



Environmental Product Declaration Type III (EPD) ITB number 526/2023

ALURON aluminium facade systems



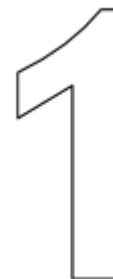
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Basic Information



The declaration is a Type III Environmental Product Declaration (EPD) based on EN 15804 and verified in accordance with ISO 14025 by an independent auditor.

It contains information on the environmental impact of the declared building materials. Their aspects have been verified by an independent entity in accordance with ISO 14025. Basically, a comparison or evaluation of EPD data is only possible if all the comparable data have been created in accordance with EN 15804 (see clause 5.3 of the standard).

LCA analysis: A1 - A3, A4, C1 - C4 and D according to EN 15804 (from cradle to grave with options)

Year of development of the EPD: 2023

Declared product lifetime: 30 years

Product standard: EN 573, EN 755, EN 12020

PCR: ITB-PCR A (based on EN 15804)

Declared unit: 1 kg of product

Reason for implementation: B2B

Representativeness: Polish products, 2022

Manufacturer



ALURON creates innovative solutions and technologies in the field of windows, doors and complex aluminium systems. Investors, architects and joinery manufacturers appreciate the diversity of construction solutions, material, aesthetics, functionality and wide arrangement possibilities of the ALURON brand which is the only manufacturer of aluminium systems for each segment of the window joinery market in Poland.

Aluminium systems offered by ALURON include profiles (structural, drip, mouldings, sills), accessories (gaskets, screws, clips, caps) and additional materials (templates, assembly elements, adhesives). All systems are interconnected which allows the use of many common components and accessories.

ALURON has a state-of-the-art production facility with machinery based on energy-saving and efficient production lines, which reduces the negative impact on the environment. System solutions meet stringent energy-saving requirements and ensure comfort, functionality and safety. ALURON performs curved and bent structures, welded and crimped connections and offers a range of possibilities for non-standard and unusual solutions. ALURON carries out its activities based on global management and production standards, including: ISO 9001, ISO 14001, Qualicoat certificate.



Product description and application



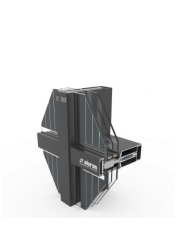
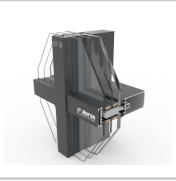
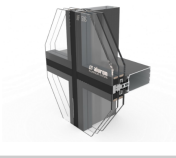
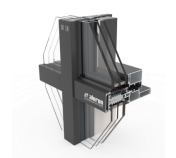
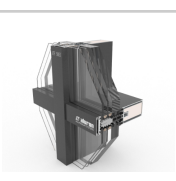
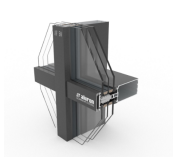
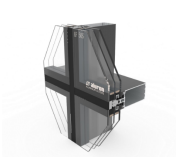
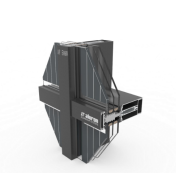
The ALURON company has been setting trends on the joinery market in Poland and abroad since 2002. Its offer includes aluminium, aluminium-timber and PVC-aluminium systems. The EPD environmental declaration developed as part of this document covers aluminium facade systems. An aluminium mullion/transom based construction, without glazing between profiles, is included in the study.





Aluminium facade systems

Facade systems act as curtain walls for buildings, forming their facade. The main materials of facade systems are aluminium profiles and glazing filling the spaces between the profiles. This EPD covers the aluminium facade structure manufactured by ALURON; glazing which can contribute to the facade is not included. Aluminium facade systems are characterised by a high level of aesthetics and great freedom in the arrangement of interior spaces. Such systems are used in various types of buildings, most often in office or retail buildings, but are also used in residential buildings or in the social and office parts of industrial and storage facilities.

In the development of ALURON systems, many years of design experience were used. The company's solutions are distinguished by original utility models and patent applications. Aluminium systems offered by ALURON consist of profiles (constructional, drip caps, slats, sills), accessories (gaskets, screws, clips, plugs) and additional materials (templates, assembly elements). All systems are interlinked which allows the use of many common components and accessories. Aluron aluminium systems present excellent technical properties in terms of thermal insulation, water tightness, wind resistance, fire resistance or smoke tightness. Products from the ALURON ALU series are multisystem and innovative aluminium building systems, developed in line with current architectural trends. They are characterised by original design, emphasising the design and aesthetics of the building in space. The durability of aluminium guarantees many years of durability and aesthetics. Systems that meet the requirements of zero-energy and energy-efficient buildings are also produced.

Overview of ALURON aluminium facade systems:

Photo	Product code	Product name	Product description
	AF 50 KW	Zero-energy facade	A modern and highly innovative construction of thermally insulated aluminium and glass curtain walls. The system has been developed for the creation of zero-energy facades thanks to the possibility of integration with transparent and nontransparent photovoltaic panels and an intelligent energy management system. The system is designed to create aluminium structures with high performance properties, providing good thermal and acoustic insulation for the external development created, while guaranteeing the possibility of easy disassembly and reassembly of the local active photovoltaic package for maintenance or service purposes.
	ATF 50	Thermally advanced single-profile facade with pillar-to-post technology	Modern construction of thermally insulated aluminium and glass curtain walls. The system also enables the construction of canopies, skylights and other spatial structures. The system is intended for making aluminium structures with high utility properties.
	ATF 50S	Silicone facade variant ATF 50	Modern construction of thermally insulated aluminium and glass curtain walls. The system also makes it possible to manufacture roofing structures, skylights and other spatial structures. The system is intended for making aluminium structures with high utility properties.
	IW 50	Facade with integrated window	Modern structure designed to build inward opening windows built into the facade. The windows are available in tilt and turn, tilt and turn (tilt first), tilt or tilt-turn functions. The use of the IW 50 system makes it possible to incorporate windows into the façade which when viewed from the outside are almost indistinguishable from the neighbouring fixed sections and therefore do not disturb the aesthetics of the facade.
	ATF 50EI	Fire-resistant single-profile facade with pillar-to-post technology	Modern construction of aluminium-glass thermally insulated fire curtain walls with fire resistance of EI30, EI60 by ALURON built on the basis of the ATF 50 facade which is designed to meet a wide range of customer needs, expectations and requirements. The system is designed to make aluminium structures with high performance properties.
	AF 50	Single-profile facade with pillar-to-post technology	Modern construction of thermally insulated aluminium and glass curtain walls. The system also enables the construction of canopies, skylights and other spatial structures. The system is intended for making aluminium structures with high utility properties.
	AF 50S	Silicone facade variant AF 50	Modern construction of thermally insulated aluminium and glass curtain walls. The system also makes it possible to manufacture roofing structures, skylights and other spatial structures. The system is intended for making aluminium structures with high utility properties.
	AF 50W	Side-hung and parallel windows	It is designed for the construction of structurally glazed windows opening outwards in two variants: - hinged; - parallel opening; The windows are intended for installation in a facade made in AF 50, AF 50S, ATF 50, ATF 50S systems and may only coexist with these systems.

	AF 50R	Windows and skylights, smoke flaps	It is designed for the construction of roof windows. The windows are intended for installation in a facade made in AF 50, AF 50S, ATF 50, ATF 50S systems and only with these systems may coexist. The system is constructed of three-chamber profiles made of high-quality aluminium sections bonded with thermal breaks made of glass fibre-reinforced polyamide. The use of specially shaped dividers increases the rigidity of the combined sections.
	AF 50EI	Single-profile facade with pillar-to-post fire protection s	Modern construction of thermally insulated aluminium-glass curtain walls with a fire resistance of EI60, built on the basis of the AF 50 facade. The system is designed for aluminium structures with high performance properties.
	VELLA	Timber - aluminium facade	<p>Timber-aluminium system, based on a mullion and transom construction, designed for the construction of facades and conservatories. The load-bearing structure is made up of wooden mullions 50, 60 or 80 mm thick and of a depth adopted on the basis of static calculations. The system consists of a wide range of aluminium profiles, seals and insulators. It provides permanent glass fixing, extraordinary tightness, high thermal performance and guarantees excellent protection for the wood. The glazing range in this system is from 9 mm to 60 mm.</p> <p>Installation of the timber elements is on the window manufacturer's side. By assembling the timber elements and the glazing, a timber-aluminium facade is created, on the original Aluron model.</p>
	VELLA S	Silicone variant of the VELLA facade	Modern construction of thermally insulated aluminium and glass curtain walls. The system also makes it possible to manufacture roofing structures, skylights and other spatial structures. The system is intended for making aluminium structures with high utility properties.

Life Cycle Assessment (LCA) - general principles



Declared unit

The declared unit is the production of 1 kg of aluminium facade systems (without glazing), described in the section “Product description and application”.

Allocation

Allocation in this study was created in accordance with ITB PCR A guidelines. Production takes place at the Zawiercie plant, for which input data have been inventoried. The results obtained are representative average for all aluminium facade systems produced in Zawiercie. All revenues from the extraction of raw materials used in production are allocated to module A1. Production of products is based on raw and recycled materials. The proportion of recycled aluminium is assumed to be 20%. Module A2 is the transport of raw materials to the production plant in Zawiercie. The electrical energy, gas, fuel and waste consumption for the entire production process has been inventoried and included in module A3.

System Boundaries

The life cycle analysis of the declared products includes the production stage (modules A1 - A3), A4, C1-C4+D (“from cradle to grave with options”) according to EN 15804 and ITB PCR A.

System Limits

100% of the input materials and 100% of the electricity and fuel consumption were inventoried at the Zawiercie plant. The assessment takes into account all relevant parameters from the collected production data, i. e. all materials used for production, electricity, gas and fuels used during production and direct production waste. Packaging materials were inventoried: finished products are packed in foil and cardboard boxes.

Modules A1 and A2 Extraction and transport of raw materials

Raw materials for production such as aluminium sections, plastics, insulators, steel components and packaging materials are transported from various European countries: Poland, Germany, Austria, Switzerland, Turkey, Serbia, Italy. Module A1 presents the impact of production and extraction of raw materials further used in the production of facade systems. Data on the transport of raw materials shall be recorded by the plant. Means of transport include trucks. European fuel averages have been used for the calculation of module A2.

Module A3 Production

The production process of facade systems is illustrated in the diagrams on page 9. Depending on the type of product ordered, the profiles are routed along one of the paths shown in the diagram. Profiles are crimped with thermal breaks, varnished, cut, welded or ground. After the main and auxiliary processes, the orders are completed and packed for shipping. Electricity and gas are consumed in the production process. Internal transport includes forklifts powered by LPG gas and electricity.

Modules A4 Transport

Finished products are transported to customers in Poland and abroad, the average transport distances are calculated in proportion to the quantity of transported products. Finished products are transported by trucks. Products are packed in boxes, cartons and foil. The largest recipients of orders are in Poland, where they are transported by trucks. The fuel used is diesel. The average kilometres for the largest customers over the last 12 months are summarised below:

Transport of facade systems		
Country	Distance [km]	Type of transport
Poland	425	lorry
Poland	475	lorry
Poland	80	lorry
Poland	335	lorry
Czech Republic	350	lorry
Poland	400	lorry

Module C1 Deconstruction and Demolition

The deconstruction of entire facade elements is assumed to be done manually or the impact from the use of powered tools is assumed to be negligible. Therefore, no contribution in terms of impact of this module is reported and the module is equal to 0.

Module C2 Transport

It is assumed that the end-of-life product will be transported by truck to the nearest waste treatment plant (truck, diesel) within 100 km.

Module C3 Waste treatment

It was assumed that after the entire facade element was dismantled, 95% of the aluminium and 100% of the steel would be recycled.

Module C4 Disposal

After the end of use, 5% of the aluminium and 100% of the plastics would end up in landfill.

Module D Benefits and Loads Outside the System Boundaries

Module D presents the burdens and benefits of recycling. Benefits are assessed at the functional equivalence point, i.e. where substitution of primary raw material takes place. The benefits of aluminium and steel recycling have been taken into account. In order to obtain a net post-consumer scrap score from the product system, the contribution of post-consumer scrap present in the assessed product is subtracted from the post-consumer scrap to be recycled at the end of life.

Period of data collection

The input data for the calculation of declared products shall cover the period from January to December 2022. The Life Cycle Assessment has been prepared for Poland as a reference area.

Data Quality

The data for the calculation of modules A1-A4 are derived from verified LCI inventory data from each plant. According to Annex E of PN-EN 15804 + A2 data quality assessment was carried out. For technical representativeness, processes with "very good" quality represent 99% of the values for climate change indicators. For geographical and temporal representativeness, the process rating was "very good".

Assumptions and estimates

The impacts of representative products were aggregated using a weighted average. The results obtained for representative products can be related proportionally to all products within the scope of facade systems.

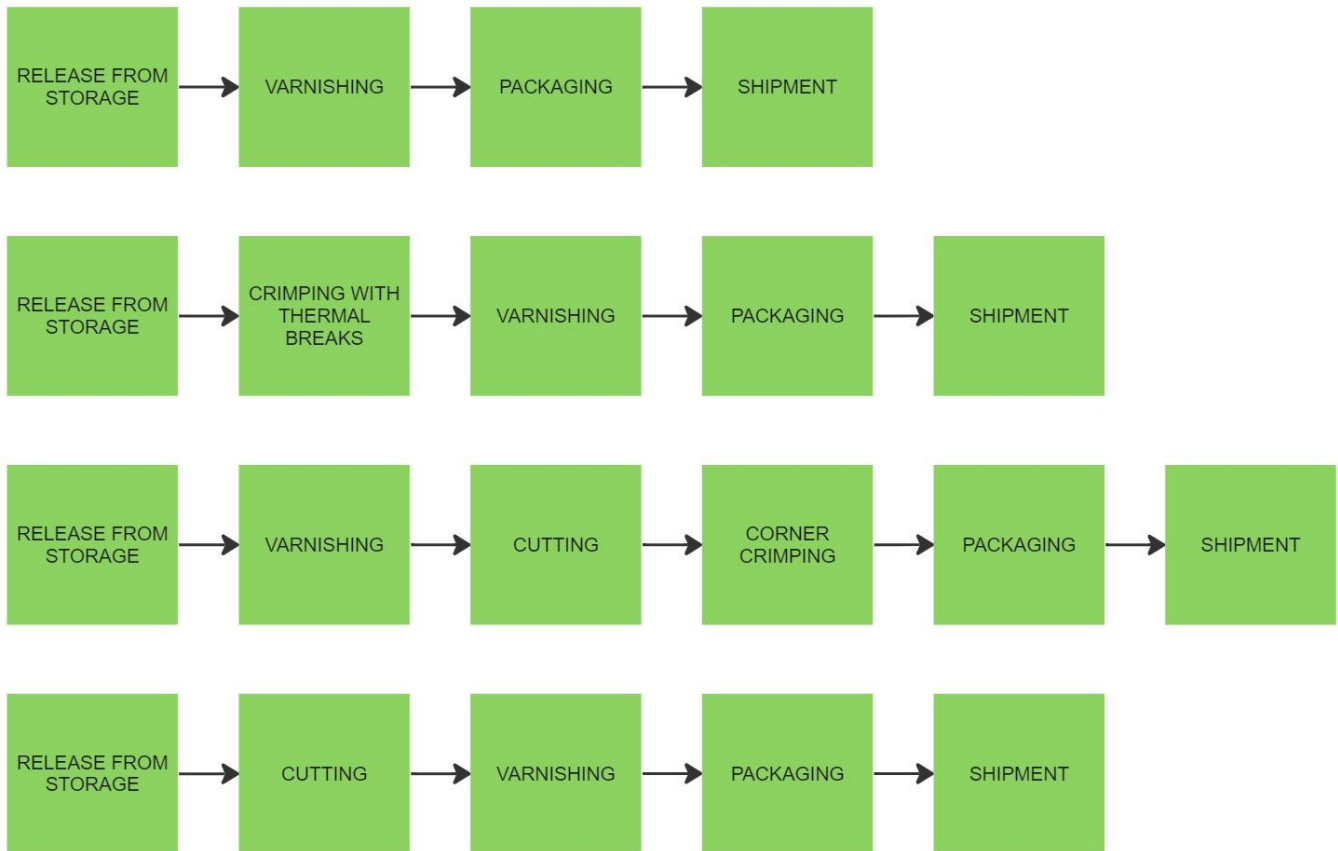
Calculation rules

LCA was made in accordance with PN-EN 15804+A2 standard and ITB PCR A (v1.6, 2023) document.

Databases

The calculation data comes from the Ecoinvent v. 3.6, Ecoinvent v. 3.8 and from the databases available in the Bionova OneClickLCA software. Characteristic factors are CML ver. 4.2 based on EN 15804+A2.

Production schedules for ALURON facade systems. Depending on the type of assortment ordered, the profiles are routed from the warehouse via one of the possible routes:



Life Cycle Assessment (LCA) - results



Declared unit

The declared unit is 1 kg of ALURON facade systems manufactured by Aluron K. Baran and Partners S.K.A.

The following indicates which LCA assessment modules were included in the assessment:

Information on system boundaries (MA = module assessed, MNA = module not assessed)																
Product stage			Construction stage		Use stage							End of life				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction and installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Disposal	Potential for reuse, recovery or recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MA	MA	MA	MA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MA	MA	MA	MA	MA

Results for facade systems

Environmental impacts

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Potential for creating a greenhouse effect - total	kg CO2 eq.	1.06E+01	3.61E-02	1.85E+00	1.25E+01	2.98E-02	2.14E-02	9.10E-03	-2.99E-02	3.51E-02	-1.04E+01
Potential for creating a greenhouse effect - resulting from the consumption of fossil fuels	kg CO2 eq.	1.05E+01	3.61E-02	1.98E+00	1.25E+01	2.98E-02	2.14E-02	9.09E-03	3.12E-02	3.51E-02	-1.04E+01
Potential for creating a greenhouse effect - biogenic	kg CO2 eq.	1.29E-01	2.70E-05	-01.21E-01	7.30E-03	2.17E-05	6.77E-06	6.60E-06	-06.12E-02	8.63E-06	-1.24E-02
Potential for creating a greenhouse effect - land use and changes in land use	kg CO2 eq.	4.31E-03	1.09E-05	7.80E-04	5.10E-03	8.97E-06	3.14E-06	2.74E-06	2.90E-05	4.94E-06	-5.38E-02
Ozone-depleting potential of the stratosphere	kg CFC 11 eq.	8.08E-07	8.76E-09	1.15E-07	9.32E-07	7.01E-09	9.85E-09	2.14E-09	3.34E-09	1.07E-09	-2.82E-07
Acidification potential of soil and water	mol H+ eq.	4.99E-02	1.52E-04	1.73E-02	6.73E-02	1.25E-04	1.86E-04	3.82E-05	2.01E-04	3.65E-05	-6.99E-02
Freshwater eutrophication potential	kg Pe	2.33E-05	2.97E-07	1.03E-04	1.26E-04	2.43E-07	3.31E-07	7.39E-08	8.49E-07	9.99E-08	-1.58E-03
Eutrophication potential of marine waters	kg N eq.	7.12E-03	4.51E-05	2.30E-03	9.47E-03	3.77E-05	2.48E-05	1.15E-05	5.73E-05	4.59E-05	-8.56E-03
Potential for terrestrial eutrophication	kg N eq.	7.78E-02	4.98E-04	2.54E-02	1.04E-01	4.17E-04	2.65E-04	1.27E-04	6.02E-04	1.24E-04	-9.54E-02
Tropospheric ozone creation potential	kg NMVOC eq.	2.53E-02	1.62E-04	7.35E-03	3.28E-02	1.34E-04	8.68E-05	4.09E-05	1.75E-04	4.28E-05	-2.87E-02
Abiotic depletion potential of non-fossil resources	kg Sb eq.	6.49E-05	5.99E-07	2.74E-06	6.82E-05	5.09E-07	2.52E-08	1.55E-07	6.10E-08	1.36E-08	-1.04E-05
Abiotic depletion potential of fossil fuels	MJ	1.54E+02	6.19E-01	3.35E+01	1.88E+02	4.64E-01	6.99E-01	1.41E-01	3.95E-01	9.11E-02	-9.59E+01
Water consumption	m ³	1.51E+00	2.08E-03	4.49E-01	1.96E+00	1.73E-03	1.59E-03	5.26E-04	7.74E-03	7.03E-04	-2.65E+00

Environmental aspects of resource use

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Renewable, primary energy as an energy carrier	MJ	5.58E+00	7.12E-03	2.16E+00	7.74E+00	5.84E-03	2.89E-03	1.78E-03	2.38E-02	2.73E-03	-9.24E+00
Renewable primary energy for material use	MJ	0.00E+00	0.00E+00	4.05E-01	4.05E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Completely renewable primary energy	MJ	5.58E+00	7.12E-03	2.57E+00	8.15E+00	5.84E-03	2.89E-03	1.78E-03	2.38E-02	2.73E-03	-9.24E+00
Non-renewable primary energy as a source of energy	MJ	1.42E+02	6.19E-01	2.16E+01	1.65E+02	4.64E-01	2.71E-01	1.41E-01	3.95E-01	9.11E-02	-9.59E+01
Non-renewable primary energy for material use	MJ	9.72E+00	0.00E+00	1.19E+01	2.16E+01	0.00E+00	4.28E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Completely non-renewable primary energy	MJ	1.52E+02	6.19E-01	3.35E+01	1.86E+02	4.64E-01	6.99E-01	1.41E-01	3.95E-01	9.11E-02	-9.59E+01
Use of secondary raw materials	kg	4.62E-02	8.90E-06	1.11E-03	4.74E-02	0.00E+00	3.87E-05	0.00E+00	1.14E-04	3.00E-05	-1.56E-02
Renewable secondary fuels	MJ	1.15E-03	0.00E+00	7.52E-04	1.90E-03	0.00E+00	4.87E-07	0.00E+00	5.94E-06	1.27E-06	-1.72E-04
Non-renewable secondary fuels	MJ	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
Use of fresh water resources	m ³	6.97E-02	1.15E-04	1.01E-02	7.99E-02	9.65E-05	4.09E-04	2.94E-05	3.35E-04	9.13E-05	-6.11E-02

Other environmental information describing waste categories

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste destined for landfill	kg	1.62E+00	5.55E-04	9.77E-02	1.71E+00	4.51E-04	4.64E-04	1.37E-04	0.00E+00	0.00E+00	-1.69E+00
Recycled non-hazardous waste	kg	7.32E+00	5.91E-02	4.37E+00	1.18E+01	4.98E-02	1.35E-02	1.52E-02	0.00E+00	3.22E-01	-7.18E+01
Radioactive waste disposed of	kg	5.08E-04	3.76E-06	5.54E-05	5.67E-04	3.18E-06	4.28E-06	9.70E-07	0.00E+00	0.00E+00	-1.03E-04
Components to be reused	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.10E-01	3.40E-02	0.00E+00
Recyclable materials	kg	0.00E+00	0.00E+00	1.10E-01	1.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	4.00E-02	4.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electricity	MJ	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

Verification

The verification process of this EPD is in accordance with ISO 14025 and ISO 21930. After verification, this EPD is valid for a period of 5 years. There is no need for recalculation after 5 years if the input data has not changed significantly.

EN 15804 serves as the basis for ITB PCR-A
Independent verification according to ISO 14025 (subsection 8.1.3.)
 internal external

External verification of EPD: Michał Piasecki, Professor ITB, m.piasecki@itb.pl

Input verification, LCI audit, LCA: Agnieszka Pikus, JW+A, a.pikus@jw-a.pl

LCA verification: Michał Piasecki, Professor ITB, m.piasecki@itb.pl

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
- 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
- EN 15804 +A2 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 573-3:2019 Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products
- EN 755-2:2016 Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties
- EN 12020-2:2016 Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 - Part 2: Tolerances on dimensions and form