

# Environmental Product Declaration

EPD®



ECO PLATFORM



In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

## Solid precast concrete floor slab

from

**INHUS Prefab, UAB**

**INHUS**  
PREFAB

Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
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*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*



## Company information

### Owner of the EPD:

INHUS Prefab, UAB

E-mail: [prefab@inhus.eu](mailto:prefab@inhus.eu)

Tel. +370 5 2600120

<https://www.inhusprefab.eu/en>

Description of the organisation: INHUS Prefab is a manufacturing company implementing various architectural ideas of buildings, producing brick, coloured, matrix and graphic concrete facade elements, which make every building unique. The company has extensive experience in developing a variety of concrete structures and elements, including prefabricated wall elements, hollow core and balcony slabs, stair and linear structural elements.

### Key facts about INHUS Prefab:

- 2 factories in Vilnius and Kaunas (Žarijų str. 6, 02300 Vilnius and Bituko str. 5, 52366 Kaunas)
- 200 000 m<sup>2</sup> of wall panel produced annually
- 200 000 m<sup>2</sup> of hollow core slabs produced annually
- 6 500 m<sup>3</sup> of frame constructions produced annually

INHUS Prefab is a part of INHUS - one of the leading “design-build” project developers in the Nordic region with sales of 60 million Euro and approximately 550 employees in 2021. INHUS cooperates with the largest Lithuanian and Scandinavian building enterprises and real estate developers to bring simplicity to “design-build” delivery.

INHUS vision is to build buildings without using construction sites - a world where clients only have to worry about their ideas and not the technical execution. Sustainability is at the core of this vision, because it requires to rethink the construction process, materials and the role of their employees. The company currently makes progress with a holistic approach, making net-positive investments into all three dimensions of sustainability - social, environmental and economical.

To create maximum value to their customers and to the environment, INHUS takes full responsibility for the entire production process; from the design and manufacturing of building components, to the development of logistic solutions and finally the construction itself. The company innovates in production methods, implements modern technologies, ensures efficient use of resources and invests in its employee’s development. INHUS has also developed a carbon reduction strategy, outlining its planned steps and obligations up to 2030.

Finally, the company is a member of Lithuanian Builders Association, Lithuanian Construction Industry Association, Lithuanian Construction Product Testing Laboratory and is recognized for meeting the management system standards - ISO 9001: 2015 (quality standard) and ISO 14001: 2015 (environmental protection standard).

Visit <https://www.inhusprefab.eu/en> to learn more.

### Name and location of production site(s):

INHUS Prefab, UAB, Žarijų str. 6, 02300 Vilnius, Lithuania.

INHUS Prefab, UAB, Bituko str. 5, 52366 Kaunas, Lithuania.

## Product information

Product name: Solid precast concrete floor slab

Product identification: Solid precast concrete floor slabs - manufactured according to EN 13369 Common rules for precast concrete products. Solid precast concrete floor slabs are certified products.

Product description: Solid precast concrete floor slabs are produced prestressed or non-prestressed with reinforcement frames. The walking surface can be smooth or rough and the ceiling surface is smooth.

The products are manufactured in the following dimensions and technical features:

- Height: 200 - 400 mm,
- Width: 120 - 1200 mm,
- Length: 600 - 17000 mm,
- Concrete: C 30/37 - C 60/75.

Solid precast concrete floor slabs intended use: for floors and roofs of buildings.

UN CPC code: 375

Geographical scope: Lithuania, Sweden, Denmark, Poland, United Kingdom

## LCA information

Functional unit / declared unit: In accordance with the PCR the declared unit is 1 metric tonne of the product.

Reference service life: The reference service life for the solid precast concrete floor slab is set at 50 years.

Time representativeness: Primary data was collected internally. The production data refers to the average of the year 2020.

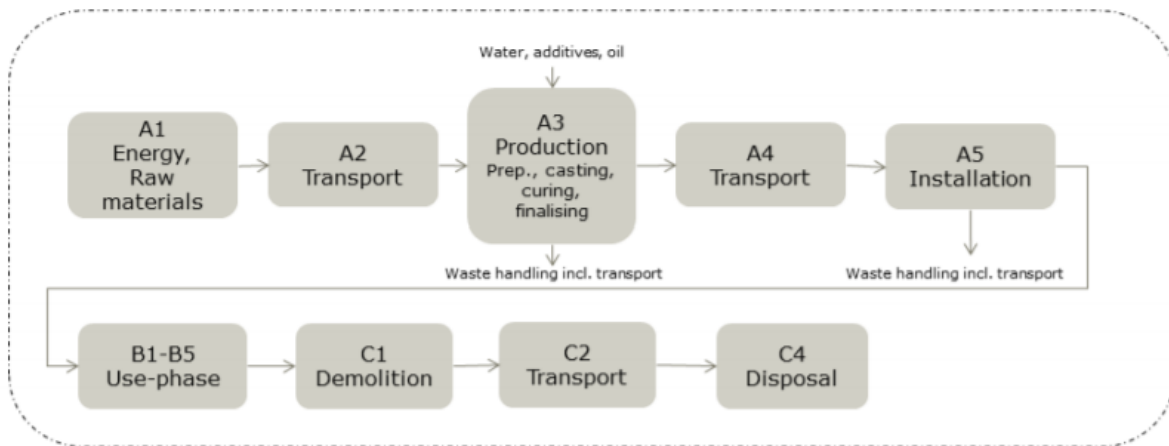
Database(s) and LCA software used: The Ecoinvent database provides the life cycle inventory data for the raw and process materials obtained from the background system. The used database is Ecoinvent 3.6. The LCA software used is One Click LCA.

Description of system boundaries: Cradle to gate with options, modules C1-C4 and module D. The LCA was carried out considering the Product stage phases (A1, A2, A3), Distribution (A4), Installation (A5), End of life (C1, C2, C3, C4), Potential environmental benefits (D) in accordance with EN 15804.

Data quality: The foreground data collected internally is based on yearly production amounts and extrapolations of measurements on specific machines and plants. Overall, the data quality can be described as good. The primary data collection has been done thoroughly.

Cut-off criteria: Life cycle inventory data for a minimum of 99% of total material and energy input flows have been included in the life cycle analysis. Although, only materials having in summa less than 1% of weight of product were not used in calculations.

System diagram:



System boundary:

Module	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential

Description of the system boundary (X = Included in LCA; MND = Module Not declared; MNR = Module Not relevant)

Product stage:

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

A2: The raw materials are transported to the manufacturing plant. In this case, the model includes road transportation of each raw material.

A3: This stage includes the manufacture of products and packaging. It has considered all the energy consumption and waste generated in the production plant.

## Production process description

Solid precast concrete floor slabs are produced on heated pallets. Broadboards from plywood are installed. Reinforcement framework is produced in reinforcement production bar and transported to the production bar by trolley. Framework is put on the pallet by crane. Strands are dragged through the framework and prestressed. Inserts, loops, etc. are placed (if needed). Concrete produced in concrete batching plant is transported to the production bar by dolly for moulding. After moulding concrete surface is smoothed or roughened and protected from drying. After the concrete has reached the strength of not less than 70%, solid precast concrete floor slabs are demoulded, inspected and transported to the warehouse by trolley.

### Construction process stage:

A4: This stage includes transport from the production gate to the construction site where the product shall be installed. Transportation distances has been calculated using a most likely scenarios, an export to Lithuania, Sweden, Denmark, Poland, United Kingdom with the parameters described in the following table. The transportation doesn't cause losses as products are packaged properly.

Scenario parameter	Distance, km	Value kgCO2e/tonkm
<b>1) Lithuania</b>		
Truck, Euro 5	30	0.0909
Ferry	-	-
<b>2) Lithuania</b>		
Truck, Euro 5	100	0.0909
Ferry	-	-
<b>3) Sweden</b>		
Truck, Euro 6	200	0.0863
Ferry	413	0.0094
<b>4) Sweden</b>		
Truck, Euro 6	300	0.0863
Ferry	413	0.0094
<b>5) Denmark</b>		
Truck, Euro 6	400	0.0863
Ferry	862	0.0094
<b>6) Denmark</b>		
Truck, Euro 6	500	0.0863
Ferry	862	0.0094
<b>7) United Kingdom</b>		
Truck, Euro 6	400	0.0863
Ferry	2070	0.0094
<b>8) United Kingdom</b>		
Truck, Euro 6	500	0.0863
Ferry	2070	0.0094
<b>9) Poland</b>		
Truck, Euro 5	500	0.0909
Ferry	-	-
<b>10) Poland</b>		
Truck, Euro 5	800	0.0909
Ferry	-	-

Capacity of utilization for truck is 56% of the capacity in volume. Capacity of utilization for ferry is 50% of the capacity in volume.

A5: This stage considers the installation of the product into the building.

Tower cranes powered by electricity are used for the installation work. Solid precast concrete floor slabs are delivered to the site by trucks and erected directly from the truck platform to the location intended for these structures according to the design. These structures are installed on top of existing walls on which a layer of ready-mixed concrete is laid before the product is placed. After the installation of the

solid precast concrete floor slab according to the project, joints between the products and the ends and sides around the perimeter of the floor slab are concreted.

Use stage:

In normal use scenario, it is assumed that no maintenance (B2), repair (B3), replacement (B4) and refurbishment (B5) is needed.

End of Life stage:

This stage includes the following modules:

**C1, Deconstruction, dismantling, demolition**

Consumption of fuel in demolition process is calculated according to transported mass. Energy consumption for demolition is 10 kWh/1000 kg = 0,01 kWh/kg. The source of energy is diesel fuel used by work machines.

**C2, Transport of the discarded product to the processing site**

It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed to have the same weight with the declared product. Whole end-of-life product is assumed to be sent to the closest facilities such as recycling and landfill. Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is lorry which is the most common.

**C3, Waste processing for reuse, recovery and/or recycling**

Based on European average 90% of steel are transformed into secondary material at a recycling plant. According to European Commission Waste Framework Directive, the preparing 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 by 2020. It is assumed that 70% of the concrete waste is recycled.

**C4, Discharge (disposal)**

The remaining 30 % of concrete and 10 % of steel are assumed to be sent to the landfill.

Benefits and loads beyond the system boundary (D):

Benefits of recyclable waste generated in the phase C3 are taken into account in the phase D. The recycled steel has been modelled to avoid use of primary materials. The scrap content in the studied product has been acknowledged and only the mass of primary steel in the product provides the benefit in order to avoid double counting. Crushed concrete is made into rubble that can be used as a raw material in concrete production for road gravel.

## Content information

Product components	Vilnius factory		Kaunas factory	
	Weight, kg	Weight, %	Weight, kg	Weight, %
Sand	385.0	38.5	337.7	33.8
Stone	402.4	40.2	397.2	39.7
Cement	131.0	13.1	131.1	13.1
Water	44.5	4.5	65.9	6.6
Reinforcement	34.5	3.4	65.2	6.5
Embedded details	1.8	0.2	2.1	0.2
Additives	0,8	0.1	0.8	0.1
<b>TOTAL</b>	<b>1000.0</b>	<b>100.0</b>	<b>1000.0</b>	<b>100.0</b>

No dangerous substances from the candidate list of SVHC for Authorisation are used in the product.

## Packaging

Distribution packaging: wooden gaskets

After use, packaging materials can be re-used or recycled.

## Environmental Information

Note: Environmental impacts according to EN 15804+A1, CML/ISO 21930 are presented below

### Potential environmental impact – mandatory indicators according to 15804:2012+A2:2019

Results per functional or declared unit of Vilnius factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	1,60E+02	1,47E+00	1,09E+01	1,72E+02	See below	3,66E+01	3,30E+00	4,55E+00	3,48E+00	1,54E+00	-5,644E0
GWP-fossil	kg CO <sub>2</sub> eq.	1,59E+02	1,47E+00	1,07E+01	1,71E+02	See below	3,64E+01	3,30E+00	4,54E+00	3,52E+00	1,54E+00	-5,567E0
GWP-biogenic	kg CO <sub>2</sub> eq.	1,54E+00	8,17E-4	1,923E-1	1,73E+00	See below	1,383E-1	9,168E-4	3,3E-3	-4,661E-2	3,055E-3	-6,88E-2
GWP-luluc	kg CO <sub>2</sub> eq.	8,159E-2	5,867E-4	3,525E-2	1,174E-1	See below	3,458E-2	2,785E-4	1,368E-3	1,166E-3	4,575E-4	-7,23E-3
ODP	kg CFC 11 eq.	8,943E-6	3,299E-7	1,625E-6	1,09E-5	See below	2,626E-6	7,119E-7	1,068E-6	7,012E-7	6,345E-7	-5,05E-7
AP	mol H <sup>+</sup> eq.	5,636E-1	5,967E-3	7,703E-2	6,466E-1	See below	1,594E-1	3,448E-2	1,909E-2	3,822E-2	1,462E-2	-3,64E-2
EP-freshwater	kg P eq.	3,534E-3	1,36E-5	8,194E-4	4,367E-3	See below	1,177E-3	1,333E-5	3,697E-5	6,79E-5	1,862E-5	-3,58E-4
EP-marine	kg N eq.	1,53E-1	1,733E-3	2,275E-2	1,775E-1	See below	4,337E-2	1,523E-2	5,752E-3	1,467E-2	5,036E-3	-7,68E-3
EP-terrestrial	mol N eq.	1,77E+00	1,916E-2	2,706E-1	2,06E+00	See below	4,848E-1	1,67E-1	6,352E-2	1,623E-1	5,546E-2	-1,01E-1
POCP	kg NMVOC eq.	4,921E-1	5,966E-3	7,729E-2	5,754E-1	See below	1,513E-1	4,592E-2	2,042E-2	4,457E-2	1,611E-2	-2,556E-2
ADP-minerals & metals*	kg Sb eq.	1,262E-2	4,539E-5	1,907E-4	1,285E-2	See below	1,869E-3	5,034E-6	7,754E-5	4,988E-5	1,408E-5	-6,15E-4
ADP-fossil*	MJ	1,13E+03	2,21E+01	1,72E+02	1,32E+03	See below	3,24E+02	4,54E+01	7,07E+01	4,86E+01	4,31E+01	-7,982E1
WDP	m <sup>3</sup>	5,47E+01	7,962E-2	4,44E+00	5,92E+01	See below	1,37E+01	8,462E-2	2,629E-1	2,317E-1	1,99E+00	-9,956E0
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption											

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## Potential environmental impact – mandatory indicators according to 15804:2012+A2:2019

Results per functional or declared unit of Kaunas factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	1,81E+02	1,31E+01	1,23E+01	2,07E+02	See below	3,66E+01	3,30E+00	4,55E+00	4,04E+00	1,51E+00	-5,462E0
GWP-fossil	kg CO <sub>2</sub> eq.	1,80E+02	1,31E+01	1,22E+01	2,05E+02	See below	3,64E+01	3,30E+00	4,54E+00	4,12E+00	1,51E+00	-5,389E0
GWP-biogenic	kg CO <sub>2</sub> eq.	1,69E+00	7,582E-4	4,991E-2	1,74E+00	See below	1,383E-1	9,168E-4	3,3E-3	-8,6E-2	2,99E-3	-6,66E-2
GWP-luluc	kg CO <sub>2</sub> eq.	1,027E-1	7,053E-3	7,653E-3	1,174E-1	See below	3,458E-2	2,785E-4	1,368E-3	1,938E-3	4,479E-4	-7,0E-3
ODP	kg CFC 11 eq.	1,084E-5	2,736E-6	1,778E-6	1,536E-5	See below	2,626E-6	7,119E-7	1,068E-6	7,81E-7	6,211E-7	-4,89E-7
AP	mol H <sup>+</sup> eq.	6,645E-1	2,879E-1	4,539E-2	9,978E-1	See below	1,594E-1	3,448E-2	1,909E-2	4,564E-2	1,432E-2	-3,52E-2
EP-freshwater	kg P eq.	4,936E-3	8,039E-5	3,048E-4	5,321E-3	See below	1,177E-3	1,333E-5	3,697E-5	1,149E-4	1,822E-5	-3,46E-4
EP-marine	kg N eq.	1,696E-1	7,253E-2	1,422E-2	2,564E-1	See below	4,337E-2	1,523E-2	5,752E-3	1,61E-2	4,929E-3	-7,43E-3
EP-terrestrial	mol N eq.	1,97E+00	8,059E-1	1,594E-1	2,93E+00	See below	4,848E-1	1,67E-1	6,352E-2	1,792E-1	5,429E-2	-9,80E-2
POCP	kg NMVOC eq.	5,731E-1	2,112E-1	4,607E-2	8,304E-1	See below	1,513E-1	4,592E-2	2,042E-2	4,919E-2	1,577E-2	-2,47E-2
ADP-minerals & metals*	kg Sb eq.	1,296E-2	2,152E-4	1,053E-4	1,328E-2	See below	1,869E-3	5,034E-6	7,754E-5	8,776E-5	1,378E-5	-5,95E-4
ADP-fossil*	MJ	1,46E+03	1,78E+02	1,90E+02	1,83E+03	See below	3,24E+02	4,54E+01	7,07E+01	5,69E+01	4,22E+01	-7,725E1
WDP	m <sup>3</sup>	7,13E+01	4,616E-1	7,639E-1	7,25E+01	See below	1,37E+01	8,462E-2	2,629E-1	3,645E-1	1,95E+00	-9,637E0

Acronyms  
 GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

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## Potential environmental impact – mandatory indicators according to 15804:2012+A2:2019

Results per functional or declared unit (only scenarios of A4 stage)											
Indicator	Unit	Lithuania		Sweden		Denmark		UK		Poland	
		30 km	100 km	613 km	713 km	1262 km	1362 km	2470 km	2570 km	500 km	800 km
		A4 LT (1)	A4 LT (2)	A4 SWE (3)	A4 SWE (4)	A4 DK (5)	A4 DK (6)	A4 UK (7)	A4 UK (8)	A4 PL (9)	A4 PL (10)
GWP-total	kg CO <sub>2</sub> eq.	2,73E+00	9,11E+00	2,14E+01	3,01E+01	4,31E+01	5,18E+01	5,45E+01	6,32E+01	4,55E+01	7,29E+01
GWP-fossil	kg CO <sub>2</sub> eq.	2,73E+00	9,11E+00	2,14E+01	3,01E+01	4,30E+01	5,18E+01	5,44E+01	6,32E+01	4,55E+01	7,28E+01
GWP-biogenic	kg CO <sub>2</sub> eq.	7,739E-5	2,58E-4	-1,58E-3	-1,32E-3	-3,35E-3	-3,00E-3	-9,5E-3	-9,24E-3	1,29E-3	2,064E-3
GWP-luluc	kg CO <sub>2</sub> eq.	8,221E-4	2,74E-3	8,145E-3	1,089E-2	1,652E-2	1,926E-2	2,431E-2	2,705E-2	1,37E-2	2,192E-2
ODP	kg CFC 11 eq.	6,421E-7	2,14E-6	5,066E-6	7,208E-6	1,02E-5	1,234E-5	1,249E-5	1,463E-5	1,07E-5	1,712E-5
AP	mol H <sup>+</sup> eq.	6,418E-3	2,139E-2	1,694E-1	1,908E-1	3,497E-1	3,712E-1	7,199E-1	7,413E-1	1,07E-1	1,711E-1
EP-freshwater	kg P eq.	1,948E-4	6,492E-4	1,453E-3	2,102E-3	2,919E-3	3,569E-3	3,371E-3	4,02E-3	3,246E-3	5,194E-3
EP-marine	kg N eq.	9,182E-4	3,061E-3	3,722E-2	4,029E-2	7,716E-2	8,022E-2	1,681E-1	1,712E-1	1,53E-2	2,449E-2
EP-terrestrial	mol N eq.	9,806E-3	3,269E-2	4,109E-1	4,436E-1	8,519E-1	8,846E-1	1,86E+00	1,90E+00	1,634E-1	2,615E-1
POCP	kg NMVOC eq.	5,412E-3	1,804E-2	1,252E-1	1,432E-1	2,583E-1	2,763E-1	5,192E-1	5,372E-1	9,02E-2	1,443E-1
ADP-minerals & metals*	kg Sb eq.	4,661E-5	1,554E-4	3,397E-4	4,951E-4	6,819E-4	8,373E-4	7,665E-4	9,218E-4	7,769E-4	1,243E-3
ADP-fossil*	MJ	4,20E+01	1,40E+02	3,30E+02	4,70E+02	6,635E	8,04E+02	8,08E+02	9,48E+02	7,00E+02	1,12E+03
WDP	m <sup>3</sup>	3,26E+01	1,09E+02	2,271E	3,36E+02	4,55E+02	5,64E+02	4,84E+02	5,93E+02	5,43E+02	8,69E+02

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## Use of resources

Results per functional or declared unit of Vilnius factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	8,37E+01	3,497E-1	3,64E+02	4,48E+02	See below	5,48E+01	2,454E-1	8,897E-1	2,00E+00	3,483E-1	-6,815E0
PERM	MJ	0,00E+00	0,00E+00	1,65E+02	1,65E+02	See below	1,81E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	8,37E+01	3,497E-1	5,29E+02	6,13E+02	See below	7,28E+01	2,454E-1	8,897E-1	2,00E+00	3,483E-1	-6,815E0
PENRE	MJ	1,13E+03	2,21E+01	1,72E+02	1,32E+03	See below	3,24E+02	4,54E+01	7,07E+01	4,86E+01	4,31E+01	-7,982E1
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	See below	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,13E+03	2,21E+01	1,72E+02	1,32E+03	See below	3,24E+02	4,54E+01	7,07E+01	4,86E+01	4,31E+01	-7,982E1
SM	kg	3,27E+01	0,00E+00	0,00E+00	3,27E+01	See below	3,43E+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	See below	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	See below	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	2,24E+00	4,055E-3	4,3E-2	2,29E+00	See below	6,908E-1	4,007E-3	1,472E-2	7,951E-3	4,712E-2	-7,95E-1
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water											

## Use of resources

Results per functional or declared unit of Kaunas factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,20E+02	1,85E+00	1,37E+02	2,59E+02	See below	5,48E+01	2,454E-1	8,897E-1	3,48E+00	3,409E-1	-6,596E0
PERM	MJ	0,00E+00	0,00E+00	4,21E+01	4,21E+01	See below	1,81E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,20E+02	1,85E+00	1,79E+02	3,01E+02	See below	7,28E+01	2,454E-1	8,897E-1	3,48E+00	3,409E-1	-6,596E0
PENRE	MJ	1,46E+03	1,78E+02	1,90E+02	1,83E+03	See below	3,24E+02	4,54E+01	7,07E+01	5,69E+01	4,22E+01	-7,725E1
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	See below	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,46E+03	1,78E+02	1,90E+02	1,83E+03	See below	3,24E+02	4,54E+01	7,07E+01	5,69E+01	4,22E+01	-7,725E1
SM	kg	5,52E+01	0,00E+00	0,00E+00	5,52E+01	See below	3,43E+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	See below	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	See below	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m <sup>3</sup>	2,50E+00	2,262E-2	1,891E-2	2,54E+00	See below	6,908E-1	4,007E-3	1,472E-2	1,173E-2	4,613E-2	-7,70E-1
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water											

## Use of resources

Results per functional or declared unit (only scenarios of A4 stage)											
		Lithuania		Sweden		Denmark		UK		Poland	
		30 km	100 km	613 km	713 km	1262 km	30 km	100 km	613 km	713 km	1262 km
Indicator	Unit	A4 LT (1)	A4 LT (2)	A4 SWE (3)	A4 SWE (4)	A4 DK (5)	DK (6)	A4 UK (7)	A4 UK (8)	A4 PL (9)	A4 PL (10)
PERE	MJ	5,348E-1	1,78E+00	3,90E+00	5,69E+00	7,83E+00	9,62E+00	8,81E+00	1,06E+01	8,91E+00	1,43E+01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	5,348E-1	1,78E+00	3,90E+00	5,69E+00	7,83E+00	9,62E+00	8,81E+00	1,06E+01	8,91E+00	1,43E+01
PENRE	MJ	4,28E+01	1,43E+02	3,35E+02	4,78E+02	6,75E+02	8,18E+02	8,20E+02	9,63E+02	7,13E+02	1,14E+03
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
PENRT	MJ	4,28E+01	1,43E+02	3,35E+02	4,78E+02	6,75E+02	8,18E+02	8,20E+02	9,63E+02	7,13E+02	1,14E+03
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
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
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
FW	m <sup>3</sup>	8,846E-3	2,949E-2	6,367E-2	9,317E-2	1,278E-1	1,573E-1	1,415E-1	1,709E-1	1,474E-1	2,359E-1
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water										

## Waste production and output flows

### Waste production

Results per functional or declared unit of Vilnius factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,09E+01	2,481E-2	4,195E-1	1,14E+01	See below	4,47E+00	4,882E-2	6,869E-2	0,00E+00	4,019E-2	-4,16E-1
Non-hazardous waste disposed	kg	1,66E+02	1,70E+00	2,26E+01	1,91E+02	See below	5,85E+01	5,218E-1	7,60E+00	0,00E+00	2,93E+02	-1,704E1
Radioactive waste disposed	kg	4,815E-3	1,505E-4	6,522E-4	5,617E-3	See below	1,235E-3	3,177E-4	4,852E-4	0,00E+00	2,85E-4	-3,68E-4

### Waste production

Results per functional or declared unit of Kaunas factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,75E+01	1,97E-1	2,119E-1	1,80E+01	See below	4,47E+00	4,882E-2	6,869E-2	0,00E+00	3,934E-2	-4,03E-1
Non-hazardous waste disposed	kg	2,32E+02	6,72E+00	8,85E+00	2,48E+02	See below	5,85E+01	5,218E-1	7,60E+00	0,00E+00	2,86E+02	-1,649E1
Radioactive waste disposed	kg	6,158E-3	1,233E-3	3,313E-4	7,723E-3	See below	1,235E-3	3,177E-4	4,852E-4	0,00E+00	2,79E-4	-3,56E-4

### Waste production

Results per functional or declared unit (only scenarios of A4 stage)											
Indicator	Unit	Lithuania		Sweden		Denmark		UK		Poland	
		30 km	100 km	613 km	713 km	1262 km	30 km	100 km	613 km	713 km	1262 km
		A4 LT (1)	A4 LT (2)	A4 SWE (3)	A4 SWE (4)	A4 DK (5)	DK (6)	A4 UK (7)	A4 UK (8)	A4 PL (9)	A4 PL (10)
Hazardous waste disposed	kg	4,129E-2	1,376E-1	3,334E-1	4,711E-1	6,719E-1	8,096E-1	8,419E-1	9,795E-1	6,882E-1	1,10E+00
Non-hazardous waste disposed	kg	4,57E+00	1,52E+01	3,12E+01	4,64E+01	6,24E+01	7,77E+01	6,46E+01	7,98E+01	7,61E+01	1,22E+02
Radioactive waste disposed	kg	2,917E-4	9,723E-4	2,296E-3	3,269E-3	4,622E-3	5,595E-3	5,643E-3	6,616E-3	4,861E-3	7,778E-3

### Output flows

Results per functional or declared unit of Vilnius factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4 (all)	A5	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	7,33E+01	7,33E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,075E2	0,00E+00	0,00E+00
Materials for energy recovery	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
Exported energy	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

### Output flows

Results per functional or declared unit of Kaunas factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4 (all)	A5	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	6,13E+01	6,13E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,137E2	0,00E+00	0,00E+00
Materials for energy recovery	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
Exported energy	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

## ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Results per functional or declared unit of Vilnius factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4 SWE (3)	A5	C1	C2	C3	C4	D
GWP	kg CO <sub>2</sub> eq.	1,56E+02	1,46E+00	1,05E+01	1,68E+02	2,12E+01	3,57E+01	3,27E+00	4,50E+00	3,49E+00	1,51E+00	-5,449E0
ODP	kg CFC 11 eq.	7,486E-6	2,628E-7	1,343E-6	9,092E-6	4,025E-6	2,186E-6	5,634E-7	8,491E-7	5,617E-7	5,028E-7	-4,61-7
AP	mol H <sup>+</sup> eq.	3,981E-1	3,023E-3	4,767E-2	4,488E-1	1,385E-1	1,046E-1	4,866E-3	9,246E-3	1,021E-2	6,097E-3	-2,24E-2
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	1,548E-1	6,499E-4	1,885E-2	1,743E-1	1,876E-2	4,972E-2	8,573E-4	1,868E-3	3,242E-3	1,18E-3	-1,21E-2
POCP	kg Ethenee	2,28E-2	1,96E-4	4,03E-3	2,702E-2	4,772E-3	9,201E-3	5,011E-4	5,858E-4	7,017E-4	4,471E-4	-1,83E-3
ADP-minerals & metals*	kg Sb eq.	1,262E-2	4,539E-5	1,907E-4	1,285E-2	3,397E-4	1,869E-3	5,034E-6	7,754E-5	4,988E-5	1,408E-5	-6,15E-4
ADP-fossil*	MJ	1,13E+03	2,21E+01	1,72E+02	1,32E+03	3,33E+02	3,24E+02	4,54E+01	7,07E+01	4,86E+01	4,31E+01	-7,982E1
Acronyms	GWP = Global Warming Potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential; EP = Eutrophication potential; POCP = Formation of ozone of lower atmosphere; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption											

## ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930


Results per functional or declared unit of Kaunas factory												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4 SWE (3)	A5	C1	C2	C3	C4	D
GWP	kg CO <sub>2</sub> eq.	1,77E+02	1,30E+01	1,20E+01	2,02E+02	2,12E+01	3,57E+01	3,27E+00	4,50E+00	4,08E+00	1,48E+00	-5,274E0
ODP	kg CFC 11 eq.	9,264E-6	2,171E-6	1,378E-6	1,281E-5	4,025E-6	2,186E-6	5,634E-7	8,491E-7	6,306E-7	4,922E-7	-4,46E-7
AP	mol H <sup>+</sup> eq.	4,779E-1	2,241E-1	2,712E-2	7,291E-1	1,385E-1	1,046E-1	4,866E-3	9,246E-3	1,525E-2	5,968E-3	-2,17E-2
EP	kg PO <sub>4</sub> <sup>3-</sup> eq.	2,081E-1	2,626E-2	8,951E-3	2,433E-1	1,876E-2	4,972E-2	8,573E-4	1,868E-3	5,33E-3	1,155E-3	-1,17E-2
POCP	kg Ethenee	3,173E-2	6,151E-3	1,662E-3	3,954E-2	4,772E-3	9,201E-3	5,011E-4	5,858E-4	9,308E-4	4,376E-4	-1,77E-3
ADP-minerals & metals*	kg Sb eq.	1,296E-2	2,152E-4	1,053E-4	1,328E-2	3,397E-4	1,869E-3	5,034E-6	7,754E-5	8,776E-5	1,378E-5	-5,95E-4
ADP-fossil*	MJ	1,46E+03	1,78E+02	1,90E+02	1,83E+03	3,33E+02	3,24E+02	4,54E+01	7,07E+01	5,69E+01	4,22E+01	-7,725E1
Acronyms	GWP = Global Warming Potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential; EP = Eutrophication potential; POCP = Formation of ozone of lower atmosphere; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption											



## General information

### Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	<a href="http://www.environdec.com">www.environdec.com</a>
E-mail:	<a href="mailto:info@environdec.com">info@environdec.com</a>

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products (version 1.1); Complementary PCR (c-PCR):C-PCR-003 (TO PCR 2019:14) - Concrete and concrete elements, version: 2019-12-20;
PCR review was conducted by: The International EPD® System
Independent third-party verification of the declaration and data, according to ISO 14025:2010  <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: Silvia Vilčeková, Silcert, s.r.o.  Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier:  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

During revision (2022-01-03) A5 stage calculations were added to the EPD.

## References

- General Programme Instructions of the International EPD® System. Version 3.01;
- PCR 2019:14 Construction products (version 1.1)
- C-PCR-003 (TO PCR 2019:14) - Concrete and concrete elements, version: 2019-12-20
- EN 15804:2012+A2:2019 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products;
- ISO 14044:2006/Amd 2:2020 Environmental management. Life Cycle Assessment. Requirements and guidelines.
- ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.

## Tools and database

- One Click LCA tool;
- Ecoinvent 3.6 database

## Contact information

<p>EPD owner:</p>	 <p>INHUS Prefab, UAB  <a href="https://www.inhusprefab.eu/en">https://www.inhusprefab.eu/en</a></p>
<p>LCA author:</p>	 <p>Vesta Consulting, UAB  <a href="https://www.vestaconsulting.lt/">https://www.vestaconsulting.lt/</a></p>
<p>Programme operator:</p>	 <p>The International EPD® System  <a href="https://www.environdec.com">https://www.environdec.com</a></p>

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