

Environmental Product Declaration

Under the general rules of the Environmental Footprint Institute and PCR3100: Construction products in general (Accordance with ISO14040, ISO14044, ISO14025, EN15804:2012 +A2:2019/AC:202) and EN 16757:2023 for:

READY MIX CONCRETE - C40

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An Environmental Footprint (EF) 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.environmentalfootprintinstitute.org

Manufactured in Saudi Arabia and distributed in Saudi Arabia and foreign countries.



شركة الخرسانة جاهزة الصب المحدودة
Ready Mix Company Limited

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1. Introduction

This report contains the environmental performance of the manufacturing process of the Ready Mix Concrete produced by Premco Ready Mix. This Environmental Product Declaration (EPD) has been developed using the Life Cycle Assessment (LCA) methodology. The environmental impact values calculated are expressed per **1 Cubic Meter (m³)** of ready mix concrete. The assessed life cycle includes all phases in the manufacturing process of the ready mix concrete within a “cradle to gate with options” scope.

This LCA covers the transportation of raw materials, production, distribution of the final product to the customer, and end-of-life stages. This EPD has been conducted according to the Environmental Footprint Institute regulations, and it has been certified and registered with The Environmental Footprint Institute. The EPD regulation is a system for the international use of Type III Environmental Declarations, according to ISO 14025:2006. Both the system and its applications are described in the Programmer's General Indications (PGI). This report has been prepared following the specifications provided in the European standard EN 15804:2012+A2:2019/AC:2021 and EN 16757:2022. Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements.

2. Company Information

2.1 About Premco Ready Mix

Premco Ready Mix Co (PRMC) is a part of Construction Products Holding Company (CPC). It established in early 2008 with the aim of meeting the booming construction needs in Saudi Arabia and maintaining the high quality standards and supplying the readymix concrete in compliances to Local and International Standards through the expertise of professional personnel.

Premco Ready Mix Co. supplied concrete to nearly all the big projects in various parts of Saudi Arabia including Jeddah, Makkah, Madina, Riyadh, Taef, Al-Hasa. PRMC is fully equipped to meet any volume and technical heights required by its customers. PREMCO Ready Mix Co. believes in establishing long term strategic relationship with customers to ensure that customer's latent and expected needs are well met to get optimum satisfaction. Premco Ready Mix has fully operational workshop providing tremendous servicing schedule and un-schedule preventive and corrective maintenance for all the vehicles and plants. Premco Ready Mix have the most advanced and modern equipped laboratory with highly qualified technical staff that has the ability to perform and ensure QA/QC functions to confirm the quality of product and required services to our customers at all time.

2.2 Sustainable practices

Premco Ready Mix is committed to integrating sustainability into its operations by upholding the highest standards of quality, safety, and environmental responsibility. The company holds prestigious certifications, including ISO 9001:2015, ISO 14001:2015, and OHSAS 18001, as part of its integrated management system, ensuring excellence in quality, health and safety, and environmental management.



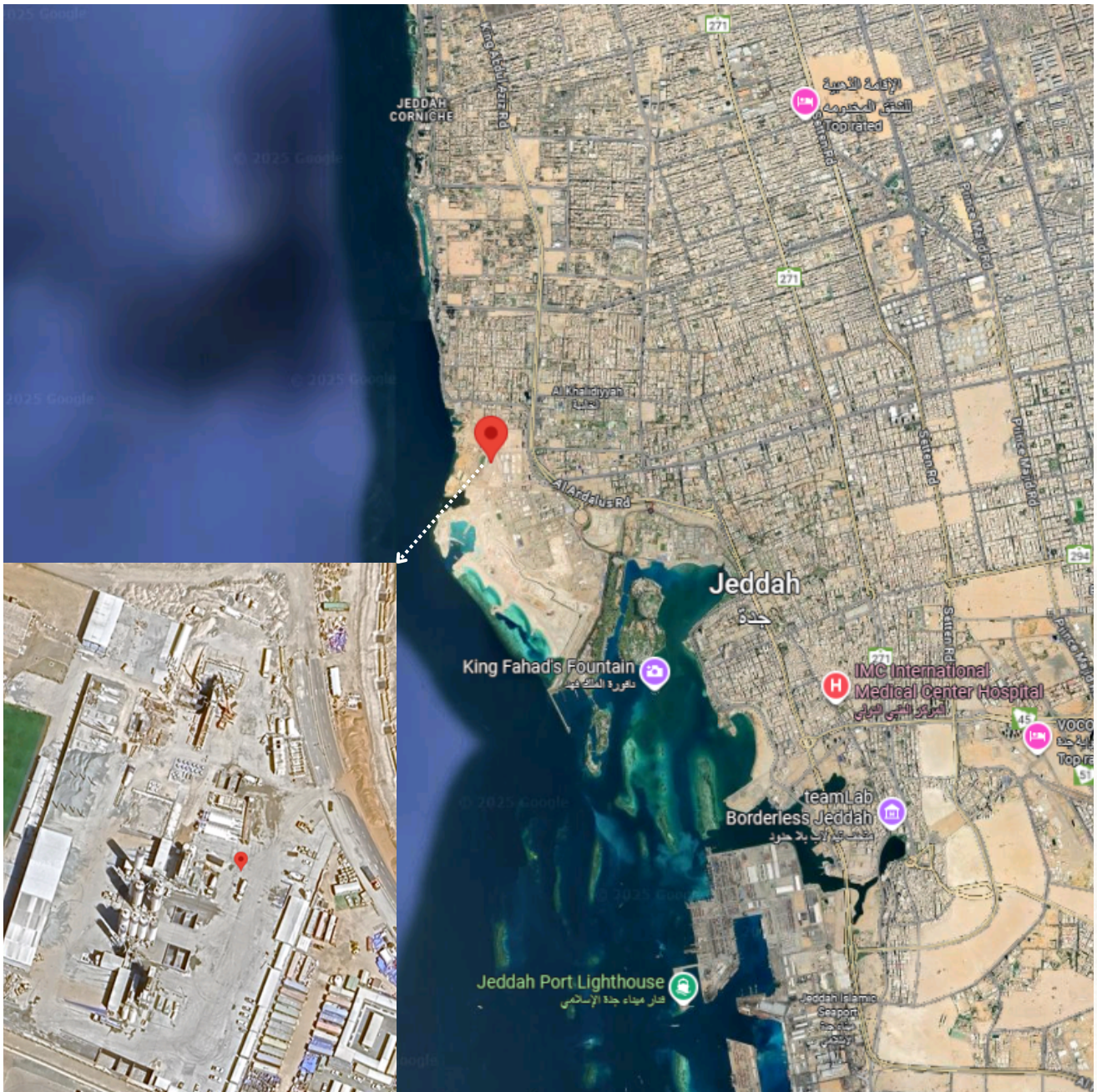
In addition, Premco Ready Mix has received the SASO Quality Mark, certified by the Saudi Standards, Metrology and Quality Organization, further reinforcing its commitment to sustainable practices and compliance with both national and international standards.

In its pursuit of sustainability, Premco Ready Mix actively implements eco-efficient practices, optimizes resource utilization, and minimizes environmental impact across its concrete production processes. The company's products are designed to contribute to internationally recognized green building standards such as LEED (Leadership in Energy and Environmental Design) and BREEAM (Building Research Establishment Environmental Assessment Method), supporting developers and contractors in achieving their sustainability goals. By delivering high-quality ready-mix solutions, Premco not only supports the growth of modern infrastructure but also prioritizes environmental responsibility. The company strives to promote sustainable construction practices, foster innovation in the industry, and establish itself as a trusted leader that values both customer satisfaction and environmental stewardship.

2.3 Geographical Location

The Premco Ready Mix manufacturing facility is located in Jeddah, Saudi Arabia. This site serves as the dedicated production unit for ready-mixed concrete and is the sole facility covered within the scope of this Environmental Product Declaration

- Latitude: 21°32'59.6"N
- Longitude: 39°07'07.8"E





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3. Product Information



3.1 Product Description

Premco Ready Mix manufactures and supplies ready-mixed concrete designed to meet the requirements of diverse construction projects across Saudi Arabia. The product is produced in fully computerized Liebherr batching plants with a total capacity of 120 m³ per hour per plant, ensuring consistency, precision, and reliability.

The concrete mixes are prepared using high-quality cement, aggregates, admixtures, and water in compliance with Saudi Standards, ASTM, and international specifications. Each batch is supported by automated control systems and batch reports, with strict quality control procedures covering raw materials, fresh concrete properties, and hardened concrete performance.

Premco Ready Mix offers a wide range of concrete grades and specialty mixes, including high-strength concrete, self-compacting concrete (SCC), and temperature-controlled mixes produced with in-house ice plants and chillers. The product is supported by advanced laboratory testing and plant trials to guarantee compliance with project-specific requirements.

By combining state-of-the-art equipment, skilled technical staff, and rigorous quality assurance, Premco Ready Mix concrete ensures superior workability, durability, and performance for infrastructure, commercial, industrial, and residential applications.

Premco Ready Mix Concrete is produced through a streamlined process that begins with sourcing high-quality materials like OPC, fly ash, micro silica, GGBFS, aggregates, and admixtures from trusted suppliers. These components are precisely weighed in dedicated hoppers and tanks before being thoroughly mixed to ensure consistent quality. The fresh concrete is then transported directly to the client's job site via transit mixers to maintain freshness. The operation is supported by a commitment to quality control and environmental responsibility, with dedicated internal and external waste areas for managing test samples and non-usable material.

The following C40 concrete mixes are produced by Prem co Ready Mix:

- (026) C40 - 34% OPC + 60% GGBFS + 6% MS + CI
- (037) C40 - 63% SRC + 30% FA + 7% MS + SR + PRAN + PRAH
- (032) C40 - 63% SRC + 30% FA + 7% MS + CI
- (030) C40 - 54% OPC + 40% GGBFS + 6% MS + SR + PRAH + PRAN
- (020) C40 - 65% GGBFS + SR + PRAN



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Premco Ready Mix – Plant and Operations



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هاتف ٥٣٣٢ ١٢ ٢٨٨ +٩٦٦ - فاكس ١٧٣١ ١٢ ٢٨٨ +٩٦٦

3.2 Technical characteristics of Raw Materials

Raw Materials for Ready Mix Concrete:

Premco Ready Mix concrete is manufactured using a carefully controlled selection of raw materials to ensure consistent quality, durability, and compliance with international standards.

Compliance with Standards

All raw materials used in Premco Ready Mix concrete are tested and verified in accordance with ASTM (American Society for Testing and Materials) and EN (European Norms) standards, ensuring international quality alignment.

- **ASTM Standards:** Define detailed testing protocols and permissible limits for cement (ASTM C150, C595), supplementary cementitious materials (ASTM C618, C989), aggregates (ASTM C33), water (ASTM C1602), and admixtures (ASTM C494).
- **EN Standards:** Provide equivalent benchmarks (e.g., EN 197 for cement, EN 934 for admixtures, EN 12620 for aggregates), widely recognized across Europe and internationally.



By following ASTM and EN standards, Premco ensures that every raw material batch meets strict quality, safety, and durability requirements, forming a consistent and reliable concrete product.

Safety Compliance

Premco Ready Mix concrete is produced using Sulphate Resisting Cement (SRC) as the primary binder, fully compliant with ASTM and Saudi Standards, with alkalis, sulfates, and chlorides maintained below permissible limits. Supplementary cementitious materials such as microsilica, fly ash, and occasionally GGBFS are used to enhance strength, workability, durability, and resistance to chemical attack, in line with ASTM C618 and C989 specifications. Locally sourced coarse aggregates (apparent relative density 2.9–2.96, absorption 0.6%, chlorides $\leq 0.03\%$, sulfates $\leq 0.02\%$) and natural sand are tested regularly, meeting ASTM C33 requirements. Potable mixing water is used, free from oils, acids, and harmful salts, with chloride and sulfate levels compliant with ASTM C1602. A controlled range of admixtures including high-performance superplasticizers, shrinkage-reducing agents, waterproofing/crystalline additives, and corrosion inhibitors are incorporated in line with ASTM C494 and EN 934-2 standards to further improve durability and performance.

4. LCA Information



4.1 Declared Unit

The Declared Unit of the Life Cycle Assessment is one cubic meter (**1 m³**) of ready-mix concrete, produced and supplied by Premco Ready Mix at its manufacturing facility in Jeddah, Saudi Arabia. All direct and indirect environmental impacts, as well as resource consumption, are reported relative to this unit. The declared unit is defined based on the average production data of the Ready Mix Concrete C40, which will influence the product variation. The average mass of the declared unit is **2333.4 kg/m³**

Name of Product	Declared Unit	Weight (Kg)
Ready Mix Concrete C40	1 m ³	2333.4

4.2 System boundaries

This EPD covers all product stages from “**cradle to grave**”, meaning the Life Cycle Assessment (LCA) includes the Production stage (A1–A3), Construction Stage (A4–A5), Use Stage (B1–B7), End-of-Life stages (C1–C4), and Resource Recovery stage (D), in accordance with EN 15804 + A2/AC:2021 and EN 16757:2022. Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements. Although EN 16757 allows for the inclusion of carbonation of concrete during the use stage, this EPD has opted not to include carbonation effects within the system boundaries.

The system boundaries of this environmental study encompass not only the processes directly controlled by Premco Ready Mix but also upstream and downstream activities such as raw material extraction, processing, fuel supply, and transportation. All related direct and indirect environmental impacts associated with these activities have been calculated and are included in the Life Cycle Assessment (LCA) within this EPD.

Possible scopes of the LCA defined in the European standard EN 15804:2012+A2:2019 are:

	Product stage			Constructi on 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	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB
Specific data used	7.5%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation Prodcuts	-28%; +5%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation sites	N			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X = Included, N = Module not declared, GB = Global

Modules from A5, B1 to B7 are not declared (X refers to considered stage, N refers to not declared stage). In the following schemes, the modules are linked to the real phases of the manufacturing and distribution process.

4.3 Time Representativeness

Facility-specific data for Premco Ready Mix have been collected as a 12-month average covering the period January 2024 to December 2024. The following rules for the time scope of data were applied: <10 years for background data and <2 years for manufacturer's data.

4.4 Content declaration

The following list includes the main components and materials used in the manufacturing of 1 cubic meter of ready mix concrete.

MATERIAL	Kg / m ³	%
Cement	279.1	12.0%
Microsilica	31.8	1.4%
Fly Ash	130.9	5.6%
GGBFS	8.2	0.3%
Water	150.0	6.4%
Aggreggates	1000.0	42.9%
Sand	719.7	30.8%
Admixtures	13.7	0.6%
TOTAL	2333.4	100%

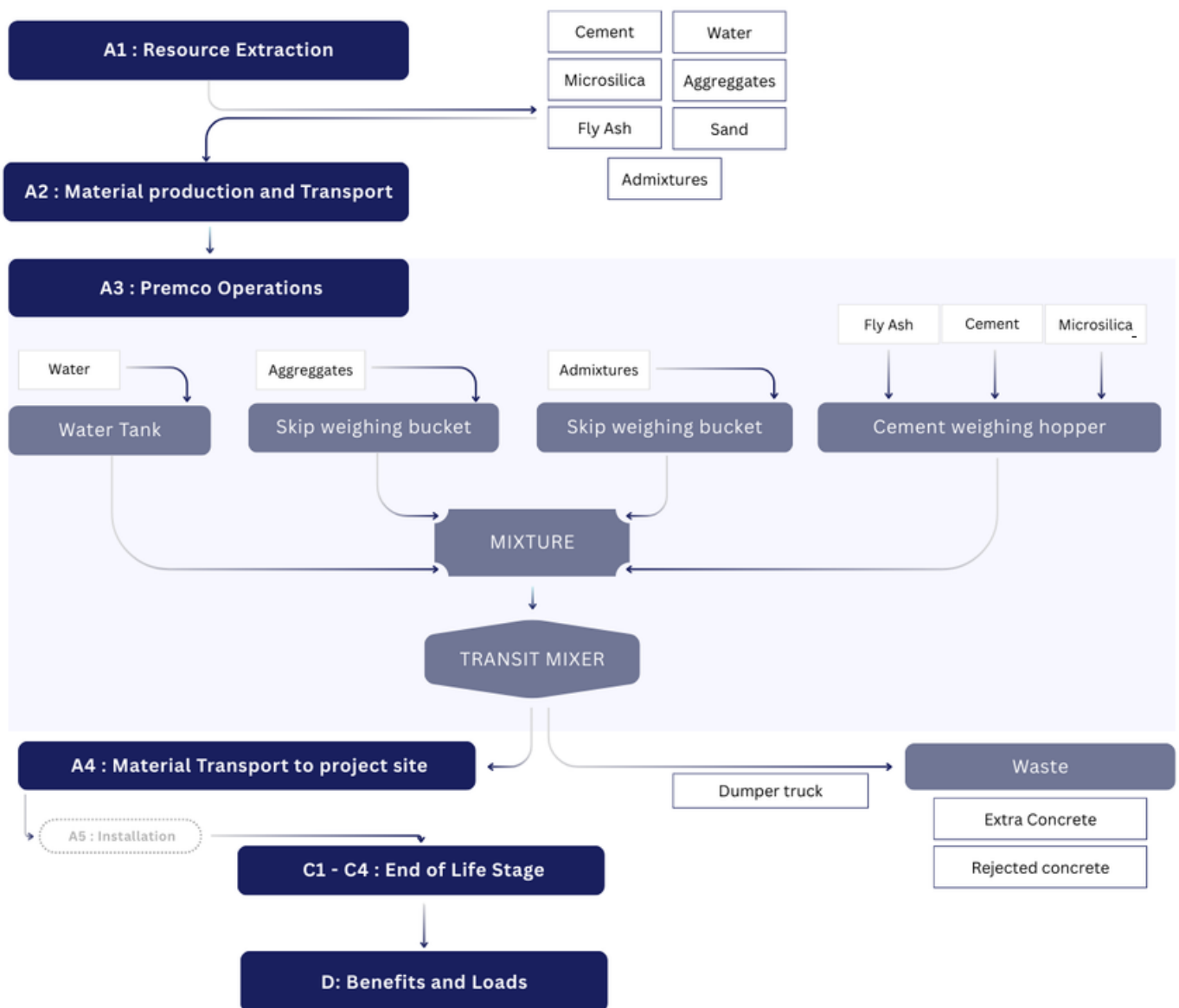
This EPD is developed based on a production volume of the five different mixes within the C40 concrete type with a strength of 40 MPa. The product was determined based on the mass of materials purchased divided by the total production. Accordingly, this EPD is classified as an **EPD of multiple products, based on the average results.**

Ready-mix concrete is supplied as a bulk material, mixed, transported, and delivered directly in the drum of a transit mixer truck, without any form of packaging. Therefore, no environmental impacts arise from the production, use, or disposal of packaging materials. Accordingly, the assessment and reporting of biogenic carbon content—typically relevant to plant-based packaging materials—are not applicable. Furthermore, no substances included in the Candidate List of Substances of Very High Concern (SVHC) for Authorization are present in the product.

4.5 LCA Software and Database

Version 3.19.5.0 of software Air.eLCA™ with Ecoinvent™ 3.11.0 database has been used for LCA modeling and impacts calculations. EN15804 system model is used in this LCA. The scope of this EPD is "cradle to gate with options". Possible scopes of the LCA defined in EN 15804:2012+A1:2014

4.6 Product Stage





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A1. Raw Material Extraction

The main raw materials used in Premco Ready Mix concrete production are cement, microsilica, fly ash, water, aggregates, sand, and admixtures. This stage includes the impacts associated with the production of cement and supplementary cementitious materials, the extraction and processing of aggregates and sand, the supply of water, and the manufacture of admixtures.

A2. Transport

This stage accounts for the transportation of raw materials to the manufacturing plant.

A3. Manufacturing

A Premco Ready Mix concrete batching plant consists of computerized mixers where cementitious materials cement, fly ash, micro silica, , aggregates, water, and admixtures are precisely weighed and mixed in specific proportions to produce concrete with specific technical characteristics. The cementitious materials are stored in separate silos and added to the mixer via screw conveyors, while water and admixtures are delivered via pumps. Aggregates of different granulometry are stored in distinct, segregated bins. After mixing, the fresh concrete is loaded into transit mixer trucks and delivered to construction sites within the specified timeframe of up to 1 hour 30 minutes under normal conditions, with a maximum limit of 2 hours.

A4. Transport

This stage involves the transportation of ready mix concrete to the construction site via Road.

A5. Installation

The A5 module covers processes related to the construction or installation of the product, including transportation to the site, placement, and any associated waste or energy use during installation. For ready-mix concrete, these activities are performed by third parties (contractors), and the manufacturer does not have operational control over this stage. Therefore, no environmental impacts are assigned to module A5 within the defined system boundaries.

B1 to B7: Use Stage

The use stage (B1–B7) covers the use, maintenance, repair, replacement, refurbishment, operational energy use, and operational water use of the product. For ready-mix concrete, these processes are not applicable within the defined system boundaries, as the carbonation of cement during the use phase has not been considered. Therefore, no environmental impacts are assigned to modules B1–B7.

C1. Deconstruction/Demolition

This stage covers the deconstruction and demolition of structures containing ready-mix concrete. The process generally involves mechanical dismantling and crushing using standard demolition equipment. Fuel consumption during demolition is considered through the use of diesel-powered machinery, and is calculated relative to the dismantled mass of concrete. The consumption of diesel is included in the assessment, in line with common practice for concrete products.

C2. Transport (Waste)

This stage refers to the transport of demolished concrete from the demolition site to the waste processing facility. A conservative transport distance of 50 km by lorry (16–32 metric tons) has been assumed for this assessment.

C3. Waste Processing

This stage involves the handling and processing of concrete fractions after deconstruction. The collected material is transported to a recycling facility where it is mechanically crushed and prepared for reuse or recovery. For this assessment, it is assumed that 20% of the demolished concrete is recycled into secondary materials, while the remainder proceeds to disposal.

C4. Disposal

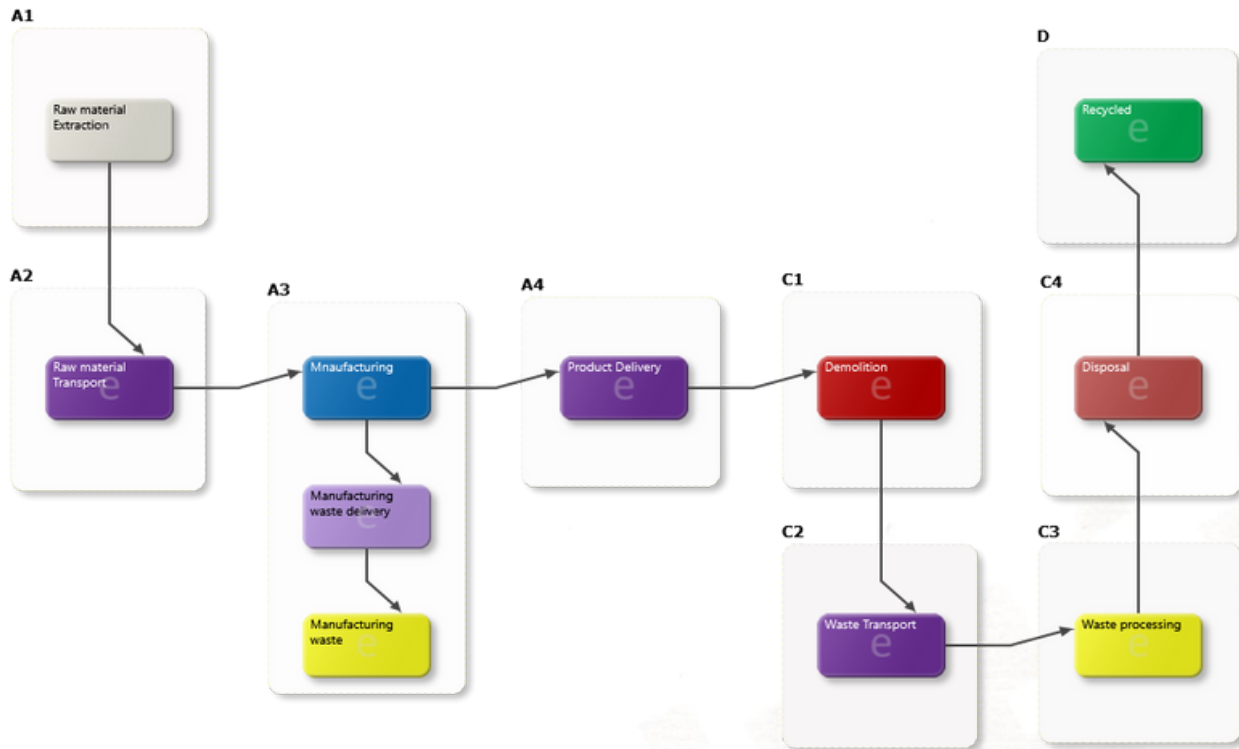
This stage accounts for the disposal of concrete waste that is not recovered or recycled. For this assessment, it is assumed that 80% of the demolished concrete is landfilled, representing the fraction of material that cannot be reused as secondary raw material

D. Benefits and Loads

Module D accounts for the potential benefits of recycling ready-mix concrete at the end of life. For this assessment, it is assumed that 50% of demolished concrete is recycled into secondary crushed concrete aggregate. The recycled material is considered to substitute natural aggregates in applications such as road base, backfilling, or other non-structural uses permitted locally. The avoided impacts from the extraction and processing of primary aggregates are credited as benefits beyond the system boundary

All material and energy flows contributing to Module D have been modeled and calculated using the Air.e LCA software, ensuring consistency, traceability, and compliance with EPD requirements. The tool provides transparent documentation of recycling rates, substitution values, and emission factors applied in the assessment.

Air.e LCA analysis



5. LCA Modelling



5.1 Calculation Methodology

This EPD represents a Type III Environmental Declarations according to ISO 14025:2006. The Life Cycle Assessment (LCA) has been developed following the ISO 14040 International Standard. The environmental impacts calculation method reported in this EPD follows the EF 3.1(ILCD). The report has been done following the specifications given in the European Standard EN 15804:2012+A2:2019/AC:2021, as Product Category Rules.

5.2 Emission Factors

Emission factors and environmental impacts of elements in life cycles that are not directly controlled by PREMCO, It have been analyzed using external studies and external emissions factors databases like Ecoinvent™ due to the lack of direct data. The next paragraphs describe the calculation rules and criteria applied in the calculation of the environmental performance of this type of element in the LCA.

5.3 Raw Materials and Chemicals

Datasets from Ecoinvent™ 3.11 with emission factors for raw materials have been characterized and adjusted to reflect the specific manufacturing processes of Premco, as well as the geographical locations of suppliers. Additionally, wherever available, supplier-specific emission data have been extracted from their Environmental Product Declarations (EPDs) to enhance accuracy. For ready mix concrete production, all inputs have been accounted in this Life Cycle Assessment (LCA).

5.4 Electricity

A specific Life Cycle Inventory (LCI) has been used for this LCA, reflecting that all electrical power for Premco's operations is generated by on-site diesel generators. The dataset models the emissions and resource consumption associated with diesel combustion to produce electricity, ensuring the assessment accurately represents the company's specific energy supply chain.

5.5 Fuels Production and Consumption

Specific datasets with emission factors corresponding to fuel combustion in the Premco have been developed for these LCAs. Indirect emissions resulting from the production and transportation of diesel is also included in the calculation of environmental impact values, using default values from the Ecoinvent™ database.

5.6 Transport to the use site Stage – A4

The ready-mix concrete is supplied to customers, and the A4 phase has been modeled based on the company's standard delivery practices. All concrete mixes are transported from the batching plant directly to the construction site, covering a maximum road distance of 2 km. The transportation scenario is based on concrete volumes sold between January 2024 and December 2024. The mode of transport considered is a transit mixer truck (32-ton capacity, EURO 4 standard) for all road transport.

5.7 Calculation Rules

Version 3.19.5.0 of software Air.e LCA™ with Ecoinvent™ 3.11 database has been used for LCA modeling and impacts calculations. Minor components are not directly related to the product, with less than 1% impact, such as office supplies, has been excluded from the assessment. All transports of components have been included in the LCA considering real distances travelled by materials used from January 2024 and December 2024. Transport of raw materials needed to produce ready mix concrete estimated in a global scale according to Ecoinvent™ criteria. The main means of transport for material purchases have been included in the analysis. Road distances are calculated using Google Maps. Additionally, transport of raw materials from the sea and air to the manufacturing site in Jeddah, Saudi Arabia has also been considered, with the distance for sea and air transport included in the transportation scenario. **Cut-off rules:** more than 99% of the materials and energy consumption have been included. The Polluter Pays Principle and the Modularity Principle have been followed.

5.8 By Products Assignment

Economic allocation was applied and the allocation was performed according to the PCR. Economic allocation was based on the income of each product. There is no List of by-Products used in this EPD.

6. Environmental Performance



6.1 Potential Environment Impacts

In the following tables, the environmental performance of the declared unit “1 m3 of the ready mix concrete” is presented for the PREMCO product, totalized and for each sub-phase of the life cycle. During the assessment, it was not possible to identify significant differences in the consumption of electricity, water, diesel, raw materials, and chemicals during the manufacturing process of concrete. Therefore, the calculations are based on total production versus total consumption for the production of the product. Environmental impacts are calculated using the EF 3.1 (ILCD) methodology in accordance with the EN 15804 standard. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding thresholds values, safety margins or risks.

6.2 Core Environmental Impact Indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	2.45E+02	5.27E-01	0.00E+00	0.00E+00	1.91E+00	1.32E+01	2.87E+00	1.17E+01	-3.77E+01
GWP-biogenic	kg CO2 eq.	2.55E-01	1.84E-04	0.00E+00	0.00E+00	1.90E-04	4.60E-03	2.86E-04	3.62E-03	-4.56E-02
GWP - luluc	kg CO2 eq.	7.95E-02	2.18E-04	0.00E+00	0.00E+00	1.96E-04	5.46E-03	2.94E-04	6.69E-03	-1.79E-02
GWP - total	kg CO2 eq.	2.45E+02	5.28E-01	0.00E+00	0.00E+00	1.91E+00	1.32E+01	2.87E+00	1.17E+01	-3.78E+01
ODP	kg CFC 11 eq.	4.45E-06	7.13E-09	0.00E+00	0.00E+00	2.84E-08	1.78E-07	4.27E-08	3.25E-07	-2.10E-07
AP	mol H+ eq.	8.70E-01	3.01E-03	0.00E+00	0.00E+00	1.71E-02	7.52E-02	2.57E-02	8.18E-02	-1.57E-01
EP-freshwater	kg P eq.	3.17E-02	5.66E-05	0.00E+00	0.00E+00	6.15E-05	1.42E-03	9.24E-05	1.02E-03	-5.68E-03
EP - marine	kg N eq.	2.63E-01	1.21E-03	0.00E+00	0.00E+00	7.97E-03	3.04E-02	1.20E-02	3.15E-02	-4.53E-02
EP-terrestrial	mol N eq.	2.92E+00	1.32E-02	0.00E+00	0.00E+00	8.71E-02	3.30E-01	1.31E-01	3.43E-01	-5.05E-01
POCP	kg NMVOC eq.	8.88E-01	4.30E-03	0.00E+00	0.00E+00	2.61E-02	1.07E-01	3.92E-02	1.24E-01	-1.51E-01
ADP-minerals & metals*	kg Sb eq.	8.41E-04	1.39E-06	0.00E+00	0.00E+00	6.67E-07	3.48E-05	1.00E-06	1.70E-05	-1.04E-04
ADP-fossil*	MJ	1.77E+03	7.48E+00	0.00E+00	0.00E+00	2.49E+01	1.87E+02	3.74E+01	2.86E+02	-2.88E+02
WDP*	m3	4.23E+01	4.77E-02	0.00E+00	0.00E+00	6.51E-02	1.19E+00	9.79E-02	1.27E+01	-1.37E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP – minerals & metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

*** Disclaimer:** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator. "Reading example: $1.57E-03 = 1.57 \times 10^{-3} = 0.00157$ "

6.3 Environmental impacts – GWP- GHG

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
GWP- GHG1	kg CO2 eq.	2.45E+02	5.28E-01	0.00E+00	0.00E+00	1.91E+00	1.32E+01	2.87E+00	1.17E+01	-3.78E+01

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A2:2019/AC:2021.

6.4 Use of Natural Resources

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
PERE	MJ	8.40E+01	0.00E+00	0.00E+00	0.00E+00	1.56E-01	0.00E+00	2.35E-01	2.67E+00	-1.90E+01
PERM	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
PERT	MJ	8.40E+01	0.00E+00	0.00E+00	0.00E+00	1.56E-01	0.00E+00	2.35E-01	2.67E+00	-1.90E+01
PENRE	MJ	1.70E+03	0.00E+00	0.00E+00	0.00E+00	2.49E+01	0.00E+00	3.74E+01	2.86E+02	-2.88E+02
PENRM	MJ	6.22E+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
PENRT	MJ	1.76E+03	0.00E+00	0.00E+00	0.00E+00	2.49E+01	0.00E+00	3.74E+01	2.86E+02	-2.88E+02
SM	kg	8.07E-01	0.00E+00	0.00E+00	0.00E+00	1.03E-02	0.00E+00	1.55E-02	7.12E-02	-1.21E-01
RSF	MJ	4.59E-02	0.00E+00	0.00E+00	0.00E+00	2.70E-05	0.00E+00	4.06E-05	1.49E-03	-5.38E-02
NRSF	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
FW	m3	1.03E+00	1.16E-03	0.00E+00	0.00E+00	1.59E-03	2.90E-02	2.40E-03	2.96E-01	-3.28E-01
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

6.5 End of Life - Waste

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	8.09E+00	1.67E-02	0.00E+00	0.00E+00	2.79E-02	4.17E-01	4.20E-02	3.26E-01	-1.43E+00
Non-hazardous waste disposed	kg	5.62E+02	9.28E-02	0.00E+00	0.00E+00	4.07E-01	2.32E+00	6.11E-01	7.53E+00	-2.91E+01
Radioactive waste disposed	kg	9.46E-04	0.00E+00	0.00E+00	0.00E+00	2.60E-06	0.00E+00	3.91E-06	4.17E-05	-1.85E-04

6.6 Output flow indicators

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
Components for re-use	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
Material for recycling	kg	4.36E-02	0.00E+00	0.00E+00	0.00E+00	1.11E-04	0.00E+00	1.67E-04	3.10E-03	-1.10E-02
Materials for energy recovery	kg	2.58E-04	0.00E+00	0.00E+00	0.00E+00	3.54E-07	0.00E+00	5.32E-07	5.51E-06	-9.25E-05
Exported energy, electricity	MJ	2.34E+01	0.00E+00	0.00E+00	0.00E+00	1.18E-03	0.00E+00	1.77E-03	1.86E-02	-7.96E-02
Exported energy, thermal	MJ	2.42E+01	0.00E+00	0.00E+00	0.00E+00	5.52E-04	0.00E+00	8.29E-04	9.86E-03	-6.97E-02

6.7 Biogenic Carbon Content (for all products listed)

Indicator	Unit	A1-A3
Biogenic carbon content in product	kg	0.00E+00
Biogenic carbon content in packaging	kg	0.00E+00

6.8 GWP Comparison of Product Variants

Low Impact GWP - C40 - 026

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
GWP-biogenic	kg CO2 eq.	1.90E-01	1.94E-04	0.00E+00	0.00E+00	1.90E-04	4.86E-03	3.03E-04	3.83E-03	-4.82E-02
GWP-fossil	kg CO2 eq.	1.78E+02	5.57E-01	0.00E+00	0.00E+00	1.91E+00	1.39E+01	3.04E+00	1.23E+01	-3.99E+01
GWP - luluc	kg CO2 eq.	9.08E-02	2.31E-04	0.00E+00	0.00E+00	1.96E-04	5.77E-03	3.11E-04	7.08E-03	-1.89E-02
GWP - total	kg CO2 eq.	1.79E+02	5.58E-01	0.00E+00	0.00E+00	1.91E+00	1.39E+01	3.04E+00	1.24E+01	-4.00E+01

High Impact GWP - C40 - 037

Indicator	Unit	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
GWP-biogenic	kg CO2 eq.	2.81E-01	1.92E-04	0.00E+00	0.00E+00	1.90E-04	4.80E-03	2.99E-04	3.78E-03	-4.76E-02
GWP-fossil	kg CO2 eq.	2.58E+02	5.50E-01	0.00E+00	0.00E+00	1.91E+00	1.38E+01	3.00E+00	1.22E+01	-3.94E+01
GWP - luluc	kg CO2 eq.	8.72E-02	2.28E-04	0.00E+00	0.00E+00	1.96E-04	5.70E-03	3.07E-04	6.98E-03	-1.87E-02
GWP - total	kg CO2 eq.	2.59E+02	5.51E-01	0.00E+00	0.00E+00	1.91E+00	1.38E+01	3.00E+00	1.22E+01	-3.95E+01

A comparative GWP assessment was conducted for low and high cement mixes, with cement identified as the major emission contributor. The declared unit was taken as the baseline (100%). The low cement mix shows a 28% reduction, while the high cement mix indicates a 5% increase in GWP, highlighting the strong correlation between cement content and overall carbon impact.

6.9 Interpretation of LCA Study Results

In general terms, as is shown in the table of core environmental impact indicators, A1-A2 and A3 modules have the higher impact, representing above 93.69% of the whole impact. A4 module has a less impact. C2 and C4 modules have little impact too, representing at most 3.91% and 12.79% respectively of the whole impact. Finally, Module D represents savings of 12.24% of the total impact.

7. Verification

Diffusion Institution	The Environmental Footprint Institute Calle CIRCE 49A Madrid 28022 Spain www.environmentalfootprintinstitute.org
EPD Registration Number	251015EPD
Published	29-10-2025
Valid until	28-10-2030
Product Category Rules	PCR P-3100: Construction products in general (EN 15804) & EN 16757:2022- Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements
Product Group Classification	UN CPC 37370
Reference year for Data	January 2024 – December 2024
Geographical Scope	Global
Product category rules (PCR): Under the general rules of the Environmental Footprint Institute, PCR P-3100: Construction products in general (EN-15804) and EN 16757:2022.	
PCR review was conducted by: The Environmental Footprint Institute.	
Independent verification of the declaration and data, according to ISO 14025:2006 and ISO 14040:	
☐ EPD Process Certification (internal) ☒ EPD Verification (external)	
Third party verifier: Mr. Manuel Rama	
Accredited by: The Environmental Footprint Institute.	

8. Mandatory Statements



Explanatory material can be obtained from EPD owner and/or LCA author. Contact information can be found below. The owner of the declaration shall be liable for the underlying information and evidence. The LCA Author shall not be liable with respect to manufacturer information, life cycle assessment data and evidence. The verifier and The Environmental Footprint Institute do not make any claim or present any responsibility about the legality of the product. EPDs within the same product category but from different programs may not be comparable.

9. Contact Information



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Programme Operator	THE ENVIRONMENTAL FOOTPRINT INSTITUTE Calle Circe 49A Madrid, Spain Web: www.environmentalfootprintinstitute.com Email: info@environmentalfootprintinstitute.com	 ENVIRONMENTAL FOOTPRINT INSTITUTE

10. References



- Ecoinvent database (v3.11) - www.ecoinvent.ch
- EN 15804:2012 + A1:2013 and EN15804:2012 +A2:2019/AC:202) - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products.
- EN ISO 14025: EN ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
- EN ISO 14040: EN ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework.
- EN ISO 14044: EN ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines.
- EN 16757:2022 - Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements.
- Air.e LCA Tool v3.19.5.0

