Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Surface Hardeners for Concrete: Qualiroc, Qualidur, Qualidur HP, Qualitop Master, Qualitop Millennium, Qualitop Metal, Qualitop Titanium, Qualitop VRS, Qualitop Master VRS and Empreintes

by

Rinol Rocland R&T, S.A.

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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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General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

The CEN EN 15804 standard serves as the basis for the Product Category Rule (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction Products (EN 15804:A2), version 1.11 Complimentary Product Category Rules (c-PCR): Concrete and Concrete Elements (EN 16757:2017)
PCR review was conducted by: *El Comité Técnico del Sistema Internacional EPD®.* President: *Claudia A. Peña. Contact via info@environdec.com*
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: CTME Technological Center of Miranda de Ebro Accredited by: The International EPD® System Verifier: *Lorena Pereda – lpereda@ctme.es*
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.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: RINOL ROCLAND R&T, S.A.

Contact: Jesus Libran
+34 918012921
jesuslibran@rinol.es
https://www.rinol.es

Description of the organisation: Rinol Rocland Suesco has been offering industrial flooring solutions in both concrete and resin for more than 40 years. Its extensive experiences make way for the development of flooring systems focused on each sector and type of industry, complying with the most demanding requirements and regulations in terms of planimetry, resistance and finishes. As an application company, it is part of the international RCR Industrial Flooring group and is supported by companies from the group that manufacture specific products for flooring and services and engineering.

With headquarters in France, Chile, South Africa, India and Spain, the company is indeed international. Its extensive distribution relationships ensure global scope and service.

Product-related or management system-related certifications:

- ISO 9001 Certification of Quality Management Systems (registration nº FS56004)
- ISO 14001:2015 Certification of Environmental Management Systems (registration nº EMS 661922)
- ISO 45001:2018 Certification of Occupational Health and Safety Management Systems — Requirements with guidance for use (Registration nº OHS73625),
- LEED Certification (registration nº G20256A)

Furthermore, Rinol's concrete surface hardener products meet the following standards:

- UNE-EN 13813 Screeds materials and floor screeds
- UNE 80305 White cements

Name and location of the production site: C/ La Marga, s/n - Pol. Ind. Nuestra Señora del Rosario, 45224 Seseña Nuevo (Toledo)

Product Information

Product Name: This EPD® represents the following concrete surface hardener products from Rinol Rocland, with and without pigments: ***Qualiroc, Qualidur, Qualidur HP, Qualitop Master, Qualitop Millennium, Qualitop Metal, Qualitop Titanium, Qualitop VRS, Qualitop Master VRS*** and ***Empreintes.***

Product identification: This EPD® covers all the forelisted ranges of concrete surface hardener products. The difference between these products is mainly based on their compositions and specific application scenarios.

This information is detailed in the next section.

Product description: The products forementioned belong to Rinol Rocland's concrete surface hardener product ranges. Consisting mainly of cement, aggregates and additives in their sophisticated proportion, they are intended to provide color and durability, as well as resistance to abrasion, impact

damage and slipping for industrial flooring. They can be applied as dry powder or grout over freshly poured concrete, creating a durable, monolithic topcoat with the paving slab that protects the floor and prolongs its life. These protective surface coatings also act as surface fiber suppressors on steel fiber reinforced concrete floors, and are also an inexpensive way to create colored concrete floors.

Rinol Rocland's special formulation guarantees that the surface hardener is extremely easy to apply and work with, simplifying polishing and ensuring desired flatness.

An amazing range of long-lasting colors in 14 base shades is available across the full range of surface hardeners products, allowing designers tremendous scope for creativity as floors can be easily segmented or conceived in their corporate colours. The slightly reflective finishing also helps reduce the lighting needs of the building.

Specialized flooring formulations can be customized to the specific requirements of users – all products are developed in accordance with ISO 9001 quality standards. They are also LEED accredited for their environmental performance.

In concrete, the description of each product studied in this EPD is shown below:

- **Qualiroc** is a surface hardener for concrete floors, for locations where fiber suppression and color are priorities. To be applied in the finishing of concrete layers. It is made up of very hard mineral granules and a hydraulic binder enriched with reactive additives.

- **Qualidur** is a dust-on surface hardener for concrete floors. It is one of the most popular mid-range products for the addition of durability and color in medium to heavy use situations. It is a dry mineral hardener, consisting of graded silica sand, selected hard mineral aggregates, cement and special additives.

- **Qualidur HP (High Performance)** offers all the benefits of Qualidur with increased abrasion resistance and antistatic properties. It is excellent for medium-use logistics and manufacturing. It is an industrial mixture of selected, classified and tared non-metallic aggregates, cements and additives. Qualidur High Performance is specially developed to provide high abrasion resistance to industrial floors.

- **Qualitop Master** is an attractive medium to heavy use surface hardener to be utilized in buildings where appearance is as important as protection. It is applied only in the form of grout. Integrates minerals, hard synthetics, selected additives and workability aids.

- **Qualitop Millenium** is the strongest surface hardener with excellent abrasion resistance. It is made up of very hard non-metallic aggregates, cement and special additives and can be applied to concrete as a dry powder or as a hydrated mortar.

- **Qualitop Metal** is an impact resistant surface hardener for concrete surfaces, particularly suitable for applications which require an antistatic and spark resistant floor. It consists of specially treated malleable iron, antioxidant aggregates, cement and selected additives and workability aids.

- **Qualitop Titanium** is the ideal hardener for concrete surfaces, for hard floors, such as heavy industry or cargo terminals. It is a non-oxidizing metallic dry hardener that is composed of very hard metal, non-oxidizing aggregates, cement and special additives. Qualitop TITANIUM can be applied to fresh concrete as a sprinkle-on or as a mortar.

- **Qualitop VRS** is a high technical performance surface hardener with VRS technology to minimize shrinkage cracks and surface cracks. To be applied as dry powder onto concrete.

- **Qualitop Master VRS** is a surface hardener with high technical performance and specially formulated for eminently aesthetic solutions with VRS technology to minimize shrinkage cracks and surface cracks. To be applied to concrete as mortar.

- **Empreintes** is a surface hardener for concrete to make a subsequent stamping or printing through the use of molds. It allows continuous, resistant, long-lasting and, above all, decorative coatings to be obtained. Can be applied to fresh concrete as sprinkle-on or as mortar.

Table 1 shows the technical characteristics of the ten products previously presented:

Table 1. Technical properties of Rinol Rocland concrete surface hardener products

	Qualiroc	Qualidur	Qualidur HP	Qualitop Master	Qualitop Millenium	Qualitop Metal	Qualitop Titanium	Qualitop VRS	Qualitop Master VRS	Empreintes
Compressive strength (EN 13892-2)	≥ 60 N/mm2	≥ 60 N/mm2	≥ 70 N/mm2	≥ 70 N/mm2	≥ 70 N/mm2	≥ 80 N/mm2	≥ 80 N/mm2	≥ 70 N/mm2	≥ 70 N/mm2	≥ 60 N/mm2
Flexural strength (EN 13892-2)	≥ 7 N/mm2	≥ 7 N/mm2 - EN 13892-2	≥ 10 N/mm2	≥ 10 N/mm2	≥ 10 N/mm2	≥ 10 N/mm2	≥ 10 N/mm2	≥ 10 N/mm2	≥ 10 N/mm2	≥ 7 N/mm2
Abrasion resistance (EN 13892-3)	< 9 cm3/ 50 cm2	< 6 cm3/ 50 cm2	< 3 cm3/ 50 cm2	< 6 cm3/ 50 cm2	< 1,5 cm3/ 50 cm2	< 3 cm3/ 50 cm2	< 3 cm3/ 50 cm2	< 3 cm3/ 50 cm2	< 6 cm3/ 50 cm2	< 9 cm3/ 50 cm2
Abrasion resistance (EN 13892-4)	in accordance withBS 8204 'AR2'	in accordance withBS 8204 'AR2'	in accordance withBS 8204 'AR1'	in accordance withBS 8204 'AR1'	in accordance withBS 8204 'AR0,5'	in accordance withBS 8204 'AR0,5'	in accordance withBS 8204 'AR0,5'	in accordance withBS 8204 'AR1'	in accordance withBS 8204 'AR1'	in accordance withBS 8204 'AR2'
Abrasion resistance TABER	3,00 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	3,00 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	1,5 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	1,50 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	2,00 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	2,00 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	0,85 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	1,50 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	1,50 gr (H-22/1000 ciclos/1000 gr ASTM C-501)	3 gr (H-22/1000 ciclos/1000 gr ASTM C-501)
LEED - VOC emission (VOC limited up to 100 g/l)	2gr/l	2gr/l	2gr/l	2gr/l	2gr/l	2gr/l	2gr/l	2gr/l	2gr/l	2gr/l

UN CPC Code: 375, belonging to the *concrete and concrete elements* group.

LCA information

Functional unit: The functional unit defines the way in which the functions identified by the performance characteristics (capability) of the product are quantified. This is a reference by which material flows, Life Cycle Analysis (LCA) results and any other information are normalized. This allows for the comparison with any other product system that has been evaluated with the same functional unit.

According to EN 15804:A2 standards, in the case of a construction product, the following must be specified: the application of the product, the magnitude (quantity) of reference, the key properties quantified under the defined conditions, and a specified period of time.

In this case, the manufacturing, distribution, installation, use and end of life of **one ton (1 tn)** of concrete surface hardening product for 50 years has been chosen as the functional unit.

As established previously in the description, the studied products are used to increase ground resistance by applying them on the concrete surface, for which reason the functional unit of one ton of Rinol products is not exhaustively equivalent to that of one ton of concrete, for which the functional unit of one ton is widely used according to the PCR and corresponding c-PCR. In this sense, to support the choice of this functional unit and provide more information on the use and function of the products target of this EPD, a table (Annex) has been prepared to provide clarifications on their performance.

Reference service life (RSL): the RSL of the product is considered to be 50 years, same as the infrastructure where it is used.

Temporal and geographical representativeness: Primary data including the consumption of raw materials and energy, the transport distances and the generation of waste come from the factory located in Toledo, Spain in the year 2020, being representative for the products studied and the production process.

This document will be used for B2B communication, with a global scope.

Data quality requirements:
Specific data has been taken regarding the amounts of materials and energy used during the life cycle of the product. These data have been provided by Rinol Rocland R&T, S.A., referring to the year 2020, and come directly from factory data. The results presented in this document are valid for the EPD® until there are no substantial modifications that affect the impact produced. Substantial modifications are considered to be any increase of over 10% in the environmental impact per functional unit.

Generic data has been taken on the impact per unit of materials or energy. These data have been obtained from the Ecoinvent Life Cycle Analysis database, of recognized international prestige, in its version 3.6. Said database has been selected as the reference database because it coincides with the input flows of matter and energy on the following aspects:

- Technological equivalence: the data derives from the same physical and chemical processes, or at least the same technological coverage.
- Limits towards nature: the data contains all the quantitative information necessary for the EPD®.

- Limits towards technical systems: the considered stages of the life cycle are equivalent.

The treatment and processing of the data has been carried out according to the international standards ISO 14025, ISOs 14040 and 14044 for the preparation of life cycle analysis and inventories, selecting the characterization factors established in the UNE 15804:2012 + A2:2019.

Database and LCA software used: The Simapro 9.2 calculation software and the Ecoinvent 3.6 database were used for the development of this study.

Description of system limits: The presented EPD® is structured by the stages of the life cycle established according to the reference standard PCR: Construction products and construction services, based on UNE-EN 15804 regulations. This EPD® is from cradle to grave with module D (A+B+C+D).

The life cycle stages analyzed are described below:

- PRODUCT STAGE A1-A3

The product stage is made up of the stages of supply of raw materials (A1), transport of raw materials (A2) and manufacturing (A3). As permitted by UNE-EN 15804 regulations, the results of stages A1-A3 have been grouped into a single product stage (A).

- A1-Supply of raw materials

This module takes into account the extraction and processing of raw materials and the energy that is produced prior to the manufacturing process under study.

These materials are mainly cement, aggregates, additives and pigments. It should be noted that the pigments and some additive components (such as corundum and metal grits) are of certified post-consumer recycled origin.

- A2-Transportation of raw materials

This module includes the transport of the different raw materials from the providers to the factory where the final product is made in Seseña Nuevo (Toledo). The distances and type of specific vehicle for each material have been introduced.

- A3-Manufacturing

This module includes the consumption of energy and packaging materials used during the manufacturing process. At the same time, factory emissions not originating from the combustion of fossil fuels are analysed, as well as the transport and management of waste originating from the factory.

The manufacturing process consists of 8 stages that are described below (Fig. 1 and 2):

1) Dosing of aggregates from silos to hoppers or Big-bags to hoppers.
2) Weighing of the aggregates and dumping to mixer.
3) Elevation belt to mixer.
4) Weighing of cement and dumping to mixer.
5) Mixed.
6) Bagged.
7) Palletized.
8) Dosage of additives.

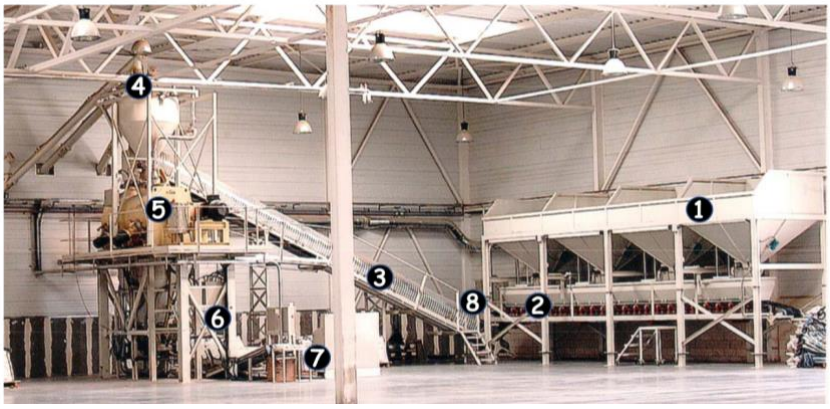


Figure 1. Consequence of production process in the manufacturing plant

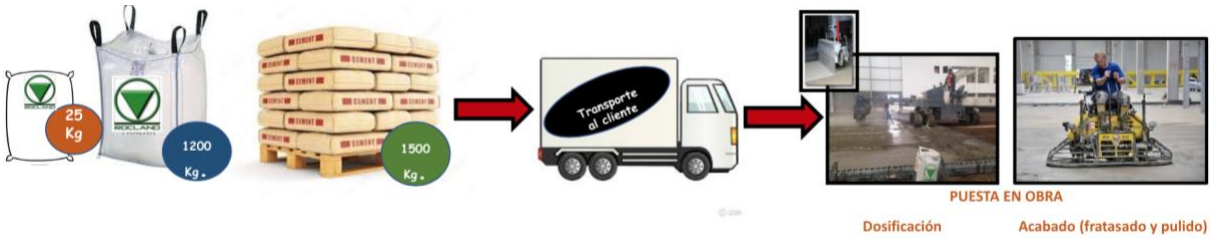


Figure 2. Summary of product stages until installation stage

- CONSTRUCTION STAGE A4-A5

The Construction Process stage is made up of modules A4 Transportation and A5 Construction-Installation Process.

The processes and scenarios presented are currently in use and are representative of one of the most likely alternatives.

- A4-Transportation

The A4 Transport module includes the transport of the finished product from the factory gate to the distributor. The main parameters that affect the result of this stage are described below.

Parameter	Value/ Description by Functional Unit
Vehicle type and fuel consumption, type of vehicles used for transportation	EURO6 truck 16-32 tn – Diesel consumption 31,1 L/100 Km Transoceanic Ship
Distance	250 km by truck 9.000km by ship
Capacity utilization (including empty return trip)	100% (round trip)
Apparent density of transported product	2.300-2.800 kg/m3 (depending on the aggregate mix of each product reference)
Useful Capacity Factor	1

Table 2. Specifications of transport to client.

The mileage assignment has been based on the sales made during the year studied (average values).

- A5-Construction-installation process

Module A5 Construction and Installation Process includes all the materials and energy used for the installation. At the same time, the transport and management of packaging waste is taken into account.

The application of the product must be done on a fresh layer of concrete. There are three application scenarios: by manual and/or mechanical sprinkling (dry-shaking and/or mechanical spreader) and by incorporated mortar ("fresh-on-fresh" topping). This EPD considers the scenario with the greatest potential impact – by incorporated mortar.

After spreading the product, a "helicopter" operation takes place to smooth out the surface with the help of trowels or polishers or mosquito machine.

Parameter	Value/ Description by Functional Unit	
	1st step – wet application	2nd step – straightening
Auxiliary materials for installation	Mixing	Trowels/ polishers/ mosquitoes
Use of water	160 liters	None
Use of other resources	Gasoline	Gasoline
Quantitative description of the type of energy (regional mix) and consumption during the installation process	Gasoline: 0,128 l	Petrol: 4,2 l
Direct emissions to air, water and land	Emission from burning fuel. Assignation based on database Ecoinvent 3.6	
Waste materials on site, before waste processing, generated by the installation of the product; specified by type	Negligible	
Outflow of materials (specified by type) resulting from the processing of waste on the construction site, for example, during collection for recycling, energy recovery (valorization) or dumping (specifying the route)	Product packaging waste is 100% collected and sent to landfill	

Table 3. Specifications of the most common installation scenario.

- USE STAGE B1-B7

The phases that involve the direct use of the product (B1) and the use of energy in service (B6 and B7) have a value of 0, as it is a passive material in construction.

The technical properties of the product (hardness, resistance to scratches, abrasion or stains,...) make repairation, replacement or rehabilitation unnecessary, so phases B2 to B5 also have a value of 0.

- END OF LIFE STAGE C1-C4

The processes and scenarios presented are currently in use and are representative of one of the most likely alternatives.

- C1-Deconstruction/Demolition

Deconstruction and/or dismantling of the surface hardening layer is considered to be part of the demolition of the entire building. As a consequence, its proportional environmental impact is very small and considered negligible.

- C2-Transport

Transport of waste generated at the end of life from the construction work to the waste manager. A local manager is considered to be within a 50 km radius. The specifications of the transport vehicle in this case maintain the same data as that previously declared in step A4.

- C3-Waste treatment

Recycling and/or reuse of end-of-life materials, if any. In this case, it is considered that there is no recycling or reuse at the end of the product's life, since in the demolition of buildings a selective separation of materials is not carried out in the vast majority of cases.

- C4-Waste deposition

Elimination of waste generated during the end of the product's life. As an inert product, it will be sent to the landfill along with other demolition waste.

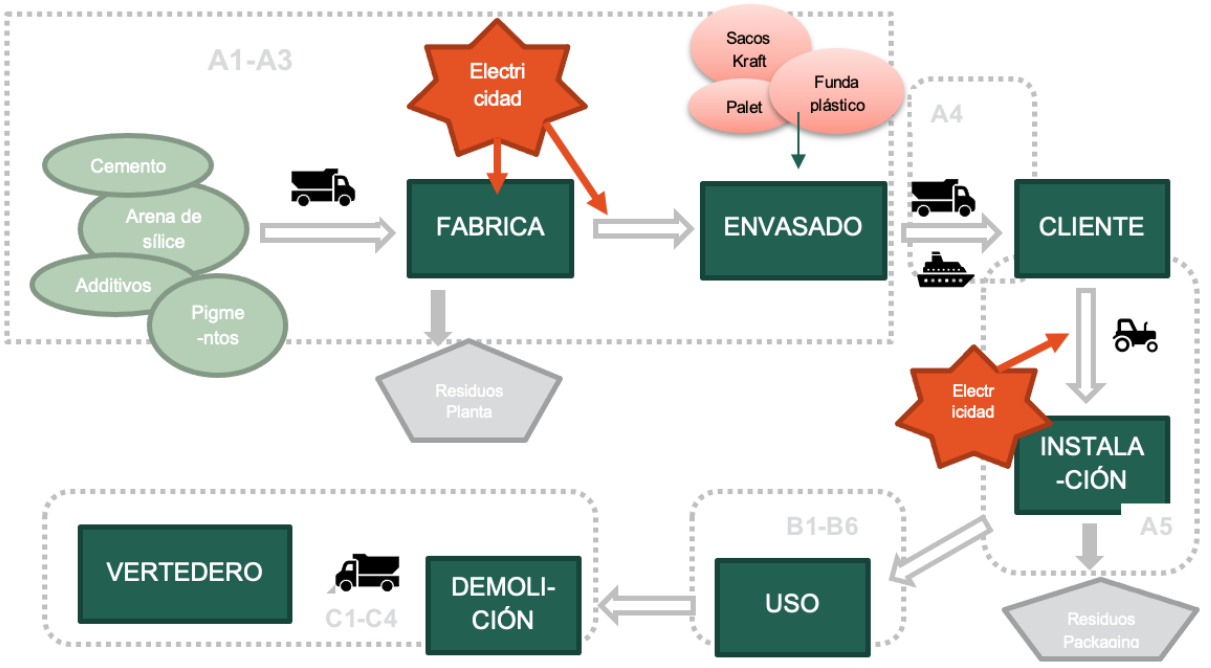
Module	Parameter	Unit (expressed per functional unit)	Value
C1 Deconstruction	Process of collection specified by type	Kg collected in a separate	0
		Kg collected mixed with waste from construction	1 tn
C2 Transportation	Type and fuel consumption of the vehicle, type of vehicles u sed for the transport	Truck of transport > 32 t EURO 5	Diesel consumption: 0,0165 kg/ tkm
	Distance	km	50
	Use of the capacity (including the ret urn in vacuum)	%	100% volume (round trip)
	Apparent density of transporte d products	Kg / m3	2.500 (average value)
	Useful capacity factor		1
C3 Waste treatment	System recovery specified by type	Kg for reuse	0
		Kg for reuse	0
		Kg for energy recovery	0
		Kg for energy recovery	0
C4 Disposal	Disposal specified by type	Kg of product for final disposal	1

Table 4. End of Life Stage Specifications

- MODULE D REUSE, RECOVERY AND RECYCLING POTENTIAL

Module D calculates the potential benefits of recycling and/or reusing materials. This product does not claim environmental benefits due to recycling and/or reuse.

System diagram:



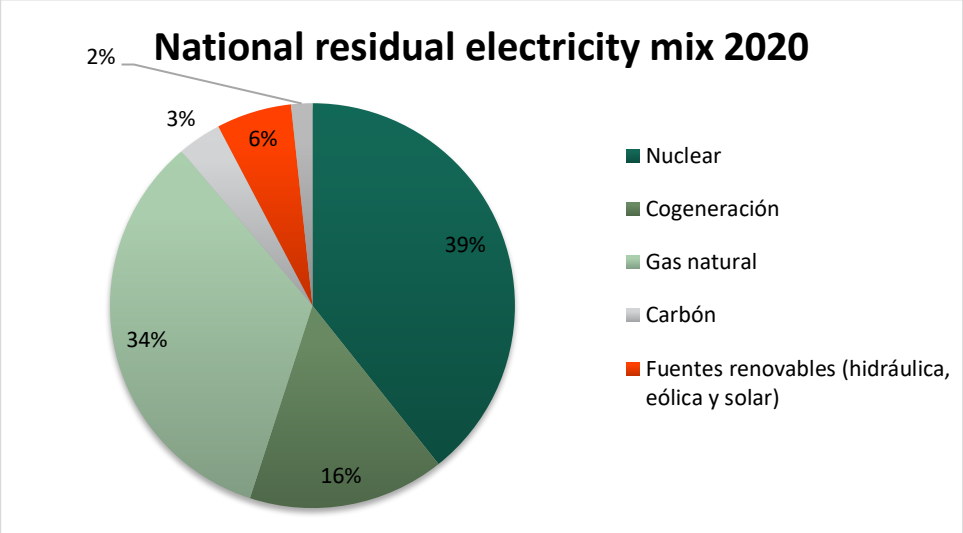
More information: www.rocland.eu

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product Stage			Construction stage		Use stage							End-of-life stage				Benefits
	Raw materials	Transport	Manufacturing	Transport	Raw materials	Transport	Manufacturing	Transport	Raw materials	Transport	Manufacturing	Transport	Raw materials	Transport	Manufacturing	Transport	Reutilization, recuperation and recycle potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Declared modules	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	EU	EU	ES	GLO	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL	LOCAL
Specific data	> 95% GWP-GHG			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Product variation	Less than 10% for each product group			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Site variation	Manufactured in one place			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Additional information

- Technical support for the implementation of the EPD: Marcel Gómez Consultoría Ambiental.
- The electricity mix used in the manufacturing plant is an adaptation for the 2020 residual national mix of Spain. The energy sources in the electricity mix are the following: nuclear (39,3%), cogeneration (15,7%), natural gas (33,8%), coal (3,5%), renewable sources-hydraulic, wind and solar (6%) and others (1,7%) [1]. 1 KWh = 3,79E-01 Kg CO2-eq.



- Cut-off rules and considerations:
  - 95% of all the mass and energy inputs and outputs of the central system have been included, identified in the life cycle inventory included in this report and at least 99% for the total life cycle.
  - The principle of modularity has been followed, as well as the polluter-payer principle.
- Allocation processes: Wherever possible, allocation has been avoided, but for energy consumption, waste production and distribution an allocation had to be made based on physical mass considerations.
- Based on the system boundaries indicated in the reference regulation PCR Construction products and construction services, the following processes have not been taken into account:
  - The manufacture of capital goods with an expected life of more than three years, buildings and other capital assets.
  - Maintenance activities of the production plant.
  - Research and development activities.
  - Transportation of personnel on the home-factory-home route.
  - Long-term emissions.
- The scenarios included are currently in use and are representative of one of the most likely alternatives for the product under review.
- Since 2021, the Rinol production center incorporates solar panels. This EPD does not take this activity into account, since the data used is from 2020.

[1]Source: Generic retailer mix defined by the National Commission for Markets and Competition (CNMC) in 2020.

Content information

Rinol concrete hardener products have a variable composition range. This table indicates the information on the content variation of the product references studied:

Raw material	Percentage, %	Post-consumer material, weight-%	Renewable material, weight-%
Cement	29,3%-39,2%	-	-
Aggregates	0%-70%	-	-
additives	12,2%-60,9%	≥ 96,5%	-
pigments	≤ 2,34%	100%	-
TOTAL	100%	-	-
Packaging Materials	**Weight, kg**	**Weight-% (versus product)**	**Post-consumer material, weight-%**
Kraft paper (bags)	3,20	0,32%	-
Polypropylene (Big bag)	1,58	0,16%	-
Wooden pallet	14,67	1,47%	60%
TOTAL	19,45		

The products studied do not include during their life cycle any dangerous substance included in the list of “Substances of Very High Concern” for Authorization (SVHC) in a percentage greater than 0,1% of the weight of the product.

Environmental information

Below are the results of the potential environmental impacts of the products under review grouped in groups with a variation of less than 10%, of ascending magnitude. These values shown are the average per group.

Group 1

These results are valid for the following products: Qualiroc, Qualidur and Empreintes (without and with pigments)

Potential environmental impact: mandatory indicators according to EN 15804

Estimated impact results are only relative statements that do not indicate impact category endpoints, exceeding threshold values, safety margins, or risks.

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	2,66E+02	3,63E+01	1,41E+01	0	0	0	0	0	0	0	0	6,97E-02	0	2,52E+00	0
GWP-fossil	kg CO_2 eq.	1,90E-01	2,41E-03	6,57E-04	0	0	0	0	0	0	0	0	4,83E-06	0	3,48E-04	0
GWP-biogenic	kg CO_2 eq.	9,07E-02	3,42E-04	2,84E-04	0	0	0	0	0	0	0	0	8,97E-07	0	6,16E-05	0
GWP-luluc	kg CO_2 eq.	2,66E+02	3,63E+01	1,41E+01	0	0	0	0	0	0	0	0	6,97E-02	0	2,52E+00	0
ODP	kg CFC 11 eq.	1,82E-05	7,86E-06	1,06E-07	0	0	0	0	0	0	0	0	1,63E-08	0	5,27E-07	0
AP	mole H^+ eq.	8,56E-01	8,60E-01	1,38E-01	0	0	0	0	0	0	0	0	1,50E-04	0	2,60E-02	0
EP-freshwater	kg PO_4^{3-}-eq.	9,69E-02	7,55E-02	2,15E-02	0	0	0	0	0	0	0	0	1,48E-05	0	3,99E-03	0
EP-freshwater	kg P eq	3,60E-03	2,51E-05	1,65E-05	0	0	0	0	0	0	0	0	1,71E-07	0	9,20E-06	0
EP-marine	kg N eq.	2,23E-01	2,14E-01	6,30E-02	0	0	0	0	0	0	0	0	2,49E-05	0	1,13E-02	0
EP-terrestrial	mole Neq.	2,55E+00	2,38E+00	6,91E-01	0	0	0	0	0	0	0	0	2,77E-04	0	1,24E-01	0
POCP	kg NMVOC eq.	6,80E-01	6,09E-01	1,88E-01	0	0	0	0	0	0	0	0	9,62E-05	0	3,45E-02	0
ADP-minerals&metals*	kg Sb eq.	5,92E-05	1,63E-06	6,94E-06	0	0	0	0	0	0	0	0	2,20E-08	0	1,05E-06	0
ADP-fossil*	MJ	1,85E+03	4,81E+02	1,77E+02	0	0	0	0	0	0	0	0	1,02E+00	0	3,36E+01	0
WDP*	m3 -	2,89E+01	-1,10E-01	6,71E+00	0	0	0	0	0	0	0	0	3,37E-04	0	1,16E-02	0
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** 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.*

Potential environmental impact: additional mandatory and voluntary indicators

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[2]	kg CO_2 eq.	2,64E+02	3,61E+01	1,39E+01	0	0	0	0	0	0	0	0	6,93E-02	0	2,47E+00	0

Use of resources

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	6,21E+02	6,52E-01	4,55E-01	0	0	0	0	0	0	0	0	1,24E-03	0	1,27E-01	0
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	6,21E+02	6,52E-01	4,55E-01	0	0	0	0	0	0	0	0	1,24E-03	0	1,27E-01	0
PENRE	MJ	1,95E+03	9,94E-01	1,62E+00	0	0	0	0	0	0	0	0	1,62E-03	0	1,60E-01	0
PENRM	MJ.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	1,95E+03	9,94E-01	1,62E+00	0	0	0	0	0	0	0	0	1,62E-03	0	1,60E-01	0
SM	kg	4,12E+01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3 -	0	0	1,60E-01	0	0	0	0	0	0	0	0	0	0	0	0
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

[2] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	2,21E-03	6,42E-04	1,23E-05	0	0	0	0	0	0	0	0	2,74E-06	0	8,46E-05	0
Non-hazardous waste disposed	kg	1,31E+00	2,23E-02	5,45E+00	0	0	0	0	0	0	0	0	2,62E-04	0	9,99E+02	0
Radioactive waste disposed	kg	1,03E-02	3,48E-03	3,89E-05	0	0	0	0	0	0	0	0	7,21E-06	0	2,33E-04	0

Output flows

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	8,80E+00	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Results per Functional Unit		
BIOGENIC CARBON CONTENT	**Unit**	**AMOUNT**
Biogenic carbon content in the product	kgC	0
Biogenic carbon content in the packaging	kgC	8,93E+00

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO2

Group 2

These results are valid for the following products: Qualitop Master and Qualitop Master VRS (without and with pigments)

Potential environmental impact: mandatory indicators according to EN 15804

Estimated impact results are only relative statements that do not indicate impact category endpoints, exceeding threshold values, safety margins, or risks.

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	7,87E+02	3,63E+01	1,41E+01	0	0	0	0	0	0	0	0	6,97E-02	0	2,52E+00	0
GWP-fossil	kg CO_2 eq.	1,13E+00	2,41E-03	6,57E-04	0	0	0	0	0	0	0	0	4,83E-06	0	3,48E-04	0
GWP-biogenic	kg CO_2 eq.	6,89E-01	3,42E-04	2,84E-04	0	0	0	0	0	0	0	0	8,97E-07	0	6,16E-05	0
GWP-luluc	kg CO_2 eq.	7,89E+02	3,63E+01	1,41E+01	0	0	0	0	0	0	0	0	6,97E-02	0	2,52E+00	0
ODP	kg CFC 11 eq.	7,13E-05	7,86E-06	1,06E-07	0	0	0	0	0	0	0	0	1,63E-08	0	5,27E-07	0
AP	mole H^+ eq.	3,62E+00	8,60E-01	1,38E-01	0	0	0	0	0	0	0	0	1,50E-04	0	2,60E-02	0
EP-freshwater	kg PO_4^{3-} eq.	3,22E-01	7,55E-02	2,15E-02	0	0	0	0	0	0	0	0	1,48E-05	0	3,99E-03	0
EP-freshwater	kg P eq	2,13E-02	2,51E-05	1,65E-05	0	0	0	0	0	0	0	0	1,71E-07	0	9,20E-06	0
EP-marine	kg N eq.	6,25E-01	2,14E-01	6,30E-02	0	0	0	0	0	0	0	0	2,49E-05	0	1,13E-02	0
EP-terrestrial	mole Neq.	7,25E+00	2,38E+00	6,91E-01	0	0	0	0	0	0	0	0	2,77E-04	0	1,24E-01	0
POCP	kg NMVOC eq.	1,95E+00	6,09E-01	1,88E-01	0	0	0	0	0	0	0	0	9,62E-05	0	3,45E-02	0
ADP-minerals&metals*	kg Sb eq.	5,25E-03	1,63E-06	6,94E-06	0	0	0	0	0	0	0	0	2,20E-08	0	1,05E-06	0
ADP-fossil*	MJ	8,47E+03	4,81E+02	1,77E+02	0	0	0	0	0	0	0	0	1,02E+00	0	3,36E+01	0
WDP*	m3 -	1,10E+02	-1,10E-01	6,71E+00	0	0	0	0	0	0	0	0	3,37E-04	0	1,16E-02	0
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** Disclaimer: The results of this environmental impact indicator should be used with caution as uncertainties in these results are high or experience with the indicator is limited.*

Potential environmental impact: additional mandatory and voluntary indicators

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[3]	kg CO_2 eq.	7,72E+02	3,61E+01	1,39E+01	0	0	0	0	0	0	0	0	6,93E-02	0	2,47E+00	0

Use of resources

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,07E+03	6,52E-01	4,55E-01	0	0	0	0	0	0	0	0	1,24E-03	0	1,27E-01	0
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	1,07E+03	6,52E-01	4,55E-01	0	0	0	0	0	0	0	0	1,24E-03	0	1,27E-01	0
PENRE	MJ	9,00E+03	5,11E+02	1,88E+02	0	0	0	0	0	0	0	0	1,08E+00	0	3,57E+01	0
PENRM	MJ.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	9,00E+03	5,11E+02	1,88E+02	0	0	0	0	0	0	0	0	1,08E+00	0	3,57E+01	0
SM	kg	2,60E+02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3 –	0	0	1,60E-01	0	0	0	0	0	0	0	0	0	0	0	0
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

[3] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	5,14E-03	6,42E-04	1,23E-05	0	0	0	0	0	0	0	0	2,74E-06	0	8,46E-05	0
Non-hazardous waste disposed	kg	4,26E+01	2,23E-02	5,45E+00	0	0	0	0	0	0	0	0	2,62E-04	0	9,99E+02	0
Radioactive waste disposed	kg	3,75E-02	3,48E-03	3,89E-05	0	0	0	0	0	0	0	0	7,21E-06	0	2,33E-04	0

Output flows

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	8,80E+00	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Results per Functional Unit		
BIOGENIC CARBON CONTENT	**Unit**	**AMOUNT**
Biogenic carbon content in the product	kgC	0
Biogenic carbon content in the packaging	kgC	8,93E+00

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO2

Group 3

These results are valid for the following products: Qualidur HP, Qualitop Titanium and Qualitop VRS (without and with pigments)

Potential environmental impact: mandatory indicators according to EN 15804

Estimated impact results are only relative statements that do not indicate impact category endpoints, exceeding threshold values, safety margins, or risks.

Results per Functional Unit

Indicator	Unit	Total A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1,72E+03	3,63E+01	1,41E+01	0	0	0	0	0	0	0	0	6,97E-02	0	2,52E+00	0
GWP-fossil	kg CO_2 eq.	4,61E+00	2,41E-03	6,57E-04	0	0	0	0	0	0	0	0	4,83E-06	0	3,48E-04	0
GWP-biogenic	kg CO_2 eq.	3,03E+00	3,42E-04	2,84E-04	0	0	0	0	0	0	0	0	8,97E-07	0	6,16E-05	0
GWP-luluc	kg CO_2 eq.	1,72E+03	3,63E+01	1,41E+01	0	0	0	0	0	0	0	0	6,97E-02	0	2,52E+00	0
ODP	kg CFC 11 eq.	1,57E-04	7,86E-06	1,06E-07	0	0	0	0	0	0	0	0	1,63E-08	0	5,27E-07	0
AP	mole H^+ eq.	8,33E+00	8,60E-01	1,38E-01	0	0	0	0	0	0	0	0	1,50E-04	0	2,60E-02	0
EP-freshwater	kg PO_4^{3-} eq.	7,67E-01	7,55E-02	2,15E-02	0	0	0	0	0	0	0	0	1,48E-05	0	3,99E-03	0
EP-freshwater	kg P eq	8,07E-02	2,51E-05	1,65E-05	0	0	0	0	0	0	0	0	1,71E-07	0	9,20E-06	0
EP-marine	kg N eq.	1,31E+00	2,14E-01	6,30E-02	0	0	0	0	0	0	0	0	2,49E-05	0	1,13E-02	0
EP-terrestrial	mole Neq.	1,51E+01	2,38E+00	6,91E-01	0	0	0	0	0	0	0	0	2,77E-04	0	1,24E-01	0
POCP	kg NMVOC eq.	4,97E+00	6,09E-01	1,88E-01	0	0	0	0	0	0	0	0	9,62E-05	0	3,45E-02	0
ADP-minerals&metals*	kg Sb eq.	4,90E-03	1,63E-06	6,94E-06	0	0	0	0	0	0	0	0	2,20E-08	0	1,05E-06	0
ADP-fossil*	MJ	2,33E+04	4,81E+02	1,77E+02	0	0	0	0	0	0	0	0	1,02E+00	0	3,36E+01	0
WDP*	m3 –	2,38E+02	-1,10E-01	6,71E+00	0	0	0	0	0	0	0	0	3,37E-04	0	1,16E-02	0
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** Disclaimer: The results of this environmental impact indicator should be used with caution as uncertainties in these results are high or experience with the indicator is limited.*

Potential environmental impact: additional mandatory and voluntary indicators

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[4]	kg CO_2 eq.	1,67E+03	3,61E+01	1,39E+01	0	0	0	0	0	0	0	0	6,93E-02	0	2,47E+00	0

Use of resources

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,51E +03	6,52E-01	4,55E-01	0	0	0	0	0	0	0	0	1,24E-03	0	1,27E-01	0
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	2,51E+03	6,52E-01	4,55E-01	0	0	0	0	0	0	0	0	1,24E-03	0	1,27E-01	0
PENRE	MJ	2,47E+04	5,11E+02	1,88E+02	0	0	0	0	0	0	0	0	1,08E+00	0	3,57E+01	0
PENRM	MJ.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	2,47E+04	5,11E+02	1,88E+02	0	0	0	0	0	0	0	0	1,08E+00	0	3,57E+01	0
SM	kg	1,48E+02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3 -	0	0	1,60E-01	0	0	0	0	0	0	0	0	0	0	0	0
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

[4] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per Functional Unit															
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,24E-02	6,42E-04	1,23E-05	0	0	0	0	0	0	0	0	2,74E-06	0	8,46E-05	0
Non-hazardous waste disposed	kg	1,70E+02	2,23E-02	5,45E+00	0	0	0	0	0	0	0	0	2,62E-04	0	9,99E+02	0
Radioactive waste disposed	kg	9,66E-02	3,48E-03	3,89E-05	0	0	0	0	0	0	0	0	7,21E-06	0	2,33E-04	0

Output flows

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	8,80E+00	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Results per Functional Unit		
BIOGENIC CARBON CONTENT	**Unit**	**AMOUNT**
Biogenic carbon content in the product	kgC	0
Biogenic carbon content in the packaging	kgC	8,93E+00

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO2

Group 4

These results are valid for the following products: Qualitop Millenium and Qualitop Metal (with and without pigments)

Potential environmental impact: mandatory indicators according to EN 15804

Estimated impact results are only relative statements that do not indicate impact category endpoints, exceeding threshold values, safety margins, or risks.

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	2,23E+03	3,63E+01	1,41E+01	0	0	0	0	0	0	0	0	6,97E-02	0	2,52E+00	0
GWP-fossil	kg CO_2 eq.	7,55E+00	2,41E-03	6,57E-04	0	0	0	0	0	0	0	0	4,83E-06	0	3,48E-04	0
GWP-biogenic	kg CO_2 eq.	4,92E+00	3,42E-04	2,84E-04	0	0	0	0	0	0	0	0	8,97E-07	0	6,16E-05	0
GWP-luluc	kg CO_2 eq.	2,25E+03	3,63E+01	1,41E+01	0	0	0	0	0	0	0	0	6,97E-02	0	2,52E+00	0
ODP	kg CFC 11 eq.	2,06E-04	7,86E-06	1,06E-07	0	0	0	0	0	0	0	0	1,63E-08	0	5,27E-07	0
AP	mole H^+ eq.	1,09E+01	8,60E-01	1,38E-01	0	0	0	0	0	0	0	0	1,50E-04	0	2,60E-02	0
EP-freshwater	kg PO_4^{3-} eq.	1,05E+00	7,55E-02	2,15E-02	0	0	0	0	0	0	0	0	1,48E-05	0	3,99E-03	0
EP-freshwater	kg P eq	1,26E-01	2,51E-05	1,65E-05	0	0	0	0	0	0	0	0	1,71E-07	0	9,20E-06	0
EP-marine	kg N eq.	1,69E+00	2,14E-01	6,30E-02	0	0	0	0	0	0	0	0	2,49E-05	0	1,13E-02	0
EP-terrestrial	mole Neq.	1,94E+01	2,38E+00	6,91E-01	0	0	0	0	0	0	0	0	2,77E-04	0	1,24E-01	0
POCP	kg NMVOC eq.	7,04E+00	6,09E-01	1,88E-01	0	0	0	0	0	0	0	0	9,62E-05	0	3,45E-02	0
ADP-minerals&metals*	kg Sb eq.	6,00E-03	1,63E-06	6,94E-06	0	0	0	0	0	0	0	0	2,20E-08	0	1,05E-06	0
ADP-fossil*	MJ	3,29E+04	4,81E+02	1,77E+02	0	0	0	0	0	0	0	0	1,02E+00	0	3,36E+01	0
WDP*	m3 -	3,36E+02	-1,10E-01	6,71E+00	0	0	0	0	0	0	0	0	3,37E-04	0	1,16E-02	0
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** Disclaimer: The results of this environmental impact indicator should be used with caution as uncertainties in these results are high or experience with the indicator is limited.*

Potential environmental impact: additional mandatory and voluntary indicators

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[5]	kg CO_2 eq.	2,17E+03	3,61E+01	1,39E+01	0	0	0	0	0	0	0	0	6,93E-02	0	2,47E+00	0

Use of resources

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3,59E+03	6,52E-01	4,55E-01	0	0	0	0	0	0	0	0	1,24E-03	0	1,27E-01	0
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	3,59E+03	6,52E-01	4,55E-01	0	0	0	0	0	0	0	0	1,24E-03	0	1,27E-01	0
PENRE	MJ	3,49E+04	5,11E+02	1,88E+02	0	0	0	0	0	0	0	0	1,08E+00	0	3,57E+01	0
PENRM	MJ.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	3,49E+04	5,11E+02	1,88E+02	0	0	0	0	0	0	0	0	1,08E+00	0	3,57E+01	0
SM	kg	4,22E+02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3 -	0	0	1,60E-01	0	0	0	0	0	0	0	0	0	0	0	0
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

[5] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,92E-02	6,42E-04	1,23E-05	0	0	0	0	0	0	0	0	2,74E-06	0	8,46E-05	0
Non-hazardous waste disposed	kg	2,70E+02	2,23E-02	5,45E+00	0	0	0	0	0	0	0	0	2,62E-04	0	9,99E+02	0
Radioactive waste disposed	kg	1,35E-01	3,48E-03	3,89E-05	0	0	0	0	0	0	0	0	7,21E-06	0	2,33E-04	0

Output flows

Results per Functional Unit																
Indicator	**Unit**	**Total A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	8,80E+00	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Results per Functional Unit		
BIOGENIC CARBON CONTENT	**Unit**	**AMOUNT**
Biogenic carbon content in the product	kgC	0
Biogenic carbon content in the packaging	kgC	8,93E+00

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO2

Annex. Performance factor

This table indicates the performance of all Rinol concrete hardening products, in relation to mass per surface unit (kg/m2):

Aplication method	Qualiroc	Qualidur	Qualidur HP	Qualitop Master	Qualitop Millenium	Qualitop Metal	Qualitop Titanium	Qualitop VRS	Qualitop Master VRS	Empreintes
Dry shaking	3-7	3-7	3-7	-	3-7	4-8	4-8	3-7	3-7	3-7
Mechanical spreader	3-7	3-7	3-7	-	3-7	4-8	4-8	3-7	3-7	3-7
Fresh-on-fresh topping*	12	12	12	12	12	15	12	12	12	12

*Paste (grout) making for hydrated layer: 3-3,5 l of water per 25 kg of product.

Information related to the EPD Sector

This EPD® is individual.

References

- General Programme Instructions of the International EPD® System. Version 3.01
- ISO 14020: 2000 Environmental labels and declarations — General principles
- ISO 14025: 2010 Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 14040: 2006 Environmental management — Life cycle assessment — Principles and framework
- ISO 14044: 2006 Environmental management — Life cycle assessment — Requirements and guidelines
- PCR 2019:14 Construction products (EN 15804: A2) version 1.11
- PCR 2019:14 c-PCR-003 Concrete and concrete elements (EN 16757) (2019-12-20)
- PCR 2012:01 Sub-PCR-G Concrete and concrete elements (EN 16757) (2021-11-08)
- UNE-EN 13813:2014 Screeds and Screed floors. Properties and requirements
- UNE-EN 15804:2012 + A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- Marcel Gómez Consultoría Ambiental (2021). Análisis del Ciclo de Vida de Endurecedores Superficiales para Hormigón Rinol. Barcelona

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