BEKRON CEMENTITIOUS ADHESIVES

Environmental Product Declaration

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

Programme:	The International EPD® System EPD registered through the fully aligned regional programme/ hub: Latin American Hub, www.epd-latinamerica.com info@environdec.com
Programme operator:	EPD® Latin America EPD International AB Regional Hub: Latin American Hub of the International EPD® System
EPD registration number:	EPD-IES-0018036
Publication date:	2025-01-09
Valid until:	2030-01-09
Geographical scope:	Chile
This EPD is of the type "EPD of multiple products, based on a product representative from the product group" This EPD covers the following products: Bekron doble acción, Bekron doble acción grueso, Bekron AC polvo gris, Bekron Steel, Bekron AC polvo, Bekron Steel antimicrobial and Bemezcla EIFS.	
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	

Content

1.General Information

Programme information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804:2012+A2:2019/AC:2021 serve as the core Product Category Rules (PCR)

Product category rules (PCR): 2019:14 Construction products. Version 1.3.4 published April 30th, 2024.

PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com 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.

Life Cycle Assessment (LCA)

LCA accountability:	Sanchez Fredd, González Mireya, Center for Life Cycle Assessment and Sustainable Design – CADIS.

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by individual verifier

Third-party verifier:

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Approved by: The International EPD® System

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.

This EPD was prepared in conformity with the international standard ISO 14025 and EN 15804:2012+A2:2012 Sustainability of Construction Works; for the Bekron Cementitious adhesives.

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.

Products information

Product	Bekron Cementitious adhesives
Declaration owner:	Aislantes Nacionales SPA planta Senador Jaime Guzmán 220 Comuna de Quilicura Santiago Chile en Chile https://www.henkel.cl/ Contact person: Massimo Collotta: massimo.collotta@henkel.com
Description of the construction product	Bekron Cementitious adhesives include seven products: Bekron doble acción, Bekron doble acción grueso, Bekron AC polvo gris, Bekron Steel, Bekron AC polvo, Bekron steel antimicrobial y Bemezcla EIFS. The products are used as high-quality adhesives for ceramics, stoneware and porcelain tiles up to 60 x 60 cm.
Declared	1000 kilograms of Cement Adhesive manufactured and packaged during the year 2022 by AISLANTES NACIONALES SPA. at the Senator Jaime Guzmán plant 220 Commune of Quilicura Santiago Chile in Chile.
Construction product identification:	Central Product Classification: 3753 - Articles of plaster or of compositions based on plaster
Main product components:	Cementitious adhesives are manufactured from arids, cement and additives.
Life cycle stages not considered:	The modules: A4, A5, B1, B2, B3, B4, B5, B6, B7.
Statement content:	This environmental product declaration is based on information modules that do not cover aspects of construction stage and use. It contains detailed information on the stage of input materials used for the generation of raw material and central process, modules A1, A2, A3, approximations of scenarios C1, C2, C3, C4 and D based on national statistics. •Definition of the product. • System boundary. •Content declaration. • Environmental performance. •Declared unit. • Evidence and verifications.
Comparability of EPD of construction products:	a. EPD of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019/AC:2021. b. Environmental product declarations within the same product category from different programs may not be comparable
For more information consult:	https://www.henkel.cl/
Site for which this EPD is representative	**Manufacturing Plant:** Senador Jaime Guzmán 220 Comuna de Quilicura Santiago Chile en Chile
Intended Public:	B2B (Business to Business)

2.Aislantes Nacionales SPA

Aislantes Nacionales SPA settled in Chile in 1985. It is a company that was bought by Henkel in 2018 and maintains the original name locally, Through the business sector known globally as "Adhesive Technologies", Aislantes Nacionales SPA has recognized brands such as Agorex, Pritt and Loctite. The company has around 345 employees of 12 different nationalities, distributed in the facilities of Pudahuel, Quilicura and Antofagasta.

Aislantes Nacionales SPA is a company that operates globally with leading innovations, brands and technologies in three business areas: Adhesive Technologies, Beauty Care and Laundry & Home Care. Currently, the Adhesive Technologies unit operates directly in Chile; Therefore, it seeks to ensure that its main products aimed at the construction sector comply with the environmental requirements established in Credit MRc2: Materials and Resources of the LEED (Leadership Energy and Environmental Design) Building Certification Program.

3.The product

Bekron cementitious adhesives, manufactured in accordance with the UNE-EN 12004 standard, stand out for their flexibility and high quality, ideal for the installation of ceramic, porcelain and stone tiles on walls and floors. This Environmental Product Declaration (EPD) covers several products in the Bekron line, including Bekron Doble Acción, Bekron Doble Acción Grueso, Bekron AC Polvo Gris, Bekron Steel, Bekron AC Polvo, Bekron Steel Antimicrobial and Bemezcla EIFS. The results of this EPD are based on the performance of the most representative product in the family, Bekron Doble Acción, which constitutes 65% of the total volume of products analysed (see table 1). Therefore, this EPD is applicable to all the products mentioned, guaranteeing their validity in different applications.

Table 1. Percentage variation of the product family

N°	Product	Contribution to the product category (%)
1	Bekron Doble Acción	65%
2	Bekron Doble Acción Grueso	15%
3	Bekron AC Polvo	5%
4	Bekron AC Polvo Gris	9.5%
5	Bekron Steel	1.7%
6	Bekron Steel Antimicrobial	0.7%
7	Bemezcla EIFS	2.7%

3.1. Bekron Doble Acción

Dual action floor and wall adhesive; more adhesion and more flexibility. It has a coefficient of flexibility, cohesion and contact adhesion much higher than that of ordinary adhesives. It has been formulated for the installation of medium-sized porcelain and large-format ceramic tiles. It allows you to work directly on very smooth surfaces, such as concrete or old floors, and on heated slabs or those subjects to vibrate.

The characteristics of Bekron Doble Acción produced by Aislantes Nacionales SPA are provided in the next table:

Technical characteristics	
Appearance	Gray Powder
Work temperature	From 5° to 23°C
Work time once kneaded	4 hours
Kneading water	0.20 to 0.22 liters of water per every kilogram
Open time	15 minutes at 20°C
Minimal thickness	2mm
Maximum thickness	5mm
Waiting time before of forging stones	3 days
Walkable on planks	After 24 hours
Passable without limits	5 days
Temperature resistance	-20° to 80°C
Yields*	1.6 kg/m2 for each mm of thickness

3.2. Bekron Doble Acción Grueso

Dual-action cementitious adhesive mortar, reinforced with polymers that ensure greater adhesion and flexibility. Its sand has a grain size for thick thicknesses up to 25mm. Firmly adheres ceramic and porcelain tiles to floors, radiators and unevenly leveled concrete slabs.

The characteristics of Bekron Doble Acción Grueso produced by Aislantes Nacionales SPA are provided in the next table:

Technical characteristics	
Appearance	Gray Powder
Work temperature	From 5° to 23°C
Work time once kneaded	2 hours
Kneading water	0.16 to 0.18 liters of water per every kilogram
Open time	15 minutes at 20°C
Minimal thickness	5mm
Maximum thickness	25mm
Waiting time before of forging stones	3 days
Walkable on planks	After 48 hours
Passable without limits	5 days
Temperature resistance	-20° to 80°C
Yields*	15 liters per bag approx.

3.3. Bekron AC Polvo Gris

Strong initial adhesion adhesive specially developed for installing ceramic tiles on flexible vertical surfaces indoors and outdoors. It can be applied on plasterboard partition walls, fiber cement, stuccoed masonry, cellular concrete, etc.

The characteristics of Bekron AC Polvo Gris produced by Aislantes Nacionales SPA are provided in the next table:

Technical characteristics	
Appearance	Gray
Work temperature	From 5° to 23°C
Work time once kneaded	2 hours
Kneading water	0.28 to 0.30 liters of water per every kilogram
Open time	20 minutes at 20°C
Minimal thickness	3mm
Maximum thickness	10mm

Waiting time before of forging stones	72 hours
Yields*	1.6 kg/m2 for each mm of thickness

3.4. Bekron Steel

Adhesive mortar based on organic resins, which combine maximum deformability with excellent adhesion. Absorbs the stresses caused by the shrinkage or work of materials such as new concrete, cellular concrete, fiber cement partitions and plasterboard. Provides high levels of adhesion for large format porcelain and ceramic tiles, marble and natural stones. Its consistency has been specially formulated to facilitate application. It can be used indoors and outdoors.

The characteristics of Bekron Steel produced by Aislantes Nacionales SPA are provided in the next table:

Technical characteristics	
Appearance	Gray Powder
Work temperature	From 5° to 23°C
Work time once kneaded	4 hours
Kneading water	0.27 to 0.28 liters of water per every kilogram
Open time	20 minutes at 20°C
Minimal thickness	3mm
Maximum thickness	12mm
Waiting time before of forging stones	72 hours
Temperature resistance	-20° to 80°C
Yields*	1.6 kg/m2 for each mm of thickness

3.5. Bekron AC Polvo

Strong initial adhesion adhesive specially developed for installing ceramic tiles on flexible vertical surfaces indoors and outdoors. It can be applied on plasterboard partition walls, fiber cement, stuccoed masonry, cellular concrete, etc. It can also be used on rigid walls (concrete). It dries faster than paste adhesives.

The characteristics of Bekron AC Polvo produced by Aislantes Nacionales SPA are provided in the next table:

Technical characteristics	
Appearance	Winter white
Work temperature	From 5° to 23°C
Work time once kneaded	2 hours
Kneading water	0.28 to 0.30 liters of water per every kilogram
Open time	20 minutes at 20°C
Minimal thickness	3mm
Maximum thickness	10mm
Waiting time before of forging stones	72 hours
Yields*	1.6 kg/m2 for each mm of thickness

3.6. Bekron Steel Antimicrobial

Adhesive mortar based on organic resins that combine maximum deformability with excellent adhesion. Absorb stresses caused by the shrinkage or working of materials such as new concrete, heated floors and pre- and post-tensioned slabs subject to vibration. Its formula incorporates additives that optimize the rheology of the product (excellent applicability) and ensure rapid setting. Provides high levels of adhesion for large format porcelain and ceramic tiles, marble and natural stones. Its consistency has been specially formulated to facilitate application. It can be used indoors and outdoors.

The characteristics of Bekron Steel Antimicrobial produced by Aislantes Nacionales SPA are provided in the next table:

Technical characteristics	
Appearance	Gray Powder
Work temperature	From 5° to 23°C
Work time once kneaded	2 hours
Kneading water	0.27 to 0.28 liters of water per every kilogram
Open time	20 minutes at 20°C
Minimal thickness	3mm
Maximum thickness	12mm
Waiting time before of forging stones	24 hours
Walkable on planks	After 12 hours
Passable without limits	24 hours
Temperature resistance	-20° to 80°C
Yields*	1.6 kg/m2 for each mm of thickness

3.7. Bemezcla EIFS

Modified cement matrix mortar, flexible and waterproof resin and fiber, specially formulated to adhere expanded polystyrene insulation externally to the perimeter walls of the building and cover the insulation, providing a base on which to apply the final exterior coating.

The characteristics of Bemezcla EIFS produced by Aislantes Nacionales SPA are provided in the next table:

Technical characteristics	
Work temperature	From 5° to 23°C
Kneading water	0.23 to 0.25 liters of water per every kilogram
Minimal thickness	2mm
Maximum thickness	5mm
Waiting time before of forging stones	2 hours
Classification NCh 382	This product can be transported by any means, since it is classified as non-hazardous
Yields*	1.20 kg/m2 for each mm of thickness

4. Content declaration

The majority of the composition of these materials is made up of aggregates and cements, while the remainder is made up of additives and admixtures. Since almost all of the materials included in this EPD are made with these components, the material content of the most representative product of the Bekron family of cementitious adhesives is presented in Tables 2 and 3, respectively.

Table 2. Typical content in Bekron cementitious adhesives

Product components	Representative producto, weight (kg)	Weight variation (kg)*	Postconsumer Recycled material (%)	Biogenic content (kg)
Cement	240	(-60.1) - (+109.5)	0.00%	0.00
Arids	739.6	(-381.1) - (+60.7)	0.00%	0.00
Additive	20.4	(-0.6) - (+371)	0.00%	0.00
TOTAL	1000	-	0%	0.00
Packaaging materials	**Weight (kg)**	**Weight-% (versus the product)**		**Biogenic content (kg C/product)**
Kraft paper	2.9	0.29%		0.39
Packaging film	0.2	0.02%		0
TOTAL	3.1	0.31%		0.39

*Range of variation due to mass difference of each material of the products included in the EPD with respect to the representative product according to section 2.2.2.1 of the PCR.

Table 3. Typical content in producto Bekron Doble Accion

Homogeneous Material or Chemical Substance	Weight (%)	Chemical Substances	CAS Number	Health class[1]
Cement	24%	Calcium oxide, silicon oxide, aluminum oxide, iron oxide	65997-15-1	EC/List no.:266-043-4
Arid	73.96%	Minerals	14808-60-7	Unlisted
Additive	0.19%	Hydroxyethyl methyl cellulose	9032-42-2	EC/List no.:618-528-0
	1.85%	Polymer powder	-	-

[1]According to EN15804 declaration of material content of the product shall List of Substances of Very High Concern (SVHC) that are listed by European Chemicals Agency.

5. Distribution packaging

The packaging material for cementitious adhesives consists of sacks made of Valve Sealed Bottom Bonded together with flexible laminated film.

6. Biogenic Carbon Content Information

Biogenic carbon from packaging and products was excluded from the system, since by mass it represents less than 5% (“2019:14 Construction products, Version 1.3.4”).

7. LCA Rules

Environmental potential impacts were calculated in accordance with EN 15804:2012+A2:2019/AC:2021 sustainability of construction works and PCR 2019:14 Construction products Version 1.3.4. This EPD is in accordance with ISO 14025:2006.

Environmental potential impacts were calculated through Life Cycle Assessment (LCA) methodology conformity to ISO 14040:2006 and ISO 14044:2006. An external third-party verification process of the EPD was conducted according to General Programme Instructions from the International EPD® System Version 4.0. Verification includes a documental review and a validation of both the underlying LCA study and documents describing additional environmental information that justify data provided in the EPD.

7.1. Declared unit

1000 kilograms of Bekron Cement Adhesive manufactured and packaged during the year 2022 by AISLANTES NACIONALES SPA. at the Senator Jaime Guzmán plant 220 Commune of Quilicura Santiago Chile in Chile.

7.2. System boundary

The potential environmental impacts were calculated using the Life Cycle Analysis (LCA) methodology for Bekron cementitious adhesives according to ISO 14040:2006 and ISO 14044:2006.

According to EN 15804 section 5.2 the next type of EPD is "cradle to gate" with modules C1-C4 and module D (A1-A3 +C+D). This EPD is based on information from previous processes and central processes, modules A1 to A3, and approximations of scenarios C1, C2, C3, C4 and D based on statistics from the construction sector in Chile (see table 4).

It does not include Construction stage A4-A5 and Use stage B

Table 4. System boundary of Bekron cementitious adhesives

Life cycle stage	Information about the modules contained in the stages	EPD			
		Cradle-to-gate with modules C1-C4 and module D	Cradle-to-gate with modules C1-C4, module D and optional modules	From cradle to grave and module D	EPD construction services: Cradle to door with modules A1-A5 and optional modules
A1-A3 products stage	A1) Raw material procurement	Mandatory	Mandatory	Mandatory	Mandatory
	A2) Transport				
	A3) Manufacture				
A4-A5 Construction stage	A4) Transport	-	Optional for goods Required for services	Mandatory	Mandatory
	A5) Construction / installation				
B Usage stage	B1) Use	-	Optional	Mandatory	Mandatory
	B2) Maintenance				
	B3) Reparation				
	B4) Replacement				
	B5) Remodeling				
	B6) Operational energy use				
	B7) Operational water use				
C End of life stage	C1) Deconstruction, demolition	Mandatory	Mandatory	Mandatory	Optional
	C2) Transport				
	C3) Waste processing				
	C4) Final disposition				
D Benefits and charges beyond the system limit	D) Reuse, recycling or energy recovery potential	Mandatory	Mandatory	Mandatory	-

7.3. Description of information modules

Table 5. Description of the modules included in this EPD.

	Product stage			Construction Process phase		Usage stage						End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction facility	Use	Maintenance	Repair	Restoration	Operational energy use	Operational use of water	Demolition/ Deconstruction	Transport	Waste processing	Disposal	Reuse Recovery Recycling potential
Module	A1	A2	A3	A4	A5	B1	B2	B4	B5	B6	B7	C1	C2	C3	C4	D
Declared modules	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	CL GER CN BEL	GER CL BEL CN USA	CL	NA	NA	NA	NA	NA	NA	NA	NA	CL	CL	CL	CL	CL
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-

Product variation	+133.7/-20%	-	-	-	-	-	-	-	-	-	-	-	-	-
Sit variation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-

X = Declared module; ND = No declared module; GER= Germany, BEL= Belgium, USA=United States of America CL= Chile CN= China

Table 6. Description of the modules included in this EPD.

A1) RAW MATERIALS SUPPLY	A2) TRANSPORTATION	A3) MANUFACTURING	C) END OF LIFE	D) BENEFITS AND CHARGES BEYOND THE SYSTEM LIMIT
• Consumption and production of raw materials. • Consumption and production of electrical energy. • Consumption and production of natural gas	• Distance of transportation of raw materials and supplies to the manufacturing site. • Fuel consumption related to internal transportation.	• Consumption of auxiliary inputs. • Air emissions. • Waste generation. • Distance of transportation for waste disposal and treatment.	• Deconstruction. • Transport final destination. • What can be recycled. • What goes to fill what is wasted and not recycled	• Avoided loads and benefits

7.4. Description of the manufacturing process

The manufacturing process is described in Figures 1, 2 and 3:

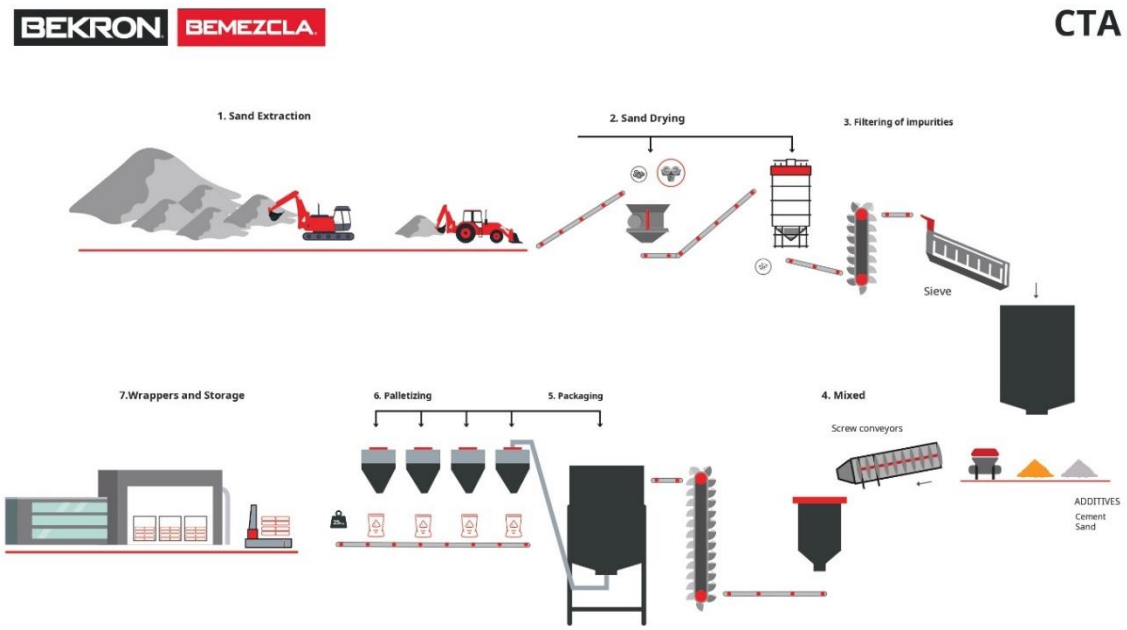

Figure 1. Flow diagram of the manufacturing process of cementitious adhesives: Bekron Doble Acción (Aislantes Nacionales SPA, 2023).

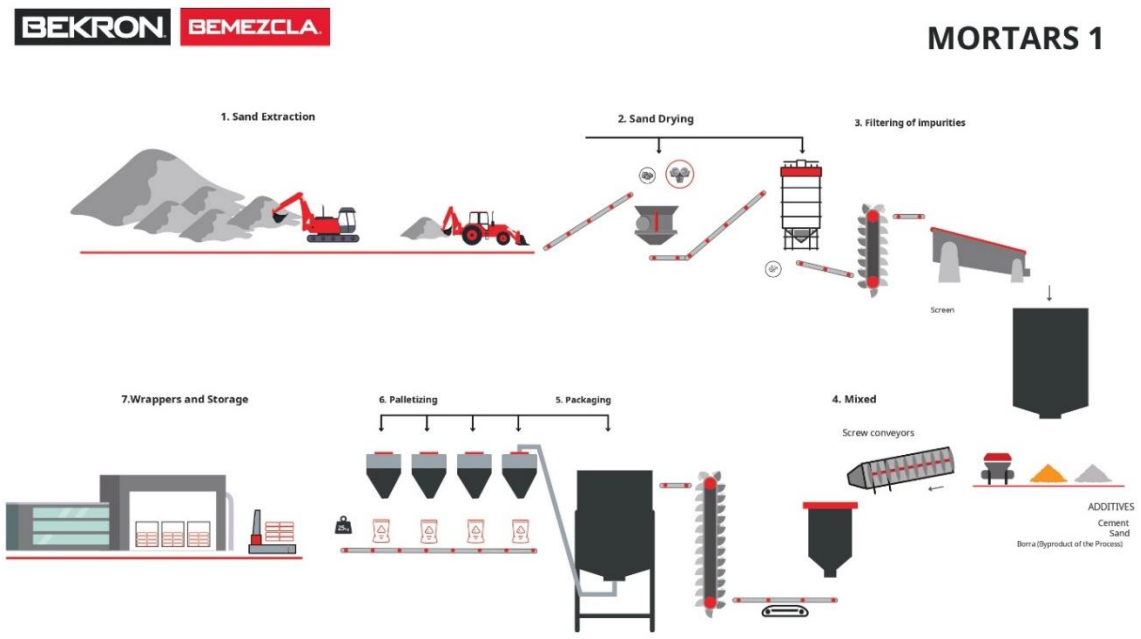

Figure 2. Flow diagram of the manufacturing process of cementitious adhesives Bekron Doble Acción Grueso (Aislantes Nacionales SPA, 2023).

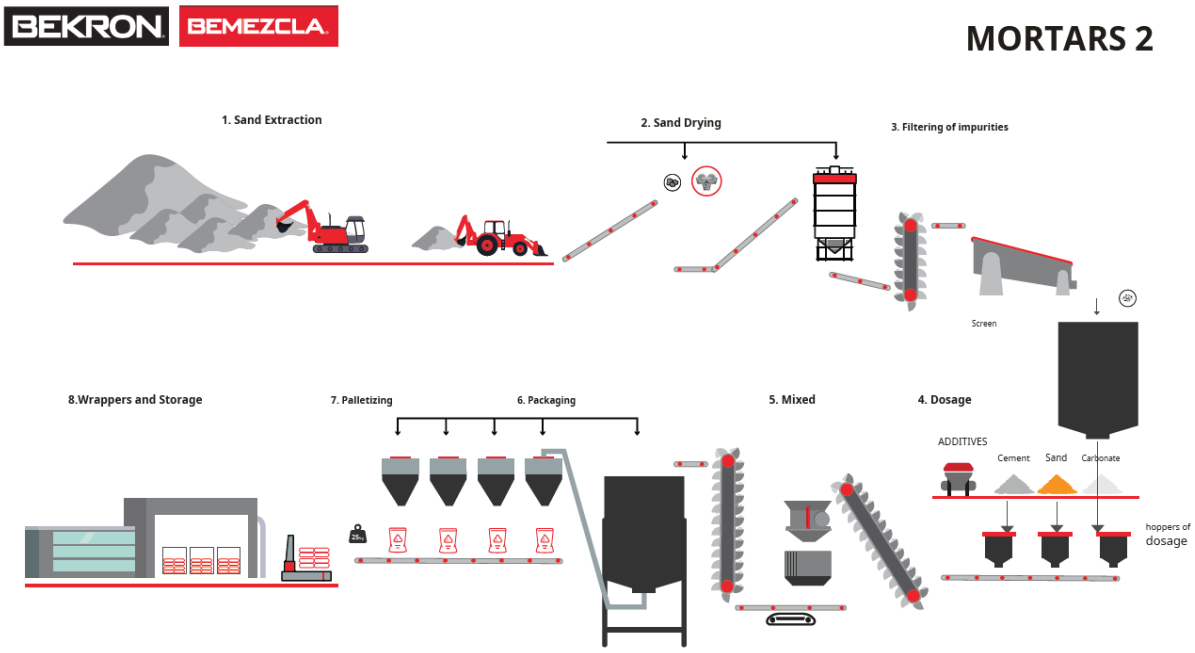

Figure 3. Flow diagram of the manufacturing process of cementitious adhesives: Bekron AC polvo gris, Bekron Steel, Bekron AC polvo, Bekron steel antimicrobial and Bemezcla EIFS (Aislantes Nacionales SPA, 2023).

7.5. Assumptions

Considerations were made for each life cycle module, which are shown in the LCA report. This document presents the considerations for the end-of-life module. The assumptions related to the cementitious adhesives manufacturing process are presented below.

Life Cycle Module	Assumptions
End of Life	• It is assumed that 4% of RCD is recycled in Chile (2025) • It is assumed that 96% of waste is disposed of in landfills • It is assumed that the distance of waste concrete transportation to the recycling site is 250.71 km • Fuel consumption and emission data for dismantling and handling of RCD are assumed.

7.6. Cut off criteria

The RCP document establishes that a minimum of 95% of the total flow (material and energy) per module must be included in the LCA. Inorder to include relevant data, we complied with the established minimum, leaving out of the scope of this study the company's infrastructure, employee transportation activities, administrative activities carried out by employees, personal protective equipment used by workers, as well as inputs used for corrective and preventive maintenance during the study year.

7.7. Allocation

In this study, mass allocation was used, based on the annual production of cementitious adhesives of Aislantes Nacionales SPA in the reference period.

7.8. Time representativeness

Direct data obtained from Aislantes Nacionales SPA is representative for 2022.

8. Environmental performance

Below are the results for the basic environmental impact parameters obtained using the EN15804:2012+A2:2019/AC:2021 method "Method V1.02 / EF 3.1 normalization and weighting set (PRé-Sustainability, 2021)" implemented in the SimaPro v.9.5.0.2 software and Ecoinvent 3.9.1 was used for Life Cycle Impact Assessment.

8.1. Potential environmental impact

All information modules are reported and valued separately. However, this EPD presents the total impact at all stages for Bekron Doble Acción, the most representative product in the production of the Bekron Cementitious adhesive's family with 65% of the total production of the family.

Module A1, raw material acquisition, makes a greater contribution to the impact, exceeding 50% in 9 basic categories, while module A2, Transportation, accounts for a contribution to the generated impact of over 30% in 8 impact categories, mostly related to the acquisition of diesel.

Electricity impact

The electricity generation data in CL come from the adaptation in Ecoinvent 3.9 of the Chilean national residual electricity matrix called "Electricity, high voltage {CL-mix residual} | electricity market, high voltage | Cut-off, U", this dataset represents the most recent CL electricity grid by technology type.

As part of the requirements of the PCR, the climate impact as kg CO2 eq/kWh of the electricity used in the manufacturing process of Leveling, is reported in the next tables. This impact was calculated using the IPCC indicator.

Table 7. Electricity Global Warming Potential (kg CO_2 eq/kWh).

Electricity	Quantity
Weighted total of electrical power sources	0.913

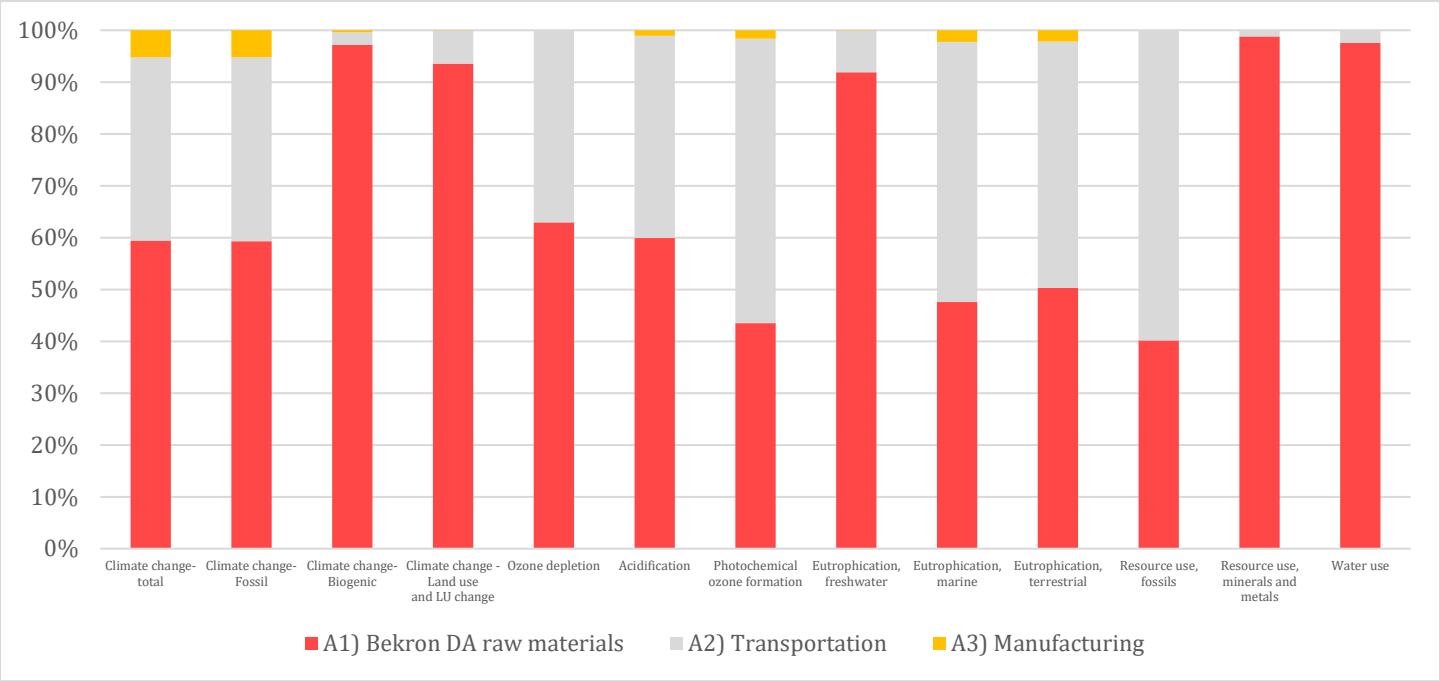

Figure 4. A1-A3 Basic impact categories results of Bekron DA

Table 8. A1-A3, C1-C4 and D basic impact categories result of Bekron Doble Acción (most representative product).

Basic impact categories	Unit	A1-A3	C1	C2	C3	C4	D
Climate change- total	kg CO_2 eq	1.82E+02	3.36E+00	1.90E+01	1.63E-01	9.01E+00	-1.34E-01
Climate change- Fossil	kg CO_2 eq	1.82E+02	3.36E+00	1.90E+01	1.63E-01	9.00E+00	-1.33E-01
Climate change- Biogenic	kg CO_2 eq	3.11E-01	2.21E-04	1.28E-03	1.07E-05	8.77E-04	-2.49E-04
Climate change - Land use and LU change	kg CO_2 eq	6.84E-02	1.37E-04	3.85E-04	6.67E-06	9.71E-03	-1.55E-04
Ozone depletion	kg CFC11 eq	5.00E-06	5.30E-08	4.24E-07	2.57E-09	1.40E-07	-1.21E-09
Acidification	mol H+ eq	9.36E-01	3.22E-02	2.45E-02	1.56E-03	7.50E-02	-8.73E-04
Photochemical ozone formation	kg NMVOC eq	8.30E-01	2.88E-06	1.54E-05	1.40E-07	2.29E-05	-4.25E-06
Eutrophication, freshwater	kg P eq	3.20E-03	1.51E-02	6.02E-03	7.34E-04	3.43E-02	-2.82E-04
Eutrophication, marine	kg N eq	2.27E-01	1.64E-01	5.82E-02	7.98E-03	3.72E-01	-3.07E-03
Eutrophication, terrestrial	mol N eq	2.54E+00	4.84E-02	4.59E-02	2.35E-03	1.10E-01	-9.54E-04
Abiotic depletion potential - Fossils resources *	MJ, net calorific value	2.70E+03	4.42E+01	2.61E+02	2.15E+00	1.18E+02	-1.68E+00
Resource use, minerals and metals*	kg Sb eq	5.76E-04	1.41E-07	6.75E-07	6.86E-09	4.30E-07	-1.22E-08
Water (user) deprivation potential*	m3 world eq. deprived	8.81E+01	5.67E-02	2.39E-01	2.75E-03	1.96E-01	-2.30E+00

*Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.
The use of the results of modules A1-A3 without considering the results of module C is not recommended

8.1.1. Global Warming Potential (GWP-GHG)

The life cycle result of the Bekron Doble Accion product (modules A1-A3, C1-C4 and D) evaluated with the IPCC GWP100 method is shown. The carbon footprint of 1000 kg of Bekron Doble Acción for modules A1-A3 is 1.82E+02 kg CO2 equivalent.

Table 9. Climate Impact (GWP-GHG) of Bekron Doble Acción (most representative product).

Impact categories	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG	kg CO_2 eq	1.82E+02	3.36E+00	1.90E+01	1.63E-01	9.01E+00	-1.34E-01

The indicator includes all greenhouse gases included in GWP-total but excludes absorption and emissions of biogenic carbon dioxide and biogenic carbon stored in the product. Therefore, this indicator is equal to the GWP indicator originally defined in the EN 15804+A2 method.

8.2. Use of resources

The parameters describing resource use were assessed using the Cumulative Energy Demand method version 1.09 (Frischknecht et al. 2007), except for the net freshwater use indicator, which was assessed using ReCiPe 2016 Midpoint (H) version 1.08 (Huijbregts et al. 2017). A detailed description of resource use is provided in Table 10.

Table 10. A1-A3, C1-C4 and D use of resources parameters.

Use of resources parameters	Unit	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as feedstock (PERE)	MJ	1.68E+02	8.62E-02	6.86E-01	0.00E+00	0.00E+00	-1.18E-01
Use of renewable primary energy as raw material (PERM)	MJ	4.82E+00	0.00E+00	0.00E+00	-8.17E-02	0.00E+00	0.00E+00
Total use of renewable primary energy (primary energy and primary energy resources used as feedstock) (PERT)	MJ	1.72E+02	8.62E-02	6.86E-01	-8.17E-02	0.00E+00	-1.18E-01
Non-renewable primary energy use excluding renewable primary energy resources used as feedstock (PENRE)	MJ	2.80E+03	4.70E+01	2.78E+02	0.00E+00	0.00E+00	-1.79E+00
Use of non-renewable primary energy as raw material (PENRM)	MJ	8.05E+01	0.00E+00	0.00E+00	-1.36E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy (primary energy and primary energy resources used as raw materials) (PENRT)	MJ	2.88E+03	4.70E+01	2.78E+02	-1.36E+00	0.00E+00	-1.79E+00
Use of secondary materials (SM)	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of secondary renewable fuels (RSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of secondary non-renewable fuels (NRSF)	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of fresh water (FW)	m^3	2.17E+00	2.20E-03	1.09E-02	1.07E-04	1.03E-02	-5.39E-02

These energy parameters are assessed using the Cumulated Energy Demand method version 1.09 (Frischknecht Rolf, 2007) and adjusted with option B of Annex 3 of PCR 2019:14 Construction products, Version 1.3.4 published on April 30, 2024 (PCR, 2024). Water use was assessed using ReCiPe 2016 Midpoint (H) version 1.08 (Huijbregts et al., 2017).

8.3. Waste categories and output flows

Environmental indicators describing waste generation were obtained from the LCI, except for the background information which was calculated using the EDIP 2003 method (Hauschild and Potting, 2005). Environmental parameters describing waste generation and parameters describing output flows because of the LCA are provided below in Tables 11 and 12 respectively.

Table 11. A1-A3, C1-C4 and D waste indicators

Output parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste	kg	1.51E-02	2.96E-04	1.72E-03	1.44E-05	7.76E-04	-5.72E-06
Non-hazardous waste	kg	7.21E+00	3.28E-03	1.29E-02	1.59E-04	9.59E+02	-3.75E-03
Radioactive waste*	kg	7.82E-04	2.15E-06	2.24E-05	1.05E-07	7.85E-06	2.61E-06

Environmental information describing waste categories and output flows is calculated using the EDIP 2003 method (Hauschild and Potting, 2005).
*No radioactive waste is produced during Aislantes Nacionales SPA operations.

Table 12. A1-A3, C1-C4 and D output flow indicators

Output parameter	Unit	A1-A3	C1	C2	C3	C4	D
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+000	0.00E+00	0.00E+00
Materials for recycling*	kg	0.00E+00	0.00E+00	0.00E+00	4.00E+01	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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

8.4. Variation on the environmental performance indicators

Below is the variation of the main indicators in A-C compared to the most representative product (R), Bekron Doble Acción, which constitutes 65% of the total production of the Bekron Cementitious Adhesives family.

Table 13. Variation of environmental performance indicators, modules A-C

Basic impact categories	Unit	Bekron DA (R)	Bekron DAG	Bekron Polvo Gris	Bekron Steel	Bekron AC Polvo	Bemezcla EIFS	Bekron Steel Antimicrobial
GWP-GHG	kg CO_2 eq	2.14E+02	-17.3%	37.4%	106.4%	43.7%	23.7%	114.0%
Climate change- total	kg CO_2 eq	2.14E+02	-17.3%	37.4%	106.4%	43.7%	23.7%	114.0%
Climate change- Fossil	kg CO_2 eq	2.14E+02	-17.4%	37.3%	106.3%	43.6%	23.6%	113.8%
Climate change- Biogenic	kg CO_2 eq	3.24E-01	-4.6%	75.5%	195.4%	94.7%	68.7%	230.6%
Climate change - Land use and LU change	kg CO_2 eq	7.86E-02	-6.2%	50.7%	179.4%	67.0%	63.8%	212.3%
Ozone depletion	kg CFC11 eq	5.62E-06	-8.5%	16.0%	208.5%	28.6%	41.3%	235.0%
Acidification	mol H+ eq	1.07E+00	-9.2%	42.5%	137.8%	55.1%	49.5%	162.5%
Photochemical ozone formation	kg NMVOC eq	1.04E+00	-14.0%	41.5%	91.6%	89.7%	24.9%	102.9%
Eutrophication, freshwater	kg P eq	3.24E-03	-5.7%	31.1%	179.2%	43.8%	49.0%	207.5%
Eutrophication, marine	kg N eq	2.83E-01	-15.2%	32.3%	81.6%	41.0%	23.8%	94.4%
Eutrophication, terrestrial	mol N eq	3.14E+00	-14.8%	32.2%	88.5%	41.5%	27.1%	102.7%
Abiotic depletion potential - Fossils resources *	MJ, net calorific value	3.12E+03	-10.5%	38.3%	156.3%	47.5%	16.9%	165.8%
Resource use, minerals and metals*	kg Sb eq	5.77E-04	-6.5%	82.8%	243.9%	112.9%	113.8%	275.0%
Water (user) deprivation potential*	m3 world eq. deprived	8.86E+01	-0.2%	13.6%	165.3%	22.0%	32.8%	187.4%

*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.

9. Certifications

During its over 35 years of presence in the country, Henkel Chile has been evolving and renewing its technologies to adapt to the needs of the local and regional markets. It has done so with a deep focus on its customers and consumers, taking actions to achieve better service, satisfaction, quality, and safety. Among them, the elimination of toluene from all its adhesives and its replacement with cyclohexane stands out.

Environment

ISO 14001:2015 – Environmental Management Systems

International standard establishes a framework for managing the environmental impact of organizations, promoting sustainability and compliance with environmental regulations.

Quality

ISO 9001:2015 - Quality management systems

Global standard for quality management systems, focused on meeting customer expectations and optimizing processes to ensure consistent, high-level products and services.

Safety

ISO 45001:2018 - Occupational health and safety management systems

Standard that provides guidelines for creating safe and healthy work environments, reducing occupational risks and promoting the prevention of accidents and occupational diseases.

10. Contact information

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