ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804+A2 & ISO 14025

READY-MIXED CONCRETE

FROM AB "HISK"

HOLISTINĖS INFRASTRUKTŪROS STATYBŲ KOMPANIJOS

Programme operator: Rakennustieto Oy

EPD registration number: RTS_355_25

Publication date: 31.1.2025

Valid until: 31.1.2030

EPD of multiple products from a company based on "worst-case product"

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	AB "HISK"
Address	Tiekimo st. 14, 35100 Panevėžys
Contact details	info@hisk.lt
Website	https://www.hisk.lt/

PRODUCT IDENTIFICATION

Product name	Ready-mixed concrete
Place(s) of production	Lithuania
Product number / reference	C12/15; C16/20; C20/25; C25/30; C30/37; C35/45
CPC code	37510 non-refractory mortars and concretes

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes 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.

EPD INFORMATION

EPD program operator	Rakennustieto Oy
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the RTS PCR (English version, 26.8.2020) is used.
EPD author	Urtė Valdavičė UAB "Vesta Consulting"
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
Verification date	2025-01-14
EPD verifier	Mari Kirss, Rangi Maja OÜ
EPD number	RTS_355_25
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Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
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PRODUCT INFORMATION

PRODUCT DESCRIPTION

Ready-mix concrete is a type of concrete that is batched and mixed at a central plant before being transported to construction sites. Ready-mix concrete is composed of cement, inert materials (such as sand, gravel, or crushed stone), water and technological additives. It is specifically formulated to meet the requirements of each project and delivered in a ready-to-pour form, reducing the need for on-site mixing.

PRODUCT APPLICATION

Ready-mix concrete is applicable for structures produced both on construction sites and in factory settings. It is also widely used in prefabricated structural components for buildings and engineering projects. This concrete type provides the necessary strength and consistency to meet the demands of various construction applications.

PRODUCT STANDARDS

Ready-mix concrete standards are defined by several technical specifications to ensure quality, safety, and environmental compliance. The primary standards include **LST EN 206:2013+A2:2021**, which covers concrete specifications, performance, production, and conformity, and **LST 1974:2012**, which sets additional guidelines specific to certain concrete types and uses. Additionally, AB "HISK" is certified under **LST EN ISO 9001:2015** for quality management, **LST EN ISO 14001:2015** for environmental management, and **LST EN ISO 45001:2018** for occupational health and safety, ensuring comprehensive compliance with industry best practices.

TECHNICAL SPECIFICATIONS

Concrete mixtures can be classified into different concrete classes: C12/15; C16/20; C20/25; C25/30; C30/37; C35/45, C45/55, C50/60.

PHYSICAL PROPERTIES OF THE PRODUCT

Ready-mix concrete consists of several essential components, each contributing to its strength and durability. Portland cement acts as the primary binder, while crushed gravel, dolomite, and granite serve as aggregates, enhancing the concrete's compressive strength and structure. Sand fills gaps between the aggregates for a denser matrix, technological additives improve workability and specific properties, and water activates the cement, allowing the mixture to harden and reach its desired strength.

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at https://www.hisk.lt/

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-%	Biogenic material, kg C/DU
Portland cement	225 – 445	0	0	0
Crushed gravel, dolomite and granite	930 – 960	0	0	0
Sand	840 – 1000	0	0	0
Additives	1.67 – 5.35	0	0	0
Water	168.5 – 197.41	0	0	0
Total	**2384.08 – 2388.85**	**0**	**0**	**0**

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	0
Minerals	91.6 – 92.7	EU
Fossil materials	0.1 – 0.2	EU
Water	7.1 – 8.3	EU
Bio-based materials	0	0

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

A1: This module considers the extraction and processing of raw materials.

A2: The raw materials are transported to the production site. Vehicle capacity utilization volume factor is assumed to be 1 which means full load. Empty returns are not considered.

A3: This module includes the manufacture of products. It has considered all the energy consumption in the production plant.

MANUFACTURING PROCESS

The concrete production plant is fully equipped with a concrete mixer, feeders, intermediate bins, scales, and conveyors, all supporting an automated mixing process. The production sequence begins as inert materials are measured from intermediate bins, weighed, and moved via conveyor to a bucket elevator, which transfers them to the mixer. Cement is then transported from the silo to a weighing feeder by a screw conveyor before being added to the mixer. Technological additives are pumped to the scales, weighed, and subsequently introduced into the mixer, followed by cold water from the supply line via a dosing unit. Once all components are in the mixer, the final mixing process is completed to produce the finished concrete. The mixture composition (recipe) determines the products durability and strength.

TRANSPORT AND INSTALLATION (A4-A5)

A4: Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

A5: This EPD does not cover the Installation phase.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1: Demolition is assumed to be done by mobile machinery (10 kWh/t) and that that 100% of the waste is collected and treated.

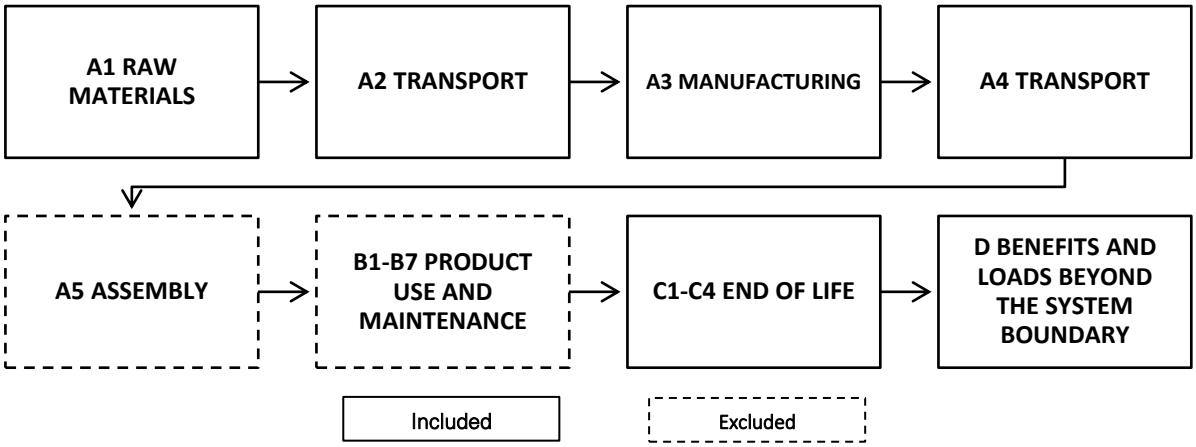
C2: Transportation distance to the closest recycling facility is estimated as 50 km and the transportation method is lorry which is the most common. It is estimated that there is no mass loss during the use of the product.

C3: According to the European commission Waste Framework Directive by 2020, the preparation for re-use, recycling and other material recovery of non-hazardous construction and demolition waste shall be increased to a minimum of 70 % by weight. It is assumed that 70% of the concrete waste is recycled.

C4: According to the European commission Waste Framework Directive it is assumed that 30 % of concrete is collected with construction waste and is sent to landfill.

D: The recycled concrete has been modelled to avoid gravel production. The impact of concrete crushing for use as gravel is also considered.

THE PROCESS DIAGRAM



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2023
EPD type	EPD of multiple products from a company based on “worst-case product”

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 Cubic meter
Mass per declared unit	2388.85 kg

SYSTEM BOUNDARY

This EPD covers the cradle to gate with options scope with following modules: A1 (Raw material supply), A2 (Transport), and A3 (Manufacturing), optional modules A4 (transportation), C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the Standards and PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. The cut-off criteria were applied in the study due to the minimal contribution of the technological additive input, which accounted for only 0.3% of the total mass of the declared unit. Furthermore, datapoints for these technological additives were scarce and challenging to locate, making it difficult to gather comprehensive and accurate data for their inclusion in the analysis. The total excluded input and output flows do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

The allocations in the Ecoinvent 3.10 datasets used in this study follow the Ecoinvent system model 'Allocation, cut-off, EN15804'.

Scenarios included in the LCA are based on realistic scenarios which are currently in use and are representative for one of the most likely scenario alternatives.

This EPD is an EPD of multiple products from a company based on "worst-case product", which is concrete mixture C35/45 due to the highest content of cement. The grouped products are with identical or similar functions, manufactured by a single company at several manufacturing sites, with the same major steps in the A3/core processes. For each indicator and module A-C, the highest result of the included products is declared, and for module D, the lowest benefit of avoided processes and the highest load of included processes is declared.

The A1-A3 GWP total value for the worst-case scenario is 4,13E+02 kg CO_2e, while the A1-A3 GWP total value for the best-case scenario is 2,31E+02 kg CO_2e. Therefore, the difference between the worst-case and best-case scenarios is approximately 44%. The worst-case scenario is evaluated, as A1-A3 GWP value differs more than 10%.

BIOGENIC CARBON CONTENT

The product and packaging do not have biogenic carbon content.

ENVIRONMENTAL IMPACT DATA

The grouped products are with identical or similar functions, manufactured by a single company at several manufacturing sites, with the same major steps in the A3/core processes. LCA results represent the worst-case scenario product which had the highest GWP value in modules A1-A3, at the year 2023.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1.

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	4,13E+02	1,79E+01	3,61E+00	1,29E+01	7,32E+00	4,48E+00	-1,68E+01
GWP – fossil	kg CO_2e	4,13E+02	1,79E+01	3,61E+00	1,29E+01	7,32E+00	4,48E+00	-1,67E+01
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	7,75E-02	6,15E-03	3,13E-04	5,16E-03	6,36E-04	2,33E-03	-1,47E-02
Ozone depletion pot.	kg CFC_{-11}e	1,82E-06	3,61E-07	5,52E-08	1,90E-07	1,12E-07	1,30E-07	-1,30E-07
Acidification potential	mol H^+e	9,21E-01	5,79E-02	3,25E-02	4,39E-02	6,61E-02	3,17E-02	-1,02E-01
EP-freshwater[2)]	kg Pe	5,01E-03	1,40E-04	1,27E-05	1,18E-04	2,57E-05	4,40E-05	-5,78E-04
EP-marine	kg Ne	2,62E-01	1,94E-02	1,51E-02	1,42E-02	3,06E-02	1,20E-02	-2,32E-02
EP-terrestrial	mol Ne	3,05E+00	2,14E-01	1,65E-01	1,57E-01	3,35E-01	1,32E-01	-2,93E-01
POCP ("smog")[3)]	kg NMVOCe	8,97E-01	9,43E-02	4,93E-02	6,47E-02	1,00E-01	4,73E-02	-8,12E-02
ADP-minerals & metals[4)]	kg Sbe	1,19E-03	4,95E-05	1,29E-06	3,59E-05	2,62E-06	7,11E-06	-8,96E-05
ADP-fossil resources	MJ	1,95E+03	2,60E+02	4,72E+01	1,87E+02	9,58E+01	1,10E+02	-2,01E+02
Water use[5)]	m^3e depr.	3,52E+01	1,31E+00	1,15E-01	8,97E-01	2,34E-01	3,07E-01	-2,51E+01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1.

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Particulate matter	Incidence	7,35E-06	1,78E-06	9,25E-07	1,28E-06	1,43E-05	7,21E-07	-1,55E-06
Ionizing radiation[6)]	kBq U235e	4,43E+00	1,15E-01	8,20E-03	6,43E-02	1,67E-02	2,72E-02	-5,49E-01
Ecotoxicity (freshwater)	CTUe	3,50E+02	6,16E+01	6,68E+00	4,51E+01	1,36E+01	1,50E+01	-9,16E+01
Human toxicity, cancer	CTUh	4,14E-07	1,11E-07	1,41E-08	6,40E-08	2,86E-08	2,02E-08	-1,52E-07
Human tox. non-cancer	CTUh	2,66E-06	1,72E-07	6,40E-09	1,23E-07	1,30E-08	1,97E-08	-1,36E-07
SQP[7)]	-	6,68E+02	2,61E+02	3,30E+00	1,88E+02	6,71E+00	2,16E+02	-1,88E+02

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1,38E+02	4,12E+00	2,89E-01	2,45E+00	5,86E-01	1,02E+00	-1,82E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,38E+02	4,12E+00	2,89E-01	2,45E+00	5,86E-01	1,02E+00	-1,82E+01
Non-re. PER as energy	MJ	1,95E+03	2,60E+02	4,72E+01	1,87E+02	9,58E+01	1,10E+02	-2,01E+02
Non-re. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	1,95E+03	2,60E+02	4,72E+01	1,87E+02	9,58E+01	1,10E+02	-2,01E+02
Secondary materials	kg	5,49E-01	1,12E-01	1,96E-02	7,94E-02	3,98E-02	2,76E-02	1,67E+03
Renew. secondary fuels	MJ	6,64E-03	1,42E-03	5,12E-05	1,01E-03	1,04E-04	5,71E-04	-1,55E-03
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,33E+00	3,78E-02	3,06E-03	2,70E-02	6,22E-03	1,14E-01	-5,95E-01

8) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	7,59E+00	3,78E-01	5,27E-02	3,18E-01	1,07E-01	1,22E-01	-1,57E+00
Non-hazardous waste	kg	2,21E+02	7,57E+00	7,20E-01	5,90E+00	1,46E+00	2,79E+00	-2,80E+01
Radioactive waste	kg	3,31E-03	7,81E-05	5,18E-06	4,04E-05	1,05E-05	1,71E-05	-3,41E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	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
Materials for recycling	kg	2,35E-01	0,00E+00	0,00E+00	0,00E+00	1,67E+03	0,00E+00	0,00E+00
Materials for energy rec	kg	2,00E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP – total	kg CO_2e	1,73E-01	7,51E-03	1,51E-03	5,39E-03	3,07E-03	1,88E-03	-7,02E-03
ADP-minerals & metals	kg Sbe	1,78E-07	2,02E-08	5,26E-10	1,46E-08	1,07E-09	2,92E-09	-3,69E-08
ADP-fossil	MJ	8,17E-01	1,09E-01	1,97E-02	7,82E-02	4,01E-02	4,60E-02	-8,41E-02
Water use	m^3e depr.	1,47E-02	5,46E-04	4,83E-05	3,76E-04	9,81E-05	1,29E-04	-1,05E-02
Secondary materials	kg	2,30E-04	4,70E-05	8,20E-06	3,33E-05	1,66E-05	1,16E-05	6,99E+00
Biog. C in product[9)]	kg C	0,00E+00	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging	kg C	0,00E+00	N/A	N/A	N/A	N/A	N/A	N/A

9) Biog. C in product = Biogenic carbon content in product

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value	Source
Residual mix (Lithuania) from the grid	0.626 kg CO2e/kWh	Average Lithuanian residual mix of last three last years (2021, 2022 and 2023) has been modelled according to the Association of Issuing Bodies data (https://www.aib-net.org/facts/european-residual-mix). Data sources: ecoinvent 3.10
Diesel, burned in building machine	0.1 kg CO2e / MJ	Data sources: ecoinvent 3.10 Country: World

Transport scenario documentation (A4)

Scenario parameter	Value
Transport, freight, lorry >32 metric ton, EURO5, kg CO_2e / tkm	0.11
Average transport distance, km	70
Capacity utilization (including empty return) %	100
Bulk density of transported products, kg/m^3	2388.85
Volume capacity utilization factor	1

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1672.20
Collection process – kg collected with mixed waste	716.66
Recovery process – kg for re-use	0
Recovery process – kg for recycling	1672.20
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	716.66
Scenario assumptions e.g. transportation	Transported 50 km with an average lorry.

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5. ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.
6. ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.
7. Ready-mix concrete LCA background report 19.11.2024
8. One Click LCA tool
9. Ecoinvent database v3.10 (2023)

ABOUT THE MANUFACTURER

The company was established on June 28, 1993. It has implemented and certified management systems in compliance with LST EN ISO 9001:2015, LST EN ISO 14001:2015, and LST EN ISO 45001:2018 standards.

The mission (policy) of AB HISK is to manage all interconnected processes to ensure the quality of constructed buildings and manufactured construction products while continuously improving quality indicators, environmental protection, and occupational health and safety performance. This policy is implemented through:

- Consistently meeting client, legal, and other applicable requirements;
- Continuously improving the quality, environmental management, and occupational health and safety systems;
- Enhancing existing technologies and adopting new, safe, and environmentally friendly solutions aligned with sustainability goals;
- Selecting appropriate materials and subcontractors;
- Implementing measures to prevent environmental pollution and ensure employee safety and health;
- Fostering employee training and development, encouraging every team member to contribute to the improvement of the company's management system, and promoting awareness of the impact of their actions on the environment and human well-being.

Manufacturer	AB "HISK"
EPD author	Urtė Valdavičė UAB "Vesta Consulting"
EPD verifier	Mari Kirss, Rangi Maja OÜ
EPD program operator	Rakennustieto Oy
Background data	This EPD is based on Ecoinvent 3.10 (Allocation, cut-off, EN15804) database.
LCA software	The LCA and EPD have been created using One Click LCA tool. The EN 15804 reference package used is based on EF 3.1.