THE INTERNATIONAL EPD® SYSTEM
TURKEY EPD®
ENVIRONMENTAL PRODUCT DECLARATIONS
ECO PLATFORM EPD VERIFIED

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ENVIRONMENTAL PRODUCT DECLARATION

Vitreous China (VC) & Fine Fire Clay (FFC) Ceramic Sanitaryware

Manufactured by by Kaleseramik Çanakkale Kalebodur Seramik Sanayi A.Ş.
in accordance with ISO 14025:2006 and EN 15804:2012 - A2:2021

Kale

Programme Information

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR).

Product Category Rules (PCR):
2019:14 Version 1.2.5, 2024-12-20, Construction Products and CPC 54 Construction Services, EN 15804:2012 - A2:2021 Sustainability of Construction Works

PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile

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

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Third-party verification

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

EPD verification by individual verifier

Third party verifier: Prof. Ing. Vladimír Koçí, Ph.D., MBA, LCA Studio Šárecká 5,16000 Prague 6 - Czech Republic

Approved by: The International EPD® System

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

Yes [x] No

Kaleseramik Çanakkale Kalebodur Seramik Sanayi A.Ş. has the sole ownership, liability, and responsibility for this EPD.

How To Read This EPD?

An Environmental Product Declaration (EPD) is an ISO Type III Environmental Declaration based on ISO 14025 standard. An EPD transparently reports the environmental performance of products or services from a lifecycle perspective. The preparation of an EPD includes different stages, from acquiring raw materials to the end of life of the final product/service. EPDs are based on international standards and consider the entire value chain. Additionally, **EPD is a third-party verified document**. This EPD includes the following sections described below.

1. General and Program Information

The first part of an EPD has information about the name of the manufacturer and product/service and other general information such as the validity and expiration dates of the document, the name of the program operator, geographical scope, etc. The second page states the standards followed and gives information about the program operator, third-party verifier, etc. The followed Product Category Rule (PCR) is indicated on the second page.

2. Company and Product/Service Information

Information about the company and the investigated product is given in this section. It summarizes the characteristics of the product provided by the manufacturer. It also includes information about the product such as product composition and packaging.

3. LCA Information

Life Cycle Analysis (LCA) information is one of the most important parts of the EPD as it describes the functional/declared unit, time representativeness of the study, database(s) and LCA software, along with system boundaries. The table presented in this part has columns for each stage in the life cycle. The considered stages are marked 'X' whereas the ones that are not considered are labeled as 'NR' (Not Relevant). Not all EPDs consider the full life cycle assessment for a product's entire life stages. The 'System Boundary' page is also the place where one can find detailed information about the stages and the assumptions made.

4. LCA Results

The results of the LCA analysis are presented in table format. The first column in each table indicates the name of the impact category and their measurement units are presented in the second column. These tables show an amount at each life cycle stage to see the impact of different indicators on different stages. Each impact can be understood as what is released through the production of the declared unit of the material. The benefits of reuse/recycling of the declared product are reflected in this section.

The first impact in the table is global warming potential (GWP), which shows how much CO_2 is released at each stage. Other impacts include eutrophication potential, acidification potential, ozone layer depletion, land use related impacts, etc. The second table provides results for resource use and the third table is about the waste produced during production. The fourth and final table shows the results for the GWP-GHG indicator, which is almost equivalent to the GWP-Total indicator mentioned previously. The only difference is that this indicator excludes the biogenic carbon content by following a certain methodology.

About Kale

Laying its foundation with Çanakkale Ceramic Factories Corporation in 1957, Kale Group pioneered the formation of the ceramics industry in Turkey, and has become an industry giant with its investments. It has grown over the course of time with investments in construction products, machinery and equipment manufacturing, defence, chemistry, electrical appliances, energy, IT, transportation, tourism and food industries. Kale Group is currently comprised of 17 companies, and is regarded as one of the most important industrial enterprises of Turkey with over 5000 employees, spanning over a geography across Çanakkale to several locations in Turkey to Italy and Russia. Today, Kale Group is Europe's 3rd and the world's 12th largest ceramics manufacturer. Kale Group provides its products to consumers in over 100 countries via more than 400 sales points.

Kaleseramik, a company of Kale Group, manufactures ceramic tiles with a production capacity of 66 million m^2 ceramic tile/year. Kaleseramik's tile products take place in market under Çanakkale Seramik, Kalebodur and Kale brand names.

Kaleseramik that aims for continuous development has received the following certifications within the scope of the system standards; TS EN ISO 9001:2015, TS ISO 10002:2018, TS EN ISO 14001: 2015, TS EN ISO 50001: 2018, ISO 27001: 2013, TS ISO 45001: 2018.

About Product

Product Description

Sanitaryware is the generic term used to describe items which traditionally were made from pottery. i.e. WC's, Washbasins and Bidets installed within a bathroom or washroom. Vitreous China (VC) is a common material used for bathroom sanitaryware, such as console sinks and toilets. Vitreous China sanitaryware products are primarily made of clay, kaolin, feldspar and quartz but they may also include small quantities of other raw materials. Its high gloss, stain resistant surface is ideal for use in both bath-rooms and kitchens. The casting slip is made of the above craw materials are prepared and cast into plaster moulds to form a green body. The green body then undergoes a natural drying process and were given a smooth finish. Glazing is applied before firing at 1200°C to obtain Vitreous China sanitaryware with almost no water absorption. In fine fireclay, (FFC) the pre-fired or calcined clay is the single most important component and can account for over 40% of the body. Other constituents include clay, kaolin and other minor raw materials. Their production starts with preparation of casting slip from the above constituents. The slip is cast into plaster moulds to form green body. The green body then undergoes a natural drying process and were given a smooth finish before tuner dryers. Glazing is applied before firing at 1220°C to obtain fire clay sanitaryware with water absorption less than 0.5% of the dry weight.

Areas of Use

A standard product classification in sanitaryware is as follows:

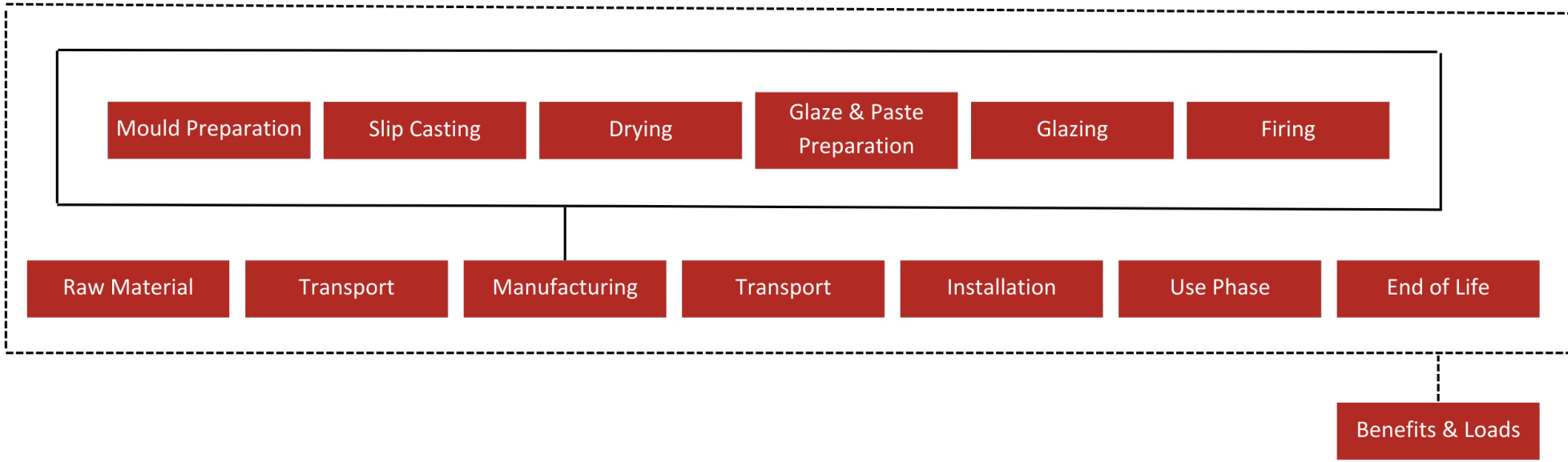
- Main pieces: WC, basin, lavatory;
- Larger bathroom pieces: shower tray, bathtub;
- Other pieces: bidet, pedestals, washbasins
- WCs for communities and for disabled people, et

Raw Material for VC	Composition (%)
Clay	30-40
Kaolin	20-30
Feldspar	20-30
Quartz	20-30
Glaze	0-5

Raw Material for FFC	Composition (%)
Chamotte	30-40
Kaolin	20-30
Clay	20-30
Quartz	10-20
Glaze	0-5

Technical Specifications

Technical Specification	Kaleseramik VC Sanitaryware	Kaleseramik FFC Sanitaryware	Related Standards
Harkord-Cracking	Compliant	Compliant	no referenced standard
Autoclave	Compliant	-	TS 605
Water Absorption	Compliant	-	EN 997
Resistance To Chemicals And Staining Agents	Compliant	Compliant	NFD 14-508-NFD 14-506
Surface Hardness	Compliant	Compliant	TS 605
Resistance To Acids	Compliant	Compliant	NFD 14-508
Resistance To Hot Alkaline Solutions	Compliant	Compliant	NFD 14-507



Product Stage

A1-A3: Represents raw material supply which includes raw material extraction and pre-treatment processes before production. A2 relevant to raw material transportation to the plant and A3 refers to the impact occurs from manufacturing process.

Construction Process Stage

A4: This stage is relevant to the transportation of the final product from the factory gate to the customers.
A5. This stage includes the adhesive mortar and water usage in the construction site. For 1 tonne sanitaryware installation; 150 kg mortar and 25 kg plastic usage was assumed.

Use Stage

B1: Sanitaryware do not cause any emissions in the use stage because of the inert feature.
B2: Usage of detergent containing stain remover or neutral lowsulphate and rinsing with tap water after cleaning was assumed. 2,5 L detergent and 5 L water use was assumed to wash 1 tonne sanitaryware.
B3-B5: Sanitaryware do not require any repairment during the use phase and therefore no impacts should be declared.
B6-B7: Sanitaryware do not require any water and energy in the use phase and therefore no impacts ocurred in this module.

End of Life Stage

C1: Deconstruction of sanitaryware at the end of their life is done manually. So no impact occurs in this module.
C2: Waste transport includes discarded sanitaryware and mortar to disposal area. Distance from demolition site to inert landfill site for final disposal is assumed as 50 km.
C3: Environmental impacts generated during the crushing of discarded sanitaryware before recycle or reuse.
C4. Disposal construction and demolition waste scenario is created separately depending on the geographic location of the use phase. After domestic usage, ceramic sanitaryware products end up at construction and demolition waste landfills as their final fate and modelled as such in the LCA.
D: Inert filler benefits and recycling of packaging materials specified in the disposal stage.

LCA Information

Functional / Declared Unit
The declared unit is 1 tonne of VC & FFC.

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)

System Boundary
The system boundary covers A1 - A3 product stages referred as 'Raw material supply', 'Transport' and ' Manufacturing', A4 - A5 'Construction', B1 - B7 'Use' and C1 – C4 'End of life' stages and Module D 'Benefits & Loads'.

Cut-off Rules
For this LCA study, no cut-off criteria was applied.

Background Data
For all LCA modelling and calculation, Ecoinvent database (v3.9) and SimaPro (v9.5) LCA software were used.

LCA Modelling, Calculation and Data Quality
The results of the LCA with the indicators as per EPD requirements are given in the LCA result tables. All energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while freshwater use is calculated with selected inventory flows in SimaPro according to the PCR. There are no co-product allocations within the LCA study underlying this EPD. The regional energy datasets were used for all energy calculations.

Period Under Review
The data used for LCA study concerns the year 2022.

Allocations
There are no co-products in the production of ceramic sanitaryware manufactured by Kaleseramik. Hence, there was no need for co-product allocation. Kaleseramik sources raw materials from different l ocations across Turkey and other parts of the world and by different means of transport (truck and ship). For this reason, transport was allocated according to tonnages for almost all raw materials bought by Kaleseramik. Kaleseramik manufactures various ceramic products in the Company's Çanakkale plant in Turkey. Electricity and combined heat power (CHP) powered by natural gas are used. Raw materials, transport, packaging, waste, and energy consumption data were allocated for each product using related production tonnages from Kaleseramik's Çanakkale plant for the average product.

Information on biogenic carbon content according to EN 15804+A2

Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0.002
Biogenic carbon content in packaging	kg C	-7.594

LCA Information

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefits and Loads
	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	Future reuse, recycling or energy recovery potentials
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
Specific Data Used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation - Products	0%					-	-	-	-	-	-	-	-	-	-	-	-
Variation - Sites	0%					-	-	-	-	-	-	-	-	-	-	-	-

(X = Module included, - = Module not included)

LCA Results for FFC

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
GWP - Fossil	kg CO_2 eq	1877	153	265	0	4.82	0	0	14.1	0	17.2	-42.0
GWP - Biogenic	kg CO_2 eq	-15.1	0.357	4.45	0	-6.40	0	0	0.027	0	107	-0.098
GWP - Luluc	kg CO_2 eq	6.98	0.078	0.230	0	8.05	0	0	0.01	0	0.010	-0.081
GWP - Total	kg CO_2 eq	1868	153	269	0	6.47	0	0	14.2	0	124	-42.2
ODP	kg CFC-11 eq	6.49E-05	3.16E-06	8.40E-06	0	2.52E-07	0	0	2.00E-07	0	3.74E-07	-6.59E-07
AP	mol H+ eq	5.72	0.703	1.52	0	0.054	0	0	0.048	0	0.113	-0.342
*EP - Freshwater	kg P eq	0.710	0.010	0.074	0	0.087	0	0	0.001	0	0.004	-0.004
EP - Marine	kg N eq	2.17	0.031	0.225	0	0.265	0	0	0.003	0	0.012	-0.014
EP - Terrestrial	mol N eq	1.31	0.176	0.253	0	0.060	0	0	0.015	0	0.112	-0.109
POCP	kg NMVOC	11.7	1.88	2.63	0	0.200	0	0	0.163	0	0.448	-1.18
ADPE	kg Sb eq	4.70	0.763	1.02	0	0.033	0	0	0.063	0	0.168	-0.368
ADPF	MJ	2.14E-03	4.56E-04	2.60E-03	0	4.63E-05	0	0	4.33E-05	0	3.16E-05	-1.59E-04
WDP	m^3 depriv.	26744	2092	4872	0	48.5	0	0	191	0	315	-560
PM	disease inc.	479	8.12	139	0	12.7	0	0	0.784	0	12.8	-46.9
IR	kBq U-235 eq	3.53E-05	8.41E-06	1.37E-05	0	8.39E-07	0	0	7.89E-07	0	2.18E-06	-3.60E-06
ETP - FW	CTUe	3405	1107	2962	0	766	0	0	116	0	304	-350
HTTP - C	CTUh	3.99E-07	6.77E-08	1.38E-07	0	1.03E-08	0	0	5.73E-09	0	1.45E-08	-3.05E-08
HTTP - NC	CTUh	1.05E-05	1.84E-06	7.78E-06	0	3.10E-07	0	0	1.79E-07	0	3.45E-07	-6.08E-07
SQP	Pt	11049	1175	1130	0	465	0	0	98.3	0	713	-1081

Acronyms	GWP-total: Climate change. GWP-fossil: Climate change- fossil. GWP-biogenic: Climate change - biogenic. GWP-luluc: Climate change - land use and transformation. ODP: Ozone layer depletion. AP: Acidification terrestrial and freshwater. EP-freshwater: Eutrophication freshwater. EP-marine: Eutrophication marine. EP-terrestrial: Eutrophication terrestrial. POCP: Photochemical oxidation. ADPE: Abiotic depletion - elements. ADPF: Abiotic depletion - fossil resources. WDP: Water scarcity. PM: Respiratory inorganics - particulate matter. IR: Ionising radiation. ETP-FW: Ecotoxicity freshwater. HTP-c: Cancer human health effects. HTP-nc: Non-cancer human health effects. SQP: Land use related impacts. soil quality.
Legend	A1: Raw Material Supply. A2: Transport. A3: Manufacturing. A4: Transport. A5: Construction Installation. B1-B7: Use Stage. C1: Deconstruction / Demolition. C2: Transport. C3: Waste Processing. C4: Disposal. D: Future reuse. recycling or energy recovery potentials
Disclaimer 1	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.
Disclaimer 2	The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

LCA Results for FFC

Resource Use

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
PERE	MJ	3755	31.4	228	0	228	0	0	2.57	0	7.19	-11.6
PERM	MJ	0	0	0	0	0	0	0	0	0	0	1.00
PERT	MJ	3755	31.4	228	0	228	0	0	2.57	0	7.19	-10.6
PENRE	MJ	26744	2092	4872	0	57.2	0	0	191	0	315	-561
PENRM	MJ	0	0	0	0	0	0	0	0	0	0	1.00
PENRT	MJ	26744	2092	4872	0	57.2	0	0	191	0	315	-560
SM	kg	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	15.7	0.330	2.74	0	1.54	0	0	0.032	0	0.361	-3.53

Acronyms: PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water.

Waste & Output Flows

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
HWD	kg	1.16	0	0	0	0	0	0	0	0	0	0
NHWD	kg	14.1	0	0	0	0	0	0	0	0	0	0
RWD	kg	0	0	0	0	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	0	0	0	0	0	0	0	0	0	0

Acronyms: HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, Thermal.

Climate Impact

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
*GHG-GWP	kg CO_2 eq	1854	150	257	0	13.1	0	0	13.9	0	69.0	-41.1

GWP-GHG = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology
* The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013

Legend: A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Construction Installation, B1-B7: Use Stage, C1: Deconstruction / Demolition, C2: Transport, C3: Waste Processing, C4: Disposal, D: Future reuse, recycling or energy recovery potentials

LCA Results for VC

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
GWP - Fossil	kg CO_2 eq	1556	153	265	0	4.82	0	0	14.1	0	17.3	-42.0
GWP - Biogenic	kg CO_2 eq	9.24	0.357	4.45	0	-6.40	0	0	0.027	0	107	-0.098
GWP - Luluc	kg CO_2 eq	5.536	0.078	0.230	0	8.05	0	0	0.007	0	0.010	-0.081
GWP - Total	kg CO_2 eq	1571	153	269	0	6.47	0	0	14.2	0	124	-42.2
ODP	kg CFC-11 eq	5.20E-05	3.16E-06	8.40E-06	0	2.52E-07	0	0	2.00E-07	0	3.74E-07	-6.59E-07
AP	mol H+ eq	4.499	0.703	1.52	0	0.054	0	0	0.048	0	0.113	-0.342
*EP - Freshwater	kg P eq	0.562	0.010	0.074	0	0.087	0	0	0.001	0	0.004	-0.004
EP - Marine	kg N eq	1.721	0.031	0.225	0	0.265	0	0	0.003	0	0.012	-0.014
EP - Terrestrial	mol N eq	0.916	0.176	0.253	0	0.060	0	0	0.015	0	0.112	-0.109
POCP	kg NMVOC	8.89	1.88	2.63	0	0.200	0	0	0.163	0	0.448	-1.18
ADPE	kg Sb eq	3.661	0.76	1.02	0	0.033	0	0	0.063	0	0.168	-0.368
ADPF	MJ	1.30E-03	4.56E-04	0.003	0	4.63E-05	0	0	4.33E-05	0	3.16E-05	-1.59E-04
WDP	m^3 depriv.	20559	2092	4872	0	48.5	0	0	191	0	315	-560
PM	disease inc.	342.3	8.12	139	0	12.7	0	0	0.784	0	12.8	-46.9
IR	kBq U-235 eq	2.51E-05	8.41E-06	1.37E-05	0	8.39E-07	0	0	7.89E-07	0	2.19E-06	-3.60E-06
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HTTP - C	CTUh	2.85E-07	6.77E-08	1.38E-07	0	1.03E-08	0	0	5.73E-09	0	1.45E-08	-3.05E-08
HTTP - NC	CTUh	7.66E-06	1.84E-06	7.78E-06	0	3.10E-07	0	0	1.79E-07	0	3.45E-07	-6.08E-07
SQP	Pt	1508	1175	1130	0	465	0	0	98.3	0	714	-1081

Acronyms	GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Construction Installation, B1-B7: Use Stage, C1: Deconstruction / Demolition, C2: Transport, C3: Waste Processing, C4: Disposal, D: Future reuse, recycling or energy recovery potentials
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LCA Results for VC

Resource Use

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
PERE	MJ	1736	31.4	228	0	228	0	0	2.57	0	7.19	-11.6
PERM	MJ	0	1.00	2.00	0	0	0	0	0	0	0	1
PERT	MJ	1736	32.4	230	0	228	0	0	2.57	0	7.19	-10.6
PENRE	MJ	20558	2092	4872	0	57.2	0	0	191	0	315	-561
PENRM	MJ	0	1.00	2.00	0	0	0	0	0	0	0	1.00
PENRT	MJ	20558	2093	4874	0	57.2	0	0	191	0	315	-560
SM	kg	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	9.83	0.330	2.74	0	1.54	0	0	0.032	0	0.361	-3.53

Acronyms: PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water.

Waste & Output Flows

Impact Category	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
HWD	kg	12.5	0	0	0	0	0	0	0	0	0	0
NHWD	kg	1.16	0	0	0	0	0	0	0	0	0	0
RWD	kg	0	0	0	0	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	0	0	0	0	0	0	0	0	0	0

Acronyms: HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, Thermal.

Climate Impact

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
*GHG-GWP	kg CO_2 eq	1534	150	257	0	13.1	0	0	13.9	0	69.0	-41.1

GWP-GHG = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology
* The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013

Legend: A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Construction Installation, B1-B7: Use Stage, C1: Deconstruction / Demolition, C2: Transport, C3: Waste Processing, C4: Disposal, D: Future reuse, recycling or energy recovery potentials

References

/ISO 9001:2015/ Quality Management Systems

/ISO 50001:2018/ Energy Management Systems

/GPI/ General Programme Instructions of the International EPD® System. Version 4.0.

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

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

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

/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)

/PCR for Construction Products and Construction Services/ Prepared by IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, 2019:14 Version 1.11 DATE 2019-12-20

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

/Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

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

/Kaleseramik/ www.kale.com.tr

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