Type III Environmental Product Declaration No. 522/2023

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Fixed smoke curtain type GSF KDS, Movable smoke curtain type GSF KDR

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 m^2
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 KDS / GSF KDR Smoke Curtains are intended to be used in buildings as barriers dividing space into smoke compartments. Their primary functions include: creating smoke compartments by containing and limiting the movement of smoke, redirecting the movement of smoke, preventing and delaying any influx of smoke into other areas or into air gaps. The design of smoke curtains permits the possibility of joining multiple curtain modules, which allows for creating barriers of any size. The curtains are suitable for a wide variety of applications in both public and commercial buildings.

TYPES OF SMOKE CURTAINS

Classified by operating principle

- GSF KDS Smoke Curtains – fixed
- GSF KDR Smoke Curtains – movable

Classified by fire resistance class

- $D_{600}160$
- $D_{600}181$
- $D_{600}60$
- DH60
- DH133

Types of GSF KDR Movable Smoke Curtains in terms of their operating principle

- **ASB1** The curtain descends as a result of activation or power outage, at a speed range of 0,06 – 0,30 m/s, no lower than 2,5 meters from the floor
- **ASB2** The curtain descends as a result of activation at a speed range of 0,06 – 0,30 m/s, no lower than 2,5 meters from the floor
- **ASB3** The curtain descends as a result of activation or power outage, at a speed range of 0,06 – 0,15 m/s, at any height
- **ASB4** The curtain descends as a result of activation at a speed range of 0,06 – 0,15 m/s, at any height

Fixed smoke curtain consists of

- Curtain - made of fire-resistant material, - Mount, - Bottom bar

The curtain is constantly kept in the closed position.

The movable smoke curtain consists of

- Curtain - made of fire-resistant material, - Shaft, - Shaft box, - Bottom bar, - Curtain motor

The curtain is rolled up around a shaft and maintained in this position by an electric motor. The curtain is released in the event of fire. The curtain is controlled by means of a central control panel.
Advantages:
- 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 https://www.globalsystem.com.pl/ and catalogues.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 m^2 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 m^2 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 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 basicly 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 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 2, 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.

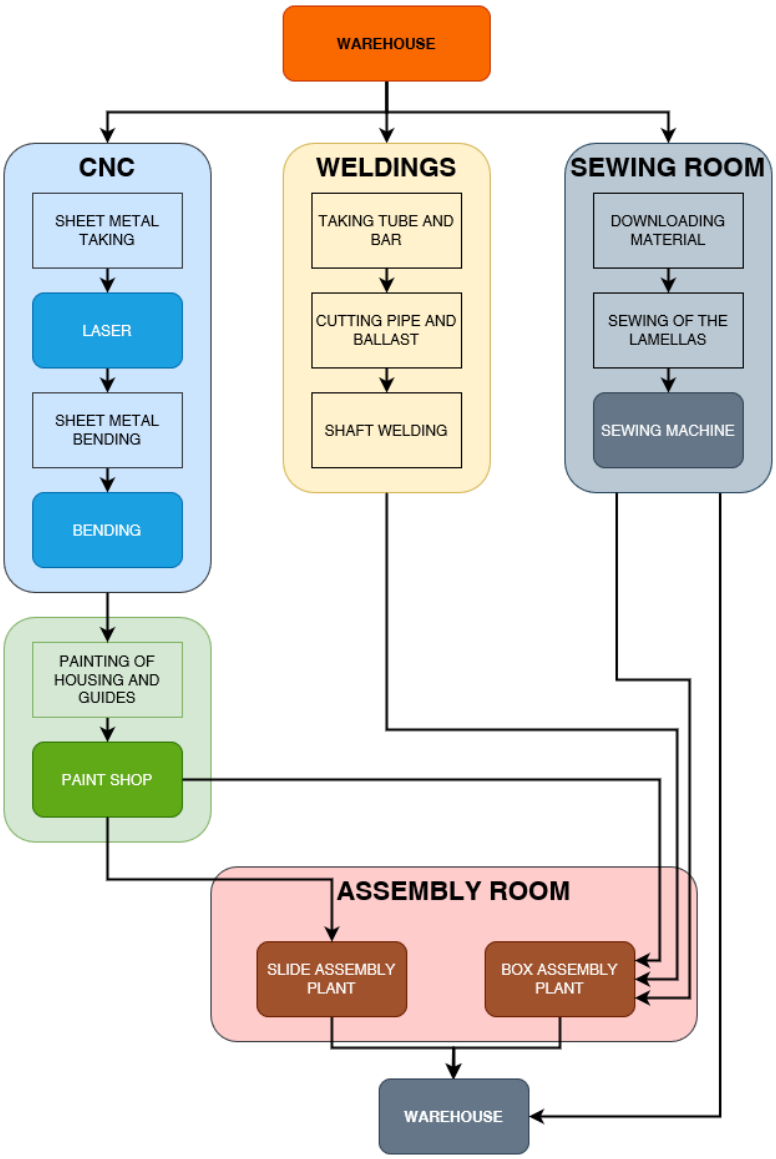

Figure 2 Manufacturing process scheme (A3)

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 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 (Eocinvent v 3.9.1 supplemented by actual national KOBiZE data) emission factor used is 0.702 kg CO_2/kWh. As a general rule, no particular environmental or health protection measures other than those specified by law are necessary.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 m^2 of Fixed smoke curtain type GSF KDS, Movable smoke curtain type GSF KDR produced in Poland. The following life cycle modules (Table 2) were included in the analysis. The following tables 3-10 and 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**

Table 3 Life cycle assessment (LCA) results for specific product GSF KDS – environmental impacts (DU: 1 m^2)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	2.51E+01	9.66E-01	3.47E+00	2.95E+01	1.61E+00	2.93E-04	3.51E-04	1.61E-01	9.24E-02	1.13E-01	-6.65E+00
Greenhouse potential - fossil	eq. kg CO_2	2.40E+01	9.62E-01	3.32E+00	2.82E+01	1.60E+00	2.93E-04	3.51E-04	1.60E-01	9.14E-02	1.12E-01	-6.68E+00
Greenhouse potential - biogenic	eq. kg CO_2	1.26E-01	3.29E-03	1.45E-01	2.74E-01	5.48E-03	1.11E-05	1.33E-05	5.48E-04	9.22E-04	1.13E-03	2.49E-02
Global warming potential - land use and land use change	eq. kg CO_2	1.42E-02	3.78E-04	1.43E-03	1.60E-02	6.30E-04	1.33E-07	1.60E-07	6.30E-05	9.26E-05	1.13E-04	-4.21E-04
Stratospheric ozone depletion potential	eq. kg CFC 11	1.50E-07	2.23E-07	1.58E-07	5.31E-07	3.71E-07	7.76E-12	9.32E-12	3.71E-08	2.78E-08	3.40E-08	-2.36E-07
Soil and water acidification potential	eq. mol H+	1.41E-01	3.91E-03	4.01E-02	1.85E-01	6.51E-03	4.21E-06	5.06E-06	6.51E-04	7.71E-04	9.43E-04	-2.65E-02
Eutrophication potential - freshwater	eq. kg P	1.41E-02	6.47E-05	6.59E-03	2.07E-02	1.08E-04	7.21E-07	8.65E-07	1.08E-05	2.65E-05	3.24E-05	-2.85E-03
Eutrophication potential - seawater	eq. kg N	2.34E-02	1.18E-03	9.58E-03	3.42E-02	1.97E-03	6.10E-07	7.32E-07	1.97E-04	2.66E-04	3.25E-04	-5.80E-03
Eutrophication potential - terrestrial	eq. mol N	3.18E-01	1.29E-02	5.09E-02	3.81E-01	2.14E-02	5.16E-06	6.19E-06	2.14E-03	2.89E-03	3.54E-03	-6.33E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.07E-01	3.94E-03	1.43E-02	1.25E-01	6.56E-03	1.44E-06	1.73E-06	6.56E-04	8.37E-04	1.02E-03	-3.35E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.14E-03	3.41E-06	1.83E-05	1.17E-03	5.69E-06	1.85E-09	2.22E-09	5.69E-07	3.10E-07	3.78E-07	-1.27E-04
Abiotic depletion potential - fossil fuels	MJ	5.56E+01	1.43E+01	6.66E+01	1.36E+02	2.38E+01	6.43E-03	7.72E-03	2.38E+00	2.11E+00	2.58E+00	-5.48E+01
Water deprivation potential	eq. m^3	6.98E+00	6.61E-02	2.09E+00	9.13E+00	1.10E-01	1.33E-04	1.60E-04	1.10E-02	1.23E-02	1.50E-02	-8.99E-01

Table 4 Life cycle assessment (LCA) results for specific product GSF KDS – additional impacts indicators (DU: 1 m^2)

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

Table 5 Life cycle assessment (LCA) results for specific product GSF KDS – 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	2.96E+01	2.05E-01	4.45E+00	3.42E+01	3.42E-01	4.77E-04	5.72E-04	3.42E-02	3.71E-02	4.53E-02	-4.60E+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	3.08E+01	2.05E-01	4.47E+00	3.55E+01	3.42E-01	4.77E-04	5.72E-04	3.42E-02	3.71E-02	4.53E-02	-4.60E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.49E+02	1.43E+01	5.88E+01	3.22E+02	2.38E+01	6.45E-03	7.74E-03	2.38E+00	2.28E+00	2.79E+00	-5.26E+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	2.58E+02	1.43E+01	6.75E+01	3.39E+02	2.38E+01	6.45E-03	7.74E-03	2.38E+00	2.28E+00	2.79E+00	-5.26E+01
Consumption of secondary materials	kg	1.15E+01	4.79E-03	1.32E-02	1.16E+01	7.98E-03	5.88E-07	7.05E-07	7.98E-04	0.00E+00	0.00E+00	8.86E+00
Consumption of renew. secondary fuels	MJ	2.53E-03	5.28E-05	4.05E-05	2.62E-03	8.80E-05	3.28E-09	3.93E-09	8.80E-06	0.00E+00	0.00E+00	-1.18E-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	3.47E-02	1.80E-03	4.03E-01	4.39E-01	3.00E-03	1.75E-06	2.10E-06	3.00E-04	3.30E-04	4.03E-04	-4.79E-02

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

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	8,53E-01	1,60E-02	2,36E-02	8,93E-01	2,67E-02	6,66E-08	7,99E-08	2,67E-03	3,32E-06	4,06E-06	-6,74E-04
Non-hazardous waste	kg	3,60E+00	2,85E-01	8,89E+00	1,28E+01	4,74E-01	3,46E-06	4,15E-06	4,74E-02	8,71E+00	1,06E+01	-1,02E+00
Radioactive waste	kg	5,97E-04	1,07E-06	6,64E-05	6,65E-04	1,78E-06	4,83E-09	5,79E-09	1,78E-07	1,28E-05	1,57E-05	-1,13E-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	5,40E-01	4,42E-05	3,47E+00	4,01E+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	3,29E-01	0,00E+00	2,22E-01	5,51E-01	0,00E+00	1,92E-05	2,30E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 7 Life cycle assessment (LCA) results for specific product GSF KDR – 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	3.69E+01	9.66E-01	3.47E+00	4.14E+01	1.61E+00	2.93E-04	3.51E-04	1.61E-01	1.44E-01	6.16E-02	-1.03E+01
Greenhouse potential - fossil	eq. kg CO_2	3.57E+01	9.62E-01	3.32E+00	4.00E+01	1.60E+00	2.93E-04	3.51E-04	1.60E-01	1.42E-01	6.09E-02	-1.04E+01
Greenhouse potential - biogenic	eq. kg CO_2	1.75E-01	3.29E-03	1.45E-01	3.23E-01	5.48E-03	1.11E-05	1.33E-05	5.48E-04	1.43E-03	6.15E-04	3.87E-02
Global warming potential - land use and land use change	eq. kg CO_2	1.96E-02	3.78E-04	1.43E-03	2.14E-02	6.30E-04	1.33E-07	1.60E-07	6.30E-05	1.44E-04	6.18E-05	-6.55E-04
Stratospheric ozone depletion potential	eq. kg CFC 11	1.49E-07	2.23E-07	1.58E-07	5.29E-07	3.71E-07	7.76E-12	9.32E-12	3.71E-08	4.33E-08	1.85E-08	-3.67E-07
Soil and water acidification potential	eq. mol H+	1.89E-01	3.91E-03	4.01E-02	2.33E-01	6.51E-03	4.21E-06	5.06E-06	6.51E-04	1.20E-03	5.14E-04	-4.12E-02
Eutrophication potential - freshwater	eq. kg P	1.98E-02	6.47E-05	6.59E-03	2.65E-02	1.08E-04	7.21E-07	8.65E-07	1.08E-05	4.13E-05	1.77E-05	-4.43E-03
Eutrophication potential - seawater	eq. kg N	3.38E-02	1.18E-03	9.58E-03	4.46E-02	1.97E-03	6.10E-07	7.32E-07	1.97E-04	4.14E-04	1.77E-04	-9.02E-03
Eutrophication potential - terrestrial	eq. mol N	4.27E-01	1.29E-02	5.09E-02	4.91E-01	2.14E-02	5.16E-06	6.19E-06	2.14E-03	4.50E-03	1.93E-03	-9.84E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.58E-01	3.94E-03	1.43E-02	1.77E-01	6.56E-03	1.44E-06	1.73E-06	6.56E-04	1.30E-03	5.58E-04	-5.21E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.18E-03	3.41E-06	1.83E-05	1.20E-03	5.69E-06	1.85E-09	2.22E-09	5.69E-07	4.82E-07	2.06E-07	-1.98E-04
Abiotic depletion potential - fossil fuels	MJ	5.32E+01	1.43E+01	6.66E+01	1.34E+02	2.38E+01	6.43E-03	7.72E-03	2.38E+00	3.28E+00	1.41E+00	-8.53E+01
Water deprivation potential	eq. m^3	1.04E+01	6.61E-02	2.09E+00	1.25E+01	1.10E-01	1.33E-04	1.60E-04	1.10E-02	1.91E-02	8.18E-03	-1.40E+00

Table 8 Life cycle assessment (LCA) results for specific product GSF KDR – 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

Table 9 Life cycle assessment (LCA) results for specific product GSF KDR – 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	4.23E+01	2.05E-01	4.45E+00	4.69E+01	3.42E-01	4.77E-04	5.72E-04	3.42E-02	5.77E-02	2.47E-02	-7.16E+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	4.35E+01	2.05E-01	4.47E+00	4.82E+01	3.42E-01	4.77E-04	5.72E-04	3.42E-02	5.77E-02	2.47E-02	-7.16E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.72E+02	1.43E+01	5.88E+01	4.45E+02	2.38E+01	6.45E-03	7.74E-03	2.38E+00	3.55E+00	1.52E+00	-8.18E+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	3.81E+02	1.43E+01	6.75E+01	4.62E+02	2.38E+01	6.45E-03	7.74E-03	2.38E+00	3.55E+00	1.52E+00	-8.18E+01
Consumption of secondary materials	kg	1.66E+01	4.79E-03	1.32E-02	1.66E+01	7.98E-03	5.88E-07	7.05E-07	7.98E-04	0.00E+00	0.00E+00	1.38E+01
Consumption of renew. secondary fuels	MJ	6.77E-03	5.28E-05	4.05E-05	6.87E-03	8.80E-05	3.28E-09	3.93E-09	8.80E-06	0.00E+00	0.00E+00	-1.83E-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	3.78E-02	1.80E-03	4.03E-01	4.42E-01	3.00E-03	1.75E-06	2.10E-06	3.00E-04	5.13E-04	2.20E-04	-7.46E-02

Table 10 Life cycle assessment (LCA) results for specific product GSF KDR – waste categories (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.16E+00	1.60E-02	2.36E-02	1.20E+00	2.67E-02	6.66E-08	7.99E-08	2.67E-03	5.17E-06	2.22E-06	-1.05E-03
Non-hazardous waste	kg	4.41E+00	2.85E-01	8.89E+00	1.36E+01	4.74E-01	3.46E-06	4.15E-06	4.74E-02	1.35E+01	5.80E+00	-1.59E+00
Radioactive waste	kg	8.23E-04	1.07E-06	6.64E-05	8.91E-04	1.78E-06	4.83E-09	5.79E-09	1.78E-07	2.00E-05	8.56E-06	-1.77E-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	5.46E-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	1.40E+00	0.00E+00	2.22E-01	1.62E+00	0.00E+00	1.92E-05	2.30E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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.) [x] external [ ] 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 CO_2, SO_2, 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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CERTIFICATE № 522/2023
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Fixed smoke curtain type GSF KDS,
Movable smoke curtain type GSF KDR

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 Physic, Acoustics and Environment Department
Agnieszka Winkler-Skalna, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, September 2023