ENVIRONMENTAL PRODUCT DECLARATION FOR

Thermal insulation systems

KLIMAEXPERT ETA AIR
KLIMAEXPERT ETA AIRPLUS
KLIMAEXPERT ETA AIRTECH

External Thermal Insulation Composite System (ETICS) with three different EPS boards

EPD registration number: S-P-01207

Publication date: 2018-09-21

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Validity date: 2023-09-20

Geographical scope: Global

CPC Code: 37510 and 37990

- ✓ Complies with ISO 14025 and EN 15804:2012+A1:2013
- ✓ Independently verified
- ✓ Cradle to Gate scope
- ✓ Products-specific

KERAKOLL The GreenBuilding Company

EPD®

ECO PLATFORM EPD VERIFIED

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 different thermal insulation systems including products both manufactured in Kerakoll S.p.A. and provided by Kerakoll suppliers.
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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CEN standard EN 15804 served as the core PCR

PCR	EN 15804:2012+A1:2013 as the core PCR, International EPD System PCR 2012:01 "Construction products and construction services", v2.33, 2020-09-18
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 – accreditation number: 006H

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.

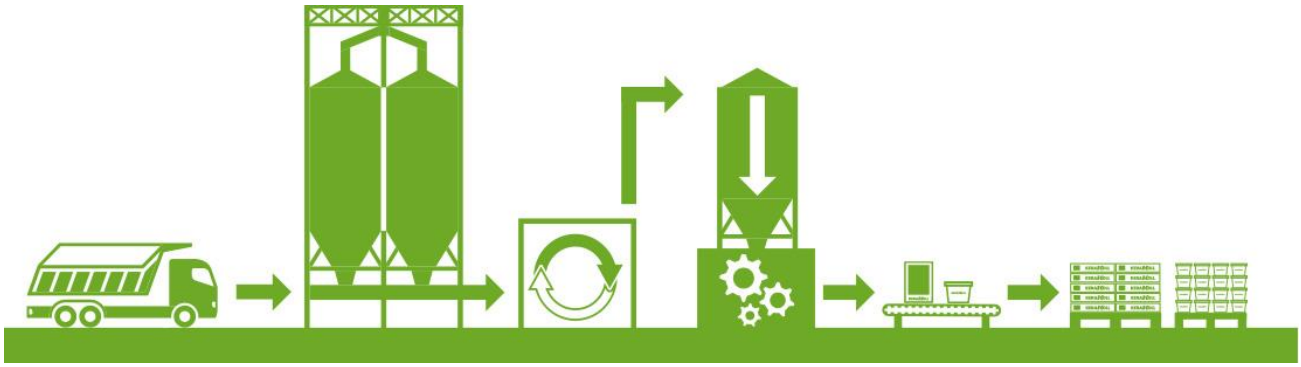
Integrated policy for total quality, wellbeing and protection of the environment
We pride ourselves on our quality, we are guided by our commitment to society and the health of people, and tireless in our promotion of environmental sustainability.
Focus on the environmental sustainability of a home as 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

Both manufacturing processes of powder and fluid products are quite similar: they start from raw materials purchased from suppliers and stored in the plant.
Bulk raw materials (water included for fluid products) 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, big bags or buckets, 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 or buckets, 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.

Information and technical details on production and supply processes concerning components not directly manufactured by Kerakoll but other suppliers are available in EPDs published by specific suppliers.



4. PRODUCTS

Description and use of the products in the thermal insulation systems
Our three thermal insulation systems include products both manufactured in Kerakoll S.p.A. and provided by Kerakoll suppliers. Each of these systems has been studied with three alternative adhesive&finishing products.

All systems studied include several components, as follows:

Klima Flex, **Keraklima Eco** or **Keraklima Eco Granello**
Category: Inorganic mineral products; Class: energy-saving, insulating mineral systems.
Single-component mineral adhesive&finishing products, specifically intended for laying and levelling systems made of extruded polystyrene, expanded polystyrene and polystyrene foam, polyurethane, cork, mineral and glass wool panels laid on concrete, clay block, cement-based plaster and mineral and cement-based finishing products. They are used both as adhesive and smoothing layer and designed according to EN 998-1 (Specification for mortar for masonry - Part 1: Rendering and plastering mortar).
Products specifically for use in the Kerakoll External Thermal Insulation Composite Systems with European Technical Approval - ETA - under ETAG004 (EAD 040083-00-0404).
They 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.
The products are manufactured by Kerakoll in the production plants located in Sassuolo (MO - Italy) and Rubiera (RE - Italy) and they are packed in 25 kg paper bags.

Kerakover Acrilex Fondo
Category: Organic mineral products; Class: mineral paint coatings and coverings.
Mineral intermediate coat to prepare substrates for the paint cycle. Based on water-based acrylic resins, for internal and external surfaces, it is a high power filler to correct imperfections in the substrate. Specifically intended for filling stabilized crazing and evening out absorption.
It must be diluted up to 20% by volume with clean water.
Manufactured by Kerakoll in the production plant located in Zimella (VR – Italy) and packed in 14 L buckets and only a few of them also in 4 L format.

Kerakover Eco Kompact
Category: Organic mineral products; Class: protection and decoration.
Fibrous, mineral covering, completely coloured, based on water-based acrylic-siloxane resins and waterproofing siloxanes. Compliant with the performance requirements of standard CE EN 15824 (Specifications for external renders and internal plasters based on organic binders), it creates high-thickness decorative coverings resistant to algae and atmospheric agents, compatible External Thermal Insulation Composite Systems, for internal and external surfaces.
It is ready to use.
Manufactured by Kerakoll in the production plant located in Zimella (VR – Italy) and packed in 25 kg buckets.

Klima Air is an insulation board made of steam sintered expanded polystyrene (EPS) with 0,1 m of thickness.
Klima Airplus is an insulation board made of expanded graphite polystyrene sintered steam (EPS) with 0,1 m of thickness.
Klima Airtech is an insulation board made of expanded steam sintered polystyrene (EPS) with 0,1 m of thickness.

All these panels are supplied on wooden pallet with around panels wrapped with LDPE.
They are for energy-efficient ETICS coat application, compliant with EN 13163 (Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products – Specification) and specific for KlimaExpert ETA system with European Technical Approval and produced by Kerakoll suppliers.
Below the technical characteristics of the insulation panels supplied to Kerakoll.

Designation	Unit	Klima Air	Klima Airplus	Klima Airtech
Mass density	kg / m^3	15,5	15,5	18,5
Thermal conductivity - λd	W / mK	0,036	0,031	0,035
Thickness	m	0,1	0,1	0,1
Thermal resistance	m^{2}K / W	2,75	3,20	2,85
Tensile strength - EN 1607	kPa	≥ 100	≥ 100	≥ 150

For further information, we refer to the Declaration of Performance and the technical datasheet available on demand as well as the following EPDs published by Kerakoll supplier:
EPDITALY0030 issued on 2018-06-20 - Klima Air;
EPDITALY0031 issued on 2018-06-20 - Klima Airplus;
EPDITALY0032 issued on 2018-06-20 - Klima Airtech.

Rinforzo V 50 is a glass fiber, alkali-resistant reinforcing mesh, suitable for reinforcing finishing coats on new or old plasters/renders, specifically intended to be inserted in heat-insulating panel systems. It increases elastic properties, compactness and resistance to the most critical working temperatures, eliminates the problem of gaps or cracks caused by dynamic changes.

For further information, we refer to the Declaration of Performance and the technical datasheet available on demand as well as the following EPD published by Kerakoll supplier: EPD-SGA-20190024-CBA1-EN issued on 2019-06-25.

Anchors used in the systems and produced by Kerakoll suppliers are not included in this study due to lack of representative data.

All components are compliant to ETAG004 ("Guideline for european technical approval of external thermal insulation composite systems (ETICS) with rendering") – EAD 040083-00-0404 – External Thermal Insulation Composite Systems (ETICS) With Renderings.
For specific physical properties, we refer to the CE declaration or Declaration of Performance available on demand or the technical datasheet on www.kerakoll.com.

Content declaration
The main components involved in the systems and their quantities and weight per m^2 of system are the following. Each of these systems has been studied with three different adhesive&finishing products.

All products manufactured by Kerakoll and those by its suppliers 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).

According to the Official Journal of the European Union of 2016-01-21 insulation panels:
- are not made using flame retardants subject to restrictions or prohibitions provided for by applicable laws or regulations;
- are produced using expandable polystyrene resins containing less than 6% blowing agents in finished products;
- are produced by blowing agents with an ozone depleting potential higher than 0.

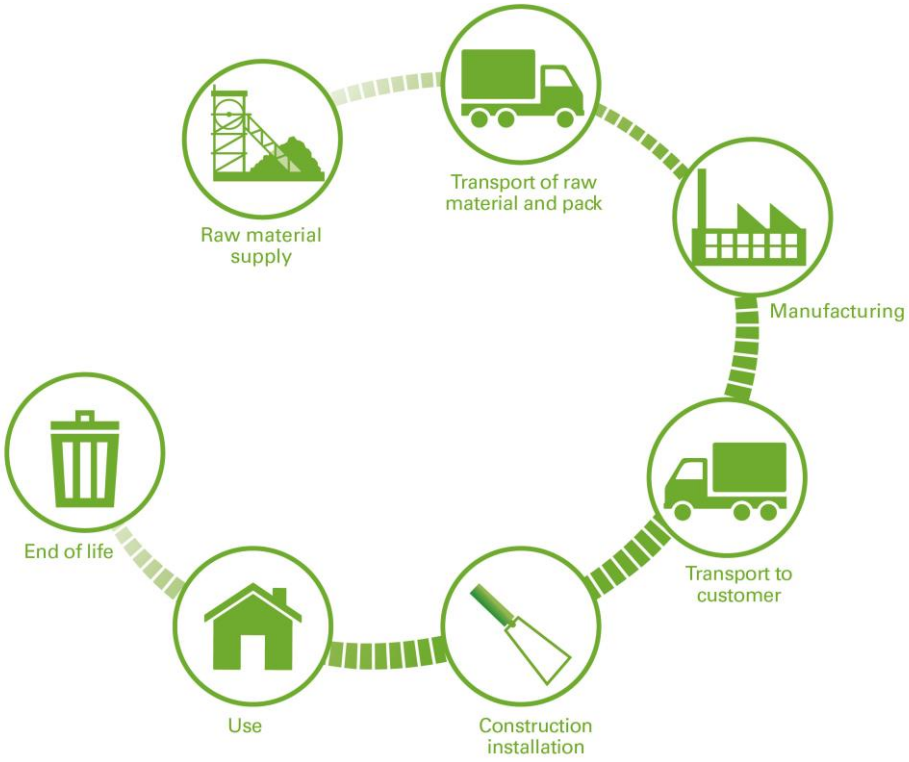
The choice of panels with 10 cm thickness reflects the most frequently used application solution on site, as well as the actual market situation.

Component	Quantity [kg]	Weight [%]	Quantity [kg]	Weight [%]	Quantity [kg]	Weight [%]
	per m^2 of system					
KLIMAEXPERT ETA AIR - Klima Flex / Keraklima Eco / Keraklima Eco Granello						
	Klima Flex		Keraklima Eco		Keraklima Eco Granello	
Mortar / Adhesive	2,56	19,2	2,40	18,8	2,56	19,2
Insulation panel KLIMA AIR (10 cm)	1,55	11,6	1,55	12,2	1,55	11,6
Mortar coating (2 layers)	6,40	48,1	6,00	47,1	6,40	48,1
Mesh RINFORZO V 50	0,18	1,4	0,18	1,4	0,18	1,4
Base coating KERAKOVER ACRILEX FONDO	0,22	1,7	0,22	1,7	0,22	1,7
Finishing colored coating KERAKOVER ECO KOMPACT	2,40	18,0	2,40	18,8	2,40	18,0
KLIMAEXPERT ETA AIRPLUS - Klima Flex / Keraklima Eco / Keraklima Eco Granello						
Mortar / Adhesive	2,56	19,2	2,40	18,8	2,56	19,2
Insulation panel KLIMA AIRPLUS (10 cm)	1,55	11,6	1,55	12,2	1,55	11,6
Mortar coating (2 layers)	6,40	48,1	6,00	47,1	6,40	48,1
Mesh RINFORZO V 50	0,18	1,4	0,18	1,4	0,18	1,4
Base coating KERAKOVER ACRILEX FONDO	0,22	1,7	0,22	1,7	0,22	1,7
Finishing colored coating KERAKOVER ECO KOMPACT	2,40	18,0	2,40	18,8	2,40	18,0
KLIMAEXPERT ETA AIRTECH - Klima Flex / Keraklima Eco / Keraklima Eco Granello						
Mortar / Adhesive	2,56	18,8	2,40	18,4	2,56	18,8
Insulation panel KLIMA AIRTECH (10 cm)	1,85	13,6	1,85	14,2	1,85	13,6
Mortar coating (2 layers)	6,40	47,0	6,00	46,0	6,40	47,0
Mesh RINFORZO V 50	0,18	1,3	0,18	1,4	0,18	1,3
Base coating KERAKOVER ACRILEX FONDO	0,22	1,6	0,22	1,7	0,22	1,6
Finishing colored coating KERAKOVER ECO KOMPACT	2,40	17,6	2,40	18,4	2,40	17,6

The main components of the involved products are the following.

Component	Weight (%)	CAS Nr.	Classification	Comment
KLIMA FLEX, KERAKLIMA ECO and KERAKLIMA ECO GRANELLO				
Aggregates and fillers	70-80	1317-65-3, 14808-60-7, 471-34-1	-	Limestone, Quartz, Calcium carbonate partially recycled
Binders (cement, plaster, lime)	20-30	65997-15-1, 68475-76-3, 1305-62-0	H315, H317, H318, H335	Portland cement, Flue dust, Calcium dihydroxide
Others (additives, etc.)	2-5	9003-20-7, 9032-42-2	-	Polyvinylacetate, Cellulose
KERAKOVER ACRILEX FONDO				
Aggregates and fillers	45-55	1317-65-3, 14808-60-4	EUH210, EUH208	-
Water	10-30	7732-18-5		
Others (additives, etc.)	20-30	1318-59-8, 12001-26-2, 13463-67-7, 2634-33-5, 55965-84-9		
KERAKOVER ECO KOMPACT				
Aggregates and fillers	60-75	1317-65-3, 14808-60-7	EUH210, EUH208	-
Water	5-15	7732-18-5		
Others (additives, etc.)	<0,1	2634-33-5, 55965-84-9, 2682-20-4		

5. LCA INFORMATION



Declared Unit and Reference Service Life

The Declared Unit (DU) is 1 m^2 of applied thermal insulation system.

This EPD describes the environmental impact of 1 m^2 of different thermal insulation systems including several components and products involved. Results are presented separately for each alternative systems.

According to the system boundary of this EPD, a RSL has not been provided.

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' type, including EN 15804 modules from A1 to A3.

Modules not accounted in the LCA since they are not assessed are marked as "MND", Module Not Declared.

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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

System boundaries and processes included in the LCA (X: Included, MND: Not Declared)

Product stage (A1-A3)

Extraction, supply and transport of raw materials and packaging to Kerakoll and manufacturing process energy consumption.

Manufacturing processes of products and components involved in the studied systems, their packaging and waste management from the same processes.

This stage covers dosage and mixing of selected and measured raw materials, additives and water to ensure that each products meets desired properties and packaging material consumption.

For those components provided by Kerakoll suppliers, data on the same processes mentioned above are taken from available EPDs provided by suppliers.

Packaging product materials include both distribution and consumer packaging, as follows.

Material	Distribution packaging	Consumer packaging
Wooden pallet	x	
Plastic and LDPE film (e.g. for wrapping material)	x	
Cardboard and cardboard boxes (Kerakover Eco Acrilex Fondo / Kerakover Eco Kompact)	x	
Printed kraft paper bags coated on the inside with PE film (Klima Flex / Keraklima Eco)		x
Polypropylene (PP) and steel for buckets (Kerakover Eco Acrilex Fondo / Kerakover Eco Kompact)		x

Data quality
For the background data the Ecoinvent v.3.5 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.

For products supplied to Kerakoll data concerning modules A1-A3 are taken from EPDs published by our suppliers.
For insulation panels data the GaBi 7 software and its related 2017 databases are used.
Production processes of the system components purchased by Kerakoll are well represented by generic datasets which reflect the actual technological situation.

The level of quality and accuracy of the study is considered high as all relevant aspects are taken into account and all flows are included. In addition, the reliability of the EPD used is also ensured by its third party verification.
Most of the primary data comes from industrial accounting.

For glass-fibre mesh data the GaBi ts software and its related 2018 databases are used.

Technological, timing and geographical representativeness is considered good.

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 of 2017 - 2019.
For insulation panels data are representative for the period year of 2015.
For glass-fibre mesh data are representative for the period year of 2017.

Allocations
There are no co-products in the production of products 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 manufacturing plants.
Raw materials, transport, energy consumption during manufacturing, packaging and waste data are allocated using data from Kerakoll involved plants.

In insulation panels EPDs, allocations are applied for energy, water and additive consumptions, production waste, emissions to water and air.
For data available on annual basis, such as electricity and gas consumption, water and additives, as well as production waste, these are allocated based on the total mass (in kg) of raw materials (including recovered materials) processed in a year at the specific production site.
For data available only for some sites (covered by different regional legislations), the same data are used adopting allocation rules rather than taking them from generic databases.

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.

All significant flows are also considered in the LCA studies for insulation panels: the only ones omitted are those relative to packaging labels whose mass is significantly less than 1% of the total input flows to the process unit and therefore the mass balance over the whole production phase (A1-A3) is less than 5%.

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 m^2 of thermal insulation system (components packaging included).

KLIMAEXPERT ETA AIR SYSTEM with Klima Flex, Keraklima Eco or Keraklima Eco Granello

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Acidification	kg SO_2 eq	3,28E-2	3,32E-2	3,28E-2
Eutrophication	kg PO_4^{3-} eq	8,99E-3	8,23E-3	8,81E-3
Global Warming (GWP100a)	kg CO_2 eq	1,16E1	1,14E1	1,15E1
Photochemical oxidation	kg C_2H_4 eq	2,84E-3	2,75E-3	2,73E-3
Ozone layer depletion	kg CFC11 eq	7,01E-6	7,01E-6	6,99E-6
Abiotic depletion	kg Sb eq	1,13E-4	1,11E-4	1,12E-4
Abiotic depletion, fossil fuels	MJ	1,73E2	1,73E2	1,73E2

USE OF RESOURCES	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Use of non-renewable primary energy excluding resources used as raw materials - PENRE	MJ	1,82E2	1,81E2	1,81E2
Use of non-renewable primary energy resources used as raw materials - PENRM	MJ	6,26E1	6,26E1	6,26E1
Total use of non-renewable primary energy resources - PENRT	MJ	2,45E2	2,44E2	2,44E2
Use of renewable primary energy excluding resources used as raw materials - PERE	MJ	3,13E1	3,00E1	3,13E1
Use of renewable primary energy resources used as raw materials - PERM	MJ	0,00E0	0,00E0	0,00E0
Total use of renewable primary energy resources - PERT	MJ	3,13E1	3,00E1	3,13E1
Use of net fresh water - FW	m^3	1,29E-1	1,34E-1	1,29E-1
Use of secondary material - SM	kg	3,65E0	1,20E0	3,56E0
Use of renewable secondary fuels - RSF	MJ	0,00E0	1,13E-1	0,00E0
Use of non-renewable secondary fuels - NRSF	MJ	0,00E0	2,10E-1	0,00E0

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Hazardous waste disposed - HWD	kg	1,13E-1	1,13E-1	1,20E-1
Non-hazardous waste disposed - NHWD	kg	1,46E-1	1,46E-1	1,31E-1
Radioactive waste disposed - RWD	kg	2,94E-4	2,94E-4	2,94E-4

KLIMAEXPERT ETA AIRPLUS SYSTEM with Klima Flex, Keraklima Eco or Keraklima Eco Granello

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Acidification	kg SO_2 eq	3,27E-2	3,32E-2	3,28E-2
Eutrophication	kg PO_4^{3-} eq	8,98E-3	8,23E-3	8,81E-3
Global Warming (GWP100a)	kg CO_2 eq	1,16E1	1,13E1	1,15E1
Photochemical oxidation	kg C_2H_4 eq	2,70E-3	2,61E-3	2,59E-3
Ozone layer depletion	kg CFC11 eq	7,01E-6	7,01E-6	6,99E-6
Abiotic depletion	kg Sb eq	1,13E-4	1,11E-4	1,12E-4
Abiotic depletion, fossil fuels	MJ	1,73E2	1,73E2	1,72E2

USE OF RESOURCES	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Use of non-renewable primary energy excluding resources used as raw materials - PENRE	MJ	1,81E2	1,80E2	1,80E2
Use of non-renewable primary energy resources used as raw materials - PENRM	MJ	6,26E1	6,26E1	6,26E1
Total use of non-renewable primary energy resources - PENRT	MJ	2,44E2	2,43E2	2,43E2
Use of renewable primary energy excluding resources used as raw materials - PERE	MJ	3,13E1	2,99E1	3,12E1
Use of renewable primary energy resources used as raw materials - PERM	MJ	0,00E0	0,00E0	0,00E0
Total use of renewable primary energy resources - PERT	MJ	3,13E1	2,99E1	3,12E1
Use of net fresh water - FW	m^3	1,29E-1	1,34E-1	1,29E-1
Use of secondary material - SM	kg	3,66E0	1,21E0	3,57E0
Use of renewable secondary fuels - RSF	MJ	0,00E0	1,13E-1	0,00E0
Use of non-renewable secondary fuels - NRSF	MJ	0,00E0	2,10E-1	0,00E0

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Hazardous waste disposed - HWD	kg	1,13E-1	1,13E-1	1,20E-1
Non-hazardous waste disposed - NHWD	kg	1,46E-1	1,46E-1	1,31E-1
Radioactive waste disposed - RWD	kg	2,94E-4	2,94E-4	2,94E-4

KLIMAEXPERT ETA AIRTECH SYSTEM with Klima Flex, Keraklima Eco or Keraklima Eco Granello

POTENTIAL ENVIRONMENTAL IMPACT	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Acidification	kg SO_2 eq	3,44E-2	3,49E-2	3,45E-2
Eutrophication	kg PO_4^{3-} eq	9,17E-3	8,42E-3	9,00E-3
Global Warming (GWP100a)	kg CO_2 eq	1,26E1	1,24E1	1,25E1
Photochemical oxidation	kg C_2H_4 eq	2,74E-3	2,65E-3	2,63E-3
Ozone layer depletion	kg CFC11 eq	7,01E-6	7,01E-6	6,99E-6
Abiotic depletion	kg Sb eq	1,22E-4	1,21E-4	1,22E-4
Abiotic depletion, fossil fuels	MJ	1,87E2	1,87E2	1,87E2

USE OF RESOURCES	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Use of non-renewable primary energy excluding resources used as raw materials - PENRE	MJ	1,96E2	1,95E2	1,95E2
Use of non-renewable primary energy resources used as raw materials - PENRM	MJ	7,70E1	7,70E1	7,70E1
Total use of non-renewable primary energy resources - PENRT	MJ	2,73E2	2,72E2	2,72E2
Use of renewable primary energy excluding resources used as raw materials - PERE	MJ	3,27E1	3,13E1	3,26E1
Use of renewable primary energy resources used as raw materials - PERM	MJ	0,00E0	0,00E0	0,00E0
Total use of renewable primary energy resources - PERT	MJ	3,27E1	3,13E1	3,26E1
Use of net fresh water - FW	m^3	1,37E-1	1,41E-1	1,36E-1
Use of secondary material - SM	kg	3,70E0	5,14E-1	3,61E0
Use of renewable secondary fuels - RSF	MJ	0,00E0	3,25E-2	0,00E0
Use of non-renewable secondary fuels - NRSF	MJ	0,00E0	6,02E-2	0,00E0

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3		
		Klima Flex	Keraklima Eco	Keraklima Eco Granello
Hazardous waste disposed - HWD	kg	1,13E-1	1,13E-1	1,21E-1
Non-hazardous waste disposed - NHWD	kg	1,52E-1	1,53E-1	1,37E-1
Radioactive waste disposed - RWD	kg	2,94E-4	2,94E-4	2,94E-4

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 product, according to ISO 16000 parts 3, 6, 9 and 11 and CN/TS 16516.
Klima Flex, Keraklima Eco and Keraklima Eco Granello meet the requirements for the emission class Emicode EC1 Plus, as "very low VOC emission", released by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.).
The products 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.

Recycled content and recyclability
For environmental information regarding recycled content and recyclability of the products, we refer to the *Product certification with validation of self-declared environmental claim (N° 16.12795)* issued by SGS Italia S.p.A. according to ISO 14021:2016 and to available EPDs provided by our suppliers.

9. DIFFERENCES VERSUS PREVIOUS VERSION OF THE EPD

2020-12-04 Integration of the system EPD with the inclusion of a few missing components.
2022-07-11 Editorial change: Ecoplatform logo added on the cover-page. Extended address of Programme Operator and Verifier added. Verifier's accreditation number added. Extended references of PCR added where missed.

10. REFERENCES

EN 998-1 - Specification for mortar for masonry - Part 1: Rendering and plastering mortar
EN 15824 - Specifications for external renders and internal plasters based on organic binders
EN 13163 -Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products – Specification
EPD Study Report KlimaExpert ETA, 2020-11-25
GPI - General Programme Instructions, The International EPD® System, Version 3.0
ISO 9001:2015 - Quality management systems - Requirements
ISO 14001:2015 - 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 v2.33, 2020-09-18
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