Environmental Product Declaration

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

Dry-pressed glazed ceramic tiles

WALL TILES

Thickness 5.5, 6.5, 7, 7.5, 8.5 and 10 mm (List of all covered products in the annexes)

from

Certeca – Indústrias Cerâmicas, S.A and Ceragni, Lda.

GRUPO ceragni

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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EPD type	Multiple products EPD based on average product

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at 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
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR Construction Products (2019:14) v.1.3.4 EN 17160:2019 - Product category rules for ceramic tiles - Environmental Product Declarations - Product category rules complementary to EN 15804 for Ceramic tiles products for use in construction works C-PCR-002 Ceramic tiles (EN 17160:2019)
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Life Cycle Assessment (LCA)
LCA accountability: Marisa Almeida, Centro Tecnológico da Cerâmica e do Vidro
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: Itxaso Trabudua, IK Ingeniería S.L. Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, 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. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

Grupo CERAGNI: Ceragni, Lda (owner) and Certeca – Indústrias Cerâmicas, S.A.

Contact:

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Description of the organisation:

Ceragni and CERTECA from the same group, are companies dedicated to the production of ceramic materials, namely ceramic floors and wall coverings, offering a wide range of solutions to residential, commercial and public spaces.

Ceragni group collections mean tradition products but also modern products. After starting the activity by producing 15x15 tiles, it evolved to new sizes, finishes and colours. Nowadays Ceragni still offers the traditional products but also some new sizes and finishes such as 7,5x15 cm, 10x20 cm, 10x30 cm, 15x30 cm, 20x25 cm, 20x30 cm.

Over the years some new modern equipment was installed to grant the best quality product. Ceragni group always searches the continuous improvement of products and proceeds, choosing innovation as a means to increasingly serve its customers.

Ceragni products are suitable for both residential decorations and for public and high traffic area. They are offered with several aesthetical effects to permit the most diverse decor solutions. Its products are distributed in more than 20 countries such as France, Germany, Denmark, Sweden, United Kingdom, Estonia, Latvia, Canada and Australia.

Name and location of production site(s):

Local of production 1: Ceragni, Lda
Parque Industrial de Viadores, Lote 23, 3050-481 Pampilhosa do Botão

Local of production 2: Certeca – Indústrias Cerâmicas, S.A.
Estrada Nacional 1 IC2 - Km 219, 45, Malaposta, 3780-294 Anadia

www.ceragni.com
www.certeca.pt

Product information

Product name:

Dry-pressed glazed ceramic tiles

Product identification:

Dry-pressed glazed ceramic tiles (BIII), marketed and produced by Ceragni, Lda. and Certeca – Indústrias Cerâmicas, S.A.

In this EPD, the wall tiles with several thickness produced by Ceragni and by Certeca are studied, covering multiple products based on the average results of products. See table below:

Thickness	Specific weight (kg/m2)
5.5	9.05
6.5	11.36
7	11.60
7.5	12.22
8.5	13.24
10	14.26

The products covered by the EPD are presented in the annexes.

Product description:

Ceragni and Certeca tiles are used for interior cladding in residential, commercial, and public spaces, offering a wide variety of sizes, shapes, and colors.

Toscana Travertino Garda

Figure 1 – Examples of some ceramic wall tiles manufactured by Certeca.

Fragments Dragor Zen

Figure 2 – Examples of some ceramic wall tiles manufactured by Ceragni.

This EPD is an average of the dry-pressed glazed ceramic wall tiles produced and marketed by the company Ceragni and Certeca, with the properties of the products presented in the table below (Table 1).
The dry-pressed glazed ceramic tiles are pressed in white paste, with water absorption Eb>10% for internal walls.

Table 1 – Properties of Dry-pressed glazed ceramic tiles from Ceragni group.

Technical Data		Testing Standard	Norm Requirement	Ceragni group
Dimensional data	Sizes Thickness Straightness Squareness Flatness	EN ISO 10545-2	± 0,5% ± 0.5mm ± 0,3% ± 0,5% ± 0,5%	± 0,5% ± 0.2mm% ± 0,2% ± 0,3% -0,3/0.5%
Water absorption		EN ISO 10545-3	>10%	14…19%
Modulus of rupture		EN ISO 10545-4	(<7,5mm) ≥12N/mm² (≥7,5mm) ≥15N/mm²	(<7,5mm)≥16N/mm² (≥7,5mm)≥16N/mm²
Breaking strength		EN ISO 10545-4	(<7,5mm) ≥200N (≥7,5mm) ≥600N	(<7,5mm)>300N (≥7,5mm)>600N
Crasing resistance		EN ISO 10545-11	Required	Resistance
Resistance to acids and alkalis	Low concentration	EN ISO 10545-13	min. LB	Guaranteed
Resistance to household chemicals		EN ISO 10545-13	min. LB	Guaranteed
Stain resistance		EN ISO 10545-14	Mín. class 3	Class 5

Application/intended use
The final commercialized product is primarily applied in wall covering for interiors.

UN CPC code:
373 Refractory products and structural nonrefractory clay products

Geographical scope:
The dataset used to model the production process is, whenever possible, based on specific Portuguese data, since it is produced in this country, or whenever it is not possible, average European data.

LCA information

Functional unit:

1 m² of dry-pressed glazed ceramic wall tiles is used, for a reference service life of 50 years.

Functional unit and mass reference:

Name	Value	Unit
Functional unit	1	m^2
Grammage	11.28	kg/m^2
Conversion factor	0.0887	-
Layer thickness	0.0075	m

Reference service life:

Based on the product standard EN14411 and EN17160 (RCP for this product category), the reference service life is 50 years, using detergent and water to wash the wall tiles once every three weeks (residential use)

Time representativeness:

The temporal representativeness is based on the data used in the Ecoinvent v3.9.1 database (the most recent at the date of preparation of the EPD), using the Portuguese electrical mix for the year 2022. The manufacturer's data refer to production specific data from 2022.

The dataset used to model upstream production processes and the process itself reflect the physical reality and technology used. For each process/material used in process modelling, datasets representative of the technologies used were used.

Electric mix:

Energy residual mix of electricity produced in Portugal in 2022: 27.9% renewable energy (7.6% wind power, 9.7% water, 4.4% renewable cogeneration, 5.2% other renewable and 1% urban solid waste), 72.1% non-renewable energy (59.3% natural gas, 3.1% cogeneration, 2.6% coal and 7.1% nuclear), (source: REN, ERSE, DGEG, EDP).
The climate impact of electricity production: 0.346 kg CO_2 eq./kWh.

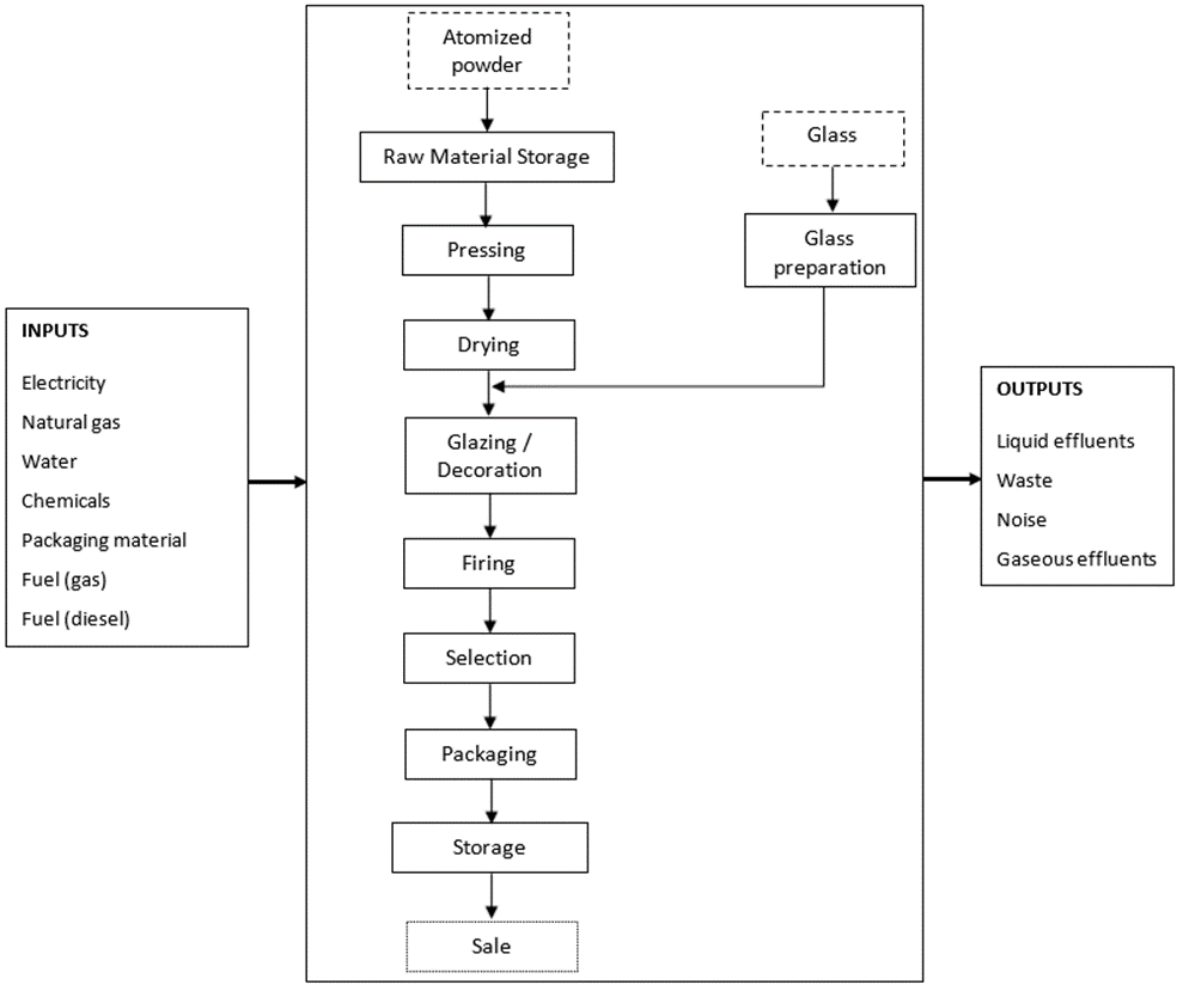
Database(s) and LCA software used:

Database: Ecoinvent v3.9.1
LCA Software: SimaPro 9.5

Description of system boundaries:

The system boundaries are Cradle to grave with module D.

System diagram:



The life cycle analysis is based on the EN 15804:2012+ A2:2019 standard, where the following cutting criteria are applied:

A1-A3 – Product stage

This step includes modules A1 (Extraction and processing of raw materials), A2 (Transport) and A3 (Manufacturing).
With regard to transport (module A2), the raw materials and auxiliary materials arrive at the installation by road, in trucks.
With regard to stage A3 (Manufacturing), the manufacturing process of the dy-pressed glazed ceramic wall tiles product comprises the following stages:
• Raw Material storage;
• Pressing;
• Drying;
• Glazing;
• Firing;

• Selection;
• Packaging;
• Storage;
• Sale.

The manufacturing process of this company begins with the receipt of atomized powder (floor, wall, and porcelain tiles) purchased from raw material supplier companies, which is then stored in dedicated silos.
Follows the pressing phase, which is supplied with the atomized powder acquired from external suppliers. This powder is properly stored and identified in previously defined locations.
The production process seamlessly integrates the operations of pressing, drying, and glazing in a continuous manner.
In the pressing operation it's used traditional hydraulic units, and drying is carried out in continuous dryers that use natural gas as fuel, with maximum temperatures reaching around 220ºC.
In this operation, various patterns and formats produced take shape. The glazing lines, located right after, are fed by conveyor belts, bringing to life the various patterns that make up the company's commercial range.
Depending on the characteristics of the final product, the number and type of auxiliary equipment activated along the line varies, as well as the type of applications used as surface finishes. These applications are prepared in advance in the glass and paint section. Glazed products are stored in wagons with shelves and transported to the entrance of the kilns. The thermal firing process is carried out in continuous kilns, fuelled by natural gas. Then, the material goes to the selection and packaging, with quality control processes in the selection phase.

A4 – A5 – Construction process stage

Module A4 includes transport from the place of production to the consumer or to the place where Ceragni and CERTECA products are installed. Three scenarios were considered:
• A4(1) – 300 km via road, by truck
• A4(2) – 1435 km via road, by truck
• A4(3) – 6520 km via ocean, by ship

Module A5 was considered, a scenario of 3.3 kg of cement mortar and 0.8 dm^3 of water per m2 of ceramic coating. The quantity of mortar was estimated based on the EN 17160:2019 standard on the rules for defining product categories for ceramic tiles (PCR for ceramic tiles).
Mortar modeling in Simapro software (Ecoinvent 3.9.1).
The planned transport of the cement mortar to the structure was 50 km.
For the treatment of packaging waste, average scenarios based on EN 17160:2019 can be used.

B1 – B7 - The use stage, which includes:

According to EN17160, ceramic wall tiles are intrinsically inert and, therefore, do not present environmental impacts during their use to be addressed in module B1.
B2 - Throughout its useful life, the ceramic product must be cleaned regularly, to a greater or lesser extent, depending on the type of building: residential, commercial, sanitary, etc., where it is installed. If the surface is dirty or oily, cleaning agents such as detergents can be added. Therefore, you can consider the consumption of water and detergent.
According to EN 17160:2019 on Product Category Rules for ceramic tiles, we have the "Maintenance scenario for ceramic tiles".

C1 - C4 – End of life stage

The end-of-life stage comprises the following modules:
Deconstruction/demolition (C1); transportation of waste to the processing and end-of-life site (C2); waste treatment for reuse, recovery and/or recycling (C3) and disposal (C4).

The end-of-life stage is the last stage of the life cycle of a material, but it can become the first if, after demolition, recycling and reuse of waste is carried out, that is, the recovery of the material considered at end of life.

C1 - Demolition process not significant (source: EN 17160).
C2 - It is assumed that waste is collected and transported to the manufacturing facilities over an average distance of 50 km.
C3 - 70% recycling (grinding), according to statistical data on CDW (construction and demolition waste) from the APA (Portuguese Environmental Agency).
C4 - The remaining 30% is deposited in landfills.

D - Recycling / reuse / recovery potential
The impacts and benefits of this step were included within the system boundary and are therefore evaluated.
It was considered that 70% of the waste is used at the end of its life (conservative value), according to statistical data on CDW (construction and demolition waste) from APA (Portuguese Environmental Agency) and EN17160.

More information:
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Assumptions:
For the processes to which the producers don't have any influence or specific information, such as the extraction of raw materials, generic data were used from the database Ecoinvent version 3.9.1.
The dataset used to model the production of electricity was adapted to the national reality. The electric mix was updated for the year of 2022 through the information supplied by the Nacional Energetic Network (REN), the Regulating Entity of Energetic Services (ERSE) and the Directorate-General for Energy and Geology (DGEG), to obtain the most recent results regarding the environmental impacts generated by the electric network in Portugal.
The environmental impacts presented in this EDP are related to the Ceragni and Certeca manufactured of 2022.

Criteria for the exclusion:
According to the point 6.3.5. of the NP EN 15804, the criteria for the exclusion for unitary processes is of 1% of the total energy consumed and of 1% of the total mass of the entries, with special attention for what doesn't exceed a total of 5% of the energy and mass flows excluded in the product stage.
The following process weren't considered in this study, since they can be covered by the exclusion criteria or by the norm scope:

- Environmental loads associated to the construction of industrial infrastructures and manufacturing of machinery and equipments;
- Environmental loads related to the infrastructures (production and maintenance of vehicles and roads) of transport of pre-products;

• Long-term emissions.

Allocations:
The manufacturing plant where these dry-pressed glazed wall ceramic tiles are produced also produces other products, namely Dry-pressed ceramic tiles for floor. Taking it into account, an mass allocation methodology was used to define which input and output flows associated only to the production of the dry-pressed glazed ceramic wall tiles being studied.

Data quality:
Data has been evaluated through a data quality matrix based on the EN 15804+A2+ AC (annex E) for the data quality management (Geographical, Technical and Time representativeness).
As a result of the data quality matrix, it is quantified that the gathered data achieves a good (4) level of quality (out of 5) in a range of very poor (1), poor (2), fair (3), good (4) and very good (5).

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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	PT	PT	PT	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU
Specific data used	> 80%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	< 10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	< 11%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

This EPD presents the average environmental performance of the entire range of wall tiles produced by Ceragni and Certeca. The production includes wall tiles in six different thicknesses and various formats, resulting in variations of less than 10% compared to the weighted average considered. The production in tons was then divided by the production in m² to obtain the weighted average of the specific weights for each format.

Product components	Weight, kg/m²	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Ceramic support	1.04E+01	-	0
Glaze (decoration)	8.65E-01	-	0
TOTAL	1.13E+01	-	0
Packaging materials	**Weight, kg/m²**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/m²**
Wood	4.37E-01	73.0	1.28E-01
Plastic	9.09E-03	1.5	-
Card boxes	1.52E-01	25.5	5.75E-02
TOTAL	5.98E-01	100	1.85E-01

When calculating the wooden pallets, a carbon content of 50% (Fc=0.50) in the dry biomass was considered (suggested in EN 16449) and a moisture content of 10% (value considered in the process taken from Ecoinvent), obtaining a value of 1.28E-01 kg C /m². In the case of cardboard boxes, a carbon content of 34% in dry biomass was considered (Dias et al, 2007) (Fc=0.34) and a moisture content of 5% (value considered by suppliers), obtaining if a value of 5.75E-02 kg C /m².

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional unit
NA	-	-	-

The product does not contain any candidate substance from the REACH candidate list of substances of very high concern with more than 0,1% by mass.

Results of the environmental performance indicators

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.

The results of module A1-A3 shouldn't be used without considering the results of module C.

Mandatory impact category indicators according to EN 15804 (version EF 3.1)

Results per functional unit (per 1 m² of dry-pressed glazed ceramic tiles)																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	7.63E+00	2.34E+00	8.72E-01	0.00E+00	4.13E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.37E-02	6.44E-02	3.97E-02	-1.43E-02
GWP-biogenic	kg CO_2 eq.	-7.81E-01	7.08E-04	7.81E-01	0.00E+00	3.96E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-05	4.91E-04	3.75E-05	-8.24E-04
GWP-luluc	kg CO_2 eq.	9.21E-03	4.59E-05	4.00E-04	0.00E+00	2.86E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.60E-07	3.05E-05	1.12E-05	-3.71E-06
GWP-total	kg CO_2 eq.	6.86E+00	2.20E-02	2.45E-03	0.00E+00	3.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-05	5.24E-04	3.13E-04	-1.14E-04
ODP	kg CFC 11 eq.	2.63E-07	5.06E-08	1.03E-08	0.00E+00	3.14E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.28E-10	1.07E-09	6.85E-10	-2.43E-10
AP	mol H^+ eq.	1.83E-02	2.94E-03	2.45E-03	0.00E+00	3.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-05	5.24E-04	3.13E-04	-1.14E-04
EP-freshwater	kg P eq.	8.25E-05	1.84E-06	1.21E-05	0.00E+00	1.28E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-08	1.13E-06	5.21E-08	-1.19E-07
EP-marine	kg N eq.	5.13E-03	7.30E-04	7.53E-04	0.00E+00	3.79E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-05	2.26E-04	1.45E-04	-5.07E-05
EP-terrestrial	mol N eq.	5.08E-02	7.11E-03	7.26E-03	0.00E+00	4.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-04	2.46E-03	1.57E-03	-5.54E-04
POCP	kg NMVOC eq.	2.00E-02	5.48E-03	2.32E-03	0.00E+00	1.74E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.89E-05	7.32E-04	4.70E-04	-1.68E-04
ADP-minerals&metals*	kg Sb eq.	6.55E-05	8.05E-08	1.99E-06	0.00E+00	2.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-09	2.81E-09	1.64E-09	-6.00E-09
ADP-fossil*	MJ	9.86E+01	3.11E+01	6.28E+00	0.00E+00	1.41E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.48E-01	9.50E-01	5.25E-01	-2.78E-01
WDP*	m^3	1.25E+00	2.85E-02	1.75E-01	0.00E+00	8.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.10E-04	3.44E-03	6.87E-04	-4.23E-03
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															

** Disclaimer: 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.*

Additional mandatory and voluntary impact category indicators

Results per functional unit (per 1 m² of dry-pressed glazed ceramic tiles)																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	7.64E+00	7.00E-01	8.73E-01	0.00E+00	4.13E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.37E-02	6.45E-02	3.97E-02	-1.43E-02
Potential incidence of disease due to PM emissions PM	Disease incidence	2.37E-07	1.67E-08	3.14E-08	0.00E+00	2.92E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E-09	8.89E-08	4.09E-08	-3.47E-09
Potential Human exposure efficiency relative to U235 IRP	kBq U 235 eq.	1.10E-01	9.42E-04	2.02E-02	0.00E+00	1.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.13E-05	2.34E-03	1.00E-04	-2.61E-03
Potential Comparative Toxic Unit for ecosystems ETP-fw	CTUe	3.57E+01	4.13E+00	2.61E+00	0.00E+00	1.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.99E-01	3.55E-01	2.56E-01	-8.53E-02
Potential Comparative Toxic Unit for humans. cancer effects HTP-c	CTUh	1.12E-09	1.04E-10	2.41E-10	0.00E+00	6.65E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.09E-12	5.79E-12	3.85E-12	-7.74E-12
Potential Comparative Toxic Unit for humans. not cancer effects HTP-nc	CTUh	2.78E-08	1.70E-09	4.50E-09	0.00E+00	1.31E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.32E-10	2.07E-10	1.52E-10	-5.08E-11
Potential soil quality index SQP	--	7.70E+01	1.20E-02	6.79E+00	0.00E+00	6.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.51E-04	2.72E-01	1.85E-01	-1.33E+00

[1] This 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 CO_2 is set to zero.

Resource use indicators (option A).

Results per functional unit (per 1 m² of dry-pressed glazed ceramic tiles)																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.72E+01	1.09E-02	1.29E+00	0.00E+00	3.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.35E-04	4.89E-02	9.52E-03	-1.13E-01
PERM	MJ	3.78E-01	0.00E+00	2.19E-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
PERT	MJ	1.76E+01	1.09E-02	1.51E+00	0.00E+00	3.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.35E-04	4.89E-02	9.52E-03	-1.13E-01
PENRE	MJ	1.08E+02	8.85E+00	7.15E+00	0.00E+00	1.59E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.58E-01	1.00E+00	5.60E-01	-3.24E-01
PENRM	MJ	4.15E-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
PENRT	MJ	1.08E+02	8.85E+00	7.15E+00	0.00E+00	1.59E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.58E-01	1.00E+00	5.60E-01	-3.24E-01
SM	kg	1.11E+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	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	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	3.48E-02	2.01E-05	4.25E-03	0.00E+00	2.07E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.48E-07	2.23E-04	2.35E-05	-2.73E-03
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															

Waste indicators

Results per functional unit (per 1 m² of dry-pressed glazed ceramic tiles)																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	7.42E-04	4.91E-06	2.66E-05	0.00E+00	7.52E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-06	1.84E-06	1.34E-06	-4.51E-07
Non-hazardous waste disposed	kg	4.86E-01	3.99E-04	2.00E-01	0.00E+00	1.37E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-05	0.00E+00	4.37E+00	-3.70E-04
Radioactive waste disposed	kg	8.69E-05	6.02E-05	2.45E-05	0.00E+00	1.18E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.13E-06	6.74E-06	3.72E-06	-2.85E-06

Output flow indicators

Results per functional unit (per 1 m² of dry-pressed glazed ceramic tiles)																
Indicator	**Unit**	**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
Material for recycling	kg	1.53E-02	0.00E+00	5.27E-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	1.02E+01	0.00E+00	0.00E+00
Materials for energy recovery	kg	7.17E-03	0.00E+00	1.47E-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
Exported energy. electricity	MJ	7.68E-01	0.00E+00	1.55E+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
Exported energy. thermal	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

Other environmental performance indicators

Not applicable.

Additional environmental information

Not applicable.

Additional social and economic information

Not applicable.

Information related to Sector EPD

Not applicable. This is an individual EPD.

Differences versus previous versions

There is no previous EPD.

References

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

PCR 2019:14. Construction Products. Version 1.3.4

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ISO 14020:2022 Environmental statements and programmes for products — Principles and general requirements

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 14044:2006 Environmental management - Life Cycle Assessment - Requirements and guidelines.

Database Ecoinvent v3.9.1 (2023) (in www.ecoinvent.org)

Direção Geral de Energia e Geologia (DGEG) - Monthly Electricity Data (2023). (http://www.dgeg.gov.pt/default.aspx?cn=689170027071AAAAAAAAAAAA)

Direção Geral de Energia e Geologia (DGEG) – Energy in Portugal (2023)

EN 15942:2011 Sustainability of construction works – Environmental product declarations - Communication format business-to-business

Redes Energéticas Nacionais (REN) – Information Centre - Monthly Statistics (2023). (http://www.centrodeinformacao.ren.pt/PT/InformacaoExploracao/Paginas/EstatisticaMensal.aspx)

c-PCR-002 Ceramic tiles (EN 17160 :2019)

EN 17160:2019 Product category rules for ceramic tiles

Annexes - Product identification - Dimensions

Unidade	Formato	Espessura
CERAGNI	150x150	5,5
CERAGNI	150x150	6,5
CERAGNI	150x150	5,8
CERAGNI	148x148	5,5
CERAGNI	148x148	7
CERAGNI	148x148	8
CERAGNI	148x198	6,5
CERAGNI	148x298	7
CERAGNI	198x198	6,5
CERAGNI	20x20	6,5
CERAGNI	20x25	7
CERAGNI	98x198	7
CERAGNI	98x198	10
CERAGNI	98x298	7
CERAGNI	98x298	10
CERAGNI	98x298	8,5
CERAGNI	198x298	7
CERAGNI	75x150	8,5
CERAGNI	20x40	8,5
CERTECA	20x20	6,5
CERTECA	20x25	7
CERTECA	20x30	7
CERTECA	20x40	7,5
CERTECA	25x40	7,5

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