| Waste materials: type and mass (kg) | Packaging waste: 29g Plastic, 1g Cardboard |
| Waste materials: output routes | Packaging waste: 29g Plastic: 40% Recycling, 37% Incineration, 23% landfill; 1g Cardboard: 83% Recycling, 8% Incineration, 9% landfill |
| Direct emissions (kg) | - |

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

| Scenario information | Value |
|---|---|
| Collection process: collected separately (kg) | Total End of Life mass of 1kg is assumed to be collected separately. |
| Collection process: Mixed waste (kg) | - |
| Recovery: re-use (kg) | 0 |
| Recovery: recycling (kg) | 0,93 |
| Recovery: energy recovery (kg) | 0,02 |
| Disposal (kg) | 0,05 |
| Scenario assumptions e.g. transportation (mode, km) & other | C2: Recycling: 500km, Incineration 150km, Landfill 50km |

# 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 cannot 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

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
17.07.2026



EPD Hub
VERIFIED ISO 14025