ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ČSN ISO 14025:2010
and EN 15804:2021+A2:2019+AC:2021

Organization	**CEMVIN s.r.o.**
Industry Program Operator	CENIA, Czech Environmental Information Agency, Executive Body of NPEZ Agency
Author	Technický a zkušební ústav stavební Praha, s.p.
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Valid until	2028-03-05 in accordance with EN 15804+A2:2019

Fibre Cement Boards CEMVIN

1. General Information Declaration

CEMVIN s.r.o.	**Fibre Cement Boards CEMVIN**
Programme: „National programme of environmental labelling“- CR **Industry operator:** CENIA, Czech Environmental Information Agency, Executive body of the NPEZ Agency, Moskevská 1523/63, Praha 10, 101 00, www.cenia.cz ,	**Name and address of the manufacturer:** **CEMVIN s.r.o.** č. p. 62 463 73 Černousy, CZ
EPD registration number: **3015-EPD-030064352**	**Declared unit:** **1 t of average product** – „Fibre Cement Boards CEMVIN“
Product category rules: EN 15804+A2:2019 as core PCR EN 16757:2017 **Publication Date:** 2023-03-06 **Valid until:** 2028-03-05 in accordance with EN 15804**+**A2:2019	**Product:** **Fibre Cement Boards CEMVIN**

The history of the current CEMVIN s.r.o. production plant in Černousy began more than 100 years ago in 1912, when the construction of production halls began. Currently, the company CEMVIN s.r.o. produces high-quality cement fiber boards with unique properties, in thicknesses from 3 mm to 30 mm for versatile applications, for construction use in general, in facade programs, design, dry construction, but also in energy, transport constructions and other applications. These are very stable and solid products which withstand moisture, water, frost and fire conditions. The unique mix of material content together with strict process and production control create a very solid cement fiber board which can be used also in applications which are highly demanding.

Maximum emphasis on environmental protection is an essential part of production and development. CEMVIN fiber cement boards, their production, and thus the product itself, thus comply not only with the strictest EU standards, but also with our own company and business philosophy – above-standard requirements for safety, health protection and ekology.

With regard to the possibility of comparing products **in the life cycle assessment of buildings** on the basis of their EPD, which is carried out by determining their contribution to the environmental properties of the building, it is necessary that the EPD of the construction products in question be prepared in accordance with the requirements of the standard **EN 15804+A2:2019** *Sustainability of construction works – Environmental product declaration – Core rules for the product category of construction products* and using PCR **EN 16757:2017** *Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements*.

1. Product data

1.1.1. Product

The boards are made from a mixture of cement, limestone, pulp, microsilica and organic fibers. Thanks to this composition, the CEMVIN board has unique properties and many ways of use.

CEMVIN boards are manufactured in accordance with **EN 12467:2012+A2:2018** *Fibre-cement flat sheets - Product specification and test methods* and in a controlled quality management system ISO 9001. The quality level of CEMVIN fiber cement boards is guaranteed by tests carried out according to the requirements of the above-mentioned standard.

1.1.2. Product data sheet

Characterization: type NT, category A, class 3, level of marginal deviations I.

Features and benefits of CEMVIN boards:

- frost resistance
- water resistance
- reaction to fire A1
- fire endurance
- weather resistance
- hygienic integrity
- electrical resistance arch
- easy divisibility
- excellent adhesion colors
- strength
- speed assembly

Table of basic physical and mechanical properties of CEMVIN	
Bulk density, dry, average (EN 12467)	1 750 kg/m^3
Bulk density, dry, minimal (EN 12467)	1 700 kg/m^3
Strength characteristics and mechanical properties	
Bending tensile strength in the transverse direction – ambient (EN 12467)	27 MPa
Bending tensile strength in the longitudinal direction – ambient (EN 12467)	17 MPa
Bending tensile strength in the transverse direction – wet (EN 12467)	22 MPa
Bending tensile strength in the longitudinal direction – wet (EN 12467)	14 MPa
Modulus of elasticity	7 400 MPa
Shear friction coefficient (ČSN 74 4507)	μs = 0,53; μd = 0,59
Humidity effects and structural physical properties	
Water absorbency of the board in water for 24 hours	max. 17 %
Balanced weight humidity at 20 °C	7–11 %
Linear expansivity when the air humidity changes from 35 % to 85 % (EN 13 009)	0,17 %
Water impermeability after 24 hours (EN 12467)	Impermeable
Weighted Sound Reduction Index – board thickness 12 mm (EN ISO 10140-2)	Rw 30 dB
Vapour resistance (EN ISO 12572)	70–90
Thermal conductivity (EN ISO 10456)	max. 0,35 W/mK
Fire properties	
Reaction to fire (EN 13 501-1)	A1
Flame spread index (ČSN 73 0863)	i = 0 mm/min
Fire resistance (EN 1363-1)	6 min (board 5 mm)
	15 min (board 8 mm)
	16 min (board 10 mm)
Other properties	
Frost resistance (max R_L> 0,75; EN 12467)	100 cycles
Board pH	11
Weight activity Ra 226	21 Bq/kg
Weight activity index	I = 0,37
Resistance to the electric arc effects (ČSN 33 2000-5-52 ed. 2)	resistant without signs of material rupture
Resistance to high voltage arc discharge (EN 61621)	th. 10 mm, min. 142 sec
Release of hazardous VOC substances (ISO 16000-10)	meets the requirements

Dimension tolerances (EN 12467)		
Board thickness	3–6 mm	±0,6 mm
	7–20 mm	±10 %
	21–40 mm	±2,0 mm
Basic format length and width		l. ±6,5 mm; w. ±5,0 mm
Accurate division of length and width		±3,0 mm
Tolerance of edge straightness		2,0 mm/m
Tolerance of rectangularity		3,0 mm/m

Product packaging:

The products are delivered in accordance with the standards listed in point 1.1.1. The majority of products are stored on pallets with spacers for transport.

1.1.3. Rules for use

Use of products

- dry construction
- internal and external wall cladding for industry
- lost formwork
- fireproof and noiseproof walls
- components for assembled buildings
- dry pavements
- cable footbridges
- insulating and non-flammable pads
- fillings and partitions switchboards
- and next

Products are manufactured and declared in accordance with the standards specified in 1.1.1. The products are subject to EU Regulation No. 305/2011 (CPR) and the manufacturer issues a corresponding declaration of performance.

Environment and health during use

During the entire production process, it is not necessary to take any special health protection measures beyond the legally specified industrial protection measures for production employees.

All dust generated during formatting or grinding of products before shipment is collected in filter systems.

Under normal conditions of use, CEMVIN fiber cement boards do not cause any adverse health effects or release volatile organic substances into the space.

Due to the nature of the product, its use is not expected to have any negative effects on the environment, nor to pollute water, air or soil.

Reference lifetime

The reference service lifetime (RSL) for fiber cement boards is not declared. These are construction products with many different application purposes. The service life of CEMVIN fiber cement boards is limited by the service life of construction where it is used.

1.1.4. Delivery method

In accordance with Regulation (EU) No. 305/2011 of the European Parliament and of the Council establishing harmonized conditions for placing construction products on the market (CPR EU 305/2011), a Declaration of performance has been issued for CEMVIN boards, which declares that the properties of the product are in accordance with the relevant harmonized technical specifications. System for assessing and verifying the constancy of properties of construction products: System 3 according to Annex V. Regulation of the European Parliament and the Council (EU) No. 305/2011

Product quality is ensured by an effective quality management system according to EN ISO 9001 and in accordance with technical regulations regarding the type of product.

1.1.5. Basic raw materials and auxiliary materials

Cement	70-80%
Limestone	10-20%
Microsilica	5-10%
Cellulose	3-6%
PVA fiber	cca 2%

Substances on the List of Substances of Very High Concern subject to authorisation by the European Chemicals Agency are not present in terrazzo products and paving stones in declarable quantities.

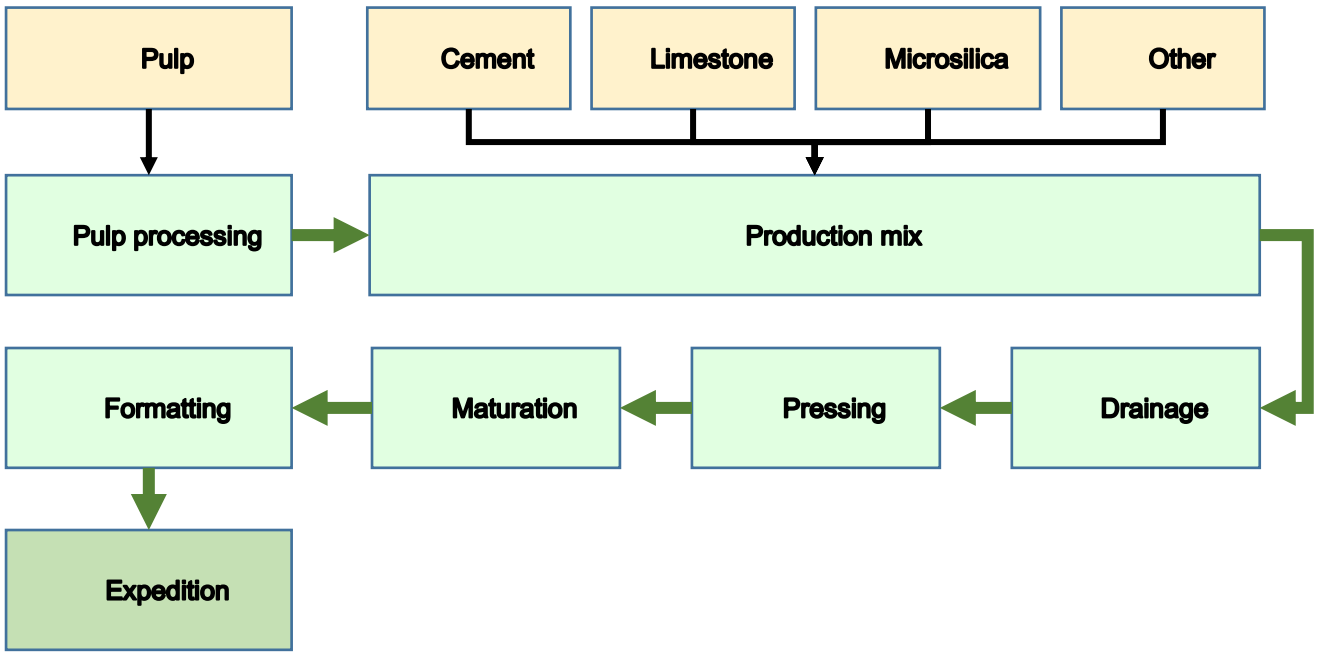
1.1.6. Production

The production of CEMVIN fiber cement boards includes several well optimized operation steps whit a pre-defined optimized sequence of individual production steps. The first production step is the preparation of cellulose - pulp. The pulp is available from the manufacturer in individual sheets, which gradually (in the water environment) become fibrous. Pulping is immediately followed by the grinding operation, where the mean length of the fibers decreases and the degree of grinding of the pulp increases. The next step in the preparation of the production mixture by dosing limestone and microsilica. A synthetic (PVA) fiber is dosed to the impregnated mixture, which is evenly dispersed in the mixing device. If an assortment with coloring in the mass is produced, the appropriate amount of pigment is also added. Subsequently, the specified amount of cement is dosed according to a given produced recipe and finally is added flocculant.

The actual production of the boards takes place on a two-vat Papcel dewatering machine. In the vat, the mixture is picked up by a rotating cylinder with a sieve. This way individual monolayers are created on the felt by transferring the picked up slury from the sieve to the felt. The felt passes through suction and guide rollers to the format roller, where the individual monolayers are gradually wind up to form a board. When the desired plate thickness is reached, the sensing device sends an impulse to cut the plate. The boards are pressed according to the set parameters. After pressing, the boards are placed on a pallet, wrapped in foil, and the pallet is transported to the maturing area. Here, the boards are cured under optimal conditions for a minimum of 28 days.

The production process is shown schematically in Fig. 1:

Fig.1: Scheme of the manufacturing process



1.1.7. Waste management

Waste generated during the production process is collected according to the type and reported in accordance with the regulations.

Possibility to recycle used products (at the end of their service life)

At the end of their service life, the boards can be crushed into a fine material that can be used as an inert filler in various products.

1.2. LCA: Calculation rules

1.2.1. Declared unit

The declared unit shall be 1 t of the average product — Fibre Cement Boards CEMVIN.

All inputs and outputs of this report were considered as consumption or production related to the production of 1 t of the mentioned product.

Table 1 Declared unit and conversion factors

Identification	Unit	Value
Declared unit	t	1
Conversion factor from kg	kg	1000
Average bulk weight	kg/m^3	1750

2. System boundary according to the modular approach

The boundary of the product life cycle system consists of **the information module A1 – A3 "Production phase", "End of life cycle phase" C1-C4 and D** in accordance with EN 15804+A2:2019. The project report includes all relevant processes for the EPD type "***From cradle to gate with modules C1-C4 and module D*** "(cradle to gate with modules C1–C4 and module D).

Information on product system boundaries is shown in Table 2.

Table 2: Information about product system boundaries – information modules

Information about product system boundaries – information modules (**X** = Included, **ND** = module not declared)																
Production stage			**Construction stage**		**Usage stage**							**End-of-life stage**				**Additional information beyond the life cycle**
Supply of mineral resources	Transport	Production	Transport to the construction site	Construction/installation process	Usage	Maintenance	Repair	Replacement	Reconstruction	Operational energy consumption	Operating water consumption	Demolition/deconstruction	Transport	Waste treatment	Removal	Benefits and costs beyond the system. Potential for reuse, recovery, and recycling
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	**X**	**X**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**X**	**X**	**X**	**X**	**X**

The system boundary is set to include both those processes that provide material and energy inputs to the system and subsequent production and transport processes up to the factory gate, and the treatment of all waste resulting from these processes.

The production stage includes the following modules:

- **A1** – extraction and processing of raw materials and production of packaging from input raw materials
- **A2** - transport of input raw materials from supplier to manufacturer, waste collection
- **A3 -** production of products, production of auxiliary materials and semi-finished products, energy consumption, including treatment of waste, up to reaching end-of-waste or after the last material residues have been removed during the production phase.

Data for the period 2021 provided by CEMVIN s.r.o. is used.

The end-of-life stage includes modules:

- **C1,** deconstruction, demolition; of the product from the building, including its dismantling or demolition, including the initial classification of materials at the site of construction
- **C2,** transport to the waste treatment site; transport of the discarded product as part of the waste treatment, e.g., to the recycling site, and transport of the waste, e.g., to the final disposal site.
- **C3,** treatment of waste for re-use, recovery and/or recycling, e.g., collection of waste fractions from deconstruction, treatment of waste from material flows intended for re-use, recycling, and energy recovery.
- **C4,** disposal of waste, including its pre-treatment and management of the disposal site

The benefits and costs beyond the product system are set out in Module D.

Module D includes:

- **D,** potential for reuse, recovery and/or recycling, expressed in net impacts or benefits.

The boundaries of the product system are considered in such a way that they **include only production processes, not administrative activities**.

As **end-of-life scenarios for** products (C1-C4, D), data resulting from an expert estimate of the possibility of reprocessing part of this glass insulation after the deconstruction of the building (as part of the take-back as a replacement for part of the inputs to production, reprocessing into another product – e.g., blown-in insulation, etc.) were used. These schemes are:

Module C1

Decomposition and/or dismantling of paving and cladding are part of the demolition of the entire building. In this case, it is assumed that the impact on the environment is very small and can be neglected.

Module C2

Transport from the dismantled building is executed by a truck with a load capacity of 7.5-16 t (EURO 6) to the landfill of inert material as demolition of a mixed building, the estimated transport distance according to calculations: 60 km to the recycling centre or to the landfill.

Module C3

A scenario where 20 % of the product is disposed of in an inert landfill is assumed. The use of products (together with other concrete products) as recyclable material is considered to be 80 % (treatment by crushing into aggregate for various purposes). The use of concrete reinforcement is similarly assumed.

Module C4

20 % of the dismantled product is disposed of as mixed construction debris in an inert material landfill, without taking into account the energy use of landfill gas from (minor) organic components.

Potential for reuse, recovery, and recycling (D)

In the module D scenario, the saving of primary raw material inputs (without considering transport and energy) in another product system (crushed aggregate) is taken into account. Impacts from the crushing and sorting process are included.

2.1. Preconditions and measures taken

Information modules **A4 to A5**, which are intended to provide additional information beyond the production stage, have not been included in the LCA due to the difficult availability of input data and are therefore not declared.

Information modules from the **usage stage B1 to B7** are also not declared because according to EN 16757 these types of products do not require maintenance, repair, or replacement during the normal life in the usage stage, provided that they are used correctly. Also, during the usage stage, they do not require consumption of energy or water.

The reference lifetime of the products is also not declared because of unavailability of representative data on the operating conditions in the usage stage of the product.

For the study, all operational data related to the consumption of main and auxiliary materials for the production of the product, energy data, diesel consumption and the distribution of annual waste and emissions according to the plant records were taken. For all inputs and outputs considered, transport costs were considered or differences in transport distances were recognised.

From the point of view of the waste produced, only the waste clearly related to production activities was included in the analysis.

For some input data, due to their complexity in obtaining them, alternative methods have been chosen in the form of a qualified calculation based on the available information. Some input data was converted into units that were needed for the selected generic process data in the environmental impact assessment calculation program.

These are:

- Energy data relating to **diesel** expressed in CU – were determined by calculation based on data on diesel consumption in litres and a coefficient of 0,845 kg/l for diesel and an energy value of 42,6 MJ/kg.
- Data on **natural gas** consumption in Kwh – were determined by conversion from the consumed quantity to MJ (1 kWh = 3,6 MJ)
- Data on the production of **waste** were taken from the continuous register of waste for the reference period.

2.2. Cut-off criteria

The processes required for the installation of production equipment and the construction of infrastructure were not included in the analysis. Administrative processes are not included either – inputs and outputs are balanced on the production stage.

2.3. Sources of environmental data

All inputs and outputs were entered in SI units, namely:

- Material and auxiliary inputs and product outputs in kg, pcs, m^3
- Sources used as energy input (primary energy), in MWh or MJ and GJ, including renewable energy sources (hydropower, wind energy)
- Water consumption in kg or m^3
- Inputs related to transport in km (distance), tkm (material transfer) and in kg (diesel consumption)
- Time was stated in practical units depending on the scale of the assessment: minutes, hours, days, years.

The time range of the required specific data provided by CEMVIN s.r.o., for the purpose of this report was set as a representative period **2021**. For this period, all available data were provided by the organization for their further processing.

The basic source of the necessary data from the area of production, purchasing, maintenance, etc. was the information system, or operational records from maintenance activities. To determine waste production, the annual report on waste production from the ISPOP system and operational records for the given production plant were used. Only those types of waste related to the production phase were included in this report, as waste destined for landfill.

For the following inputs it was proceeded this way (direct data not available):

- Distances on the transport of inputs and outputs (waste) – data from Google maps were used

For the complete analysis of environmental parameters were used:

- computing software SimaPro, version 9.4 SimaPro Analyst (database Ecoinvent version 3.8)

2.4. Data quality

The data used to calculate the EPD meet the following principles:

Time period: For specific data, manufacturer's data from 2021 have been used. This is due to significant technological changes in the production process. For generic data, the data of the Ecoinvent version database 3.8 have been used. Based on the evaluation in accordance with EN 15804+A2, Annex E, tab. E.1 the generic data used meet the quality level - very good.

Technological aspect: Data corresponding to the current production of individual types of sub-products and corresponding to the current state of new technologies in the plant used have been used.

Based on the evaluation in accordance with EN 15804+A2, Annex E, tab. E.1 the generic data used meet the level of quality - very good.

Completeness and complexness aspect: Most of the input data is based on consumption balances, which are precisely recorded in the information system. As part of the completeness check, the company CEMVIN s.r.o. was visited, and it was checked whether all used inputs/outputs are entered in the records. The reliability of the source of specific data is determined by the uniformity of the methodology of the information system collection method.

Geographical aspect: The generic data used from the Ecoinvent database are used with validity for the Czech Republic (e.g., energy inputs) and if data are not available for the Czech Republic, data valid for the EU or according to the supplier's location are used. Based on the evaluation according to EN 15804+A2, Annex E, tab. E.1 used generic data meet the level of quality - medium.

Consistency aspect: Uniform aspects are used throughout the scope of the report (allocation rules, age of data, technological scope of validity, time scope of validity, geographical scope of validity).

Credibility aspect: All important data were checked to ensure cross-comparison of weight balances.

2.5. Period considered

As the period of the required specific data, provided by CEMVIN s.r.o.,, for the purpose of this report, a calendar period **2021** was determined as a representative period.

2.6. Allocation

In the balance of inputs, their direct monitoring was used at individual centres, or allocation based on weight was used.

2.7. Comparability

Environmental product declarations from different programmes may not be comparable. Comparison or assessment of EPD data is only possible if all compared data reported in accordance with EN 15804+A2:2019 have been determined according to the same rules.

2.8. Product variability

The resulting data are given for **1 t of average product - Fibre Cement Boards CEMVIN**.

2.9. LCA: Results

Information on environmental impacts is indicated in the following tables. The individual results for the impact categories are presented in Tables 3 and 4. Tables 5 to 7 provide additional environmental information. They are related to the declared unit (DJ) – **1 t of the average product - Fibre Cement Boards CEMVIN**.

The impact assessment was carried out using the characterisation factors used in the European Life Cycle Reference Database (ELCD) provided by the European Commission – Directorate-General of the Joint Research Centre – Institute for Environment and Sustainability.

Table 3: Parameters describing **the basic environmental impacts**

Ultimately LCA – Parameters describing basic environmental impacts (DJ = 1 t of the product)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global warming potential (**GWP-total**)	kg CO_2 Eq.	5,64E+02	0	4,75E+01	4,20E-01	1,85E+00	-4,37E+00
Global warming potential (**GWP-fossil**)	kg CO_2 eq.	7,14E+02	0	4,74E+01	4,07E-01	1,84E+00	-4,45E+00
Global warming potential (**GWP-biogenic)**)	kg CO_2 eq.	-1,51E+02	0	2,40E-02	1,26E-02	1,83E-03	-7,76E-02
Global warming potential from land use and land-use change (**GWP-luluc**)	kg CO_2 eq.	6,49E-01	0	2,32E-02	9,30E-04	1,74E-03	-9,30E-04
Stratospheric ozone depletion potential (**ODP**)	kg CFC 11 eq.	3,87E-05	0	1,01E-05	2,06E-08	7,46E-07	-6,50E-07
Acidification potential, Cumulative exceedance (**AP**)	mol H+ eq.	3,14E+00	0	1,93E-01	2,17E-03	1,73E-02	-4,21E-02
Eutrophication potential, proportion of nutrients entering fresh water (**freshwater EP**)	kg P eq.	4,55E-01	0	4,02E-03	3,94E-04	1,69E-04	3,93E-04
Eutrophication potential, proportion of nutrients entering seawater (**seawater EP**)	kg N eq.	8,08E-01	0	5,48E-02	3,81E-04	6,03E-03	-8,59E-03
Eutrophication potential, Cumulative overshoot (**soil EP**)	mol N eq.	7,82E+00	0	5,98E-01	3,35E-03	6,60E-02	-9,47E-02
Ground-level ozone formation potential (**POCP**)	kg NMVOC eq.	2,09E+00	0	1,83E-01	9,64E-04	1,92E-02	-2,39E-02
Raw material depletion potential for **non-fossil sources (ADP-minerals and metals)**)	kg Sb eq.	2,66E-03	0	2,09E-04	1,11E-06	4,20E-06	9,75E-07
Raw material depletion potential for fossil resources (**ADP-fossil fuels**)	MJ, calorific value	7,14E+03	0	6,86E+02	8,52E+00	5,15E+01	-7,58E+01
Water scarcity potential (for users), water scarcity weighted by water scarcity (**WDP**)	m3 eq. scarcity	2,23E+02	0	2,60E+00	9,50E-02	2,32E+00	-3,12E+01

Table 4 Parameters describing **additional environmental impacts**

LCA result – Parameters indicating additional environmental impacts (DJ = 1 t of the product)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Potential occurrence of disease due to particulate matter emissions (**PM**)	Occurrence of the disease	2,25E-05	0	3,51E-06	8,04E-09	3,49E-07	-5,36E-07
Potential effect of human exposure to the isotope U235 (**IRP**)	kBq U235 eq.	1,06E+02	0	3,13E+00	2,28E-01	2,29E-01	-8,32E-01
Potential comparative toxic unit for ecosystems (**ETP-fw**)	CTUe	7,02E+03	0	6,32E+02	4,86E+00	3,25E+01	-1,63E+01
Potential comparative toxic unit for humans (**HTP-c**)	CTUh	6,26E-06	0	5,80E-07	6,94E-09	2,14E-08	-1,33E-08
Potential comparative toxic unit for humans (**HTP-nc**)	CTUh	2,06E-07	0	2,06E-08	3,65E-10	8,25E-10	1,77E-11
Potential Soil Quality Index (**SQP**)	dimensionless	2,04E+04	0	4,01E+02	1,27E+00	1,08E+02	1,27E+00

Table 5: Parameters describing **resource consumption**

LCA result – Parameters describing resource consumption (DJ = 1 t of the product)							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Consumption of renewable primary energy, excluding energy sources used as raw materials **(PERE)**	MJ	3,47E+03	0	9,19E+00	1,48E+00	4,39E-01	-3,53E+00
Consumption of renewable primary energy sources used as raw materials (**PERM**)	MJ	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total consumption of renewable primary energy sources (primary energy and primary energy sources used as raw materials) (**PERT**)	MJ	3,47E+03	0	9,19E+00	1,48E+00	4,39E-01	-3,53E+00
Consumption of non-renewable primary energy, excluding energy sources used as raw materials (**PENRE**)	MJ	7,60E+03	0	7,29E+02	8,94E+00	5,47E+01	-7,97E+01
Consumption of non-renewable primary energy sources used as raw materials (**PENRM**)	MJ	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total consumption of non-renewable primary energy sources (primary energy and primary energy sources used as raw materials) (**PENRT**)	MJ	7,60E+03	0	7,29E+02	8,94E+00	5,47E+01	-7,97E+01
Consumption of secondary raw materials (**SM**)	kg	7,24E+01	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Consumption of renewable secondary fuels (**RSF**)	MJ	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Consumption of non-renewable secondary fuels (**NRSF**)	MJ	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net potable water consumption (**FW**)	m^3	2,47E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 6 Other environmental information **- waste category description**

LCA result — Other environmental information — waste category description (DJ = 1 t of the product)							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed of (**HWD**)	kg	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Other waste disposed of (**NHWD**)	kg	1,33E+00	0	0,00E+00	0,00E+00	3,50E+02	0,00E+00
Radioactive waste disposed of (**RWD**)	kg	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 7 Other environmental information **- description of output flows**

LCA result - Other environmental information - description of output flows (DJ = 1 t of the product)							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Construction units for reuse (**MFR**)	kg	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (**MER**)	kg	2,05E+01	0	0,00E+00	1,40E+03	0,00E+00	0,00E+00
Materials for energy recovery (**EEE**)	kg	1,09E+01	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy (**EET**)	MJ per energy carrier	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	1,85E+02

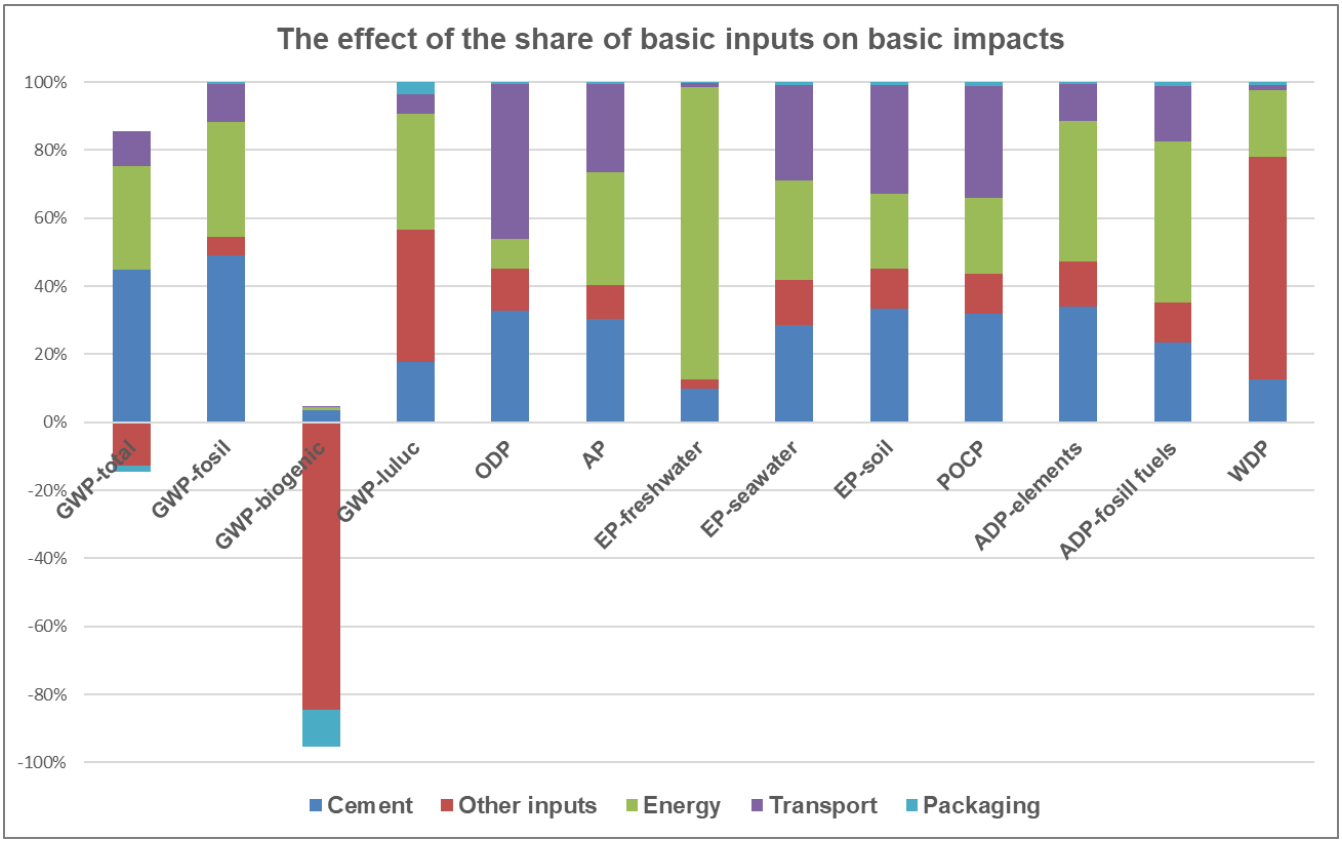
Table 8 Information describing the **biogenic carbon content** of the plant gate

LCA result – Information describing the biogenic carbon content at the plant gate (DJ = 1 t of the product)		
Parameter	**Unit**	**At the plant gate**
Biogenic carbon content of the product	kg C	0
Biogenic carbon content in the appropriate packaging	kg C	1,77E+01

2.9.1. LCA: Interpretation

The impact of basic groups of inputs on basic environmental impacts is shown in Figure 3:

Figure. 3 Impact of the share of basic inputs on the basic impacts



It can be seen from the figure that the **consumption of raw materials (mainly cement)** and **electricity** and its energy mix (CZ) have a very significant influence on environmental impacts. To a lesser extent, the effect of **transport** is also applied.

3. LCA: scenarios and other technical information

Information modules A4, A5 and B1-B7 were not included in the LCA analysis.

4. LCA: Additional information

EPD does not include additional documentation related to the declaration of supplementary information.

5. References

ČSN ISO 14025:2010 Environmentální značky a prohlášení - Environmentální prohlášení typu III - Zásady a postupy (Environmental labels and declarations - Type III environmental declarations - Principles and procedures)

ČSN EN 15804+A2:2020 Udržitelnost staveb - Environmentální prohlášení o produktu - Zásadní pravidla pro produktovou kategorii stavebních výrobků (Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products)

ČSN EN ISO 14040:2006 Environmentální management - Posuzování životního cyklu - Zásady a osnova (Environmental management - Life Cycle Assessment - Principles and Framework)

ČSN EN ISO 14044:2006 Environmentální management - Posuzování životního cyklu – Požadavky a směrnice (Environmental management - Life Cycle Assessment – Requirements and guidelines)

ČSN ISO 14063:2007 Environmentální management - Environmentální komunikace - Směrnice a příklady (Environmental management - Environmental communication - Guidelines and examples)

ČSN EN 15643-1:2011 Udržitelnost staveb - Posuzování udržitelnosti budov - Část 1: Obecný rámec (Sustainability of construction works - Sustainability assessment of buildings - Part 1: General framework)

ČSN EN 15643-2:2011 Udržitelnost staveb - Posuzování udržitelnosti budov - Část 2: Rámec pro posuzování environmentálních vlastností (Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of environmental performance)

ČSN EN 15942:2013 Udržitelnost staveb - Environmentální prohlášení o produktu - Formát komunikace mezi podniky (Sustainability of construction works - Environmental product declarations - Communication format business-to-business)

TNI CEN/TR 15941:2012 Udržitelnost staveb - Environmentální prohlášení o produktu - Metodologie výběru a použití generických dat (Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data)

ILCD handbook - JRC EU, 2011

Zákon č. 541/2020 Sb. v platném znění (Zákon o odpadech) / Act. No. 541/2020 Coll., as amended (Waste Act)

Vyhláška č. 8/2021 Sb. Katalog odpadů – Katalog odpadů / Decree No. 8/2021 Coll. Waste catalogue – Waste catalogue

Nařízení Evropského parlamentu č. 1907/2006 o registraci, hodnocení, povolování a omezování chemických látek a o zřízení Evropské agentury pro chemické látky - REACH (registrace, evaluace a autorizace chemických látek) / Regulation (EC) No 1907/2006 of the European Parliament concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency - REACH (Registration, Evaluation and Authorisation of Chemicals

Nařízení Evropského parlamentu a Rady (ES) č. 1272/2008 o klasifikaci, označování a balení látek a směsí, o změně a zrušení směrnic 67/548/EHS a 1999/45/ES a o změně nařízení (ES) č. 1907/2006 (nařízení CLP) / Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No 1907/2006 (CLP Regulation)

SimaPro LCA Package, Pré Consultants, the Netherlands, www.pre-sustainability.com

Ecoinvent Centre, www.Ecoinvent.org

Explanatory documents are available from the head of Technical Support of CEMVIN s.r.o.

6. EPD verification

CEN standard EN 15804+A2 serves as the core PCR	
Independent verification of the declaration and data, according to EN ISO 14025:2010: ☐ Internal ☒ External	
Third party verifier: Technický a zkušební ústav stavební Praha, s.p. Prosecká 811/76a, Praha 9, 190 00 Czech Republic Certification Body for EPD, accredited by CAI - Czech Accreditation Institute, under No. 95/2023	

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