Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Terrazzo™ COMPAC®

From:

COMPAC

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-06529
Publication date:	2022-07-29
Valid until:	2027-07-19 *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
E-mail:	info@environdec.com

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 2019:14 Construction products (EN 15804:A2) (version 1.11)*
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: *Eco Intelligent Growth, info@ecointelligentgrowth.net*
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: *Patxi Hernández Iñarra, AUREA CONSULTING IRELAND*  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 from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: COMPAC CORPORATE, S.L. (COMPAC®)

Contact

Contact person	Clara Planes
Telephone and email contact	T: +34 962 954 053 Ext.4135 M: +34 673 754 820 E: cplanes@compac.es

Description of the organisation

Founded in 1975, COMPAC® is the leading Spanish firm specialised in the manufacture and distribution of Terrazzo™, Quartz™ and Obsidiana™ Surfaces for architecture and design. A company with a deep-rooted culture of technological innovation aimed at satisfying not only the functional needs of construction and housing, but also at achieving more personal, attractive and healthy spaces.

COMPAC® has two production centers for Terrazzo™ and Obsidiana™ (Valencia, Spain) and Quartz™ (Santarém, Portugal), with a joint capacity that exceeds 4.5 million m² per year. A large company made up of more than 400 professionals, whose common goal is to improve COMPAC® products day by day and offer a more complete and convenient service to its customers.

Over the years, the company has worked with internationally renowned designers, artists and architects, applying their versatile materials in some of the most exclusive designs and thereby demonstrating their relevance for even the most ambitious of projects. COMPAC® is known for its significant investments in Research, Development and Innovation, as this is the backbone around which its main values revolve: maximum sustainability and efficient design. We continue along a path undertaken since the company was conceived and which is part of its personality: the recycling of materials through technological innovations to produce a quality product that improves the characteristics and performance of the original product without losing its natural values.

All designs produced with IQ Circular Science are manufactured in a sustainable way, from 100% renewable energies and rainwater from which more than 98% is reused. In addition, IQ Circular Science Pro include recycled raw materials in the production process, making it possible to recycle the materials.

Today, COMPAC® enjoys a strong international presence, distributed in more than 60 countries around the world.

Product-related or management system-related certifications: ISO 9001, LEED, WELL and BREEAM, Greenguard and Greenguard Gold.

Table 1. Name and location of production site(s).

Production site	MARMOL COMPAC
Location	Real de Gandia, Valencia, España

Product information

<u>Product name:</u> Terrazzo™ COMPAC®

<u>Product identification:</u>

- Afion
- Albufera
- Aluminum
- Anthracite
- Basalt
- Beige Dune
- Beige Faraya
- Bering
- Blanco Lhasa
- Blanco Micro
- Blanco Stone
- Blanco Stone
- Caramelo
- Classic Black
- Classic Dark Brown
- Classic Dark Grey
- Classic New Beige
- Classic New Brown
- Classic New Grey
- Classic New White
- Crema Altea
- Crema Madani
- Crema Valencia
- Dakar
- Eneus
- Hermon
- HPS Petra Grey Chip
- HPS Petra Grey Stone
- HPS Petra Grey
- HPS Petra White Chip
- Jura
- La Perla
- Marfil Stone
- Micro Thassos
- Nacarado
- Nilo
- Nubia Fog
- Palladium
- Petra Grey Chip
- Petra Grey Stone
- Petra Grey
- Petra White Black Chip
- Petra White Chip
- Petra White
- Sirocco
- Sunset
- Travertine
- White Faraya
- White Ibiza
- White Teide

<u>Product description</u>

Terrazzo™ COMPAC® is an advanced product made up of natural marble (>90%) to which resins and other binding products are added to, through advanced technology called engineered stone based on vacuum vibrocompression, achieving a product that improves the natural stone, maintaining its essence and substantially improving its functional properties and decorative possibilities.

Terrazzo™ COMPAC® is a high-quality product capable of exceeding the highest technical and functional demands of both professionals and end users. The material that reinvents itself to offer a wide versatility of applications that provides a solution to all Surfaces, including outdoor, countertops and bathroom partitions. Repaired and repolishable in a simple way.

It is also a product recognized with the Greenguard Indoor Air Quality seals that certify its contribution to creating healthy indoor environments by not producing volatile emissions and the Greenguard Children & Schools that guarantees its use in schools or other buildings where children spend long periods of time.

Terrazzo™ COMPAC® Surfaces are manufactured in three specific thickness: 12 mm, 20 mm and 30 mm. It can be manufactured in different thicknesses on request.

The intense exploitation of the quarries and the large amount of unusable waste caused by their extraction are the origin of the search for an advanced product capable of expressing the new and innovative aesthetic and functional ideas of modern architecture and being respectful of the environment.

Due to its special characteristics and durability, Terrazzo™ COMPAC® is suitable for use as an advanced alternative to natural stone or other construction materials in a large number of applications:

- On high-traffic surfaces (airports, stations, shopping malls, public buildings...) where its homogeneity, resistance, ease of maintenance and decorative possibilities find the right place to demonstrate its qualities.
- It is a high-performance product for both indoor and outdoor use (including outdoor kitchens), as it maintains its qualities even in extreme weather conditions.
- Its versatility and ease of handling make it the ideal product to apply and combine on steps, chimney trims, doors and windows, column coverings, furniture tops and many other applications that allow the development of decorative projects with no limits other than the imagination.
- Due to its high decorative capacity and practically zero porosity, it is highly recommended for use in the home, especially in bathrooms, both as flooring, wall cladding or countertops.

Table 2. Product description.

Property	Units of measurement	Results[1]
Fire reaction	Euroclases	A2fl s1
UNE EN 13501-1		
Thermal expansion coefficient	ºC^{-1}	0.8 - 1.1 · 10^{-5}
UNE EN 14617-11		
Flexural resistance	MPa	15 - 39
UNE EN 14617-2		
Surface hardness	Mohs	3 - 4
UNE EN 101:1991		
Impact resistance	J	2.5 - 7
UNE EN 14617-9		
Slip resistance	USRV	Polish: 5 wet / 50 dry
UNE EN 14231: 2003		Glacé: 16 wet / 48 dry
		Bush hammered: 80 wet / 86 dry
DIN 51097	Class	Lineal, Sierra, Dune: Class C
Abrasion resistance	mm	33.5 – 38.5
UNE-EN 14617-4		
Water absorption	%	0.04 – 0.06
UNE EN 14617-1		
Apparent density	kg/cm^3	2370 – 2578
UNE EN 14617-1		
Chemical resistance	-	To alkalis: C4 (Material keeps at least 80% of their resistance reference value after 8 hours of basis attack).
UNE EN 14617-10		To acids: C1 (Material keeps at least 60% of their resistance reference value after 8 hours of basis attack).

<u>UN CPC code</u>

Division 376 "Monumental or building stone and articles thereof"

- Class 3761, Subclass 37610 Marble, travertine and alabaster, worked, and articles thereof (except setts, curbstones, flagstones, tiles, cubes and similar articles); artificially coloured granules, chippings and powder of marble, travertine and alabaster.

[1] The values in this table are only typical values and not vinculant. For more information or test reports please contact our quality department.

Geographical scope

- Production site location: Real de Gandia, Valencia, Spain
- Use and end-of-life location: Global
-

LCA information

Declared unit

Since the final product is marketed in three different thicknesses (12 mm, 20 mm and 30 mm) and for various uses (tiles, skirtings and slabs), the declared unit selected for Terrazzo™ Surfaces is:

- 1000 kg of stone surface (1 t).

Additionally, based on the thickness of use, the equivalent results from the LCA study may be applicable to:

- 1 m^2 of surface covered with the product, by thickness.

This document will be used for B2B communication, with a global scope.

Reference service life

COMPAC® products described are used as finishing materials in construction of buildings. As a complementary reference, the useful life of these buildings is estimated to be greater than 50 years, and it is possible that the use of COMPAC® products equals this range of service, since due to their nature and composition, these materials are of high quality and proven durability.

Time representativeness

The production period included for the analysis was from January 1, 2020 to December 31, 2020.

Database(s) and LCA software used

The SimaPro 9.3 software and the ecoinvent 3.8 database have been used for the life cycle analysis with the "cut-off" system model and the "polluter pays" principle, which considers that "the philosophy underlying is that a producer is fully responsible for the disposal of their waste and does not receive any credit for the supply of recyclable materials.

Additionally, the principle of modularity has been applied to assign the waste treatment and disposal processes of the productive activities in the scope of the study.

The assessments methods selected are those corresponding to the EN 15804:2012+A2:2019 standard and compatible with the ecoinvent 3.8 database, including the methods determined for each of the indicators by impact category.

Description of system boundaries

The selected scope for the life cycle analysis is: Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and additional module A4).

A1. Raw materials extraction

Regarding the types of raw materials, the quantities and descriptions of the different types of materials and their origins have been compiled. In the case of Terrazzo™ products, an average composition has been determined for each of the product models/series and, in turn, based on the production reported for the study period, the most representative average composition model in volume has been defined. and with an equivalent model in the reference database. The extraction and processing of raw materials is included, as well as upstream energy consumption.

A2. Transportation of raw materials

The production site has reported the place from where the raw materials are transported and the transport mode used to move the raw materials from the place of origin to the production plant. For each of the raw materials, considering their consumption according to the reported production, a t*km ratio has been determined, which is consolidated by type of transportation used, for the representative model.

A3. Production (Manufacturing)

The general manufacturing processes within the operational limits of Terrazzo™ production are presented in following figure and listed below:

1) Reception of the raw material.
2) Quality control.
3) Storage.
4) Mixing with resins and pigments.
5) Mixture distribution.
6) Pressing.
7) Curing.
8) Cutting on racks.
9) Calibrated and polished.
10) Quality control.
11) Table Storage.
12) Cut to size.
13) Transportation.

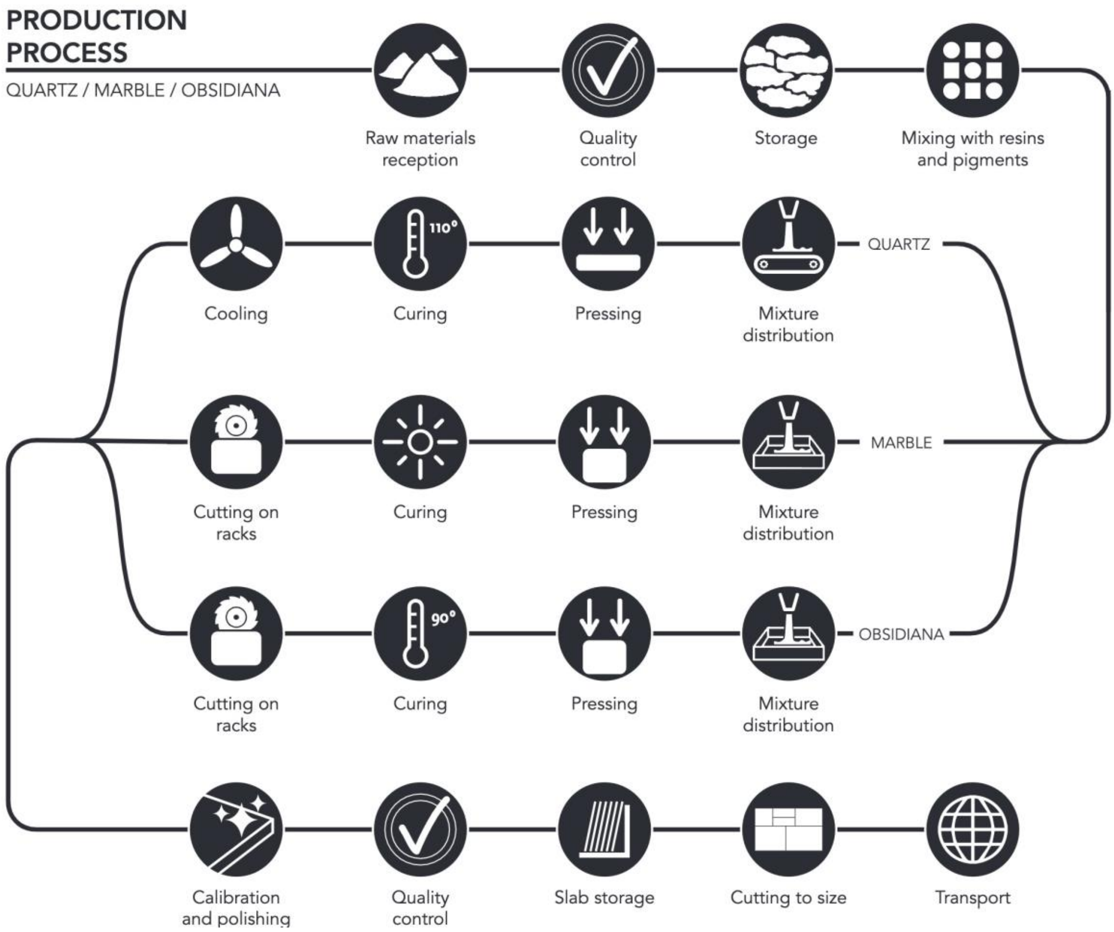

Figure 1. Manufacturing process for COMPAC® materials.

The main inputs of the manufacturing system are:

- Energy: Electricity and Fuels.
- Water: Well intake or network consumption.
- Consumables: External raw materials, waste to be processed and/or recovered.

The main outputs of the production system are:

- Waste generated: Hazardous, Non-hazardous.
- Emissions: Air, Water.

A4. Product transport

Considering the wide distribution of products at an international and regional level, based on the sales distribution report, the total production sold by family and by country of destination is recorded. For each of the destinations, according to information for internal use, the export ports in the country of origin and import ports in the destination countries are determined. An average transportation distance to the construction site is represented by the distance to the main city in each destination country.

For each case, the transport distances are determined and associated with a means of transport: road freight vehicle, sea container ship and road freight vehicle. Based on the distribution of sales by country, the average distance scenario is determined for each means of transport and each of the product families, which is used in the modelling. The detail of the technical parameters for the transport model is obtained from the ecoinvent 3.8 database and its reference technical studies.

Table 3. Product transport module.

PARAMETER	VALUE EXPRESSED PER DECLARED UNIT	
Type and fuel consumption of the vehicle, type of vehicles used for the transport; for example, trucks for long distance, boat, etc.	Transport, freight, lorry 16-32 metric t, EURO 5 {RER}| transport, freight, lorry 16-32 metric t, EURO6 | Cut-off, U	Transport, freight, sea, container ship {GLO}| transport, freight, sea, container ship | Cut-off, U
Distance	km by truck: 24,69	km by ship: 7852,66
Capacity utilization (including empty return trip)	0,60	0,70
Apparent density	2370 – 2580 kg/m^3	2370 – 2580 kg/m^3
Useful capacity factor	<1	<1

A5. Installation (construction module)

Considering the diverse and multiple applications by type of product and based on the indications of the design criteria and expert criteria, described in the installation manuals, the representative average scenario selected considers the most extensive use to be 80% pavement and 20% walls or facades as the most common product applications. Other applications include use in bathroom backsplash, shower trays, decorative fireplaces and vanity tops. Since final installation may require additional finishing processes (e.g., cutting) based on design and selected functional use, there is no specific average scenario to model installation process considering a standard amount of finished product, ancillary materials for installation, power tool usage, and material scrap or loss rates. The LCA study has excluded this module from the impact analysis estimation.

B. Use phase

Based on their design features and components, Terrazzo™ COMPAC® products have a service life of at least 50 years. Depending on the installation conditions and multiple applications for final finishing, maintenance needs are limited to cleaning routines (daily or weekly). The company has a manual of recommendations to maintain the quality and finish conditions of the product throughout the useful life of the material. Since no specific scenario is defined as representative for the impact analysis, this module is not declared in the LCA study.

C. End of life phase

The conceptual approach for planning the end-of-life phase modules is described below.

- **C1. Demolition**. There are no statistics that demonstrate usual practices of dismantling for reuse or recovery of the material at the end of its lifespan. A generic demolition process is assumed, with the use of heavy equipment, as well as the generation of air emissions during this activity, according to the default process in the ecoinvent 3.8 database.
- **C2. Transportation.** Given the wide distribution of the product in the international market, the transport distances to final disposal sites for inert waste are variable. Considering national and local conditions, an average scenario of 50 km of road transport is assumed using the default processes of the ecoinvent 3.8 database.
- **C3. Waste processing.** Although the material could have a recovery potential for reuse (total or partial) or transformation into recycled aggregates, there is no evidence of widespread practices at a global level for the recovery of the material after the demolition phase for the purpose of recycling the material. product. Commonly, all the material is finally disposed in a sanitary landfill, without any recovery. Therefore, the model assumes the scenario of zero impacts associated with this life cycle module.
- **C4. Final disposal.** In accordance with common practices in the local market, demolition waste is usually deposited as inert material in a sanitary landfill, without material recovery actions. The final disposal scenario in a sanitary landfill is assumed according to the default processes of the ecoinvent 3.8 database.

Table 4. End of life phase module

Module	Parameter	Unit (per declared unit)	Value
C1 Demolition	Process of collection specified by type	kg collected in a separate	0
		kg collected mixed with waste from construction	1
C2 Transport	Type and fuel consumption of the vehicle, type of vehicles used for the transport	Transport, freight, lorry 16-32 metric t, EURO6	Diesel consumption : 0,0366 kg/t*km
	Distance	km	50
	Use of the capacity (including the return in vacuum)	%	0,60
	Apparent density of transported products	kg / m^3	2370 – 2580
	Useful capacity factor		1
C3 Treatment of waste	System recovery specified by type	kg for reuse	0
		kg for recycle	0
		kg for energy recovery	0
C4 Disposal	Disposal specified by type	kg of product for final disposal	1

D. Benefits and loads beyond the system boundaries.

In accordance with the forecasts indicated, the model assumes a scenario of total disposal of the demolition waste to a sanitary landfill. There is no information available to assume demolition waste recovery scenarios in the countries covered by the LCA study.

<u>System diagram:</u>

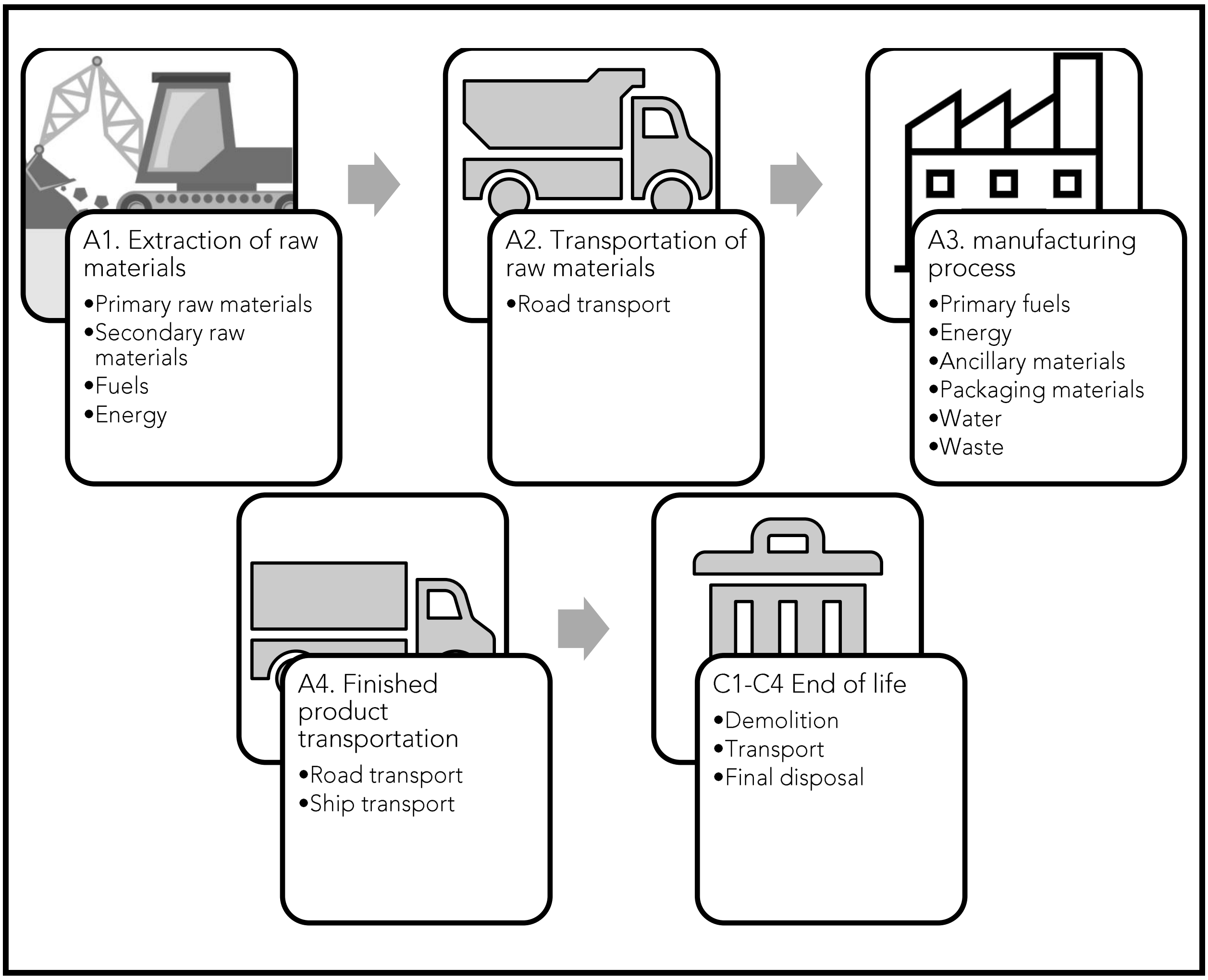

Figure 2. Life cycle modules within the system boundaries.

<u>LCA practitioner:</u>

Eco Intelligent Growth, info@ecointelligentgrowth.net

Assumptions:

Production stage

All data is representative of actual production management. Electrical generation mix was modelled based on certificates of guarantee of origin provided by the electricity supplier to the manufacturer and the national electrical annual reports. All energy consumed comes from certified renewable energy.

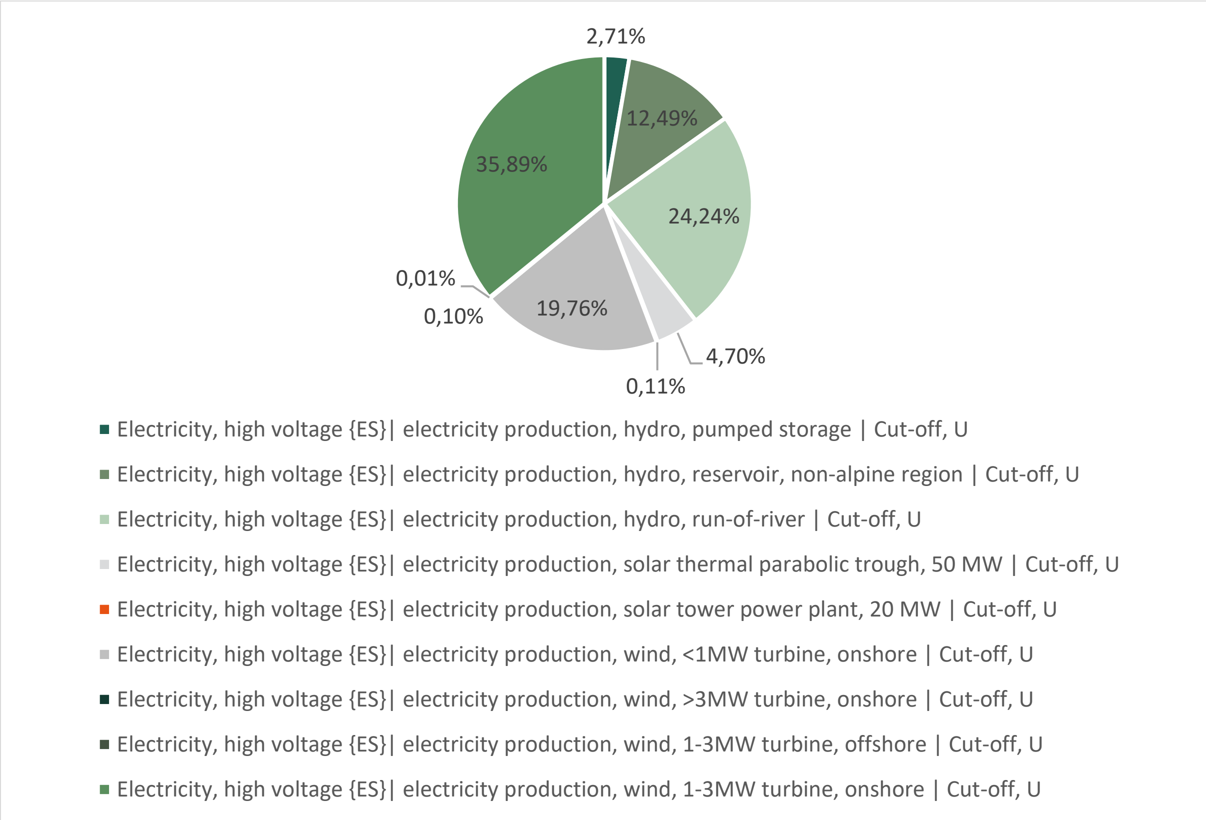

Figure 3. Energy mix from 100 % renewable energy supplier, based on Spain energy mix from ecoinvent 3.8.

a) Total production

Based on the internal records from the production site, the quantity of materials produced per year, by type of product, was accounted and reported for the year of study. Raw materials losses were accounted in the analysis.

b) Electricity consumption

The total electrical energy consumed in its operations has been reported. The facilities operation in Spain produces Terrazzo™ and Obsidiana™ Surfaces, with all energy consumption directly attributable to the total production of these construction materials.

c) Fuel consumption

The production site has reported the total fuel consumed in its operations. Fuel consumption includes diesel (L/year), gasoline (L/year), fuel oil (kg/year), gas (Nm^3/year), butane gas (L/kg), propane gas (kg), LPG (kg), and K120 (kg). Once the consumption ratio per kg of production has been calculated, the conversions have been applied (based on the density and caloric value of each fuel) to obtain the equivalence in energy units (MJ) for the modelling of the process.

d) Water consumption

The production site has reported the volume of water consumption by type of supply source (public or private network water). The annual consolidated consumption in the industrial process is obtained, accounting the benefits from the recirculation system. Recorded consumption is assigned to the material production process. The specific consumption per ton of product is calculated in m^3/kg and its equivalence in L/kg.

e) Waste generation

Through the annual report from the production site, municipal solid waste, non-hazardous recyclable waste, recyclable hazardous waste and hazardous waste to be disposed of are identified and accounted for. For each type of waste, the generation ratio is calculated with respect to the total production of the production site. For materials sent to recycling facilities, a transport distance of 50 kilometres to the treatment provider has been assumed, but no treatment specific burdens were considered, following the modularity and polluter pays principle.

f) Consumption of packaging materials

Through the annual report from the production site, the packaging materials used for the dispatch and marketing of products in their different presentations are identified and accounted for. For each of these, the product ratio (cardboard and pallet) per declared unit has been determined, selecting the most critical scenario, under conservative criteria for modelling. Additionally, the company has identified the use of other materials such as strapping, rachet, wood, inflatable bags, plastic corners, and crossbar slabs that are used in container exports, however, the analysis of the available inventory data does not allow the reliable estimation of quantities for these materials, which are then excluded from the LCA.

<u>Cut-off rules</u>

In general, the cut-off criteria are 1% of the consumption of renewable and non-renewable primary energy and 1% of the total input mass of the manufacturing process (according to the UNE-EN 15804 standard). In the evaluation, all available data of the production process is considered, i.e., all raw materials used, ancillary materials used and energy consumption using the best available data sets in the reference database. The following processes have been excluded:

- Manufacture of equipment used in production, infrastructure, or any other capital goods.
- Packaging materials for products dispatched in container: strapping, rachet, wood, inflatable bags, plastic corners, and crossbar slabs.
- Transportation of personnel to the plant or from the production site.
- Long-term emissions.

Data quality

All primary data used for the environmental impact estimation was obtained from production data registered by the manufacturer at the reported production site for the year of assessment. All secondary data was selected from ecoinvent 3.8 database considering most important parameters regarding geographical, technological, and temporary representativeness.

Allocation

All primary data used in the LCA is directly related to Terrazzo™ Surfaces production, no allocation criteria were required for the data analysis of production information (e.g., raw materials used).

In the case of the production of Obsidiana™ and Terrazzo™, both processes are carried out in the same production facilities, so the inputs and outputs of general processes for the entire production were assigned based on the weighting with respect to the production of each material in the site (by mass).

The waste management data corresponds to all the waste generated in the facilities of the production plant, since there are no methodologies to segregate the data by processes or activities of the organization. Therefore, the reported data may include waste generated in other operational and administrative processes, which does not generate significative contributions to the environmental impacts assessed.

Consequently, distribution and product end-of-life scenarios were created for the declared unit (by mass). The modularity principle has been followed, as well as the polluter pays principle.

Environmental Assessment Methods

The indicators and impact categories used for the environmental assessment, as well as the assessment methods were those indicated in standard EN 15804+A2 and the program operator PCR.

Table 5. Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation.

	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	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	ES	ES	ES	GLO	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	> 90% GWP					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	(-54,00%) – (18,83%)					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	NR. 1 production site					-	-	-	-	-	-	-	-	-	-	-	-

X: Included; ND: Not declared; NR: Not relevant. ES: Spain; GLO: Global

Content information

Terrazzo™ COMPAC® Surfaces can have a variable composition range. The composition range of the product is shown below. For its representation in the calculation model, an average product has been represented at the composition level, based on the contribution to the environmental impact of the different raw materials.

Table 6. Content information.

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Marble and other mineral materials	0,91 – 0,95	0,00 %	0,00 %
Polyester resin	0,05 – 0,08	0,00 %	0,00 %
Additives	0,01	0,00 %	0,00 %
TOTAL	1,00	0,00 %	0,00 %
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Cardboard box	0,04	3,96%	
Wood pallet	0,02	1,91%	
TOTAL	0,06	5,87%	

The determination of the average composition has been carried out through a sensitivity analysis to see which raw materials have a higher impact within the composition of the product, varying the potential composition of those raw materials that have a greater contribution to the environmental impact of the product. The average composition is represented by the scenario considering the lowest and highest environmental impact for the consumption of raw materials.

Declaration of dangerous substances

The declared products contain less than 0,1% or no dangerous substances, from the list of "Candidate list of Substances of Very High Concern". All products made of materials declared here comply with the REACH Regulation (CE) nº 1907/2006, regarding the registration, evaluation, authorization and restriction of chemical substances.

Environmental Information

All data results are representative for 1000 kg of Terrazo™ COMPAC® Surfaces, as declared unit. Estimated impact results are only relative statements that do not indicate impact category endpoints, exceeding threshold values, safety margins, or risks. The declared product is an average that is not available for purchase on the market.

Table 7. Potential environmental impact – mandatory indicators according to EN 15804.

		Results per declared unit											
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	3,93E+02	2,62E+01	1,46E+02	5,66E+02	1,42E+02	ND	ND	3,76E+00	6,75E+00	0,00E+00	5,35E+00	0,00E+00
GWP-fossil	kg CO_2 eq.	3,90E+02	2,62E+01	1,71E+02	5,87E+02	1,42E+02	ND	ND	3,76E+00	6,74E+00	0,00E+00	5,27E+00	0,00E+00
GWP-biogenic	kg CO_2 eq.	3,49E+00	8,90E-03	-2,60E+01	-2,25E+01	4,22E-02	ND	ND	1,11E-03	2,22E-03	0,00E+00	7,97E-02	0,00E+00
GWP-luluc	kg CO_2 eq.	2,94E-01	2,19E-04	1,45E+00	1,75E+00	1,60E-03	ND	ND	9,27E-05	5,46E-05	0,00E+00	1,91E-03	0,00E+00
ODP	kg CFC 11 eq.	1,07E-04	6,44E-06	4,00E-05	1,54E-04	3,20E-05	ND	ND	8,41E-07	1,60E-06	0,00E+00	9,36E-07	0,00E+00
AP	mol H^+ eq.	1,86E+00	5,36E-02	8,14E-01	2,73E+00	2,24E+00	ND	ND	4,05E-02	1,34E-02	0,00E+00	4,91E-02	0,00E+00
EP-freshwater	kg PO_4^{3-} eq.	3,68E-02	4,26E-05	1,97E-02	5,65E-02	2,31E-04	ND	ND	8,12E-06	1,06E-05	0,00E+00	1,94E-04	0,00E+00
EP-freshwater	kg P eq.	1,20E-02	1,39E-05	6,43E-03	1,84E-02	7,54E-05	ND	ND	2,65E-06	3,46E-06	0,00E+00	6,33E-05	0,00E+00
EP-marine	kg N eq.	2,93E-01	8,81E-03	2,12E-01	5,14E-01	5,72E-01	ND	ND	1,82E-02	2,23E-03	0,00E+00	2,03E-02	0,00E+00
EP-terrestrial	mol N eq.	3,29E+00	9,77E-02	1,82E+00	5,21E+00	6,35E+00	ND	ND	1,99E-01	2,48E-02	0,00E+00	2,23E-01	0,00E+00
POCP	kg NMVOC eq.	1,29E+00	3,46E-02	5,94E-01	1,92E+00	1,63E+00	ND	ND	5,45E-02	8,73E-03	0,00E+00	6,16E-02	0,00E+00

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
		Results per declared unit											
ADP-minerals &metals*	kg Sb eq.	1,46E-03	1,18E-06	4,48E-04	1,91E-03	4,32E-06	ND	ND	1,94E-07	2,93E-07	0,00E+00	2,40E-07	0,00E+00
ADP-fossil*	MJ	8,53E+03	3,84E+02	3,35E+03	1,23E+04	1,93E+03	ND	ND	5,20E+01	9,57E+01	0,00E+00	7,01E+01	0,00E+00
WDP*	m^3	2,40E+02	-6,43E-02	1,45E+02	3,85E+02	-3,33E-01	ND	ND	1,34E-02	-1,60E-02	0,00E+00	1,75E-01	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												

** 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.*

Table 8. Potential environmental impact – additional mandatory and voluntary indicators.

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
		Results per declared unit											
GWP-GHG[2]	kg CO_2 eq.	3,75E+02	2,61E+01	1,75E+02	5,77E+02	1,41E+02	ND	ND	3,72E+00	6,70E+00	0,00E+00	5,20E+00	0,00E+00

[2] 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 almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Table 9. Use of resources.

		Results per declared unit											
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	4,51E+02	5,89E-01	7,85E+02	1,24E+03	2,82E+00	ND	ND	8,39E-02	1,47E-01	0,00E+00	1,65E+00	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	7,66E+02	7,66E+02	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	4,51E+02	5,89E-01	1,55E+03	2,00E+03	2,82E+00	ND	ND	8,39E-02	1,47E-01	0,00E+00	1,65E+00	0,00E+00
PENRE	MJ	7,32E+03	4,08E+02	3,58E+03	1,13E+04	2,05E+03	ND	ND	5,52E+01	1,02E+02	0,00E+00	7,45E+01	0,00E+00
PENRM	MJ	1,82E+03	0,00E+00	7,56E+00	1,83E+03	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	9,15E+03	4,08E+02	3,59E+03	1,31E+04	2,05E+03	ND	ND	5,52E+01	1,02E+02	0,00E+00	7,45E+01	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	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	ND	ND	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	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	6,56E+00	1,05E-03	3,30E+00	9,85E+00	6,13E-03	ND	ND	8,78E-04	2,63E-04	0,00E+00	8,42E-03	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												

Table 10. Waste production.

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
		Results per declared unit											
Hazardous waste disposed	kg	5,36E-03	1,01E-03	2,78E-03	9,15E-03	3,61E-03	ND	ND	1,36E-04	2,52E-04	0,00E+00	1,50E-04	0,00E+00
Non-hazardous waste disposed	kg	1,72E+01	1,58E-02	1,74E+02	1,92E+02	8,41E-02	ND	ND	3,20E-03	3,95E-03	0,00E+00	1,00E+03	0,00E+00
Radioactive waste disposed	kg	1,83E-02	2,75E-03	9,02E-03	3,01E-02	1,39E-02	ND	ND	3,72E-04	6,85E-04	0,00E+00	4,42E-04	0,00E+00

Table 11. Output flows.

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
		Results per declared unit											
Components for re-use	kg	0,00E+00	0,00E+00	1,85E-03	1,85E-03	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	6,55E-04	6,55E-04	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 12. Information on biogenic carbon content

Results per declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0,00
Biogenic carbon content in packaging	kg C	26,8

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

Additional information

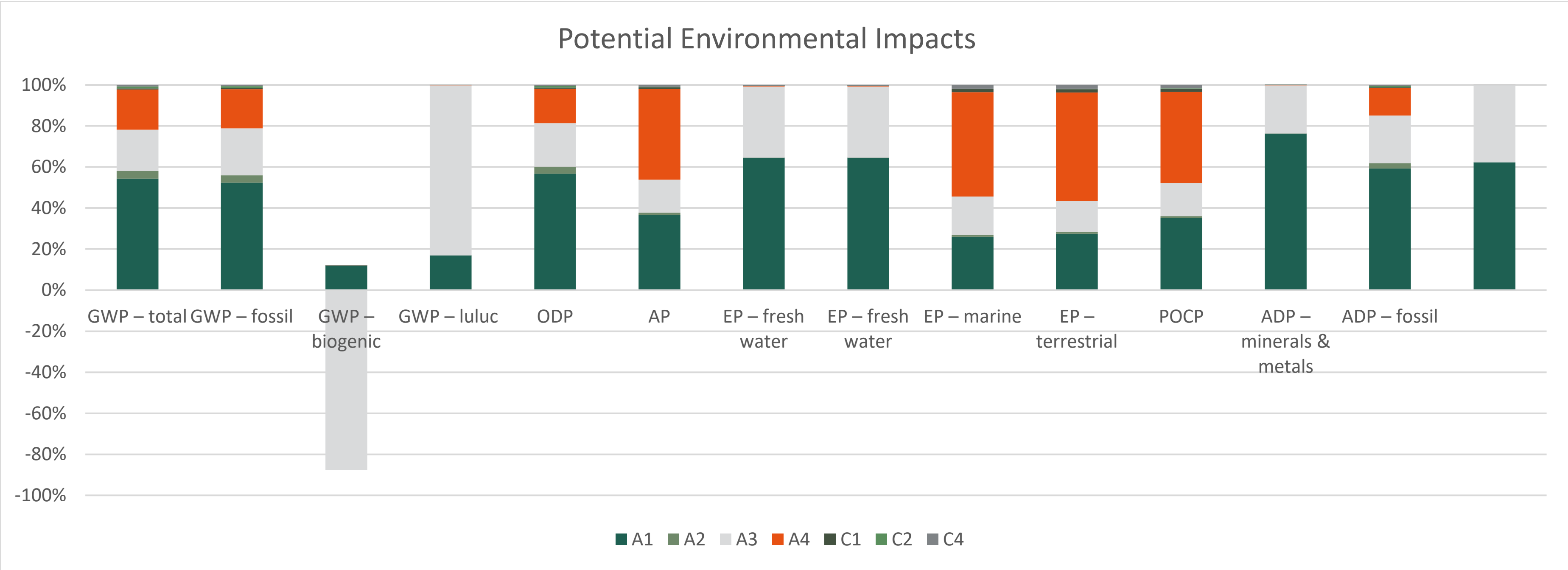

Figure 4. Environmental impact indicators, contribution by LCA assessed modules.

The results from the LCA assessment show that the upstream processess from the raw materials extraction and its manufacturing have the most significant contribution to all environmental impact indicators in a range above 30 % (EP) and up to <80 % (ADPE). On second importance is the contribution of manufacturing activities at the production site, where direct resources (energy, fuels and water) consumption takes place. Finally, product transportation, considering international freight transport shows a contribution of relative importance (>40 %) to AP, EP – marine, EP – terrestrial and POCP indicators. As shown in the graphic above GWP – biogenic indicator reveals that carbon fixation takes place when analysing the production activities; this contribution responds to the use of bio-based content from the packaging materials (i.e. cardboard and wood pallets).

Global warming potential for market products

Based on technical product properties all environmental impact indicators may be quantifyied for usual market product thickness. The following results present the GWP indicator for each of Terrazzo™ COMPAC® regular product thickness, based on an average density of 2662 kg/m^3.

Table 13. Global warming potential for market products.

Parameter	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C4
GWP – total	kg CO_2 eq. / 1000 kg	3,93 E+02	2,62 E+01	1,46E+02	5,66E+02	1,42 E+02	3,76 E+00	6,75 E+00	5,35 E+00
GWP – total - 12 mm	kg CO_2 eq. / m^2	1,26 E+01	8,38 E-01	4,67E+00	1,81E+01	4,52 E+00	1,20 E-01	2,16 E-01	1,71 E-01
GWP – total 20 mm	kg CO_2 eq. / m^2	2,09 E+01	1,40 E+00	7,79E+00	3,01E+01	7,54 E+00	2,00 E-01	3,59 E-01	2,85 E-01
GWP – total 30 mm	kg CO_2 eq. / m^2	3,14 E+01	2,10 E+00	1,17E+01	4,52E+01	1,13 E+01	3,00 E-01	5,39 E-01	4,27 E-01

Variation – products

The variation on the GWP- GHG indicator has been assessed considering the different resin content of the products grouped by Terrazzo™ COMPAC®.The minimum and maximum resin content scenarios' results are shown in the following table. The declared product is an average that is not available for purchase on the market.

Table 14. Global warming potential range due to variation of products.

A1-A3	Resin content	Deviation vs average product	A1-A3 GWP-GHG	Deviation vs average product
Scenario	**kg/t**	**%**	**kgCO$_2$eq/t**	**%**
Minimum resin content product	2,50E+01	-64,8%	2,65E+02	-54,0%
Maximum resin content product	1,20E+02	69,04%	6,85E+02	18,83%
Average product	7,10E+01	0,00%	5,77E+02	0,0%

Differences versus previous versions

This is the first publication of this EPD, then there are no changes to previous versions.

References

- General Programme Instructions of The International EPD® System. Version 3.01.
- PCR 2019: 14 Construction products (EN 15804:A2) (version 1.11)
- ISO 14020:2000 Environmental labels and declarations - General principles.
- ISO 14025:2010 Environmental labels and declarations - Type III Environmental Declarations - Principles and procedures.
- ISO 14040:2006 Environmental management - Life Cycle Assessment - Principles and framework.
- ISO 14044:2006 Environmental management - Life Cycle Assessment - Requirements and guidelines.
- Marcel Gómez Consultoría Ambiental. LCA Report for COMPAC®: Terrazzo™, Quartz™ and Obsidiana™. Spain. 2022.

EPD®

www.environdec.com