ENVIRONMENTAL PRODUCT DECLARATION FOR

Geolite®, Geolite® 10, Geolite® 40, Geolite® Asfalto, Geolite® Magma, Geolite® Magma 20

Mineral geo-mortars for monolithic restoration and for structural strengthening of concrete

EPD registration number: S-P-01089

Pubblication date: 2017-10-12

Revision date: 2018-07-11

Validity date: 2022-10-10

Geographical scope: Global

CPC Code: UN CPC 37510 - Non-refractory mortars and concretes

- ✓ Complies with ISO 14025 and EN 15804
- ✓ Independently verified
- ✓ Cradle to Gate with options scope
- ✓ Products-specific

KERAKOLL
The GreenBuilding Company

EPD®

CONTENTS

1. ABOUT THIS EPD

What is an EPD?
Environmental Product Declaration (EPD) is label that provide a transparent, multi-faceted overview of the environmental performance of a product during its life cycle.
Our intention in providing this EPD is to present the potential environmental impacts for our products.
They are presented in single EPDs such that they can be combined to calculate the impacts of a more complex building system.
Target audiences of the study are customers and other parties interested in the environmental impacts of our products.
According to EN 15804, EPD of construction products may not be comparable if they do not comply with this standard.
EPDs within the same product category from different programs may not be comparable.

Declaration owner and LCA Author

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EPD programme and programme operator

The International EPD® System
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CEN standard EN 15804 served as the core PCR

PCR	EN 15804 as the core PCR, International EPD System PCR 2012:01 "Construction products and construction services", v2.2, 2017-05-30
PCR review conducted by	The Technical Committee of the International EPD® System
Chair	Massimo Marino info@environdec.com
Independent verification of the Declaration and data, according to ISO 14025	☒ EPD process certification (Internal) ☐ EPD verification (External)

Third party verifier

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Accredited by	Accredia

2. ABOUT KERAKOLL

Kerakoll - The GreenBuilding Company

From the outset, the pillar of the Kerakoll vision has always been to make the difference through sustainable innovation. This belief led to the launch of Biocalce and Healthy Building in April 2005, i.e. the new take on sustainable building in which the focus is to safeguard health and improve the quality of life.

Kerakoll became The GreenBuilding Company, the leading manufacturer of green solutions for designing, building and living in harmony with the environment and in healthy spaces: the company earned certification for the GreenBuilding Rating from the Societé Générale de Sourveillance (SGS) and get the EPD Process Certification, meaning that our internal processes to produce EPDs have been quality assured by an external certification body.

Mission & Vision

To represent GreenBuilding, the new low environmental impact approach to building that safeguards the health and wellbeing of people. We think, develop and produce innovative solutions that focus on the environment and on improving both health and quality of life by using building materials that avoid the most common illnesses caused by indoor pollution. Our vision is to interpret GreenBuilding as a new way of building that is kind on the environment, promoting higher quality homes around the world and helping people to live better.

Products, services and specific know-how formed the basis of Kerakoll's rise to become the GreenBuilding Company, the only company to provide a global GreenBuilding solution that aims at designing, building, and living in harmony with the environment and in healthy spaces.

Values

The Kerakoll business culture to create value over time.

Kerakoll is determined to improve its performance in all ways, firm in the belief that to create value over time you have to first create a firm business culture.

Business culture in Kerakoll means being committed to recognizing and reclaiming the value of key experiences and practices of the past, and at the same time being constantly willing to go out on a limb.

Research and innovation only make sense in such a context, where progress goes hand-in-hand with restoration, preservation and reclaiming the heritage of the company's past.

The Kerakoll mission is to meet the needs of its consumers with a constant supply of new and original ideas, remaining ever faithful to a business culture always ready to consider the ideas of all its members.

When it comes to knowledge assets, people are a key resource for Kerakoll along with the values, expectations, hopes, ideas and originality they bring with them.

This belief is the cornerstone of the Kerakoll business ethos, and the five pillars of this approach represent our modus operandi in both life and work.

Integrated policy for total quality, wellbeing and protection of the environment

We pride ourselves on our quality, we are guided by our commitment to society and the health of people, and tireless in our promotion of environmental sustainability.

Focus on the environmental sustainability of a home as it relates to the health of its inhabitants: this is the core philosophy that underlies Kerakoll GreenBuilding. The pillars of healthy housing are indoor air quality, advanced environmental and energy standards, and healthy spaces that exist in harmony with nature. Kerakoll's personal approach aims to integrate the many aspects of GreenBuilding into everyday life, in keeping with the growing environmental sensibility of every individual.

We believe that our mission is to make technology more sustainable and to develop an associated model of development: the true aim of any business should be to develop projects of low environment impact but of huge technological innovation.

Kerakoll's commitment in this direction can be seen in everyday things, in business, and in our awareness of consumer needs in order to satisfy current requirements without jeopardizing the wellbeing of future generations. This is not just an economic mission, but also one of corporate social responsibility which guides and unites everyone here at Kerakoll.

That's why at Kerakoll we see business and social responsibility as going hand in hand, which means we make it our business to improve the quality of life of people and the environment they live in.

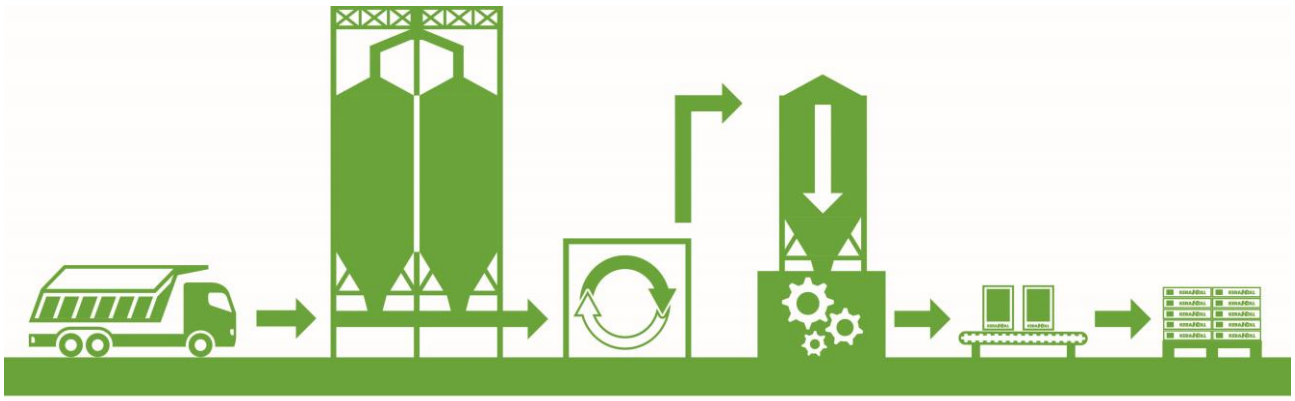
Taking "Made in Italy" excellence around the world

In its 40 years in the industry, Kerakoll has been so successful that it has gone from being top of the domestic market to a top Italian-based business in Europe, before also becoming a leading European group (and Italian at heart) bound for the international arena. International expansion and an ever more global approach have certainly not eroded the longstanding Kerakoll identity. The company has remained faithful to the values that saw it rise to 1st place in the production of GreenBuilding solutions around the world with more than 1,700 items.

Innovation, respect for the environment, concern for health and living comfort, and a pure wholesome approach are the defining tenets of Kerakoll.

3. MANUFACTURING

The manufacturing process starts from raw materials purchased from suppliers and stored in the plant.
Bulk raw materials are stored in specific silos and added mostly automatically in the production mixer, according to the formula of the products. Other raw materials, supplied in bags or big bags, are stored in their warehouse and added automatically or manually in the mixer.
The production is a discontinuous process, in which all the components are mechanically mixed in batches.
The semi-finished products are then packaged in bags, put on wooden pallets, covered by stretched hoods and stored in the Finished Products' warehouse. The quality of final products is controlled before the sale.



4. PRODUCTS

Description and use of the products

These products are manufactured by Kerakoll S.p.A. in the production plants located in Sassuolo (MO - Italy) and Rubiera (RE - Italy).
They are supplied in 25 kg paper bags and only a few of them also in 5 kg format.

Geo-binder based mortars for restoration and strengthening of reinforced concrete and masonry, for passivation and monolithic protection of deteriorated concrete structures such as beams, pillars, slabs, front sections, ramps, facades, decorative elements and cornices.

Geolite®, Geolite® 10 and Geolite® 40 are thixotropic mortars specific for operations involving mobile platforms, low temperatures and where the result must be ready for use quickly.

Geolite® Asfalto is a thixotropic mortar ideal for those applications that must be ready for use quickly, such as industrial and airport flooring, pavements and to anchor and fix traps and drains, manholes, fences, sign posts, safety barriers.

Geolite® Magma and Geolite® Magma 20 are pourable mortars used to consolidate reinforced concrete civil engineering structures such as bridges, viaducts and to anchor and fix metal elements.

Category: Inorganic mineral products.
Class: Mineral geo-mortars for monolithic repair and for structural strengthening of reinforced concrete and masonry.

Products standard

Geolite®, Geolite® 10 and Geolite® 40 are designed and CE marked according to EN 1504-2,-3 and -7 (Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 2: Surface protection systems for concrete, Part 3: Structural and non-structural repair, Part 7: Reinforcement corrosion protection).
Geolite® Asfalto meets the requirements defined by EN 1504-3 and -7.
Geolite® Magma and Geolite® Magma 20 are produced and CE marked according to EN 1504-3, -6 and -7 (Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 6: Anchoring of reinforcing steel bar).

Physical characteristics

The products are supplied from production in dry form, premixed in respect of all contents but water.
Water is added at the building site in the construction/ installation stage, in a defined amount and technique, in order to get easily workable mortars of high performance with high thixotropic, expansive and pourable properties.
For specific physical properties, we refer to the CE declaration or Declaration of Performance available on demand or to the technical datasheet on www.kerakoll.com/it.

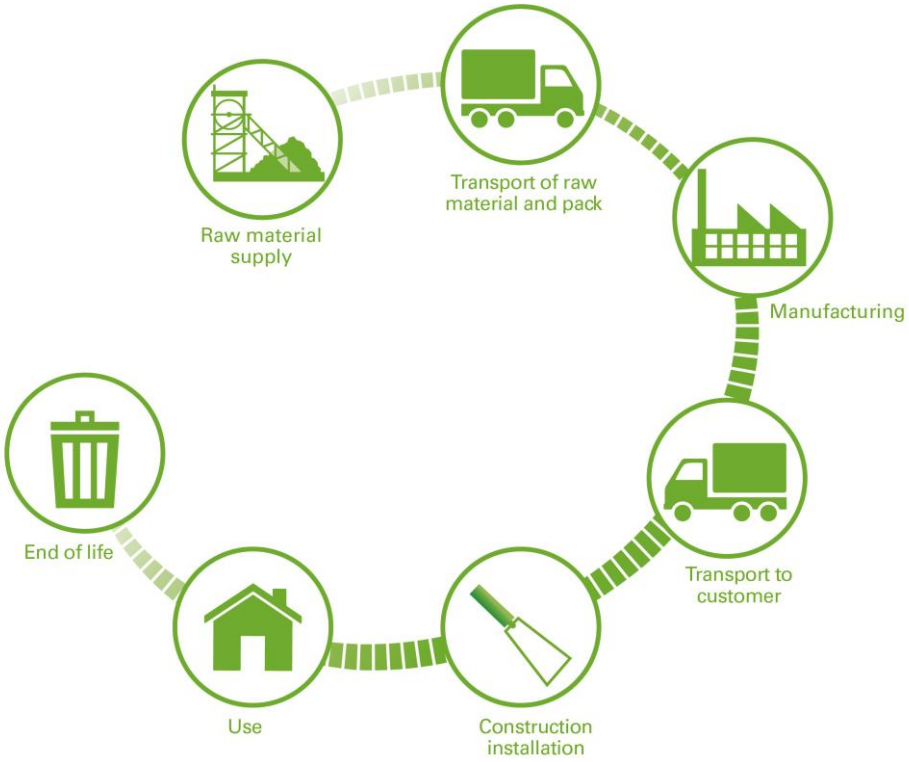
Content declaration

The main components of the involved products are the following.

Component	Weight (%)	CAS Nr.	Classification	Comment (i.e. recycled materials)
Aggregates and fillers	50-70%	1317-65-3, 14808-60-7	-	Calcium carbonate partially recycled
Binders	20-40%	11104-48-6, 65997-15-1, 7778-18-9	H315, H317, H318, H319, H335, GHS07, GHS05	-
Others (additives, etc.)	1-15%	-	-	-

Products are free from substances of very high concern (SVHC) on the REACH Candidate List published by the European Chemicals Agency in a concentration more than 0,1% (by unit weight).

5. LCA INFORMATION



Declared Unit and Reference Service Life

The Declared Unit (DU) is 1 dm^3 of applied finished product. This EPD describes the environmental impact of 1 dm^3 of the applied mortars. The quantities of dry matter used in this analysis are as follows and results are presented separately for each product.

Product name	Dry product quantity
Geolite	1,70 kg
Geolite 10	1,75 kg
Geolite 40	1,70 kg
Geolite Asfalto	1,90 kg
Geolite Magma	1,90 kg
Geolite Magma 20	1,95 kg

Scope

CEN developed the EN 15804, a core set of rules for the development of EPD applicable to construction products. This standard is developed with a modular structure, described below.

This EPD is of the 'Cradle to Gate with options' type, including EN 15804 modules from A1 to C4.

Certain modules accounted in the LCA (i.e. B1-B7) are not relevant to the environmental performance of the products, because their environmental contribution is negligible and showed as "NR", not relevant in the table above.

Upstream - Core			Downstream											
Product stage			Construction process stage		Use stage							End of life stage			
Raw material supply	Transport of raw materials and pack	Manufacturing	Transport to customer	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport to waste processing	Waste processing	Disposal
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
X	X	X	X	X	NR	NR	NR	NR	NR	NR	NR	X	X	X	X

System boundaries and processes included in the LCA (X: Included, NR: Not Relevant)

Product (A1-A3)

- A1-A2: extraction, supply and transport of raw materials and packaging to Kerakoll and manufacturing process energy consumption.
- A3: manufacturing process of product and its packaging and waste management from the same process.

It covers dosage and mixing of selected and measured raw materials and additives to ensure that the product meets desired properties and packaging material consumption.
Packaging product materials consist of wooden pallet, cardboard and LDPE used as wrapping material.

Construction process (A4-A5)

- A4: distribution to typical Customer by transport of packaged product from production gate to end user (building site).
- A5: installation of product into building, including required water and its blending energy.

Use (B1)

Characterization of Reference Service Life (RSL) of the product identified.
B2 to B7 are not relevant (NR) as they are not applicable: the product does not need maintenance or replacement during its RSL.

End of life (C1-C4)

- C1: deconstruction and demolition of the product into the building.
- C2: transport of waste product from demolition to recycling/disposal facility, that is waste collection.
- C3-C4: treatment and disposal of applied product on a surface (floor or wall) when that surface reaches the end of its useful life (e.g. during building renovation or demolition), that is processing of waste from demolition.

Scenarios

Construction process (A4-A5)

In the present LCA study, the following conditions are been considered for the transport to Customer phase:

- 500 km via road transport by a Euro 4 lorry of 16-32 metric ton

In the present LCA study, the following conditions are been considered for the application phase:

- Water consumption: 0,2-0,3 l/FU
- Mixing electricity consumption: 0,002 kWh/FU

Use (B1)

If professionally used and properly installed and according to Kerakoll experience, the Reference Service Life (RSL) of the products is estimated to be equal to the lifetime of the building and at least 60 years as a default.

End of life (C1-C4)

Demolition electricity consumption: 0,2 kWh/FU
Based on Italian average recycling rates for waste from construction and demolition (C&D), 65% of them are assumed to be recycled and 35% remainder disposed in landfill (ISPRA, Report “L’Italia del Riciclo 2013”).

Data quality

For the background data the Ecoinvent v.3.3 database is mainly used.
Raw materials and packaging, energy and water consumption and waste data are collected from Kerakoll.
The most relevant considered data are European or specific from supplier.
All dataset are not more than 10 years old (according to EN 15804 § 6.3.7 “Data quality requirements”).

Period under review

All primary data collected from Kerakoll are representative for the period year of 2016.

Allocations

There are no co-products in the production of mortars manufactured by Kerakoll. Hence, there is no need for co-product allocation. The Company sources raw materials from different locations across Europe and other parts of the world and by different means of transport. For this reason, transport is allocated according to raw material quantities.
Kerakoll manufactures various products with specifications for different applications in its different manufacturing plants. Raw materials, transport, energy consumption during manufacturing, packaging and waste data are allocated using data from Kerakoll involved plants.

Cut-off rules

The consumption of auxiliary materials and waste related to extraordinary activities (A3), having a periodicity exceeding 3 years, are excluded. Quantified contribution from those process: less than 0,5% by mass of product.

6. ENVIRONMENTAL INDICATORS

An introduction to each environmental indicator is provided below. All indicators represent the potential to cause environmental impacts; they do not predict if specific environmental thresholds, safety margins or risks will be exceeded. The actual impacts on the environment typically depend upon local, regional and/or global conditions.

Abiotic Depletion Potential (ADP) - Resource Consumption

The consumption of non-renewable resources leads to a decrease in the future availability of the functions supplied by these resources. Depletion of mineral resource elements (ADPE) and non-renewable fossil energy resources (ADPF) are reported separately.

Ozone Depletion Potential (ODP) - Ozone Hole

A measure of greenhouse gas emissions, such as carbon dioxide and methane. These emissions increase absorption of radiation emitted by the earth, intensifying the natural greenhouse effect.

Acidification Potential (AP) - Acid Rain

A measure of emissions that cause acidifying effects to the environment. Acidification potential is a measure of a molecule's capacity to increase the hydrogen ion (H+) concentration in the presence of water, thus decreasing the pH value. Potential effects include forest decline and the deterioration of building materials.

Eutrophication Potential (EP) - Algal Blooms

A measure of nutrient enrichment that may cause an undesirable shift in species composition and elevated biomass production in both terrestrial and aquatic ecosystems. It includes potential impacts of excessively high levels of macronutrients, the most important of which are nitrogen and phosphorus.

Global Warming Potential (GWP) - Climate Change

A measure of greenhouse gas emissions, such as carbon dioxide and methane. These emissions increase absorption of radiation emitted by the earth, intensifying the natural greenhouse effect.

Photochemical Ozone Creation Potential (POCP) - Smog

A measure of emissions of precursors that contribute to ground level smog formation (mainly ozone O3), produced by the reaction of volatile organic compounds (VOCs) and carbon monoxide in the presence of nitrogen oxides under the influence of UV light. Ground level ozone may be harmful to human and ecosystem health and may also damage crops.

7. ENVIRONMENTAL PERFORMANCE

All results are referred to the Declared Unit that is 1 dm^3 of the applied products.

Geolite®

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3	A4	A5	C1	C2	C3	C4
Acidification	kg SO_2 eq	3,02E-3	6,34E-4	3,06E-5	4,18E-4	6,39E-4	-	6,12E-5
Eutrophication	kg PO_4^{3-} eq	7,55E-4	1,26E-4	5,78E-6	1,02E-4	1,11E-04	-	1,15E-5
Global Warming (GWP100a)	kg CO_2 eq	9,64E-1	1,39E-1	5,57E-3	1,02E-1	1,10E-1	-	7,46E-3
Photochemical oxidation	kg C_2H_4 eq	2,01E-4	2,32E-5	1,09E-6	2,15E-5	2,08E-5	-	2,02E-6
Ozone layer depletion	kg CFC11 eq	7,05E-8	2,62E-8	9,63E-10	1,14E-8	2,00E-8	-	1,82E-9
Abiotic depletion	kg Sb eq	1,34E-6	4,20E-7	3,78E-9	3,53E-8	7,32E-8	-	9,07E-9
Abiotic depletion, fossil fuels	MJ	1,29E+1	2,23	8,11E-2	1,29	1,67	-	1,61E-1

USE OF RESOURCES	Unit	A1-A3	A4	A5	C1	C2	C3	C4
PENRE	MJ	1,07E+1	2,29	8,39E-2	1,52	1,68	-	1,63E-1
PENRM	MJ	-	-	-	-	-	-	-
PENRT	MJ	1,07E+1	2,29	8,39E-2	1,52	1,68	-	1,63E-1
PERE	MJ	1,42	2,94E-2	2,64E-3	2,31E-1	7,17E-3	-	3,17E-3
PERM	MJ	-	-	-	-	-	-	-
PERT	MJ	1,42	2,94E-2	2,64E-3	2,31E-1	7,17E-3	-	3,17E-3
FW	m^3	1,09E-2	4,43E-4	3,65E-4	1,47E-3	2,22E-4	-	1,15E-4
SM	kg	2,76E-1	-	-	-	-	-	-
RSF	MJ	3,96E-2	-	-	-	-	-	-
NRSF	MJ	7,34E-2	-	-	-	-	-	-
Legend	PENRE: Use of non-renewable primary energy excluding 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, PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy resources, FW: Use of net fresh water, SM: Use of secondary material, RSF: Use of renewable secondary fuels, NRSF: Use of non-renewable secondary fuels.							

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3	A4	A5	C1	C2	C3	C4
HWD	kg	7,87E-4	-	-	-	-	-	5,95E-1
NHWD	kg	5,94E-3	1,36E-2	6,80E-2	-	-	1,11	-
RWD	kg	-	-	-	-	-	-	-
Legend	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed.							

Geolite® 10

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3	A4	A5	C1	C2	C3	C4
Acidification	kg SO_2 eq	3,04E-3	6,53E-4	3,14E-5	4,18E-4	6,58E-4	-	6,30E-5
Eutrophication	kg PO_4^{3-} eq	7,64E-4	1,30E-4	5,91E-6	1,02E-4	1,14E-4	-	1,18E-5
Global Warming (GWP100a)	kg CO_2 eq	8,54E-1	1,43E-1	5,71E-3	1,02E-1	1,13E-1	-	7,68E-3
Photochemical oxidation	kg C_2H_4 eq	1,95E-4	2,39E-5	1,12E-6	2,15E-5	2,14E-5	-	2,08E-6
Ozone layer depletion	kg CFC11 eq	6,64E-8	2,70E-8	9,85E-10	1,14E-8	2,06E-8	-	1,87E-9
Abiotic depletion	kg Sb eq	1,50E-6	4,32E-7	3,84E-9	3,53E-8	7,54E-8	-	9,34E-9
Abiotic depletion, fossil fuels	MJ	1,24E+1	2,30	8,32E-2	1,29	1,72	-	1,66E-1

USE OF RESOURCES	Unit	A1-A3	A4	A5	C1	C2	C3	C4
PENRE	MJ	1,14E+1	2,36	8,61E-2	1,52	1,73	-	1,68E-1
PENRM	MJ	-	-	-	-	-	-	-
PENRT	MJ	1,14E+1	2,36	8,61E-2	1,52	1,73	-	1,68E-1
PERE	MJ	1,47	3,03E-2	2,69E-3	2,31E-1	7,38E-3	-	3,26E-3
PERM	MJ	-	-	-	-	-	-	-
PERT	MJ	1,47	3,03E-2	2,69E-3	2,31E-1	7,38E-3	-	3,26E-3
FW	m^3	1,07E-2	4,57E-4	3,41E-4	1,47E-3	2,29E-4	-	1,18E-4
SM	kg	4,18E-1	-	-	-	-	-	-
RSF	MJ	2,84E-2	-	-	-	-	-	-
NRSF	MJ	5,26E-2	-	-	-	-	-	-
Legend	PENRE: Use of non-renewable primary energy excluding 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, PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy resources, FW: Use of net fresh water, SM: Use of secondary material, RSF: Use of renewable secondary fuels, NRSF: Use of non-renewable secondary fuels.							

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3	A4	A5	C1	C2	C3	C4
HWD	kg	8,05E-4	-	-	-	-	-	6,13E-1
NHWD	kg	5,90E-3	1,40E-2	7,00E-2	-	-	1,14	-
RWD	kg	-	-	-	-	-	-	-
Legend	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed.							

Geolite® 40

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3	A4	A5	C1	C2	C3	C4
Acidification	kg SO_2 eq	2,87E-3	6,34E-4	3,06E-5	4,18E-4	6,39E-4	-	6,12E-5
Eutrophication	kg PO_4^{3-} eq	6,79E-4	1,26E-4	5,78E-6	1,02E-4	1,11E-4	-	1,15E-5
Global Warming (GWP100a)	kg CO_2 eq	8,93E-1	1,39E-1	5,57E-3	1,02E-1	1,10E-1	-	7,46E-3
Photochemical oxidation	kg C_2H_4 eq	1,84E-4	2,32E-5	1,09E-6	2,15E-5	2,08E-5	-	2,02E-6
Ozone layer depletion	kg CFC11 eq	6,13E-8	2,62E-8	9,63E-10	1,14E-8	2,00E-8	-	1,82E-9
Abiotic depletion	kg Sb eq	1,25E-6	4,20E-7	3,78E-9	3,53E-8	7,32E-8	-	9,07E-9
Abiotic depletion, fossil fuels	MJ	1,20E+1	2,23	8,11E-2	1,29	1,67	-	1,61E-1

USE OF RESOURCES	Unit	A1-A3	A4	A5	C1	C2	C3	C4
PENRE	MJ	1,01E+1	2,29	8,39E-2	1,52	1,68	-	1,63E-1
PENRM	MJ	-	-	-	-	-	-	-
PENRT	MJ	1,01E+1	2,29	8,39E-2	1,52	1,68	-	1,63E-1
PERE	MJ	1,35	2,94E-2	2,64E-3	2,31E-1	7,17E-3	-	3,17E-3
PERM	MJ	-	-	-	-	-	-	-
PERT	MJ	1,35	2,94E-2	2,64E-3	2,31E-1	7,17E-3	-	3,17E-3
FW	m^3	9,94E-3	4,43E-4	3,65E-4	1,47E-3	2,22E-4	-	1,15E-4
SM	kg	3,14E-1	-	-	-	-	-	-
RSF	MJ	3,61E-2	-	-	-	-	-	-
NRSF	MJ	6,69E-2	-	-	-	-	-	-
Legend	PENRE: Use of non-renewable primary energy excluding 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, PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy resources, FW: Use of net fresh water, SM: Use of secondary material, RSF: Use of renewable secondary fuels, NRSF: Use of non-renewable secondary fuels.							

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3	A4	A5	C1	C2	C3	C4
HWD	kg	7,85E-4	-	-	-	-	-	5,95E-1
NHWD	kg	5,88E-3	1,36E-2	6,80E-2	-	-	1,11	-
RWD	kg	-	-	-	-	-	-	-
Legend	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed.							

Geolite® Asfalto

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3	A4	A5	C1	C2	C3	C4
Acidification	kg SO_2 eq	3,18E-3	7,08E-4	3,39E-5	4,18E-4	7,14E-4	-	6,85E-5
Eutrophication	kg PO_4^{3-} eq	6,46E-4	1,41E-4	6,35E-6	1,02E-4	1,24E-4	-	1,28E-5
Global Warming (GWP100a)	kg CO_2 eq	9,74E-1	1,55E-1	6,16E-3	1,02E-1	1,23E-1	-	8,33E-3
Photochemical oxidation	kg C_2H_4 eq	1,70E-4	2,59E-5	1,20E-6	2,15E-5	2,33E-5	-	2,26E-6
Ozone layer depletion	kg CFC11 eq	7,55E-8	2,93E-8	1,06E-9	1,14E-8	2,24E-8	-	2,04E-9
Abiotic depletion	kg Sb eq	6,37E-7	4,69E-7	4,09E-9	3,53E-8	8,18E-8	-	1,01E-8
Abiotic depletion, fossil fuels	MJ	1,29E+1	2,50	8,99E-2	1,29	1,87	-	1,80E-1

USE OF RESOURCES	Unit	A1-A3	A4	A5	C1	C2	C3	C4
PENRE	MJ	8,58	2,56	9,30E-2	1,52	1,88	-	1,83E-1
PENRM	MJ	-	-	-	-	-	-	-
PENRT	MJ	8,58	2,56	9,30E-2	1,52	1,88	-	1,83E-1
PERE	MJ	1,40	3,29E-2	2,88E-3	2,31E-1	8,01E-3	-	3,54E-3
PERM	MJ	-	-	-	-	-	-	-
PERT	MJ	1,40	3,29E-2	2,88E-3	2,31E-1	8,01E-3	-	3,54E-3
FW	m^3	8,07E-3	4,96E-4	3,16E-4	1,47E-3	2,49E-4	-	1,28E-4
SM	kg	4,17E-1	-	-	-	-	-	-
RSF	MJ	3,52E-2	-	-	-	-	-	-
NRSF	MJ	6,52E-2	-	-	-	-	-	-
Legend	PENRE: Use of non-renewable primary energy excluding 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, PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy resources, FW: Use of net fresh water, SM: Use of secondary material, RSF: Use of renewable secondary fuels, NRSF: Use of non-renewable secondary fuels.							

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3	A4	A5	C1	C2	C3	C4
HWD	kg	6,67E-4	-	-	-	-	-	6,65E-1
NHWD	kg	4,33E-3	1,52E-2	7,60E-2	-	-	1,24	-
RWD	kg	-	-	-	-	-	-	-
Legend	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed.							

Geolite® Magma

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3	A4	A5	C1	C2	C3	C4
Acidification	kg SO_2 eq	2,72E-3	7,08E-4	3,39E-5	4,18E-4	7,14E-4	-	6,85E-5
Eutrophication	kg PO_4^{3-} eq	6,42E-4	1,41E-4	6,35E-6	1,02E-4	1,24E-4	-	1,28E-5
Global Warming (GWP100a)	kg CO_2 eq	8,54E-1	1,55E-1	6,16E-3	1,02E-1	1,23E-1	-	8,33E-3
Photochemical oxidation	kg C_2H_4 eq	1,50E-4	2,59E-5	1,20E-6	2,15E-5	2,33E-5	-	2,26E-6
Ozone layer depletion	kg CFC11 eq	5,37E-8	2,93E-8	1,06E-9	1,14E-8	2,24E-8	-	2,04E-9
Abiotic depletion	kg Sb eq	1,13E-6	4,69E-7	4,09E-9	3,53E-8	8,18E-8	-	1,01E-8
Abiotic depletion, fossil fuels	MJ	1,13E+1	2,50	8,99E-2	1,29	1,87	-	1,80E-1

USE OF RESOURCES	Unit	A1-A3	A4	A5	C1	C2	C3	C4
PENRE	MJ	9,29	2,56	9,30E-2	1,52	1,88	-	1,83E-1
PENRM	MJ	-	-	-	-	-	-	-
PENRT	MJ	9,29	2,56	9,30E-2	1,52	1,88	-	1,83E-1
PERE	MJ	1,54	3,29E-2	2,88E-3	2,31E-1	8,01E-3	-	3,54E-3
PERM	MJ	-	-	-	-	-	-	-
PERT	MJ	1,54	3,29E-2	2,88E-3	2,31E-1	8,01E-3	-	3,54E-3
FW	m^3	9,43E-3	4,96E-4	3,16E-4	1,47E-3	2,49E-4	-	1,28E-4
SM	kg	7,42E-1	-	-	-	-	-	-
RSF	MJ	3,67E-2	-	-	-	-	-	-
NRSF	MJ	6,79E-2	-	-	-	-	-	-
Legend	PENRE: Use of non-renewable primary energy excluding 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, PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy resources, FW: Use of net fresh water, SM: Use of secondary material, RSF: Use of renewable secondary fuels, NRSF: Use of non-renewable secondary fuels.							

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3	A4	A5	C1	C2	C3	C4
HWD	kg	6,67E-4	-	-	-	-	-	6,65E-1
NHWD	kg	4,35E-3	1,52E-2	7,60E-2	-	-	1,24	-
RWD	kg	-	-	-	-	-	-	-
Legend	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed.							

Geolite® Magma 20

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3	A4	A5	C1	C2	C3	C4
Acidification	kg SO_2 eq	3,48E-3	7,27E-4	3,47E-5	4,18E-4	7,33E-4	-	7,03E-5
Eutrophication	kg PO_4^{3-} eq	7,79E-4	1,45E-4	6,48E-6	1,02E-4	1,27E-4	-	1,32E-5
Global Warming (GWP100a)	kg CO_2 eq	1,05	1,59E-1	6,31E-3	1,02E-1	1,26E-1	-	8,55E-3
Photochemical oxidation	kg C_2H_4 eq	1,91E-4	2,66E-5	1,23E-6	2,15E-5	2,39E-5	-	2,32E-6
Ozone layer depletion	kg CFC11 eq	7,75E-8	3,01E-8	1,08E-9	1,14E-8	2,30E-8	-	2,09E-9
Abiotic depletion	kg Sb eq	8,56E-7	4,82E-7	4,16E-9	3,53E-8	8,40E-8	-	1,04E-8
Abiotic depletion, fossil fuels	MJ	1,36E+1	2,56	9,21E-2	1,29	1,91	-	1,85E-1

USE OF RESOURCES	Unit	A1-A3	A4	A5	C1	C2	C3	C4
PENRE	MJ	9,18	2,63	9,52E-2	1,52	1,93	-	1,87E-1
PENRM	MJ	-	-	-	-	-	-	-
PENRT	MJ	9,18	2,63	9,52E-2	1,52	1,93	-	1,87E-1
PERE	MJ	1,71	3,38E-2	2,94E-3	2,31E-1	8,22E-3	-	3,63E-3
PERM	MJ	-	-	-	-	-	-	-
PERT	MJ	1,71	3,38E-2	2,94E-3	2,31E-1	8,22E-3	-	3,63E-3
FW	m^3	9,75E-3	5,09E-4	3,01E-4	1,47E-3	2,55E-4	-	1,31E-4
SM	kg	4,24E-1	-	-	-	-	-	-
RSF	MJ	3,70E-2	-	-	-	-	-	-
NRSF	MJ	6,86E-2	-	-	-	-	-	-
Legend	PENRE: Use of non-renewable primary energy excluding 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, PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy resources, FW: Use of net fresh water, SM: Use of secondary material, RSF: Use of renewable secondary fuels, NRSF: Use of non-renewable secondary fuels.							

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3	A4	A5	C1	C2	C3	C4
HWD	kg	6,85E-4	-	-	-	-	-	6,83E-1
NHWD	kg	4,46E-3	1,56E-2	7,80E-2	-	-	1,27	-
RWD	kg	-	-	-	-	-	-	-
Legend	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed.							

8. ADDITIONAL ENVIRONMENTAL INFORMATION

Quality and Environmental management systems
Kerakoll is ISO 9001 certified since 2000 and ISO 14001 since 2012.

VOC emissions
Volatile Organic Compounds (VOC) tests and evidence have been carried out on the product (both colors), according to ISO 16000 parts 3, 6, 9 and 11 and CN/TS 16516.
The involved products meet the requirements for the emission class Emicode EC1R Plus, as "very low VOC emission", released by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.).
The mortars have been evaluated in emission chambers, in order to detect their VOC emissions after 3 and 28 days storage in the ventilated chambers, according to GEV test method.

Product name	Recycled content (pre-consumer)	Recyclable (end-of-life product recyclability)	Reduced use of resources
Geolite	≈ 14%	yes	yes
Geolite 10	≈ 17%		
Geolite 40	≈ 16%		
Geolite Asfalto	≈ 19%		
Geolite Magma	≈ 34%		
Geolite Magma 20	≈ 19%		

As stated in the validation of self-declared environmental claim (N° 16.12795) issued by SGS Italia S.p.A., according to ISO 14021:2016.

9. DIFFERENCES VERSUS PREVIOUS VERSION OF THE EPD

Some editorial changes for consistency and clarity and modification of system boundaries.

10. REFERENCES

EN 1504-2:2004 - Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 2: Surface protection systems for concrete
EN 1504-3:2005 - Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 3: Structural and non-structural repair
EN 1504-6:2006 - Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 6: Anchoring of reinforcing steel bar
EN 1504-7:2006 - Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 7: Reinforcement corrosion protection
EPD Study Report Geolite, 17-10-04
GPI - General Programme Instructions, The International EPD® System, Version 2.5
ISO 9001:2008 - Quality management systems - Requirements
ISO 14001:2004 - Environmental management systems - Requirements with guidance for use
ISO 14021:2016 - Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling)
ISO 14025:2009 - Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14040/44:2006 - Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006) and Requirements and guidelines (ISO 14044:2006)
EN 15804:2012+A1:2013 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
PCR for Construction Products and CPC 54 Construction Services, The International EPD System, 2012:01 Version 2.2, DATE 2017-05-30
The International EPD® System - The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025 www.environdec.com
Ecoinvent - Ecoinvent Centre, www.ecoinvent.org
SimaPro - SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com