

## Environmental Product Declaration

Specific EPD

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

# Precast concrete products

PREFA invest, a.s.



### Programme

EPD Square | [www.epdsquare.com](http://www.epdsquare.com)

### Programme operator

EPD Square, s.r.o.

### EPD Registration number

SQ 00-034

### Publication date

18.06.2025

### Valid until

17.06.2030

## General information

### Product

Precast concrete products

### Program operator

EPD Square, s.r.o.

Lermontovova 3, 811 05 Bratislava, Slovakia

Email: [info@epdsquare.com](mailto:info@epdsquare.com)

### Registration number

SQ 00-034

### Publication date

18.06.2025

### Valid until date

17.06.2030

### Owner of the declaration

PREFA invest, a.s.

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### Manufacturer

PREFA invest, a.s.

Podhradská cesta 2,

038 52 Sučany

Slovakia

Telephone: 043/ 49 11 100

Email: [prefa@prefa-su.sk](mailto:prefa@prefa-su.sk)

### Place of production

Podhradská cesta 2

038 52 Sučany

Slovakia

### Product Category Rules (PCR)

EPD Square PCR v1.0, 2024

### Declared/Functional unit

1 m<sup>3</sup>

### Mass per DU

2500 kg

### UN CPC code

375 - Articles of concrete, cement and plaster

### Geographical scope

Slovakia, Europe

### Year of study

2024

### Comparability

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in the context of the building.

### EPD author

Želmíra Blichová, Silvia Vilčeková, EPD Clarity s.r.o.

### Verification type

Independent verification of the declaration and data, according to ISO14025:2006

Internal:

External:

### Verified by

Daniel Satola, Daniel Satola Consulting

*Satolã Daniel*

*The owner of the declaration shall be liable for the underlying information and evidence.*

*EPD Square shall not be liable with respect to manufacturer, life cycle assessment data and evidence.*

## System boundaries

This EPD is based on system boundary cradle to gate (A1-A3) with modules C1-C4, module D and optional modules A4 and A5.

## Modules declared and geographical scope

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

Modules not declared = MND

## Description of Organization

Prefa invest, a.s. is a young dynamic company that builds on the traditional foundations of concrete production in the Sučany factory. Since 1948, it has been producing prefabricated products for the construction of industrial buildings, shopping centres, administrative buildings and housing. The company's present-day operations date back to 2012. The production part of PREFA invest, a.s. can be divided into the following basic segments:

- Prefabricated building structures,
- Sewerage program,
- Concrete pavements and blocks,
- Mining and processing of aggregates,
- Demolition works, and
- Transport concrete.

## Product information

### Product name

Precast concrete products

### Additional labels

Bar load-bearing elements EN 13225, Ceiling plates for filigree ceilings EN 13747, Foundation elements EN14991, Wall elements EN 14992, Staircases EN 14843, Bridge components EN 15050, Box culverts EN 14844, Retaining wall elements EN 15258, Buttressed cavity panels EN 1168

### Product description

Prefabricated elements for the construction of reinforced concrete structures are among the most represented products that the company supplies to the market. Precast concrete frame is an ideal solution for industrial and warehouse halls, logistics centres, shopping centres, office buildings and residential construction. This range of production also finds application in atypical and original types of construction.

### Product application

In the construction of civil buildings and other civil engineering structures, for interconnected reinforced concrete floor structures, for load-bearing foundation structures - footings, cups, foundation beams, columns interconnected with the foundation element transferring the load of the building structure to the foundation soil, for load-bearing single-layer, composite and sandwich walls with/without facade functions, for the load-bearing connection of the individual height levels of the building structure, for bridges, in the construction of underground spaces for the transport and storage of materials, cable tunnels, culverts and underpasses, for the creation of retaining walls of large earth embankments and bodies and retaining walls of storage areas for bulk materials, for the creation of load-bearing structures of ceilings and roofs.

The precast concrete products have been issued with a Certificate of Conformity of the Production Control System 1301-CPR-1136, issued on 19 December 2023 by the Building Testing and Research Institute, NPO, Bratislava.

### Product standards

EN 13225, EN 13747, EN 14991, EN 14992, EN 14843, EN 15050, EN 14844, EN 15258, EN 1168

### Geographical scope

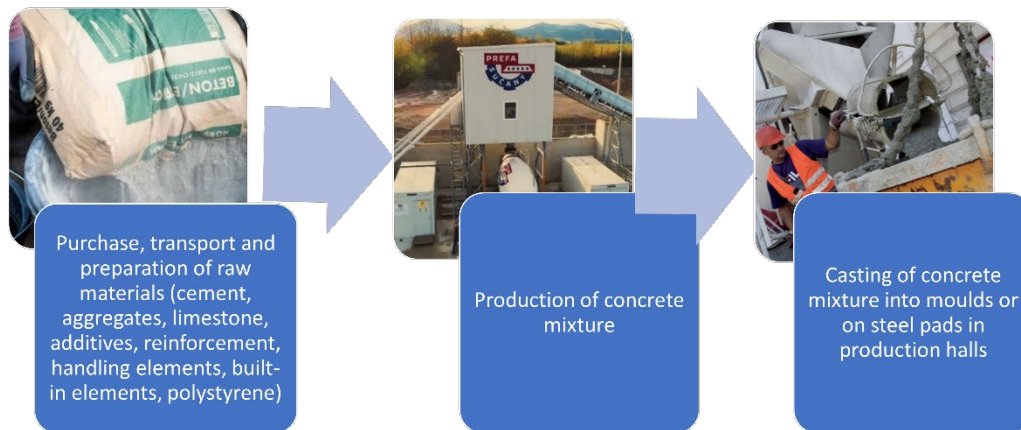
Slovakia, Europe

## Product contents information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Aggregate	1738,33	-	-
Limestone	76,10	-	-
Cement CEM I 42,5R	374,35	-	-
Additives	3,28	-	-
Water	117,46	-	-
Other steel elements	19,39	11.45	-
Reinforcement steel	169,90	15	-
Unmoulders	0,19	-	-
Polystyrene	0,84	-	-
Plastic elements	0,11	-	-
TOTAL	2500	1,11	-
Packaging materials	Weight, kg	Weight-% (versus the product)	
Wooden beams	0,8793	0,034	
Wooden lath	0,8186	0,032	
TOTAL	1,6979	0,066	

Material losses	Weight, kg	Weight-% (versus the product)
Plastic	0,14	-
Steel	13,19	15
Other	0,15	-
Concrete	65,93	-
Plastic	0,14	-
TOTAL	79,41	2,49

## Manufacturing process



## Life cycle assessment

### Cut-off criteria

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process that is more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

### Allocation, estimations, and assumptions

Allocation is based on annual production rate and made with high accuracy and precision. The values for 1 m<sup>3</sup> of the product which is used within this study are calculated by considering the total product weight per annual production. The product output is fixed to 1 m<sup>3</sup> and the corresponding amount of product is used in the calculations.

In the production plant only, precast concrete is produced. The annual production percentages are taken into consideration for allocation. According to the annual production of the declared product, the annual total energy consumption and the generated waste per the declared product are allocated.

Module A1: This stage considers the extraction and processing of all raw materials. Within the product stage accurate data has been used. In the case of absence in the database, it was modelled as close to reality as possible using proxy, representative datapoint. Material losses are considered based on the manufacturer data.

Module A3: In the plant, electricity, LPG, and diesel are allocated on yearly consumption.

Module A2, A4 & C2: These stages account for transport activities. Vehicle capacity utilization volume factor is assumed to be 1 which means full load. It may vary but as the role of transportation emission in total results is small and so the variety in load is assumed to be negligible. Empty returns are considered.

Module A4: Transportation doesn't cause losses as products are packaged properly. Also, volume capacity utilization factor is assumed to be 1 for the nested packaged products. Additionally, transportation distances and vehicle types are assumed according to the delivery in the last year. The distance is assumed to be 141,18 km and the transportation method is assumed to be lorry.

Module A5: It is assumed that wooden beams and planks are incinerated in the households for energy recovery. The distance is assumed as 15 km and the transportation method is assumed to be lorry. No additional construction activities are assumed.

Module C1: The impacts of the disassembly stage are assumed to take 25 kWh / m<sup>3</sup> of the product. The source of energy is diesel fuel used by work machines.

Module C2: It is estimated that there is no mass loss during the use of the product, therefore the end-of-life product is assumed that it has the same weight as the declared product. All the end-of-life products are 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 assumed as lorry which is the most common.

Module C3, C4: In the case of selective demolition of buildings, the product can be recovered and sent to companies specialized in recovery. It is assumed that 70% of the concrete waste and 85% of the steel will be recycled and 30% of the concrete waste and 15% of steel will be taken to landfill for final disposal.

Module D: There are declared benefits and loads of recycling and energy recovery.

### Database(s) and LCA software

This EPD has been created using One Click LCA Pre-Verified EPD Generator. Ecoinvent v3.10.1, One Click LCA and Worldsteel 2023 Methodology Report databases were used as sources of environmental data, as well as EPDs were used for some materials as source of environmental data.

## LCA Scenarios and additional technical information

### Manufacturing energy scenario

Electricity data source and quality	Electricity, medium voltage, residual mix, Slovak Republic	Ecoinvent 3.10.1
Electricity CO2e / kWh	0,26	
Electricity data source and quality	Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted (Reference product: electricity, low voltage)	Ecoinvent 3.10.1
Electricity kg CO2e / kWh	0,0819	
Natural gas source and quality	Natural gas	LCA inventory for heat production from natural gas (OneClickLCA 2023)
Natural gas kg CO2e / m3	2,42	
Diesel source and quality	Diesel, burned in building machine	Ecoinvent 3.10.1
Electricity kg CO2e / MJ	0,1	

### Transportation scenario (A4)

Vehicle type used for transport	Transport, freight, lorry >32 metric ton, EURO6
Distance to the construction site	141,18
Capacity utilization	100
Capacity utilization factor	1

### End of Life (C1, C3, C4)

	Value	Unit
Collected separately	2500	kg
Collected as mixed construction waste	-	kg
Reuse	-	kg
Recycling	1778,42	kg
Energy recovery	-	kg
To landfill	721,58	kg

## LCA results

### Core environmental impact indicators – EN 15804+A2, PEF 3.1

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	8,48E+02	3,65E+01	3,04E+00	9,01E+00	2,42E+01	1,16E+01	4,63E+00	-2,88E+02
GWP-fossil	kg CO2 eq.	8,52E+02	3,65E+01	5,79E-02	9,01E+00	2,42E+01	1,07E+01	4,50E+00	-2,88E+02
GWP-biogenic	kg CO2 eq.	-3,96E+00	0,00E+00	2,98E+00	1,08E-19	-6,78E-21	8,57E-01	1,20E-01	0,00E+00
GWP-LULUC	kg CO2 eq.	5,53E-01	1,42E-02	8,77E-05	9,23E-04	8,71E-03	5,22E-03	2,57E-03	-4,67E-02
ODP	kg CFC11 eq.	3,60E-05	7,62E-07	9,55E-10	1,38E-07	4,70E-07	1,57E-07	1,30E-07	-1,02E-06
AP	mol H <sup>+</sup> eq.	3,29E+00	8,62E-02	3,21E-04	8,13E-02	7,60E-02	1,07E-01	3,19E-02	-1,17E+00
EP-freshwater	kg P eq.	3,04E-02	2,55E-03	1,54E-05	2,60E-04	1,63E-03	2,55E-03	3,70E-04	-1,21E-01
EP-marine	kg N eq.	7,08E-01	2,26E-02	3,45E-04	3,77E-02	2,56E-02	3,92E-02	1,22E-02	-2,62E-01
EP-terrestrial	mol N eq.	7,98E+00	2,45E-01	1,31E-03	4,13E-01	2,78E-01	4,33E-01	1,33E-01	-2,90E+00
POCP	kg NMVOC eq.	2,89E+00	1,50E-01	4,30E-04	1,23E-01	1,18E-01	1,29E-01	4,76E-02	-9,69E-01
ADP-M&M	kg Sb eq.	9,19E-03	1,05E-04	1,56E-07	3,23E-06	7,92E-05	2,61E-04	7,16E-06	-2,72E-03
ADP-fossil	MJ	7,11E+03	5,49E+02	8,25E-01	1,18E+02	3,40E+02	1,41E+02	1,11E+02	-2,66E+03
WDP	m <sup>3</sup>	2,55E+02	2,81E+00	2,21E-02	2,94E-01	1,66E+00	1,11E+00	3,19E-01	-6,96E+01

**GWP-total:** Global Warming Potential; **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; See "additional requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

## Additional (optional) environmental impact indicators – EN 15804+A2, PEF

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	4,45E-05	3,56E-06	5,71E-09	2,31E-06	1,90E-06	1,44E-05	7,27E-07	-1,95E-05
IRP	kBq U235 eq.	2,86E+01	6,61E-01	2,14E-03	5,22E-02	4,21E-01	4,55E-01	6,95E-02	8,82E+00
ETP-fw	CTUe	1,76E+04	6,46E+01	2,74E-01	6,49E+00	4,53E+01	3,36E+01	9,27E+00	-7,11E+02
HTP-c	CTUh	2,44E-06	6,08E-09	2,82E-11	9,27E-10	4,12E-09	3,98E-09	8,30E-10	-4,78E-08
HTP-nc	CTUh	2,35E-05	3,55E-07	1,55E-09	1,47E-08	2,13E-07	2,32E-07	1,91E-08	-2,27E-06
SQP	Dimensionless	2,51E+03	5,52E+02	7,71E-01	8,26E+00	2,02E+02	1,02E+02	2,18E+02	-9,67E+02

*PM* Particulate matter emissions; *IRP* Ionising radiation, human health; *ETP-fw* Ecotoxicity (freshwater); *ETP-c* Human toxicity, cancer effects; *HTP-nc* Human toxicity, non-cancer effects; *SQP* Land use related impacts / soil quality

### Use of Natural Resources

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	5,13E+02	8,93E+00	-2,50E+01	7,47E-01	5,78E+00	9,69E+00	1,07E+00	-1,83E+02
RPEM	MJ	1,00E+02	0,00E+00	-2,43E+01	0,00E+00	0,00E+00	-5,33E+01	-2,27E+01	0,00E+00
TPE	MJ	6,13E+02	8,93E+00	-4,93E+01	7,47E-01	5,78E+00	-4,37E+01	-2,17E+01	-1,83E+02
NRPE	MJ	6,38E+03	5,49E+02	8,26E-01	1,18E+02	3,40E+02	1,41E+02	1,11E+02	-2,66E+03
NRPM	MJ	8,26E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-5,78E+02	-2,48E+02	0,00E+00
TRPE	MJ	7,21E+03	5,49E+02	8,26E-01	1,18E+02	3,40E+02	-4,37E+02	-1,37E+02	-2,66E+03
SM	kg	5,94E+01	2,37E-01	5,47E-04	4,90E-02	1,55E-01	9,81E-02	2,78E-02	1,50E+02
RSF	MJ	3,11E-02	2,99E-03	5,54E-06	1,28E-04	1,96E-03	2,87E-03	5,75E-04	-2,39E-02
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m <sup>3</sup>	4,68E+00	8,10E-02	-2,17E-03	7,79E-03	4,57E-02	3,21E-02	1,15E-01	-1,17E+00

*RPEE* Renewable primary energy resources used as energy carrier; *RPEM* Renewable primary energy resources used as raw materials; *TPE* Total use of renewable primary energy resources; *NRPE* Non-renewable primary energy resources used as energy carrier; *NRPM* Non-renewable primary energy resources used as materials; *TRPE* Total use of non-renewable primary energy resources; *SM* Use of secondary materials; *RSF* Use of renewable secondary fuels; *NRSF* Use of non-renewable secondary fuels; *W* Use of net fresh water

### End of life – Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	9,62E+01	7,94E-01	5,21E-03	1,31E-01	4,95E-01	4,22E-01	1,22E-01	-9,13E+01
NHW	kg	1,07E+03	1,59E+01	3,80E+00	1,79E+00	1,03E+01	1,29E+01	2,79E+00	-7,26E+02
RW	kg	2,17E-02	1,64E-04	5,32E-07	1,28E-05	1,05E-04	1,16E-04	1,69E-05	2,32E-03

*HW* Hazardous waste disposed; *NHW* Non-hazardous waste disposed; *RW* Radioactive waste disposed

End of life – Output flows

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	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
MR	kg	1,33E+01	0,00E+00	5,40E-01	0,00E+00	0,00E+00	1,78E+03	0,00E+00	0,00E+00
MER	kg	7,22E-12	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	5,83E-04	0,00E+00	1,14E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	1,56E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

*CR* Components for reuse; *MR* Materials for recycling; *MER* Materials for energy recovery; *EEE* Exported electric energy; *ETE* Exported thermal energy

Information describing biogenic carbon content at factory gate

Biogenic carbon content	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in the accompanying packaging	0,0002	kg C

Specific data (GWP-GHG) and data variation for A1-A3

Specific data and data variation	Value-%
Specific data	87,71
Variation - product	-
Variation - site	-

## Hazardous substances

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

## Contact information

### **Programme operator**

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## Bibliography

### **ISO 14020:2000**

Environmental labels and declarations – General principles

### **ISO 14025:2010**

Environmental labels and declarations - Type III environmental declarations - Principles and procedures

### **ISO 14040:2006**

Environmental management. Life cycle assessment. Principles and frameworks.

### **ISO 14044:2006**

Environmental management - Life cycle assessment - Requirements and guidelines

### **EN 15804:2012+A2:2019**

Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

EPD Square PCR v.1.0, 2024

EPD Square, General Programme Instructions v.1, 2024

Ecoinvent database v3.10.1 (2024) and One Click LCA database

EPD MAPEFORM ECO OIL 70

EPD Concrete admixtures – Plasticisers and Superplasticisers

EPD Concrete admixtures – Hardening Accelerators European Federation of Concrete Admixtures Associations a.i.s.b.l. (EFCA)

IDEMAT

EPD NFG Factory - Gorzow - Plain Steel Products Nordic Fastening Group AB

EPD MasterFinish RL 224

World Steel Association. Life cycle inventory methodology report. World Steel Association 2017

EUROSTAT, [https://ec.europa.eu/eurostat/databrowser/view/env\\_waspac\\_\\_custom\\_8519174/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_8519174/default/table?lang=en)

<https://eplca.jrc.ec.europa.eu/LCDN/EN15804.html>

Annex

Environmental impacts – EN 15804+A1, CML/ISO 21930

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO2 eq.	8,42E+02	3,63E+01	9,49E-02	8,96E+00	2,40E+01	1,07E+01	4,46E+00	-2,86E+02
ODP	kg CFC11 eq.	3,17E-05	6,06E-07	7,69E-10	1,09E-07	3,74E-07	1,26E-07	1,04E-07	-1,10E-06
AP	kg SO2 eq.	2,60E+00	6,84E-02	2,38E-04	5,72E-02	5,78E-02	7,98E-02	2,36E-02	-9,41E-01
EP	kg PO4 eq.	1,07E+00	1,71E-02	8,63E-05	1,34E-02	1,47E-02	1,55E-02	7,51E-03	-1,74E-01
POCP	kg C2H4 eq.	2,80E-01	6,97E-03	2,72E-05	4,29E-03	5,48E-03	5,43E-03	2,23E-03	-1,43E-01
ADP-M&M	kg Sb eq.	9,23E-03	1,02E-04	1,50E-07	3,14E-06	7,73E-05	2,60E-04	7,02E-06	-2,71E-03
ADP-fossil	MJ	7,29E+03	5,38E+02	7,90E-01	1,17E+02	3,33E+02	1,34E+02	1,09E+02	-2,83E+03

Environmental impacts – GWP-GHG

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - GHG	kg CO2e	8,52E+02	3,65E+01	5,79E-02	9,01E+00	2,42E+01	1,07E+01	4,51E+00	-2,88E+02

*GWP- GHG* Global Warming Potential, greenhouse gases