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## Mobile walls



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### Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

**Life cycle analysis (LCA):** A1-A3, C1-C4 and D modules in accordance with EN 15804 (Cradle-to-Gate with options)

**The year of preparing the EPD:** 2024

**Product standard:** EAD 210005-00-0505

**Service Life:** 75 years

**PCR:** ITB-PCR A

**Functional unit:** 1 m<sup>2</sup>

**Reasons for performing LCA:** B2B

**Representativeness:** Poland, European

## **MANUFACTURER**

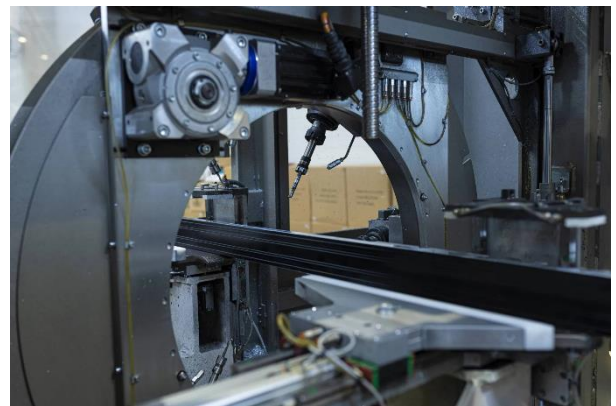
VITRINTEC is a manufacturer of aluminium and glass systems that also specializes in their design and distribution. Vitrintec contains extensive machinery, which includes two production lines for aluminium prefabrication and complex glass processing. Aluminium profiles are prefabricated in energy-efficient CNC-controlled machines. The glass production line is fully automated. The manufacturing plant has an area of 1600 m<sup>2</sup>.

The proximity of the aluminium and glass production, as well as the profile and accessory warehouses, is a major advantage. This makes it possible to prepare a complex order within one location. The process of assembling system profiles, glass and accessories needed for installation is coordinated entirely in-house.

The company has implemented an Integrated Management System: ISO 14001 and ISO 9001.



*Fig. 1. Vitrintec Sp. z o.o. manufacturing plant located in Kielce, Poland.*



*Fig. 2. Pictures from the Vitrintec manufacturing plant. On the left, glass processing, on the right, aluminum profile processing.*

### PRODUCTS DESCRIPTION AND APPLICATION

The ZIG ZAK system partition wall kits by Vitrintec Sp. z o.o. (mobile walls) are a product that allows for dynamic management of the interiors of offices, conference rooms, hotels, restaurants and other facilities where flexibility in the organization of space is required. The product is characterized by ease of assembly, disassembly and ongoing service, and its purpose is to quickly change the layout of rooms, depending on the needs.

The non-load-bearing, internal fixed and sliding system partition wall kits (ZigZak mobile walls) are designed to make partition walls in residential, public utility and industrial buildings to the extent resulting from the functional properties.

#### 1. Construction and materials:

- Load-bearing structure: The Zig Zak system partition wall kit is based on a lightweight, durable aluminum structure. Aluminum profiles used in the production of individual sliding wall modules are made in the process of plastic processing from an aluminum alloy
- The structural profiles are designed to ensure the greatest possible module transparency. For example, the transparency of a repeatable module is approx. 87 percent of their entire surface.
- The filling (glazing/paneling) of Zig Zak system partition wall kit depends on the customer's expectations. Vitrintec Sp. z o.o. offers full personalization of the final effect of each module. The flagship and most frequently ordered product in the sliding wall category are modules filled with glass: laminated, tempered or laminated-tempered, according to the customer's instructions.
- Finish: Sliding walls are available in a wide range of surface finishes. Their aluminum profiles can be powder coated (RAL colors), and wood-like veneers, veneered, laminated (furniture boards) can be used as filling. The glass constituting the filling can be painted with ceramic paint for glass (RAL color), decorative prints can be made on its surface on glass, ending with textile materials. The final appearance of the product and its composition depend on the customer's expectations. The flagship and most frequently ordered product of this type are modules filled with glass.

#### 2. Movement mechanism

- Sliding system: ZigZak sliding walls consist of a track and trolleys moving in it, which allow sliding modules to be moved and folded in parking lots. The unsealing and sealing of the sliding wall modules in order to extend/retract them is carried out manually or semi-automatically. The modules are moved manually. The track assembly system ensures the stability of the entire structure during the installation and movement of the modules. Thanks to the system of wheels and rollers in the trolleys, the modules can be moved smoothly, even in the case of panels up to 4.5 meters high.

#### 3. Functionality and possibilities

- Acoustics: Zig Zak system partition wall kits offer various variants in terms of acoustic insulation, including modules with sound-absorbing panels. Thanks to the use of sound-proofing technology, the sliding walls can effectively separate spaces, ensuring privacy and acoustic comfort.
- Size and configuration: The system allows for the separation of both small and large spaces, and thanks to the possibility of easily connecting several modules, users can adapt the arrangement of sliding walls to changing needs. These walls can be set in various configurations: straight arrangement, corner arrangement, angular arrangement.
- Aesthetics and personalization: For users who prefer an individual approach to interior design, various options for personalizing the panels are available - from different colors and textures to built-in elements such as doors. The filling of sliding walls can be fully glass, solid or mixed (glass and opaque modules). Modules in sliding walls can be made of high-quality materials, such as: glass, MDF board, furniture board, as well as plastics. The glass can be matt, transparent or with graphics,

depending on the user's preferences. Vitrintec customers also have the option of modifying the level of transparency of the glass module in the Zig Zak system partition wall kit, if they decide on a sliding wall with integrated LCD adhesive film. In the case of sound-absorbing panels, special acoustic inserts are used, which improve the acoustic insulation of rooms.

#### 4. Safety and ease of use

- **Locking systems:** Zig Zak system partition wall kits are equipped with locking mechanisms that guarantee stability and safety of use, preventing accidental movement of the panels during use.
- **Ease of assembly:** The entire system is designed in a way that allows quick and easy assembly and disassembly, without the need to use specialist tools. These walls can be moved by one person or in a team, which reduces the time needed to change the space layout.

#### 5. Application

Zig Zak system partition wall kits are a perfect solution for:

- Offices and open spaces,
- Conference and lecture rooms,
- Restaurants and hotels,
- Event spaces,
- Meeting and workshop rooms,
- Public spaces that require easy reorganization.

Thanks to their flexibility, aesthetics and functionality, Zig Zak system partition wall kit sliding wall systems are an ideal solution for people looking for innovative and modern ways to arrange space.

#### 6. Warranty and service

The Vitrintec manufacturer offers a warranty on all elements of the Zig Zak system partition wall kit sliding wall system. Additionally, a service and technical support option is available, which ensures maintenance and repair if necessary.

For non-load-bearing systems, internal sliding walls from Vitrintec, the width is not limited and can be finished with a free edge. The maximum height of the full sliding wall modules can be 4500 mm, and the glass one 3600 mm. The maximum width of the modules is 1250 mm. A door leaf with maximum dimensions of 1023 mm x 3000 mm can be installed in the door module.

Vitrintec aluminum systems can be either anodized or powder-coated in one of the RAL colors. Structural painting is very effective, allowing you to obtain an interesting texture in any finish from matt to gloss on the surface of the profiles.

The national system used for the assessment and verification of constancy of performance for non-load-bearing walls and doors without declared fire resistance is Assessment System 3

The national system used for the assessment and verification of constancy of performance for non-load-bearing walls and doors with declared fire resistance is Assessment System 1

Detailed parameters of mobile walls systems are specified in their catalogues and product cads, which can be downloaded from the Vitrintec Sp. z o.o. website: [www.vitrintec.pl](http://www.vitrintec.pl)

### LIFE CYCLE ASSESSMENT (LCA) – general rules applied

#### Declared unit

The declaration refers to declared unit (DU) – 1 m<sup>2</sup> of averaged mobile walls manufactured by VITRINTEC Sp. z o. o.

#### Allocation

The allocation rules used for this EPD are based on general ITB PCR A v. 1.6. Production of mobile walls systems is two lines process conducted in the manufacturing plant located in Kielce (Poland). All impacts from raw materials extraction and processing are allocated in A1 module of EPD. Impacts from the Vitrintec production were inventoried on the annual production volume expressed in mass units. The allocation was made on average weight of products. Water and energy consumption, associated emissions and generated wastes are allocated to module A3. Energy supply was inventoried for whole production process. Packaging materials were taken into consideration. The obtained results are representative average for all mobile walls manufactured in the inventory year at the Kielce manufacturing plant.

#### System boundary and limits

The life cycle analysis (LCA) of the declared products covers: product stage – modules A1-A3, end of life – modules C1-C4 and benefits and loads beyond the system boundary – module D (cradle-to-gate with options) in accordance with EN 15804 + A2 and ITB PCR A v. 1.6. Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculations. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804 + A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

#### Modules A1 and A2: *Raw materials supply and transport*

Raw materials such as aluminium, float glass, tempered glass, bent glass, seals or paints are produced in Poland and others European plants whereas other ancillary items come from both local and foreign suppliers. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include small truck (< 10 t e.g. couriers) and lorries (> 16 t) are applied. Based on data provided by the manufacturer, all input of transport resources was inventoried in details. European standards for average combustion were used for calculations.

#### Module A3: *Production*

Production contains two lines for aluminium prefabrication and complex glass processing. Aluminium profiles are prefabricated in energy-efficient CNC-controlled machines. The glass production line is fully automated. Electricity supplied is from grid electricity and about 10% from photovoltaic panels. A scheme of mobile walls production process is presented in Fig. 3.

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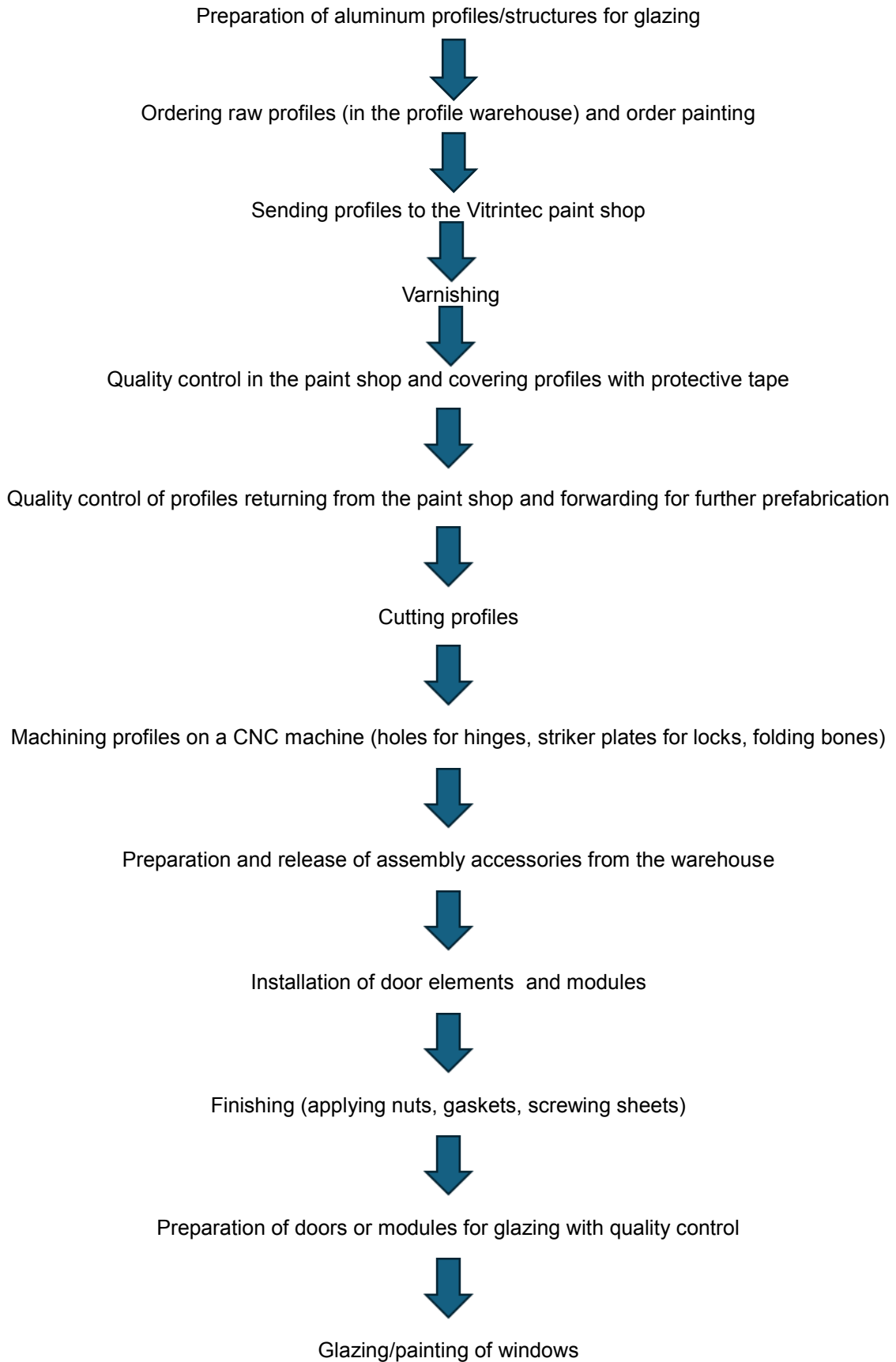


Fig. 3. A scheme of mobile walls production by VITRINTEC Sp. z o. o.

### Modules C1-C4 and D: *End-of-life (EoL)*

It is assumed that at the end-of-life, 100% of mobile walls are demounted using electric tools (module C1) and it is transported to waste processing plant distant by 60 km, on 16-32 t lorry (Euro 6) (module C2). Materials recovered from dismantled products are prepared to recycling (module C3) and landfilling (module C4) according to a realistic treatment practice for industrial waste what is presented in Table 1.

It is assumed that 95 % of aluminium undergo recycling after sorting and cutting while the remaining 5 % is forwarded to landfill as mixed construction and demolition wastes. In the case of glass, 30 % is energy/material recovery, while 70 % goes to landfill. A potential credit resulting from the recycling of aluminium scrap and glass are presented in module D. Utilization of packaging material was not taken into consideration.

Table 1. *End-of-life scenario for mobile walls manufactured by VITRINTEC Sp. z o. o.*

Material	Waste processing (energy / material recovery)	Landfilling
aluminium	95 %	5 %
glass	30 %	70 %

### Data quality

The data selected for LCA analysis originates from ITB-LCI questionnaires completed by VITRINTEC Sp. z o. o. using the inventory data, ITB and Ecoinvent database v. 3.10 and KOBIZE. KOBIZE data is supplemented with Ecoinvent v. 3.10 data on the national electricity mix impact where no specific indicator data is provided. Data for some raw materials can come from available supplier EPDs. No specific data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability and consistency are judged as sufficient for calculations.

### Data collection period

The data for manufacture of the declared products refers to period between 01.01.2023 – 31.12.2023 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

### Assumptions and estimates

Impacts were inventoried and obtained results are calculated as a representative average for all mobile walls manufactured in the inventory year at the Kielce manufacturing plant. According to the data adopted for the Ecoinvent v 3.10 and available EPDs database, post-consumer is not burdened with the environmental impacts, however, aluminium scrap processing impacts were included. The results for 1 m<sup>2</sup> of averaged mobile walls are presented in Tables 3-6.

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### Calculation rules

LCA was performed using ITB-LCA tool and own algorithms for impact calculations developed in accordance with EN 15804 + A2 and ITB PCR A v. 1.6 document. Calculations are presented for averaged mass of 75.3 kg based on data obtained from the LCI inventory and Vitrintec Sp. z o. o. data.

### Databases

The data for the processes comes from Ecoinvent v. 3.10 and ITB-Database. Specific data quality analysis was a part of external audit. Polish electricity mix used (production) is 0.685 kg CO<sub>2</sub>/kWh (KOBiZE 2023).

## LIFE CYCLE ASSESSMENT (LCA) – Results

### Declared unit

The declaration refers to declared unit (DU) – 1 m<sup>2</sup> of averaged mobile walls manufactured by Vitrintec Sp. z o. o.

Table 2. System boundaries for the environmental characteristic of mobile walls systems.

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MND	MND	MND	MND	MND	MND	MND	MND	MND	MD	MD	MD	MD	MD



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Table 3. LCA results for mobile walls – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO <sub>2</sub>	2.80E+02	1.08E+00	2.78E+01	3.09E+02	1.75E-01	8.59E-01	1.31E+00	4.10E-01	-1.29E+01
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	2.85E+02	1.08E+00	2.77E+01	3.14E+02	1.72E-01	8.58E-01	5.67E-01	4.07E-01	-1.28E+01
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	-3.41E+00	7.08E-04	1.44E-01	-3.27E+00	3.10E-03	5.65E-04	7.42E-01	3.27E-03	-1.14E-01
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	2.07E+00	3.59E-04	7.33E-03	2.07E+00	4.04E-05	2.85E-04	7.47E-04	3.21E-04	-8.68E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.72E-05	2.15E-08	1.35E-06	1.86E-05	3.02E-09	1.71E-08	3.84E-08	9.69E-08	-3.70E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	2.08E+00	2.25E-03	2.07E-01	2.29E+00	1.67E-03	1.79E-03	4.00E-03	3.56E-03	-8.20E-02
Eutrophication potential - freshwater	eq. kg P	1.18E-01	7.32E-05	3.38E-02	1.52E-01	2.86E-04	5.81E-05	2.66E-04	3.40E-05	-3.66E-03
Eutrophication potential - seawater	eq. kg N	2.52E-01	5.40E-04	3.19E-02	2.84E-01	2.38E-04	4.29E-04	1.38E-03	1.36E-03	-1.14E-02
Eutrophication potential - terrestrial	eq. mol N	2.61E+00	5.83E-03	2.62E-01	2.88E+00	2.04E-03	4.63E-03	1.08E-02	1.49E-02	-2.02E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	9.07E-01	3.74E-03	7.73E-02	9.88E-01	5.71E-04	2.97E-03	3.17E-03	4.37E-03	-3.44E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.56E-03	3.60E-06	5.00E-05	1.61E-03	2.27E-07	2.85E-06	2.11E-05	1.04E-06	-3.96E-04
Abiotic depletion potential - fossil fuels	MJ	3.04E+03	1.52E+01	4.35E+02	3.49E+03	2.57E+00	1.21E+01	6.03E+00	8.63E+00	-9.65E+01
Water deprivation potential	eq. m <sup>3</sup>	2.91E+02	7.44E-02	7.01E+00	2.98E+02	5.23E-02	5.90E-02	1.25E-01	3.64E-02	-7.86E+00

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Table 4. LCA results for mobile walls – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 5. LCA results for mobile walls – waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	2.08E+01	2.21E-02	2.48E-02	2.09E+01	5.32E-07	1.76E-02	5.11E-02	1.32E-02	-9.32E-01
Non-hazardous waste neutralised	kg	5.45E+01	4.69E-01	2.57E+00	5.76E+01	1.52E-02	3.72E-01	3.25E+00	1.80E-01	-2.60E+01
Radioactive waste	kg	3.37E-02	4.94E-06	2.86E-04	3.40E-02	2.21E-06	3.89E-06	2.35E-05	4.32E-05	-2.43E-04
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
Materials for recycling	kg	7.61E+00	1.16E-04	8.90E-03	7.61E+00	1.56E-05	9.17E-05	2.94E+01	4.67E-03	-2.57E+01
Materials for energy recovery	kg	3.57E-03	9.58E-07	5.61E-04	4.13E-03	2.19E-08	7.77E-07	8.30E-07	5.16E-07	-2.28E-05
Energy exported	MJ	4.98E+00	6.96E-03	9.55E-01	5.94E+00	7.46E-03	5.08E-03	2.00E-01	2.06E-02	-1.43E+00

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Table 6. LCA results for mobile walls - the resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	6.26E+02	2.62E-01	3.31E+01	6.59E+02	1.87E-01	2.07E-01	7.55E-01	9.43E-02	-6.91E+00
Consumption of renewable primary energy resources used as raw materials	MJ	4.43E+01	0.00E+00	0.00E+00	4.43E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	6.71E+02	2.62E-01	3.31E+01	7.04E+02	1.87E-01	2.07E-01	7.55E-01	9.43E-02	-1.38E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.95E+03	1.52E+01	4.64E+02	3.43E+03	2.72E+00	1.21E+01	6.03E+00	8.63E+00	-6.49E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.02E+02	0.00E+00	7.34E-01	1.03E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	3.05E+03	1.52E+01	4.64E+02	3.53E+03	2.72E+00	1.21E+01	6.03E+00	8.63E+00	-9.66E+01
Consumption of secondary materials	kg	6.00E+00	7.05E-03	4.01E-02	6.05E+00	2.08E-04	5.60E-03	9.11E-03	3.11E-03	-7.38E-02
Consumption of renewable secondary fuels	MJ	5.80E-01	8.86E-05	3.50E-04	5.81E-01	1.14E-06	7.08E-05	7.32E-04	4.70E-05	-5.70E-03
Consumption of non-renewable secondary fuels	MJ	4.08E-01	0.00E+00	0.00E+00	4.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	3.86E+00	2.05E-03	2.19E-02	3.89E+00	8.37E-04	1.62E-03	3.72E-03	7.96E-03	-2.11E-01

## Type III Environmental Product Declaration No. 709/2024

### Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 + A2 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.1.3) <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: Halina Prejzner, PhD Eng LCA, LCI audit and input data verification: Mateusz Kozicki, PhD Verification of LCA: Michał Piasecki, PhD. DSc. Eng

Note 1: The declaration owner has the sole ownership, liability and responsibility for the information provided and contained in EPD. Declarations within the same product category but from different programs may not be comparable. Declarations of construction products may not be comparable if they do not comply with EN 15804 + A2. For further information about comparability, see EN 15804 + A2 and ISO 14025. Depending on the application, a corresponding conversion factor such as the specific weight per surface area must be taken into consideration.

Note 2: ITB is a public Research Organization and Notified Body (EC Reg. no 1488) to the European Commission and to other Member States of the European Union designated for the tasks concerning the assessment of building products' performance. ITB acts as the independent, third-party verification organization (17065/17025 certified). ITB-EPD program is recognized and registered member of The European Platform – Association of EPD program operators and ITB-EPD declarations are registered and stored in the international ECO-PORTAL.

### Normative references

- ITB PCR A v. 1.6 General Product Category Rules for Construction Products
- EAD 210005-00-0505 Internal partition kits for use as non-loadbearing walls
- ISO 14025:2006. Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification
- EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- KOBIZE Emissions (CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO and total dust) from electricity, 2023

LCA, LCI audit and input data verification  
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02-656 Warsaw, Ksawerów 21

# **CERTIFICATE No 709/2024 of TYPE III ENVIRONMENTAL DECLARATION**

Products:

**Mobile walls ZIGZAG**

Manufacturer:

**Vitrintec Sp. z o.o.**

Karola Olszewskiego 23, 25-663 Kielce, Poland

confirms the correctness of the data included in the development of  
Type III Environmental Declaration and accordance with the requirements of the standard

**EN 15804+A2**

**Sustainability of construction works.**

**Environmental product declarations.**

**Core rules for the product category of construction products.**

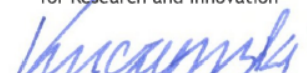
This certificate, issued on 19<sup>th</sup> December 2024 is valid for 5 years  
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physics, Acoustics  
and Environment Department

  
Agnieszka Winkler-Skalna, PhD



Deputy Director  
for Research and Innovation

  
Krzysztof Kuczyński, PhD

Warsaw, December 2024