Type III Environmental Product Declaration No. 765/2025

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BSP KB balustrade systems

Owner of the EPD:

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ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www.eco-platform.org

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-A4, C1-C4 and D modules in accordance with EN 15804
(Cradle-to-Gate with options)
Product standards: ITB-KOT-2023/2496
The year of preparing the EPD: 2025
Service Life: 25 years for standard product
PCR: ITB-PCR A
Declared unit: 1 kg
Reasons for performing LCA: B2B
Representativeness: Poland, European, 2023

MANUFACTURER

BSP sp. z o. o. is an experienced, fully professional company dealing comprehensively with issues related to ventilated facades and fastening techniques. The company is based on many years of experience of the management staff, who gained it in the area of professional construction services in Poland and abroad. The main goal of the company's activity is to provide customers with innovative technological and financial solutions, based on the possessed know-how and experience. The staff of BSP sp. z o. o. consists of experienced and recognized specialists on the market from various industries included in the construction processes: management, financing, engineering. The company cooperates with many companies of world renown. These include: research institutes, investment companies, production, executive, transport companies, design offices, construction experts and many others.

Fig. 1. Street view of the plant of BSP sp. z o. o. in Przasnysz

PRODUCTS DESCRIPTION AND APPLICATION

The BSP KB system is an aluminum system of external and internal balustrades with the possibility of using various fillings: glass, photovoltaic panels, plates (e.g. HPL). This system includes two methods of fastening the balustrade structure - to the front of the balcony slab or from the top of the balcony slab. In addition, there are three methods of lower fastening of the balustrade filling: without a blend, with an aluminum blend, with a blend made of a plate (e.g. HPL). The system consists of consoles, posts, profiles for lower fastening of the filling and handrail profiles. All aluminum elements of the BSP KB system are manufactured from extruded aluminum alloy EN AW 6060 T66 or EN AW 6063 T6. Aluminum consoles KO-01, fastened to the front of the balcony slabs, have an I-shaped shape. The base of the console is 10 mm thick, while the console arms are 8 mm thick. The thicknesses of the element have been selected so that the console transfers the balustrade loads with a post spacing of up to 1.2 m. The PR-01 balustrade post has dimensions of 50 x 65 mm and a wall thickness of 3 mm. The post profile is fastened in the console arms using screws. The lower MS-01 profile for fastening the balustrade filling is connected to the PR-01 post profile using self-drilling screws. The fastenings of the lower profiles are covered with the MS-02 masking profile. The MS-01 profile is equipped with gaskets of various sizes depending on the thickness of the balustrade filling. The upper fastening of the balustrade filling, which also constitutes the balustrade handrail, can be one- or two-part. In the case of two-part fastening, the P-05 profile is fastened first, equipped with a socket with gaskets, constituting the upper fastening of the balustrade filling. Then, a second covering profile P-03 or P-04 is attached to this profile, which is the visible part of the railing handrail. The advantage of this solution is the possibility of attaching the railing filling long before attaching the decorative part of the handrail, which can be attached at the last stage of assembly, after dismantling the scaffolding. In this way, we avoid exposing the decorative part to mechanical damage. All types of BSP handrails have a special channel for routing electric cables in the case of using photovoltaic panels as railing filling. All fasteners in the BSP KB system are invisible, thanks to which the railing gains aesthetic value. The aluminum elements of the BSP KB system are classified in the scope of reaction to fire without testing in class A1 according to the PN-EN 13501-1+A1:2010 standard based on the decisions of the European Commission no. 96/603/EC,

2000/605/EC and 2003/424/WE. The BSP KB system is characterized by durability class B according to the PN-EN 1999-1-1:2011 standard and can be used without protective coatings in environments with atmospheric corrosivity category C1, C2 and C3 according to the PN-EN ISO 12944-2:2001 standard. After carrying out an additional protective procedure - anodizing of aluminum elements - it can also be used in an environment with atmospheric corrosivity category C4.
All additional technical information about the product is available on the manufacturer's website.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 kg of product.

System boundary

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 . 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.

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of the BSP KB balustrade systems is a line process conducted in plant of BSP sp. z o. o. located in Przasnysz (Poland). Allocation was done on product mass basis. All impacts associated with the extraction and processing of raw materials used for the production of the declared product are allocated in module A1 of the LCA. Impacts from the global line production of BSP sp. z o. o. were inventoried and 100% were allocated to BSP KB balustrade systems production. Water and energy consumption (electricity, natural gas, LPG), associated emissions and generated wastes are allocated to module A3. Packaging materials were taken into consideration.

System limits

Minimum 99.0% input materials and 100% energy consumption (electricity, natural gas, LPG) were inventoried in a processing plant and were included in the calculation. In the assessment, all available data from production have been considered, i.e. all raw materials/elements used as per formulation process, utilized thermal energy for heating, and electric power consumption. Thus, material and energy flows contributing less than 1 % of mass or energy have been considered. It can be assumed that the total sum of neglected processes does not exceed 1 % of energy usage and mass per modules A or D. Machines and facilities required during production are neglected. The packaging products (stretch film, pallets, etc.) are included.

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

Modules A1 and A2 represent the extraction and processing of raw materials (mainly aluminum profiles) and transport to the production site. The aluminum profiles come from domestic suppliers. Module A2 (transport) includes truck and uses Polish averages for fuel data.

Module A3: *Production*

The production of the BSP KB balustrade systems is carried out in plant of BSP sp. z o. o. in Pszasnysz in Poland. The production includes the receipt of raw material deliveries for production, which are mainly aluminum profiles. The structural elements undergo processes such as cutting, drilling holes, knurling, and crimping. Then the completed elements are transported to the construction site, where they are assembled. The diagram of the production process is shown in Figure 2.

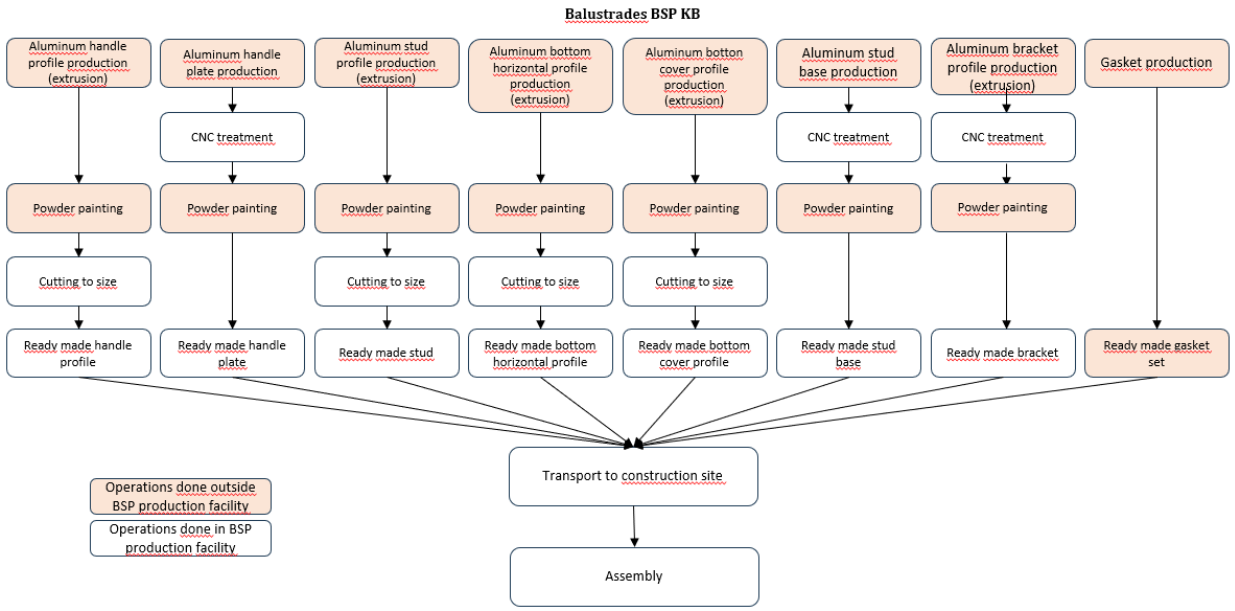

Figure 2. Diagram of the manufacturing process BSP KB balustrade systems

Module A4: *Transport to consumer*

Transport of the BSP KB balustrade systems from plant to the recipient is carried out using trucks. Vehicle transport at distance 100 km is considered (emission standard: Euro 5) with 100% load capacity.

Modules C and D*: End-of-life (EoL)*

It is assumed that at the end of life, 100 % of BSP KB balustrade systems are demounted using electric tools. Recovered material is transported to waste processing plant distant of about 200 km using > 24t lorry with 100% capacity utilization and fuel consumption of 35 L per 100 km (module C2). About 90% of the resulting aluminum scrap undergo recycling after shredding (C3) while the remaining 10% of them is forwarded to landfill in the form of mixed construction and demolition waste. Environmental burdens declared in module C4 are associated with treatment of aluminum scrap, prepared for recycling at refiner and waste-specific emissions to air and groundwater via landfill. A potential credit resulting from the recycling of the aluminum scrap are presented in module D (calculated for the primary aluminum content).

Table 1. End-of-life scenario for the products produced by BSP sp. z o. o.

Material	Material recovery	Recycling	Landfilling
Aluminum scrap	100%	90%	10%

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2023 – 31.12.2023 (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 questionnaires completed by BSP sp. z o. o. and verified during 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.3.10. Specific (LCI) data quality analysis was a part of the input data verification.

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

Poland electricity (Ecoinvent v 3.10 supplemented by actual national KOBiZE data) emission factor used is 0.685 kg CO_2/kWh (National for 2023). 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 kg of BSP KB balustrade systems produced in Poland. 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-A4+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	MND	MND	MND	MND	MND	MND	NMD	MND	MD	MD	MD	MD	MD

Table 3 Life cycle assessment (LCA) results of the product – environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	3.41E+00	7.63E-02	8.03E-02	3.56E+00	1.67E-02	4.11E-03	1.67E-02	6.98E-01	1.06E-03	-2.17E+00
Greenhouse potential - fossil	eq. kg CO_2	3.35E+00	7.60E-02	8.03E-02	3.51E+00	1.66E-02	4.11E-03	1.66E-02	6.97E-01	1.05E-03	-2.13E+00
Greenhouse potential - biogenic	eq. kg CO_2	2.21E-02	2.60E-04	2.60E-04	2.26E-02	5.68E-05	1.20E-04	5.68E-05	4.89E-04	1.06E-05	-1.41E-02
Global warming potential - land use and land use change	eq. kg CO_2	5.16E-02	2.98E-05	1.47E-05	5.17E-02	6.52E-06	1.44E-06	6.52E-06	1.23E-03	1.07E-06	-3.28E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	3.11E-07	1.76E-08	1.01E-09	3.30E-07	3.85E-09	8.40E-11	3.85E-09	2.08E-08	3.20E-10	-1.98E-07
Soil and water acidification potential	eq. mol H+	4.11E-02	3.08E-04	7.62E-04	4.22E-02	6.75E-05	4.56E-05	6.75E-05	6.19E-03	8.88E-06	-2.61E-02
Eutrophication potential - freshwater	eq. kg P	2.47E-03	5.11E-06	1.18E-04	2.59E-03	1.12E-06	7.80E-06	1.12E-06	2.93E-04	3.06E-07	-1.57E-03
Eutrophication potential - seawater	eq. kg N	4.11E-03	9.31E-05	1.10E-04	4.31E-03	2.04E-05	6.60E-06	2.04E-05	9.04E-04	3.06E-06	-2.61E-03
Eutrophication potential - terrestrial	eq. mol N	4.01E-02	1.02E-03	9.82E-04	4.21E-02	2.22E-04	5.58E-05	2.22E-04	9.84E-03	3.33E-05	-2.55E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.37E-02	3.11E-04	3.22E-04	1.43E-02	6.80E-05	1.56E-05	6.80E-05	3.70E-03	9.64E-06	-8.69E-03
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.52E-05	2.69E-07	9.95E-08	2.56E-05	5.89E-08	2.00E-08	5.89E-08	1.55E-05	3.56E-09	-1.60E-05
Abiotic depletion potential - fossil fuels	MJ	5.66E+01	1.13E+00	1.58E+00	5.93E+01	2.47E-01	6.96E-02	2.47E-01	8.36E+00	2.43E-02	-3.60E+01
Water deprivation potential	eq. m^3	4.02E+00	5.21E-03	2.15E-02	4.05E+00	1.14E-03	1.44E-03	1.14E-03	2.24E-01	1.41E-04	-2.56E+00

Table 4 Life cycle assessment (LCA) results of the product – additional impacts indicators (DU: 1 kg)

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

Table 5 Life cycle assessment (LCA) results of the product - the resource use (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.52E+01	1.62E-02	1.08E-01	1.53E+01	3.54E-03	5.16E-03	3.54E-03	7.07E-01	4.27E-04	-9.67E+00
Consumption of renewable primary energy resources used as raw materials	MJ	1.16E-01	0.00E+00	0.00E+00	1.16E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.36E-02
Total consumption of renewable primary energy resources	MJ	1.53E+01	1.62E-02	1.08E-01	1.54E+01	3.54E-03	5.16E-03	3.54E-03	7.07E-01	4.27E-04	-9.74E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	5.58E+01	1.13E+00	1.18E+00	5.82E+01	2.47E-01	6.98E-02	2.47E-01	8.36E+00	2.63E-02	-3.55E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	7.33E-01	0.00E+00	3.95E-01	1.13E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.66E-01
Total consumption of non-renewable primary energy resources	MJ	5.66E+01	1.13E+00	1.58E+00	5.93E+01	2.47E-01	6.98E-02	2.47E-01	8.36E+00	2.63E-02	-3.60E+01
Consumption of secondary materials	kg	8.00E-01	3.78E-04	1.77E-04	8.01E-01	8.27E-05	6.36E-06	8.27E-05	2.99E-02	0.00E+00	-5.09E-01
Consumption of renew. secondary fuels	MJ	4.03E-03	4.17E-06	1.51E-06	4.04E-03	9.11E-07	3.55E-08	9.11E-07	1.25E-04	0.00E+00	-2.57E-03
Consumption of non-renewable secondary fuels	MJ	7.07E-03	0.00E+00	0.00E+00	7.07E-03	0.00E+00	5.63E-05	0.00E+00	0.00E+00	0.00E+00	-4.50E-03
Net consumption of freshwater	m^3	9.00E-02	1.42E-04	3.39E-03	9.35E-02	3.10E-05	1.89E-05	3.10E-05	5.01E-03	3.79E-06	-5.72E-02

Table 6 Life cycle assessment (LCA) results of the product – waste categories (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	8.71E-01	1.27E-03	1.28E-02	8.85E-01	2.77E-04	7.20E-07	2.77E-04	5.31E-02	3.83E-08	-5.54E-01
Non-hazardous waste	kg	1.16E+00	2.25E-02	5.80E-01	1.76E+00	4.92E-03	3.74E-05	4.92E-03	1.22E+00	1.00E-01	-7.36E-01
Radioactive waste	kg	7.11E-04	8.42E-08	2.48E-07	7.12E-04	1.84E-08	5.22E-08	1.84E-08	9.81E-06	1.48E-07	-4.52E-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
Materials for recycling	kg	2.91E-04	3.49E-06	1.04E-05	3.05E-04	7.64E-07	7.20E-08	7.64E-07	5.43E-02	0.00E+00	-1.85E-04
Materials for energy recovery	kg	1.31E-06	2.82E-08	7.88E-08	1.42E-06	6.18E-09	6.30E-10	6.18E-09	8.58E-07	0.00E+00	-8.36E-07
Exported Energy	MJ	1.25E-03	0.00E+00	9.58E-04	2.21E-03	0.00E+00	2.08E-04	0.00E+00	5.91E-03	0.00E+00	-7.98E-04

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.) [x] external [ ] internal
External verification of EPD: PhD. Eng. Halina Prejzner LCI audit and verification: Filip Poznański, 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 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: 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 (2023)
- Krajowa Ocena Techniczna ITB nr ITB-KOT-2023/2496 – Zestawy wyrobów do wykonywania balustrad BSP KB
- 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
- KOBiZE Wskaźniki emisyjności CO2, SO2, NOx, CO i pyłu całkowitego dla energii elektrycznej. December 2023
- https://ecoinvent.org/

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CERTIFICATE № 765/2025
of TYPE III ENVIRONMENTAL DECLARATION

Products:

BSP KB balustrade systems

Manufacturer:

BSP Bracket System Polska Sp. z o. o.
Prochowa 35 lok. 31, 04-388 Warsaw, 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 19th February 2025 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, February 2025