

Environmental Product Declaration



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

WHITE DIONYSSOS MARBLE SLABS (3cm thickness) by



Quarried at
Dionyssomarble S.A.
Dionyssovouni, Dionyssos, Attica, Greece

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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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 v.1.3.3 Construction products. EPD System. Date 2024-03-01. UN CPC 15120
PCR review was conducted by: 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: No chair appointed
Life Cycle Assessment (LCA)
LCA accountability: GEOFASMA www.geofasma.gr
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by accredited certification body Third-party verification:  Business Quality Verification P.C. – BQV www.bqv.gr , info@bqv.gr is an approved certification body accountable for the third-party verification The certification body is accredited by: Hellenic Accreditation System SA (E.S.Y.D) with accreditation number 1218
Procedure for follow-up of data during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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: **Dionyssomarble S.A.**
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Website: **www.dionyssomarble.com**
E-mail address: **info@dionyssomarble.gr**

The Company

Leaders in marble production, processing and trade

Dionyssomarble holds a leading position in the production, processing and trade of marble and other decorative rocks. Moreover, we use the raw materials available to offer other products, such as marble dust and calcium carbonate filler.



The company enjoys a historic course of more than 100 years, acquiring a prominent position both in Greece and abroad.

The company's name has become synonymous with reliability, consistency and continuity in all areas of operation. We heavily invest in our people, making sure to incorporate talent among scientists/engineers, as well as experienced technicians and technicians who transmit knowledge and experience to the younger generations of workers. We strive to create a working environment for our employees that recognises and leverages their skills, and we constantly invest in their capacity-building and development.

The cornerstone behind the company's success is the excellent quality of the marble it extracts in Dionyssos, Attica, as well as of all other products, mainly raw materials based on Pentelicon marble.

Dionyssomarble's on-going objectives are the following:

- Optimum quality of products and services at competitive prices
- Capable and adequately trained staff in an excellent working environment
- Modern technological equipment and production methods to continuously improve productivity and reduce costs
- Respect to the community and the natural environment



Dionyssos Quarry

The Dionyssos quarry offers the renowned white and semi-white Dionyssos marble

The world famous "Dionyssos" marble is extracted here. The quarry operates since the end of the 19th century. More than 100 years. Since 1949 it is exclusively operated by "Dionyssos-Penteli Marble Quarries S.A.".

Nowadays, mining, apart from the ground mining fronts, takes also place in underground sites (following the methodology of rooms with support pillars). Dionyssos marble, which has the same chemical composition and texture as Pentelic marble, of Parthenon fame is among the most sought-after linings for large and smaller projects, not only in Greece, but all over the world.



Vision & Values

Our vision is to operate our company in the field of marble and other decorative stones and related materials in an efficient and suitable way in order to satisfy our stakeholders: customers, suppliers, employees and shareholders.

The four pillars upon which our vision is built are:

- Providing reliable products and services, with a steadfast commitment towards our customers' satisfaction and building relationships of trust with them.
- Creating a working environment for our employees that recognises and leverages their skills, while consistently investing in their capacity-building and development.
- Respecting the natural environment.
- Ensuring satisfactory financial results in order to achieve our long-term sustainability

Product-related or management system-related certifications

Since 2000, Dionyssomarble Group has adapted the activities of its main companies to the requirements of the ISO 9001 standard for quality management.

In March 2001, Dionyssos-Penteli Marble Quarries S.A. was certified for the first time.

Since then, the certificates are being renewed on a yearly basis, following relevant audits by the certification body.

The ISO 9001 certification and the applicable quality management system also contribute to the company's effort to minimise any deviations from the target quality level of products and services. Dionyssos-Penteli Marble Quarries S.A has developed and implements a Quality Management System according to **ISO 9001:2015**.

The company has also developed a control and production procedures system in the plant, through which it provides **CE marking** (according to below harmonised EN standards) to the products.

EN 1469 : 2015	Natural stone slabs for cladding
EN 12057 : 2004	Modular tiles of natural stone for cladding or floors and stairs
EN 12058 : 2004	Slabs of natural stone for floors and stairs

Furthermore, it provides declarations of conformity to its customers, depending on the use for which those materials are intended.

In the context of the continuous efforts to protect the environment, the company has developed and implements an environmental management system according to the **ISO 14001:2015** Standard from 2022.

Projects with White Dionyssos Marble



Restoration of Acropolis monuments
Athens, Greece

Our company is proud to have undertaken the marble supply for the restoration of the Acropolis monuments, including the Parthenon, a task of great cultural significance.

Athens Concert Hall
Athens Greece

For the depiction of a unique aesthetics and artistry, the excellent white marble of Dionyssos was selected almost exclusively, for its exterior lining.



Stavros Niarchos Foundation
Cultural Centre
Athens Greece

A total of 20,000 square metres of Dionyssos marble were applied inside and outside the building.

Pavilion of Perfect Harmony
Fuji, Japan

Dionyssos marble was chosen to line the Buddhist Grand Main Temple



Bahai house of worship
New Delhi, India

One of the largest places of worship of the Baha'i faith in India is made exclusively with Dionyssos marble

Palace of Justice
Haifa, Israel

An impressive project with blocks of white Dionyssos marble



Pius Church
Meggen, Switzeland

What makes Pius Church unique is the very thin, almost transparent Dionyssos marble slabs that were used for the façade, instead of glass, concrete or metal

Product information

Product name:

1 m² Marble Slab (3cm)
Slabs of White Dionyssos Marble



Product identification:

Denomination in accordance with EN 12440

Traditional name:	Dionyssos White
Petrological family:	Calcitic marble
Mineral composition:	Main minerals: calcite (> 97%) and dolomite (2%)
Typical colour:	Predominantly white colouration features light grey or green veins, with localised off-white parts

Product description:

Characteristics	Unit	Performance	Test method
Apparent density	kg/m ³	2710	EN 1936
Water absorption at atmospheric pressure	%	0,1	EN 13755
Open porosity	%	0,4	EN 1936
Flexural strength	MPa	15,9	EN 12372
Compressive strength	MPa	102	EN 1926

Applications

White Dionyssos Marble is appropriate for any type of application, both in building constructions as well as in decoration.

Appropriate for large and small construction projects, public buildings, shopping malls and private residences. Ideal for exterior floors in balconies, terraces, etc. as well as swimming pool areas following a special anti-slip treatment. Indoors, it can be used to cover floors and line vertical surfaces, such as bathroom and kitchen walls. It is an excellent choice for kitchen countertops.

UN CPC code:

151 Monumental and building stone
Sub code: 15120 Marble and other calcareous monumental or building stone)

Geographical scope:

Global

Content information

This is a product specific EPD.

The packaging of the products includes wooden pallet boxes and stretch film.

All packaging used is recyclable.

Biogenic carbon in both packaging and products is less than 5% and therefore not reported (but taken into account during the LCA).

The product declared does not contain any substances of very high concern (SVHC) according to REACH.

For more information about the product please visit:

<https://www.dionyssomarble.com/en>

LCA information

Functional unit / declared unit:

1 m² of Marble Slab

Time representativeness:

Data referring to 2022 production

Database(s) and LCA software used:

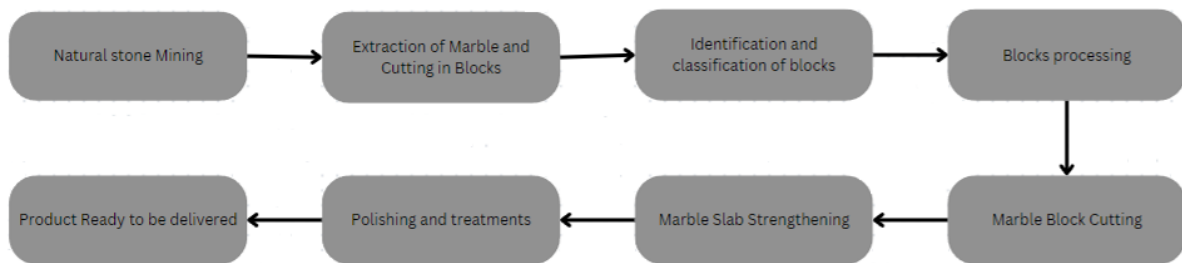
Open LCA v.2.0.0, Ecoinvent v.3.9.1

Description of system boundaries:

The scope of the study is set to be Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

It should be noted that construction stage (modules A4-A5) and use stage (modules B1-B7) are optional and are not under the scope of this study.

System diagram:



A1	A2	A3					
Extraction	Transportation	Manufacturing					
Production of Fuels Production of Explosives	Transport	Squaring, cutting, reinforcing the slabs with epoxy resin, polishing the slabs	Use of water for the cutting and polishing process	Waste collection and recycling processes up to the manufacture of secondary raw materials	Packaging	Production and transportation of raw materials used in the processes of squaring, cutting, reinforcing and polishing the slabs	Loading of slabs

Product stage includes raw material supply, transportation and manufacturing. There are no excluded processes.

A1: Raw Material Supply

Production starts with raw materials supply. The main raw materials used for the production of marble slabs are energy carriers (diesel and electricity) and explosives used for the mining of limestone rock. Furthermore, small quantities of oils and lubricants are utilized for equipment operation during the manufacturing process. What is more, water is utilized, both for wire cutting activities, as well as for quarry’s everyday operation.

The manufacturing of limestone slabs commences with the drilling of the sedimentary rock mass and then the use of explosives to blast and release rocks.

A2: Transportation of raw materials to manufacturer

Transportation stage involves the impacts of raw materials (and spare parts) delivery impact from the supplier to the manufacturing plant.

The blocks are transported to the processing area by trucks which use diesel fuel.

A3: Manufacturing

Primary Processing:

At the processing facility, large blocks are cut into more manageable sizes using diamond wire saws or similar cutting equipment.

The blocks may be cut into rough slabs or other preliminary shapes.

Sawing:

The rough slabs are further cut into specific dimensions using gang saws or multi-blade saws.

This stage helps create the desired thickness for the marble slabs.

Finishing:

The cut slabs undergo various finishing processes to achieve the desired surface texture and appearance.

Common finishing techniques include polishing, honing, or applying other treatments to enhance the aesthetic qualities of the marble.

Quality Control:

Each slab is inspected for quality, and any imperfections or defects are addressed during this stage.

Quality control ensures that the finished slabs meet the desired standards and specifications.

Packaging:

Finished marble slabs are carefully packaged for transportation. Packaging helps protect the slabs from damage during shipping and handling.

Co-products are: marble slabs of different dimensions, marble-blocks, and marble-originated aggregates (e.g. marble sand).

Regarding **Assumptions**, spare parts quantity was assumed to be the same with scrap quantity. What is more, for stages C1, C2, C3, C4, D, the following assumptions were made:

C1: Based on "Model for Life Cycle Assessment (LCA) of buildings ", 0.070MJ/kg was used.

C2: An average distance of 50 km from waste treatment facility was used

C3: The assumption that the 100% of demolition waste will go to EC&D Waste treatment facility was used

C4: The assumption that the 0% of demolition waste goes to disposal facilities was used

D: The assumption that 100% of demolition waste is recycled and reused as aggregates (gravel) was used

Allocation rules have been performed in accordance with the requirements of ISO 14044:2006. Wherever possible, allocation was avoided by dividing the unit process to be allocated into two or more sub-processes and collecting the input and output data related to these sub-processes. In instances where direct attribution of input/output data to the product was not possible, allocation was carried out relying on physical properties, particularly mass. Mass allocation was applied to the following streams:

- Diesel for A1 & A2 stage
- Packaging
- Electricity (based on specific data given for A3 stage)
- Waste

Regarding **Cut-off criteria**, all product components and production processes are included when the necessary information is readily available or a reasonable estimate can be made. Where there is insufficient data or data gaps for a unit process, the cut-off criteria are 1% of the total mass of input of that process. The total of neglected input flows per module is a maximum of 5% of energy usage and mass. In this case, cut-off was applied in small quantity wastes (batteries, other solvents and solvent mixtures) during the manufacturing process.

Finally, the study does not include the followings:

- Capital equipment production
- Equipment maintenance
- Human labor and employee transport

It should be noted that generic data from the ecoinvent database (version 3.9.1) are included in the background system of this study.

Regarding **primary data**, production data were used for the quantities used in the study. For waste, the records submitted to the National Electronic Waste Registry for the reference year were used.

For the **transportation** of raw materials to the manufacturing plant, diesel consumption records for the transportation of blocks was available and therefore used.

For the **transportation** of raw materials from external providers, the relevant distance was available.

Regarding **electricity mix**, the latest (2022) residual electricity mix for Heron as published in DAPEEP SA was utilized. GWP-GHG for the above mentioned energy mix was calculated to **5.88E-01kg CO₂ eq.**

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

Module	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GR	GR	GR	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Specific data used	>95%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Manufactured in 1 site			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X: Included, ND: Not Declared

Results of the environmental performance indicators

ENVIRONMENTAL INDICATORS							
Indicator	Unit	A1-A3	C1	C2	C4	C4	D
GWP-total ¹	kg CO ₂ eq	1.09E+01	5.65E-01	5.79E-02	3.53E-01	0.00E+00	-4.74E-01
GWP-fossil	kg CO ₂ eq	1.08E+01	5.65E-01	0.00E+00	3.53E-01	0.00E+00	-4.72E-01
GWP-biogenic ³	kg CO ₂ eq	2.33E-02	7.11E-05	0.00E+00	4.44E-05	0.00E+00	-9.82E-04
GWP-luluc	kg CO ₂ eq	2.06E-03	6.36E-05	1.68E-01	3.97E-05	0.00E+00	-7.90E-04
GWP-GHG	kg CO ₂ eq	1.08E+01	5.62E-01	0.00E+00	3.51E-01	0.00E+00	-4.70E-01
ODP	kg CFC-11 eq	3.57E-07	8.98E-09	1.68E-01	5.61E-09	0.00E+00	-2.05E-09
AP	mol H ₊ eq	6.20E-02	5.23E-03	1.09E+01	3.27E-03	0.00E+00	-1.83E-03
EP-freshwater	kg P eq	9.97E-03	1.73E-05	0.00E+00	1.08E-05	0.00E+00	-2.69E-04
EP-marine	kg N eq	9.06E-03	2.43E-03	1.09E+01	1.51E-03	0.00E+00	-3.10E-04
EP-terrestrial	mol N eq	7.83E-02	2.64E-02	0.00E+00	1.65E-02	0.00E+00	-2.02E-03
POCP	kg NMVOC eq	3.28E-02	7.81E-03	0.00E+00	4.88E-03	0.00E+00	-8.15E-04
ADPe ²	kg Sb eq	7.83E-06	1.79E-07	0.00E+00	1.12E-07	0.00E+00	-4.08E-06
ADPf	MJ	1.57E+02	7.45E+00	1.35E-03	4.65E+00	0.00E+00	-5.62E+00
WDP ²	m ³ eq	3.01E+00	3.04E-02	0.00E+00	1.90E-02	0.00E+00	-1.31E+00

¹ This indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013).

² The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

³ GWP-biogenic is balanced-out, thus resulting in a total value of zero.

GWP-total: Global warming potential-total, **GWP-fossil:** Global warming potential-fossil **GWP-biogenic:** Global warming potential-biogenic, **GWP-luluc:** Global warming potential-luluc, **GWP-GHG:** Global warming potential-GHG, **ODP:** Ozone Depletion Potential, **AP:** Acidification Potential, **EP-freshwater:** Eutrophication potential-freshwater, **EP-marine:** Eutrophication potential-marine, **EP-terrestrial:** Eutrophication potential-terrestrial, **POCP:** Photochemical oxidant formation potential, **ADPe:** Abiotic depletion potential-elements, **ADPf:** Abiotic depletion potential-fossil, **WDP:** Water scarcity potential

RESOURCE USE							
Indicator	Unit	A1-A3	C1	C2	C4	C4	D
PERE	MJ	3.00E+01	4.21E-02	1.48E+01	2.63E-02	0.00E+00	-8.81E-01
PERM	MJ	3.96E-02	0.00E+00	0.00E+00	2.44E+02	0.00E+00	-8.13E+01
PERT	MJ	3.00E+01	4.21E-02	1.48E+01	2.44E+02	0.00E+00	-8.22E+01
PENRE	MJ	1.51E+02	7.40E+00	3.43E+02	4.62E+00	0.00E+00	-5.55E+00
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	8.13E+01	0.00E+00	-8.13E+01
PENRT	MJ	1.51E+02	7.40E+00	3.43E+02	8.59E+01	0.00E+00	-8.69E+01
SM	kg	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
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	6.21E-02	7.07E-04	3.56E-01	4.41E-04	0.00E+00	-4.98E-02

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 resources, SM: Use of secondary materials, RSF: Use of renewable secondary materials, NRSF: Use of non-renewable secondary fuels, FW: Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES							
Indicator	Unit	A1-A3	C1	C2	C4	C4	D
HWD	kg	5.12E-04	4.98E-05	1.75E-04	3.11E-05	0.00E+00	-7.14E-06
NHWD	kg	1.12E+01	5.69E-01	1.25E+01	3.55E-01	0.00E+00	-6.32E-01
RWD	kg	3.26E-05	8.10E-07	2.81E-04	5.06E-07	0.00E+00	-2.01E-05
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for re-use, MFR: Materials for recycling, MER: Materials for energy recovery, EE: Exported energy

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.

Additional environmental information

Marble slabs are a fully reusable and recyclable product with almost unlimited duration in time. There is no release of dangerous substances to indoor air, soil and water during the use stage. At the end of their life cycle they can be reused in their original form or if they are found in the demolition of the building they can be recycled as aggregates (sand, gravels) after mechanical processing (crushing and screening). They do not require maintenance during their life cycle and no energy or water consumption is required after they are placed in the structure.

Dionyssomable SA provide for and take substantial environmental measures, ensuring a gradually reduction in its environmental footprint.

The company's concern for the environment translates into actions such as:

- Actions for the care and restoration of the environment.
- Ensuring the restoration and promotion of old and inactive quarry areas
- Restoring the exhausted sections of the quarries it exploits.
- Planting and reforestation of the neighbouring burnt areas. It ensures the complete recycling of all consumables and raw materials used in the production activity.
- Carrying out measurements of environmental factors (dust, noise, water quality, etc.) and taking the necessary measures to improve its performance.
- Carrying out underground mining operations in order to reduce both the visual pollution and the soil surface deterioration.
- It is an independent Civil Protection Foundation and participates with its own resources and staff in the prevention and suppression of major disasters (fires, snowploughs, etc.).
- It measures water consumption and makes sure to recycle almost all the water it manages in its facilities.

For more information about the environmental actions please visit:
<https://www.dionyssomarble.com/en/dionyssomarble/reducing-the-environmental-footprint-through-environmental-actions>

Differences versus previous versions

- No previous versions

References

- **GPI V.4.0.** General Programme Instructions of the International EPD® System. Version 4.0, 2021-03-29
- **PCR 2019:14** Construction products (EN 15804+A2) Version1.3.3, 2024-03-01
- **EN 15804:2012+A2:2019/AC:2021** Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products, 2021-08-18
- **ISO 14020:2000** Environmental labels and declarations — General principles
- **ISO 14025:2006** 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\
- **Residual Energy Mix 2022** from Renewable Energy Sources Operator & Guarantees of Origin (DAPEEP SA)
- **United Nations Statistics Division (2015).** Central Product Classification.
- **Ecoinvent Version 3.9.1.** Ecoinvent Centre, www.Eco-invent.org

