ENVIRONMENTAL PRODUCT DECLARATION

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

Organization	**DAKO Brno, spol. s r.o.**
Industry Program Operator	CENIA, Czech Environmental Information Agency, Executive Body of NPEZ Agency
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Glassfibre Reinforced Concrete DAKO-GRC

1. General Information Declaration

DAKO Brno, spol. s r.o.	**Glassfibre Reinforced Concrete DAKO-GRC**
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:** **DAKO Brno, spol. s r.o.** Křenovská 333 664 58 Prace, CZ
EPD registration number: **3015-EPD-030065109**	**Declared unit:** **1 m^2 of average product**
Product category rules: EN 15804+A2:2019 as core PCR EN 16757:2017 **Publication Date:** 2023-12-18 **Valid until:** 2023-12-18in accordance with EN 15804**+**A2:2019	**Product:** **Glassfibre Reinforced Concrete DAKO-GRC**

DAKO Brno is a wholly Czech family-owned company that has been involved for more than twenty-seven years in the production of precast concrete façade cladding made of DAKO-GRC material and unattended public toilet modules featuring a special vandalism-proof design.

We have developed and are still improving our GRC material, which allows us to supply quality façade elements and other products ranging from architectural façade accessories and original interior elements to large-volume flower pots.

The great advantage of this material is its high strength and durability thanks to the use of glass fibre while maintaining the relatively low weight of the individual elements.

Another great advantage is the variability of the elements - in addition to classic cladding boards, it is possible to make panels with full corners, spatial elements or more complex architectural 3D elements, large-format panels and design solitaires.

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 parts are designed from fiberglass concrete from alkali-resistant glass fiber, cement, sand and other additives and admixtures. The substance does not contain organic additives. The front surface of the parts can be aesthetically modified.

Glassfibre Reinforced Concrete (GRC), or fine-grained concrete reinforced with glass fibre, is a material that offers architects complete freedom in the design of ventilated facades.

1.1.2. Product data sheet

Fiberglass concrete products are increasingly popular due to their excellent physical and mechanical properties and are widely used in architecture and construction.

DAKO-GRC products are characterized by high strength and durability while maintaining a relatively low weight, which significantly reduces transport costs and facilitates handling and

assembly. These advantages are achieved thanks to the dispersion of glass fibers in a basic mixture of Portland cement, sand, water and other improving additives. Fine-grained particles in the structure of the composite ensure low water absorption and frost resistance.

The standards apply to the DAKO-GRC glass fiber concrete part product: **EN 12467:2012+A2:2018** *Fiber cement flat plates - Product specifications and test methods*, **EN 1169:1999** *Precast concrete products - General rules for production control of glass fiber concrete* and **EN 15191:2009** *Precast concrete - Classification of functional properties of fiberglass concrete*.

The quality level of the product is guaranteed by tests carried out in accordance with the requirements of the above-mentioned standard, and the products are produced under the **ISO 9001** quality management system.

The main product range – fiberglass concrete panels for ventilated facades.

Table 1: Main typical features

Parametr	Standard	Limit value
Bending strength	EN 1170-5	MOR > 16 / 18 MPa LOP > 7 MPa
Density	EN 1170-6	1950 $kg \cdot m^{-3}$
Absorption	EN 1170-6	< 11 %
Coefficient of frost resistance	EN 492+A1	> 0.9
Durability - climatic cycles	EN 1170-8	> 0.8
Linear change in dimension due to humidity	EN 12467+A1	0,018 %
Linear change in dimension due to temperature	EN 14581:2005	$10 \cdot 10^{-6}$ $°C^{-1}$
Reaction to fire	EN 13501-1+A1	A1

A comprehensive description of the products is available at www.dakogrc.cz.

Product packaging:

Fiberglass concrete facade panels are stored in a horizontal position on spatially rigid and custom-made wooden pallets.

The base of the pallet is made of wooden prisms, most often with a square cross-section of 100 x 100 mm.

Ventilation of the pallets and individual floors, possibly other auxiliary structures subsequently made of wooden prisms/slats usually 60 x 40 mm.

The individual parts, if they are stored facing the pallet construction, are protected/separated from the wooden pallet construction by means of foam PE film (mirelon).

The parts are bound in the pallet and secured against movement with plastic tapes.

The pallets are secured around the perimeter against the weather with foil.

Leakage from above is prevented by using a foil pulled over the sides of the pallet.

1.1.3. Rules for use

DAKO-GRC fiberglass composite panels are intended for pre-hung cladding outside and inside buildings, so they cannot be designed for load-bearing structures. They are made of fiberglass concrete, reinforced with a perimeter frame and stiffening ribs around the perimeter, or even inside the surface. The dimensions of the parts are variable according to the construction, the parts are made to order. The anchoring of tiles for individual use is designed and assessed individually.

Use of products

- Ventilated facades
- Large format and 3D facade elements
- Architectural additions to facades - cornices, attics

- Cladding of bridge structures
- Interior accessories
- Bulky flower pots
- Elements of urban furniture (benches, circular benches)
- Balcony fillings

Environment and health during use

Under normal conditions of use, the products do not create any adverse health effects or release volatile organic compounds into indoor air.

Due to the areas of use of the product, no impacts on the environment and emissions to water, air or soil are expected.

Reference lifetime

The reference lifetime for fiber cement boards is not declared.

Long life and sustainability are among the main features of GRC material. The result is visually impressive facade panels that can easily withstand the effects of weather for decades. The first known facade of GRC material at 30 Cannon Street in London, installed in 1977, has served its purpose for more than forty years without the need for reconstruction.

1.1.4. Basic raw materials and auxiliary materials

Table 2 Basic input materials

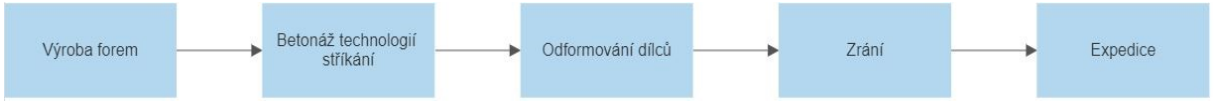
Component	%	Content
Cement	%	40-50
Sand	%	40-50
Glass fiber	%	4-7
Microsilica	%	1-3
Pigment	%	<1
Polymer	%	<1
Plasticizer, defoamer	%	<1

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.

1.1.5. Production

The production process is shown schematically in Fig. 1:

Giant. 1: Schematic of the manufacturing process



1.1.6. Waste management

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

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

The use of construction debris saves natural resources and at the same time contributes to reducing the amount of construction waste in landfills. The waste generated during production is of a natural nature - it is concrete that can be used as recycled material for strengthening walking and driving surfaces, for road embankments, for backfilling engineering networks and for various landscaping.

Crushed waste concrete is also used in the company's premises for paved surfaces.

Currently, the company is working on the possibility of using recycled GRC in prefabricated WC modules in the public toilet production division.

1.2. LCA: Calculation rules

1.2.1. Declared unit

The declared unit shall be 1 m^2 of the average product — Glassfibre Reinforced Concrete DAKO-GRC.

All inputs and outputs of this report were considered as consumption or production related to the production of 1 m^2 of the mentioned product.

Table 3 Declared unit and conversion factors

Identification	Unit	Value
Declared unit	**m^2**	**1**
Conversion factor from kg	kg	0,01680
Average surface weight	kg/m^2	51,53098
Average bulk weight	kg/m^3	2000

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 4.

Table 4: 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 2022 provided by DAKO Brno spol. 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 only in the energy for dismantling.

Module C2

Transport from the dismantled building is carried out by a truck with a capacity of 7.5 - 16 t (EURO 5), estimated transport distance: 25 km to the recycling centre.

Module C3

A scenario where 100% of the product is recycled (treatment by crushing into aggregates for various purposes) is assumed.

Module C4

Landfilling after dismantling the products is not considered.

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 (e.g. 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 DAKO Brno spol. s r.o., for the purpose of this report was set as a representative period **2022**. 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 2022 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 DAKO Brno spol. 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 DAKO Brno spol. s r.o., for the purpose of this report, a calendar period **2022** 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 m^2 of average product - Glassfibre Reinforced Concrete DAKO-GRC**.

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 m^2 of the average product - Glassfibre Reinforced Concrete DAKO-GRC**.

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 m² of the product)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global warming potential (**GWP-total**)	kg CO_2 Eq.	5,48E+01	7,75E-02	6,39E-01	1,74E-01	0,00E+00	-6,62E-01
Global warming potential (**GWP-fossil**)	kg CO_2 eq.	5,44E+01	7,75E-02	6,38E-01	1,74E-01	0,00E+00	-6,75E-01
Global warming potential (**GWP-biogenic)**)	kg CO_2 eq.	3,78E-01	2,73E-05	5,79E-04	6,15E-05	0,00E+00	-1,23E-02
Global warming potential from land use and land-use change (**GWP-luluc**)	kg CO_2 eq.	2,04E-02	7,73E-06	3,00E-04	1,74E-05	0,00E+00	1,74E-05
Stratospheric ozone depletion potential (**ODP**)	kg CFC 11 eq.	3,29E-06	1,66E-08	1,43E-07	3,73E-08	0,00E+00	-9,07E-08
Acidification potential, Cumulative exceedance (**AP**)	mol H+ eq.	1,98E-01	8,05E-04	2,54E-03	1,81E-03	0,00E+00	-5,62E-03
Eutrophication potential, proportion of nutrients entering fresh water (**freshwater EP**)	kg P eq.	2,99E-02	2,40E-06	4,79E-05	5,40E-06	0,00E+00	5,26E-06
Eutrophication potential, proportion of nutrients entering seawater (**seawater EP**)	kg N eq.	4,91E-02	3,57E-04	7,38E-04	8,02E-04	0,00E+00	-3,93E-04
Eutrophication potential, Cumulative overshoot (**soil EP**)	mol N eq.	4,74E-01	3,91E-03	8,06E-03	8,79E-03	0,00E+00	-4,48E-03
Ground-level ozone formation potential (**POCP**)	kg NMVOC eq.	1,29E-01	1,07E-03	2,48E-03	2,42E-03	0,00E+00	-9,44E-04
Raw material depletion potential for **non-fossil sources (ADP-minerals and metals)**)	kg Sb eq.	1,88E-04	3,98E-08	2,91E-06	8,96E-08	0,00E+00	6,77E-08
Raw material depletion potential for fossil resources (**ADP-fossil fuels**)	MJ, calorific value	5,96E+02	1,06E+00	9,52E+00	2,39E+00	0,00E+00	-1,24E+01
Water scarcity potential (for users), water scarcity weighted by water scarcity (**WDP**)	m3 eq. scarcity	6,58E+00	1,66E-03	3,15E-02	3,74E-03	0,00E+00	-2,59E+00

Table 4 Parameters describing **additional environmental impacts**

LCA result – Parameters indicating additional environmental impacts (DJ = 1 m² 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	1,47E-06	2,16E-08	4,75E-08	4,85E-08	0,00E+00	-3,69E-08
Potential effect of human exposure to the isotope U235 (**IRP**)	kBq U235 eq.	1,00E+01	4,79E-03	5,06E-02	1,08E-02	0,00E+00	-1,92E-01
Potential comparative toxic unit for ecosystems (**ETP-fw**)	CTUe	3,87E+02	6,22E-01	7,77E+00	1,40E+00	0,00E+00	-2,63E+00
Potential comparative toxic unit for humans (**HTP-c**)	CTUh	7,66E-07	4,51E-10	7,86E-09	1,01E-09	0,00E+00	-2,81E-09
Potential comparative toxic unit for humans (**HTP-nc**)	CTUh	2,14E-08	2,41E-11	2,84E-10	5,41E-11	0,00E+00	-1,12E-11
Potential Soil Quality Index (**SQP**)	dimensionless	1,41E+02	1,35E-01	5,62E+00	3,04E-01	0,00E+00	3,04E-01

Table 5: Parameters describing **resource consumption**

LCA result – Parameters describing resource consumption (DJ = 1 m² 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	2,90E+01	5,97E-03	1,61E-01	1,34E-02	0,00E+00	-7,27E-01
Consumption of renewable primary energy sources used as raw materials (**PERM**)	MJ	0,00E+00	0,00E+00	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	2,90E+01	5,97E-03	1,61E-01	1,34E-02	0,00E+00	-7,27E-01
Consumption of non-renewable primary energy, excluding energy sources used as raw materials (**PENRE**)	MJ	6,36E+02	1,13E+00	1,01E+01	2,54E+00	0,00E+00	-1,30E+01
Consumption of non-renewable primary energy sources used as raw materials (**PENRM**)	MJ	0,00E+00	0,00E+00	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	6,36E+02	1,13E+00	1,01E+01	2,54E+00	0,00E+00	-1,30E+01
Consumption of secondary raw materials (**SM**)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Consumption of renewable secondary fuels (**RSF**)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Consumption of non-renewable secondary fuels (**NRSF**)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net potable water consumption (**FW**)	m^3	5,99E-04	0,00E+00	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 m² of the product)							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed of (**HWD**)	kg	0	0	0	0	0	0
Other waste disposed of (**NHWD**)	kg	1,44E+01	0	0	0	0	0
Radioactive waste disposed of (**RWD**)	kg	0	0	0	0	0	0

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

LCA result - Other environmental information - description of output flows (DJ = 1 m² of the product)							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Construction units for reuse (**MFR**)	kg	0	0	0	0	0	0
Materials for recycling (**MER**)	kg	0	0	0	5,95E+01	0	0
Materials for energy recovery (**EEE**)	kg	0	0	0	0	0	0
Exported energy (**EET**)	MJ per energy carrier	0	0	0	0	0	0

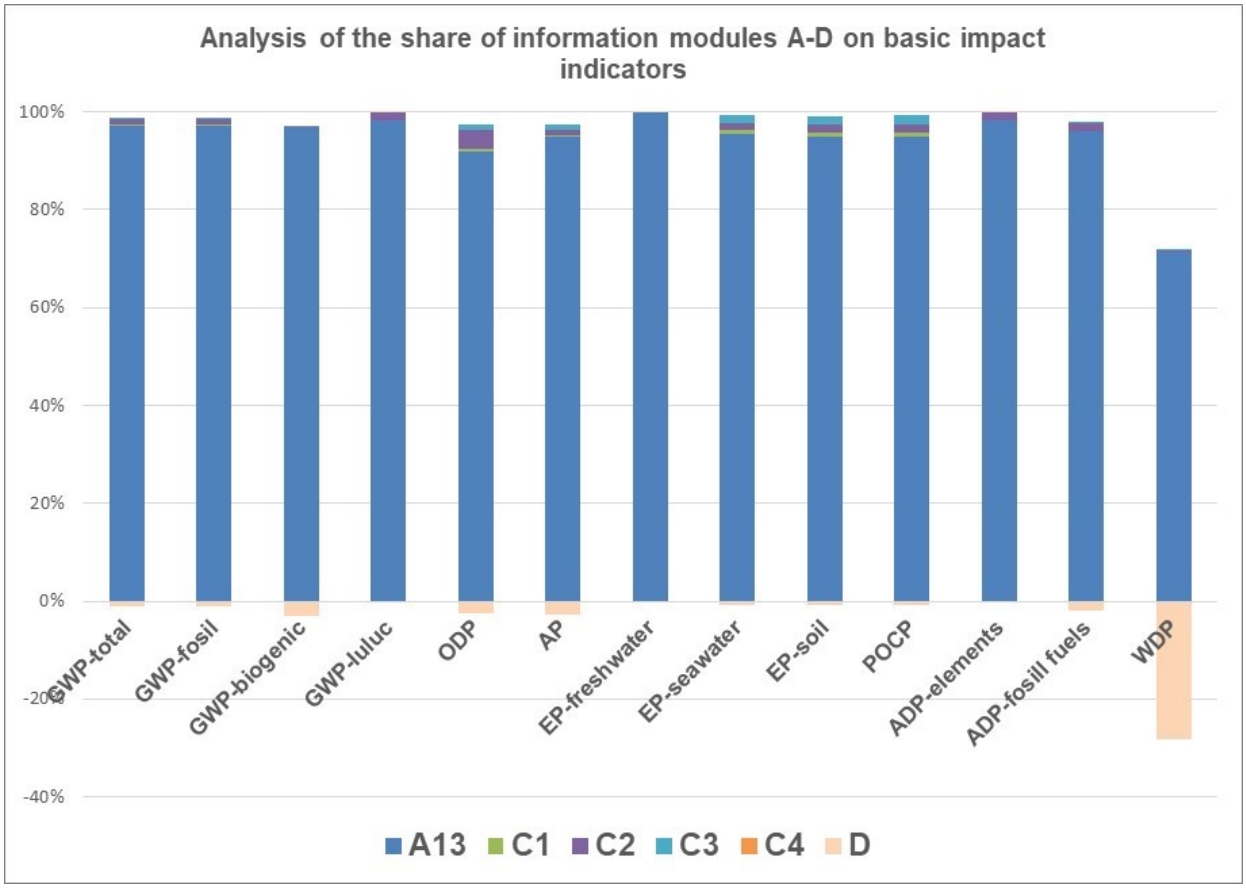
Table 8 Information describing the **biogenic carbon content** of the plant gate

LCA result – Information describing the biogenic carbon content at the plant gate (DJ = 1 m^2 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 influence of the share of information modules A-D on the basic environmental impacts is shown in the following figure:

Figure. 2 The influence of the share of information modules A-D on basic environmental impacts.



The results show that the **consumption of raw materials** (mainly cement) and **electricity** and its energy mix have a very significant influence on environmental impacts (CZ). To a lesser extent, the effect of **transport** is also applied. The potential for possible impact reduction is therefore mainly in the use of renewable energy sources.

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 DAKO Brno spol. 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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