ENVIRONMENTAL PRODUCT DECLARATION

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

Reservoir

from EGE VİTRİFİYE SAĞLIK GEREÇLERİ SAN. VE TİC. A.Ş.

Programme: The International EPD System
www.environdec.com
Programme Operator: EPD International AB
Licensee: EPD Türkiye
EPD Registration Number: EPD-IES-0025431
Version Date: 2025-09-10
Validity Date: 2030-09-09
Type of EPD: EPD of multiple products from a company

"EPD of multiple products, based on a representative product, weight from 9.12 kilograms to 15.06 kilograms with representative weight of 11.11 kilograms."

This EPD covers only the vitreous china reservoir. Other components and accessories shown are excluded.

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 Box 210 60 SE-100 31 Stockholm Sweden
Website :www.environdec.com
E-mail :support@environdec.com

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): PCR 2019:14 Construction products, version 2.0.1., Construction EN 15804:2012+A2:2019/AC:2021 Sustainability of Construction Works, UN CPC code is 37210

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review Chair: Rob Rouwette (chair), Noa Meron (co-chair).
The review panel may be contacted via the Secretariat www.environdec.com/contact.

Life Cycle Assessment (LCA)

LCA accountability: Furkan Can Akalın & Yıldıray Yılmaz - Metsims Sustainability Consulting
info@metsims.com

Third-party Verification

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

Individual EPD verification without a pre-verified LCA/EPD tool
Third-party verifier: Vijay Thakur
Approved by: International EPD System

*EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.envrondec.com.

Procedure for follow-up of data during EPD validity involves third party verifier:
Yes No X

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

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Ege Vitrifiye Sağlık Gereçleri San. Ve Tic. A.Ş.
Address: Kemalpaşa OSB Mahallesi 513 Sokak Dış Kapı No:291, İç Kapı No:1 Kemalpaşa / İZMİR

Ege Vitrifiye Sağlık Gereçleri San. ve Tic. A.Ş., was founded in 1994 in İzmir and has been manufacturing sanitary ware products (washbasin, wc pan, squatting pan, bidet, cistern, urinal, pedestal) Our factory is one of the few modern facilities in theworld operating on an area of 59.000 m² in total, 41.600 m² of which is closed area. The production capacity is 1,400,000 pes/ year and it serves with full capacity. 86% of its production is realized with "high pressure casting technique" which is the most advanced point reached in sanitaryware business, in molds made of resin . The Product portfolio and designs are constantly updated in line with the trends that dominate the world markets and new product studies are made with both the design team in the factory and the designers from abroad. Ege Vitrifiye products are sold in domestic market with 120 authorized dealers and 2 different construction markets, and in exports it reaches a total of 120 customers in 70 countries.

It has the relevant standard conformity certificates of the countries that it exports . Ege Vitrifiye has ISO 9001 Quality Management System. ISO 14001 Environmental Management System. ISO 10002 Customer Satisfaction Management System. ISO 27001 Information Security Management System. ISO 50001 Energy Management System, Global Security Verification GSV, Double Star Quality certificates and Authorised Consignee Status are available at Ege Vitrifiye. Due to its compliance with European and global standards, in addition to the TSE certificate, it also has France's NF, Germany's TÜVRheinland LGA, the Netherlands' KIWA, Australia - New Zealand's Global-Mark and United States - Canada's ASME standard certificates.

Our Vision

In the ceramic sanitary ware industry; to make a difference in terms of design and quality, to continuously increase our market share, brand recognition and profitability, to reach higher limits in total customer satisfaction, to produce environmentally friendly products with an environmental sustainability approach.

Our Mission

While producing ceramic sanitary ware in accordance with national and international standards; to use our resources in the most efficient way, to be respectful to nature, environment and people, to ensure the satisfaction of our customers, employees, stakeholders and shareholders at the highest possible level.

PRODUCT INFORMATION

Product name: Reservoir

UN CPC code: 37210: Ceramic sinks, baths, water closet pans, flushing cisterns and similar sanitary fixtures

Production site: Kemalpaşa OSB Mahallesi 513 Sokak Dış Kapı No:291, İç Kapı No:1 Kemalpaşa / İZMİR

Definition: A water tank that controls the water flow in toilets and performs the flushing function. It can be made of plastic or ceramic.

Area of Use: Used with toilets in both residential and public areas.

User Profile: Indirect user group – users interact with the control button.

Technical Specifications

Test / Feature	Test Description	Specification / Requirement
Material Suitability	All parts must be durable, corrosion-resistant, and made from materials suitable for hygiene.	Must comply with EN 997 or EN 14528 standards for durability and hygiene material.
Surface Quality	The surface must not have cracks, surface degradation, or deformation in the reservoir body.	No cracks, holes, sharp edges, or degradation on the surface.
Installation Suitability	Check the suitability and leak resistance of the mounting points for connecting to the wall or toilet.	There should be no sagging or leakage at the connection points.
Mechanical Durability	The structure must withstand 400 N load without cracking or deformation.	Must withstand 400 N load without structural deformation.
Water Tightness	There must be no leakage from the inlet and outlet connections in all positions.	All connections must be leak-proof.
Noise Level	Measure the noise level during operation.	Noise level should not exceed 30 dB(A) for standard products.
Water Flow Rate and Volume	Test the flow and volume of the reservoir at specified intervals.	Single flush: 6 liters; Dual flush: 6/3 liters.
Filling Time	Measure the time it takes to fill the system.	Filling should be completed within 60 seconds.
Drainage Performance	Ensure that all surfaces are cleaned effectively during flushing.	No residue should remain on the surface after flushing, and all areas should be cleaned thoroughly.

LCA INFORMATION

A1 - Raw Material Supply

This stage includes raw materials extraction and pre-treatments before its use in manufacturing. The effects of raw materials such as kaolin, clay, feldspar etc. were evaluated at this stage.

A2 - Raw Material Transport

Transport information of the raw materials is provided by the manufacturer. The distances and routes are calculated accordingly.

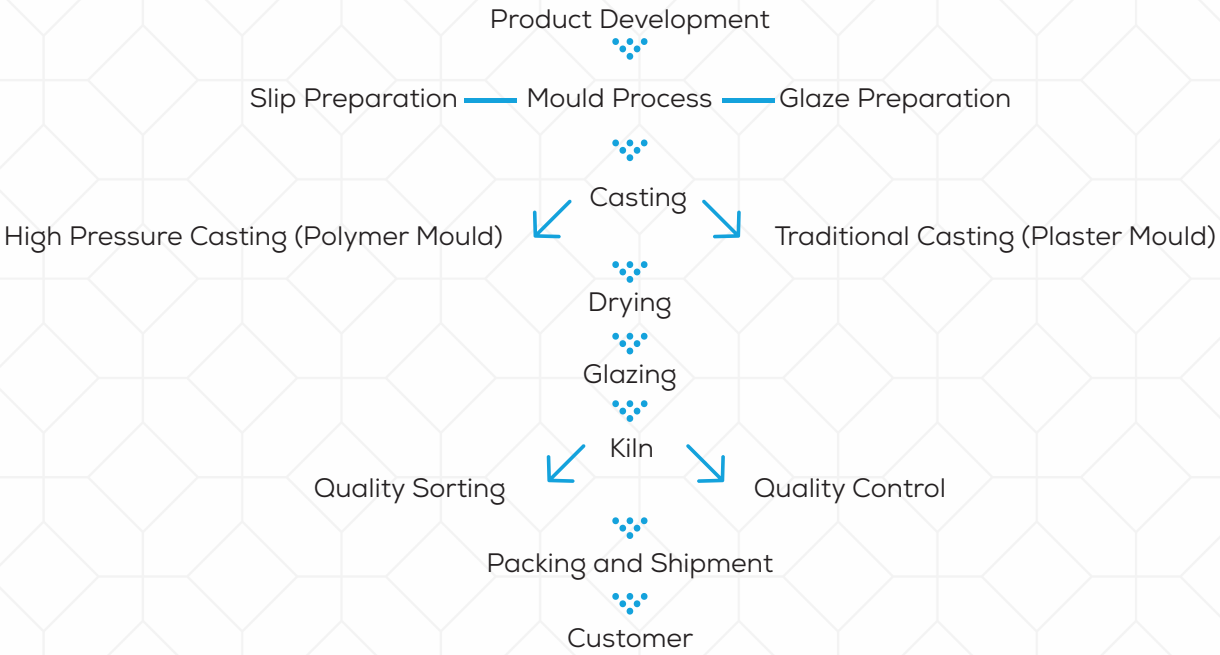
Transport Mode		Type
Road	Vehicle: Lorry Size Class: 16-32 metric ton Emission Standard: EURO6 Fuel Type: Diesel	Vehicle: Lorry Size Class: >32 metric ton Emission Standard: EURO6 Fuel Type: Diesel
Sea	Vehicle: Container Ship DWT (Load Capacity): 43000 tonnes Fuel Type: Heavy Fuel Oil	Vehicle: Bulk Carrier DWT (Load Capacity): 51000 tonnes Fuel Type: Heavy Fuel Oil

A3 - Manufacturing

This stage includes the production-related environmental impacts of the investigated product. All energy-related inputs are supplied by the manufacturer. The effects of packaging are also included in this stage. In addition, direct emissions from calcination processes and the impacts associated with the casting moulds used during production are also included in this stage. The manufacturing stage includes the following processes as shown in the production flow diagram below.

For vitreous products, the natural gas demand is relatively high due to the high-temperature firing processes required during production. The manufacturer holds an I-REC certificate and meets its electricity demand with renewable electricity certified via I-REC.

Ege Vitrifiye Production Process



Scenarios used are realistic and representative of one of the most probable alternatives and shall not include processes or procedures that are not in current use, or which have not been demonstrated to be practical. (For module A4, A5, B1-B7, C1-C4, & D)

LCA INFORMATION

A4 - Product Transport

Product transport from manufacturer to customer is considered in product material supply stage. The distances and routes are calculated accordingly. Depending the customer location, product is transported via trucks and other supplies come through seaway.

Transport Mode	Type
Road	Vehicle: Lorry Size Class: >32 metric ton Emission Standard: EURO6 Fuel Type: Diesel
Sea	Vehicle: Container Ship DWT (Load Capacity): 43000 tonnes Fuel Type: Heavy Fuel Oil

A5 - Installation

In the installation of the reservoir, two screws weighing 35 grams each and two plastic components and two rubber gaskets weighing 5 grams each are used, along with approximately 0.2 kg of silicone. These impacts are accounted for under the A5 stage of the life cycle assessment. In addition, the end-of-life treatment of the packaging waste associated with the product is also included in this stage.

B1 – Use

Reservoir products do not cause any environmental impacts during their use phase.

B2 – Maintenence

The periodic cleaning of the reservoir has been excluded from the system boundaries due to its negligible contribution to the overall environmental impact. Such maintenance activities are typically performed infrequently (e.g., once per year) and involve minimal use of water and cleaning agents. Therefore, their exclusion is not expected to significantly affect the results of this study.

B3 – Repair

Reservoirs do not require any repair under normal conditions of use. Therefore, there are no associated impacts in this stage.

B4 – Replacement

Reservoirs are durable sanitary products and do not typically require replacement within their expected lifespan. Thus, no impacts are considered for this module.

B5 – Refurbishment

Reservoirs do not require any refurbishment during the use phase. No impacts occur in this module.

B6 – Operational Energy Use

Reservoirs do not consume energy during the use phase. Hence, there are no impacts related to operational energy use.

B7 – Operational Water Use

At this stage, the impacts related to water usage from flushing have been calculated. It is assumed that a family of four uses a 4.5-liter capacity reservoir three times per person per day over a technical lifespan of 20-year period.

LCA INFORMATION

C1 - Demolition

The energy required for the demolition or deconstruction of the reservoir is estimated at 5 kWh diesel per ton of product according to PCR 2019:14 v2.0.1 . Accordingly, for a reference product weight of 11.11 kg, a total of 0.0555 kWh of diesel is assumed to be consumed during demolition.

C2 - Waste Transport

This step includes the transport of materials after they reach their end-of-life. The average distance was assumed 80 km by truck from demolition site to a waste or recycling area with 50% load capacity based on the directives of PCR 2019:14 v.2.0.1

Transport Mode	Type
Vehicle Type	Vehicle: Lorry Size Class: 16-32 metric ton Emission Standard: EURO5 Fuel Type: Diesel
Distance	80 km
Utilization factor	50%

C3 - Waste Processing

At this stage, the impacts arising from the crushing of the product for landfill disposal have been included in the calculations as 1.5 kWh of diesel per tonne, in accordance with PCR 2.0.1.

C4 - Disposal

It is assumed that all reservoir products are disposed of as inert waste in landfill at the end of their life. Accordingly, the landfill impacts and the impacts related to the compaction of inert construction waste for landfill, as defined in PCR 2.0.1, are included in this stage.

D - Reuse, recovery, or recycling potential

Since all waste products are landfilled there is no benefit for reservoir products.

LCA INFORMATION

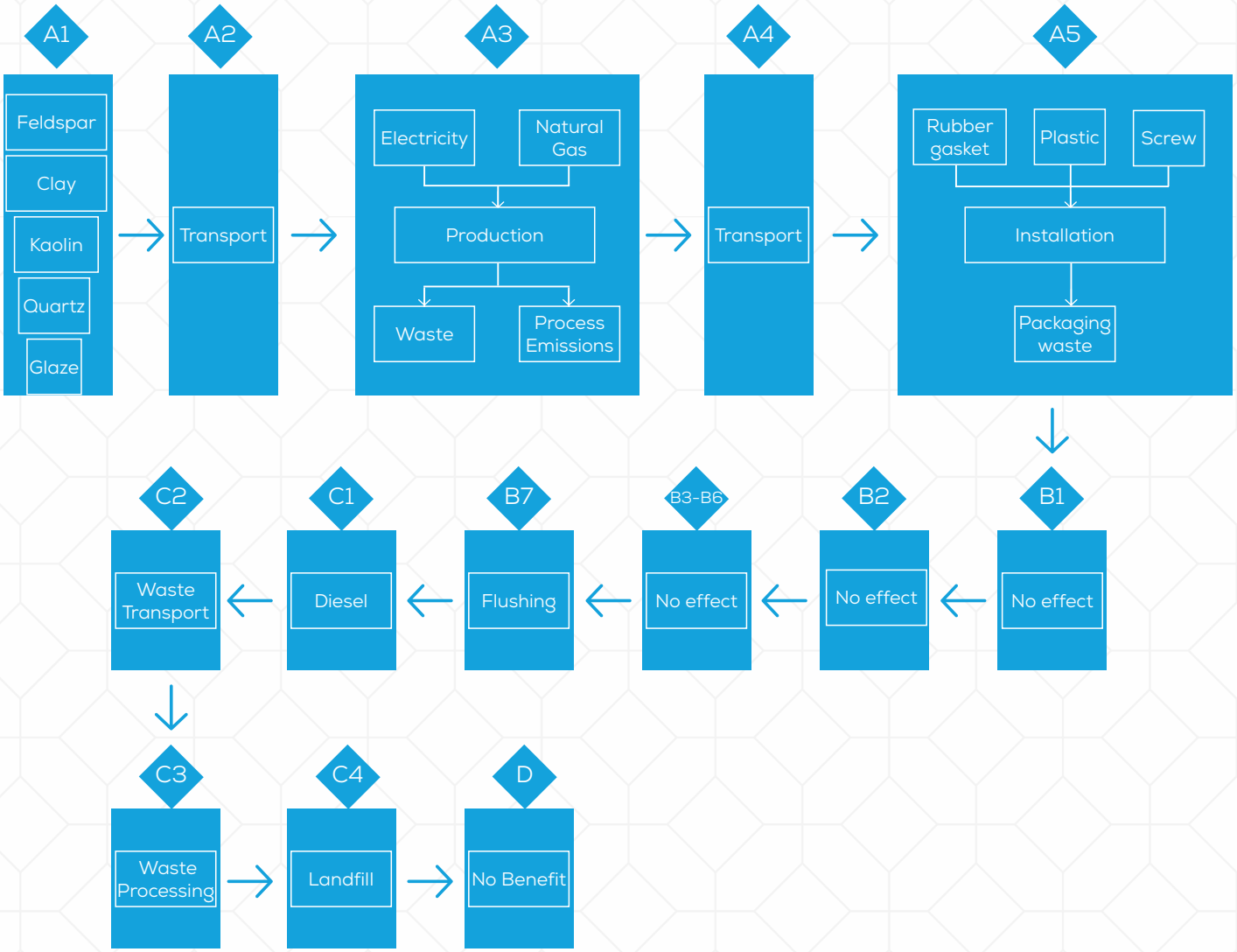
Declared unit: 20 years use of 1 piece of Reservoir with a mass of 11.11 kg/piece
Conversion factor: 0.09
Technical lifespan of the product: 20 years
Time representativeness: Full year of 2024 (2024.01.01- 2024.12.31).
Geographical scope:
Module A1 and A2 Material suppliers are Global (European and Türkiye)
Module A3 production is located in Türkiye (TR)
Module A4 transport locations are Global (Türkiye, European, Africa)
Module A5, B, C and D scenarios are for Global
Database(s) and LCA software used: Ecoinvent 3.11 and SimaPro 10.2
Description of system boundaries: Cradle to gate with options, modules A4-A5, modules B, modules C1–C4, and module D
Process flow diagram:

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Beyond product life cycle
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction / 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	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	TR	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Share of Specific Data	88%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products	-18% +35%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

(ND = Not declared, X = Module included)

LCA INFORMATION

Process flow diagram:



Electricity used in the manufacturing process in A3

Type of electricity mix	Certificated renewable electricity	
Energy sources	Hydro	100%
Climate impact (GWP-GHG)	0.00456 kgCO_2/kWh	

100% of the electricity used is purchased from energy company and has I-REC sertificate. This electricity is generated from hydroelectric power plant .

LCA INFORMATION

Allocation

Source of raw material, water consumption, energy consumption and raw material transportation were weighted according to 2024 production figures. In addition, hazardous and non-hazardous waste amounts were also allocated from the 2024 total waste generation.

Cut-Off Criteria

The criteria for exclusion were set so that individual input flows less than 1% of the total, with a cumulative limit of less than 5%, could be omitted. This was contingent upon confirming that these excluded flows did not significantly alter the reported data, with "significant" defined as affecting the total by less than 5%.

Data Quality

The EPD is based on data collected by Ege Vitrifiye from one site over one year from January 2024. The EPD is representative of the production of reservoir sanitaryware product. The use and end-of-life stage of the EPD covers mostly Europe. The EPD study is representative, with the selected product having a weight of 11.11 kg/piece. Within the relevant product group, weights range from a minimum of 9.12 kg/piece to a maximum of 15.06 kg/piece, with no changes to the product recipes. Due to the weight differences, the GWP values vary between -18% and +35%, while the variations in other LCA indicators also range from -18%to +35%. Background data was sourced from the Ecoinvent 3.11 database. No fair, poor or very poor data was found during the assessment of relevant data using EN 15804:2012+A2:2019, Annex E, only E.2.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing processes	Collected data	EPD owner	2024	Primary data	75%
Process emissions	Collected data	EPD owner	2024	Primary data	0.1%
Transport of raw materials to manufacturing site	Database	Ecoinvent v3.11	2024	Primary data	7%
Production of raw materials	Collected data	EPD owner	2024	Primary data	6%
Production of packaging	Database	Ecoinvent v3.11	2024	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					88.1%

CONTENT DECLARATON

Content Declaration

The content declaration is provided as intervals due to confidentiality reasons.

Content Name	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/declared unit
Feldspar	25-30%	0	0	0
Clay	25-30%	0	0	0
Kaolin	20-25%	0	0	0
Quartz	15-20%	0	0	0
Glaze	5-10%	0	0	0
TOTAL	**11.11 kg**	**0**	**0**	**0**

The percentages are representative for the product with the lowest weight, 9.12 kg/p, and the product with the highest weight, 15.06 kg/p. Raw material ratios do not change as product weight changes. They increase or decrease proportionally.

Packaging Materials

Material Name	Mass, kg	Mass-% (versus the product)
Corrugated board box	0.26	2%
Euro pallet	0.031	<1%
Plastic film	0.029	<1%
Plastic strap	0.006	<1%
TOTAL	**0.33**	**2.9%**

REACH Regulation

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

ENVIRONMENTAL PERFORMANCE

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

Mandatory impact category indicators according to EN 15804

Results per declared unit

Impact category	indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO_2 eq.	9.27E+00	4.23E-01	3.81E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E+02	2.01E-02	3.60E-01	6.04E-03	1.34E-01	0.00E+00
Climate change - fossil	GWP-fossil	kg CO_2 eq.	9.68E+00	4.23E-01	3.27E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E+02	2.01E-02	3.59E-01	6.04E-03	1.33E-01	0.00E+00
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	-4.25E-01	7.42E-05	4.75E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.50E-01	2.16E-06	5.88E-05	5.28E-07	7.73E-04	0.00E+00
Climate change - land use and land-use change	GWP-luluc	kg CO_2 eq.	1.16E-02	2.02E-04	6.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.42E-01	2.06E-06	1.61E-04	6.18E-07	7.22E-05	0.00E+00
Ozone depletion	ODP	kg CFC 11 eq.	1.64E-07	6.22E-09	1.46E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.96E-05	2.99E-10	4.55E-09	8.96E-11	3.25E-09	0.00E+00
Acidification	AP	mol H+ eq.	1.92E-02	2.30E-03	1.64E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E+00	1.80E-04	1.23E-03	5.40E-05	1.40E-03	0.00E+00
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	8.72E-04	4.37E-05	1.53E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-01	6.47E-07	3.94E-05	1.94E-07	1.95E-04	0.00E+00
Eutrophication aquatic marine	EP-marine	kg N eq.	5.36E-03	5.73E-04	6.94E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.59E-01	8.37E-05	3.89E-04	2.51E-05	3.63E-04	0.00E+00
Eutrophication terrestrial	EP-terrestrial	mol N eq.	5.47E-02	6.29E-03	4.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.62E+00	9.17E-04	4.23E-03	2.75E-04	3.91E-03	0.00E+00
Photochemical ozone formation	POCP	kg NMVOC eq.	2.87E-02	2.44E-03	1.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E+00	2.74E-04	1.66E-03	8.23E-05	1.36E-03	0.00E+00
Depletion of abiotic resources - minerals and metals	ADP-minerals &metals*	kg Sb eq.	1.48E-05	1.13E-06	1.42E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E-03	7.02E-09	1.18E-06	2.10E-09	2.80E-07	0.00E+00
Depletion of abiotic resources - fossil fuels	ADP-fossil*	MJ, net calorific value	1.52E+02	6.16E+00	4.52E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.33E+03	2.62E-01	4.97E+00	7.86E-02	2.85E+00	0.00E+00
Water use	WDP*	m^3	1.75E+00	3.73E-02	1.87E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E+04	7.60E-04	2.82E-02	2.28E-04	-1.77E+00	0.00E+00

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
General Disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.
Disclaimer 1	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

ENVIRONMENTAL PERFORMANCE

Additional mandatory and voluntary impact category indicators

Results per declaredunit

Impact Category	indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate Change -GWP-GHG	GWP-GHG	kg CO_2 eq.	9.24E+00	4.23E-01	3.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E+02	2.01E-02	3.60E-01	6.04E-03	1.33E-01	0.00E+00
Acronyms	GWP-GHG = Global warming potential greenhouse gas.																
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.																
Disclaimer 1	The GWP-GHG indicator is termed GWP-IOBC/GHG in the ILCD+EPD+ data format. The 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 CO2 is set to zero																

Resource use indicators

Results per declared unit

indicators	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ, net calorific value	3.24E+00	7.65E-02	5.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.88E+02	1.60E-03	6.40E-02	4.81E-04	5.13E-04	0.00E+00
PERM	MJ, net calorific value	3.79E+00	0.00E+00	-3.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ, net calorific value	7.03E+00	7.65E-02	1.46E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.88E+02	1.60E-03	6.40E-02	4.81E-04	5.13E-04	0.00E+00
PENRE	MJ, net calorific value	1.78E+02	6.07E+00	1.76E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E+03	2.62E-01	4.88E+00	7.86E-02	8.39E-02	0.00E+00
PENRM	MJ, net calorific value	1.21E+00	0.00E+00	-1.21E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, net calorific value	1.80E+02	6.07E+00	1.64E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E+03	2.62E-01	4.88E+00	7.86E-02	8.39E-02	0.00E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	5.37E-02	8.79E-04	4.53E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.94E+02	1.88E-05	6.52E-04	5.63E-06	-4.11E-02	0.00E+00
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															
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.															

ENVIRONMENTAL PERFORMANCE

Waste indicators

Results per declared or declared unit

indicators	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	2.39E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	2.12E+01	0.00E+00	3.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E+01	0.00E+00
RWD	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed															
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.															

Output flow indicators

Results per declared unit

indicators	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0,00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ, net calorific value	0.00E+00	0.00E+00	5.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ, net calorific value	0.00E+00	0.00E+00	1.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.															
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.															

VERSION HISTORY

Version History

Original version of the EPD, 2025-09-10.

REFERENCES

Ecoinvent 3.11 / Ecoinvent Centre, www.ecoinvent.org

EN 15804:2012+A2:2019 / AC:2021 Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

GPI / General Programme Instructions for the International EPD® System. Version 5.0.1. www.environdec.com.

ISO 14020:2000/ Environmental Labels and Declarations – General principles

ISO 14040/44 / DIN EN ISO 14040: 2006-10 / Environmental management - Life cycle assessment- Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)

ISO 14025 / DIN EN ISO 14025:2009-11 / Environmental labels and declarations - Type III environmental declarations - Principles and procedures

ISO 5001:2018 / Energy Management System

ISO 9001:2015 / Quality Management System

PCR for Construction Products and Construction Services / PCR 2019:14 Construction products (EN 15804:A2). Version 2.0.1. www.environdec.com.

The International EPD® System / The International EPD System is a programme for type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

SimaPro 10.2 / SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

Ege Vitrifiye / www.egevitrifiye.com

Metsims / www.metsims.com

ADDITIONAL LCA RESULTS

Additional LCA results (other environmental performance results) of the product

The table below shows the ratio of mandatory indicator results for the selected density to the minimum and maximum weight values. For example, a value of 136% indicates that it is 1.36 times the representative value, while a value of 82% indicates it is 0.82 times the representative value for GWP-Total indicator.

Mandatory indicators	Unit	Min (9.12 kg/p)	Representative (11.11 kg/p)	Max (15.06 kg/p)
GWP-total	kg CO_2 eq.	82%	9.27E+00	135%
GWP-fossil	kg CO_2 eq.	83%	9.68E+00	134%
GWP-biogenic	kg CO_2 eq.	100%	-4.25E-01	100%
GWP-luluc	kg CO_2 eq.	95%	1.16E-02	109%
ODP	kg CFC 11 eq.	83%	1.64E-07	133%
AP	mol H+ eq.	84%	1.92E-02	132%
EP-freshwater	kg P eq.	86%	8.72E-04	128%
EP-marine	kg N eq.	85%	5.36E-03	131%
EP-terrestrial	mol N eq.	84%	5.47E-02	132%
POCP	kg NMVOC eq.	83%	2.87E-02	133%
ADP- minerals &metals*	kg Sb eq.	84%	1.48E-05	132%
ADP-fossil*	MJ	83%	1.52E+02	134%
WDP*	m^3	84%	1.75E+00	132%

ADDITIONAL LCA RESULTS

In compliance with the PCR requirements, 100% recycling scenario have been modelled for the product. Tables below present the results for modules C4 and D, based on these scenarios, covering all mandatory impact indicators as specified in EN 15804.

Additional LCA results for 100% recycling scenario

Impact category	Mandatory indicators	Unit	C4	D
Climate change - total	GWP-total	kg CO_2 eq.	0.00E+00	-4.84E-02
Climate change - fossil	GWP-fossil	kg CO_2 eq.	0.00E+00	-4.83E-02
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	0.00E+00	-5.84E-05
Climate change - land use and land-use change	GWP-luluc	kg CO_2 eq.	0.00E+00	-3.98E-05
Ozone depletion	ODP	kg CFC 11 eq.	0.00E+00	-4.60E-10
Acidification	AP	mol H+ eq.	0.00E+00	-3.25E-04
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	0.00E+00	-1.38E-05
Eutrophication aquatic marine	EP-marine	kg N eq.	0.00E+00	-9.93E-05
Eutrophication terrestrial	EP-terrestrial	mol N eq.	0.00E+00	-1.12E-03
Photochemical ozone formation	POCP	kg NMVOC eq.	0.00E+00	-3.32E-04
Depletion of abiotic resources - minerals and metals	ADP- minerals &metals*	kg Sb eq.	0.00E+00	-2.32E-07
Depletion of abiotic resources - fossil fuels	ADP-fossil*	MJ	0.00E+00	-5.94E-01
Water use	WDP*	m^3	0.00E+00	-6.71E-01

ABBREVIATIONS

Abbreviation	Definition
ADP	Abiotic depletion potential
ADP-fossil	Abiotic depletion potential for non-fossil resources (MJ)
ADP-minerals&metals	Abiotic depletion potential for minerals & metals (kg Sb eq.)
AP	Acidification Potential (mol H+ eq.)
CAS No.	Chemical Abstracts Service Number
CEN	European Committee for Standardization
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CFR	Components for Reuse (kg)
CLC	Co-location centre
CO_2 eq.	Carbon Dioxide Equivalents
CPC	Central product classification
EC No.	European Community Number
EEE	Exported Energy, Electricity (MJ)
EET	Exported Energy, Thermal (MJ)
EF	Environmental Footprint
EN	European Norm (Standard)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
FW	Use of net fresh water (m^3)
GHG	Greenhouse gas
GHS	Globally harmonized system of classification and labelling of chemicals
GLO	Global
GPI	General Programme Instructions
GRI	Global Reporting Initiative
GWP	Global Warming Potential (kg CO_2 eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO_2 eq.)

ABBREVIATIONS

GWP-total	Total Global Warming Potential (kg CO_2 eq.)
HW	Hazardous Waste (disposed) (kg)
ISO	International Organization for Standardization
kg	Kilogram
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
m^3	Cubic Meter
MER	Materials for Energy Recovery (kg)
MJ	Megajoule
MR	Material for Recycling (kg)
N eq.	Nitrogen Equivalents
ND	Not Declared
NHW	Non-Hazardous Waste (disposed) (kg)
NMVOC	Non-Methane Volatile Organic Compounds
NRSF	Use of non-renewable secondary fuels (MJ)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
P eq.	Phosphorus Equivalents
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
RSF	Use of renewable secondary fuels (MJ)
RW	Radioactive Waste (disposed) (kg)
Sb eq.	Antimony Equivalents
SM	Use of secondary material (kg)
SVHC	Substances of Very High Concern
TR	Türkiye
WC	Water Closet
WDP	Water Deprivation Potential (m^3)

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