Environmental Product Declaration

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

200: C20/25 S3
250: C25/30 S3
300: C30/37 S3
350: C35/45 S3
351: C35/45 Γ/M S3
450: C40/50 S3

from

SUPER BETON Single Member Private Company- (KOROPI BRANCH)

EPD of multiple products, based on the average results of the product group.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0015486
Publication date:	2024-07-12
Valid until:	2029-07-11
	An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

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

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products (EN 15804: A2); Version 1.3.2; 2023-12-08 c-PCR-003 Concrete and concrete elements (EN 16757); Version 2023-01-02 UN CPC: 375
PCR review was conducted by: THE TECHNICAL COMMITTEE OF THE INTERNATIONAL EPD SYSTEM.
Life Cycle Assessment (LCA)
LCA accountability: ND Nikolaou & Partners
Third-party verification
Third party verifier: Business Quality Verification P.C Accredited by E.S.Y.D., Accreditation No. 1218
Procedure for follow-up of data during EPD validity involves third party verifier: Yes [x] No [ ]

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Environmental Product Declaration in accordance with ISO 14025 and EN 15804. This EPD is in accordance to the corresponding LCA analysis.

Company information

Owner of the EPD:

SUPER BETON SINGLE MEMBER PRIVATE COMPANY – (Koropi Branch)
APOLLONIOU 8, KOROPI, ATHENS - P.C 19400 - GREECE

Contact:

SUPER BETON SINGLE MEMBER PRIVATE COMPANY – (Koropi Branch)
N. Nikolaou, Quality Consultant, Tel: +30 2106026000, 2103456163, email: info@superbeton.gr

Description of the organization:

Building materials manufacturer (Ready mixed Concrete).

Product-related or management system-related certifications:

The company is certified with ISO 9001:2015 Quality Management System.

Name and location of production site(s):

SUPER BETON SINGLE MEMBER PRIVATE COMPANY – (Koropi Branch)
(Apolloniou 8, Koropi, Athens - Greece)

INTRODUCTION

Super Beton has been active in the ready-mixed concrete industry for more than 60 years. The company is operating according to the specifications and standards set by each regulation and it is focused on the satisfaction of the consumer. The company owns two concrete production units in Attica, located in Koropi and Tavros, Athens, as well as excellent mechanical equipment for concrete production, transport and pumping.
Super Beton gives great importance to the quality of its products and covers every need of ready-mix concrete- delivery, in the wider area of Attica.

Product information

Product name:

200: C20/25 S3
250: C25/30 S3
300: C30/37 S3
350: C35/45 S3
351: C35/45 Γ/Μ S3
450: C40/50 S3

Product identification:

Conventional Compressive Strength 28 days: 25, 30, 37, 45, 45 and 50 MPa respectively.

Product description:

This is an EPD of multiple products, based on the average results of the product group for 200:C20/25 S3, 250:C25/30 S3, 300:C30/37 S3, 350:C35/45 S3, 351:C35/45 Γ/Μ S3 and 450:C40/50 S3 concrete mix designs which complies with the requirements of ELOT EN 206 and the Concrete Technology Regulation KTS 2016. The above concrete mix designs are produced regionally by SUPER BETON SINGLE MEMBER PRIVATE COMPANY – (Koropi Branch).

These specific types of concrete have a wide range of applications and are mainly utilized in civil engineering works and in residential and commercial construction.
The concrete is manufactured at ready-mix batch plant and is delivered to the construction sites in a liquid state. Ready mix concrete is a composite material consists of cement, coarse and fine aggregates, water and admixtures. When water is mixed with cement and aggregates, the mixture forms fluid slurry which can be poured easily. Moreover, the reaction between cement and water occurs and within several hours it hardens and form a hard matrix bind.
The final product is transported to the construction sites with ready-mix trucks.

Technical characteristics and composition of the products:

Product	200 C20/25, S3	250 C25/30, S3	300 C30/37, S3	350 C35/45, S3	351 C35/45 Γ/M, S3	450 C40/50, S3
Characteristic Compressive Strength $fck_{,cube}$ (Mpa)	25	30	37	45	45	50
	(kg/m^3)	(kg/m^3)	(kg/m^3)	(kg/m^3)	(kg/m^3)	(kg/m^3)
Cement	280	310	340	370	400	400
Water	180	180	180	185	190	180
Aggregates	1880	1860	1830	1795	1760	1710
Admixtures	1,6	1,9	2,2	2,8	3,0	3,9
Concrete Density	2342	2352	2353	2353	2353	2374

No substance in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" exceeds 0.1% wt in the ready-mix concrete products.

UN CPC code:
375.

LCA information

Goal and scope:
This EPD evaluates the average environmental impacts of the production of 1 m3 of ready-mix concrete for "cradle-to-gate" with modules C1-C4 & module D, of the concrete batch plant at Koropi, Athens.

Production Process:
The production process is fully automated to ensure superior quality products, conforming to the national and European concrete standards. The raw materials (cement, aggregates, water, admixtures etc.) are accurately weighed according to the proprietary mix designs to produce ready-mixed concrete with specific characteristics (strength, durability, finishability, pumpability etc.). Once manufactured, the fresh concrete is transported with concrete trucks to the construction sites.

Time representativeness:
The data used in this study is for the full year 2023.

Geographical scope:
The scope of this LCA is being considered to apply in Greece

Functional unit / declared unit:
The declared unit is one (1) cubic meter (m^3) of Ready-mix Concrete.

Database(s) and LCA software used:
OpenLCA software 1.11.0 and the Ecoinvent database (3.8)

Data quality:
The International EPD® System, which provides the framework to develop and publish EPDs based on ISO 14025 and EN 15804, gives the final approval of the tool's compliance with the rules.
The ISO 14044 was applied in terms of data collection and quality requirements. The data concerning the modules A1 (raw material supply), A2 (transportation) and A3 (product manufacturing) were provided by SUPER BETON SINGLE MEMBER PRIVATE COMPANY – (Koropi Branch).The background data for raw materials as well energy consumption, waste production and transport distances have been obtained from the company's Quality Assurance system and correspond the exact and accurate mix designs.
Data collected refer to the period from January 1st to December 31st 2023.There is no missing data for these concrete mixes, since all the required raw data were provided from the Quality Assurance system that company uses.
Regarding follow-up activities, every reporting year, the indicators, which define the environmental impacts of specific concrete type, should be re-calculated. In case the results (even one indicator) differ from that of previous reporting year by ±10%, then the EPD should be updated.

Allocations:
Wherever possible allocation was avoided. Allocation based on physical properties was applied to the electricity. Based on the data collected concerning the electricity consumption at SUPER BETON SINGLE MEMBER PRIVATE COMPANY – (Koropi Branch) for 2023, there was a subtraction of 20%, assuming that this proportion of electricity concerns office electricity consumption and not manufacturing. The final result is divided with the total concrete production (m^3) for this year and in this way, the electricity consumption kWh per m^3 is calculated and entered into the OpenLCA software.

Cut-off rules:
The cut-off rule for insufficient data or data gaps that are less than 1% of the total input mass and less than 5% of energy usage and mass per module was applied to diesel for the loader.
In case of insufficient input data or data gaps for a unit process, the cut-off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass input of that unit process. The total of neglected input flows for the stages 'cradle through gate' shall be a maximum of 5% of energy usage and mass." (EN 15804:2012 +A2:2019). Regarding the LCA model, the default cut-off criteria are applied for all processes from the Ecoinvent database. In addition, all custom processes developed for the specific purposes of the project are consistent with the rules and guidelines of the Ecoinvent database, and hence the same cut-off criteria are applied.

Comparability:

The EPDs of construction products may not be comparable if they do not comply with EN 15804. The EPDs within the same product category but from different programs may not be comparable.

Assumptions:

The assumptions that are made in this EPD Process are given below:

- Module A1: The utilized input for fine gravel is “crushed gravel” and for the production of retarder used in concrete, dataset “plasticizer production, for concrete” was used.
- Module A2: The utilized truck types have capacity 16-32 t for aggregates and cement, while for transportation of admixtures 7,5-16 t. The default emission standard considered for these trucks is EURO 4.

Electricity mix:

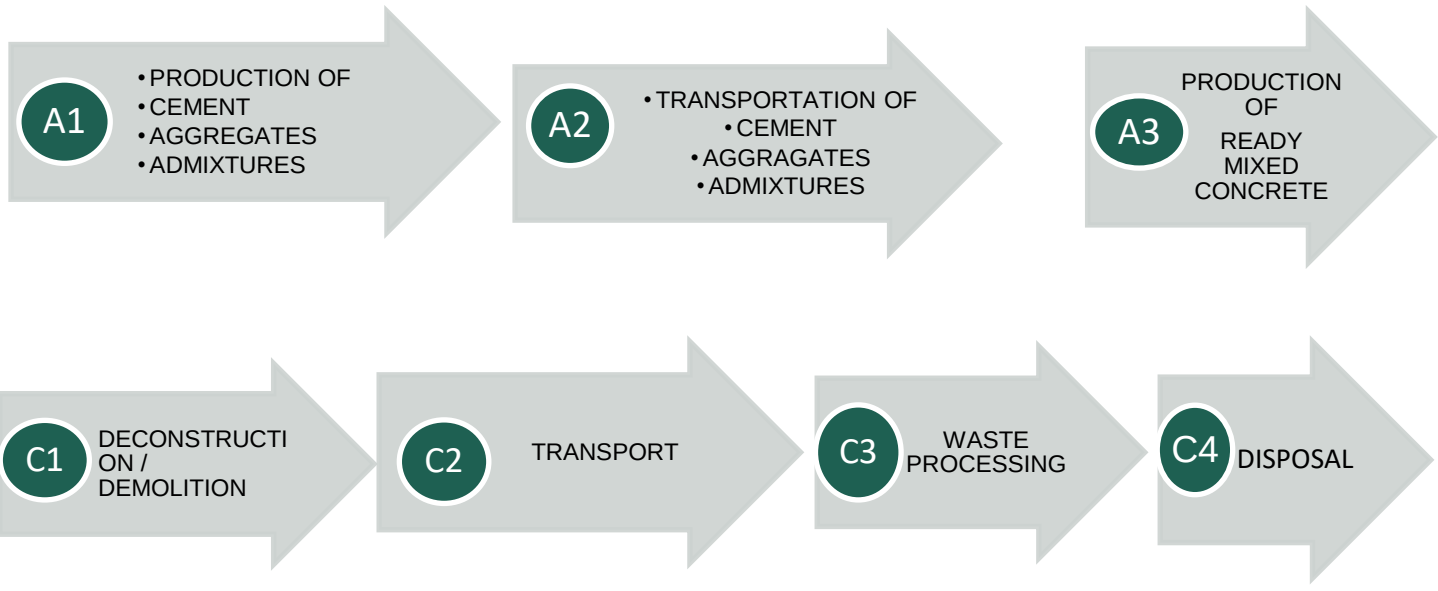
The latest national residual electricity mix as published in DAPEEP for 2022, was utilized: 6,81E-01 CO2 Emissions (kgCO2/ KWh)

Description of system boundaries:

The scope of this study is Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D) as analyzed here below.

	Product stage			Construction process stage		Usestage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operationalenergyuse	Operationalwateruse	De-constructiondemolition	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	GR	GR	GR	-	-	-	-	-	-	-	-	-	GR	GR	GR	GR	GR
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-18,74%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

More information: X= included, MND = module not declared



A1-A3 Production stage information:

A1: Raw Material Supply
The main raw materials for concrete production are aggregates, cement, water and concrete admixtures. This stage includes mainly the impact associated with the production of cement, water and the mining processing of raw materials.

A2: Transportation of raw materials to manufacturer
The transportation involves the delivery impact of raw materials from the supplier to the concrete batching plant. Cement is transported by silo trucks, aggregates and admixtures by trucks.

A3: Manufacturing
A concrete batching plant consists of a mixer where cement, aggregates, water and admixtures are weighted and mixed together in specific proportions to produce concrete of specific technical characteristics. Aggregates of different granulometry (gravel, fine gravel, sand) are stored in open areas and distinct piles. The cement is stored in separate silos depending on the quality type and added to the mixer via screw conveyors while the water and admixtures via pumps. After the required mixing time, the concrete is loaded to the mixer truck and must be delivered within 1.0 hour and 30 minutes (under normal environmental conditions, max 2.0 hours) to the construction site.

C1-C4 End of life stage information:

C1: Deconstruction / demolition
This section takes into consideration the demolition of the building or structure. The use of diesel during the demolition process has been included and the diesel consumption was considered 164,78 MJ / m^3.

C2: Transport
This refers to the transport of the demolished concrete for the demolition site to the waste processing site. A conservative assumption of 50km by lorry 16-32 metric ton was used.

C3: Waste processing
Involves the impact arising from the collection of concrete fractions from the deconstruction site and the waste processing of material flows intended for reuse, recycling and recovery. The product is 50% recycled.

C4: Disposal
It is the impact coming from the disposal (e.g. landfilling) of the non-recovered concrete waste. The product is 50% landfilled.

Considering that Module C is included in this EPD, is discouraged to use the results of modules A1-A3 without considering the results of module C

D Reuse- Recovery- Recycling potential:

D: Reuse- Recovery- Recycling potential

Module D aims to present the environmental benefits or loads resulting from reusable products. The considered scenario in module D is to reuse the recyclable concrete in the concrete production by substituting natural gravel. As a result, this stage depicts the difference between the impacts of recycling concrete until it reaches the end-of-waste state and the impacts of using the primary material. It must be noticed that in Greece, the use of recycled aggregates in concrete is not applicable, as KTS 2016 requires the use of natural aggregates in the concrete production.

Environmental Information

The following tables present the overall impact on indicator groups assessed for A1-A3, C1-C4 and D stages of Life Cycle.

POTENTIAL ENVIRONMENTAL IMPACTS / 1 M3 OF AN AVERAGE READY-MIX CONCRETE COMPOSITION STUDY

CORE ENVIRONMENTAL IMPACT INDICATORS

Impact category	Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Acidification	AP	mol H+ eq	8,32E-01	1,57E-01	1,03E-01	4,91E-02	5,83E-02	-1,36E-02
Climate change - Biogenic	GWP-biogenic	kg CO2 eq	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Climate change - Fossil	GWP-fossil	kg CO2 eq	2,79E+02	1,51E+01	2,02E+01	4,73E+00	6,20E+00	-5,03E+00
Climate change - Land use and LU change	GWP-luluc	kg CO2 eq	9,28E-02	1,56E-03	8,57E-03	4,87E-04	5,72E-03	-1,33E-02
Climate change	GWP-total	kg CO2 eq	2,79E+02	1,51E+01	2,02E+01	4,73E+00	6,20E+00	-5,04E+00
Global Warming Potential – GHG [1]	GWP-GHG	kg CO2 eq	2,79E+02	1,51E+01	2,02E+01	4,73E+00	6,20E+00	-5,04E+00
Resource use, minerals and metals [2]	ADP-minerals&metals	kg Sb eq	1,22E-03	7,08E-06	6,68E-05	2,21E-06	1,33E-05	-8,28E-05
Resource use, fossils [2]	ADP-fossil	MJ	7,59E+02	1,02E+01	3,45E+01	3,19E+00	1,30E+01	-6,60E+01
Eutrophication, freshwater	EP-freshwater	kg P eq	3,58E-02	4,74E-04	1,53E-03	1,48E-04	5,72E-04	-5,17E-03
Eutrophication, marine	EP-marine	kg N eq	2,33E-01	6,97E-02	3,48E-02	2,18E-02	2,03E-02	7,28E-03
Eutrophication, terrestrial	EP-terrestrial	mol N eq	2,63E+00	7,64E-01	3,80E-01	2,38E-01	2,22E-01	6,41E-02
Ozone depletion	ODP	kg CFC11 eq	1,44E-05	3,24E-06	4,40E-06	1,01E-06	2,51E-06	2,24E-07
Photochemical ozone formation	POCP	kg NMVOC eq	6,66E-01	2,08E-01	1,07E-01	6,48E-02	6,30E-02	2,28E-02
Water use [2]	Water use	m3 depriv.	9,10E+01	5,08E-01	1,48E+00	1,59E-01	7,97E+00	-1,89E+01

Disclaimers:

[1]This indicator includes all greenhouse gases included in GWP-total but excluded biogenic carbon dioxide emissions and uptake and biogenic carbon stored in the product with characterization factors (CFs) based on IPCC (2013).

[2]The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

POTENTIAL ENVIRONMENTAL IMPACTS / 1 M3 OF AN AVERAGE READY-MIX CONCRETE COMPOSITION STUDY

RESOURCE USE INDICATORS

Impact category	Indicator	Unit	A1-A3	C1	C2	C3	C4	D
resources - energy, non-renewable - PENRT	PENRT	MJ-Eq	1,87E+03	2,07E+02	3,07E+02	6,45E+01	1,74E+02	-1,07E+02
resources - energy, non-renewable, use as energy - PENRE	PENRE	MJ-Eq	9,04E+02	1,15E+01	3,81E+01	3,60E+00	1,47E+01	-9,90E+01
resources - energy, non-renewable, use as raw material - PENRM	PENRM	MJ-Eq	9,69E+02	1,95E+02	2,69E+02	6,09E+01	1,59E+02	-8,27E+00
resources - energy, renewable - PERE, use as energy	PERE	MJ-Eq	6,54E+01	9,01E-01	2,46E+00	2,81E-01	1,00E+00	-1,07E+01
resources - energy, renewable - PERM, use as raw material	PERM	MJ-Eq	2,28E+01	2,63E-01	9,98E-01	8,22E-02	4,74E-01	-2,46E+00
resources - energy, renewable - PERT	PERT	MJ-Eq	8,82E+01	1,16E+00	3,46E+00	3,63E-01	1,48E+00	-1,32E+01
resources - net use of fresh water - FW	NFW	m3FW	2,17E+00	1,20E-02	3,60E-02	3,76E-03	1,87E-01	-4,52E-01
resources - use of secondary materials - SM	SM	kgSM	1,10E+01	1,53E-01	2,10E-01	4,76E-02	9,29E-02	-1,21E+00
resources -use of non-renewable secondary fuels - NRSF	NRSF	MJSF	3,28E+00	2,33E-02	5,42E-02	7,26E-03	2,37E-02	-2,43E-01
resources -use of renewable secondary fuels - RSF	RSF	MJSF	2,07E+00	1,46E-02	3,00E-02	4,54E-03	1,64E-02	-4,93E-01

POTENTIAL ENVIRONMENTAL IMPACTS / 1 M3 OF AN AVERAGE READY-MIX CONCRETE COMPOSITION STUDY

OUTPUT FLOWS

Impact category	Indicator	Unit	A1-A3	C1	C2	C3	C4	D
output flows - components for reuse	CRU	kg CRU	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
output flows - exported energy	EE	MJ EE	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
output flows - materials for energy recovery	MER	kg MER	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
output flows - materials for recycling	MFR	kg MFR	3,83E+00	9,56E-02	1,53E-01	2,98E-02	5,95E-02	-9,07E-01

POTENTIAL ENVIRONMENTAL IMPACTS / 1 M3 OF AN AVERAGE READY-MIX CONCRETE COMPOSITION STUDY

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Impact category	Indicator	Unit	A1-A3	C1	C2	C3	C4	D
waste - hazardous, disposed - HW	HWD	kgHW	1,83E+02	2,24E+00	7,91E+00	6,99E-01	2,86E+00	-2,60E+01
waste - non-hazardous, disposed -NHW	NHWD	kgW	4,31E+01	1,53E-01	1,51E+01	4,77E-02	1,18E+03	-2,07E+00
waste - radioactive, disposed - RW	RWD	kgRW	9,49E-02	2,38E-03	4,30E-03	7,42E-04	2,19E-03	-2,01E-02

POTENTIAL ENVIRONMENTAL IMPACTS / 1 M3 OF AN AVERAGE READY-MIX CONCRETE COMPOSITION STUDY

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

Impact category	Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Ecotoxicity, freshwater [2]	ETP-fw	CTUe	2,20E+01	1,14E+00	9,78E+00	3,55E-01	1,20E+00	-8,82E-01
Human toxicity, cancer [2]	HTP-c	CTUh	5,82E-08	3,90E-09	6,45E-09	1,22E-09	2,37E-09	-6,62E-09
Human toxicity, non-cancer [2]	HTP-nc	CTUh	4,45E-06	6,23E-08	4,17E-07	1,95E-08	8,46E-08	-4,05E-07
Ionising radiation [3]	IRP	kBq U-235 eq	1,19E+01	9,36E-01	1,38E+00	2,92E-01	7,69E-01	-1,93E+00
Land use [2]	SQP	Pt	8,78E+02	5,44E+00	2,48E+02	1,70E+00	2,95E+02	-9,53E+01
Particulate matter	PM	disease inc.	6,33E-06	4,17E-06	1,44E-06	5,96E-06	1,14E-06	5,22E-06

Disclaimers:

[2]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.

[3]Ionizing radiation potential (IRP) impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Additional Environmental Information

As per the PCR 2019:14 Construction Products version 1.3.2, when the products included exhibit a difference of over 10% concerning their declared environmental impact indicators, the specific variance for each impact indicator should be reported. The subsequent tables showcase total variances observed for all examined products, encompassing all the environmental impacts considered, compared to the potential environmental impacts of an average product.

% VARIATIONS FROM THE AVERAGE READY-MIX CONCRETE COMPOSITION STUDY						
Indicator	**C20/25**	**C25/30**	**C30/37**	**C35/45**	**C35/45 ГМ**	**C40/50**
Climate Change- Total	-18,74%	-10,51%	-3,48%	7,11%	13,10%	12,52%
Global Warming Potential- GWP-GHG	-18,74%	-10,51%	-3,48%	7,11%	13,10%	12,52%
Climate Change- Fossil	-18,74%	-10,50%	-3,48%	7,11%	13,09%	12,52%
Climate Change- Biogenic	NA	NA	NA	NA	NA	NA
Climate Change- Land Use and Land Use Change	-30,24%	-16,19%	-8,13%	17,88%	20,84%	15,84%
Ozone Depletion	-10,90%	-6,04%	-2,53%	4,75%	7,16%	7,56%
Acidification	-16,54%	-9,13%	-3,66%	7,52%	11,33%	10,48%
Eutrophication, fresh water	-20,42%	-11,36%	-4,23%	8,79%	13,66%	13,55%
Eutrophication, marine	-16,07%	-8,74%	-3,75%	8,00%	11,17%	9,38%
Eutrophication, terrestrial	-16,22%	-8,82%	-3,77%	8,06%	11,27%	9,47%
Photochemical Ozone formation, human health	-15,33%	-8,35%	-3,58%	7,54%	10,61%	9,11%
Resource use, minerals and metals	-24,45%	-13,81%	-5,61%	10,64%	16,45%	16,78%
Resource use, fossils	-28,84%	-15,68%	-7,02%	15,24%	20,11%	16,19%
Water Use	0,08%	0,03%	-0,19%	-1,80%	1,44%	0,43%

% VARIATIONS FROM THE AVERAGE READY-MIX CONCRETE COMPOSITION STUDY						
Indicator	**C20/25**	**C25/30**	**C30/37**	**C35/45**	**C35/45 ГМ**	**C40/50**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	-16,27%	-9,24%	-2,85%	5,55%	10,58%	12,23%
Use of renewable primary energy resources used as raw materials	-25,78%	-14,13%	-5,93%	12,72%	17,78%	15,35%
Total use of renewable primary energy resources	-18,74%	-10,51%	-3,65%	7,41%	12,45%	13,04%
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	-24,14%	-13,29%	-5,37%	11,40%	16,57%	14,83%
Use of non-renewable primary energy resources used as raw materials	-12,25%	-6,85%	-2,97%	5,46%	7,94%	8,68%
Total use of non-renewable primary energy re-sources	-16,65%	-9,23%	-3,86%	7,66%	11,14%	10,95%
Use of secondary material	14,48%	6,18%	8,60%	-21,18%	-11,39%	3,31%
Use of renewable secondary fuels	9,01%	3,58%	6,32%	-15,45%	-8,15%	4,69%
Use of non-renewable secondary fuels	12,26%	4,94%	7,97%	-20,00%	-9,65%	4,48%
Use of net fresh water	-0,64%	-0,34%	-0,39%	-1,30%	1,91%	0,76%

% VARIATIONS FROM THE AVERAGE READY-MIX CONCRETE COMPOSITION STUDY						
Indicator	**C20/25**	**C25/30**	**C30/37**	**C35/45**	**C35/45 ГМ**	**C40/50**
Hazardous waste disposed	-20,77%	-11,56%	-4,36%	8,99%	13,89%	13,80%
Non-hazardous waste disposed	-0,77%	-0,24%	-0,17%	0,09%	0,11%	0,97%
Radio active waste disposed	0,09%	-0,91%	2,96%	-7,80%	-1,53%	7,20%

% VARIATIONS FROM THE AVERAGE READY-MIX CONCRETE COMPOSITION STUDY						
Indicator	**C20/25**	**C25/30**	**C30/37**	**C35/45**	**C35/45 ГМ**	**C40/50**
Components for re-use	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Material for recycling	5,89%	2,10%	4,91%	-12,16%	-5,83%	5,08%
Materials for energyrecovery	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Exportedenergy, electricity	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%

% VARIATIONS FROM THE AVERAGE READY-MIX CONCRETE COMPOSITION STUDY						
Indicator	**C20/25**	**C25/30**	**C30/37**	**C35/45**	**C35/45 ГМ**	**C40/50**
Particulate matter emissions	-8,75%	-4,64%	-2,28%	4,75%	5,85%	5,07%
Ionising radiation human	-4,78%	-3,17%	0,66%	-2,37%	2,28%	7,38%
Ecotoxicity, freshwater	-13,24%	-7,33%	-3,59%	6,62%	8,48%	9,07%
Human toxicity, cancer	-20,25%	-11,19%	-4,83%	9,78%	13,52%	12,97%
Human toxicity, non-cancer effects	-23,52%	-13,04%	-5,62%	11,32%	15,93%	14,92%
Land use related impacts / Soil quality	-27,71%	-14,36%	-8,41%	19,05%	19,50%	11,92%

Additional information
Differences versus previous versions

First EPD version – No previous versions

References

- **GPI v.4.01** General Programme Instructions of the International EPD® System
- **PCR 2019:14 v.1.3.2** Product Category rules | Construction products | The International EPD® System
- **EN 15804:2012+A2:2019/AC:2021** Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
- **EN 16757:2022** Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements
- **c-PCR-003** Concrete and concrete elements (EN 16757); Version 2023-01-02
- **ISO 14020:2000** Environmental labels and declarations - General principles
- **ISO 14025:2006** Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- **ISO 14040:2006** Environmental management - Life Cycle Assessment - Principles and framework
- **ISO 14044:2006** Environmental management - Life Cycle Assessment - Requirements and guidelines
- **openLCA EPD software** Eco invent database

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