Environmental product declaration for:

Cementoresina

Resin floor with a coloured-body trowelled texture and high-performance natural finish.

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

Programme operator: EPD International AB

EPD registration number: S-P-11739

Publication date: 2023-12-18

Revision date: 2024-01-09

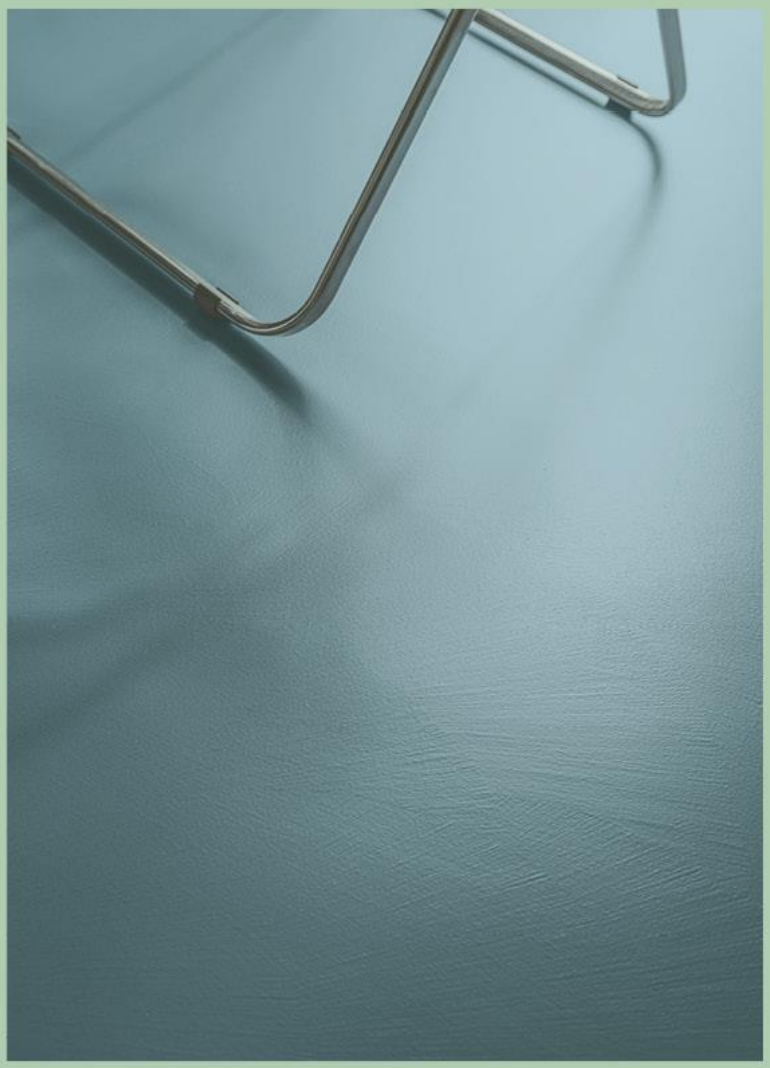
Valid until: 2028-12-18

CPC Code: 35110 - Paints and varnishes and related products

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

→ **Cradle to Gate scope**

→ **Multiple products**



kerakoll

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.

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", v1.2, 2022-06-22
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

SGS Italia S.p.A.
www.sgsgroup.it
Via Caldera, 21 – 20153 Milano, Lombardia (Italy)

Accredited by Accredia - accreditation number: 006H

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.

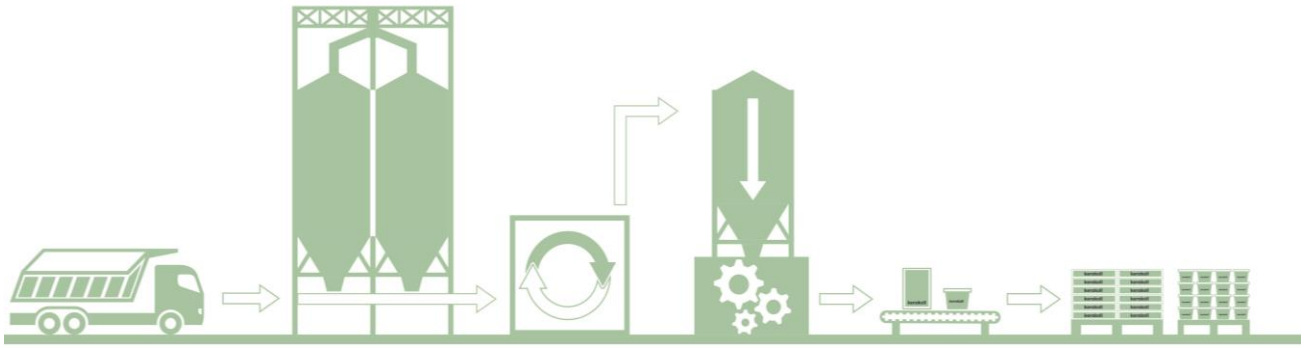
This is why at Kerakoll Group we are naturally committed to combining business with social responsibility that is raising the living standards of the individual and the environment. Our commitment is reflected in our daily life, in our way of doing business and in our sensitivity to consumer needs, with 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. PRODUCT

Description and use of the product

The products included in floor resin decorative system Cementoresina are manufactured by Kerakoll S.p.A. in the production plant located in Brugine (PD).

Cementoresina is an high performance, natural finish resin floor with trowelled texture, suitable for use in domestic and commercial interior environments. Made by first laying over the surface the glass-fibre Net 90 reinforcing mesh; then by subsequently applying Floorzero, structural base finishing product; subsequent dusting with Quarzo 1.3, calibrated mineral quartz with controlled grain size. Subsequent application of Cementoresina 1, a stress dividing, coloured base finishing product, followed by application of Cementoresina 2, a coloured decorative finishing product defining the decorative trowelled texture. At the end, application of Cementoresina Gel, transparent gel in order to guarantee total cleanability of the surfaces and preventing bacterial growth, defining a protective sealing layer, followed by two coats of a protective, transparent micro-resin with matt finish, such as Microresina Xtreme.

Depending on the substrate to be coated, suitable preparation should be provided: in the case of absorbent materials, like cementitious one, EP 21 should be adopted, while in the case of non-absorbent, such as marble and ceramic floors, Keragrip Eco Pulep must be used.

This EPD involves both the cases, by adopting a worst-case approach scenario, better described in chapter 7.

Product standard

CE-marked and compliant according to EN 13813 standard.

Physical characteristics

Products are in a liquid form, except for Net 90 and Quarzo 1.3 which are in a solid state. Where dilution with water is required, this is eventually done at the building site in the construction/ installation stage, in a defined amount and technique defined with technical guidance documents. For specific physical properties, we refer to the CE declaration or Declaration of Performance or to the technical datasheet available on www.kerakoll.com/it.

Content declaration

The main components of the involved products assembled into the product system Cementoresina are resumed as follows:

Component	Weight (kg)	Post-consumer recycled material (%)	Biogenic material, weight - % and kg C/kg[1]
Aggregates and fillers	0,3 - 0,4	-	-
Binders	0,6 - 0,7	-	-
Others (additives, etc.)	< 0,05	-	-

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). 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.

Since different products are combined into Cementoresina decorative system, primary packaging accounted for the study are resumed in the following table. For Cementoresina 1 and Cementoresina 2, packaging format 7+1,8 kg and 2,6+0,5 kg have been considered respectively as representative for the EPD.

[1] 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Primary packaging	Weight - kg	Weight - % (versus the product)	Weight biogenic carbon - kg C/kg[1]
EP 21 - tank and bottle (3,5 kg)	0,20	3,3%	2,35E-04
Keragrip Eco Pulep - bottle (1 L)	0,07	1,2%	8,38E-05
Floorzero - bucket (10 kg)	0,56	9,3%	1,16E-03
Net 90 - plastic film (50 m roll)	0,04	0,6%	1,05E-05
Quarzo 1.3 - plastic bag (25 kg)	0,10	1,7%	1,17E-04
Cementoresina 1 - bucket (8,8 kg)	0,69	11,5%	3,89E-04
Cementoresina 2 - bucket (3 kg)	0,27	4,5%	3,04E-04
Cementoresina Gel - bucket (0,6 kg)	0,12	2,0%	1,11E-04
Microresina Xtreme - tank and bottle (3 kg)	0,16	2,7%	2,49E-04

The weight of biogenic carbon is the lowest amount between the two products, following the worst-case approach (see section 7. for details).

BIOGENIC CARBON CONTENT	Unit	A1 - Product	A3 -Packaging [2]
Biogenic Carbon content [3]	kg C	0,00E+00	2,15E-01

5. LCA INFORMATION

Declared Unit

The Declared Unit (DU) is 1 m^2. Packaging is included according to proportion in respect to each product as shown in table above (section 4.). For the DU of 1 m^2 the following amounts of products have been taken into account for the study:

Cementoresina - absorbent substrates	kg / 1 m^2
EP21	0,200
Net 90	0,090
Quarzo 1.3	2,000
Floorzero	2,500
Cementoresina 1	0,600
Cementoresina 2	0,400
Cementoresina Gel	0,070
Microresina Xtreme	0,120

[2] Primary, secondary and tertiary packaging included.

[3] The indicator reported is for satisfying what asked by EN 15804:2012+A2:2019/AC:2021. It Is considered the lowest amount of biogenic carbon content between the two products, according to the worst-case approach.

Cementoresina - non-absorbent substrates	kg / 1 m²
Keragrip Eco Pulep	0,030
Net 90	0,090
Quarzo 1.3	2,000
Floorzero	2,500
Cementoresina 1	0,600
Cementoresina 2	0,400
Cementoresina Gel	0,070
Microresina Xtreme	0,120

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" type, including EN 15804 modules from A1 to A3. Modules not accounted in the LCA since they are not assessed are marked as "ND", Not Declared.

	Upstream - Core			Downstream												Resource recovery stage
	Product stage			Construction process stage		Use stage							End of life 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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	ES - EU 27	ES - EU 27	ES - EU 27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	10,7%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

The “Cradle to Gate” type adopted is justified since:

- the product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life, and
- the product or material is no longer identifiable at end of life as a result of a physical or chemical transformation process, and
- the product or material does not contain biogenic carbon

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

The EPD is a multiple products type. Two system alternatives are available for the EPD analysed: version for absorbent substrate using EP 21 and the one for non-absorbent, adopting Keragrip Eco Pulep. Therefore, a sensitivity analysis has

been performed between these two alternatives and the results show that a variation of GWP-GHG indicator for A1-A3 is not larger than 10,7% between them.
The EPD is based on a single manufacturing site.

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 and they 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	
Bucket, tank, bottle, plastic bag and film		x

Data quality

For the background data the Ecoinvent v.3.9 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"). The overall data quality has been assessed as "high" according to DQR - Data Quality Rating methodology (ILCD).

Period under review

All primary data collected from Kerakoll are representative for the year 2022.

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, as well as raw material packaging. Quantified contribution from those process: less than 0,5% by mass of product

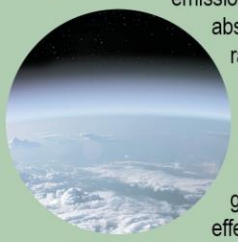
6. ENVIRONMENTAL INDICATORS

An introduction to each environmental indicator is provided below. 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 m^2 of decorative resin (packaging included).

Two variants, for absorbent and non-absorbent substrates, of Cementoresina are represented within this study, reporting one single set of results. An analysis according to core indicators (PCR 2019:14 v1.2) for modules A1-A3 has been carried on. The results show that variations larger than 10% have been obtained. Therefore a worst-case approach has been followed, represented by the variant for absorbent substrate. The results reported below are the highest one within the two variants involved, except for SM - Use of secondary raw materials and Biogenic Carbon content (see notes n.5 and n.8).

Cementoresina

POTENTIAL ENVIRONMENTAL IMPACTS	Unit	A1-A3
Climate change (GWP-total)	kg CO_2 eq	9,76E+00
Climate change - Fossil (GWP-fossil)	kg CO_2 eq	1,05E+01
Climate change - Biogenic (GWP-biogenic) [4]	kg CO_2 eq	-7,90E-01
Climate change - Land use and LU change (GWP-luluc)	kg CO_2 eq	3,29E-02
Ozone depletion (ODP)	kg CFC-11 eq	2,76E-05
Acidification (AP)	mol H^+ eq	5,22E-02
Eutrophication, freshwater (EP-freshwater)	kg P eq	2,96E-03
Eutrophication, marine (EP-marine)	kg N eq	1,22E-02
Eutrophication, terrestrial (EP-terrestrial)	mol N eq	9,65E-02
Photochemical ozone formation (POCP)	kg NMVOC eq	4,14E-02
Resource use, minerals and metals (ADP-minerals & metals) [5]	kg Sb eq	1,01E-04
Resource use, fossils (ADP-fossil) [5]	MJ	1,89E+02
Water use (WDP) [5]	m^3 depriv.	5,52E+00

ADDITIONAL ENVIRONMENTAL IMPACTS	Unit	A1-A3
Particulate matter (PM)	disease inc.	5,22E-07
Ionising radiation (IRP) [6]	kBq U-235 eq	7,96E-01
Ecotoxicity, freshwater (ETP-fw) [5]	CTUe	2,99E+02
Human toxicity, cancer (HTP-c) [5]	CTUh	1,15E-08
Human toxicity, non-cancer (HTP-nc) [5]	CTUh	2,83E-07
Land use / Soil quality (SQP) [5]	Pt	1,10E+02

[4] Since the EPD is a Cradle to Gate type (A1-A3) the biogenic uptake in module A3 is not manually balanced. Take care of this if the data is intended to be used for downstream systems and studies.

[5] 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

[6] 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.

RESOURCE USE INDICATORS	Unit	A1-A3
Use of non-renewable primary energy excluding resources used as raw materials - PENRE	MJ	1,71E+02
Use of non-renewable primary energy resources used as raw materials - PENRM	MJ	1,81E+01
Total use of non-renewable primary energy resources - PENRT	MJ	1,89E+02
Use of renewable primary energy excluding resources used as raw materials - PERE	MJ	7,58E+00
Use of renewable primary energy resources used as raw materials - PERM	MJ	1,73E+01
Total use of renewable primary energy resources - PERT	MJ	2,49E+01
Use of secondary material - SM[7]	kg	0,00E+00
Use of renewable secondary fuels - RSF	MJ	0,00E+00
Use of non-renewable secondary fuels - NRSF	MJ	0,00E+00
Use of net fresh water - FW	m3	1,47E-01

WASTE INDICATORS AND OUTPUT FLOWS	Unit	A1-A3
Hazardous waste disposed - HWD	kg	3,56E-02
Non-hazardous waste disposed - NHWD	kg	1,87E-01
Radioactive waste disposed - RWD	kg	0,00E+00
Components for re-use	kg	0,00E+00
Material for recycling	kg	1,11E-01
Materials for energy recovery	kg	0,00E+00
Exported energy, electricity	MJ	0,00E+00
Exported energy, thermal	MJ	0,00E+00

CLIMATE CHANGE	Unit	A1-A3
GWP-GHG [8]	kg CO_2 eq	1,06E+01

[7] Lowest amount of secondary raw material between the two products, according to the worst-case approach

[8] 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 CO_2 is set to zero.

8. ADDITIONAL ENVIRONMENTAL INFORMATION

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

9. DIFFERENCES VERSUS PREVIOUS VERSIONS

2024-01-09 - Editorial correction: typo error for CPC code on the cover page

10. REFERENCES

- Ecoinvent - Ecoinvent Centre, www.ecoinvent.org
- EN 13813:2002 Screed material and floor screeds - Screed materials - Properties and requirements
- EN 15804:2012+A2:2019/AC:2021 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
- EPD Study Report Cementoresina - Kerakoll SpA, 12-12-2023
- GPI - General Programme Instructions, The International EPD® System, Version 4.0
- ISO 9001:2015 - Quality management systems - Requirements
- 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)
- International Reference Life Cycle Data System (ILCD) Handbook - General guide for Life Cycle Assessment - Provisions and Action Steps. EUR 24378 EN. Luxembourg (Luxembourg): Publications Office of the European Union; 2010
- PCR for Construction Products, The International EPD System, 2019:14 Version 1.2, 2022-06-22
- 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.