LAMINAM
SUPERIOR NATURAL SURFACES

Environmental Product Declaration

Product Name: CERAMIC TILES

"Ceramic surfaces for flooring and cladding, indoor and outdoor, for kitchen countertops and table tops."

Laminam S.p.A.
Via Ghiarola Nuova 258, Fiorano Modenese (MO), Italy
Via Primo Brindani 1, Borgo Val di Taro (PR), Italy

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

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1. General information

Owner of the declaration	Laminam S.p.A. - Via Ghiarola Nuova, 258 41042, Fiorano Modenese (MO), Italy
Plants involved in the EPD	Laminam S.p.A. - Via Ghiarola Nuova, 258 41042, Fiorano Modenese (MO), Italy Laminam S.p.A. – Via Primo Brindani 1 43043, Borgo Val di Taro (PR), Italy
Program Operator	EPDITALY (www.epditaly.it) Via Gaetano De Castillia 10 - 20124 Milan, Italy
Independent verification	This declaration has been developed in accordance with the EPDItaly Regulations; further information and the Regulations themselves are available on the website: www.epditaly.it. The EN 15804 standard is the framework reference for PCR (PCR ICMQ-001/15 rev 3). The PCR revision was carried out by ICMQ-info@epditaly.it. Independent verification of the declaration and data according to ISO 14025:2010. Internal ☐ External ☒ Third party verification performed by: ICMQ S.p.A, Via Gaetano De Castillia, n°10 - 20124 Milan, Italy. Accredited by Accredia.
CPC-Based Code	37370
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Comparability	Environmental statements published within the same product category, but from different programs, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804.
Responsibility	Laminam releases EPDItaly from any non-compliance with environmental legislation self-declared by the manufacturer. The holder of the declaration will be responsible for the information and supporting evidence; EPDItaly declines all responsibility for the manufacturer's information, data and results of the evaluation of the life cycle of the product.
Reference documents	This declaration has been developed following the EPDItaly Programme Regulations, available on the website:www.epditaly.it.
Product Category Rules (PCR)	PCR ICMQ-001/15 rev3 EN 15804/2019 provides the framework reference for PCR.

2. Company profile

The story of Laminam is made up of an unwavering pursuit of absolute quality and perseverance in the desire to innovate, which has taken it further, always, beyond national boundaries. Our architectural surfaces are proving increasingly popular in Europe and in all other continents, where excellence Made in Italy traditionally matches high-quality finishes with impeccable aesthetic taste. Some of the most interesting markets include Europe, Russia and the Far East.

However, Laminam also has a significant presence on the American continent and is also rousing interest in the Middle East. Consequently, the brand has boosted its exposure abroad, also from a corporate perspective. The parent company, Laminam S.p.A., has been supplemented with subsidiary companies that are controlled directly or in partnership with local commercial players: LaminamRUS, Laminam USA, Laminam Canada, Laminam UK, Laminam Germany, Laminam France, Laminam China, Laminam Japan, Laminam Israel and the latest to be established: Laminam Australia.

The company headquarters firmly remain in Italy, in Fiorano Modenese. Again in Italy are two of the three production plants, the Research & Development laboratories and a company specialising in installation services: Laminam Service. This is to emphasise the brand's strong national component and its desire for Italian know-how to become known. Over the coming years, the objective is to increase the international reach in terms of sales, production and logistics, to make its range of products more accessible to the global market, providing speedy and on-time deliveries and responses. It should be noted that Laminam works at international level, relying on solid partnerships with first-level distributors who are able to convey the distinguishing values of Laminam to the market, with respect to other surface materials. Laminam's strength lies in valuing partnerships, providing considerable support for all market players, in addition to superior product quality.

Shaping tomorrow's world

Surfaces inspired by nature, which go beyond nature. Laminam produces ceramic slabs which challenge the traditional uses of this material, creating large sized minimum thickness surfaces, which are used in exterior architecture, interior design and furnishings.The aim is to redefine and ply spaces so that they become an expression of our personality and give rise to places to live and work and feel at ease with ourselves and with others. From the onset, we revolutionised the ceramic world thanks to a pioneering vision and to the introduction of ever more innovative products in terms of thicknesses and sizes. What's more, IN-SIDE technology has enabled us to take a leap forward, achieving for the first time ever body and surface continuity. The end result is a product which accompanies elegance with structure and beauty. Our company grows continually thanks also to the development of solid partnerships and a mutually beneficial exchange of know-how and ideas with those who, like us, nurture the ambition of shaping tomorrow's world.

The ceramic specialists

Laminam works with an ancient material, ceramic, which it has reinterpreted by creating its surfaces, combining its natural qualities with a new application connotation. This is a constantly evolving process, which allows us to study ever new application possibilities in international architecture and in state-of-the-art contexts, through to increasingly precious and sophisticated furnishing finishes. From tradition to production, Laminam has deployed innovation not just in terms of technology, but also aesthetic styling, constantly raising the market standards with our surfaces, without ever forgetting our focus on sustainability and safety.

Technology and Innovation

At the heart of the Laminam philosophy lies an unwavering propensity for innovation and the pursuit of uniqueness. We dedicate intensive research activity for each and every product, to combine aesthetic and qualitative excellence with environmental friendliness, which is one of the key values of the brand. The introduction of bio-active treatments AMBIENCE which lend our slabs anti-bacterial, self-cleaning* and pollutant eradication properties is just one example of how Laminam intends to pursue excellence through innovation. Indeed, this does not stop with the product, but rather stretches across the entire value chain, involving processes, people and environments. These are the pillars underpinning the success of Laminam and on which we intend to build our future.

*In exterior surfaces, AMBIENCE encourages the natural elimination of organic compounds due to the aggression of polluting substances, contributing towards keeping building facades cleaner compared with un-treated surfaces. In interior surfaces, it has a notable anti-bacterial action.

Certifications

Product certifications

CCC	China Compulsory Certificate mark
UPEC	French flooring material quality certification
UNI EN ISO 14021	Laminam slabs contain up to 40% pre-consumer recycled material
ITB	Polish Quality Certification Russian certification for the use of Laminam 3+ in the building sector Russian certification of compliance with hygiene regulations in the building sector Russian certification of conformity with fire regulations
NSF	American Standard for food equipment “Ceramic Solid Surface For Splash Zone”
KASHERUT	Laminam slabs are certificated Kosher Parve

System certifications

UNI EN ISO 9001	International Standard for Quality management systems
ISO 14001	Environmental management system
MED 96/98/EC e 2014/90/EU	Certification for use in the marine sector
C-TPAT	Customs-Trade Partnership Against Terrorism - USA

Production plants

The Group's headquarters are located in Fiorano Modenese, in the province of Modena. Laminam has three manufacturing plants (two in Italy and one in Russia), Research & Development and Technology laboratories in Italy and Russia, and a service company in Italy (Laminam Service). In addition, the company has sales subsidiaries in the USA, Canada, UK, France, Germany, Poland, Israel, China, Japan and Australia, several showrooms and a network of distributors worldwide.

The Laminam locations subject to EPD verification are:

- Laminam S.p.A - Via Ghiarola Nuova 258, Fiorano Modenese (MO)
- Laminam S.p.A. - Via Primo Brindani 1, Borgo Val di Taro (PR)

Fiorano Modenese

Borgo Val di Taro

Company contact

For more information on Laminam's activities or in relation to this environmental product declaration, you can contact:

Roberto Pederzoli
Quality Manager
info@laminam.com

Alternatively, you can consult the website: www.laminam.com/en/

3. Scope and type of the EPD

System boundaries

This EPD considers the entire life cycle of the ceramic slabs produced by Laminam; the EPD type is therefore "from cradle to grave". In accordance with the framework defined by EN 15804, the life cycle is divided into the following phases and respective modules:

Product stage

modules A1-A2-A3: include the production processes of energy, fuels and raw materials (A1), transport of materials to manufacturing sites (A2), manufacturing processes and related input of materials and energy and output of waste, pollutants into the atmosphere and water (A3).

Construction stage

module A4: includes the transport of the product from the production plant to the point of use of the product.
module A5: considers the installation phases of the slab (such as the consumption of adhesives) and the treatment of waste generated by packaging (recycling, incineration, disposal).

Use stage

module B1: takes into consideration the use of the slabs. During the use phase, the generation of dangerous emissions in indoor environments is not expected.
module B2: concerns the maintenance and cleaning of the product. The supply of water and detergent for cleaning is considered. If the plates are installed correctly, no repair, replacement and refurbishment processes are required.
modules B3-B4-B5: refer to the repair, replacement, and renovation of the product. If the slabs are correctly installed, repair, replacement and renovation processes are not necessary and are therefore are considered as non-significant in this study.
modules B6-B7: consider the use of energy to operate the technical systems integrated in the building (B6) and the use of operating water for technical systems related to the building (B7).

End of life

module C1: concerns the process of demolition and deconstruction of the slabs from the building. It is not considered relevant from the point of view of environmental impacts.
module C2: considers the transport of the demolished slab to a recycling or disposal process.
module C3: considers each process (collection, crushing process, etc.) suitable for the recycling of slabs.
module C4: includes all landfill disposal processes.

Benefits and environmental burdens beyond system boundaries

module D: includes credits deriving from the flows of matter and energy that leave the system boundaries of the product studied. The impacts of the packaging incineration processes in phase A5 and the resulting energy credits (electricity and thermal energy) are declared in module D.

Product Stage			Construction Process Stage		Use Stage							End of life Stage				Resouce Recovery Stage
Raw materials 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
A1	A2	A 3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X = Module included in the LCA study; ND = Undeclared module

Type of EPD

Average EPD relative to average products. The environmental performances declared in this EPD refer to 6 average products, each of which is representative of a specific Laminam product family. The product families considered are:

- 3 mm thick slabs
- 3+ mm thick reinforced slabs
- 5 mm thick slabs
- 5+ mm thick reinforced slabs
- 12+ mm thick reinforced slabs
- 20+ mm thick reinforced slabs

The average product for each family is obtained by averaging the compositions of all Laminam products belonging to that particular family. The average is weighted with respect to the production volumes of each product in reference to the year 2019.

Software and Database

The software used for the LCA calculations is SIMAPRO 9.1.
The database used for process modeling is ECOINVENT 3.6.

Geographical scope

Manufacturing: Italy
Product distribution: global/internazional

4. Product description

Product identification

The products covered by this EPD are porcelain stoneware ceramic slabs, produced in Italy in the Laminam plants in Fiorano Modenese and Borgo Val di Taro. The slabs, and their respective environmental performance, are grouped into product families according to the thickness and / or particular characteristics of the slab. This EPD refers to six product families:

1) 3 mm thick slabs
2) 3+ mm thick reinforced slabs
3) 5 mm thick slabs
4) 5+ mm thick reinforced slabs
5) 12+ mm thick reinforced slabs
6) 20+ mm thick reinforced slabs

For more information, you can scan the QR Code to view and/or download the ***Available Product***, a document, always updated, containing information on the entire Laminam product range.

Laminam 3

Laminam 3 is the basic slab and starting point for other versions. Untrimmed end product. Laminate porcelain obtained by wet grinding of clayish raw materials, granite and metamorphic, feldspar-containing rocks and ceramic pigments. Compacted by a special shaping in compatter and sintering at 1200°C, with hybrid firing. With single gauge square edge.

Processing surface: 1000x3000mm (39.4''x118.1'')**

Nominal thickness: 3mm (1/8")

Minimum useful area-thickness ratio: $8x10^5$

Use of Laminam 3

- Construction industry: internal and external applications, for wall and ceiling covering, with adhesive
- Furniture industry and interior design application

Laminam 3+

Laminam 3+ is the basic slab structurally reinforced with a fibreglass mesh attached to the back with a special adhesive. Laminate porcelain obtained by wet grinding of clayish raw materials, granite and metamorphic, feldspar-containing rocks and ceramic pigments. Compacted by a special shaping in compatter and sintering at 1200°C, with hybrid firing. With single gauge square edge and with a structural reinforcement in inert material (fiberglass mesh bonded at the back).

Processing surface: 1000x3000mm (39.4''x118.1'')**

Nominal thickness: 3mm (1/8")

Use of Laminam 3+

- Construction industry: residential flooring and wall covering application either on screed or existing wall and floors not affected by heavy traffic, through direct adhesion.
- Ventilated façades
- Curtain walls
- Furniture industry and interior design application

Laminam 5

Laminam 5 is the basic slab and starting point for other versions.
Laminate porcelain obtained by wet grinding of clayish raw materials, granite and metamorphic, feldspar-containing rocks and ceramic pigments. Compacted by a special shaping in compatter and sintering at 1200°C, with hybrid firing. With single gauge square edge and with a structural reinforcement in inert material (fiberglass mesh bonded at the back).

Processing surface: 1000x3000mm (39.4''x118.1'')** 1200x3000mm (47.2"x118.1")**

e 1620x3240mm (63.7"x127.5")**

Nominal thickness: 5.6mm (¼")

Use of Laminam 5

- Construction industry: residential flooring and wall covering application either on screed or existing walls and floors not affected by heavy traffic, through direct adhesion.
- Ventilated façades (prior application of fibreglass mesh to the back of the slabs)
- Curtain walls (prior application of fibreglass mesh to the back of the slabs)
- Furniture industry and interior design application

Laminam 5+

Laminam 5+ is the basic slab structurally reinforced with a fibreglass mesh attached to the back with a special adhesive. Laminate porcelain obtained by wet grinding of clayish raw materials, granite and metamorphic, feldspar-containing rocks and ceramic pigments. Compacted by a special shaping in compatter and sintering at 1200°C, with hybrid firing. With single gauge square edge and with a structural reinforcement in inert material (fiberglass mesh bonded at the back).

Processing surface: 1200x3000mm (47.2”x118.1”)** e 1620x3240mm (63.7”x127.5”)**

Nominal thickness: 6mm (¼”)

Use of Laminam 5+

- Construction industry: residential flooring and wall covering application either on screed or existing wall and floors not affected by heavy traffic, through direct adhesion.
- Ventilated façades
- Curtain walls
- Furniture industry and interior design application

Laminam 12+

Laminam 12+ is made up of a base slab, strengthened with a fibreglass mesh bonded on the back. Laminate porcelain obtained by wet grinding of clay raw materials, granite and metamorphic rocks, with a feldspathic component and ceramic pigments. Specially shaped in a compactor and sintered at 1200°C, with gas firing. Structurally reinforced with inert material (fiberglass mesh bonded on the back).

Processing surface: 1620x3240mm (63.7”x127.5”)**

Nominal thickness: 12.5mm (½”)

Use of Laminam 12+

- Furnishing and interior design sector: flat surfaces for bathroom and kitchens, tables, desks and furnishings in general.
- Shipbuilding sector: finishing material.
- Building sector*: floor and wall covering systems.

Laminam 20+

Laminam 20+ is made up of a base slab, strengthened with a fiberglass mesh bonded on the back. Laminate porcelain obtained by wet grinding of clay raw materials, granite and metamorphic rocks, with a feldspathic component and ceramic pigments. Specially shaped in a compactor and sintered at 1200°C, with gas firing. Structurally reinforced with inert material (fiberglass mesh bonded on the back).

Processing surface: 1620x3240mm (63.7”x 127.5”)**
Nominal thickness: 20,5mm (¾”)

Use of Laminam 20+

- Furnishing and interior design sector: flat surfaces for bathrooms and kitchens, tables, desks and furnishings in general
- Shipbuilding sector: finishing material.
- Building sector*: floor covering systems.

One surface, a multitude of technical features

Easy to clean and maintain
Laminam is simple, fast and easy to clean and has no special maintenance requirements as time passes by. Generally speaking, all you need to clean the surface is warm water and a neutral detergent.

Hygienic surface
Laminam surfaces are ideal for application in places where maximux hygiene is needed.

Suitable for contact with foodstuffs

Laboratory tests have proven that Laminam is totally compatible with foodstuffs, as it does not release elements in solution.

Resistant to mould and fungi

Laminam doesn’t allow mould, bacteria or fungi to grow.

Impervious surface

Laminam surface porosity is average 0.1% and it does not absorb water.

Resistant to freeze-thaw

Laminam is frost resistant and suitable for any weather condition, thanks to its low average water absorption (0.1%)

Dimensional stability

Laminam is not subject to dimensional variations of any significance, as it has a low coefficient of thermal expansion.

Suitable for indoor and outdoor applications

Laminam can be used both for interior and exterior décor. Weathering exposure does not damage or alter surfaces.

Resistant to heat and high temperatures

Laminam does not contain any organic materials therefore it is resistant to fire and high temperatures.
In the event of fire, it does not release smoke or toxic substances. Used as a kitchen countertop, it is
suitable for direct contact with hot surfaces, such as pots and pans.

Resistant to staining**

Laminam is not affected by prolonged contact with products commonly found in the kitchen that can cause staining, such as wine, coffee, olive oil or lemon juice and its colour or shine will not be affected permanently.

Resistant to detergents and cleaning products**

Laminam is not affected by prolonged contact with normal household detergents, including products to eliminate grease or lime scale. It is extremely easy to clean while maintaining the characteristics of the surface unaltered.

Resistant to chemicals, acids, alkalis and solvents**

Laminam is not affected by organic and inorganic solvents, chemicals and disinfectants. The only chemical that can damage ceramics is hydrofluoric acid.

Resistant to thermal shock

Sudden changes in outdoor temperature will not damage Laminam.

Resistant to humidity

The ceramic surface of Laminam is not affected by long-term humidity.

Resistant to UV rays, no alteration to colours

Laminam surface is not affected by exposure to UV light and will preserve its original good looks throughout its lifetime.

Resistant to deflection

Laminam has a high modulus of rupture.

Resistant to scratches and abrasions**

Laminam is resistant to scratching and deep abrasion. Its properties do not change even if it is subjected to intensive use and frequent cleaning.

Graffiti proof

Laminam is the first graffiti proof ceramic surface. It is easy to clean and even the strongest paints can be easily removed.

Eco-friendly and recyclable

Laminam is a product made of 100% natural materials. It does not release any elements into the environment and can be easily milled and recycled in other manufacturing processes.

The properties and characteristics of the Laminam products indicated and described above, refer to test methods and technical specifications reported in the product Technical Sheets, which can be consulted in the Surfaces Book catalog.

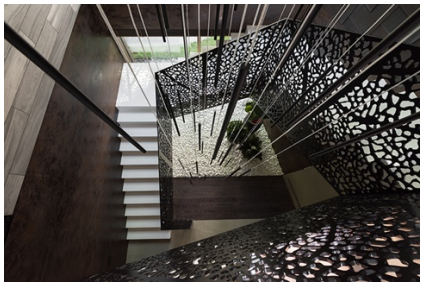
* For the surface properties of the individual finishes, see technical data sheets.
** Not guaranteed for Laminam Lucidato as it is more sensitive than other Laminam surfaces. However, Laminam Lucidato surfaces still offer a similar or a better performance than other work top materials.

Fields of application

Laminam finishes are increasingly used not only in exterior architecture but also in interior design and in the furniture and furnishing accessories sector. The main applications are:

- **Exterior Facades**: facade cladding systems
- **Traditional Building**: floors and coverings
- **Furniture and Interior Design**: surfaces for bathroom and kitchen tops, tables, desks and furniture in general

External facades



Traditional building

Furnishing & Design

Technical features

The products meet the requirements defined by European standard EN 14411 and International standard ISO 13006, according to the criteria established by the test methods ISO 10545 - International Organization for Standardization Specifications for Ceramic Tile reported below. Porcelain stoneware slabs Group BIa according to UNI EN 14411 All. G/ISO 13006 All. G

	Measurement method	LAMINAM 3+ Average value	LAMINAM 5 Average value	LAMINAM 5+ Average value	LAMINAM 12+ Average value	LAMINAM 20+ Average value
Surface quality	EN ISO 10545-2	Minimum 95% of the tiles tested must be free from visible defects	Minimum 95% of the tiles tested must be free from visible defects	Minimum 95% of the tiles tested must be free from visible defects	Minimum 95% of the tiles tested must be free from visible defects	Minimum 95% of the tiles tested must be free from visible defects
Water absorption	EN ISO 10545-3	E ≤ 0.1% * BIa	E ≤ 0.1% BIa	E ≤ 0.1% * BIa	E ≤ 0.1% BIa	E ≤ 0.1% BIa
Modulus of rupture (R)	EN ISO 10545-4	50 N/mm² * (samples 200x300 mm)	50 N/mm² (samples 1000x1000 mm)	50 N/mm² * (samples 1000x1000 mm)	50 N/mm² * (samples 400x800 mm)	50 N/mm² * (samples 400x800 mm)
Breaking strenght (S)	EN ISO 10545-4	-	1100 N (samples 1000x1000 mm)	1100 N * (samples 1000x1000 mm)	>4000 N * (samples 400x800 mm)	>10000 N * (samples 400x800 mm)
Coefficient of linear thermal expansion / 10¯6/°C	EN ISO 10545-8	6.6 *	6.6	6.6 *	6.6 *	6.6 *
Frost resistance	EN ISO 10545-12	Compliant*	Compliant	Compliant *	Compliant *	Compliant *
Thermal shock resistance	EN ISO 10545-9	Compliant *	Compliant	Compliant *	Compliant *	Compliant *
Deep abrasion resistance	EN ISO 10545-6	≤ 175 mm³	≤ 175 mm³	≤ 175 mm³	≤ 175 mm³	≤ 175 mm³
Weight	LAMINAM	8.2Kg/sqm	14 Kg/sqm	14.9 Kg/sqm	30 Kg/sqm	50 Kg/sqm
Resistance to household chemicals and swimming pool salts	EN ISO 10545-13	A	A	A	A	A
Resistance to high or low concentration of acids or bases		Min LB Min HB	Min LC Min HC	Min LC Min HC	Min LC Min HC	Min LC Min HC
Resistance to staining	EN ISO 10545-14	Min Class 4	Min Class 2	Min Class 2	Min Class 2	Min Class 2

Functional unit and reference flows

Functional unit: covering and / or decoration of 1 m^2 of surface for residential and commercial, indoor and outdoor use.

Reference flow: the reference flow (average slabs weight) is shown below for each product group.

Porcelain stoneware slabs	Reference flows (kg/m^2)
Thickness 3 mm	7,8
Thickness 3+ mm	8,2
Thickness 5 mm	14,5
Thickness 5+ mm	14,9
Thickness 12+ mm	30,0
Thickness 20+ mm	50,4

Reference service life (RSL)

The servicel life of the slabs is generally over 50 years (BNB 2011). Furthermore, according to the US Green Building Council this could have the same duration as the useful life of the building itself; therefore a duration of 60 years represents an alternative service life value for the ceramic slabs.
The environmental performance results refer to the service life of the slabs, with the exception of phase B2-Maintenance for which they refer to 1 year (multiplying the B2 values by 50 or 60 it is possible to obtain values relating to the service life).

5. Product composition

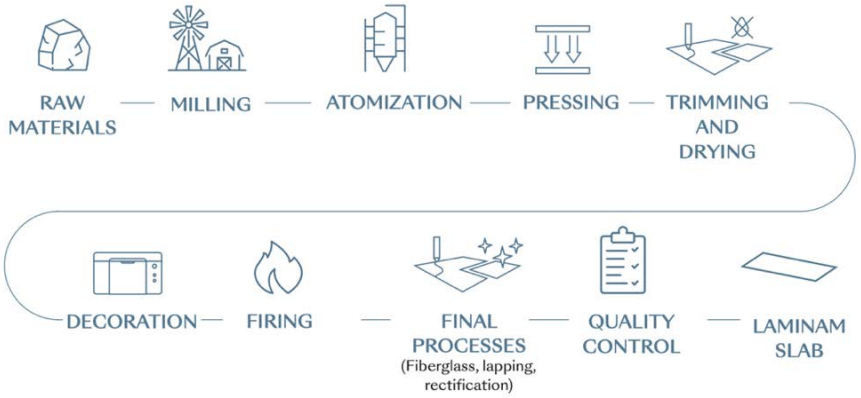
The main raw materials used in the production of Laminam ceramic slabs are clays, sands and feldspars of certified origin, natural substances that are carefully selected to ensure a homogeneous composition. To these materials are added inorganic colouring pigments and eco-compatible glazes (not containing dangerous substances according to the European REACH Regulation) during the decoration phase.

Depending on the type, Laminam slabs contain up to 40% pre-consumer recycled material (i.e. reused industrial waste) as certified by LEED and BREEAM certification. In addition, because they are made from natural raw materials, the slabs can be easily milled and recycled in other production cycles.

Average composition product families	U.M.	3 mm	3+ mm	5 mm	5+ mm	12+ mm	20+ mm
Clay	%	27	25	21	20	10	7
Bentonite	%	0	0	1	1	2	3
Feldspar	%	55	52	47	45	31	27
Kaolin	%	1	1	4	5	10	11
Sand	%	8	7	11	11	16	19
Pre-consumer waste material	%	4	4	8	9	15	13
Additives	%	2	2	5	5	12	15
fluidifying agents	%	1	1	1	1	1	1
Coloring pigments	%	2	2	2	1	1	2
Glue + fiberglass reinforcement mat	%	0	5	0	3	2	1

As foreseen in article 33 of the REACH regulation, no substances of "very high concern" (SVHC : Substances of Very High Concern) are intentionally added to Laminam materials during the production process, in quantities greater than 0.1% by weight/weight.

6. Manufacturing process



The production process for the creation of a Laminam slab is characterized by innovative, highly automated and digitalised methods and technologies which increase its energy efficiency and safe- ty while reducing its environmental impact. A Laminam slab is made from natural raw materials: clays, sands and feldspars which, after being subjected to quality controls, are treated and milled. Afterwards, inorganic and eco-compatible colours are added to the milled raw materials to pigment the base, after which they are mixed and subjected to the spray drying process that considerably reduces humidity. The granulated material obtained in this way, unlike the traditional technique that involves the use of moulds, is spread on a mobile tape and subjected to uniform pressure with the freedom to expand. In this way any internal tension is released, obtaining a perfectly regular surface. The slabs thus obtained are sent to the trimming unit which removes the rough and jagged edge and to a dryer to reduce residual moisture. Subsequently, the slabs are decorated using sophisticated digital inkjet equipment which makes it possible to obtain a chromatic and grain size variability which makes the range of obtainable decorations almost unlimited. Finally, the slabs are preheated and fired in the kiln at temperatures over 1200 degrees centigrade. Upon leaving the kiln, the slabs are subjected to a computer integrity that allows defective slabs to be discarded. In some cases, at the customer's request or for safety reasons related to the future use of the slab (e.g. for external facades), the slabs are reinforced by pasting a fiberglass that increases their me- chanical properties. Afterwards they can be lapped using special industrial sanding machines and the use of special abrasive scales obtaining a polishing that makes the slab similar to marble and rectified if a custom-made product is required. At the end of the production process, the material is subjected to quality control which divides it into first, second choice and scrap.

7. Environmental impact

The environmental performance of Laminam slabs is shown below for each product family, expressed with respect to the functional unit used for the LCA study (1 m^2 of product). The environmental indicators for which the corresponding values are reported are the following, divided into the categories provided for by the technical specifications.

Core Environmentl Impact Indicators

GWP-total = Climate change; **GWP-fossil** = Climate change – fossil; **GWP-biogenic** = Climate change – biogenic; **GWP-luluc** = Climate change - land use and land use change; **GWP-GHG** = GWP total excluded biogenic carbon dioxide emissions and biogenic carbon stored in the product; **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 use

Resource Use

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; **RM**: Use of recycled materials and by-products (according to Green Building Protocols as LEED and BREEAM); **RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of net fresh water;

Waste production

HW = Hazardous waste disposed; **NHW** = Non-hazardous waste disposed; **RW** = Radioactive waste disposed;

Output Flows

REUSE = Components for reuse; **RECYCLE** = Materials for recycling ; **EN-REC** = Materials for energy recovery; **EE-E**= Exported energy electricity; **EE-T**= Exported energy Thermal energy

Slabs 3 mm

Potential Environmental Impact - 3 mm (Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3 B4 B5 B6 B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	1,02E+01	9,99E-01	2,63E-01	0	4,63E-02	0	0	1,26E-01	6,72E-02	9,05E-03	-1,35E-01
GWP-fossil	kg CO2 eq	1,02E+01	9,98E-01	2,28E-01	0	3,58E-02	0	0	1,26E-01	6,70E-02	9,04E-03	-1,34E-01
GWP-biogen.	kg CO2 eq	-2,05E+0	2,55E-04	3,18E-01	0	-1,54E-02	0	0	6,73E-05	2,02E-04	1,79E-05	6,74E-01
GWP-luluc	kg CO2 eq	2,44E-03	4,62E-04	8,14E-05	0	1,04E-02	0	0	4,41E-05	5,51E-05	2,52E-06	-2,58E-04
ODP	kg CFC11eq	1,77E-06	2,18E-07	1,74E-08	0	2,44E-09	0	0	2,87E-08	1,13E-08	3,72E-09	-1,85E-08
AP	mol H+ eq	3,28E-02	1,35E-02	7,72E-04	0	2,28E-04	0	0	5,16E-04	5,26E-04	8,58E-05	-7,65E-04
EP-freshw.	kg P eq	1,22E-03	6,18E-05	2,73E-05	0	1,27E-05	0	0	9,24E-06	1,51E-05	9,28E-07	-4,99E-05
EP-marine	kg N eq	7,23E-03	3,47E-03	3,74E-04	0	1,44E-04	0	0	1,55E-04	1,91E-04	2,97E-05	-1,33E-04
EP-terrestrial	mol N eq	8,54E-02	3,84E-02	2,49E-03	0	6,31E-04	0	0	1,69E-03	2,08E-03	3,25E-04	-1,56E-03
POCP	kgNMVOCe q	2,40E-02	1,04E-02	6,90E-04	0	1,96E-04	0	0	5,18E-04	5,76E-04	9,45E-05	-5,91E-04
ADPmin&met[1]	kg Sb eq	6,58E-05	2,05E-05	1,05E-05	0	8,68E-07	0	0	3,41E-06	4,20E-07	8,27E-08	-5,21E-06
ADPfossil[1]	MJ	1,50E+02	1,43E+01	1,58E+00	0	6,76E-01	0	0	1,90E+00	9,82E-01	2,53E-01	-3,09E+00
WDP[1]	m3 depriv.	2,25E+00	3,42E-02	1,95E-02	0	2,59E-01	0	0	5,30E-03	1,41E-02	1,13E-02	-2,68E-01

1: The results of this environmental impact indicator shall be used with case as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource Use - 3 mm (Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
PERE	MJ	3,11E+01	1,71E-01	1,18E-01	0	3,24E-01	0	0	2,69E-02	3,81E-02	2,04E-03	-4,97E+00
PERM	MJ	2,05E+01	0	0	0	0	0	0	0	0	0	0
PERT	MJ	5,16E+01	1,71E-01	1,18E-01	0	3,24E-01	0	0	2,69E-02	3,81E-02	2,04E-03	-4,97E+00
PENRE	MJ	1,50E+02	1,43E+01	1,58E+00	0	6,76E-01	0	0	1,90E+00	9,82E-01	2,53E-01	-3,09E+00
PENRM	MJ	1,92E+00	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	1,50E+02	1,43E+01	1,58E+00	0	6,76E-01	0	0	1,90E+00	9,82E-01	2,53E-01	-3,09E+00
SM	Kg	5,33E-01	0	0	0	0	0	0	0	0	0	0
RM	kg	1,57E+00	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m3	5,81E-02	1,23E-03	6,60E-04	0	7,02E-03	0	0	1,96E-04	4,03E-04	2,67E-04	-6,44E-03

Waste Production - 3 mm (Functional unit = 1 m²)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
HW	Kg	2,45E-04	3,02E-05	3,79E-06	0	4,76E-07	0	0	4,99E-06	1,78E-06	3,78E-07	-4,84E-06
NHW	Kg	0	0	0	0	0	0	0	0	0	0	0
RW	kg	1,67E-04	9,80E-05	8,23E-06	0	1,04E-06	0	0	1,30E-05	5,33E-06	1,66E-06	-5,68E-06

Output Flows - 3 mm (Functional unit = 1 m²)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
REUSE	Kg	0	0	9,63E-02	0	0	0	0	0	0	0	0
RECYCLE	Kg	5,49E+00	0	3,78E-01	0	0	0	0	0	7,19E+00	0	0
EN-REC	Kg	0	0	0	0	0	0	0	0	0	0	0
EE-E	MJ	0	0	3,89E-01	0	0	0	0	0	0	0	0
EE-T	MJ	0	0	1,17E+00	0	0	0	0	0	0	0	0

Slabs 3+ mm

Potential Environmental Impact - 3+ mm (Functional unit = 1 m²)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3 B4 B5 B6 B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	1,24E+01	1,04E+00	1,12E+00	0	4,63E-02	0	0	1,81E-01	9,64E-02	1,30E-02	-1,37E-01
GWP-fossil	kg CO2 eq	1,23E+01	1,04E+00	1,06E+00	0	3,58E-02	0	0	1,81E-01	9,61E-02	1,30E-02	-1,36E-01
GWP-biogen.	kg CO2 eq	-2,01E+00	2,67E-04	3,33E-01	0	-1,54E-02	0	0	9,66E-05	2,91E-04	2,57E-05	6,74E-01
GWP-luluc	kg CO2 eq	2,94E-03	4,83E-04	4,66E-04	0	1,04E-02	0	0	6,33E-05	7,90E-05	3,62E-06	-2,60E-04
ODP	kg CFC11eq	1,86E-06	2,28E-07	7,00E-08	0	2,44E-09	0	0	4,11E-08	1,62E-08	5,34E-09	-1,87E-08
AP	mol H+ eq	4,46E-02	1,41E-02	4,05E-03	0	2,28E-04	0	0	7,40E-04	7,55E-04	1,23E-04	-7,71E-04
EP-freshw.	kg P eq	1,60E-03	6,46E-05	1,57E-04	0	1,27E-05	0	0	1,33E-05	2,16E-05	1,33E-06	-5,07E-05
EP-marine	kg N eq	9,94E-03	3,63E-03	1,28E-03	0	1,44E-04	0	0	2,22E-04	2,75E-04	4,26E-05	-1,33E-04
EP-terrestrial	mol N eq	1,08E-01	4,02E-02	1,25E-02	0	6,31E-04	0	0	2,43E-03	2,98E-03	4,67E-04	-1,56E-03
POCP	kgNMVOCeq	3,11E-02	1,08E-02	3,35E-03	0	1,96E-04	0	0	7,43E-04	8,27E-04	1,36E-04	-5,92E-04
ADPmin&met[1]	kg Sb eq	9,48E-05	2,14E-05	6,50E-05	0	8,68E-07	0	0	4,90E-06	6,03E-07	1,19E-07	-5,43E-06
ADPfossil[1]	MJ	1,86E+02	1,49E+01	7,36E+00	0	6,76E-01	0	0	2,73E+00	1,41E+00	3,63E-01	-3,12E+00
WDP[1]	m3 depriv.	3,82E+00	3,57E-02	1,07E-01	0	2,59E-01	0	0	7,60E-03	2,02E-02	1,63E-02	-2,80E-01

1: The results of this environmental impact indicator shall be used with case as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource Use - 3+ mm (Functional unit = 1 m²)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
PERE	MJ	3,30E+01	1,79E-01	7,42E-01	0	3,24E-01	0	0	3,86E-02	5,47E-02	2,94E-03	-4,97E+00
PERM	MJ	2,05E+01	0	0	0	0	0	0	0	0	0	0
PERT	MJ	5,36E+01	1,79E-01	7,42E-01	0	3,24E-01	0	0	3,86E-02	5,47E-02	2,94E-03	-4,97E+00
PENRE	MJ	1,86E+02	1,49E+01	7,36E+00	0	6,76E-01	0	0	2,73E+00	1,41E+00	3,63E-01	-3,12E+00
PENRM	MJ	1,92E+00	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	1,86E+02	1,49E+01	7,36E+00	0	6,76E-01	0	0	2,73E+00	1,41E+00	3,63E-01	-3,12E+00
SM	Kg	5,33E-01	0	0	0	0	0	0	0	0	0	0
RM	kg	1,55E+00	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m3	9,69E-02	1,29E-03	3,68E-03	0	7,02E-03	0	0	2,82E-04	5,78E-04	3,84E-04	-6,73E-03

Waste Production - 3+ mm (Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
HW	Kg	2,61E-04	3,16E-05	1,73E-05	0	4,76E-07	0	0	7,16E-06	2,56E-06	5,42E-07	-4,92E-06
NHW	Kg	0	0	0	0	0	0	0	0	0	0	0
RW	kg	2,05E-04	1,02E-04	3,44E-05	0	1,04E-06	0	0	1,86E-05	7,64E-06	2,38E-06	-5,76E-06

Output Flows - 3+ mm (Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
REUSE	Kg	0	0	9,63E-02	0	0	0	0	0	0	0	0
RECYCLE	Kg	5,46E+00	0	3,78E-01	0	0	0	0	0	1,03E+01	0	0
EN-REC	Kg	0	0	0	0	0	0	0	0	0	0	0
EE-E	MJ	0	0	3,89E-01	0	0	0	0	0	0	0	0
EE-T	MJ	0	0	1,17E+00	0	0	0	0	0	0	0	0

Slabs 5 mm

Potential Environmental Impact - 5 mm (Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3 B4 B5 B6 B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	1,70E+01	1,78E+00	1,00E+00	0	4,63E-02	0	0	2,70E-01	1,44E-01	1,94E-02	-2,83E-01
GWP-fossil	kg CO2 eq	1,70E+01	1,77E+00	9,60E-01	0	3,58E-02	0	0	2,70E-01	1,43E-01	1,94E-02	-2,82E-01
GWP-biogen.	kg CO2 eq	-1,55E+00	4,54E-04	2,63E-01	0	-1,54E-02	0	0	1,44E-04	4,34E-04	3,84E-05	5,28E-01
GWP-luluc	kg CO2 eq	3,48E-03	8,22E-04	4,21E-04	0	1,04E-02	0	0	9,44E-05	1,18E-04	5,40E-06	-4,16E-04
ODP	kg CFC11eq	2,98E-06	3,88E-07	6,52E-08	0	2,44E-09	0	0	6,14E-08	2,41E-08	7,97E-09	-2,78E-08
AP	mol H+ eq	5,54E-02	2,40E-02	3,67E-03	0	2,28E-04	0	0	1,10E-03	1,13E-03	1,84E-04	-1,72E-03
EP-freshw.	kg P eq	2,12E-03	1,10E-04	1,42E-04	0	1,27E-05	0	0	1,98E-05	3,23E-05	1,99E-06	-1,29E-04
EP-marine	kg N eq	1,20E-02	6,17E-03	1,15E-03	0	1,44E-04	0	0	3,31E-04	4,10E-04	6,36E-05	-3,62E-04
EP-terrestrial	mol N eq	1,43E-01	6,83E-02	1,13E-02	0	6,31E-04	0	0	3,62E-03	4,45E-03	6,97E-04	-4,09E-03
POCP	kgNMVOCeq	3,95E-02	1,84E-02	3,06E-03	0	1,96E-04	0	0	1,11E-03	1,23E-03	2,02E-04	-1,31E-03
ADPmin&met[1]	kg Sb eq	1,15E-04	3,65E-05	5,85E-05	0	8,68E-07	0	0	7,31E-06	9,00E-07	1,77E-07	-1,02E-05
ADPfossil[1]	MJ	2,48E+02	2,54E+01	6,76E+00	0	6,76E-01	0	0	4,07E+00	2,10E+00	5,41E-01	-4,76E+00
WDP[1]	m3 depriv.	3,18E+00	6,07E-02	9,65E-02	0	2,59E-01	0	0	1,13E-02	3,02E-02	2,43E-02	-4,56E-01

1: The results of this environmental impact indicator shall be used with case as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource Use - 5 mm (Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
PERE	MJ	2,93E+01	3,04E-01	6,67E-01	0	3,24E-01	0	0	5,95E-02	8,44E-02	4,53E-03	-4,33E+00
PERM	MJ	1,61E+01	0	0	0	0	0	0	0	0	0	0
PERT	MJ	4,54E+01	3,04E-01	6,67E-01	0	3,24E-01	0	0	5,95E-02	8,44E-02	4,53E-03	-4,33E+00
PENRE	MJ	2,48E+02	2,54E+01	6,76E+00	0	6,76E-01	0	0	4,21E+00	2,17E+00	5,59E-01	-4,76E+00
PENRM	MJ	1,57E+00	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	2,48E+02	2,54E+01	6,76E+00	0	6,76E-01	0	0	4,21E+00	2,17E+00	5,59E-01	-4,76E+00
SM	Kg	1,87E+00	0	0	0	0	0	0	0	0	0	0
RM	kg	4,17E+00	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m3	8,62E-02	2,19E-03	3,32E-03	0	7,02E-03	0	0	4,35E-04	8,91E-04	5,92E-04	-1,11E-02

Waste Production - 5 mm (Functional unit = 1 m²)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
HW	Kg	3,99E-04	5,37E-05	1,60E-05	0	4,76E-07	0	0	1,10E-05	3,94E-06	8,36E-07	-6,31E-06
NHW	Kg	0	0	0	0	0	0	0	0	0	0	0
RW	kg	2,98E-04	1,74E-04	3,19E-05	0	1,04E-06	0	0	2,87E-05	1,18E-05	3,67E-06	-1,23E-05

Output Flows - 5 mm (Functional unit = 1 m²)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
REUSE	Kg	0	0	3,21E-01	0	0	0	0	0	0	0	0
RECYCLE	Kg	8,02E+00	0	8,21E-01	0	0	0	0	0	1,59E+01	0	0
EN-REC	Kg	0	0	0	0	0	0	0	0	0	0	0
EE-E	MJ	0	0	3,07E-01	0	0	0	0	0	0	0	0
EE-T	MJ	0	0	9,22E-01	0	0	0	0	0	0	0	0

Slabs 5+ mm

Potential Environmental Impact - 5+ mm (Functional unit = 1 m²)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3 B4 B5 B6 B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	1,98E+01	1,82E+00	9,56E-01	0	4,63E-02	0	0	2,78E-01	1,48E-01	1,99E-02	-2,92E-01
GWP-fossil	kg CO2 eq	1,97E+01	1,82E+00	9,36E-01	0	3,58E-02	0	0	2,77E-01	1,47E-01	1,99E-02	-2,90E-01
GWP-biogen.	kg CO2 eq	-1,34E+00	4,64E-04	1,55E-02	0	-1,54E-02	0	0	1,48E-04	4,45E-04	3,94E-05	4,76E-01
GWP-luluc	kg CO2 eq	3,99E-03	8,41E-04	4,24E-04	0	1,04E-02	0	0	9,69E-05	1,21E-04	5,54E-06	-4,18E-04
ODP	kg CFC11eq	3,12E-06	3,96E-07	6,31E-08	0	2,44E-09	0	0	6,30E-08	2,48E-08	8,19E-09	-2,78E-08
AP	mol H+ eq	6,94E-02	2,46E-02	3,66E-03	0	2,28E-04	0	0	1,13E-03	1,16E-03	1,89E-04	-1,78E-03
EP-freshw.	kg P eq	2,64E-03	1,12E-04	1,42E-04	0	1,27E-05	0	0	2,03E-05	3,31E-05	2,04E-06	-1,35E-04
EP-marine	kg N eq	1,50E-02	6,31E-03	1,02E-03	0	1,44E-04	0	0	3,40E-04	4,21E-04	6,53E-05	-3,78E-04
EP-terrestrial	mol N eq	1,69E-01	6,99E-02	1,12E-02	0	6,31E-04	0	0	3,72E-03	4,57E-03	7,15E-04	-4,26E-03
POCP	kgNMVOCeq	4,76E-02	1,89E-02	3,01E-03	0	1,96E-04	0	0	1,14E-03	1,27E-03	2,08E-04	-1,36E-03
ADPmin&met[1]	kg Sb eq	1,46E-04	3,73E-05	5,94E-05	0	8,68E-07	0	0	7,51E-06	9,24E-07	1,82E-07	-1,05E-05
ADPfossil[1]	MJ	2,91E+02	2,60E+01	6,65E+00	0	6,76E-01	0	0	4,18E+00	2,16E+00	5,56E-01	-4,79E+00
WDP[1]	m3 depriv.	5,36E+00	6,21E-02	9,65E-02	0	2,59E-01	0	0	1,16E-02	3,10E-02	2,49E-02	-4,66E-01

1: The results of this environmental impact indicator shall be used with case as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource Use - 5+ mm (Functional unit = 1 m²)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
PERE	MJ	2,98E+01	3,11E-01	6,78E-01	0	3,24E-01	0	0	6,08E-02	8,62E-02	4,62E-03	-3,99E+00
PERM	MJ	1,45E+01	0	0	0	0	0	0	0	0	0	0
PERT	MJ	4,43E+01	3,11E-01	6,78E-01	0	3,24E-01	0	0	6,08E-02	8,62E-02	4,62E-03	-3,99E+00
PENRE	MJ	2,91E+02	2,60E+01	6,65E+00	0	6,76E-01	0	0	4,30E+00	2,22E+00	5,71E-01	-4,79E+00
PENRM	MJ	1,46E+00	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	2,91E+02	2,60E+01	6,65E+00	0	6,76E-01	0	0	4,30E+00	2,22E+00	5,71E-01	-4,79E+00
SM	Kg	1,97E+00	0	0	0	0	0	0	0	0	0	0
RM	kg	4,33E+00	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m3	1,48E-01	2,24E-03	3,33E-03	0	7,02E-03	0	0	4,44E-04	9,11E-04	6,05E-04	-1,13E-02

Waste Production - 5+ mm (Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
HW	Kg	4,22E-04	5,49E-05	1,57E-05	0	4,76E-07	0	0	1,13E-05	4,03E-06	8,54E-07	-6,22E-06
NHW	Kg	0	0	0	0	0	0	0	0	0	0	0
RW	kg	3,45E-04	1,78E-04	3,10E-05	0	1,04E-06	0	0	2,93E-05	1,20E-05	3,75E-06	-1,26E-05

Output Flows - 5+ mm (Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
REUSE	Kg	0	0	5,01E-01	0	0	0	0	0	0	0	0
RECYCLE	Kg	7,92E+00	0	6,86E-01	0	0	0	0	0	1,62E+01	0	0
EN-REC	Kg	0	0	0	0	0	0	0	0	0	0	0
EE-E	MJ	0	0	1,46E-02	0	0	0	0	0	0	0	0
EE-T	MJ	0	0	4,37E-02	0	0	0	0	0	0	0	0

Slabs 12+ mm

Potential Environmental Impact - 12+ mm(Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3 B4 B5 B6 B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	2,99E+01	3,57E+00	7,88E-02	0	4,63E-02	0	0	4,53E-01	2,41E-01	3,25E-02	-6,95E-01
GWP-fossil	kg CO2 eq	2,98E+01	3,57E+00	7,87E-02	0	3,58E-02	0	0	4,53E-01	2,40E-01	3,24E-02	-6,92E-01
GWP-biogen.	kg CO2 eq	1,86E-01	9,13E-04	3,27E-05	0	-1,54E-02	0	0	2,42E-04	7,27E-04	6,43E-05	-5,85E-03
GWP-luluc	kg CO2 eq	5,48E-03	1,65E-03	2,29E-05	0	1,04E-02	0	0	1,58E-04	1,98E-04	9,04E-06	-8,47E-04
ODP	kg CFC11eq	5,14E-06	7,80E-07	1,35E-08	0	2,44E-09	0	0	1,03E-07	4,05E-08	1,34E-08	-5,15E-08
AP	mol H+ eq	9,71E-02	4,84E-02	2,89E-04	0	2,28E-04	0	0	1,85E-03	1,89E-03	3,08E-04	-4,55E-03
EP-freshw.	kg P eq	3,48E-03	2,21E-04	4,80E-06	0	1,27E-05	0	0	3,32E-05	5,41E-05	3,33E-06	-3,58E-04
EP-marine	kg N eq	2,16E-02	1,24E-02	9,62E-05	0	1,44E-04	0	0	5,55E-04	6,87E-04	1,07E-04	-1,06E-03
EP-terrestrial	mol N eq	2,53E-01	1,37E-01	1,03E-03	0	6,31E-04	0	0	6,07E-03	7,46E-03	1,17E-03	-1,17E-02
POCP	kgNMVOCeq	7,01E-02	3,71E-02	3,06E-04	0	1,96E-04	0	0	1,86E-03	2,07E-03	3,39E-04	-3,50E-03
ADPmin&met[1]	kg Sb eq	2,75E-04	7,34E-05	1,84E-06	0	8,68E-07	0	0	1,23E-05	1,51E-06	2,97E-07	-2,22E-05
ADPfossil[1]	MJ	4,41E+02	5,11E+01	9,05E-01	0	6,76E-01	0	0	6,83E+00	3,52E+00	9,07E-01	-9,37E+00
WDP[1]	m3 depriv.	8,13E+00	1,22E-01	5,99E-03	0	2,59E-01	0	0	1,90E-02	5,06E-02	4,07E-02	-8,54E-01

1: The results of this environmental impact indicator shall be used with case as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource Use - 12+ mm(Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
PERE	MJ	1,43E+01	6,12E-01	1,38E-02	0	3,24E-01	0	0	9,65E-02	1,37E-01	7,34E-03	-1,74E+00
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	1,43E+01	6,12E-01	1,38E-02	0	3,24E-01	0	0	9,65E-02	1,37E-01	7,34E-03	-1,74E+00
PENRE	MJ	4,41E+02	5,11E+01	9,05E-01	0	6,76E-01	0	0	6,83E+00	3,52E+00	9,07E-01	-9,37E+00
PENRM	MJ	8,17E-01	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	4,41E+02	5,11E+01	9,05E-01	0	6,76E-01	0	0	6,83E+00	3,52E+00	9,07E-01	-9,37E+00
SM	Kg	6,82E+00	0	0	0	0	0	0	0	0	0	0
RM	kg	1,13E+01	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m3	2,49E-01	4,41E-03	1,77E-04	0	7,02E-03	0	0	7,05E-04	1,45E-03	9,60E-04	-2,12E-02

Waste Production - 12+ mm(Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
HW	Kg	6,64E-04	1,08E-04	2,35E-06	0	4,76E-07	0	0	1,79E-05	6,39E-06	1,36E-06	-9,39E-06
NHW	Kg	0	0	0	0	0	0	0	0	0	0	0
RW	kg	6,06E-04	3,51E-04	6,10E-06	0	1,04E-06	0	0	4,65E-05	1,91E-05	5,96E-06	-3,08E-05

Output Flows - 12+ mm(Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
REUSE	Kg	0	0	1,00E+00	0	0	0	0	0	0	0	0
RECYCLE	Kg	1,28E+01	0	2,20E+00	0	0	0	0	0	2,58E+01	0	0
EN-REC	Kg	0	0	0	0	0	0	0	0	0	0	0
EE-E	MJ	0	0	2,97E-02	0	0	0	0	0	0	0	0
EE-T	MJ	0	0	8,92E-02	0	0	0	0	0	0	0	0

Slabs 20+ mm

Potential Environmental Impact - 20+ mm(Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3 B4 B5 B6 B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	4,85E+01	6,00E+00	1,31E-01	0	4,63E-02	0	0	7,61E-01	4,05E-01	5,45E-02	-1,21E+00
GWP-fossil	kg CO2 eq	4,84E+01	6,00E+00	1,31E-01	0	3,58E-02	0	0	7,61E-01	4,04E-01	5,45E-02	-1,20E+00
GWP-biogen.	kg CO2 eq	2,63E-01	1,53E-03	5,49E-05	0	-1,54E-02	0	0	4,06E-04	1,22E-03	1,08E-04	-9,95E-03
GWP-luluc	kg CO2 eq	8,74E-03	2,78E-03	3,84E-05	0	1,04E-02	0	0	2,66E-04	3,32E-04	1,52E-05	-1,46E-03
ODP	kg CFC11eq	8,68E-06	1,31E-06	2,26E-08	0	2,44E-09	0	0	1,73E-07	6,80E-08	2,24E-08	-9,14E-08
AP	mol H+ eq	1,51E-01	8,12E-02	4,84E-04	0	2,28E-04	0	0	3,11E-03	3,17E-03	5,17E-04	-7,72E-03
EP-freshw.	kg P eq	5,38E-03	3,71E-04	8,05E-06	0	1,27E-05	0	0	5,57E-05	9,08E-05	5,60E-06	-6,15E-04
EP-marine	kg N eq	3,41E-02	2,09E-02	1,61E-04	0	1,44E-04	0	0	9,32E-04	1,15E-03	1,79E-04	-1,76E-03
EP-terrestrial	mol N eq	4,06E-01	2,31E-01	1,73E-03	0	6,31E-04	0	0	1,02E-02	1,25E-02	1,96E-03	-1,96E-02
POCP	kgNMVOCeq	1,12E-01	6,23E-02	5,13E-04	0	1,96E-04	0	0	3,12E-03	3,47E-03	5,70E-04	-5,83E-03
ADPmin&met[1]	kg Sb eq	4,93E-04	1,23E-04	3,08E-06	0	8,68E-07	0	0	2,06E-05	2,53E-06	4,99E-07	-4,19E-05
ADPfossil[1]	MJ	7,16E+02	8,59E+01	1,52E+00	0	6,76E-01	0	0	1,15E+01	5,92E+00	1,52E+00	-1,64E+01
WDP[1]	m3 depriv.	9,37E+00	2,05E-01	1,00E-02	0	2,59E-01	0	0	3,19E-02	8,50E-02	6,83E-02	-1,70E+00

1: The results of this environmental impact indicator shall be used with case as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource Use - 20+ mm(Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
PERE	MJ	2,15E+01	1,03E+00	2,32E-02	0	3,24E-01	0	0	1,62E-01	2,30E-01	1,23E-02	-2,97E+00
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	2,15E+01	1,03E+00	2,32E-02	0	3,24E-01	0	0	1,62E-01	2,30E-01	1,23E-02	-2,97E+00
PENRE	MJ	7,16E+02	8,59E+01	1,52E+00	0	6,76E-01	0	0	1,15E+01	5,92E+00	1,52E+00	-1,64E+01
PENRM	MJ	1,36E+00	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	7,16E+02	8,59E+01	1,52E+00	0	6,76E-01	0	0	1,15E+01	5,92E+00	1,52E+00	-1,64E+01
SM	Kg	2,13E+00	0	0	0	0	0	0	0	0	0	0
RM	kg	9,31E+00	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0
FW	m3	2,72E-01	7,40E-03	2,96E-04	0	7,02E-03	0	0	1,18E-03	2,43E-03	1,61E-03	-4,18E-02

Waste Production - 20+ mm(Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
HW	Kg	1,12E-03	1,82E-04	3,95E-06	0	4,76E-07	0	0	3,01E-05	1,07E-05	2,28E-06	-1,73E-05
NHW	Kg	0	0	0	0	0	0	0	0	0	0	0
RW	kg	1,05E-03	5,89E-04	1,02E-05	0	1,04E-06	0	0	7,82E-05	3,21E-05	1,00E-05	-5,32E-05

Output Flows - 20+ mm(Functional unit = 1 m^2)

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3-B4 B5-B6-B7	C1	C2	C3	C4	D
REUSE	Kg	0	0	1,67E+00	0	0	0	0	0	0	0	0
RECYCLE	Kg	2,12E+01	0	3,69E+00	0	0	0	0	0	4,33E+01	0	0
EN-REC	Kg	0	0	0	0	0	0	0	0	0	0	0
EE-E	MJ	0	0	4,86E-02	0	0	0	0	0	0	0	0
EE-T	MJ	0	0	1,46E-01	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Biogenic carbon content	Unit	3 mm	3+ mm	5 mm	5+ mm	12+ mm	20+ mm
Biogenic carbon content in the product	kg C	0	0	0	0	0	0
Biogenic carbon content in the accompanying packaging	kg C	0,49	0,49	0,39	0,35	0	0

Additional environmental impact indicators

The additional impact indicators (optional) provided for by the reference technical standard EN 15804: 2019 were calculated during the LCA analysis; further information on this subject is available upon request by writing to info@laminam.com

8. Calculation rules

Functional unit

Name	Unit	3 mm	3+ mm	5 mm	5+ mm	12+ mm	20+ mm
Functional unit	m^2	1	1	1	1	1	1
Grammage	kg/m^2	7,8	8,2	14,5	14,9	30,0	50,4
Conversion factor to 1 kg	-	0,128	0,122	0,069	0,067	0,033	0,020

Assumptions

Modules A4, A5, B2, C2, C3, C4, relating to processes not under the direct control of Laminam, are partly based on average scenarios developed by the European Federation of Ceramic Tile Manufacturers (Cerame-Unie) and included as default scenarios in the international standard EN 17160 "Product category rules for ceramic tiles", and in the PCRb of the IBU Program Operator "Ceramic tiles and panels". These scenarios refer to the transport of the finished product, to the product installation and maintenance methods, to the destination rates for the various treatment processes of end-of-life materials.

Cut-off rules

All relevant input and output flows of matter and energy included within the system boundaries were considered. In compliance with the provisions of the technical specifications referred to in EN 15804, paragraph 6.3.6, non-significant material flows of less than 1% of the total mass input were excluded, such as the grinding bodies of the mills (which wear and periodically need to be replenished) and applications with crystalline and digital.

Data quality

Primary data, relating to 2019, regarding the amounts and types of raw materials, auxiliaries, packaging materials, fuels and electricity produced in module A1 (raw materials supply), the inputs and outputs of materials and energy associated with theLaminam plants (module A3, manufacturing), the distances and modes of transport of the materials accounted for in module A2 (transport) were collected. The aggregate data (plant level) related to the consumption of materials, fuels, energy, water resources and emissions into the atmosphere are taken from the annual reporting on environmental aspects drawn up in the context of European legislation (Integrated Prevention and Control of pPollution - IPPC), emission trading (EU-ETS), waste management. The modeling of the inputs and outputs of matter and energy of the processes in the upstream and downstream phases of the life cycle required the use of secondary data taken from international database (Ecoinvent 3.6).

Allocations

The allocations made concern the flows of materials and energy into and out of the manufacturing phase processes (A3). The flows of the products studied were calculated by allocation on the basis of production data on both mass and surface area. For the process phases in which the thickness of the product determines variations in the consumption of electricity (pressing) or methane gas (drying and firing), the allocations for the products studied were made according to the specific mass of the slab expressed in kg / m^2.

9. Calculation scenarios

A4 - Product distribution

The module includes the transport of the porcelain stoneware slabs from the Laminam production sites in Italy to the customer or to the installation point. Marketing takes place all over the world. The transport scenarios (distances and means of transport) used are shown in the following table and refer to average data indicated in the EN 17160: 2019 standard (Product category rules for ceramic tiles).

Scenario information	Unit / description
Fuel type and fuel consumption	Diesel - 31,6 l/100 km (National and European average data)
Distance	National destination (Truck with a capacity of 16-32 tons): 300 km European destination (Truck with a capacity of 16-32 tons): 1390 km International (non-European) destination (Transoceanic freight ship): 6520 km
Capacity utilization	% assumed in Ecoinvent 3.6
Bulk density of transported product	2500-2890 kg/m3 per Functional Unit, depending on product thickness

A5 - Product installation

The module includes the product installation phases, the production of auxiliary materials for installation, the treatment of the waste produced from packaging. The slabs with thickness of 3/3+ and 5%5+ are fixed to the surfaces of walls and floors using specific materials. The installation scenarios used are shown in the following table and refer to average data reported in the EN 17160: 2019 standard (Product category rules for ceramic tiles). The production of ceramic waste in the installation phase is equal to 6,5%.

Scenario information	Unit / description
Ancillary materials for installation	Thicknesses 3/3+ and 5/5+: cementitious adhesive equal to 4 kg per m^2, based on the indications and technical specifications for installation acquired by the company. For thicknesses 12+ and 20+ the installation phase does not require the use of cementitious adhesives.
Use of water	No use of water resulting from product installation
Use of other resources	No use of other resources resulting from product installation
Quantitative description of the type of energy and the consumption during the installation process	No consumption of energy resulting from product installation
Waste materials on the building site generated by the product's installation	Packaging waste (kg / UF): Wood: 0,9 - 1,4 depending on the thickness Plastic: 0,01 - 0,1 depending on the thickness Metal: 0,3 - 1 depending on the thickness Ceramic waste (kg / UF): 2,0 - 3,3 depending on the thickness
Output materials as a result of waste processing at the building's site	Packaging waste (kg / UF): Wood: 0,3 - 0,5 recycling; 0,2 - 0,3; energy recovery; 0,4- 0,6 landfill Plastic: 0,004-0,02 recycling; 0,003-0,02 energy recovery; 0,002-0,1 landfill Metal: 0,2-0,8 recycling; 0,1-0,2 landfill Ceramic waste (kg/UF): 0,4-2,7 recycling; 0,1-0,6 landfill
Direct emissions to ambient air, soil and water	No emissions to air, soil or water resulting from product installation

The scenario used in the A5 installation phase takes into account the reuse of part of the wooden and metal packaging; the reuse of these materials takes place to the extent of about 10% and 60% respectively.

B2 - Maintenance

The maintenance of the slab consists of cleaning operations with detergents, which varies according to the type of building (residential, commercial, sanitary). The module therefore includes the water supply and detergent production processes. The maintenance scenarios used are shown in the following table and refer to average data reported in the EN 17160: 2019 standard (Product category rules for ceramic tiles). The values declared in this stage refer to a time period of 1 year

Scenario information	Unit / description
Maintenance process	Periodic cleaning using floor disinfectants.
Maintenance cycle	52/year
Ancillary materials for maintenance	Liquid detergent: 0,134 ml/two weeks
Waste materials resulting from maintenance	Not relevant
Net fresh water consumption during maintenance	0,1 l/week
Energy input during maintenance	No energy input during maintenance

B3-B4-B5 - Repair, replacement and refurbishment

These types of interventions are not necessary: if correctly installed, the tiles do not require repair, replacement or renovation.

B6-B7 - Operational energy use and Operational water use

These modules are not relevant for ceramic slabs.

C1 - De-construction demolition

This module includes the de-construction and removal of tiles at the end of their life; It is not relevant for ceramic slabs.

C3 - Waste processing e C4 - Disposal

The modules include the treatment processes aimed at recycling (C3) and final disposal in landfills (C4) of the slab at the end of life.

Scenario information	Unit / description
Collection process	kg/UF collected separaltely: 0%
	Kg/UF collected with mixed construction waste: 100% for all products
Recovery system	kg/UF for re-use: 0
	kg/UF for recycling (depending on product thickness): 6,3 (3 mm) - 6,6 (3+ mm) - 11,7 (5 mm) - 12,1 (5+ mm) - 24,3 (12+ mm) - 40,8 (20+ mm)
	kg/UF for energy recovery: 0
Disposal	kg/UF for final disposal (depending on product thickness): 1,5 (3 mm) - 1,6 (3+ mm) - 2,8 (5 mm) - 2,8 (5+ mm) - 5,7 (12+ mm) - 9,6 (20+ mm)
Waste transportation (distance)	50 km. The return trip is included in the system.

Module D - Reuse-Recovery-Recycling Potential

Module D accounts for the potential net environmental benefits produced beyond the boundaries of the system studied, deriving from the flows of material leaving the system under study and usable by subsequent production systems. For ceramic Slabs, the net environmental credits from recycling of tiles and packaging and the net environmental credits from energy recovery of the packaging are calculated in this EPD.

10. Additional environmental information

Laminam's commitment to reducing and mitigating its environmental impact focuses on management of the performance of its production sites and is reflected through tangible actions and initiatives aimed at complying with the most demanding standards and parameters, continuous improvement of processes and research of sustainable technologies. The environmental aspects of the aforementioned establishments (Fiorano Modenese and Borgo Val di Taro) are managed by the Environmental, Health and Safety (EHS) department in compliance with the most stringent standards and criteria. Both sites hold an "Integrated Environmental Permit" (AIA - Autorizzazione Integrata Ambientale) which covers air emissions, noise impact, raw materials balance, waste management and water balance and according to which the EHS department annually drafts a report containing data related to Laminam's environmental performance. Moreover, the plants' greenhouse gas emissions are regulated by the "European Union Emissions Trading Scheme" (EU ETS), a system that regulates the exchange of greenhouse gas emission certificates related to the production process. Starting from 2019, the emissions of particulate and nitrogen oxides of the Italian sites are regulated by the "Agreement on emissions to protect the air quality of the Ceramic District" which, as the EU ETS scheme, introduces a system of emission certificates

Laminam and Circular Economy

Many aspects of Laminam's production process and of the ceramic slabs itself can be associated with a circular economy model aimed at minimising raw materials, energy consumption and waste production, creating reuse and recovery flows and maximizing product life.
Laminam's production process, in fact, allows reuse of most of the production scraps. Approximately 91% of unfired ceramic scrap is reinserted into the production cycle thus avoiding the extraction, transport and use of new raw materials and related environmental impact such as greenhouse gas emissions and generated waste. Water consumption is an important aspect of the production phase: thanks to the waste water treatment systems, all process water is recycled and reused in the production cycle. In 2019, 53,909 cbm of water were treated and reused in the production process thus avoiding the consumption of new water resources. Another important factor from a circular economy perspective is waste management.

Laminam, in fact, has developed synergies with local companies that use its production waste as raw materials within their production process. In this way, in 2019, 19,480 tonnes of waste (i.e. unfired ceramic scrap, fired ceramic scrap, sludge and dust) were reused in another production process, thus avoiding the costs and environmental impact related to their disposal.
Laminam's slab itself is an extremely durable and easily recyclable material. Moreover, the lower thickness, compared to other ceramic products, reduces the quantity of raw materials needed and the environmental impact related to transportation due to the slab's low weight. Finally, the digital decoration reduces ink and water quantities, further reducing the environmental impact related to the slabs' production.

Energy consumption and emissions

Laminam's energy consumption is related to the natural gas and electricity mainly used for heating the kilns. The company has developed a production process characterised by innovative methods and highly automated technologies typical of Industry 4.0 that include the use of hybrid ovens, digital decoration systems, dry cutting systems and internal logistics managed with automatic laser-guided vehicles. The company also has a photovoltaic system installed on the roof of the Fiorano Modenese site with an estimated capacity of 1,387 MWh. Laminam also monitors on a monthly basis emissions of other pollutants associated with production at its plants, that are always largely lower than the authorised flows. In January 2019, an innovative abatement system with activated carbon was installed at the Fio- rano Modenese site to further reduce the odor impact linked to production activities. This plant is an evolution of the prototype system installed in 2017 at the Borgo Val di Taro site which, at the time, was the first prototype in the world applied to ceramic process fumes.

Volatile Organic Compounds (VOC)

Ceramic slabs have been recognised as inert materials free of harmful emissions. For Laminam materials with fibre, tests are available according to UNI EN ISO 16.000, the current European reference for VOC emissions, carried out at the laboratory 'Catas' whose results confirm that our materials do not emit VOC (Volatile Organic Compounds).

End of life

Laminam products are defined as inert. They do not release any hazardous substance, so it is feasible to reuse them at the end of their life. They can be used as backfill material for construction sites and as filler for roadways, thus reducing the need for quarry gravel.

Compliance with CAM requirements (Minimum Environmental Criteria)

Laminam slabs meet the characteristics and environmental quality requirements provided for by national Green Public Procurement (GPP) programs, such as the Minimum Environmental Criteria (CAM) set in Italy by Decree of the Ministry of the Environment of 11 October 2017.
The environmental quality requirements adopted by the Italian CAM program for ceramic floor and wall coverings are shown below and are taken from the european environmental quality requirements used for the award of the Ecolabel to hard coverings in construction (EU Commission Decision of 09/07 / 2009):

- 4.2 Consumption and use of water: the consumption of water in the production phase, from the preparation of raw materials to firing, for fired products must not exceed the value of 1 litre/kg of product. The waste water produced by the production chain processes must have a recycling rate of at least 90%.
- 4.3.b Emissions to air: the emissions to air for the firing stage must not exceed the following values: Particulate matter (dust) 200 mg / m^3 (test method EN 13284-1), Fluorides (HF) 200 mg / m^3 (ISO 15713 test method); cold emissions must not exceed the value: Particulate matter 5 g / m^3 (test method EN 13284-1).
- 4.4 Emissions into water: in the Laminam plants, industrial wastewater is completely recycled within the production cycle, therefore, as no industrial waste emissions are generated, the criterion is not applicable.
- 5.2 Waste recovery: at least 85% (by weight) of the total waste generated by the processes must be recovered, according to the general terms and definitions contained in Council Directive 75/442 / EEC.

Laminam ceramic slabs therefore comply with the following environmental requirements.

Requirement	Parameter	Threshold
Water consumption and use	Fresh Water specific consumption (Cwp-a)	<1 l/kg
	Wastewater recycling ratio	>90%
Emissions to air	Particulate matter (dust) from cold emissions	<5 gr/m2
	Particulate matter (dust) from firing	<200 g/m2
	Fluorides (HF) from firing	<200 mg/m2
Emissions to water	Suspended solid emission to water	< 40 mg/l
	Cd emission to water	<0.015 mg/l
	Cr(VI) emission to water	< 0.15 mg/l
	Pb emission to water	< 0.15 mg/l
Waste recovery	Waste generated by the processes	>85%

Laminam has received third party recognition of compliance with the above requirements (certificate n. IT-IND-F-020_CAM 01 issued by Bureau Veritas Italia Spa). For further details, please refer to the website's web page: https://www.laminam.com/en/corporate-responsibility/

11. References

- EPDItaly - Program Reguation version 5.0
- EN 15804:2012+A2:2019 Sustainability of Construction Works
- UNI EN 17160 Product category rules for ceramic tiles
- Institut Bauen und Umwelt e.V.(IBU) Part B: Requirements on the EPD for Ceramic tiles and panels
- 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 14044:2018 Environmental management-Life Cycle AssessmentRequirements and guidelines
- Bureau Veritas Nexta - LCA study report, rev 2, June 2021
- PCR ICMQ-001/15, rev 3, 02/12/2019

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