

Environmental product declaration for:



H40 Extreme

Multipurpose Hybrid Gel-Adhesive
structural extra-flexible and extra-workable.
For tiles and stone of all types and formats.

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

Programme operator: EPD International AB

EPD registration number: S-P-08889

Publication date: 2023-06-15

Revision date: 2023-07-25

Valid until: 2028-05-30

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 scope

→ Single product



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

1. About this EPD
2. About Kerakoll
3. Manufacturing
4. Products
5. LCA Information
6. Environmental Indicators
7. Environmental Performance
8. Additional Environmental Information
9. Differences versus previous version of the EPD
10. References

kerakoll

2. ABOUT KERAKOLL GROUP

Our company

We are a Benefit Company, international leader in the sustainable construction sector and we offer a comprehensive package of sustainable building materials and services to build and live in respect of the environment and housing well-being.

Since 1968 – when the Group was founded in Sassuolo (Italy), the heart of the most important ceramic district in the world, thanks to the business initiative of Romano Sghedoni – our company has undergone a constant growth both on the national and international market for building materials that has taken the company to the forefront of the sustainable building sector and to a level of technological leadership recognized all over the world.

Our commitment

Quality, well-being and safeguarding the environment have always been the company's guiding pillars. As the first Benefit Company among the top player in the Italian building construction sector, we work to create increasingly better places for people to live, in a state of well-being and respect for the environment, co-operating with those who share the same passion for excellence and commitment to work in a responsible, sustainable and transparent manner in four areas of interest: product sustainability, strategic processes and partnerships, people and civic engagement.

Our values

Our main goal is to meet the needs of consumers thanks to new ideas and constant feedback from its associates. The human factor is indeed a key element in our corporate culture. The Group's shared belief is that only by developing corporate culture can value be created over time, retaking and enhancing the experience of the past, in order to constantly question oneself.

The concepts of research and innovation thus acquire value by coexisting with the recovery, preservation and full understanding of the company's past.

Our entrepreneurial philosophy is therefore based on five corporate values that represent at the same time a way of being as much as of working. In Kerakoll Group, people are innovative, responsible, dynamic, true and in touch.

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. We are now active in 12 countries and the process of progressive internationalisation has led us to achieve a 44% share of our turnover in foreign markets. International expansion and an ever more global approach have not eroded our longstanding Kerakoll identity. We offer each customer personalised options that include 81 ranges of innovative products and more than 6.100 references, 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.

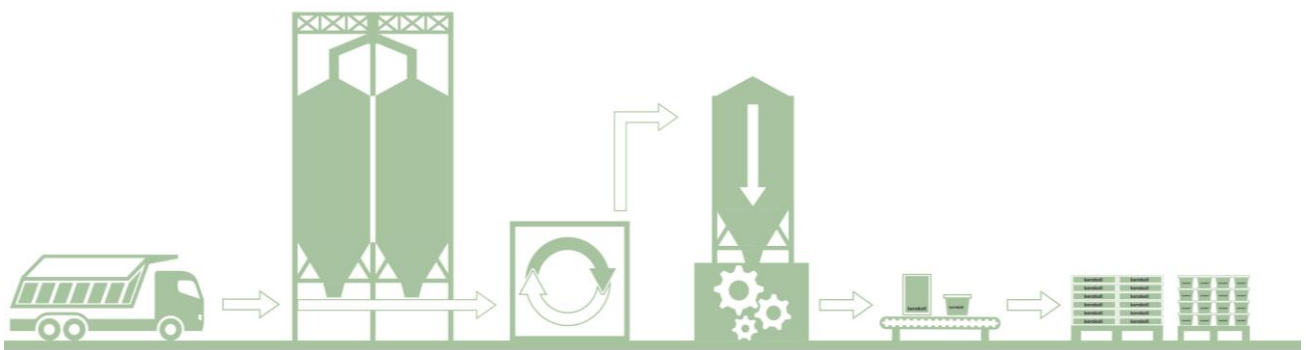
The Kerakoll Group system combines the “Total Quality Management” and “Life Cycle Thinking” approaches, thus confirming our commitment in certifying its products from the sourcing of raw materials with low environmental impact, to their design, implementation and distribution, to their performance on 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, tanks or big bags, are stored in the 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 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.



4. PRODUCT

Description and use of the product

The product is manufactured by Kerakoll S.p.A. in the production plant located in Brugine (PD - Italy) and is supplied in 10 kg plastic bucket.

H40 Extreme is an extra-flexible and extra-workable structural hybrid gel-adhesive, tested for extreme conditions and uses.

It has a very fast bonding, with an adhesive strength (4.5 N/mm²) 5 times superior to a class C2 cement-based adhesive after 24 hours. It is stress resistant, 10 times more deformable than a class S2 (> 50 mm) cement-based adhesive, and easy to spread, 5 times less viscous than a (35 Pa·s) polyurethane adhesive, it transforms into a smooth gel like a cement-based adhesive.

Class: Gel-adhesives for ceramic tiles and natural stone

Coverage: 1,45 kg/m²

Product standard

CE-marked and compliant according to EN 12004 - class R2T.

Physical characteristics

The product is supplied in a single Pack: Part B is found inside the pack. It must be respected the pre-set ratio of 8.6:1.4. Part B has to be remixed into the bucket containing part A, being careful to mix the two parts uniformly until a smooth, even coloured mixture is obtained. 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 product are the following, divided for better clarity into part A (8,6 kg) and part B (1,4 kg), according to the pre-set mixed ratio :

Component	Weight (kg)	Post-consumer recycled material (%)	Biogenic material, weight - % and kg C/kg ¹
Part A (8,6 kg)			
Aggregates and fillers	0,5 - 0,7	-	-
Binders	0,2 - 0,3	-	-
Others (additives, etc.)	0,01 - 0,1	-	-
Part B (1,4 kg)			
Aggregates and fillers	0,6 - 0,8	-	-
Binders	0,2 - 0,3	-	-
Others (additives, etc.)	< 0,1	-	-

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.



¹ 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

The primary packaging is a monopack 10 kg (8,6 +1,4 kg) plastic bucket. The main characteristics of the primary packaging are shown in the table below.

Primary packaging	Weight - kg	Weight - % (versus the product)	Weight biogenic carbon - kg C/kg ¹
Plastic bucket (A+B)	0,6	6,2%	0,01 / 0,6

5. LCA INFORMATION

Declared Unit

The Declared Unit (DU) is 1 kg of product. Packaging is included since it is proportioned to 1 kg of product, accounting for 6,2% w/w in respect to the packaging format of 10 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" 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
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Reuse - Recovery - Recycling - potential
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Geography	IT - EU 27	IT - EU 27	IT - EU 27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation - products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	
Variation - sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	

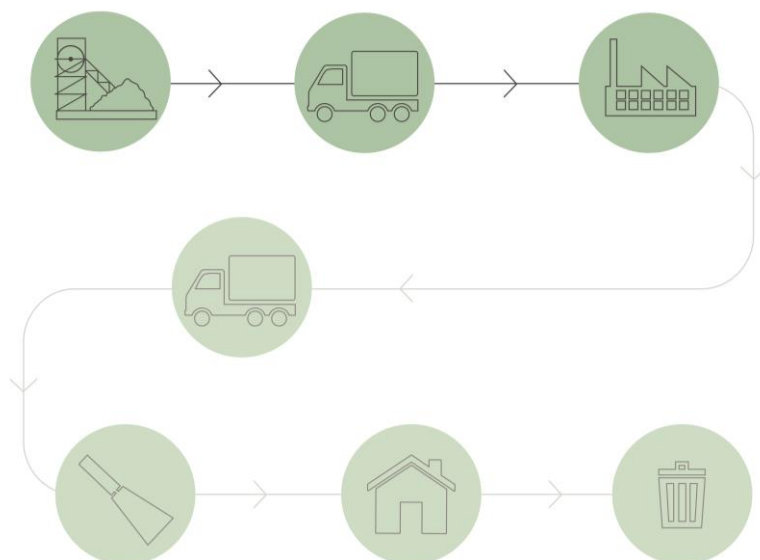
System boundaries and processes included in the LCA (X included, ND: Not Declared)

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 single product type. 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	
Paper bag		x

Data quality

For the background data the Ecoinvent v.3.8 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 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.

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.



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.

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.



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.



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.



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.

7. ENVIRONMENTAL PERFORMANCE

All results are referred to the Declared Unit that is 1 kg of adhesive (packaging included accounting for 6,2% w/w in respect to the packaging format of 10 kg).

H40 Extreme

POTENTIAL ENVIRONMENTAL IMPACTS	Unit	TOT (A1-A3 Product stage)	A1 RM SUPPLY	A2 TRANSPORT OF RM and PACK	A3 MANUFACTURING
Climate change (GWP-total)	kg CO ₂ eq	1,30E+00	1,27E+00	5,28E-02	-2,40E-02
Climate change - Fossil (GWP-fossil)	kg CO ₂ eq	1,47E+00	1,24E+00	5,28E-02	1,81E-01
Climate change - Biogenic (GWP-biogenic) ²	kg CO ₂ eq	-2,01E-01	3,82E-03	5,99E-05	-2,05E-01
Climate change - Land use and LU change (GWP-luluc)	kg CO ₂ eq	3,11E-02	3,07E-02	2,54E-05	3,25E-04
Ozone depletion (ODP)	kg CFC-11 eq	8,31E-07	7,91E-07	1,16E-08	2,83E-08
Acidification (AP)	mol H ⁺ eq	6,92E-03	5,99E-03	1,63E-04	7,68E-04
Eutrophication, freshwater (EP-freshwater)	kg P eq	3,59E-04	2,96E-04	4,53E-06	5,83E-05
Eutrophication, marine (EP-marine)	kg N eq	1,85E-03	1,65E-03	3,38E-05	1,71E-04
Eutrophication, terrestrial (EP-terrestrial)	mol N eq	1,32E-02	1,10E-02	3,68E-04	1,76E-03
Photochemical ozone formation (POCP)	kg NMVOC eq	4,84E-03	4,08E-03	1,35E-04	6,27E-04
Resource use, minerals and metals (ADP-minerals & metals) ³	kg Sb eq	1,33E-05	1,24E-05	2,15E-07	6,48E-07
Resource use, fossils (ADP-fossil) ³	MJ	2,96E+01	2,56E+01	7,90E-01	3,16E+00
Water use (WDP) ³	m ³ depriv.	8,38E-01	7,72E-01	4,23E-03	6,11E-02

ADDITIONAL ENVIRONMENTAL IMPACTS	Unit	TOT (A1-A3 Product stage)	A1 RM SUPPLY	A2 TRANSPORT OF RM and PACK	A3 MANUFACTURING
Particulate matter (PM)	disease inc.	7,20E-08	6,03E-08	3,93E-09	7,73E-09
Ionising radiation (IRP) ⁴	kBq U-235 eq	1,29E-01	9,29E-02	4,29E-03	3,22E-02
Ecotoxicity, freshwater (ETP-fw) ³	CTUe	5,58E+01	5,29E+01	6,49E-01	2,33E+00
Human toxicity, cancer (HTP-c) ³	CTUh	1,85E-09	1,50E-09	2,49E-11	3,30E-10
Human toxicity, non-cancer (HTP-nc) ³	CTUh	2,08E-08	1,84E-08	6,34E-10	1,75E-09
Land use / Soil quality (SQP) ³	Pt	2,59E+01	6,57E+00	5,20E-01	1,88E+01

² 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.

³ 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

⁴ 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	TOT (A1-A3 Product stage)	A1 RM SUPPLY	A2 TRANSPORT OF RM and PACK	A3 MANUFACTURING
Use of non-renewable primary energy excluding resources used as raw materials - PENRE	MJ	2,13E+01	1,75E+01	7,85E-01	2,99E+00
Use of non-renewable primary energy resources used as raw materials - PENRM	MJ	8,33E+00	8,16E+00	5,14E-03	1,72E-01
Total use of non-renewable primary energy resources - PENRT	MJ	2,96E+01	2,56E+01	7,90E-01	3,16E+00
Use of renewable primary energy excluding resources used as raw materials - PERE	MJ	1,15E+00	9,77E-01	1,77E-02	1,56E-01
Use of renewable primary energy resources used as raw materials - PERM	MJ	4,58E+00	1,17E+00	4,56E-03	3,40E+00
Total use of renewable primary energy resources - PERT	MJ	5,73E+00	2,15E+00	2,22E-02	3,56E+00
Use of secondary material - SM	kg	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
Use of non-renewable secondary fuels - NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water - FW	m3	2,40E-02	2,18E-02	1,41E-04	2,09E-03

WASTE PRODUCTION AND OUTPUT FLOWS	Unit	TOT (A1-A3 Product stage)	A1 RM SUPPLY	A2 TRANSPORT OF RM and PACK	A3 MANUFACTURING
Hazardous waste disposed - HWD	kg	1,12E-02	0,00E+00	0,00E+00	1,12E-02
Non-hazardous waste disposed - NHWD	kg	4,93E-02	0,00E+00	0,00E+00	4,93E-02
Radioactive waste disposed - RWD	kg	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
Material for recycling	kg	2,87E-02	0,00E+00	0,00E+00	2,87E-02
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CLIMATE CHANGE	Unit	TOT (A1-A3 Product stage)	A1 RM SUPPLY	A2 TRANSPORT OF RM and PACK	A3 MANUFACTURING
GWP-GHG ⁵	kg CO ₂ eq	1,51E+00	1,27E+00	5,28E-02	1,82E-01

BIOGENIC CARBON CONTENT	Unit	A1 - Product	A3 - Packaging ⁶
Biogenic Carbon content ⁷	kg C	0,00E+00	5,61E-02

⁵ 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.

⁶ Primary, secondary and tertiary packaging included.

⁷ The indicator reported is for satisfying what asked by EN 15804:2012+A2:2019/AC:2021. Other information are reported in Content Declaration paragraph. 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

8. ADDITIONAL ENVIRONMENTAL INFORMATION

Quality and Environmental management systems

Kerakoll is ISO 9001 certified since 2000.

9. DIFFERENCES VERSUS PREVIOUS VERSION OF THE EPD

2023-07-25 - Corrections of computational method for "use of resources - energy" indicators; correction of computational method for "GWP-GHG" indicator; corrections for indicators "waste production and output flows"; some editorial updates on the cover page and about general information of EPD (page 2).

10. REFERENCES

Ecoinvent - Ecoinvent Centre, www.ecoinvent.org

EN 12004 Adhesives for ceramic tiles - Part 2: Test methods

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 H40 Extreme, 21-07-2023

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)

ISO 16000-3:2013-01 - Indoor air - Part 3: Determination of formaldehyde and other carbonyl compounds by sampling using a pump

PCR for Construction Products, The International EPD System, 2019:14 Version 1.2.5, 2022-11-01

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.

All rights reserved. © Kerakoll. All rights to the content of this publication are reserved in accordance with applicable law. The duplication, publication and distribution, in full or in part, of all material contained herein are expressly forbidden without written authorization.