Environmental product declaration for:

Klima Flex
Klima Fix

Certified, mineral adhesive & finishing product, suitable for bonding and finishing of all types of heat insulating panels for thermal insulation panelling application.

Programme: The International EPD® System, www.environdec.com

Programme operator: EPD International AB

EPD registration number: EPD-IES-0015992

Publication date: 2024-08-06

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Valid until: 2029-08-06

CPC Code: 375-Articles of concrete, cement and plaster

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

→ **Cradle to Gate with A4-A5, B1, C and D**

→ **EPD of multiple products, based on worst-case results**

kerakoll

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

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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.

Declaration owner and LCA Author

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CEN standard EN 15804:2019 served as the core PCR

PCR	EN 15804:2012+A2:2019/AC:2021 serves as the core PCR, International EPD System PCR 2019:14 "Construction products", v1.3.4, 2024-04-30
PCR committee	IVL Swedish Environmental Research Institute Secretariat of the International EPD® System
PCR review was conducted by	The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Independent third-party verification of the declaration and data according to ISO 14025:2006	☒ EPD Process Certification* ☐ EPD verification by accredited certification body ☐ EPD verification by individual verifier

*For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI v.4, Section 7.5.

Third party verifier

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Accredited by Accredia - accreditation number: 0009VV

Procedure for follow-up of data during EPD validity involves third party verifier
☐ Yes
☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

2. ABOUT KERAKOLL GROUP

Our company
The Kerakoll Group is a multinational company operating in the construction industry, offering an integrated range of products and services to build better places to live.
Kerakoll was established in 1968, in the heart of the Sassuolo ceramic district, and began by producing ceramic tile adhesives. Today, the Group is divided into three Business Units focusing on the needs of Laying, Building and Surfaces.
Kerakoll is a Benefit Corporation and in 2023 obtained the B Corp certification, confirming the journey towards a new ESG business model generating economic, social and environmental value.

Our commitment
After converting to a Benefit Corporation in 2021, Kerakoll Group achieved the B Corp certification in 2023, joining a global movement of leading companies promoting positive change.
This further milestone in our ESG journey marks our evolution from a green building tradition to a new business model: Kerakoll becomes a positive force for generating economic, social and environmental value and inspiring the entire construction industry.

Our values
Kerakoll wants to offer the world a chance to build better places to live.
To achieve this, Kerakoll brings together people who share the same passion for what they do.
Employees, architects, engineers, craftsmen and end-users, who conceive and develop new ideas and projects on a daily basis.
Our philosophy is based on five values which represent who we are and inspire us every day, as individuals, as a team and as a company. At Kerakoll we are: innovative, responsible, genuine, dynamic and in touch. Sustainability starts with our people and is in their interest. It translates into better choices for the well-being, safety and growth of our human resources.

Integrated policy for total quality, wellbeing, and protection of the environment
Focusing on the environmental sustainability on a home and its eco-friendly qualities, in relation to the health of its inhabitants: this is what we care about more. This is the core philosophy behind Kerakoll Group. Indoor air quality, high energy-environmental standards of buildings, and healthy environments in balance with nature: these are the pillars of our living well-being. Our approach aims to integrate the many aspects of sustainable building into everyday life, in keeping with the growing environmental awareness. We believe that sustainable technology along with a coherent development model is the goal to be achieved. The aim of any business should be to develop projects with low environmental impact but hugely innovative in technological terms.

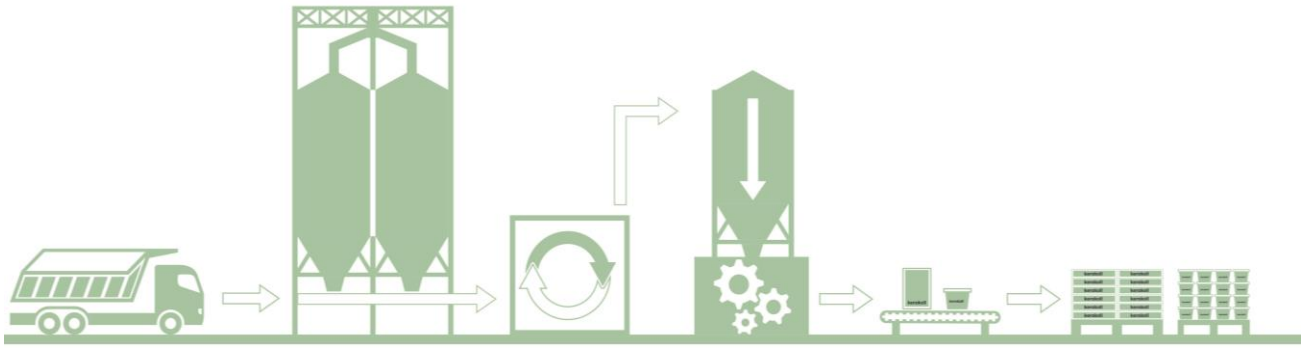
This is why at Kerakoll Group we are naturally committed to combining business with social responsibility that is raising the living standards of the individual and the environment. Our commitment is reflected in our daily life, in our way of doing business and in our sensitivity to consumer needs, with the aim of ensuring the satisfaction of present needs, without compromising the wellbeing of tomorrow. This represents not only our economic mission, but the commitment to social responsibility that guides and unites everyone here at Kerakoll Group.

Taking "Made in Italy" excellence around the world
In our 50 years in the industry, we have made ourselves a position on the market as supplier of sustainable building materials, from being top of the domestic market to a top Italian-based business in the world. As the result of increasing internationalisation, 38% of Kerakoll Group's turnover now comes from foreign markets. The Group has a direct presence in 11 countries with production plants (Italy, Spain, Poland, Greece, France, United Kingdom, India, Brazil and Portugal) and commercial subsidiaries (Germany and United Arab Emirates).
We offer each customer personalised options, with which to design, build and live in harmony with the environment and in a state of well-being, together with high added value services such as planning, technical consultancy, training, and on-site assistance.

Quality for safety, sustainability and product performance
In addition to major investments in research and development that have made us champion in its field, and in order to achieve the highest possible quality standards in compliance with international rules and regulations, we have established both in Italy and abroad an integrated management system for ISO 9001 quality. It pushes the company to increasingly standardize processes, to create sustainability-driven synergy with our suppliers and to enhance our employees' ever growing expertise.
The Kerakoll Group system combines the "Total Quality Management" and "Life Cycle Thinking" approaches, thus confirming our commitment in certifying its products from the sourcing of raw materials with low environmental impact, to their design, implementation and distribution, to their performance on site. Through the years, we have adopted a set of rigorous qualification plans aimed at certifying product performance (CE marking, CE MED, CSTB) and quantifying its environmental sustainability (CFP, EPD, GreenBuilding Rating, ISO 14021), thus offering the customer the possibility to transfer quality and sustainability to the "building system" (CAM, LEED and other protocols) in order to build better places to live.

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) and are supplied in 25 kg paper bag.

Klima Fix is certified, mineral adhesive & finishing product, suitable for bonding and finishing of all types of heat-insulating panels for thermal insulation panelling application.
Klima Fix is specifically intended for bonding and finishing thermal insulation panelling systems on heat-insulating panels made of extruded polystyrene, expanded polystyrene and polystyrene foam for specific use in ETICS plinths, polyurethane, phenolic resin, cork, mineral and glass wool, wood fibre, aerogel, on concrete, cement-based plaster/render, mineral and cement-based finishing products.

Klima Flex is high performance, mineral Adhesive & Finishing product, specific for ETICS Klima Expert ETA guaranteed performance insulation panelling systems. Product specifically for use in the Kerakoll Panelling system with European Technical Approval - ETA - under EAD 040083-00-0404. Formulated for high resistance laying with improved flexibility of all heat-insulating panels for panelling systems, in particular EPS.
Klima Flex is specific for the bonding and finishing of EPS heat-insulating panels of the Klima Expert ETA systems on concrete, brick, cement-based plaster/render and mineral finishing products. Extra white. For internal and external use. Both products are for both internal and external use.

Products standard
The product is designed, produced and CE marked according to EN 998-1 (Specification for mortar for masonry Rendering and plastering mortar).

Physical characteristics
The product is 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 produce a deformable cementitious adhesive of high performance. 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:

Product components	Weight, kg	Post-consumer recycled material, weight-%	Biogenic material, weight-% and kg C/product or declared unit
Aggregates and fillers	0,79 -0,81	-	-
Binders	0,17 – 0,16	-	
Others (additives, etc.)	0,04 – 0,03	-	

Product is 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). Related to specific components, the table above shows only hazardous ones within the meaning of the CLP regulation and their related classification as stated into product Safety Data Sheet.

The primary packaging is a paper bag. The most representative one, in terms of market supply, is the 25 kg format. The main characteristics of primary and secondary packaging are shown in the tables below.

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/product or declared unit
Paper Bag (25 kg)	0,10	0,40%	1,87E-03

5. LCA INFORMATION

Declared Unit

The Declared Unit (DU) is 1 kg of product and packaging is proportioned to it, accounting for 0,4% w/w in respect to the packaging format of 25 kg.

Scope

CEN developed the EN 15804:2012+A2:2019/AC:2021, 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" (A1-A3) with A4-A5, B1, C and D. Modules not accounted in the LCA since they are not assessed are marked as "ND", Not Declared.

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transports (raw materials - 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	Reuse - Recovery - Recycling - potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	IT - EU 27	IT - EU 27	IT - EU 27	EU 27	EU 27	-	-	-	-	-	-	-	EU 27	EU 27	IT	IT	IT - EU 27
Share of specific data	18,19%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	14,5%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

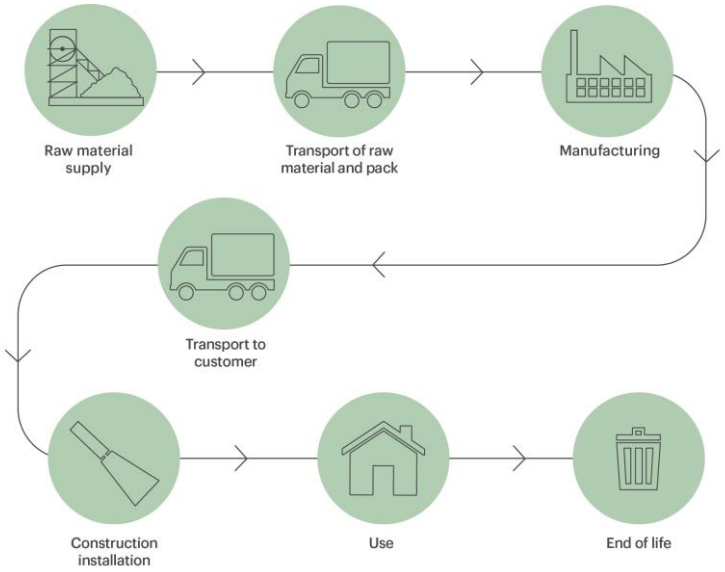
System boundaries and processes included in the LCA (X included, ND: Not Declared)

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

The EPD is of a multiple product type consisting of Klima Fix and Klima Flex. However, two alternatives are available for Klima Fix: the White and Grey one. Therefore, a sensitivity analysis has been performed between Klima Fix White, Klima Fix Grey and Klima Flex. The results show that a variation of GWP-GHG indicator for A1-A3 is not larger than 14,5 % between them. The EPD is therefore representative for all the variants available. A worst-case approach has been followed for the results.

Regarding the share of specific data, according to 5.4.3 PCR 2019:14 v.1.3.4 definition, materials involved into production phase (e.g. raw materials) even when combined with specific activity data can't be qualified as specific data. Therefore, according to this, a computation of the sharing in GWP-GHG impact of other A1-A3 data except those related to raw materials are quantified in percentage terms over the total A1-A3 module. According to this method, the share of specific data in GWP-GHG accounts for 18,19%.

Even if considering raw materials modelled with dataset as proxy data (this definition differs from the one reported in GPI), an assessment quality for raw materials data is applied according to ILCD Handbook - DQR (Data Quality Rating). According to this methodology, the data quality of raw materials can be considered as Very Good - High. Beside this, Kerakoll continues to stimulate the use of EPD in the value chain especially for its supplier, in order to improve the use of specific data and increase the overall quality of the EPDs published.



Product stage: Raw material supply, Transport and Manufacturing (A1-A3)

- A1-A2: extraction, supply and transport of raw materials and packaging to Kerakoll and manufacturing process energy consumption.

Detailed data of energy sources behind electricity used in manufacturing process (Guarantee of Origin adopted) and GWP-GHG impact are reported in the following table.

Energy source	Ecoinvent process	kg CO_2-eq / kWh
Solar power	Electricity, low voltage {IT}| electricity production, photovoltaic, 570kWp open ground installation, multi-Si | Cut-off, U	7,69E-02

- 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 and they include both distribution and consumer packaging, as follows.

Packaging material	Distribution packaging	Consumer packaging
Wooden pallet	x	
Cardboard, paper	x	
Plastic and LDPE film (e.g. for wrapping material)	x	
Paper bag		x

Construction stage: Transport to customer and Construction installation (A4-A5)

- A4: transport to customer and tertiary / secondary packaging waste management.

Transport to customer is assumed along 500 km, done by road with EURO 6 diesel truck, 16-32 ton.
Regarding secondary and tertiary packaging waste treatment, a distance of 50 km to waste treatment plant is considered. Moreover, the following waste scenario is assumed.

Secondary / tertiary packaging material	Recycling	Energy recovery	Landfill
Wooden pallet - EPAL	100%	-	-
Wooden pallet - Non EPAL	-	-	100%

Plastic and LDPE film (e.g. for wrapping material)	47%	40%	13%
Cardboard and paper	84%	6%	10%

- A5: product installation and primary packaging waste management.

Product installation consumption of energy (electricity) and water varies depending on product categories. In this case a mechanical mixing with electricity consumption has been assumed, as well as water consumption as suggested on technical data sheet.
Regarding primary packaging waste treatment, a distance of 50 km to waste treatment plant is considered. Moreover, the following waste scenario is assumed.

Primary packaging material	Recycling	Energy recovery	Landfill
Paper bag (25 kg)	84%	6%	10%

Use stage: Use (B1)

VOC emissions released during product application are accounted in this module.

End of life stage: De-construction demolition, Transport, Waste processing and Disposal (C1-C4)

- C1: De-construction demolition.

Consumption of energy (electricity) due to product de-construction / demolition depends on product categories. In this case a mechanical demolition with electricity consumption has been assumed.

- C2-C4: Demolition waste transport, processing and disposal.

For waste transport**,** a distance of 50 km is considered. Moreover, demolition waste is assumed as non-hazardous and the following scenario has been adopted.

Demolition waste	Recycling	Landfill
Inert demolition waste	80%	20%

Resource recovery stage: Reuse - Recovery - Recycling potential (D)

Module D is related to benefits beyond system boundaries, containing environmental credits coming from modules A4+A5 and C. Indeed, potential benefits are related to recycling and energy recovery of packaging wastes (A4+A5) and recycling of product (C3). At the end of life, the product can be recycled as inert material and used as an alternative for virgin raw aggregates.

Data quality

For the background data the Ecoinvent v.3.10 database is 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. Generic and producer specific data are not more than 10 and 5 years old respectively (according to EN 15804 6.3.8.2. “Data quality requirements”).

Period under review

All primary data collected from Kerakoll are representative for the year 2023.

Allocations

There are no co-products in the production of 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 products. Moreover, raw material packaging consumption is excluded, whereas it is accounted as waste in module A3.

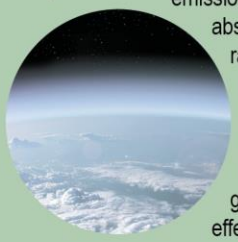
6. ENVIRONMENTAL INDICATORS

An introduction to each environmental indicator is provided below. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The actual impacts on the environment typically depend upon local, regional and/or global conditions.

Abiotic Depletion Potential (ADP)
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.

Acidification Potential (AP)
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.

Ozone Depletion Potential (ODP)
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.



Eutrophication Potential (EP)
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.

Water Deprivation Potential (WDP)
It represents the relative available water remaining per area in a watershed, after the demand of humans and aquatic ecosystems has been met. It assesses the potential of water deprivation, to either humans or ecosystems, building on the assumption that the less water remaining available per area, the more likely another user will be deprived.

Global Warming Potential (GWP)
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)
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 kg of skim coat powder (packaging proportioned to it accounting for 0,4% w/w in respect to the packaging format of 25 kg). Two products are represented within this study, reporting one single set of results based on worst case approach. It is discouraged the use of the results from modules A1-A3 without considering the results of module C. Core and Additional environmental impacts indicators are assessed with EN 15804:2012+A2:2019/AC:2021 reference package based on EF 3.0. For Primary Energy Use indicators, option B of PCR 2019:14 v.1.3.4 has been followed. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Klima Flex, Klima Fix

CORE ENVIRONMENTAL IMPACTS	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
Climate change (GWP-total)	kg CO_2 eq	2,98E-01	1,26E-01	8,37E-03	8,46E-05	9,05E-03	7,15E-02	1,26E-03	2,10E-03	-4,41E-03
Climate change - Fossil (GWP-fossil)	kg CO_2 eq	3,29E-01	9,89E-02	9,53E-04	8,46E-05	9,00E-03	7,15E-02	1,26E-03	2,09E-03	-4,40E-03
Climate change - Biogenic (GWP-biogenic)	kg CO_2 eq	-3,23E-02	2,73E-02	7,41E-03	0,00E+00	5,14E-05	6,96E-06	3,21E-06	4,49E-06	-1,02E-05
Climate change - Land use and LU change (GWP-luluc)	kg CO_2 eq	2,17E-03	3,19E-05	2,98E-07	0,00E+00	1,14E-06	6,95E-06	2,99E-06	4,88E-07	-4,30E-06
Ozone depletion (ODP)	kg CFC-11 eq	5,17E-09	1,90E-09	5,88E-11	0,00E+00	1,90E-10	1,07E-09	2,25E-11	6,27E-11	-6,04E-11
Acidification (AP)	mol H^+ eq	8,96E-04	2,03E-04	4,26E-06	0,00E+00	3,03E-05	3,68E-04	7,89E-06	2,21E-05	-2,64E-05
Eutrophication, freshwater (EP-freshwater)	kg P eq	5,71E-05	6,49E-06	1,59E-07	0,00E+00	1,41E-06	1,31E-06	9,23E-07	3,36E-06	-1,54E-06
Eutrophication, marine (EP-marine)	kg N eq	2,32E-04	5,01E-05	1,91E-06	0,00E+00	5,09E-06	1,60E-04	1,87E-06	5,51E-06	-8,03E-06
Eutrophication, terrestrial (EP-terrestrial)	mol N eq	2,36E-03	5,38E-04	1,27E-05	0,00E+00	5,47E-05	1,75E-03	1,87E-05	5,91E-05	-8,89E-05
Photochemical ozone formation (POCP)	kg NMVOC eq	1,02E-03	3,37E-04	4,97E-06	4,70E-06	2,43E-05	6,96E-04	5,91E-06	2,17E-05	-2,82E-05
Resource use, minerals and metals (ADP-minerals & metals) [1]	kg Sb eq	1,19E-06	3,10E-07	2,04E-09	0,00E+00	1,62E-08	4,53E-08	1,36E-08	3,83E-09	-2,07E-08
Resource use, fossils (ADP-fossil) [1]	MJ	9,29E-01	1,11E-01	3,63E-03	0,00E+00	3,68E-02	2,28E-02	1,65E-02	3,15E-03	-2,19E-02
Water use (WDP) [1]	m^3 depriv.	7,85E-02	5,66E-03	8,76E-03	0,00E+00	6,31E-03	1,46E-03	2,96E-04	-2,61E-02	-4,87E-02

[1] Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator

The table below declares the variation of each environmental impact indicator results for which the variation, aggregated over all included modules (from A to C), is above 10% between any of the included products.

CORE ENVIRONMENTAL IMPACTS	Unit	A-C % variation between included products
Ozone depletion (ODP)	%	16,7%
Eutrophication, freshwater (EP-freshwater)	%	16,1%
Resource use, minerals and metals (ADP-minerals&metals)	%	23,3%
Resource use, fossils (ADP-fossil)	%	19,8%

ADDITIONAL ENVIRONMENTAL IMPACTS	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
Particulate matter (PM)	disease inc.	1,00E-08	7,08E-09	7,37E-11	0,00E+00	1,62E-10	9,06E-09	6,03E-09	3,36E-10	-4,70E-10
Ionising radiation (IRP) [2]	kBq U-235 eq	1,75E-02	1,74E-03	6,85E-05	0,00E+00	1,06E-03	2,81E-04	6,26E-04	6,24E-05	-3,34E-04
Ecotoxicity, freshwater (ETP-fw) [1]	CTUe	1,87E+00	4,42E-01	1,27E-02	3,83E-05	2,82E-02	1,05E-01	1,38E-02	3,30E-01	-2,70E-02
Human toxicity, cancer (HTP-c) [1]	CTUh	8,62E-10	6,79E-10	5,39E-12	0,00E+00	1,89E-11	1,05E-10	5,69E-12	1,14E-11	-3,20E-11
Human toxicity, non-cancer (HTP-nc) [1]	CTUh	3,91E-09	1,05E-09	4,39E-11	1,02E-12	4,94E-11	3,32E-10	1,94E-11	6,12E-11	-6,36E-11
Land use / Soil quality (SQP) [1]	Pt	4,86E+00	8,07E-01	2,64E-03	0,00E+00	2,67E-02	1,03E-01	1,72E-02	1,14E-01	-1,41E-01

[1] Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

[2] Disclaimer: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear full cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

USE OF RESOURCES	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
Use of non-renewable primary energy excluding resources used as raw materials - PENRE	MJ	3,27E+00	1,34E+00	1,29E-02	0,00E+00	1,42E-01	9,05E-01	2,59E-02	4,66E-02	-5,48E-02
Use of non-renewable primary energy resources used as raw materials - PENRM	MJ	7,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-8,61E-06	0,00E+00	-5,60E-03
Total use of non-renewable primary energy resources - PENRT	MJ	4,05E+00	1,34E+00	1,29E-02	0,00E+00	1,42E-01	9,05E-01	2,59E-02	4,66E-02	-6,04E-02
Use of renewable primary energy excluding resources used as raw materials - PERE	MJ	1,08E-01	2,22E-02	2,36E-03	0,00E+00	4,83E-02	3,77E-03	6,88E-03	9,36E-04	-1,04E-03
Use of renewable primary energy resources used as raw materials - PERM	MJ	7,15E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,62E-04	0,00E+00	-1,48E-02
Total use of renewable primary energy resources - PERT	MJ	8,23E-01	2,22E-02	2,36E-03	0,00E+00	4,83E-02	3,77E-03	6,12E-03	9,36E-04	-1,58E-02
Use of secondary material - SM	kg	2,12E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels - RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels - NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water - FW	m3	2,16E-03	1,89E-04	2,25E-04	0,00E+00	1,77E-04	4,84E-05	1,99E-05	-5,63E-04	-1,14E-03

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
Hazardous waste disposed - HWD	kg	1,03E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed - NHWD	kg	3,60E-02	6,87E-03	4,00E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,00E-01	0,00E+00
Radioactive waste disposed - RWD	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	1,48E-02	5,28E-04	4,29E-03	0,00E+00	0,00E+00	0,00E+00	8,00E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	3,03E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	4,09E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CLIMATE CHANGE	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
GWP-GHG [3]	kg CO_2 eq	3,31E-01	9,90E-02	1,50E-03	8,46E-05	9,05E-03	7,15E-02	1,26E-03	2,10E-03	-4,41E-03

[3] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

8. ADDITIONAL ENVIRONMENTAL INFORMATION

Recycled Content

Kerakoll is always looking to promote circular economy with its product whenever feasible. In this product, recycled (pre-consumer) calcium carbonate is contained according to the amount shown in the table below.

Product	Recycled material content - pre-consumer
Klima Flex	45%
Klima Fix	20%

VOC emissions

Volatile Organic Compounds (VOC) tests and evidence have been carried out on the product, according to ISO 16000 parts 3, 6, 9 and 11 and EN 16516. The involved product meets 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.).

It has 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.

Company Quality and Sustainability

Kerakoll is a B Corp since 2023 and also ISO 9001 and ISO 14001 certified.

9. DIFFERENCES VERSUS PREVIOUS VERSIONS

2024-09-02 Updated with additional information for variation for all indicators >10%.

10. REFERENCES

Ecoinvent - Ecoinvent Centre, www.ecoinvent.org
EMICODE GEV - Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e. V. (pub.). www.emicode.de
EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
EN ISO 16000-9:2008-04 - Indoor air – Part 9: Determination of the emission of volatile organic compounds from building products and furnishings – Emission test chamber method
EPD Study Report Klima Fix + Klima Flex, 2024-08-05
GPI - General Programme Instructions, The International EPD® System, Version 4.0
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)
ISO 16000-3:2013-01 - Indoor air –Part 3: Determination of formaldehyde and other carbonyl compounds by sampling using a pump
ISO 16000-6:2012-11 - Indoor air –Part 6: Determination of volatile organic compounds indoors and in test chambers by sampling on TENAX TA®, thermal desorption and gas chromatography using MS or FID
PCR for Construction Products, The International EPD System, 2019:14 Version 1.3.4, 2024-04-30
SimaPro - SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com
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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

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