epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Steinsteypan
No.: MD-24117-EN
Issued: 05-02-2025
Valid to: 05-02-2030

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration

Steinsteypan,
Koparhella 1,
221 Hafnarfirði,
Iceland
VAT number: 521223-0300

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Declared product is 1 m^3 of plastic concrete for construction in class C25.

Number of declared datasets/product variations: 1

Production site
Steinsteypan,
Koparhella 1,
221 Hafnarfirði,
Iceland

Use of Guarantees of Origin
☒ No certificates used
☐ Electricity covered by GoO
☐ Biogas covered by GoO

Declared/ functional unit
Declared unit is 1 m^3 of C25 concrete.

Year of production site data (A3)
November 2022-October 2023.

EPD version
1, 02-01-2025.

Issued: 05-02-2025
Valid to: 05-02-2030

Basis of calculation
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☒Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025
☐ internal ☒ external

Third party verifier:
Mirko Miseljic

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

The product from Steinsteypan is plastic concrete used for construction. This EPD covers the declared unit of 1 m^3 of concrete with characteristic strength classes of C25 as specified in ÍST EN 206. The main product components are shown in the table below.

Material	Weight-% of declared product
Cement, CEM I, 52.5,5N	14%
Sand	23%
Water	7%
Air entraining agent	0.02%
Lava granulate	56%
Superplasticizer	0.07%
Total	100.00

Raw material and Product packaging:

No packaging of raw material is used. No packaging for the product is used since it is transported directly in a truck mixer.

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of concrete on the production site located Steinsteypan located in Iceland. Product specific data are based on average values collected in the period November 2022-October 2023. Background data are based on GaBi and Ecoinvent databases and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

C25 does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

(http://echa.europa.eu/candidate-list-table)

Product(s) use

Plastic concrete is used for many different construction aspects, including basic foundations, exterior surfaces, superstructures, floor construction, wastewater treatment facilities, and parking lots/structures. It serves as a fundamental building material in these applications.

Essential characteristics

C25 is covered by the harmonized technical specification ÍST EN 206. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations. The cement has a strength class of C25 and an exposure class of XC2. It contains a mix proportion binder of cement class I 52.5.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website: Steinsteypan

Reference Service Life (RSL)

The reference service life (RSL) is 100 years according to the Annex AA in DS/EN 16757:2022 Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements.

Picture of product

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to the declared unit 1 m^3 concrete, see the Table below with indication of average density per product type and a conversion from m^3 to kg.

Name	Value	Unit
Declared unit	1	m^3
Density	2271.92	kg/m^3
Conversion factor to 1 kg.	0.00044	m^3/kg

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2:2019, and DS/EN 16757:2022 - Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements

Energy modelling principles

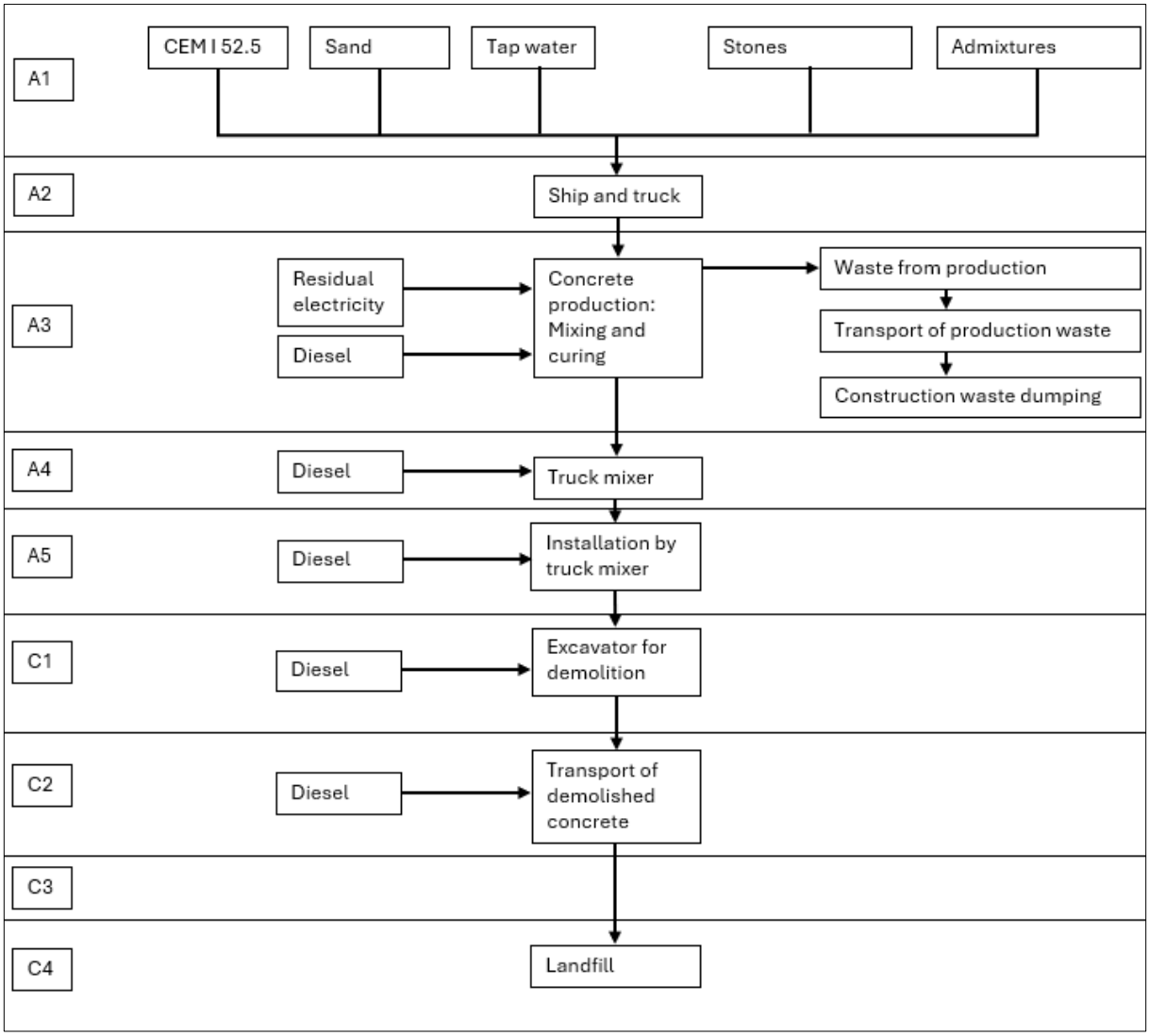
Foreground system:

The product is produced using residual grid mix from Iceland and diesel for the production of the concrete.

Background system:

For the background system, the upstream and downstream processes energy consumption are modelled using fuel input as of RER: Diesel mix at filling station Sphera and electricity input used is grid mix of medium voltage.

Flowdiagram



System boundary

This EPD is based on a cradle-to-grave LCA and covers the life cycle sub modules A1-A3, B1-B7 C1-C4 and D, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804+A2:2019, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the" end-of-waste" state or final disposal.

The concrete manufacturing process takes place at the Steinsteypan site. First the raw materials are batched, which means the measurement of the aggregates, cement and water necessary for preparing the specific grade of concrete. When the raw materials have been batched, they are mixed together, to produce a uniform concrete.

The electricity, water, and heat are based on a one-year cycle. The inputs are then divided by the total production output at the production site for one year to allocate the energy consumption to the declared unit (DU) based on m^3 produced.

Construction process stage (A4-A5) includes:

The product is assumed to be applied in Iceland. An average distance of 30 km is given by Steinsteypan. A truck mixer is used for the transport of concrete. The diesel consumption is given by Steinsteypan. It is calculated that 2.32 kg of diesel is used to transport 1 m^3 of concrete 30 km. This is 20% more diesel input that a typical truck consumes for the same mass kilometer in GaBi. The truck mixer has the purpose of mixing the concrete and loading the concrete for installation which is processes contained in Module A5. The additional 20% diesel input is therefore allocated to A5 for the installation of the concrete.

Use stage (B1-B7) includes:

As there is no maintenance, repair, refurbishment or any operational water or energy consumption related to the use the product during their reference service life, all modules in the use stage (B1-B7) are considered to have no environmental impact. Carbonation in B1 of concrete where CO_2 in the ambient air penetrates the concrete is not relevant for the Steinsteypan concrete. The carbonation is 0 because the concrete is covered under layers that are closing it off from ambient air such as lays of insulation material, tiles, parquet and laminate. When the concrete is covered by layers like these, there is no contact with ambient air and thereby no carbonation and thereby no CO_2-uptake. The method of assessing the carbonation of the concrete is based on the DS/EN 16757 Annex G.

End of Life (C1-C4) includes:

Module C1 accounts for the environmental impacts associated with dismantling and demolition of the facade boards. Fuel used for demolition equipment and transport on site vehicles. Demolition requires 3.75 kg of Diesel from a 150-kW excavator.

The average distance to waste handling facilities is 60 km. The truck type for all product types is the GLO: Truck, Euro 6 A-C, 28 - 32t gross weight.

Module C3 – The concrete product is sent to landfill and therefore there is no environmental impacts associated with waste processing of materials flows intended for reuse, recycling or energy recovery.

100% of the product is sent to landfill. This is based on information given by Steinsteypan. According to Steinsteypan and LCA building expert in COWI Iceland it is standard practice to be sending building materials to landfill in Iceland. As the waste scenario described above is based on the currently available information, the scenarios are currently in use and are representative for one of the most likely scenario alternatives.

Re-use, recovery and recycling potential (D) includes: No parts of the product are sent to recycling and there has been no product packaging. There is therefore no material recycling or energy recovery by incineration.

LCA results

ENVIRONMENTAL IMPACTS PER m^3												
Indicator	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	2.50E+02	1.78E+01	4.71E+00	7.10E+00	1.67E+00	0.00E+00	4.68E-01	1.42E+01	0.00E+00	3.42E+01	0.00E+00
GWP-fossil	kg CO_2 eq.	2.50E+02	1.77E+01	4.64E+00	6.99E+00	1.65E+00	0.00E+00	4.32E-01	1.40E+01	0.00E+00	3.40E+01	0.00E+00
GWP-biogenic	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO_2 eq.	9.85E-02	7.06E-02	6.99E-02	1.15E-01	2.70E-02	0.00E+00	3.60E-02	2.29E-01	0.00E+00	2.04E-01	0.00E+00
ODP	kg CFC 11 eq.	1.93E-06	1.65E-12	7.91E-08	1.00E-12	2.37E-13	0.00E+00	3.15E-13	2.01E-12	0.00E+00	9.18E-11	0.00E+00
AP	mol H^+ eq.	4.54E-01	2.57E-01	1.58E-02	1.02E-02	2.41E-03	0.00E+00	1.85E-03	2.05E-02	0.00E+00	2.41E-01	0.00E+00
EP-freshwater	kg P eq.	6.67E-03	2.14E-05	1.10E-03	2.91E-05	6.86E-06	0.00E+00	9.14E-06	5.82E-05	0.00E+00	7.73E-05	0.00E+00
EP-marine	kg N eq.	1.10E-01	1.08E-01	3.93E-03	3.85E-03	9.08E-04	0.00E+00	5.40E-04	7.70E-03	0.00E+00	6.22E-02	0.00E+00
EP-terrestrial	mol N eq.	1.31E+00	1.19E+00	4.25E-02	4.54E-02	1.07E-02	0.00E+00	6.61E-03	9.09E-02	0.00E+00	6.84E-01	0.00E+00
POCP	kg NMVOC eq.	3.42E-01	2.97E-01	1.24E-02	1.02E-02	2.40E-03	0.00E+00	1.89E-03	2.04E-02	0.00E+00	1.90E-01	0.00E+00
ADPm[1]	kg Sb eq.	2.14E-04	6.58E-07	4.69E-06	5.94E-07	1.40E-07	0.00E+00	1.86E-07	1.19E-06	0.00E+00	2.20E-06	0.00E+00
ADPf[1]	MJ	7.71E+02	2.13E+02	1.23E+02	8.98E+01	2.12E+01	0.00E+00	2.82E+01	1.80E+02	0.00E+00	4.48E+02	0.00E+00
WDP[1]	m^3 world eq. deprived	3.16E+03	8.91E-02	1.66E+00	1.06E-01	2.49E-02	0.00E+00	3.31E-02	2.11E-01	0.00E+00	3.89E+00	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use											
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.											

ADDITIONAL ENVIRONMENTAL IMPACTS PER m^3												
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	4.39E-06	6.70E-06	1.08E-07	9.88E-08	2.33E-08	0.00E+00	2.26E-08	1.98E-07	0.00E+00	3.03E-06	0.00E+00
IRP[2]	[kBq U235 eq.]	1.20E+00	3.97E-02	1.33E+00	2.37E-02	5.60E-03	0.00E+00	7.45E-03	4.75E-02	0.00E+00	5.45E-01	0.00E+00
ETP-fw[1]	[CTUe]	4.08E+03	1.58E+02	4.36E+01	6.67E+01	1.57E+01	0.00E+00	2.09E+01	1.33E+02	0.00E+00	2.58E+02	0.00E+00
HTP-c[1]	[CTUh]	1.34E-07	2.94E-09	1.56E-09	1.35E-09	3.17E-10	0.00E+00	4.22E-10	2.69E-09	0.00E+00	6.10E-09	0.00E+00
HTP-nc[1]	[CTUh]	3.78E-07	1.04E-07	6.18E-08	6.04E-08	1.42E-08	0.00E+00	1.90E-08	1.21E-07	0.00E+00	2.36E-07	0.00E+00
SQP[1]	-	6.71E+02	2.76E+01	3.70E+01	4.42E+01	1.04E+01	0.00E+00	1.39E+01	8.84E+01	0.00E+00	1.24E+02	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality											
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. [2] 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.											

RESOURCE USE PER m³												
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.57E+02	5.53E+00	9.78E+00	7.74E+00	1.82E+00	0.00E+00	2.43E+00	1.55E+01	0.00E+00	7.83E+01	0.00E+00
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	0.00E+00	0.00E+00
PERT	[MJ]	2.57E+02	5.53E+00	9.78E+00	7.74E+00	1.82E+00	0.00E+00	2.43E+00	1.55E+01	0.00E+00	7.83E+01	0.00E+00
PENRE	[MJ]	7.71E+02	2.13E+02	1.23E+02	8.98E+01	2.12E+01	0.00E+00	2.82E+01	1.80E+02	0.00E+00	4.48E+02	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	7.71E+02	2.13E+02	1.23E+02	8.98E+01	2.12E+01	0.00E+00	2.82E+01	1.80E+02	0.00E+00	4.48E+02	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00
FW	[m³]	2.54E+00	2.82E-04	1.31E-04	8.62E-03	2.03E-03	0.00E+00	2.71E-03	1.72E-02	0.00E+00	1.19E-01	0.00E+00
Caption	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 = Net use of fresh water											

WASTE CATEGORIES AND OUTPUT FLOWS PER m³												
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	6.71E-01	7.04E-09	2.88E-09	3.44E-09	8.11E-10	0.00E+00	1.08E-09	6.88E-09	0.00E+00	1.12E-07	0.00E+00
NHWD	[kg]	1.94E+00	2.42E-02	2.27E+01	1.47E-02	3.46E-03	0.00E+00	4.60E-03	2.93E-02	0.00E+00	2.27E+03	0.00E+00
RWD	[kg]	9.48E-04	2.82E-04	1.31E-04	1.64E-04	3.86E-05	0.00E+00	5.14E-05	3.27E-04	0.00E+00	4.71E-03	0.00E+00
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	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy											

BIOGENIC CARBON CONTENT PER m³		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0

Additional information

LCA interpretation

It has been found that 1 m^3 of C25 has an emission of 329.97 kg CO_2/m^3. The climate impact of the C25 is approximately 70 kg CO2 eq higher/m^3 C25 concrete in the market. The fact that CEM I 52.5 N is used for the clicker for Steinsteypan might explain the higher emission factor, since no fly ash or burden free material is used for the clincker.

The results show that the input of cement has the largest contribution to most of the impact categories. Cement accounts for approximately 67% of the contribution to climate change and is the main contributor to 7 of the impact categories.

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type	RER: Diesel mix at filling station Sphera	-
Vehicle type	A2: GLO: Truck, Euro 6 A-C, 28 - 32t gross weight / 22t payload capacity Sphera <u-so>	-
Transport distance	30	km
Capacity utilisation (including empty runs)	61	%
Gross density of products transported	2,271.92	kg/m^3
Capacity utilisation volume factor	1	-

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials		kg
Water use		m^3
Other resource use		kg
Energy type and consumption: RER: Diesel mix at filling station	0.46	kg
Waste materials		kg
Output materials		kg
Direct emissions to air, soil or water		kg

Reference service life

RSL information		Unit
Reference service Life	100	Years
Declared product properties	Declared by the producer	As appropriate
Design application parameters	See DS/EN 16757:2022	As appropriate
Assumed quality of work	See DS/EN 16757:2022	As appropriate
Outdoor environment	Yes	As appropriate
Indoor environment	See DS/EN 16757:2022	As appropriate
Usage conditions	See DS/EN 16757:2022	As appropriate
Maintenance	no	As appropriate

Use (B1-B7)

Scenario information	Value	Unit
B1 – Use		
B2 - Maintenance		
Maintenance process	Description or reference	-
Maintenance cycle		/year
Ancillary materials for maintenance (specify which)		kg/cycle
Waste materials resulting from maintenance (specify which)		kg
Net freshwater consumption during maintenance		m^3
Energy input during maintenance		kWh
B3 – Repair		
Repair process	Description or reference	-
Inspection process	Description or reference	-
Repair cycle		/year
Ancillary materials (specify which)		kg/cycle
Waste materials (specify which)		kg
Net freshwater consumption during repair		m^3
Energy input during repair		kg/cycle
B4 – Replacement		
Replacement cycle		/year
Energy input during replacement		kWh
Exchange of worn parts during products life cycle		kg
B5 - Refurbishment		
Refurbishment process		
Refurbishment cycle		/year
Energy input during refurbishment		kWh
Material input for refurbishment (specify which)		kg/cycle
Waste materials resulting from refurbishment		kg
Further assumptions for scenario development		As appropriate
B6 + B7 – Use of energy and water		
Ancillary materials specified by material		kg
Net freshwater consumption		m^3
Type of energy carrier		kWh
Power output of equipment		kW
Characteristic performance		As appropriate
Further assumptions for scenario development		As appropriate

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately		kg
Collected with mixed waste		kg
For reuse		kg
For recycling		kg
For energy recovery		kg
For final disposal	2,271.92	kg
Assumptions for scenario development		As appropriate

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Displaced material		kg
Energy recovery from waste incineration		MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

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LCA-practitioner	Cecilie Holm Arentoft COWI A/S Parallelvej 2 2800 Kgs. Lyngby
LCA software /background data	GaBi Sphera Professional 2024 *Ecoinvent 3.10* *EN 15804 reference package 3.1*
3rd party verifier	*Mirko Miseljic* LCA Specialists Denmark lcaspecialists@outlook.com

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

Product-specific cPCR
DS/EN 16757:2022 Bæredygtighed inden for byggeri og anlæg – Miljøvaredeklarationer – Produktkategoriregler for beton og betonelementer

EN 15942
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040
DS/EN ISO 14040:2008 – ” Environmental management – Life cycle assessment – Principles and framework”

ISO 14044
DS/EN ISO 14044:2008 – ” Environmental management – Life cycle assessment – Requirements and guidelines”

This appendix refers to the EPD MD-24117-EN, developed according to EN15804+A2:2019.
Results in the appendix communicates LCA results in the format described in EN15804+A1:2013, in order to accommodate a need in the transition period between the two standard revisions. The appendix cannot stand alone, as the reference EPD describes the basis of the assessment.

ENVIRONMENTAL IMPACTS PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO_2-eq.]	2.65E+02	6.73E+00	1.59E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.56E-01	1.35E+01	0.00E+00	3.33E+01	0.00E+00
ODP	[kg CFC11-eq.]	1.95E-06	1.18E-12	2.79E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.71E-13	2.36E-12	0.00E+00	1.08E-10	0.00E+00
AP	[kg SO_2-eq.]	6.16E-01	7.22E-03	1.70E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E-03	1.44E-02	0.00E+00	1.92E-01	0.00E+00
EP	[kg PO_4^{3-}-eq.]	1.15E+00	1.68E-03	3.95E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-04	3.35E-03	0.00E+00	2.18E-02	0.00E+00
POCP	[kg ethene-eq.]	2.24E-01	9.48E-04	2.23E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.97E-04	1.90E-03	0.00E+00	1.59E-02	0.00E+00
ADPE	[kg Sb-eq.]	2.20E-04	5.92E-07	1.40E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-07	1.18E-06	0.00E+00	2.23E-06	0.00E+00
ADPF	[MJ]	1.07E+03	8.82E+01	2.08E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E+01	1.76E+02	0.00E+00	4.30E+02	0.00E+00
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.															

RESOURCE USE PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	2.72E+02	7.74E+00	1.82E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.43E+00	1.55E+01	0.00E+00	7.83E+01	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.72E+02	7.74E+00	1.82E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.43E+00	1.55E+01	0.00E+00	7.83E+01	0.00E+00
PENRE	[MJ]	1.11E+03	8.98E+01	2.12E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.82E+01	1.80E+02	0.00E+00	4.48E+02	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.11E+03	8.98E+01	2.12E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.82E+01	1.80E+02	0.00E+00	4.48E+02	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	2.59E+00	8.62E-03	2.03E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-03	1.72E-02	0.00E+00	1.19E-01	0.00E+00
Caption	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															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.															

WASTE CATEGORIES AND OUTPUT FLOWS PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	6.71E-01	3.44E-09	8.11E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-09	6.88E-09	0.00E+00	1.12E-07	0.00E+00
NHWD	[kg]	2.47E+01	1.47E-02	3.46E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.60E-03	2.93E-02	0.00E+00	2.27E+03	0.00E+00
RWD	[kg]	1.36E-03	1.64E-04	3.86E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.14E-05	3.27E-04	0.00E+00	4.71E-03	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.

Checked and approved by

Mirko Miseljic
Third party verifier of MD-24117-EN

Martha Katrine Sørensen
EPD Danmark

epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Steinsteypan
No.: MD-24119-EN
Issued: 05-02-2025
Valid to: 05-02-2030

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration

Steinsteypan,
Koparhella 1,
221 Hafnarfirði,
Iceland
VAT number: 521223-0300

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Declared product is 1 m^3 of plastic concrete for construction in class C35. Number of declared datasets/product variations: 1

Production site
Steinsteypan,
Koparhella 1,
221 Hafnarfirði,
Iceland

Use of Guarantees of Origin
☒ No certificates used
☐ Electricity covered by GoO
☐ Biogas covered by GoO

Declared/ functional unit
Declared unit is 1 m^3 of C35 concrete.

Year of production site data (A3)
November 2022-October 2023.

EPD version
1, 02-01-2025.

Issued: 05-02-2025
Valid to: 05-02-2030

Basis of calculation
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☒Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Mirko Miseljic

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

The product from Steinsteypan is plastic concrete used for construction. This EPD covers the declared unit of 1 m^3 of concrete with characteristic strength classes of C35 as specified in ÍST EN 206. The main product components are shown in the table below.

Material	Weight-% of declared product
Cement, CEM I, 52.5,5N	17%
Sand	6%
Water	16%
Air entraining agent	60%
Lava granulate	0%
Superplasticizer	0%
Total	100%

Raw material and Product packaging:

No packaging of raw material is used. No packaging for the product is used since it is transported directly in a truck mixer.

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of concrete on the production site located Steinsteypan located in Iceland. Product specific data are based on average values collected in the period November 2022-October 2023. Background data are based on GaBi and Ecoinvent databases and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

C35 does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

(http://echa.europa.eu/candidate-list-table)

Product(s) use

Plastic concrete is used for many different construction aspects, including basic foundations, exterior surfaces, superstructures, floor construction, wastewater treatment facilities, and parking lots/structures. It serves as a fundamental building material in these applications.

Essential characteristics

C35 is covered by the harmonized technical specification ÍST EN 206. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations. The cement has a strength class of C35 and an exposure class of XC2. It contains a mix proportion binder of cement class I 52.5.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website: Steinsteypan

Reference Service Life (RSL)

The reference service life (RSL) is 100 years according to Annex AA in DS/EN 16757:2022 Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements.

Picture of product

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to the declared unit 1 m^3 concrete, see the Table below with indication of average density per product type and a conversion from m^3 to kg.

Name	Value	Unit
Declared unit	1	m^3
Density	2,292.10	kg/m^3
Conversion factor to 1 kg.	0.00044	m^3/kg

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2:2019, and DS/EN 16757:2022 - Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements

Energy modelling principles

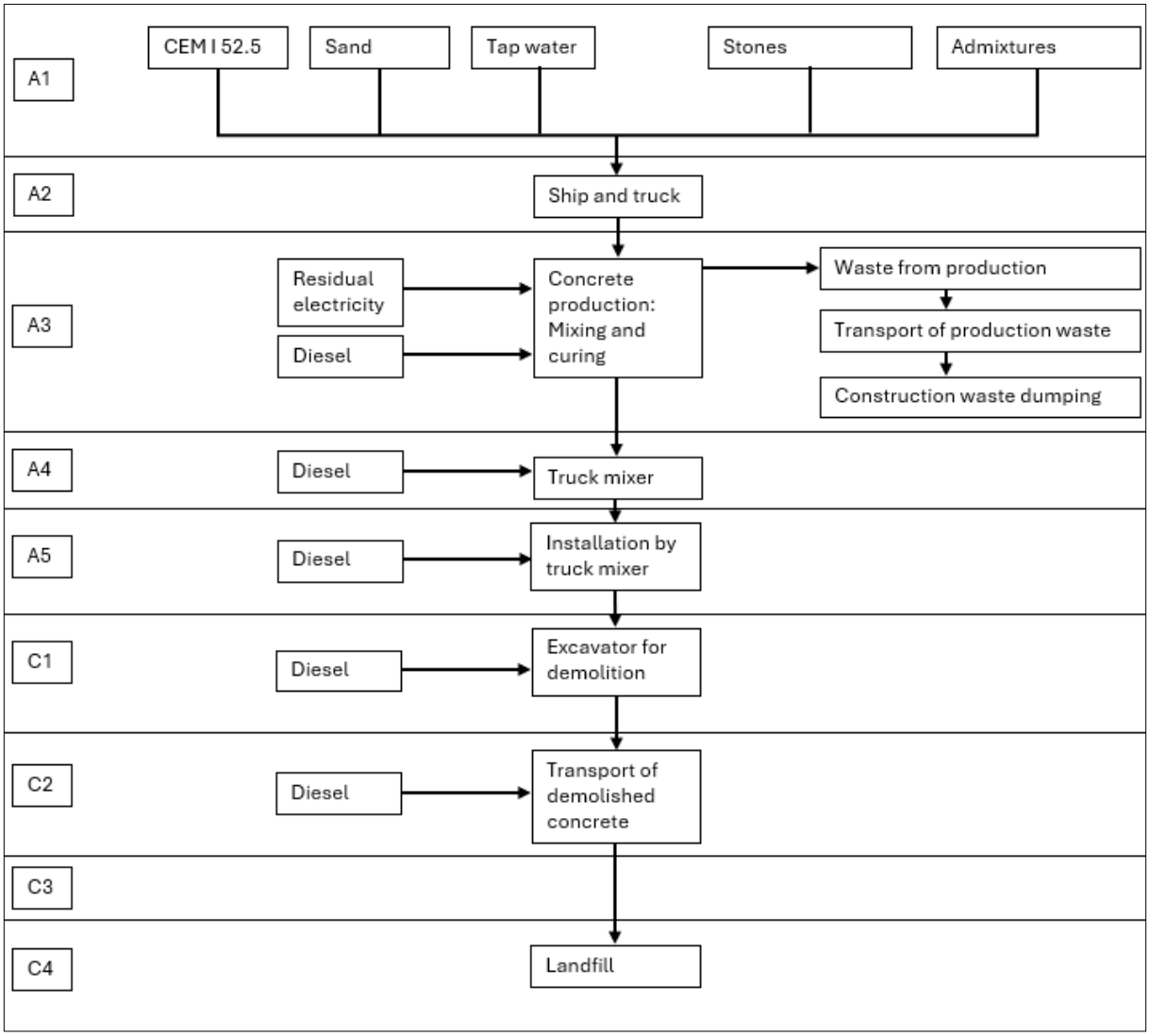
Foreground system:

The product is produced using residual grid mix from Iceland and diesel for the production of the concrete.

Background system:

For the background system, the upstream and downstream processes energy consumption are modelled using fuel input as of RER: Diesel mix at filling station Sphera and electricity input used is grid mix of medium voltage.

Flowdiagram



System boundary

This EPD is based on a cradle-to-grave LCA and covers the life cycle sub modules A1-A3, B1-B7, C1-C4 and D, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804+A2:2019, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the" end-of-waste" state or final disposal.

The concrete manufacturing process takes place at the Steinsteypan site. First the raw materials are batched, which means the measurement of the aggregates, cement and water necessary for preparing the specific grade of concrete. When the raw materials have been batched, they are mixed together, to produce a uniform concrete.

The electricity, water, and heat are based on a one-year cycle. The inputs are then divided by the total production output at the production site for one year to allocate the energy consumption to the declared unit (DU) based on m^3 produced.

Construction process stage (A4-A5) includes:

The product is assumed to be applied in Iceland. An average distance of 30 km is given by Steinsteypan. A truck mixer is used for the transport of concrete. The diesel consumption is given by Steinsteypan. It is calculated that 2.32 kg of diesel is used to transport 1 m^3 of concrete 30 km. This is 20% more diesel input that a typical truck consumes for the same mass kilometer in GaBi. The truck mixer has the purpose of mixing the concrete and loading the concrete for installation which is processes contained in Module A5. The additional 20% diesel input is therefore allocated to A5 for the installation of the concrete.

Use stage (B1-B7) includes:

As there is no maintenance, repair, refurbishment or any operational water or energy consumption related to the use the product during their reference service life, all modules in the use stage (B1-B7) are considered to have no environmental impact. Carbonation in B1 of concrete where CO_2 in the ambient air penetrates the concrete is not relevant for the Steinsteypan concrete. The carbonation is 0 because the concrete is covered under layers that are closing it off from ambient air such as lays of insulation material, tiles, parquet and laminate. When the concrete is covered by layers like these, there is no contact with ambient air and thereby no carbonation and thereby no CO_2-uptake. The method of assessing the carbonation of the concrete is based on the DS/EN 16757 Annex G.

End of Life (C1-C4) includes:

Module C1 accounts for the environmental impacts associated with dismantling and demolition of the facade boards. Fuel used for demolition equipment and transport on site vehicles. Demolition requires 3.75 kg of Diesel from a 150-kW excavator.

The average distance to waste handling facilities is 60 km. The truck type for all product types is the GLO: Truck, Euro 6 A-C, 28 - 32t gross weight.

Module C3 – The concrete product is sent to landfill and therefore there is no environmental impacts associated with waste processing of materials flows intended for reuse, recycling or energy recovery.

100% of the product is sent to landfill. This is based on information given by Steinsteypan. According to Steinsteypan and LCA building expert in COWI Iceland it is standard practice to be sending building materials to landfill in Iceland. As the waste scenario described above is based on the currently available information, the scenarios are currently in use and are representative for one of the most likely scenario alternatives.

Re-use, recovery and recycling potential (D) includes: No parts of the product are sent to recycling and there has been no product packaging. There is therefore no material recycling or energy recovery by incineration.

LCA results

ENVIRONMENTAL IMPACTS PER m^3												
Indicator	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	3.06E+02	2.17E+01	4.71E+00	7.17E+00	1.69E+00	0.00E+00	4.72E-01	1.43E+01	0.00E+00	3.45E+01	0.00E+00
GWP-fossil	kg CO_2 eq.	3.06E+02	2.16E+01	4.64E+00	7.05E+00	1.66E+00	0.00E+00	4.36E-01	1.41E+01	0.00E+00	3.43E+01	0.00E+00
GWP-biogenic	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO_2 eq.	1.06E-01	7.48E-02	6.99E-02	1.16E-01	2.73E-02	0.00E+00	3.63E-02	2.31E-01	0.00E+00	2.06E-01	0.00E+00
ODP	kg CFC 11 eq.	2.39E-06	1.96E-12	7.91E-08	1.01E-12	2.39E-13	0.00E+00	3.18E-13	2.03E-12	0.00E+00	9.26E-11	0.00E+00
AP	mol H^+ eq.	4.94E-01	3.25E-01	1.58E-02	1.03E-02	2.44E-03	0.00E+00	1.87E-03	2.07E-02	0.00E+00	2.44E-01	0.00E+00
EP-freshwater	kg P eq.	6.15E-03	2.34E-05	1.10E-03	2.94E-05	6.93E-06	0.00E+00	9.22E-06	5.88E-05	0.00E+00	7.80E-05	0.00E+00
EP-marine	kg N eq.	1.22E-01	1.37E-01	3.94E-03	3.88E-03	9.17E-04	0.00E+00	5.45E-04	7.77E-03	0.00E+00	6.27E-02	0.00E+00
EP-terrestrial	mol N eq.	1.46E+00	1.50E+00	4.25E-02	4.58E-02	1.08E-02	0.00E+00	6.67E-03	9.17E-02	0.00E+00	6.91E-01	0.00E+00
POCP	kg NMVOC eq.	3.77E-01	3.76E-01	1.25E-02	1.03E-02	2.42E-03	0.00E+00	1.91E-03	2.05E-02	0.00E+00	1.92E-01	0.00E+00
ADPm[1]	kg Sb eq.	2.56E-04	7.59E-07	4.69E-06	5.99E-07	1.41E-07	0.00E+00	1.88E-07	1.20E-06	0.00E+00	2.22E-06	0.00E+00
ADPf[1]	MJ	8.43E+02	2.59E+02	1.23E+02	9.06E+01	2.14E+01	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
WDP[1]	m^3 world eq. deprived	4.00E+03	9.94E-02	1.66E+00	1.07E-01	2.51E-02	0.00E+00	3.34E-02	2.13E-01	0.00E+00	3.93E+00	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use											
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.											

ADDITIONAL ENVIRONMENTAL IMPACTS PER m^3												
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	4.14E-06	8.50E-06	1.08E-07	9.97E-08	2.35E-08	0.00E+00	2.28E-08	1.99E-07	0.00E+00	3.06E-06	0.00E+00
IRP[2]	[kBq U235 eq.]	1.38E+00	4.73E-02	1.33E+00	2.39E-02	5.65E-03	0.00E+00	7.52E-03	4.79E-02	0.00E+00	5.50E-01	0.00E+00
ETP-fw[1]	[CTUe]	5.14E+03	1.92E+02	4.37E+01	6.73E+01	1.59E+01	0.00E+00	2.11E+01	1.35E+02	0.00E+00	2.61E+02	0.00E+00
HTP-c[1]	[CTUh]	1.31E-07	3.56E-09	1.56E-09	1.36E-09	3.21E-10	0.00E+00	4.26E-10	2.72E-09	0.00E+00	6.16E-09	0.00E+00
HTP-nc[1]	[CTUh]	3.94E-07	1.25E-07	6.18E-08	6.10E-08	1.44E-08	0.00E+00	1.91E-08	1.22E-07	0.00E+00	2.38E-07	0.00E+00
SQP[1]	-	5.55E+02	2.93E+01	3.70E+01	4.46E+01	1.05E+01	0.00E+00	1.40E+01	8.92E+01	0.00E+00	1.25E+02	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality											
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. [2] 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.											

RESOURCE USE PER m³												
Parameter	Unit	A1	A2	A3	A4	A5	B1	C1	C2	C3	C4	D
PERE	[MJ]	3.16E+02	6.01E+00	9.79E+00	7.80E+00	1.84E+00	0.00E+00	2.45E+00	1.56E+01	0.00E+00	7.90E+01	0.00E+00
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	0.00E+00	0.00E+00
PERT	[MJ]	3.16E+02	6.01E+00	9.79E+00	7.80E+00	1.84E+00	0.00E+00	2.45E+00	1.56E+01	0.00E+00	7.90E+01	0.00E+00
PENRE	[MJ]	8.39E+02	2.59E+02	1.23E+02	9.06E+01	2.14E+01	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	8.39E+02	2.59E+02	1.23E+02	9.06E+01	2.14E+01	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00
FW	[m³]	2.83E+00	3.37E-04	1.32E-04	8.69E-03	2.05E-03	0.00E+00	2.73E-03	1.74E-02	0.00E+00	1.20E-01	0.00E+00
Caption	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 = Net use of fresh water											

WASTE CATEGORIES AND OUTPUT FLOWS PER m³												
Parameter	Unit	A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	5.93E-01	8.50E-09	2.89E-09	3.47E-09	8.19E-10	0.00E+00	1.09E-09	6.94E-09	0.00E+00	1.13E-07	0.00E+00
NHWD	[kg]	2.44E+00	2.88E-02	2.29E+01	1.48E-02	3.49E-03	0.00E+00	4.65E-03	2.96E-02	0.00E+00	2.29E+03	0.00E+00
RWD	[kg]	1.18E-03	3.37E-04	1.32E-04	1.65E-04	3.90E-05	0.00E+00	5.18E-05	3.30E-04	0.00E+00	4.75E-03	0.00E+00
CRU	[kg]	9.34E-05	2.82E-04	1.31E-04	1.64E-04	3.86E-05	0.00E+00	5.14E-05	3.27E-04	0.00E+00	4.71E-03	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy											

BIOGENIC CARBON CONTENT PER m³		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0

Additional information

LCA interpretation

It has been found that 1 m^3 of C35 has an emission of 391.02 kg CO_2/m^3. The climate impact of the C35 is similar to the impact of average C35 concrete in the market.

The results show that the input of cement has the largest contribution to most of the impact categories. Cement accounts for approximately 72% of the contribution to climate change and is the main contributor to 8 of the impact categories.

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type	RER: Diesel mix at filling station Sphera	-
Vehicle type	A2: GLO: Truck, Euro 6 A-C, 28 - 32t gross weight / 22t payload capacity Sphera <u-so>	-
Transport distance	30	km
Capacity utilisation (including empty runs)	61	%
Gross density of products transported	2,292,10	kg/m^3
Capacity utilisation volume factor	1	-

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials		kg
Water use		m^3
Other resource use		kg
Energy type and consumption: RER: Diesel mix at filling station	0.46	kg
Waste materials		kg
Output materials		kg
Direct emissions to air, soil or water		kg

Reference service life

RSL information		Unit
Reference service Life	100	Years
Declared product properties	Declared by the producer	As appropriate
Design application parameters	See DS/EN 16757:2022	As appropriate
Assumed quality of work	See DS/EN 16757:2022	As appropriate
Outdoor environment	Yes	As appropriate
Indoor environment	See DS/EN 16757:2022	As appropriate
Usage conditions	See DS/EN 16757:2022	As appropriate
Maintenance	no	As appropriate

Use (B1-B7)

Scenario information	Value	Unit
B1 – Use		
B2 - Maintenance		
Maintenance process	Description or reference	-
Maintenance cycle		/year
Ancillary materials for maintenance (specify which)		kg/cycle
Waste materials resulting from maintenance (specify which)		kg
Net freshwater consumption during maintenance		m^3
Energy input during maintenance		kWh
B3 – Repair		
Repair process	Description or reference	-
Inspection process	Description or reference	-
Repair cycle		/year
Ancillary materials (specify which)		kg/cycle
Waste materials (specify which)		kg
Net freshwater consumption during repair		m^3
Energy input during repair		kg/cycle
B4 – Replacement		
Replacement cycle		/year
Energy input during replacement		kWh
Exchange of worn parts during products life cycle		kg
B5 - Refurbishment		
Refurbishment process		
Refurbishment cycle		/year
Energy input during refurbishment		kWh
Material input for refurbishment (specify which)		kg/cycle
Waste materials resulting from refurbishment		kg
Further assumptions for scenario development		As appropriate
B6 + B7 – Use of energy and water		
Ancillary materials specified by material		kg
Net freshwater consumption		m^3
Type of energy carrier		kWh
Power output of equipment		kW
Characteristic performance		As appropriate
Further assumptions for scenario development		As appropriate

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately		kg
Collected with mixed waste		kg
For reuse		kg
For recycling		kg
For energy recovery		kg
For final disposal	2,292,10	kg
Assumptions for scenario development		As appropriate

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Displaced material		kg
Energy recovery from waste incineration		MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

Publisher	www.epddanmark.dk Template version 2024.1
Programme operator	Danish Technological Institute Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Cecilie Holm Arentoft COWI A/S Parallelvej 2 2800 Kgs. Lyngby
LCA software /background data	GaBi Sphera Professional 2024 *Ecoinvent 3.10* *EN 15804 reference package 3.1*
3rd party verifier	Mirko Miseljic LCA Specialists Denmark lcaspecialists@outlook.com

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

Product-specific cPCR
DS/EN 16757:2022 Bæredygtighed inden for byggeri og anlæg – Miljøvaredeklarationer – Produktkategoriregler for beton og betonelementer

EN 15942
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040

DS/EN ISO 14040:2008 – ” Environmental management – Life cycle assessment – Principles and framework”

ISO 14044
DS/EN ISO 14044:2008 – ” Environmental management – Life cycle assessment – Requirements and guidelines”

This appendix refers to the EPD MD-24119-EN, developed according to EN15804+A2:2019.
Results in the appendix communicates LCA results in the format described in EN15804+A1:2013, in order to accommodate a need in the transition period between the two standard revisions. The appendix cannot stand alone, as the reference EPD describes the basis of the assessment.

ENVIRONMENTAL IMPACTS PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO_2-eq.]	3.23E+02	6.79E+00	1.60E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.58E-01	1.36E+01	0.00E+00	3.36E+01	0.00E+00
ODP	[kg CFC11-eq.]	2.41E-06	1.19E-12	2.82E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.75E-13	2.39E-12	0.00E+00	1.09E-10	0.00E+00
AP	[kg SO_2-eq.]	7.10E-01	7.29E-03	1.72E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-03	1.46E-02	0.00E+00	1.94E-01	0.00E+00
EP	[kg PO_4^{3-}-eq.]	1.44E+00	1.69E-03	3.99E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-04	3.38E-03	0.00E+00	2.20E-02	0.00E+00
POCP	[kg ethene-eq.]	2.78E-01	9.56E-04	2.26E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-04	1.91E-03	0.00E+00	1.60E-02	0.00E+00
ADPE	[kg Sb-eq.]	2.61E-04	5.97E-07	1.41E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-07	1.19E-06	0.00E+00	2.25E-06	0.00E+00
ADPF	[MJ]	1.19E+03	8.89E+01	2.10E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.79E+01	1.78E+02	0.00E+00	4.34E+02	0.00E+00
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.															

RESOURCE USE PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	3.32E+02	7.80E+00	1.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E+00	1.56E+01	0.00E+00	7.90E+01	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	3.32E+02	7.80E+00	1.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E+00	1.56E+01	0.00E+00	7.90E+01	0.00E+00
PENRE	[MJ]	1.22E+03	9.06E+01	2.14E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.22E+03	9.06E+01	2.14E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	2.88E+00	8.69E-03	2.05E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-03	1.74E-02	0.00E+00	1.20E-01	0.00E+00
Caption	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															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.															

WASTE CATEGORIES AND OUTPUT FLOWS PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	5.93E-01	3.47E-09	8.19E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-09	6.94E-09	0.00E+00	1.13E-07	0.00E+00
NHWD	[kg]	2.54E+01	1.48E-02	3.49E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.65E-03	2.96E-02	0.00E+00	2.29E+03	0.00E+00
RWD	[kg]	1.65E-03	1.65E-04	3.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.18E-05	3.30E-04	0.00E+00	4.75E-03	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.

Checked and approved by

Mirko Miseljic
Third party verifier of MD-24119-EN

Martha Katrine Sørensen
EPD Danmark

epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Steinsteypan
No.: MD-24118-EN
Issued: 05-02-2025
Valid to: 05-02-2030

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration

Steinsteypan,
Koparhella 1,
221 Hafnarfirði,
Iceland
VAT number: 521223-0300

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Declared product is 1 m^3 of plastic concrete for construction in class C30
Number of declared datasets/product variations: 1

Production site
Steinsteypan,
Koparhella 1,
221 Hafnarfirði,
Iceland

Use of Guarantees of Origin
☒ No certificates used
☐ Electricity covered by GoO
☐ Biogas covered by GoO

Declared/ functional unit
Declared unit is 1 m^3 of C30 concrete.

Year of production site data (A3)
November 2022-October 2023.

EPD version
1, 02-01-2025.

Issued: 05-02-2025
Valid to: 05-02-2030

Basis of calculation
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☒Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025
☐ internal ☒ external

Third party verifier:

Mirko Miseljic

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

The product from Steinsteypan is plastic concrete used for construction. This EPD covers the declared unit of 1 m^3 of concrete with characteristic strength classes of C30 as specified in ÍST EN 206. The main product components are shown in the table below.

Material	Weight-% of declared product
Cement, CEM I, 52.5,5N	15%
Sand	6%
Water	24%
Air entraining agent	56%
Lava granulate	0%
Superplasticizer	0%
Total	100%

Raw material and Product packaging:

No packaging of raw material is used. No packaging for the product is used since it is transported directly in a truck mixer.

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of concrete on the production site located Steinsteypan located in Iceland. Product specific data are based on average values collected in the period November 2022-October 2023. Background data are based on GaBi and Ecoinvent databases and are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

Hazardous substances

C30 does not contain substances listed on the "Candidate List of Substances of Very High Concern for authorisation"

(http://echa.europa.eu/candidate-list-table)

Product(s) use

Plastic concrete is used for many different construction aspects, including basic foundations, exterior surfaces, superstructures, floor construction, wastewater treatment facilities, and parking lots/structures. It serves as a fundamental building material in these applications.

Essential characteristics

C30 is covered by the harmonized technical specification ÍST EN 206. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations. The cement has a strength class of C30 and an exposure class of XC2. It contains a mix proportion binder of cement class I 52.5.

Further technical information can be obtained by contacting the manufacturer or on the manufacturers website: Steinsteypan

Reference Service Life (RSL)

The reference service life (RSL) is 100 years according to Annex AA in DS/EN 16757:2022 Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements.

Picture of product

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to the declared unit 1 m^3 concrete, see the Table below with indication of average density per product type and a conversion from m^3 to kg.

Name	Value	Unit
Declared unit	1	m^3
Density	2,290.84	kg/m^3
Conversion factor to 1 kg.	0.00044	m^3/kg

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2:2019, and DS/EN 16757:2022 - Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements.

Energy modelling principles

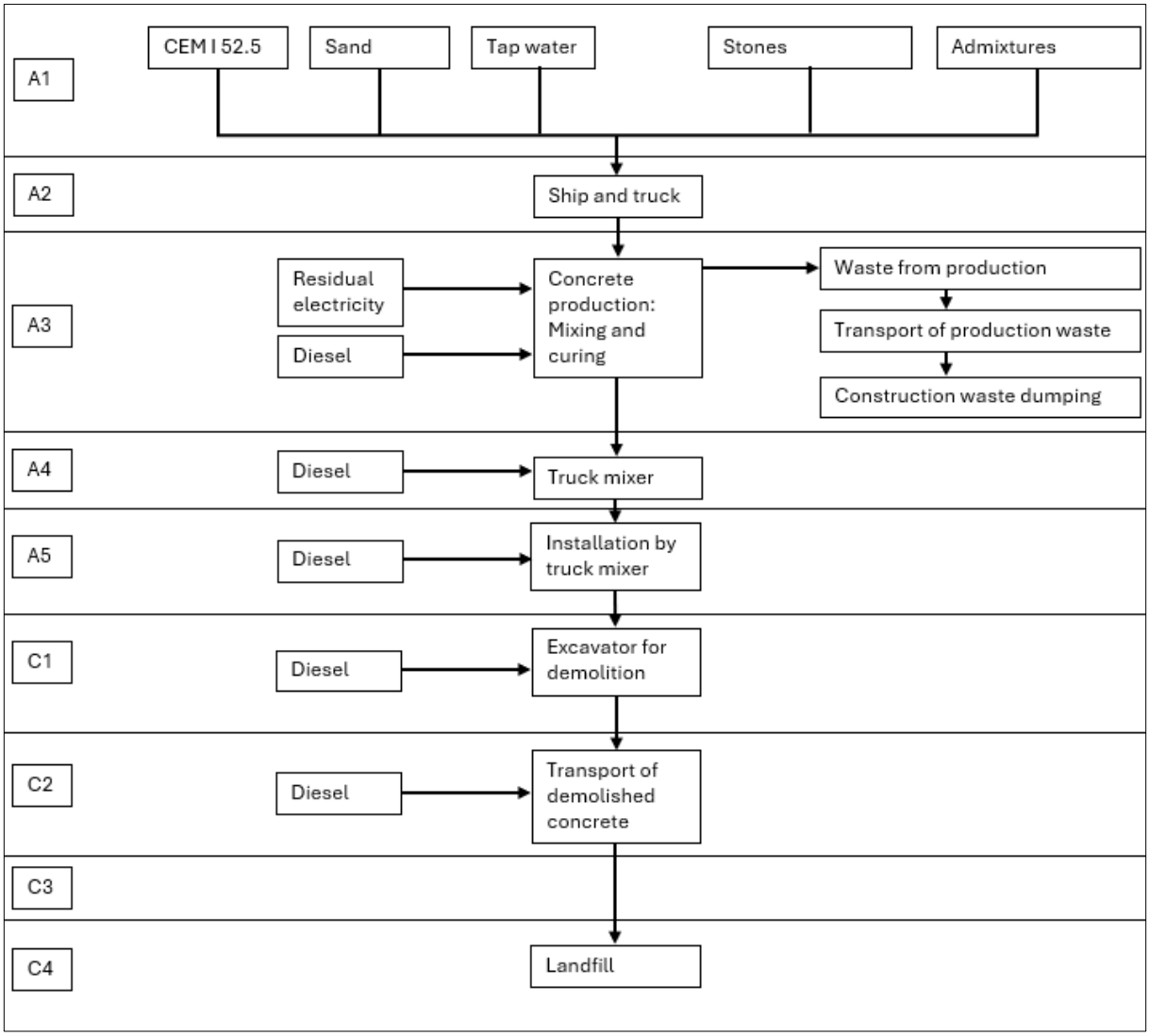
Foreground system:

The product is produced using residual grid mix from Iceland and diesel for the production of the concrete.

Background system:

For the background system, the upstream and downstream processes energy consumption are modelled using fuel input as of RER: Diesel mix at filling station Sphera and electricity input used is grid mix of medium voltage.

Flowdiagram



System boundary

This EPD is based on a cradle-to-grave LCA and covers the life cycle sub modules A1-A3, B1-B7, C1-C4 and D, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804+a2:2019, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the" end-of-waste" state or final disposal.

The concrete manufacturing process takes place at the Steinsteypan site. First the raw materials are batched, which means the measurement of the aggregates, cement and water necessary for preparing the specific grade of concrete. When the raw materials have been batched, they are mixed together, to produce a uniform concrete.

The electricity, water, and heat are based on a one-year cycle. The inputs are then divided by the total production output at the production site for one year to allocate the energy consumption to the declared unit (DU) based on m^3 produced.

Construction process stage (A4-A5) includes:

The product is assumed to be applied in Iceland. An average distance of 30 km is given by Steinsteypan. A truck mixer is used for the transport of concrete. The diesel consumption is given by Steinsteypan. It is calculated that 2.32 kg of diesel is used to transport 1 m^3 of concrete 30 km. This is 20% more diesel input that a typical truck consumes for the same mass kilometer in GaBi. The truck mixer has the purpose of mixing the concrete and loading the concrete for installation which is processes contained in Module A5. The additional 20% diesel input is therefore allocated to A5 for the installation of the concrete.

Use stage (B1-B7) includes:

As there is no maintenance, repair, refurbishment or any operational water or energy consumption related to the use the product during their reference service life, all modules in the use stage (B1-B7) are considered to have no environmental impact.

Carbonation in B1 of concrete where CO_2 in the ambient air penetrates the concrete is not relevant for the Steinsteypan concrete. The carbonation is 0 because the concrete is covered under layers that are closing it off from ambient air such as lays of insulation material, tiles, parquet and laminate. When the concrete is covered by layers like these, there is no contact with ambient air and thereby no carbonation and thereby no CO_2-uptake. The method of assessing the carbonation of the concrete is based on the DS/EN 16757 Annex G.

End of Life (C1-C4) includes:

Module C1 accounts for the environmental impacts associated with dismantling and demolition of the facade boards. Fuel used for demolition equipment and transport on site vehicles. Demolition requires 3.75 kg of Diesel from a 150-kW excavator.

The average distance to waste handling facilities is 60 km. The truck type for all product types is the GLO: Truck, Euro 6 A-C, 28 - 32t gross weight.

Module C3 – The concrete product is sent to landfill and therefore there is no environmental impacts associated with waste processing of materials flows intended for reuse, recycling or energy recovery.

100% of the product is sent to landfill. This is based on information given by Steinsteypan. According to Steinsteypan and LCA building expert in COWI Iceland it is standard practice to be sending building materials to landfill in Iceland. As the waste scenario described above is based on the currently available information, the scenarios are currently in use and are representative for one of the most likely scenario alternatives.

Re-use, recovery and recycling potential (D) includes: No parts of the product are sent to recycling and there has been no product packaging. There is therefore no material recycling or energy recovery by incineration.

LCA results

ENVIRONMENTAL IMPACTS PER m^3												
Indicator	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	2.72E+02	1.92E+01	4.71E+00	7.16E+00	1.69E+00	0.00E+00	4.72E-01	1.43E+01	0.00E+00	3.45E+01	0.00E+00
GWP-fossil	kg CO_2 eq.	2.72E+02	1.92E+01	4.64E+00	7.05E+00	1.66E+00	0.00E+00	4.35E-01	1.41E+01	0.00E+00	3.43E+01	0.00E+00
GWP-biogenic	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO_2 eq.	1.00E-01	7.32E-02	6.99E-02	1.16E-01	2.73E-02	0.00E+00	3.63E-02	2.31E-01	0.00E+00	2.06E-01	0.00E+00
ODP	kg CFC 11 eq.	2.11E-06	1.77E-12	7.90E-08	1.01E-12	2.39E-13	0.00E+00	3.18E-13	2.03E-12	0.00E+00	9.25E-11	0.00E+00
AP	mol H^+ eq.	4.88E-01	2.81E-01	1.58E-02	1.03E-02	2.44E-03	0.00E+00	1.86E-03	2.06E-02	0.00E+00	2.43E-01	0.00E+00
EP-freshwater	kg P eq.	7.06E-03	2.24E-05	1.10E-03	2.93E-05	6.93E-06	0.00E+00	9.22E-06	5.87E-05	0.00E+00	7.80E-05	0.00E+00
EP-marine	kg N eq.	1.18E-01	1.18E-01	3.94E-03	3.88E-03	9.17E-04	0.00E+00	5.45E-04	7.77E-03	0.00E+00	6.27E-02	0.00E+00
EP-terrestrial	mol N eq.	1.40E+00	1.30E+00	4.25E-02	4.58E-02	1.08E-02	0.00E+00	6.67E-03	9.16E-02	0.00E+00	6.90E-01	0.00E+00
POCP	kg NMVOC eq.	3.67E-01	3.24E-01	1.24E-02	1.03E-02	2.42E-03	0.00E+00	1.91E-03	2.05E-02	0.00E+00	1.92E-01	0.00E+00
ADPm[1]	kg Sb eq.	2.33E-04	6.99E-07	4.68E-06	5.99E-07	1.41E-07	0.00E+00	1.88E-07	1.20E-06	0.00E+00	2.22E-06	0.00E+00
ADPf[1]	MJ	8.25E+02	2.30E+02	1.23E+02	9.05E+01	2.14E+01	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
WDP[1]	m^3 world eq. deprived	3.46E+03	9.37E-02	1.66E+00	1.06E-01	2.51E-02	0.00E+00	3.34E-02	2.13E-01	0.00E+00	3.93E+00	0.00E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use											
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.											

ADDITIONAL ENVIRONMENTAL IMPACTS PER m^3												
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	4.62E-06	7.34E-06	1.08E-07	9.96E-08	2.35E-08	0.00E+00	2.28E-08	1.99E-07	0.00E+00	3.05E-06	0.00E+00
IRP[2]	[kBq U235 eq.]	1.30E+00	4.26E-02	1.32E+00	2.39E-02	5.65E-03	0.00E+00	7.51E-03	4.79E-02	0.00E+00	5.50E-01	0.00E+00
ETP-fw[1]	[CTUe]	4.46E+03	1.70E+02	4.37E+01	6.72E+01	1.59E+01	0.00E+00	2.11E+01	1.34E+02	0.00E+00	2.60E+02	0.00E+00
HTP-c[1]	[CTUh]	1.42E-07	3.17E-09	1.56E-09	1.36E-09	3.20E-10	0.00E+00	4.26E-10	2.72E-09	0.00E+00	6.15E-09	0.00E+00
HTP-nc[1]	[CTUh]	4.02E-07	1.12E-07	6.18E-08	6.09E-08	1.44E-08	0.00E+00	1.91E-08	1.22E-07	0.00E+00	2.38E-07	0.00E+00
SQP[1]	-	7.05E+02	2.86E+01	3.70E+01	4.45E+01	1.05E+01	0.00E+00	1.40E+01	8.91E+01	0.00E+00	1.25E+02	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality											
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. [2] 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.											

RESOURCE USE PER m³												
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.80E+02	5.77E+00	9.79E+00	7.80E+00	1.84E+00	0.00E+00	2.45E+00	1.56E+01	0.00E+00	7.89E+01	0.00E+00
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	0.00E+00	0.00E+00
PERT	[MJ]	2.80E+02	5.77E+00	9.79E+00	7.80E+00	1.84E+00	0.00E+00	2.45E+00	1.56E+01	0.00E+00	7.89E+01	0.00E+00
PENRE	[MJ]	8.22E+02	2.30E+02	1.23E+02	9.05E+01	2.14E+01	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	8.22E+02	2.30E+02	1.23E+02	9.05E+01	2.14E+01	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00
FW	[m³]	2.70E+00	3.03E-04	1.31E-04	8.69E-03	2.05E-03	0.00E+00	2.73E-03	1.74E-02	0.00E+00	1.20E-01	0.00E+00
Caption	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 = Net use of fresh water											

WASTE CATEGORIES AND OUTPUT FLOWS PER m³												
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	6.58E-01	7.59E-09	2.89E-09	3.47E-09	8.19E-10	0.00E+00	1.09E-09	6.94E-09	0.00E+00	1.13E-07	0.00E+00
NHWD	[kg]	9.95E-02	2.60E-02	2.29E+01	1.48E-02	3.49E-03	0.00E+00	4.64E-03	2.96E-02	0.00E+00	2.29E+03	0.00E+00
RWD	[kg]	2.06E+00	3.03E-04	1.31E-04	1.65E-04	3.89E-05	0.00E+00	5.18E-05	3.30E-04	0.00E+00	4.75E-03	0.00E+00
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	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy											

BIOGENIC CARBON CONTENT PER m³		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0

Additional information

LCA interpretation

It has been found that 1 m^3 of C30 has an emission of 354.52 kg CO_2/m^3. The climate impact of the C30 is approximately 50 kg CO2 eq higher/m^3 C30 concrete in the market. The fact that CEM I 52.5 N is used for the clicker for Steinsteypan might explain the higher emission factor, since no fly ash or burden free material is used for the clincker.

The results show that the input of cement has the largest contribution to most of the impact categories. Cement accounts for approximately 69% of the contribution to climate change and is the main contributor to 7 of the impact categories.

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type	RER: Diesel mix at filling station Sphera	-
Vehicle type	A2: GLO: Truck, Euro 6 A-C, 28 - 32t gross weight / 22t payload capacity Sphera <u-so>	-
Transport distance	30	km
Capacity utilisation (including empty runs)	61	%
Gross density of products transported	2,290.84	kg/m^3
Capacity utilisation volume factor	1	-

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials		kg
Water use		m^3
Other resource use		kg
Energy type and consumption: RER: Diesel mix at filling station	0.46	kg
Waste materials		kg
Output materials		kg
Direct emissions to air, soil or water		kg

Reference service life

RSL information		Unit
Reference service Life	100	Years
Declared product properties	Declared by the producer	As appropriate
Design application parameters	See DS/EN 16757:2022	As appropriate
Assumed quality of work	See DS/EN 16757:2022	As appropriate
Outdoor environment	Yes	As appropriate
Indoor environment	See DS/EN 16757:2022	As appropriate
Usage conditions	See DS/EN 16757:2022	As appropriate
Maintenance	no	As appropriate

Use (B1-B7)

Scenario information	Value	Unit
B1 – Use		
B2 - Maintenance		
Maintenance process	Description or reference	-
Maintenance cycle		/year
Ancillary materials for maintenance (specify which)		kg/cycle
Waste materials resulting from maintenance (specify which)		kg
Net freshwater consumption during maintenance		m^3
Energy input during maintenance		kWh
B3 – Repair		
Repair process	Description or reference	-
Inspection process	Description or reference	-
Repair cycle		/year
Ancillary materials (specify which)		kg/cycle
Waste materials (specify which)		kg
Net freshwater consumption during repair		m^3
Energy input during repair		kg/cycle
B4 – Replacement		
Replacement cycle		/year
Energy input during replacement		kWh
Exchange of worn parts during products life cycle		kg
B5 - Refurbishment		
Refurbishment process		
Refurbishment cycle		/year
Energy input during refurbishment		kWh
Material input for refurbishment (specify which)		kg/cycle
Waste materials resulting from refurbishment		kg
Further assumptions for scenario development		As appropriate
B6 + B7 – Use of energy and water		
Ancillary materials specified by material		kg
Net freshwater consumption		m^3
Type of energy carrier		kWh
Power output of equipment		kW
Characteristic performance		As appropriate
Further assumptions for scenario development		As appropriate

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately		kg
Collected with mixed waste		kg
For reuse		kg
For recycling		kg
For energy recovery		kg
For final disposal	2,290.84	kg
Assumptions for scenario development		As appropriate

Re-use, recovery and recycling potential (D)

Scenario information/Materiel	Value	Unit
Displaced material		kg
Energy recovery from waste incineration		MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

Publisher	www.epddanmark.dk Template version 2024.1
Programme operator	Danish Technological Institute Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Cecilie Holm Arentoft COWI A/S Parallelvej 2 2800 Kgs. Lyngby
LCA software /background data	GaBi Sphera Professional 2024 *Ecoinvent 3.10* *EN 15804 reference package 3.1*
3rd party verifier	*Mirko Miseljic* LCA Specialists Denmark lcaspecialists@outlook.com

General programme instructions
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

Product-specific cPCR
DS/EN 16757:2022 Bæredygtighed inden for byggeri og anlæg – Miljøvaredeklarationer – Produktkategoriregler for beton og betonelementer

EN 15942
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040

DS/EN ISO 14040:2008 – ” Environmental management – Life cycle assessment – Principles and framework”

ISO 14044
DS/EN ISO 14044:2008 – ” Environmental management – Life cycle assessment – Requirements and guidelines”

This appendix refers to the EPD MD-24118-EN, developed according to EN15804+A2:2019.
Results in the appendix communicates LCA results in the format described in EN15804+A1:2013, in order to accommodate a need in the transition period between the two standard revisions. The appendix cannot stand alone, as the reference EPD describes the basis of the assessment.

ENVIRONMENTAL IMPACTS PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO_2-eq.]	2.88E+02	6.78E+00	1.60E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.58E-01	1.36E+01	0.00E+00	3.36E+01	0.00E+00
ODP	[kg CFC11-eq.]	2.13E-06	1.19E-12	2.81E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.74E-13	2.38E-12	0.00E+00	1.09E-10	0.00E+00
AP	[kg SO_2-eq.]	6.65E-01	7.28E-03	1.72E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-03	1.46E-02	0.00E+00	1.94E-01	0.00E+00
EP	[kg PO_4^{3-}-eq.]	1.26E+00	1.69E-03	3.99E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-04	3.38E-03	0.00E+00	2.20E-02	0.00E+00
POCP	[kg ethene-eq.]	2.45E-01	9.55E-04	2.26E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-04	1.91E-03	0.00E+00	1.60E-02	0.00E+00
ADPE	[kg Sb-eq.]	2.38E-04	5.96E-07	1.41E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-07	1.19E-06	0.00E+00	2.25E-06	0.00E+00
ADPF	[MJ]	1.14E+03	8.89E+01	2.10E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.79E+01	1.78E+02	0.00E+00	4.33E+02	0.00E+00
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.															

RESOURCE USE PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	2.96E+02	7.80E+00	1.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E+00	1.56E+01	0.00E+00	7.89E+01	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.96E+02	7.80E+00	1.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E+00	1.56E+01	0.00E+00	7.89E+01	0.00E+00
PENRE	[MJ]	1.18E+03	9.05E+01	2.14E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.18E+03	9.05E+01	2.14E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E+01	1.81E+02	0.00E+00	4.52E+02	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	2.75E+00	8.69E-03	2.05E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-03	1.74E-02	0.00E+00	1.20E-01	0.00E+00
Caption	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															
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.															

WASTE CATEGORIES AND OUTPUT FLOWS PER m^3

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	6.58E-01	3.47E-09	8.19E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-09	6.94E-09	0.00E+00	1.13E-07	0.00E+00
NHWD	[kg]	2.31E+01	1.48E-02	3.49E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.64E-03	2.96E-02	0.00E+00	2.29E+03	0.00E+00
RWD	[kg]	2.06E+00	1.65E-04	3.89E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.18E-05	3.30E-04	0.00E+00	4.75E-03	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112.

Checked and approved by

Mirko Miseljic
Third party verifier of MD-24118-EN

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