

global system



Issuance date: 13.09.2023

Validity date: 13.09.2028

Rolling shutter, type GSF KPR



Owner of the EPD:

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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, A4-A5 and D modules in accordance with EN 15804

(Cradle-to-Gate with options)

The year of preparing the EPD: 2023

Product standard: EN 16034 and EN 12101

Service Life: 50 years

PCR: ITB-PCR A

Declared unit: 1 m²

Reasons for performing LCA: B2B

Representativeness: Poland, 2022

MANUFACTURER

GLOBAL SYSTEM is a manufacturer of fire curtains and loading systems with a manufacturing plant located in Brzezna (Poland). The core products offered by the company are: fire rated rolling curtains, horizontal sliding fire doors, vertical fire doors. The company also offers movable and fixed smoke curtains. Apart from fire rated solutions, company produces loading systems with a full range of accessories used in loading technology for industry, sectional and roller doors and high-speed doors. GLOBAL SYSTEM has over twenty years of experience in the sale of its products.



Figure 1 The view of GLOBAL SYSTEM Sp. z o.o. manufacturing plant

All of products are designed in accordance with the highest standards, health and safety regulations.

PRODUCTS DESCRIPTION

GSF KPR Fire Curtains are intended for closing off openings in vertical partitions, both internal and external, in order to prevent fire and heat from spreading in public spaces and in other buildings. The curtain gate coat is made of fire-proof fabric, which is wound on a shaft and fixed between the guides. Shaft casing and guides of the curtain gate are made of galvanized steel sheet as a standard. All elements made of galvanized sheet can be painted in any colour from the RAL palette. Fasteners (screws) are made of galvanized steel, which are not painted as standard

TYPES OF FIRE-CURTAINS

Classified by control system:

- GSF KPR Fire Curtain with electric drive
- GSF KPR Fire Curtain with fusible link

Classified by fire resistance class:

- E180/EW180
- E120/EW120
- E120/EW60
- E120/EW30
- E60/EW30

GSF KPR Fire Curtains consist of:

- Curtain
- System of guide rails
- Curtain housing box
- Bottom bar
- Tubular motor or fusible link

The curtain - made of fire-resistant material – is rolled up around a shaft and maintained in this position. The shutter is controlled via

- Electric drive – it can be integrated with the fire alarm system
- Fusible link – in the event of fire the fusible link will release the shutter at ca. 70°C and the shutter will close as a result of gravitational force.

Optional features:

- Painting guide rails and the housing box any colour from the RAL colour chart
- Resistance to wind load Class2 or Class3
- Smoke control Class Sa, S₂₀₀

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- Durability of self-closing - against ageing (corrosion) achieved
- Durability of self-closing - against degradation (cycling testing) C1, C2

Advantages:

- Only one light layer of ULFFG curtain
- Significant reduction in mass – lower load-bearing capacity requirements, easier to install
- Less space required – compact-sized curtain and gate

All additional technical information about the product is available on the manufacturer's website and catalogues.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 m² of product (based on reference product 3 m x 3 m). Directly used material flows are determined using reference size and assigned to the declared unit. All other inputs and outputs in the production are scaled to the declared unit. The reference period is the year 2022. For products with dimensions other than the reference one, the environmental impact of 1 unit is calculated by multiplying the values for 1 m² by the product area.

System boundary

The life cycle analysis of the declared products covers “Product Stage” A1-A3, A4-A5, C2-C4+D modules in accordance with EN 15804 and ITB PCR A (cradle to gate with options). Energy and water consumption, emissions as well as information on generated wastes were inventoried in manufacturing plant (LCI) and were included in the calculation. 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.

Allocation

The allocation rules used for this EPD are based on general ITB's document PCR v1.6., 2023. Production of the rolling shutter, type GSF KPR products is a line process (as presented in Figure 2) conducted in the manufacturing plant located in Brzezna (Poland). Input and output data from the production is inventoried and allocated to the production on the mass basis. The declaration covers a wide range of fire curtains. Their production resources and processing stages are basically similar, so it was possible to average the production by product mass and reference size. The reference is calculated as the representative selection of the product group.

System limits

Minimum 99.5% input materials and 100% energy consumption (electricity, gas, other) were inventoried in a processing plant and were included in the calculation. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilized thermal energy, and electric power consumption, direct production waste and available emission measurements. Tires consumption for transport was not considered. Substances with a percentage share of less than 0.1% of total mass were excluded from the calculations. The packaging products (wooden pallets) are included.

Modules A1 and A2: Raw materials supply and transport

The modules A1 and A2 represent the extraction and processing of raw materials/elements (mainly metal and curtain elements) and transport to the production site. For A2 module (transport) European

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averages for fuel data are applied. All input material transport's distances from supplier were considered and included into calculation.

Module A3: Production

The product specific manufacturing process line is presented in Figure 3, the input products are processed by: CNC, welding and sewing processes and finally assembled. Electricity are consumed in the process. The products are painted. In the production process, technical gases and materials for welding elements are used. The production process is depicted schematically as can be seen below.

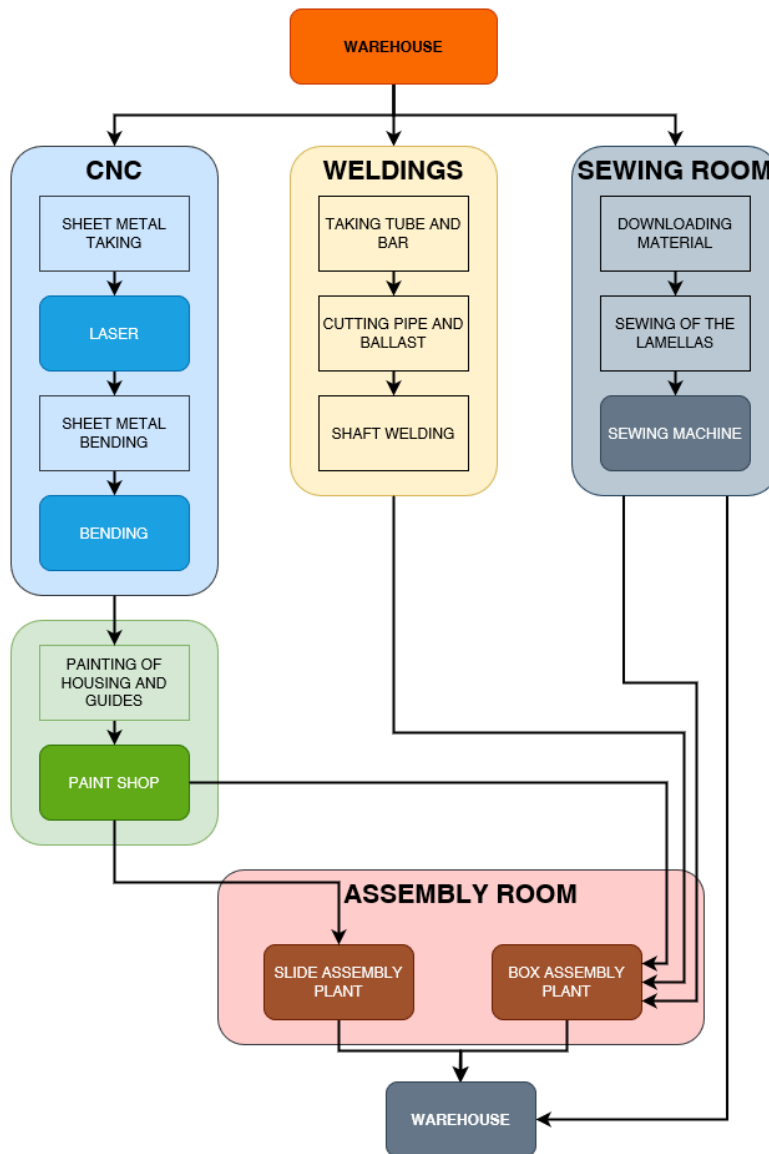


Figure 3 Manufacturing process scheme (A3)

Module A4: transport to consumer

Vehicle transport at distance 500 km is considered (emission standard: Euro 5) with 100% load capacity.

Modules C and D: End-of-life (EOL)

The system boundaries of the Smoke and Fire curtains were set following their disposal, reaching their end-of-waste status. Due to the fact that the declaration covers a wide range of products for

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various purposes and usage scenarios, it is not possible to directly specify the de-construction technology and the amount of energy for disassembly in C1 module (so this module was based on assumption). In the adapted end-of-life scenario, the de-constructed products are transported to a mill distant by 50 km on > 16t lorry EURO 5 where are used as metal scrap to produce a new metals. It is assumed that all elements other than metal ones shall go to a landfill. The recycling potential of C3 module is for metals is 100%. All other material in C4 module are located in disposal landfill (Table 1). Module D presents credits resulting from the recycling of the metal scrap (used for new production), calculated in accordance with the approach developed by World Steel Association.

Table 1 End-of-life scenario for the *Rolling shutter, type GSF KPR EI*

Material	Material recovery	Recycling	Landfilling
Metals	100%	100%	0%
All other materials	100%	0%	100%

Electricity at end-of-life (module C) has been modelled using an average Polish electricity mix as the location where the product reaches end-of-life is unknown.

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2022 – 31.12.2022 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Data quality

The data selected for LCA originate from ITB-LCI questionnaire completed by GLOBAL SYSTEM Sp. z o.o. and verified during LCI data audit. No data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency is judged as good. The background data for the processes come from the following resources database Ecoinvent v.3.9.1 (steel, sheet metal, aluminium, welding products, paints, graphite, fibre matts, EUR-flat pallet). Specific (LCI) data quality analysis was a part of the input data verification. Where no background data is available, data gaps were complemented by manufacturer information and literature research.

Assumptions and estimates

The impacts of the representative products were aggregated using weighted average.

Calculation rules

LCA was performed using ITB-LCA tool developed in accordance with EN15804+A2. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100-year horizon. Emission of acidifying substances, Emission of substances to water contributing to oxygen depletion, Emission of gases that contribute to the creation of ground-level ozone, Abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method

Additional information

Polish electricity (Ecoinvent v 3.9.1 supplemented by actual national KOBiZE data) emission factor used is 0.702 kg CO₂/kWh. As a general rule, no particular environmental or health protection measures other than those specified by law are necessary.

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LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 m² of Rolling shutter, type GSF KPR produced in Europe. The following life cycle modules (Table 2) were included in the analysis. The following tables 3-6 show the environmental impacts of the life cycle of selected modules (A1-A5+C1-C4+D).

Table 2 System boundaries for the environmental characteristic of the product.

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	MD	MD	MND	MND	MND	MND	MND	MND	MND	MD	MD	MD	MD	MD

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Table 3 Life cycle assessment (LCA) results for specific product – environmental impacts (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	4.10E+01	9.66E-01	3.47E+00	4.54E+01	1.61E+00	2.93E-04	3.51E-04	1.61E-01	1.64E-01	4.11E-02	-1.18E+01
Greenhouse potential - fossil	eq. kg CO ₂	3.98E+01	9.62E-01	3.32E+00	4.40E+01	1.60E+00	2.93E-04	3.51E-04	1.60E-01	1.62E-01	4.06E-02	-1.19E+01
Greenhouse potential - biogenic	eq. kg CO ₂	2.05E-01	3.29E-03	1.45E-01	3.53E-01	5.48E-03	1.11E-05	1.33E-05	5.48E-04	1.64E-03	4.10E-04	4.42E-02
Global warming potential - land use and land use change	eq. kg CO ₂	2.06E-02	3.78E-04	1.43E-03	2.24E-02	6.30E-04	1.33E-07	1.60E-07	6.30E-05	1.65E-04	4.12E-05	-7.48E-04
Stratospheric ozone depletion potential	eq. kg CFC 11	1.46E-07	2.23E-07	1.58E-07	5.26E-07	3.71E-07	7.76E-12	9.32E-12	3.71E-08	4.94E-08	1.24E-08	-4.19E-07
Soil and water acidification potential	eq. mol H ⁺	2.06E-01	3.91E-03	4.01E-02	2.49E-01	6.51E-03	4.21E-06	5.06E-06	6.51E-04	1.37E-03	3.43E-04	-4.71E-02
Eutrophication potential - freshwater	eq. kg P	2.18E-02	6.47E-05	6.59E-03	2.85E-02	1.08E-04	7.21E-07	8.65E-07	1.08E-05	4.72E-05	1.18E-05	-5.06E-03
Eutrophication potential - seawater	eq. kg N	3.72E-02	1.18E-03	9.58E-03	4.80E-02	1.97E-03	6.10E-07	7.32E-07	1.97E-04	4.73E-04	1.18E-04	-1.03E-02
Eutrophication potential - terrestrial	eq. mol N	4.64E-01	1.29E-02	5.09E-02	5.28E-01	2.14E-02	5.16E-06	6.19E-06	2.14E-03	5.14E-03	1.29E-03	-1.13E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.76E-01	3.94E-03	1.43E-02	1.94E-01	6.56E-03	1.44E-06	1.73E-06	6.56E-04	1.49E-03	3.72E-04	-5.95E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.15E-03	3.41E-06	1.83E-05	1.18E-03	5.69E-06	1.85E-09	2.22E-09	5.69E-07	5.50E-07	1.38E-07	-2.27E-04
Abiotic depletion potential - fossil fuels	MJ	5.11E+01	1.43E+01	6.66E+01	1.32E+02	2.38E+01	6.43E-03	7.72E-03	2.38E+00	3.75E+00	9.39E-01	-9.74E+01
Water deprivation potential	eq. m ³	1.14E+01	6.61E-02	2.09E+00	1.36E+01	1.10E-01	1.33E-04	1.60E-04	1.10E-02	2.18E-02	5.45E-03	-1.60E+00

Table 4 Life cycle assessment (LCA) results for specific product – additional impacts indicators (DU: 1 m²)

Indicator	Unit	A1-A3	A4-A5	C1-C4	D
Particulate matter	disease incidence	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA

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Table 5 Life cycle assessment (LCA) results for specific product - the resource use (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	4.59E+01	2.05E-01	4.45E+00	5.05E+01	3.42E-01	4.77E-04	5.72E-04	3.42E-02	6.59E-02	1.65E-02	-8.18E+00
Consumption of renewable primary energy resources used as raw materials	MJ	4.81E-01	0.00E+00	0.00E+00	4.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	4.71E+01	2.05E-01	4.47E+00	5.18E+01	3.42E-01	4.77E-04	5.72E-04	3.42E-02	6.59E-02	1.65E-02	-8.18E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	4.12E+02	1.43E+01	5.88E+01	4.85E+02	2.38E+01	6.45E-03	7.74E-03	2.38E+00	4.06E+00	1.01E+00	-9.35E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	3.98E-02	0.00E+00	0.00E+00	3.98E-02	0.00E+00	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 resources	MJ	4.21E+02	1.43E+01	6.75E+01	5.03E+02	2.38E+01	6.45E-03	7.74E-03	2.38E+00	4.06E+00	1.01E+00	-9.35E+00
Consumption of secondary materials	kg	1.83E+01	4.79E-03	1.32E-02	1.83E+01	7.98E-03	5.88E-07	7.05E-07	7.98E-04	0.00E+00	0.00E+00	1.57E+01
Consumption of renew. secondary fuels	MJ	4.37E-03	5.28E-05	4.05E-05	4.46E-03	8.80E-05	3.28E-09	3.93E-09	8.80E-06	0.00E+00	0.00E+00	-2.09E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	4.57E-02	4.57E-02	0.00E+00	5.21E-06	6.25E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater	m ³	3.60E-02	1.80E-03	4.03E-01	4.40E-01	3.00E-03	1.75E-06	2.10E-06	3.00E-04	5.86E-04	1.46E-04	-8.52E-02

Table 6 Life cycle assessment (LCA) results for specific product – waste categories (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.27E+00	1.60E-02	2.36E-02	1.31E+00	2.67E-02	6.66E-08	7.99E-08	2.67E-03	5.91E-06	1.48E-06	-1.20E-03
Non-hazardous waste	kg	3.53E+00	2.85E-01	8.89E+00	1.27E+01	4.74E-01	3.46E-06	4.15E-06	4.74E-02	1.55E+01	3.87E+00	-1.82E+00
Radioactive waste	kg	8.96E-04	1.07E-06	6.64E-05	9.64E-04	1.78E-06	4.83E-09	5.79E-09	1.78E-07	2.28E-05	5.71E-06	-2.02E-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	0.00E+00	0.00E+00
Materials for recycling	kg	5.41E-01	4.42E-05	3.47E+00	4.02E+00	7.37E-05	6.66E-09	7.99E-09	7.37E-06	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	1.41E-01	3.58E-07	6.23E-01	7.64E-01	5.96E-07	5.82E-11	6.99E-11	5.96E-08	0.00E+00	0.00E+00	0.00E+00
Exported Energy	MJ	5.01E-01	0.00E+00	2.22E-01	7.23E-01	0.00E+00	1.92E-05	2.30E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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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 and ITB PCR A	
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.)	
<input checked="" type="checkbox"/> external	<input type="checkbox"/> internal
External verification of EPD: Halina Prejzner, PhD. Eng. LCI audit and verification: Michał Chwedaczuk, M.Sc. Eng. LCA, LCI audit and input data verification: Michał Piasecki, PhD., D.Sc., eng.	

Note 1: The declaration owner has the sole ownership, liability, and responsibility for the for the information provided and contained in EPD. 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.

Note 2: Note: 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 (ISO 17025/17065/17029). 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 General Product Category Rules for Construction Products
- EN 16034:2014-11 Pedestrian doorsets, industrial,commercial, garage doors and openable windows – Product standard, performance characteristics - Fire resistance and/or smoke control characteristics.
- PN-EN 1090-1+A1:2012 - Wykonanie konstrukcji stalowych i aluminiowych -- Część 1: Zasady oceny zgodności elementów konstrukcyjnych
- 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
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- ISO 20915:2018 Life cycle inventory calculation methodology for steel products
- KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej. December 2021
- World Steel Association 2017 Life Cycle inventory methodology report for steel products



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Thermal Physics, Acoustics and Environment Department

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CERTIFICATE № 521/2023
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Rolling shutter, type GSF KPR

Manufacturer:

GLOBAL SYSTEM Sp. z o.o.

ul. Brzezna 495, 33-386 Podegrodzie, 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 13th September 2023 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 Kulczyński, PhD

Warsaw, September 2023