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A VERIFIED ENVIRONMENTAL DECLARATION

AENOR

Environmental Product Declaration

Prestressed precast concrete structure – Green Spine Line®

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CONSOLIS TECNYCONTA

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The holder of this Declaration is responsible for its contents and for keeping the records and the documentation that supports data and statements included during the validity period

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AENOR is a founding member of ECO Platform, the European Association of Environmental Product Declaration Verification Programs

UNE-EN 16757:2022 The European Standard EN 15804:2012+A2:2019 serves as the basis for CPR
Independent verification of the declaration and data in accordance with EN ISO 14025:2010 ☐ Internal ☒ External
Verification body AENOR Product certification body accredited by ENAC with accreditation No. 1/C-PR468

1. General Information

1.1. The organisation

Consolis Tecnyconta is a Spanish company in the precast concrete elements industry, which activity is specialized in design, structural calculation, manufacturing, sales and assembly of residential buildings, logistic, industrial or data centres and any other building built by precast concrete elements.

From its beginning, in 1993, Consolis Tecnyconta has achieved to become a reference in the Spanish precast market. To get this, all the organization must be committed with the work development in a professional manner and with maximum quality standard, having the optimum customer satisfaction and the environment protection as objectives.

Entering Consolis Group, a European precast concrete leader, in 2018, was a big milestone in Tecnyconta's history. This allows the company to offer their customers a wider variety of products, services and innovative solutions.

Since 2026, Consolis Tecnyconta has two manufacturing facilities, located in Tauste (Zaragoza) and Aranda de Duero (Burgos); as well as offices in Zaragoza and Madrid. Both manufacturing facilities holding modern industrial equipment which allows the most efficient production. Factory design and layout is the result of a strategical project conducted to improve material flow and manufacturing operations.

Consolis Tecnyconta factories hold certified integrated management systems in the following areas:

- ISO 9001. Quality
- ISO 14001. Environment
- ISO 45001. Health and Safety

Since 2022, sustainability has been one main pillar for Consolis Tecnyconta. As a result of that, the organization started the development of a line of products with reduced carbon footprint, Green Spine Line®.

1.2. Scope of the Declaration

This Environmental Product Declaration includes environmental information of Green Spine Line® prestressed precast concrete structure manufactured in the factory of Tauste (Zaragoza) with data of 2024.

The declared data represent the average production of Green Spine Line® products manufactured at the Tauste plant during the year 2024. Therefore, the results are representative of an average Green Spine Line® product based on annual production.

The scope of this Environmental Product Declaration (hereafter EPD) is cradle to gate with options, declaring modules A1-A5, B1-B3, B6-B7, C1-C4 and D, according to EN 15804:2012+A2:2019, covering with this almost the totality of the life cycle of the product, from raw material extraction to end of life.

1.3. Lifecycle and compliance.

This EPD has been developed and verified in accordance with the EN ISO 14025: 2010, EN 15804: 2012+A2: 2019, EN15804: 2012+A2: 2019/ AC: 2021 and EN 16757: 2022 (Product category rules for concrete and concrete elements).w

This Environmental declaration includes the following stages of the life cycle:

System limits. Information modules considered

Product stage	A1	Raw material supply	X
	A2	Transport to factory	X
	A3	Manufacture	X
Cons-truction	A4	Transport to construction site	X
	A5	Installation/construction	X
Use stage	B1	Use	NR
	B2	Maintenance	NR
	B3	Repair	NR
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational energy use	NR
	B7	Operational water use	NR
End of life	C1	Deconstruction/demolition	X
	C2	Transport	X
	C3	Waste processing	X
	C4	Waste disposal	X
	D	Potential for reuse, recovery and/or recycling	X

X = Module included in the LCA; ND = Module not declared; NR = Module not relevant

This EPD may not be comparable with those developed in other Programs or in accordance with different reference documents, specifically it may not be comparable with EPDs not prepared in accordance with the EN 15804: 2012+A2: 2019 Standard.

Product category rule information	
Descriptive title	Sustainability of construction works. Environmental product declarations. Product Category Rules for concrete and concrete elements
Registration code and version	EN 16757:2018
Date of issue	October 2022
Conformity	EN 15804:2012 + A2:2020
Program Manager	AENOR

Similarly, this EPD may not be comparable if the source of the data is different (e.g. databases), not all relevant information modules are included or are not based on the same scenarios.

The comparison of construction products must be made with the same function, applying the same functional unit and at the level of the building (or architectural or engineering work), that is, including the behaviour of the product throughout its entire life cycle, as well as the specifications of section 6.7.2 of the EN ISO 14025: 2010 Standard.

2. The product

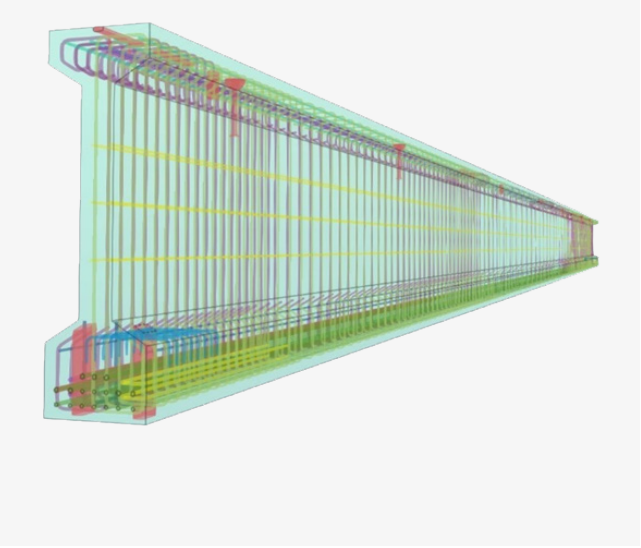
2.1. Product identification

Structural prestressed precast concrete elements (CPC code: 3755) define part of the structure of buildings. In this category Green Spine Line® beams and other prestressed structural elements are included.

There is variety of cross-sections and sizes in the elements within this category.

For the structural prestressed precast concrete elements manufacturing, following materials are used:

- Concrete with typical minimum strength class C60/75, complying with national regulations (Código Estructural). Strength class will always depend on project requirements.
- Steel rebars for the reinforcement.
- Steel strands for prestressing.



2.2. Product features

The manufacturer declares the following information on the technical specifications of the product:

Product features

Benefit	Worth	Units
Concrete compressive strength	fck>40	N/mm²
Steel ultimate tensile strength	ftk=550	N/mm²
Steel tensile yield strength	fyk=500	N/mm²
Prestressing steel ultimate tensile strength	fpk=1860	N/mm²

Other properties such as fire resistance or the noise impact factor are calculated according to the project. Variations in these properties do not affect the EPD calculations.

The products that are included in this EPD are regulated by standards UNE-EN 13225 and UNE-EN 13693.

2.3. Product composition

The composition declared by the manufacturer is as follows:

Product composition

Substance	CAS #	Weigh in final product (%)
Grey Cement	65997-15-1	13,0 – 16,3 %
Calcium Carbonate	1317-65-3	0,3 – 3,8 %
Additives	(*)	0,3 – 0,4 %
Aggregates	NA	69,1 – 75,5%
Steel	NA	4,2 – 5,4%
Water	NA	5,8 – 6,1%
(*) Different type of additives. NA= Not applicable (it is not a chemical product)		

Main composition of this product is concrete (cement, aggregates, water, additives and other possible additions) and steel.

Products included in this Life Cycle Assessment do not include any substance included in the current SVHC list (Substance Of Very High Concern) in a concentration higher than 0.01% (100 ppm) taking into account the current candidate list and REACH regulations.

3. LCA Information

3.1. Life cycle Analysis

The LCA has been performed using SimaPro Craft 10.2.0.1, employing the Ecoinvent 3.11 database. In addition, specific Environmental Product Declarations (EPDs) for materials used in the study have been incorporated as foreground data sources. The results presented in this Environmental Product Declaration are based on the LCA study "LCA_prestressed_precast_concrete_final_report", version 4.0, dated 09/06/2026, which constitutes the supporting project report for this EPD. The characterization has been carried out in accordance with EN 15804: 2012+A2: 2019 and, where applicable, using the characterization factors specified in EN 16757:2022 (e.g., additional factors for certain materials/flows), for consistency with the selected methodological framework. In addition, the impact assessment is based on the Environmental Footprint (EF) 3.1 characterization factors.

3.2. Declared unit

1000 kg (1 ton) of Green Spine Line® precast concrete prestressed structure.

3.3. Reference Service Life (RSL)

According to EN 16757: 2022, Product Category Rules for concrete and concrete elements, in table F.2, structural concrete elements have a Reference service life of 100 years.

3.4. Allocation criteria

Allocation is done according to EN 15804: 2012+A2: 2019 regulations.

Energy consumption, concrete/steel waste and other auxiliary materials such as anchoring for assembly on site and lifting hooks, are allocated in the different product groups depending on the total concrete volume produced for each of the groups.

3.5. Cut-Off Criteria

All input and output flows are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass. Background data from the Ecoinvent 3.11 database have been modelled using the "cut-off by classification" system model. This approach is consistent with the cut-off rules defined in EN 15804:2012+A2:2019, where primary (recycled) materials entering the system are considered burden-free, and recycling processes are allocated to the subsequent product system.

3.6. Representativeness, quality and selection of data

Primary data sources

The primary data used to compile the Life Cycle Inventory (LCI) are based on real plant data provided by Consolis Tecnyconta and correspond to the Green Spine Line® production of the year 2024.

These foreground data are obtained from monitoring and control processes within the production plant and are fully traceable.

In addition, supplier Environmental Product Declarations (EPDs) provided directly by Consolis Tecnyconta are considered primary data, as they are specific to the declared products and represent the actual production conditions.

Primary data include the following information:

- Types and quantities of raw materials used in the concrete mix design, as well as energy and water consumption during the manufacturing stage.
- Energy consumption associated with the production process.
- Waste generation data arising from the manufacturing activities.

The foreground data are considered representative of the actual operating conditions of the plant in terms of technical, geographical and temporal aspects, with Spain as the geographical scope for production, use and end-of-life stages.

Secondary data sources

When primary data were not available, secondary data were used. These data are based on generic datasets from the Ecoinvent database, version 3.11.

Secondary data were applied to model upstream processes related to raw material production, energy supply, transport and waste management. The Ecoinvent 3.11 database has an age of less than 10 years. Therefore, the overall data quality is considered good, in accordance with the data quality requirements established in EN 15804: 2012+A2: 2020, taking into account geographical, technical and temporal representativeness.

Data quality and representativeness

Inventory data	Geogra-phical	Techni-cal	Tempo-ral
Raw material supply (A1)	1.07	1.10	1.03
Transport (A2)	2.00	2.00	1.00
Manufacturing (A3)	2.50	2.47	1.76
Use stage (C1-C4)	1.85	1.62	1.00
Benefits and loads beyond the system boundary (D)	4.00	3.00	2.00

To assess the quality of the primary and secondary data used for the production of the declared precast concrete product, a semi-quantitative data quality evaluation approach was applied.

This assessment is based on the principles of the Data Quality Rating (DQR) framework recommended by the European Commission within the Product Environmental Footprint (PEF) and Organisation Environmental Footprint (OEF) guidance, adapted in accordance with the provisions set out in Annex E of the standard in EN 15804: 2012+A2: 2019.

Specifically, the evaluation follows the criteria defined in Table E.1 of Annex E, which establishes a semi-quantitative scoring system for geographical, technical and temporal representativeness in accordance with product category rules.

The data quality evaluation considers the following three criteria:

- Geographical representativeness
- Technical representativeness
- Temporal representativeness

The overall data quality rating obtained is 1.95, indicating a good level of data quality.

Furthermore, the share of primary data used in the EPD reaches 86.67%, ensuring a high degree of representativeness of the actual production conditions.

3.7. Other calculation rules and assumptions

- Average distance to construction sites is 222,8 km per ton of product. This distance has been calculated as a weighted average, considering the total number of truck trips to site, distance of them and tonnage transported to each site.
- Average energy consumption on site per ton of product has been calculated as the total consumption in a specific project divided by the total tons of products assembled on that site.
- Transport type has been determined to be EURO VI because most of the trucks owned by the regular logistic operator belong to this category.

4. System limits, scenarios and additional technical information

4.1. Pre-manufacturing processes (upstream) (A1-A2)

Raw materials are processed in the origin and transported to factory by generic trucks. Truck type is considered generic as all truck categories from suppliers are not known.

100% of electric energy consumption is coming from renewable sources, specifically hydroelectric power (Certified by Guarantees of origin), therefore the GWP of the specifically applied electricity mix is 0.0562 kg CO_2-eq/kWh (medium voltage).

4.2. Product manufacturing (A3)

First, reinforcement cages are placed on steel beds and strands are pulled through the reinforcement cages.

Reinforcement cages can be prepared in the factory or purchased as ready-made reinforcement cages. Both options are contemplated in this LCA.

Once the reinforcement and strands are in place, the latter are prestressed.

Afterwards, different components are placed, tying them to the cages. These components are necessary for lifting or assembling the elements, for example.

Finally, mould sides are placed around the cage and fixed to correct position.

Concrete raw materials are mixed in the mixer located in the batching and mixing plant. The resulting material (fresh concrete) is taken to the moulds by concrete distributors and poured in the mould. Concrete may be vibrated if necessary and always levelled to the mould edge.

Once the concrete has been poured, it must reach a minimum compressive strength to be able to demould. When the strength has been achieved, strands are cut, the mould sides are taken away and the pieces are lifted.

Last step is to take the element out from the production hall and transport it to the stockyard where it will wait until it is required on site.

4.3. Assembly process (A4-A5)

Elements are transported to site on trucks. Average distance to site is 222,8 km per ton of product. This distance has been calculated as a weighted average, considering the total number of truck trips to site, distance of them and tonnage transported to each site. Transport type has been determined as EURO VI because most of the trucks owned by logistic operator belong to this category.

Stage information	Unit (expressed by functional unit or per declared unit)
Fuel type and consumption of the vehicle, type of vehicles used for transport (e.g. long-distance truck, ship, etc.)	EURO VI truck
Average distance	222,8 km
Capacity utilisation (including empty return)	53%
Bulk density of transported products	2510 kg/m3
Capacity utilisation factor (factor = 1 or < 1 or ≥ 1 for products packaged in compressed or nested form)	Not applicable

Once on site, using a telescopic crane (or two, if it is necessary because of weight and/or size), the element is lifted into its final assembly position.

The average energy consumption on site per ton of product has been calculated as the total consumption in a specific project divided by the total tons of product assembled on that site.

When the element has been located, it is connected to the support via anchoring systems to keep it in the final position.

Module A5 - Installation

Stage information	Unit (expressed per functional unit or per declared unit)
Use of fuel in assembly site	0.63 l

No significant losses or waste are generated during installation; therefore, a zero-waste rate is assumed for module A5.

4.4. Use stage (B1-B7)

Modules B1–B7 are not relevant for the declared product, as no emissions or environmental impacts occur during the use phase. No maintenance, repair, replacement or refurbishment operations are required under normal conditions of use, and the product does not consume energy or water during its service life.

4.5. End of life stage (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA.

The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

Energy consumption for demolition of precast products is based on the report NR U 5176 report made by IVL Swedish Environmental Research Institute (Erlandsson and Petersson, 2015).

In this report, it is stated that for the demolition of a precast concrete structure 10 kWh/ton of product are consumed, which equals to 1.066 litres of diesel (10kWh*3.6 (MJ per kWh)/35.8 (MJ per litre of diesel)).

Generally, pieces of precast concrete in the end of life can be crushed and separated in two major constituents:

- Concrete. Once crushed it can be used as aggregate, ballast or other construction purposes.
- Steel. It can be recycled.

According to NR U 5176 report made by IVL Swedish Environmental Research Institute (Erlandsson and Petersson, 2015), necessary energy to crush precast concrete pieces is 2 kWh/ton.

After demolition and transport of the waste streams to the applicable waste processing routes, the waste is processed for final disposal or recycling and/or reuse.

Precast concrete elements can be reused/recycled almost in full. For concrete, it can be considered that 99% of waste is reused/recycled and just 1% goes to landfill.

For steel, 95% is recyclable and 5% is considered to go to landfill at the end of life.

Some waste streams are not recycled or used for energy recovery; instead, they are finally disposed of (e.g., landfill). This also includes cases where the product is not removed and remains in the work/site. The following amounts apply for each final disposal stream for the product.

End of life

Material	Unit (expressed by functional unit)
Energy used in demolition	1.066 l
Amount of final product that goes to recycling (once it is separated in two major constituents)	Concrete: 928.49 kg
	Steel: 53.06 kg
	Anchors, lifting devices, etc.: 6.21 kg
Amount of final product that goes to landfill (once it is separated in two major constituents)	Concrete: 9.38 kg
	Steel: 2.79 kg

4.6. Benefits and charges beyond the system (D)

This module considers all benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

In this study, Module D includes the benefits associated with the recycling of materials generated in both the production stage (Module A3) and the end-of-life processing stage (Module C3).

From Module A3, the following material flows are considered:

- Concrete waste
- Scrap metal
- Waste oils

From Module C3, the following material flows are considered:

- Construction and demolition waste (concrete rubble)
- Scrap and mixed metals, including steel, aluminium and anchorage elements

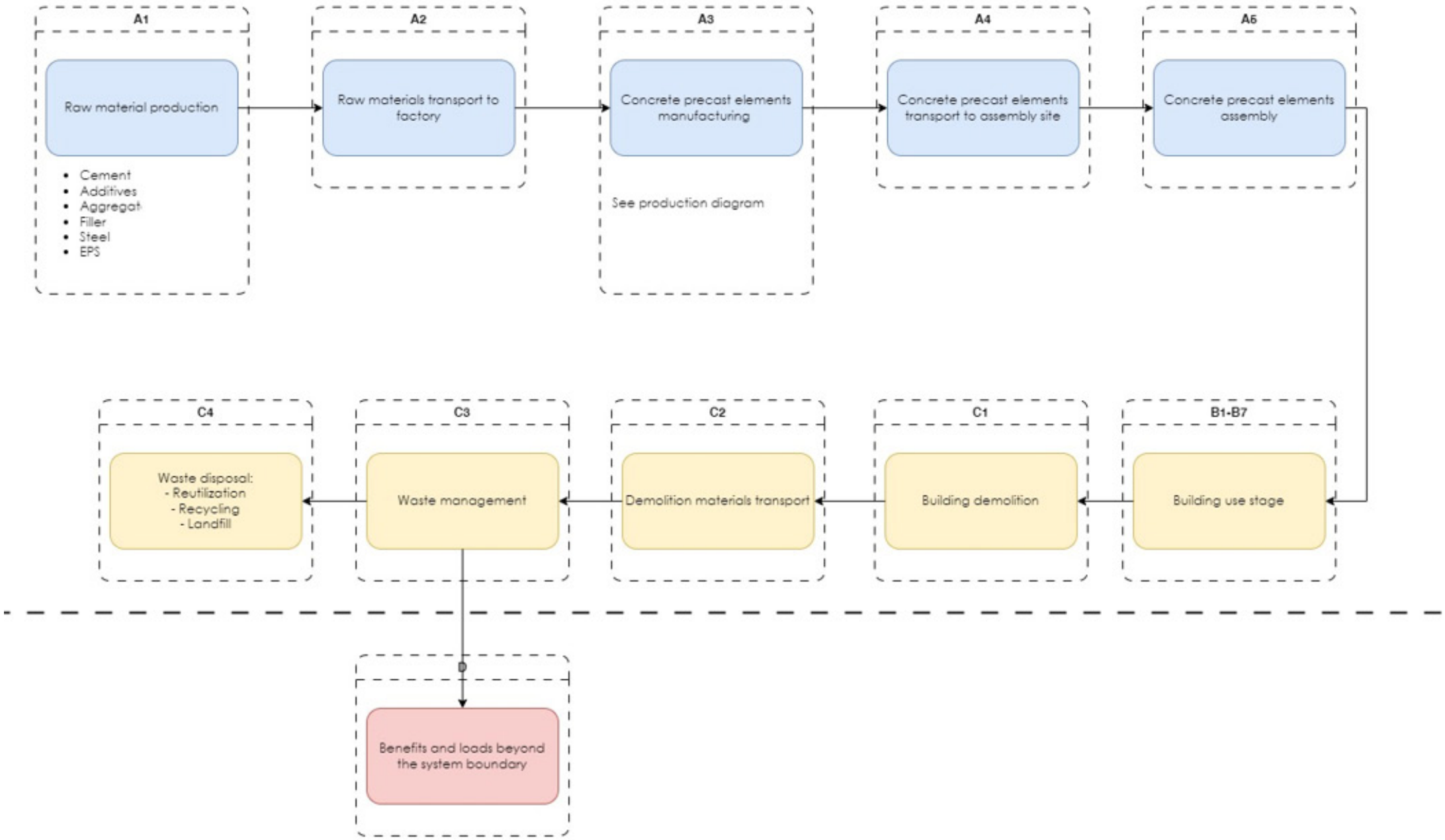
The recycling rates applied are:

- Concrete: 85%
- Scrap metal: 81%
- Waste oils: 61%

These recycling rates are based on Eurostat statistical data and are applied consistently to calculate the avoided production of primary materials outside the system boundary.

The environmental benefits reported in Module D represent the avoided impacts from the substitution of primary materials with recycled materials, following the requirements of EN 15804.

Material	Kg per ton of product
Avoided primary material; Recycling	988.67
Avoided primary material; Reuse	0
Net output flow	988.67


A1
Raw material production
Cement
Additives
Aggregat
Filler
Steel
EPS
A2
Raw materials transport to factory
A3
Concrete precast elements manufacturing
See production diagram
A4
Concrete precast elements transport to assembly site
A5
Concrete precast elements assembly
B1-B7
Building use stage
C1
Building demolition
C2
Demolition materials transport
C3
Waste management
C4
Waste disposal:
- Reutilization
- Recycling
- Landfill
D
Benefits and loads beyond the system boundary

5. Declaration of the environmental parameters of the ACV and the ICV

Environmental impacts

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

Parameter	units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	1.28E+02	4.06E+00	1.09E+01	1.43E+02	1.69E+01	2.11E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.34E+00	6.11E+00	1.35E+01	3.23E-01	-8.82E+00
GWP-fossil	kg CO_2 eq	1.27E+02	4.06E+00	1.09E+01	1.42E+02	1.69E+01	2.11E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.34E+00	6.11E+00	1.35E+01	3.08E-02	-8.78E+00
GWP-biogenic	kg CO_2 eq	4.13E-01	9.44E-04	2.47E-02	4.39E-01	3.93E-03	3.27E-04	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	5.18E-04	1.42E-03	5.92E-02	2.93E-01	-3.38E-02
GWP-luluc	kg CO_2 eq	2.49E-01	6.64E-05	4.74E-03	2.53E-01	2.76E-04	2.45E-05	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.87E-05	1.00E-04	4.12E-03	1.56E-06	-6.49E-03
ODP	kg CFC11 eq	7.34E-06	9.54E-08	4.10E-07	7.85E-06	3.97E-07	4.72E-08	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.48E-08	1.44E-07	2.99E-07	4.43E-10	-5.93E-08
AP	mol H+ eq	2.28E-01	5.17E-03	6.04E-02	2.93E-01	2.15E-02	1.98E-02	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.14E-02	7.78E-03	1.12E-01	2.77E-04	-4.52E-02
EP-freshwater	kg P eq	6.94E-03	2.59E-06	1.11E-04	7.05E-03	1.08E-05	9.63E-07	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.52E-06	3.91E-06	2.18E-04	1.01E-07	-3.60E-04
EP-marine	kg N eq	1.01E-01	1.15E-03	2.71E-02	1.30E-01	4.79E-03	9.36E-03	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.49E-02	1.73E-03	4.18E-02	1.26E-04	-1.12E-02
EP-terrestrial	mol N eq	7.79E-01	1.25E-02	2.85E-01	1.08E+00	5.20E-02	1.02E-01	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.63E-01	1.88E-02	4.56E-01	1.39E-03	-1.24E-01
POCP	kg NMVOC eq	2.76E-01	1.02E-02	9.09E-02	3.77E-01	4.23E-02	3.05E-02	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.85E-02	1.53E-02	1.45E-01	4.20E-04	-4.06E-02
ADP-minerals& metals [2]	kg Sb eq	2.19E-04	1.10E-07	5.09E-06	2.24E-04	4.56E-07	5.42E-08	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	8.60E-08	1.65E-07	1.23E-06	1.02E-09	-1.16E-06
ADP-fossil [2]	MJ	5.77E+02	5.58E+01	1.13E+02	7.45E+02	2.33E+02	2.74E+01	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.34E+01	8.41E+01	2.27E+02	3.94E-01	-1.11E+02
WDP [2]	m^3	1.45E+02	1.83E-02	1.04E+01	1.55E+02	7.61E-02	8.24E-03	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.31E-02	2.75E-02	-4.71E+01	3.45E-04	-1.20E+01

GWP - Total: Global Warming Potential; **GWP** - fossil: Global warming potential of fossil fuels; **GWP** - biogenic: Biogenic Global Warming Potential; **GWP** - luluc : Global warming potential of land use and land use change; **ODP**: Stratospheric Ozone Depletion Potential; **AP**: Acidification potential, accumulated surplus; **EP-freshwater**: Eutrophication potential, fraction of nutrients that reach the final freshwater compartment; **EP-marine:** Eutrophication potential, fraction of nutrients that reach the final compartment of seawater; **EP-terrestrial:** Eutrophication potential, cumulative surplus; **POCP**: tropospheric ozone formation potential; ADP-minerals&metalsAbiotic resource depletion potential for non-fossil resources; **APD-fossil:** Abiotic Resource Depletion Potential for fossil resources; **WDP**: Water deprivation potential (user), weighted water deprivation consumption. **NR**: Not relevant

Additional environmental impacts

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	disease incidence	1.60E-06	3.19E-07	1.82E-06	3.73E-06	1.33E-06	5.71E-07	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.07E-07	4.80E-07	9.50E-06	7.86E-09	-7.57E-07
IRP [1]	kBq U235 eq	4.65E+00	5.36E-03	1.68E-01	4.82E+00	2.23E-02	1.95E-03	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.09E-03	8.08E-03	2.82E-01	3.90E-05	-3.00E-01
ETP-fw [2]	CTUe	2.93E+02	2.25E+00	3.83E+01	3.34E+02	9.38E+00	6.08E-01	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	9.60E-01	3.39E+00	5.54E+01	1.51E-02	-1.76E+01
HTP-c [2]	CTUh	1.01E-07	2.70E-10	4.34E-09	1.06E-07	1.13E-09	1.06E-10	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.68E-10	4.07E-10	2.16E-09	2.12E-12	-3.72E-09
HTP-nc [2]	CTUh	7.79E-07	3.49E-08	4.13E-08	8.55E-07	1.45E-07	1.99E-09	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	3.05E-09	5.26E-08	1.24E-07	4.07E-11	-3.29E-08
SQP [2]	-	1.08E+02	7.10E-02	1.37E+01	1.22E+02	2.96E-01	2.68E-02	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	4.24E-02	1.07E-01	2.04E+02	4.65E-01	-5.89E+01

PM: Potential incidence of diseases due to particulate matter (PM) emissions; **IRP** : Human Potential Exposure Efficiency Relative to U235; **ETP-fw** : Comparative Ecosystem Toxic Unit Potential - Freshwater; **HTP-c :** Comparative Ecosystem Toxic Unit Potential - Carcinogenic Effects; **HTP-nc** : Comparative Ecosystem Toxic Unit Potential - Non-Carcinogenic Effects; **SQP** : Soil quality potential index.; **NR**: Not relevant

Notice 1: This impact category deals mainly with the eventual impacts of low doses of ionizing radiation on human health, from the nuclear fuel cycle. It does not consider the effects due to possible nuclear accidents or occupational exposure due to the disposal of radioactive waste in underground facilities. The ionizing radiation potential of the ground, due to radon or from some construction materials, is not measured with this parameter either.

Warning 2: The results of this indicator of environmental impact should be used with caution, since the uncertainties of the results are high and the experience with this parameter is limited.

Use of resources

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.17E+02	1.39E-01	3.41E+00	1.21E+02	5.80E-01	4.98E-02	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.88E-02	2.10E-01	8.64E+00	1.85E-03	-8.82E+00
PERM	MJ	5.41E-01	0.00E+00	0.00E+00	5.41E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.18E+02	1.39E-01	3.41E+00	1.21E+02	5.80E-01	4.98E-02	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	7.88E-02	2.10E-01	8.64E+00	1.85E-03	-8.82E+00
PENRE	MJ	5.97E+02	3.73E-04	1.38E+01	6.11E+02	1.56E-03	1.16E-04	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.83E-04	5.62E-04	3.09E-02	2.39E-06	-1.24E-02
PENRM	MJ	3.78E+02	0.00E+00	1.29E+01	3.90E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	9.76E+02	3.73E-04	2.67E+01	1.00E+03	1.56E-03	1.16E-04	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.83E-04	5.62E-04	3.09E-02	2.39E-06	-1.24E-02
SM	kg	3.99E+01	0.00E+00	1.19E+00	4.11E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	1.65E+02	0.00E+00	5.95E+00	1.71E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	1.39E+02	0.00E+00	5.03E+00	1.44E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	4.18E+00	1.08E-03	2.07E-01	4.39E+00	4.50E-03	3.56E-04	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	5.62E-04	1.63E-03	-1.00E+00	1.33E-05	-2.90E-01

PERE : Use of renewable primary energy excluding primary renewable energy resources used as raw material; **PERM**: Use of primary renewable energy used as raw material; **PERT**: Total use of primary renewable energy; **PENRE**: Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials; **PENRM**: Use of non-renewable primary energy used as raw material; **PENRT**: Total use of non-renewable primary energy; **SM**: Use of secondary materials; **RSF**: Use of renewable secondary fuels; **NRSF**: Use of non-renewable secondary fuels; **FW**: Net use of running water resources; **NR**: Not relevant

Waste categories

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	1.24E-01	3.18E-05	6.05E-03	1.30E-01	1.33E-04	1.04E-05	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.64E-05	4.79E-05	3.78E-02	6.72E-07	-2.44E-03
NHWD	kg	1.35E+01	1.85E-03	1.70E+01	3.05E+01	7.69E-03	7.63E-04	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.21E-03	2.78E-03	3.74E+02	1.13E+01	-1.10E-01
RWD	kg	8.48E-03	3.37E-06	2.03E-04	8.69E-03	1.40E-05	1.12E-06	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	1.78E-06	5.07E-06	2.22E-04	2.23E-08	-1.95E-04

HWD: Hazardous Waste Disposed; **NHWD**: Non-hazardous waste disposed of; **RWD**: Radioactive waste disposed of; **NR**: Not relevant

Output flows

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	5.04E+00	0.00E+00	1.50E+00	6.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	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	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	MJ	1.05E-03	0.00E+00	0.00E+00	1.05E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU: Components for reuse; **MFR**: Materials for recycling; **MER**: Materials for energy recovery; **EE**: Exported energy; **NR:** Not relevant

Biogenic carbon content information

Biogenic carbon content	Units	Result per functional unit or declared unit
Biogenic carbon content of the product - KgC	Kg C	0.00E+00
Biogenic carbon content of the packaging - KgC	Kg C	0.00E+00

6. Additional environmental information.

The factory located in Tauste holds management systems according to ISO 9001, ISO 14001 and ISO 45001. Additionally, all precast products hold the the AENOR Sustainable N Mark.

References

[1] Standard UNE-EN 15804:2012+A2:2020. Sustainability in construction. Environmental product declarations. Basic product category rules for construction products.

[2] General Instructions of the GlobalEPD Program, 3rd Revision. AENOR. October 2023.

[3] Standard UNE-EN ISO 14025:2010. Environmental labels and declarations. Type III environmental declarations. Principles and procedures. (ISO14025:2006)

[4] Rule UNE-EN ISO 14040 Standard. Environmental Management. Life cycle analysis. Principles and frame of reference. 2006.

[5] Rule UNE-EN ISO 14044 Standard. Environmental Management. Life cycle analysis. Requirements and guidelines. 2006.

[6] Life Cycle Assessment Report for the EPDs of Consolis Tecnyconta's reinforced precast concrete structure. Written by CIRCE, June 2026.

[7] UNE-EN 16757 – Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements.

[8] UNE-EN 16757 – Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements

[9] PCR 2019:14 Construction Products (EN 155804+A2) v2.0.1

[10] General Programme Instructions (GPI) for the International EPD System, version 5.0.1

[11] UNE-EN 15941. Sustainability of construction works. Data quality for environmental assessment of products and construction work. Selection and use of data.

[12] PRé Sustainability B.V. (2025). SimaPro Craft v10.2.0.1 – Life Cycle Assessment Software. Amersfoort, The Netherlands.

[13] Ecoinvent Association (2024). Ecoinvent database v3.9.1. Zurich, Switzerland

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GlobalEPD