ENVIRONMENTAL PRODUCT DECLARATION

In accordance with UNE-EN ISO 14025:2010 and UNE-EN 15804: EN 15804:2012 + A2:2019

Program:	**The International EPD® System, www.environdec.com**
Program Operator:	**EPD International AB**
EPD registration number:	**S-P-07691**
Publication date:	**2023-01-16**
Valid until:	**2028-01-15**

This EPD must provide current information and may be updated if conditions change. Therefore, the indicated validity is subject to its continued registration and publication on ww.environdec.com

Program Information

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

Product category rules (PCR):	**PCR 2019:14 Construction products version 1.2.5** (EN 15804+A2)

The PCR review was performed by: The Technical Committee of the International EPD® System.
Full list of members available at *www.environdec.com* *(Members of the Committee were requested to state any potential conflict of interest with the PCR moderator or PCR committee and if so were excused from the review)*
Chair: Claudia A. Peña.
Contact Via *info@environdec.com*

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

☐ EPD process certification ☒ EPD verification

Third party verifier: Verifier accredited by the International EPD® System**.**

Marcel Gomez Ferrer.

Marcel Gómez Environmental Consulting (www.marcelgomez.com)

Phone: 0034 630 64 35 93

Email: info@marcelgomez.com

Approved by: The International EPD® System

The procedure for tracking data during the validity of the EPD involves a third-party verifier:

☒ Yes ☐ No

Manufacturer Information:

Owner of the EPD: KRYSTALINE TECHNOLOGY S.A.

Address**:** C/ Nicolas de Bussi (PQ. Industrial) 52, 032003, Elche (Alicante).
Contact: Jose Manuel Carballal Davila (jose@krystalinetechnology.com)

Web: www.krystalinetechnology.es

Development of EPD: **SGS TECNOS S.A.U**

The owner of the EPD presents the exclusive ownership and responsibility of the EPD. EPDs within the same product category, but from different programs may not be comparable. EPD construction products may not be comparable if they do not comply with EN 15804. For more information on comparability, see EN 15804 and ISO 14025.

Overview

Maker: KRYSTALINE TECHNOLOGY S.A.
C/ Nicolas de Bussi (PQ. Industrial), 52
032003, Elche (Alicante).
Spain

Company Overview: Krystaline Technology, S.A. is a commercial company located in the Industrial Park of Elche (Alicante) that specializes in the manufacture and commercialization of C-S-H hydration enhancing admixtures for the waterproofing of concrete.

Manufacturing a chemical industrial compound that confers impermeable properties to concrete, turning its structures, hydraulic and maritime works watertight for multiple applications, both in new construction works and repairing existing concrete structures. Its advanced hydration enhancing C-S-H type crystalline technology achieves in addition to waterproofing, to make a concrete more durable and protected from external agents.

Product Category Rule (PCR): PCR 2019:14 Construction products version 1.2.5 (EN 15804+A2)

Product Description

Name of the product or family of products covered by this EPD:

This Environmental Product Declaration (EPD) describes the environmental impacts of adding 1kg of Krystaline Add1 to one cubic meter of concrete.

Description of the product and its use:

Krystaline Add1 is a hydrophilic, hydration enhancing C-S-H technology admixture for waterproofing concrete. Designed to waterproof and increase the durability of concrete by using hydration enhancing C-S-H type crystalline technology to improve the hydration of cement paste.

The product makes concrete waterproof, corrosion-free and self-sealing. It is a chemical admixture used for the treatment of concrete structures and elements against water leakage, shrinkage, cracking, chemical attack and corrosion of reinforcing steel. Concrete is a porous material, with microcracks, gaps, pores and capillaries that mainly form in the early stages of setting. The more connected these gaps are, the more permeable the concrete is and the more prone it is to damage caused by the ingress of water and corrosive agents. However, Krystaline Add1 technology makes it possible to virtually eliminate the porosity of concrete and many of its natural weaknesses. It should be noted that the admixture Krystaline Add1 has CE marking (DoP) under CPF Certificate of Conformity No. 1170/CPR/AT.04078 and Technical Approvals Plus (DIT plus) No. 649pR/20 whose CPC code is 545.

Figure 1: Krystaline Add1.

Technical data and physical characteristics:

Colour	White	
Texture	Powder	
Mixture density	1.4 g/cm^3	
Granulometry	40-150 microns	
Solids content	100%	
Resistance to hydrostatic pressure	20 bar (204 m H_2O)	
Dosage	1kg/m^3 concrete	
Self-sealing of cracks	< 0.5 mm	
Chloride content	≤ 0.1%	UNE EN 934-2:2009+A1:2012
Alkaline content (Na_2Or equivalent)	≤ 40%	
Corrosion behavior	Only contains components of chapter A1 EN 934-1:2008	
Capillary absorption	To 7 days: ≤ 50% of control To 28 days ≤ 60% of control	
Compressive strength	Compressive strength A 28 days: ≥ 85% of control	
On-air content	≤ 2% of control	
Hazardous substances	Annex ZA of EN 934-2	

Description of system components:

The admixture, Krystaline Add1, is mainly composed of cement and inorganic raw materials that give it its hydration enhancing properties. The typical dosage of the product is 1kg per cubic meter of concrete.
The packaging materials are a recycled polypropylene bucket, shrink wrap and pallets.
The amount of packaging materials does not vary.
The weight content of the admixture Krystaline Add1 included in the EPD is shown in the following tables.

The composition of the product is detailed in the following table, corresponding to the components of the admixture Krystaline Add1.

Board 1: **Admixture composition table**.

Krystaline Add1			
System components	**Weight%**	**Recycled material, weight %**	**Renewable material, weight %**
White cement	10-60%	0	0
Alkaline compounds	20-90%	0	0
Base	5-50%	0	0
TOTAL	**100,00%**	**0,00%**	**0,00%**
	Packaging	**% Product weight**	
	Polypropylene Cube	0,65%	
	Pallet	0,14%	
	TOTAL	**0,80%**	

During the life cycle of the product, no hazardous substances included in the "Candidate List for Authorisation (SVHC)" have been used in a percentage greater than 0.1% of the weight of the product.
All the quantities specified in the table of description of components of the admixture Krystaline Add1 together, unifying all stages of the life cycle.

Board 2: **Amount of biogenic carbon in the product.**

Results per functional unit		
Biogenic carbon content	**Unit**	**Amount**
Biogenic carbon contained in the product	kg C	0
Biogenic carbon contained in the packaging	kg C	2,60E-03

LCA Information

FUNCTIONAL UNIT	1 kg product with an estimated shelf life of 50 years.
SYSTEM LIMITS	From "Cradle to Tomb + Module D" (A + B + C + D)
REFERENCE SERVICE LIFE (RSL)	50 years
CUTTING RULES	At least 99% energy consumption is considered for manufacturing facilities It is considered 99% of the raw material by mass. The following processes have been excluded: - Manufacture of equipment used in production, buildings or any other equipment - Transportation of personnel to the plant - Transportation of personnel within the plant - Research and development activities - Long-term emissions.
ASSIGNMENTS	Wherever possible, assignments have been avoided. For cases where this has not been possible, a mass-based physical allocation is made. The data referring to the composition of the system have been obtained directly and have been analyzed following the principles of *modularity* and *polluter pays*.
GEOGRAPHICAL COVERAGE	Global
PERIOD	2021
LCA SOFTWARE USED FOR CALCULATION	Ecoinvent 3.8 (allocation, cut-off by classification) with the database Simapro 9.3.0.2 used for LCS calculations. The LCA methods used are in accordance with Standard UNE-EN 15804: EN 15804:2012 + A2:2019

Data quality

The data collected regarding components and energy corresponds to the year 2021 and includes data on raw materials consumed and energy consumption. The plausibility and consistency of the data collected has been verified. Good data quality can therefore be considered.
In the calculation of the LCA of the system, the flows related to the construction of the production plants, the application machines or the transport of the employees have not been considered.

Other information:

This LCA has been carried out by **SGS TECNOS S.A.U**. Material and energy consumption bills have been collected and checked. The study covers at least 95% of the materials and energy per module and at least 99% of the total material and energy use of each unit process.

Lifecycle and compliance:

This DAP includes the steps shown in Table 3. This statement is of the cradle-to-grave type.

This statement may not be comparable with those developed in other programmes or according to different reference documents; in particular it may not be comparable with Declarations not prepared in accordance with Standard UNE-EN 15804: EN 15804:2012 + A2:2019. Similarly, environmental declarations may not be comparable if the source of the data is different, the same information modules are not included, or are not based on the same scenarios.

Board 3 : **System limits. X: Declared module; GLO: Global; ES: Spain**

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	IS	IS	IS	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	>90% GWP-GHG					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	1 product to analyze					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	1 production site					-	-	-	-	-	-	-	-	-	-	-	-

Life cycle stages

Understanding System Boundaries: Cradle to grave + module D

Figure 2: Stages of the life cycle of a product according to the analysis "from the cradle to the grave".

Product Stage A1 - A3

Description of the stage:

The product stage of the admixture Krystaline Add1 is subdivided into modules A1® supply of raw materials, A2 transport to manufacturer and A3 manufacturing. The grouping of these three modules is a possibility contemplated by the UNE-EN 15804 standard: EN 15804:2012 + A2:2019 that applies in this EPD.

A1 Supply of Raw Materials

This module refers to the extraction and pre-processing of the raw materials and energy sources used in the manufacture of the products that make up the system.

A2 Transport

This module includes the transport of raw materials to the manufacturing plant.

A3 Manufacturing

This module mainly contemplates the energy consumption during the manufacture of the product, as well as the manufacture of the product. Stage A3, corresponding to manufacturing, begins with proper cleaning of the machinery to avoid contamination of other manufactured admixtures. Subsequently, cement and admixtures are added with the mixing times stipulated by the technical department and proceed to the packaging of the product in water-soluble bags of 1 kg, by dosing with scale, and at the same time performing a quality control in which the appearance, uniformity and color of the mixture is inspected. The electricity production model used corresponds to the year 2021 in Spain, with its origin being 43% renewable, 3.9% high efficiency cogeneration and 7.4% cogeneration, 18% CC Natural Gas, 2.1% from coal, 1.7% from Fuel / Gas, 22.9% from nuclear origin and 1.0% from other types of energy.

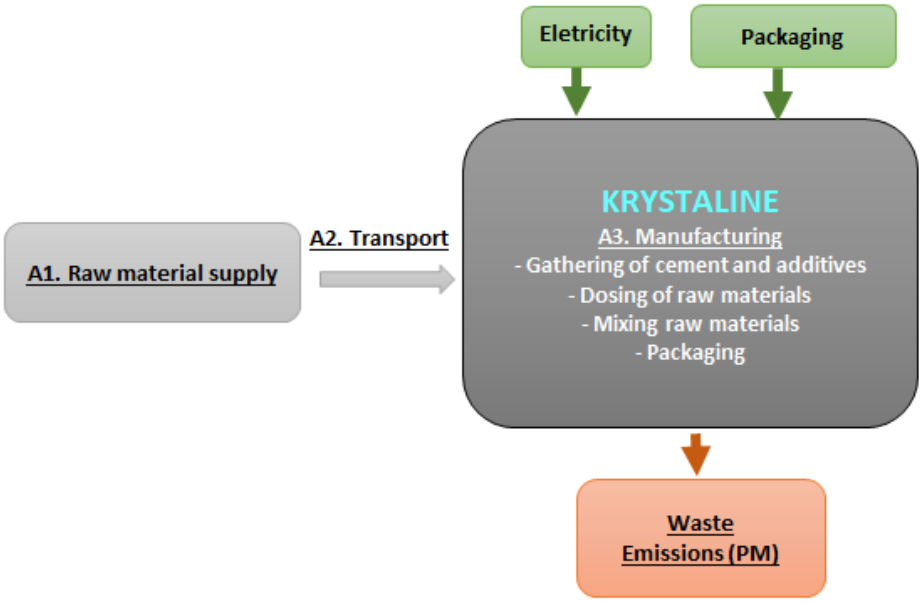

Figure 3: Simplified flow scheme of the production process of Krystaline Add1®.

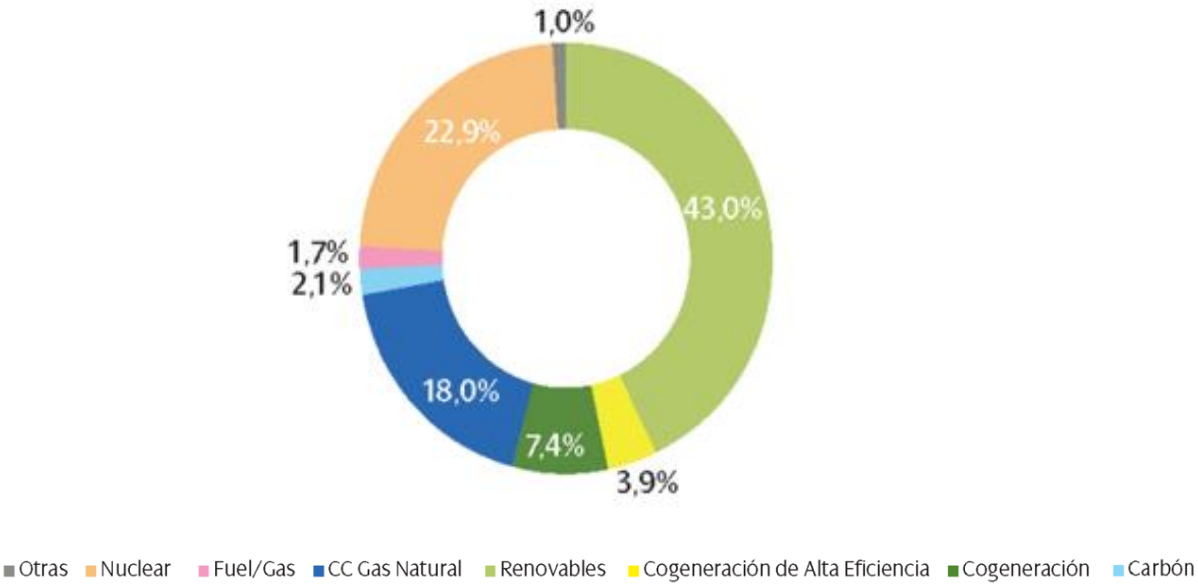

Figure 4: Electric mix.

Construction process stage A4 - A5

Description of the stage:

The construction process stage of the admixture Krystaline Add1 is subdivided into modules A4 transport to the site and A5 installation.

A4 Transport to the construction site

This module contemplates the transport of the system components from the production center to the application site, including the possibility of intermediate storage. An average distance of transport is estimated depending on the final destination of the product.

Transport is calculated on the basis of an average scenario whose characteristic parameters are described in the following table.

PARAMETER	VALUE (expressed by Functional unit)
Fuel consumption of the vehicle or means of transport used	Truck with an average load 16-32 t (euro 6) for land transport, cargo freighter and medium distance cargo aircraft for air transport and medium cargo cargo ship for maritime transport
Total distance	74,607 km
Bulk density of the transported product	1,400 kg/m3
Utilization of load capacity (in volume, including return of unladen transport)	% Assumed in the Ecoinvent database
Load capacity utilization factor, in volume	1 (default)

Figure 5: Stage A4.

A5 Installation

This module covers the application of the product on site, and includes:

- There are no residues derived from the application of the admixture, the residues produced correspond to the packaging of the product.
- There is no water or energy consumption during the installation of the Krystaline Add1® admixture as it is considered an intermediate product.

PARAMETER	VALUE (expressed by functional unit)
Secondary materials used in the installation	None
Water use	0 liters
Use of other resources (electricity)	0 kWh
Electricity consumption during the installation process	It is considered negligible.
Material residue during on-site installation	1% of components
Waste on site (collection for recycling, energy recovery (recovery) or landfill (specifying the route)	The waste from the product packaging is deposited in landfill. Conservative methodology: product waste deposited in landfill.
Packaging waste	0.008 kg
Direct emissions to air, soil or water	They are not generated.
Packaging by m^2 recycling	0%

Figure 6: Stage A5.

The declaration does not include the impact related to the optional use of products or accessories not expressed in the technical sheet of the system used.

Stage of Use (excluding possible savings) B1 - B7

Description of the stage:

This stage refers to the operation of the building including any emission to the environment caused by the use of the product (module B1) or by subsequent technical operations: maintenance (B2), repair (B3), replacement (B4) or rehabilitation (B5).

- B1: Emissions of volatile organic compounds into the environment from the applied product are considered irrelevant.
- B2-B5: The performance of the product under consideration leads to the conclusion that its service life equals or exceeds the useful life of the building. Once applied, the system components do not require technical actions or operations until the end-of-life stage, so it is considered that the product does not generate environmental loads at this stage.

The use stage also includes the use of energy in service (module B6) and the use of water in service (module B7).

- B6, B7: The product does not use water or electricity during the operational life of the building. And the energy and emission savings from the waterproofing properties of the system have not been accounted for.

End of life stage, C1 - C4

Description of the stage:

This phase consists of the modules related to the end of life, C1 to C4, detailed below:

- C1 Deconstruction, demolition: As the demolition and / or dismantling of the product is part of the demolition of the building itself, it is assumed that the environmental impact is extremely low and therefore can be disregarded.
- C2 Transport: Contemplates the transfer of construction waste from the work to the waste treatment point.
- C3 Waste treatment: Includes the reuse, recovery and/or recycling of waste. Law 7/2022 establishes that construction and demolition waste must be destined for reuse, recycling or other forms of recovery operations at least 70% and therefore it is considered that the product is sent to recovery after the demolition of the building together with the concrete material extracted by 70%.
- C4 Waste disposal: It is assumed that 30% of waste is disposed of in a landfill and an average distance of 50 km is considered.

PARAMETER	VALUE (expressed by functional unit)	
Collection process (mixed with the rest of CDW)	Krystaline Add1	
Recovery system	Valorization (70%)	
Disposal (landfill)	Krystaline Add1	30%
Transport assumptions for the development of the scenario	Medium load truck 16-32 t (euro 6)	
Distance to landfill	50 km	

Figure 7: Stage C1-C4

Reuse/recovery/recycling potential, D

Module D declares the environmental benefits resulting from the reuse and recycling of products, as well as energy recovery.

This EPD considers the environmental burdens avoided as a result of recycling carried out throughout the life cycle of the product, considering that 70% of the product is taken to recycling and 30% of the product is taken to landfill, so it has been considered an environmental benefit.

In this module, 70% savings resulting from recycling carried out throughout the life cycle have not been computed.

Environmental impacts of Krystaline Add1

The LCA results are detailed in the tables on the following pages together with the interpretation of the overall impacts produced per functional unit (1 kg of Krystaline Add1 admixture per m^3 concrete). Estimated impact results are only relative statements that do not indicate impact category endpoints, threshold exceedances, safety margins or risks.

The Simapro 9.3.0.2 software was used to perform the LCA, together with the Ecoinvent 3.8 database.

As impact models have been used:

- CML-IA baseline V3.07/ EU25.
- ReCiPe 2016 Midpoint (H) V1.06 / World (2010) H.
- EDIP 2003 V1.07 / Default.
- Cumulative Energy Demand V1.11
- EF 3.0 Method (adapted) V1.02 / EF 3.0 normalization and weighting set.
- IPCC 2022

POTENTIAL ENVIRONMENTAL IMPACTS OF THE ADMIXTURE KRYSTALINE ADD1

Parameters		Product Stage	Construction Process Stage		Stage of use							End of life stage				Module D
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Substitution	B5 Rehabilitation	B6 In-service energy use	B7 Use of water in service	C1 Deconstruction/demolition	C2 Transport	C3 Waste treatment	C4 Waste disposal	D Reuse Potential, Recovery and Recycling
Global warming potential, GWP - *kg CO_2 eq (NA)*	Fossil- *kg CO_2 Eq*	1,37E+00	1,61E+00	2.99E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2.02E-03	0,00E+00	1.58	-2.72E-03
	Biogenic- *kg CO_2 Eq*	-4.24E-01	4,23E-04	-4.24E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,45E-07	0,00E+00	1.57 E-	-3.97E-06
	Land use and transformation- *kg CO_2 Eq*	4,20E-03	2.04E-05	4,22E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1.64E-08	0,00E+00	1, 49 E-06	-2.79E-06
	TOTAL– *kg CO_2 Eq*	9.49E-01	1,62E+00	2.57E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2.02E-03	0,00E+00	1.58 E-	-2.73E-03
Stratospheric ozone depletion potential (ODP)	*kg CFC11 eq (NA)*	1,15E-07	3.71E-07	4.88E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4.81E-10	0,00E+00	6. 39 E-10	-2.68E-10
Acidification potential of soil and water resources, (PA)	*mol H+ eq (NA)*	1,34E-02	7.94E-03	2,14E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4.03E-06	0,00E+00	1, 49 E-05	-1.98E-05

Eutrophication potential, Fraction of nutrients reaching freshwater as final compartment (EP-freshwater)	*kg PO_4 Eq*	3.54E-04	2.93E-06	3.57E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,18E-09	0,00E+00	5.08E-08	-2.40E-07
	kg P eq	1,15E-04	1,15E-04	1,16E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1.04E-09	0,00E+00	1.66	-7.80E-08
Eutrophication potential, Fraction of nutrients reaching seawater as final compartment (EP-[illegible])	*kg N eq (NA)*	2,22E-03	2,22E-03	5.03E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6.68E-07	0,00E+00	5.14E-06	-5.90E-06
Eutrophication potential, Accumulated excess (EP-terrestrial)	*mol N eq (NA)*	3,70E-02	3,70E-02	6,78E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7.43E-06	0,00E+00	5.65E-05	-6.83E-05
Tropospheric Ozone Formation Potential (POCP)	*kg NMVOC eq (NA)*	3.87E-03	3.87E-03	1,19E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2.62E-06	0,00E+00	1.65E-05	-1.89E-05
Potential for depletion of abiotic resources for non-fossil resources (ADP - minerals & metals)	*kg Sb eq (2)*	3.03E-05	3.03E-05	3.04E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8.80E-11	0,00E+00	3,60E-09	-2.31E-08
Potential for depletion of abiotic resources for fossil resources (ADP –fossil)	*MJ, net calorific value (2)*	1,63E+01	1,63E+01	3.90E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2.87E-02	0,00E+00	4,41E-02	-3.22E-02
Water (use) potential, weighted lack and	*m^3 depriv. (2)*	1,89E+00	1,89E+00	1.90E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-4.80E-06	0,00E+00	1.99E-03	-4.21E-02

water consumption (WDP)																

Disclaimer-(1)- This impact category refers primarily to the potential impact of low doses of ionizing radiation on human health from the nuclear fuel cycle. It does not take into account the effects due to possible nuclear accidents, occupational exposure or underground radioactive waste disposal facilities. The potential ionizing radiation from soil, radon and some building materials is also not measured with this indicator.
Disclaimer-(2)- The results of this environmental impact indicator should be used with caution, as uncertainties about these results are high or experience with the indicator is limited.

POTENTIAL ENVIRONMENTAL IMPACTS OF THE ADMIXTURE KRYSTALINE ADD1 ADDITIONAL AND MANDATORY IMPACTS

Parameters		Product Stage	Construction Process Stage		Stage of use							End of life stage				Module D
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Substitution	B5 Rehabilitation	B6 In-service energy use	B7 Use of water in service	C1 Deconstruction/demolition	C2 Transport	C3 Waste treatment	C4 Waste disposal	Reuse Potential Recovery and Recycling
GWP –GHG[2]	*kg CO2 eq*	1,38E+00	1,61E+00	3.00E-02	0,00E+00	0,00E+00	0,00 E+00	0,00E+00	0,00E+00	0,00E+00	0,00 E+00	0,00E+00	2.02E-03	0,00 E+00	1.57E-03	-2.69E-

Disclaimer-(1)- This impact category refers primarily to the potential impact of low doses of ionizing radiation on human health from the nuclear fuel cycle. It does not take into account the effects due to possible nuclear accidents, occupational exposure or underground radioactive waste disposal facilities. The potential ionizing radiation from soil, radon and some building materials is also not measured with this indicator.
Disclaimer-(2)- The results of this environmental impact indicator should be used with caution, as uncertainties about these results are high or experience with the indicator is limited.

POTENTIAL ENVIRONMENTAL IMPACTS OF THE ADMIXTURE KRYSTALINE ADD1® ADDITIONAL AND VOLUNTARY IMPACTS															
Parameters		Product Stage	Construction Process Stage		Stage of use							End of life stage				Module D
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Substitution	B5 Rehabilitation	B6 In-service energy use	B7 Use of water in service	C1 Deconstruction/demolition	C2 Transport	C3 Waste treatment	C4 Waste disposal	D Reuse Potential, Recovery and
Potential incidence of diseases due to emissions	PM (PM) - disease inc. (NA)	9.49E-08	2.00E-08	1,16E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1.37E-10	0,00E+00	2.99E-10	-3.71E-10
Potential for human exposure efficiency relative to	U235 (IRP) - kBq U-235 eq (1)	6,31E-02	6,31E-02	1,62E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,25E-04	0,00E+00	1,81E-04	-1.09E-04
Potential Comparative Toxic Unit for Humans (HTP-c)	CTUh (2)	1,23E-09	1,23E-09	1,32E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1.51E-13	0,00E+00	7.07E-13	-2.18E-12
Potential Comparative Toxic Unit for Humans (HTP-nc)	CTUh (2)	3.79E-08	1,39E-09	1.54E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1.80E-11	0,00E+00	6,17E-13	-4.94E-11
Potential comparative toxic unit for ecosystems	CTUe (2)	9,76E+01	9,76E+01	1,05E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E-02	0,00E+00	2.79E-02	-5.36E-02
Potential of the Soil Quality Index (PQS)	Pt (2)	1,35E+01	1,35E+01	1,37E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7.72E-05	0,00E+00	9.26E-02	-4.65E-02

Disclaimer-(1)- This impact category refers primarily to the potential impact of low doses of ionizing radiation on human health from the nuclear fuel cycle. It does not take into account the effects due to possible nuclear accidents, occupational exposure or underground radioactive waste disposal facilities. The potential ionizing radiation from soil, radon and some building materials is also not measured with this indicator.
Disclaimer-(2)- The results of this environmental impact indicator should be used with caution, as uncertainties about these results are high or experience with the indicator is limited.

USE OF KRYSTALINE ADD1 ADMIXTURE RESOURCES

Parameters		Product Stage	Construction Process Stage		Stage of use							End of life stage				Module D
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Substitution	B5 Rehabilitation	B6 In-service energy use	B7 Use of water in service	C1 Deconstruction/demolition	C2 Transport	C3 Waste treatment	C4 Waste disposal	D Reuse Potential, Recovery and Recycling
Primary Energy Resources - Renewables	Used as an energy source *MJ, net calorific value*	6,95E+00	2.83E-02	2.83E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,40E-05	0,00E+00	3.76E-04	-1.87E-03
	Used as raw material *MJ, net calorific value*	2,70E-02	0,00E+00	2.70E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	TOTAL *MJ, net calorific value*	6,97E+00	2.83E-02	2.85E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,40E-05	0,00E+00	3.76E-04	-1.87E-03
Primary energy resources - Non-renewable	Used as an energy source *MJ, net calorific value*	1,74E+01	2,40E+01	2,40E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3.05E-02	0,00E+00	4.69E-02	-3.42E-02

	Used as raw material - MJ, *net calorific value*	4,48E-01	0,00E+00	4,48E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	TOTAL *MJ, net calorific value*	1,78E+01	2,40E+01	2,40E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3.05E-02	0,00E+00	4.69E-02	-3.42E-02
Secondary materials	*kg*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Renewable secondary fuels	*MJ, net calorific value*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-renewable secondary fuels	*MJ, net calorific value*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of freshwater	*m^3*	3.73E-02	3.73E-02	3.76E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7.88E-08	0,00E+00	4.73E-05	-9.84E-04

WASTE CATEGORY OF ADMIXTURE KRYSTALINE ADD1																
Parameters		Product Stage	Construction Process Stage		Stage of use							End of life stage				Module D
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Substitution	B5 Rehabilitation	B6 In-service energy use	B7 Use of water in service	C1 Deconstruction/demolition	C2 Transport	C3 Waste treatment	C4 Waste disposal	Reuse Potential Recovery and Recycling
Hazardous waste disposed of	*kg*	2,30E-05	2,30E-05	8,22E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7.55E-08	0,00E+00	6.67E-08	-7.22E-08
Non-hazardous waste	*kg*	3,30E-01	1.55E-03	1.55E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,51E-06	0,00E+00	3,00E-01	-4,14E-04
Radioactive waste disposed of	*kg*	6,27E-05	2.64E-04	2.64E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2.05E-07	0,00E+00	3.37E-06	-1.27E-07

OTHER OUTPUT STREAMS OF THE ADMIXTURE KRYSTALINE ADD1																
Parameters		Product Stage	Construction Process Stage		Stage of use							End of life stage				Module D
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Usage	B2 Maintenance	B3 Repair	B4 Substitution	B5 Rehabilitation	B6 In-service energy use	B7 Use of water in service	C1 Deconstruction/demolition	C2 Transport	C3 Waste treatment	C4 Waste disposal	Reuse Potential Recovery and Recycling
Components for reuse	*kg*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	*kg*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,70E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery (energy recovery)	*kg*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Energy exported, electricity	*MJ*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Energy exported, thermal	*MJ*	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Interpretation of LCA

The following graph allows us to determine which stages of the Life Cycle have the greatest impact on the selected environmental indicators.

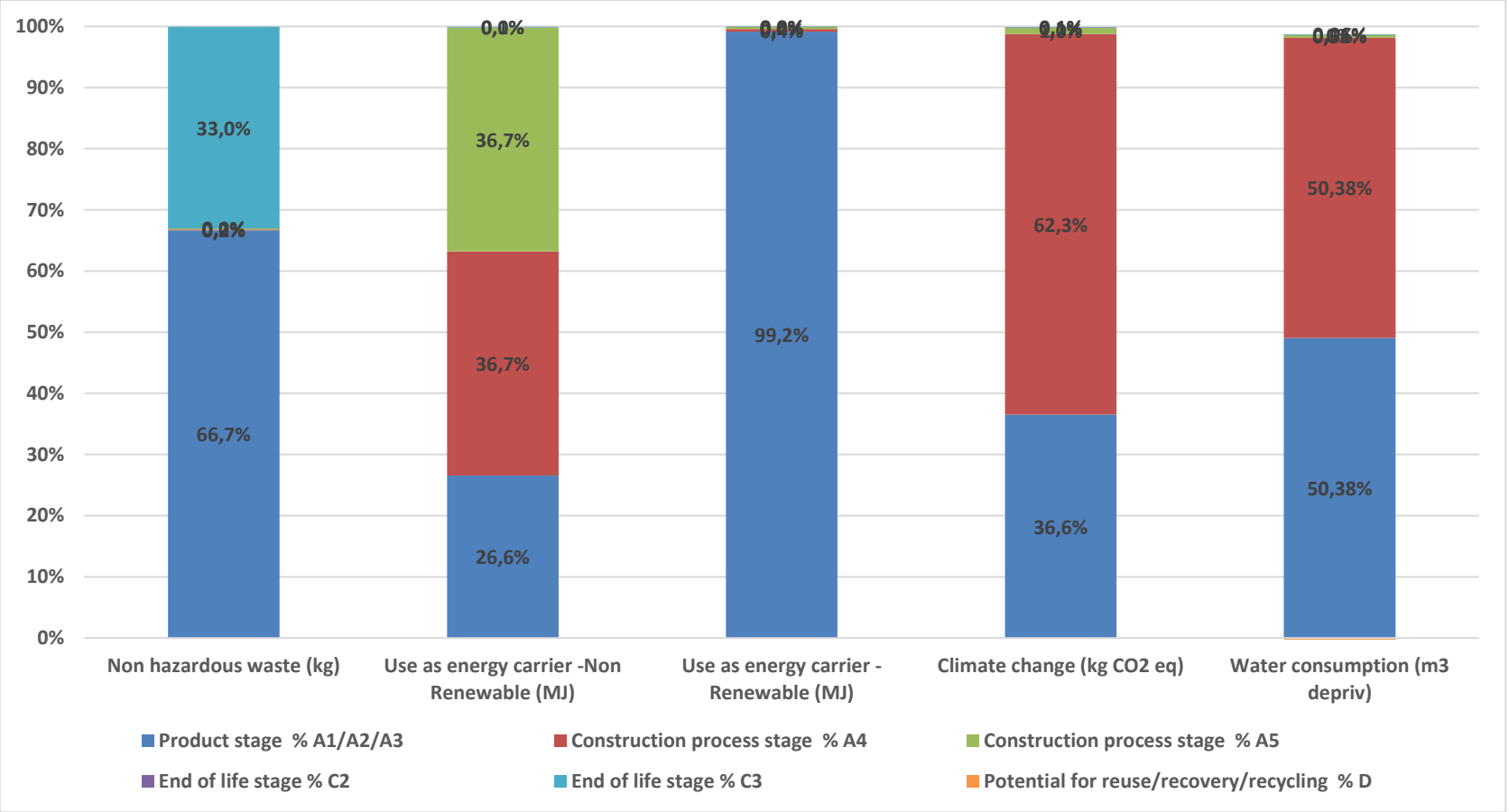

Figure 8: Environmental impacts of Krystaline Add1.

Health Information

View the safety data sheets of the system components.
https://krystalinetechnology.es/

Positive contributions to the environment

Krystaline, an organization dedicated to the design, development, production and marketing of concrete waterproofing systems, is additionally committed to comply with the policy of quality, environmental management and health and safety, linked to its management system. Krystaline shows a firm commitment to the environment and develops products with sustainability and the future in mind, relying on R&D as one of their hallmarks.

The development of Krystaline Add1 allows, from a point of view committed to the environment, to achieve waterproof concrete that protects the structure from water ingress in line with the principles of bioconstruction providing better efficiency to the building and preventing corrosion of reinforcing steel.

Information relating to the EPD sector

This EDP is a Krystaline Add1 product statement.

Origin of the information

Ambit: Spain

Period: 2021

The information has been obtained from the Ecoinvent 3.8 databases and/or from raw material suppliers.

Raw Materials	Generic databases, and information from suppliers or producer associations
Production	Own data
Transport	Generic or specific information
Application	Generic or specific information
Life in Use	Generic information
End of Life	Generic information
Energy	Specific information

References

1. General Programme Instructions of the International EPD® System. Version 4.0.
2. ISO 14020:2000: Environmental labels and declarations — General principles
3. ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures (2010).
4. ISO 14040, Environmental management – Life cycle assessment – Principles and reference framework (2006).
5. ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines (2006).
6. PCR 2019:14 Construction products - version 1.2.5 - CEN (2019): EN 15804:2012+A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for product category of construction products)
7. UNE-EN 15804:2012+A2:2019/AC:2021 – Environmental Product Declarations – Commodity Category Rules for Construction Products (2021).
8. Krystaline ACV (2022).