



Issuance date: 27.05.2019
Validity date: 27.05.2024

FACADE SYSTEMS



EPD Program Operator:

Instytut Techniki Budowlanej (ITB)
Address: Filtrowa 1, 00-611 Warsaw, Poland
Website: www.itb.pl
Contact: Justyna Tomaszewska
j.tomaszewska@itb.pl
energia@itb.pl

Owner of the EPD:

Aluprof S.A.
Address: Warszawska 153
43-300 Bielsko-Biała, Poland
Website: <https://aluprof.eu/pl>
Tel.: +48 (33) 819 53 00
Contact: aluprof@aluprof.eu

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 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. Their aspects were verified by the independent body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

Life cycle analysis (LCA): A1-A3 modules in accordance with EN 15804 (Cradle to Gate)

The year of preparing the EPD: 2019

Product standard: PN-EN 13830

Service Life: 25 years for standard product

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

Declared unit: 1 kg

Reasons for performing LCA: B2B

Representativeness: Polish product

MANUFACTURER

Aluprof S.A. is part of Grupa Kęty S.A. Capital Group. The company is a producer of aluminium systems in Europe, with branches in many European countries and, also, in the US. With over 60 years of experience and annual sales revenues exceeding 297 M EUR, Aluprof S.A. has over 1,300 regular clients. Exports account for 40% of total sales. The company employs more than 2,200 employees.

Aluprof S.A. sells its solutions to most European countries and to the USA. The company has representative offices and distribution centres across Europe: in Germany, Great Britain, Ukraine, the Czech Republic, Hungary, Romania, Denmark and also in the USA.



Fig. 1. A view of the Aluprof S.A. production hall in Bielsko-Biała.

Of particular note is the state-of-the-art logistics centre in Hungary, which holds a warehouse occupying 2,900 m² and fitted with eight high storage warehouse racks.

PRODUCT DESCRIPTION

Façade systems are used to fabricate glass façades of buildings such as banks, hotels, administration offices, office buildings, car showrooms, gyms, etc. They are also used for multiple spatial structures and roof glazing that light the interior and create a suitable atmosphere and comfort to its users. They are an useful tool for shaping contemporary architecture and implementing designers' bold visions. The most popular among these products are the mullion-transom systems. ALUPROF's façade solutions include also a range of products of various design and appearance, including a bunch of individual solutions.

The MB-TT50 mullion and transom façade is the company's most state-of the art solution. This product brings a whole new approach to the construction of profiles and accessories for tightness and thermal insulation.

An important place in façade systems is occupied by the mullion-transom wall MB MB-SR50N. It has enhanced thermal insulation variants: MB-SR50N HI and MB-SR50N HI+, as well as variants for fabricating constructions of different appearances: vertical or horizontal line or "semi-structural" façade MB-SR50N EFEKT. When it comes to openable elements, the MB-SR50N is the basis for constructions such as tilt-and-pull windows MB-SR50N OW, façade-integrated windows MB-SR50N IW, and, very aesthetic and functional roof windows MB-SR50N RW. The MB-SR50N mullion-transom system is also a basis for fire resisting façades MB-SR50N EI and glazed roofs. The MB-SR50N-based roof constructions and façades can optionally be fabricated in a fire-resistant variant.

ALUPROF façade offering also includes structural glazing systems: MB-SG50 and the semi-structural MB-SG50 SEMI designed to fabricate façades that convey to the buildings a representative character. In top of the façade systems ALUPROF offer EXTRABOND ventilated wall whose external coat consists of wall cladding. It ensures a good appearance and a thermal insulation of the construction. A separate group of façade systems are segment-based walls, such as MB-SE75 and individual solutions, that is, systems designed with respect to strict criteria set out in collaboration with buildings' designers. These systems are, by definition, designed to meet project-specific requirements for aesthetics and performance.

MB-TT50	Mullion-transom wall system
MB-SR50N A	Mullion-transom wall system
MB-SR50N	Mullion-transom wall system
MB-SR50N HI+	Mullion-transom wall system featuring enhanced thermal insulation performance
MB-SR50N HI	Mullion-transom wall system featuring enhanced thermal insulation performance
MB-SR50N EI	Fire protection and smoke exhaust system
MB-SR50N EFEKT	Semi-structural façade
MB-SR50N EI EFEKT	Fire protection and smoke exhaust system
MB-SR50N OW	Awning-parallel outward-opening window
MB-SR50N IW	Inward-opening window
MB-SR50N RW	Roof window
MB-SR50N PL	Mullion-transom wall system in which horizontal and vertical baffles are emphasized
MB-SR60N	Mullion-transom wall system
MB-RW	Roof window system
MB-SG50	Mullion-transom wall system
MB-SE70	Segment-based façade
MB-SE75	Segment-based façade
MB-SE80	Segment-based façade
MB-SE85	Segment-based façade
MB-SE90	Segment-based façade
Extrabond	Ventilated façade
MB-WG60	Winter garden system
MB-SUNPROF	Sun shades
MB-70CW	Window-based curtain wall (cold - warm)
MB-70CW HI	Window-based curtain wall (cold - warm)

APPLICATIONS

Façade systems which ALUPROF offer: mullion-transom curtain walls, semi structural mullion-transom walls, awning-parallel outward-opening window, skylight windows, fire-rated glazed roofs, roof windows, segment-based walls, ventilated walls, winter gardens.

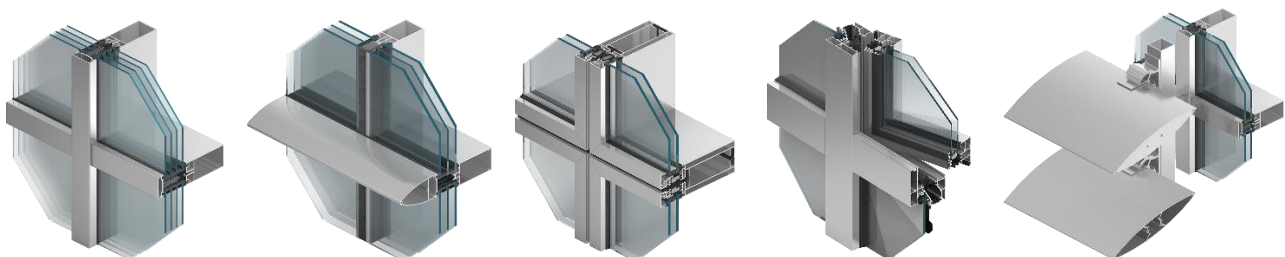


Fig. 2. Façade systems manufactured by Aluprof S.A.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of facade systems is a line process in a factory of Aluprof S.A. in Bielsko-Biala (Poland). Allocation was done on product mass basis. All impacts from raw materials extraction are allocated in A1 module of the EPD (including materials and energy consumption, transportation, emissions and wastes resulting from the production of the facade systems). 100% of impacts from line production of Aluprof were inventoried and 40% were allocated to the facade systems. Municipal waste and waste water of Bielsko-Biala factory were allocated to module A3. Energy supply was inventoried for whole production processes. Emissions in the factories were measured and were allocated to module A3.

System limits

The life cycle analysis of the declared products covers “Product Stage”, A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB PCRA. The details of systems limits are provided in product technical report. All materials and energy consumption inventoried in factories and were included in calculation. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A1, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

A1 and A2 Modules: Raw materials supply and transport

Raw materials such as aluminium and steel used in the production process come from local suppliers while plastics and substances originate from more distant suppliers. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include trucks and Polish and European fuel averages are applied.

A3: Production

The production process at the plant in Bielsko-Biala begins with the delivery of aluminum profiles produced in the press. Then, after unpacking, the profiles are joined together with the thermal break in special profiles joining machines. Subsequently, the thermal separators are crimped, but not in every case. After joining and crimping, profiles can be found in one of the two paint shops - vertical or horizontal, where they are subjected to the painting process. After drying, they are packed and then transported to the customer.



Fig. 3. A scheme of manufacturing of facade systems by Aluprof S.A. in factory in Bielsko-Biala (Poland)

Environmental Product Declaration Type III ITB No. 087/2019

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2017 – 31.12.2017 (1 year). The life cycle assessments were prepared for Poland as reference area.

Data quality

The values determined to calculate the LCA originate from verified Aluprof S.A. inventory data

Assumptions and estimates

The impacts of the representative facade systems were aggregated using weighted average. Impacts were inventoried and calculated for all products of facade systems.

Calculation rules

LCA was done in accordance with ITB PCR A document.

Databases

The data for the processes come from the following databases: Ecoinvent v.3.5, specific EPDs, ELCD, Ullmann's, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on EN 15804:2013+A1 version (PN-EN 15804+A1:2014-04).

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to functional unit (FU) – 1 kg of facade systems manufactured by Aluprof S.A.

Table 1. System boundaries for the environmental characteristic of facade systems

Environmental assessment information (MNA – Module not assessed, MD – Module 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	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	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

FACADE SYSTEMS

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	7.13E+00	5.39E-03	4.50E-01	7.58E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2.71E-07	0.00E+00	0.00E+00	2.71E-07
Acidification potential of soil and water	[kg SO ₂ eq.]	3.49E-02	3.66E-05	2.05E-05	3.50E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.69E-03	2.58E-06	0.00E+00	3.70E-03
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.17E-02	6.44E-06	2.90E-06	1.17E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2.39E-04	0.00E+00	1.67E-06	2.40E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.01E+02	1.88E-03	5.16E+00	1.06E+02
Environmental aspects on resource use: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	2.94E+01	1.32E-04	2.23E-01	2.96E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1.06E+02	1.98E-03	5.41E+00	1.11E+02
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	0.00E+00	9.89E-05	0.00E+00	9.89E-05
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	2.36E-03	6.46E-07	1.48E-02	1.72E-02
Non-hazardous waste disposed	[kg]	1.04E+00	6.00E-04	3.50E-02	1.07E+00
Radioactive waste disposed	[kg]	1.31E-04	0.00E+00	1.31E-04	2.61E-04
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	0.00E+00	0.00E+00	3.15E-02	3.15E-02
Materials for energy recover	[kg]	0.00E+00	0.00E+00	9.36E-03	9.36E-03
Exported energy	[MJ per energy carrier]	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 (subclause 8.1.3.) <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: PhD. Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl Verification of LCA: PhD. Eng. Michał Piasecki, m.piasecki@itb.pl

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
- 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+A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej, grudzień 2017
- PN-EN 13830:2015-06 Ściany osłonowe – Norma wyrobu



Building Research Institute

00-611 Warszawa, ul. Filtrowa 1

KIEROWNIK
Zakładu Fizyki Ciepłej, Akustyki i Środowiska

dr inż. Michał Piasecki



Instytut Techniki Budowlanej

00-611 Warsaw, Filtrów 1

Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

CERTIFICATE No 087/2019 of TYPE III ENVIRONMENTAL DECLARATION

Product:

Facade systems

Manufacturer:

ALUPROF S.A.

Warszawska 153, 43-300 Bielsko-Biała, Poland

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

PN-EN 15804+A1:2014-04

Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 27th May 2019 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physics, Acoustics
and Environment Department


Michał Piasecki, PhD



Deputy Director
for Research and Innovation


Krzysztof Kuczyński, PhD

Warsaw, May 2019