

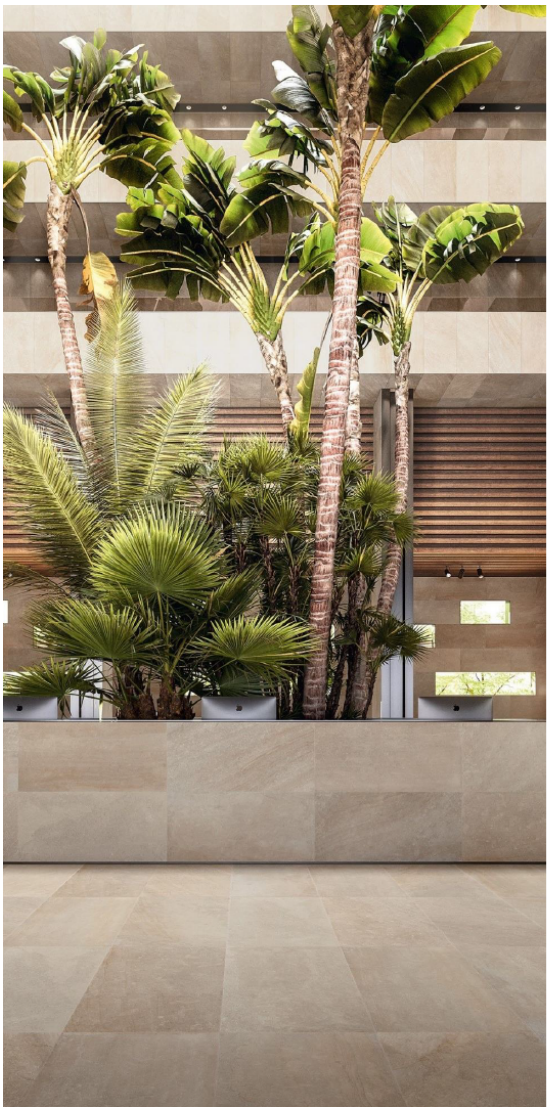
EPD

CERTIFICATION

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MARSAI COLLECTION



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Ceramiche Refin Porcelain Stoneware (9 mm thickness)
Ceramiche Refin

EPD HUB, HUB-1186
Published on 01.03.2024, last updated on 01.03.2024, valid until 01.03.2029.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Ceramiche Refin
Address	Via Giorgio Ambrosoli, 42013 Salvaterra RE - ITALY
Contact details	sustainability@gruppoconcorde.it
Website	www.refin.it

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022 EN 17160 Product category rules for ceramic tiles
Sector	Construction products
Category of EPD	Third-party verified EPD
Scope of the EPD	Cradle to gate with options, A4-B7, and modules C1-C4, D
EPD author	Davide Carra
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Haiha Nguyen, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs 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	Ceramiche Refin Porcelain Stoneware (9 mm thickness)
Additional labels	-
Product reference	-
Place of production	Salvaterra (RE), Italy
Period for data	01.01.2022 - 31.12.2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m2 of ceramic tile for covering walls and floors for a period of 50 years
Declared unit mass	20.13 kg
GWP-fossil, A1-A3 (kgCO2e)	6,76E+00
GWP-total, A1-A3 (kgCO2e)	5,75E+00
Secondary material, inputs (%)	0.0276
Secondary material, outputs (%)	54.4
Total energy use, A1-A3 (kWh)	32.4
Total water use, A1-A3 (m3e)	3,62E-02

EPD Hub

REFIN CERAMICHE

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

"We are an Italian company and we are active on the international markets since 1962.
We are part of Gruppo Concorde, a world's leading group in the ceramic industry sector.
Our brand purpose is to embellish living spaces around the world with the beauty and emotion of Italian design while respecting the goals of our stakeholders, society and the environment we live in.
We believe that true sustainability can exist only when a company has a positive impact on all the areas it operates in. For this reason, our internal management system listens to people's needs and respects the society and environment around us.
We provide the world of architecture and interior design with a wide range of porcelain stoneware solutions. We are able to satisfy even the most complex needs of our customers while guaranteeing the quality of our products and all related elements of health and safety.
Our laboratory is the beating heart of our company and we stand out in the market thanks to our unique and creative approach. We believe that the synergy between technological innovation and artisan experimentation is the key to develop a Made in Italy product of the highest aesthetic and technical quality.

PRODUCT DESCRIPTION

Ceramic tiles are shaped by dry pressing natural materials such as clay, feldspar, sand and kaolin.
The type of tiles produced are in porcelain stoneware, with a very compact structure and able to guarantee excellent performance both for flooring and cladding of walls, terraces and façades.
Identified and adopted for this study is a 9 mm thick product.

Further information can be found at www.refin.it.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	-	-
Minerals	100	EU & Asia
Fossil materials	-	-
Bio-based materials	-	-

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	0.226

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m2
Mass per declared unit	20.13 kg
Functional unit	1 m2 of ceramic tile for covering walls and floors for a period of 50 years
Reference service life	50 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

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PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

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

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

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

The product is made of a mixture of minerals like clay, feldspar, kaolin and sand. The materials are transported to the manufacturers production facility, where the manufacturing includes material preparation, shaping, drying, followed by decoration, firing, and finally, post-firing processing.
Raw waste is directly reintroduced in the production cycle.
The manufacturing process requires electricity and fuels for the different equipment as well as heating. Waste hot air that occurs during the production of electrical energy in the cogeneration plants is used in spray dryers. In addition, waste heat is recycled from various parts of the furnaces to ensure that the heat inside the furnace remains efficient.
Certain ancillary materials needed to prevent air pollution are also included.
The product is finally packaged in cardboard and sent to the installation site on a wooden pallet, covered by a plastic film with a content of at least 80% of recycled plastic.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Module A4 includes the transport from the production site to the customer or to the point of installation of the tiles (IT: 17.8 % - EU: 54.7 % - WW: 27.5 %, as per Confindustria Ceramica average EPD).

Vehicle capacity utilization volume factor is assumed to be 100 % which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as product is packaged properly.

During installation, a little waste is generated because of losses (the loss of ceramic material considered is equal to 6,5% of declared unit) and packaging materials.
Mortar and tap water is used for installation of the ceramic tiles in the building site.
The wooden pallet used during transportation is incinerated for energy recovery, while cardboard and plastic packaging is recycled.

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PRODUCT USE AND MAINTENANCE (B1-B7)

Module B1 considers the use of the tiles. During the use of ceramic tiles there is no generation of dangerous emissions indoors. Module B2 concerns the cleaning of the tiles. It considers the use of water, tile cleaning detergent – including the treatment of wastewater – for 50 years of use (lifespan of the tiles).
As per in Confindustria Ceramica EPD (EPD-COI-20220297-ICG1-EN), the consumption of water and disinfectant has been considered. The values declared in this stage refer to a time period of 1 year.
Scenario for maintaining ceramic floor and wall tiles:
Residential use: 0.2 ml of detergent and 0.1 l of water are used to wash 1 m2 of ceramic tiles once a week for floor tiles and once every three months for wall tiles.
This stage scenario is based on average data from different manufacturers of ceramic tiles in Europe.
Modules B3-B4-B5 refer to the repair, replacement and renovation of the tiles. If the tiles are installed correctly, no repair, replacement or renovation is required.
Modules B6-B7 consider the use of energy for the operation of the technical systems integrated into the building (B6) and the use of operating water for technical installations related to the building. The use of operating energy or water is not considered. Cleaning water is declared in module B2.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Module C1 concerns the process of demolition and deconstruction of the tiles from the building.
As per in Confindustria Ceramica average EPD (EPD-COI-20220297-ICG1-EN), C1 module considers the use of machinery (diesel consumption of 1.69E-5 litre per kg) to dismantle the product to enable its subsequent transport.

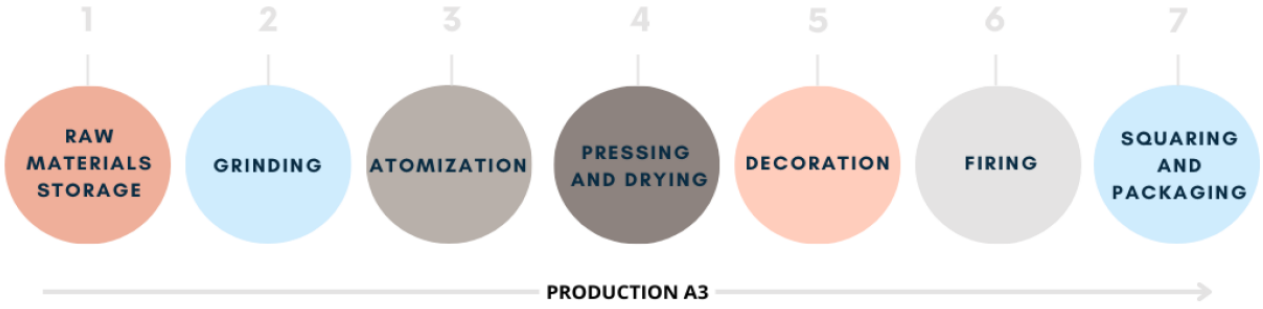
Module C2 considers the transport of the discarded tile to a recycling or disposal process.

The ceramic tile demolition waste is transported from the building site to a container or treatment plant by truck and an average distance of 20 km is considered. The return trip shall be included in the system. It can be considered an average distance of 30 km from the container or treatment plant to the final destination.

Module C3 considers every process (collection, crushing process, etc.) necessary for tile recycling.
As per in Confindustria Ceramica EPD (EPD-COI-20220297-ICG1-EN), C1 module considers the use of machinery (diesel consumption of 1.69E-5 litre per kg) to dismantle the product to enable its subsequent transport.
Module C4 includes all landfill disposal processes, including pre-treatment and management of the disposal site.
Module D includes the benefits deriving from all the net flows at the end of life stage that leave the product limit system after having passed the end of waste stage. Incineration of packaging and the resulting energy credits (electricity and thermal energy) are declared in module D.

As per stated in the Table 4 - Default EOL scenarios for ceramic tiles of the PCR Guidance-Texts for Building-Related Products and Services - From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU) the proportion (%) between recycling and landfilling is 70-30.

MANUFACTURING PROCESS



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LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	N/A
Variation in GWP-fossil for A1-A3	0%

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

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ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	5,61E-01	4,69E-01	4,72E+00	5,75E+00	1,92E+00	4,12E+00	0,00E+00	6,33E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,29E-02	1,83E-01	7,35E-02	8,26E-02	-4,47E-02
GWP – fossil	kg CO_2e	5,61E-01	4,68E-01	5,73E+00	6,76E+00	1,92E+00	3,28E+00	0,00E+00	6,87E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,29E-02	1,83E-01	7,35E-02	8,25E-02	-4,44E-02
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	-1,00E+00	-1,00E+00	7,00E-04	8,39E-01	0,00E+00	-5,77E-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	-3,11E-04
GWP – LULUC	kg CO_2e	3,99E-04	2,39E-04	1,72E-03	2,36E-03	8,35E-04	2,01E-03	0,00E+00	3,42E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,27E-06	7,23E-05	7,32E-06	8,36E-05	-2,96E-05
Ozone depletion pot.	kg CFC_{-11}e	9,51E-08	1,04E-07	9,12E-07	1,11E-06	4,32E-07	2,82E-07	0,00E+00	8,80E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,02E-09	4,30E-08	1,57E-08	2,51E-08	-6,21E-09
Acidification potential	mol H^+e	2,46E-03	4,90E-03	7,02E-03	1,44E-02	1,79E-02	9,89E-03	0,00E+00	1,12E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,41E-04	5,32E-04	7,63E-04	6,96E-04	-4,04E-04
EP-freshwater[2)]	kg Pe	7,20E-06	3,37E-06	2,77E-05	3,83E-05	1,40E-05	1,06E-03	0,00E+00	2,85E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,09E-07	1,31E-06	2,43E-07	1,28E-06	-7,04E-07
EP-marine	kg Ne	7,13E-04	1,18E-03	2,03E-03	3,92E-03	4,71E-03	2,49E-03	0,00E+00	6,17E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,51E-04	1,08E-04	3,38E-04	2,38E-04	-1,18E-04
EP-terrestrial	mol Ne	8,30E-03	1,31E-02	2,07E-02	4,21E-02	5,22E-02	2,71E-02	0,00E+00	1,21E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,66E-03	1,20E-03	3,71E-03	2,61E-03	-1,60E-03
POCP ("smog")[3)]	kg NMVOCe	2,27E-03	3,75E-03	7,05E-03	1,31E-02	1,49E-02	7,92E-03	0,00E+00	3,19E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,56E-04	4,65E-04	1,02E-03	7,56E-04	-3,74E-04
ADP-minerals & metals[4)]	kg Sbe	4,96E-06	1,03E-06	4,16E-06	1,01E-05	4,17E-06	9,85E-06	0,00E+00	7,88E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,67E-08	6,22E-07	3,73E-08	2,78E-07	-1,02E-06
ADP-fossil resources	MJ	8,83E+00	6,79E+00	9,55E+01	1,11E+02	2,81E+01	3,37E+01	0,00E+00	9,16E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,42E-01	2,76E+00	9,89E-01	1,91E+00	-6,41E-01
Water use[5)]	m^3e depr.	1,33E-01	2,88E-02	3,95E-01	5,57E-01	1,19E-01	6,69E-01	0,00E+00	2,73E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E-03	1,29E-02	2,66E-03	1,11E-02	-2,19E-01

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

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USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8]	MJ	1,33E-01	7,14E-02	6,57E+00	6,77E+00	3,00E-01	2,39E+01	0,00E+00	9,01E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,53E-03	3,93E-02	5,65E-03	3,31E-02	-2,20E-01
Renew. PER as material	MJ	0,00E+00	0,00E+00	8,79E+00	8,79E+00	0,00E+00	-8,79E+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
Total use of renew. PER	MJ	1,33E-01	7,14E-02	1,54E+01	1,56E+01	3,00E-01	1,51E+01	0,00E+00	9,01E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,53E-03	3,93E-02	5,65E-03	3,31E-02	-2,20E-01
Non-re. PER as energy	MJ	8,83E+00	6,79E+00	9,40E+01	1,10E+02	2,81E+01	1,69E+01	0,00E+00	9,16E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,42E-01	2,76E+00	9,89E-01	1,91E+00	-6,41E-01
Non-re. PER as material	MJ	0,00E+00	0,00E+00	1,51E+00	1,51E+00	0,00E+00	-1,51E+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
Total use of non-re. PER	MJ	8,83E+00	6,79E+00	9,55E+01	1,11E+02	2,81E+01	1,54E+01	0,00E+00	9,16E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,42E-01	2,76E+00	9,89E-01	1,91E+00	-6,41E-01
Secondary materials	kg	5,55E-03	2,31E-03	1,50E-01	1,58E-01	8,59E-03	2,09E+00	0,00E+00	1,32E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,73E-04	9,08E-04	3,87E-04	6,86E-04	-1,74E-03
Renew. secondary fuels	MJ	3,52E-05	1,69E-05	2,54E-01	2,54E-01	7,12E-05	1,66E-02	0,00E+00	5,60E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,65E-07	9,66E-06	1,26E-06	2,64E-05	-1,30E-05
Non-ren. secondary fuels	MJ	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	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m³	1,48E-02	7,93E-04	2,06E-02	3,62E-02	3,35E-03	2,00E-02	0,00E+00	6,37E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,68E-05	3,55E-04	6,00E-05	2,05E-03	-5,08E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	2,17E-01	9,41E-03	5,15E-02	2,78E-01	3,70E-02	3,15E-02	0,00E+00	5,97E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,91E-04	3,11E-03	1,32E-03	0,00E+00	-4,96E-03
Non-hazardous waste	kg	3,04E-01	1,34E-01	8,07E-01	1,25E+00	5,60E-01	2,63E+00	0,00E+00	1,62E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,16E-03	5,50E-02	9,30E-03	7,84E+00	-3,60E+00
Radioactive waste	kg	2,49E-05	4,60E-05	6,39E-05	1,35E-04	1,90E-04	3,64E-05	0,00E+00	3,11E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,11E-06	1,90E-05	6,96E-06	0,00E+00	-4,72E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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
Materials for recycling	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	1,83E+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	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
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,02E+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

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

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_2e	5,52E-01	4,64E-01	5,62E+00	6,64E+00	1,90E+00	6,49E+00	0,00E+00	6,78E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,25E-02	1,81E-01	7,27E-02	8,10E-02	-4,36E-02
Ozone depletion Pot.	kg CFC_{-11}e	8,19E-08	8,25E-08	8,00E-07	9,65E-07	3,43E-07	7,02E-07	0,00E+00	7,48E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,56E-09	3,41E-08	1,24E-08	1,99E-08	-5,05E-09
Acidification	kg SO_2e	1,88E-03	3,93E-03	5,49E-03	1,13E-02	1,42E-02	6,41E-02	0,00E+00	9,63E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,43E-04	4,35E-04	5,44E-04	5,27E-04	-2,87E-04
Eutrophication	kg PO_4^3e	7,63E-04	5,39E-04	1,61E-03	2,91E-03	2,17E-03	1,47E-02	0,00E+00	6,51E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,65E-05	9,36E-05	1,26E-04	1,69E-04	-8,44E-05
POCP ("smog")	kg C_2H_4e	8,07E-05	1,22E-04	5,01E-04	7,04E-04	4,34E-04	3,97E-03	0,00E+00	4,01E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,32E-06	2,16E-05	1,19E-05	2,15E-05	-1,30E-05
ADP-elements	kg Sbe	4,78E-06	9,99E-07	3,97E-06	9,75E-06	4,05E-06	8,31E-05	0,00E+00	7,85E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,64E-08	6,07E-07	3,67E-08	2,68E-07	-1,00E-06
ADP-fossil	MJ	8,83E+00	6,79E+00	9,55E+01	1,11E+02	2,81E+01	1,11E+02	0,00E+00	9,15E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,42E-01	2,76E+00	9,89E-01	1,91E+00	-6,41E-01

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VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
01.03.2024



VERIFIED ISO 14025