Environmental Product Declaration Type III ITB No. 088/2019

Issuance date: 27.05.2019
Validity date: 27.05.2024

WINDOW AND DOOR SYSTEMS

EPD Program Operator:

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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 14351
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.

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

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, Denamark and also in the USA.

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

ALUPROF aluminium systems allow to fabricate many different types of windows and doors, depending on the scope and specific requirements for functionality, aesthetics, thermal insulation, burglary resistance, smoke control or fire resistance. These include both structures with no thermal insulation designed to fabricate internal partition walls and door (MB-45, MB-45 Office, MB-EXPO) or balcony developments (MB-23P system), and solutions based on thermally insulated profiles (MB-60, MB-70, MB-59S). A significant part of thermally insulated systems is available in “HI” variant, and is characterized by special inserts into the profiles that lower the thermal conductivity coefficient.

The best thermally insulated structure offered by ALUPROF is the MB-104 PASSIVE system, which uses innovative materials and technical solutions.

The MB series includes not only structures with the most common types of opening: side/bottom, but also lifting sliding patio doors MB-77HS, sliding windows & doors MB-Slide / MB-Slide ST, pivot windows “Pivot”, outward openable windows (e.g. MB-59S Casement) or windows dedicated to specific façade solutions, such as MB-60EF. ALUPROF also offer “Industrial” type windows, dedicated to the revitalized historic buildings.

Numerous MB series systems allow for the fabrication of accordion doors, burglary resistant constructions, and smoke exhaust windows. For buyers who want to reconcile the right technical parameters with an affordable price, we offer a whole range of economic solutions, such as MB-45S, MB-59SE, and MB-60E.

Window & door systems offering includes special, fire- and smoke-resisting partition walling: MB-78EI with the fire resistance class of EI15-EI90 and the MB-118EI with the fire resistance class of EI120. This group of products is completed by smoke-resisting doors with no fire resistance: MB-45D.

MB-45S	Doors with clamp hinges without a thermal barrier
MB-45	Window and door system
MB-45 OFFICE	Internal door and wall partition wall system
MB-45 EW	Fireproof walls with doors of class EW 30
MB-80 OFFICE	Internal door and wall partition wall system
MB-EXPO/MOBILE	System of fixed, operable and mobile internal partition walls
MB-59S	Door and window system with a thermal break
MB-59S HI	Door and window system with a thermal break
MB-59SE	Door system with a thermal barrier
MB-59S Pivot	The pivot window
MB-59S Pivot HI	The pivot window
Mb-59S Casement	Outward-opening windows
Mb-59S Casement HI	Outward-opening windows
MB-60	Door and window system with a thermal break
MB-60 HI	Door and window system with a thermal break
MB-60E	Thermally insulated doors
MB-60E HI	Thermally insulated doors
MB-60US	Hidden sash
MB-60US HI	Hidden sash
MB-60 Pivot	The pivot window
MB-60 Industrial	Window and door system
MB-60 Industrial HI	Window and door system
MB-70	Door and window system with a thermal break
MB-70 HI	Door and window system with a thermal break
MB-70 Industrial	Window system with a thermal barrier
MB-70 Industrial HI	Window system with a thermal barrier
MB-70US	Hidden sash
MB-70US HI	Hidden sash
MB-70SG	Window system with a thermal barrier
MB-70 Casement	Outward-opening windows
MB-70SE	Window wall system
MB-70 PD	Inward-opening doors
MB-70B	Window-door system with a thermal barrier
MB-86	Door and window system with a thermal break
MB-86US	Window system with a concealed sash
MB-86 SOFT	Door and window system with a thermal break
MB-86B	Door and window system with a thermal break
MB-86 Casement	Outward-opening windows
MB-86EI	Fireproof windows of class EI30

MB-104 Passive	Door and window system with a thermal break
MB-Slimline	Window system with a thermal barrier
MB-Ferroline	Window system with a thermal barrier
MB-60E EI	Fireproof walls with doors of class EW15, EW30, EI15, EI30.
MB-78EI	Fireproof walls with doors of class EW15, EW30, EI15, EI30, EI45, EW60, EI60, EI90
MB-118EI	Fireproof walls with doors of class EI120
MB-78EI DPA	Fireproof sliding door class EI15,EI30
MB-23P	Glazed balcony walls
MB-Slide	Thermally insulated sliding doors
MB-59 Slide Galandage	Balcony door system with a thermal break
MB-Slide ST	Thermally insulated sliding doors
MB-59HS	Balcony door system with a thermal break
MB-77HS	Lift & slide balcony door system with a thermal barrier
MB-77HSB	Lift & slide balcony door system with a thermal barrier
MB-DPA	Automatically and manually operated sliding doors
MB-86 Fold Line	Folding door
MB-Folding doors	Folding door
MB-SUNSHADES	Window shutter system
MB-PŁYTY	Sandwich panel-based system of development
MB-Slider Window	Sliding window system
MB-Glass Barrier	The system of external window barriers
MB-Installation Solution	System of warm and tight installation of windows and doors

APPLICATIONS

Many types of windows and doors like: internal and external doors, panel doors, silicone-jointed partition walling, smoke exhaust windows, folding doors, sliding windows and doors, internal walls, pivot windows, outward-opening windows, fire rated wall partitions, muntin-free walls, automatic sliding doors e.t.c.

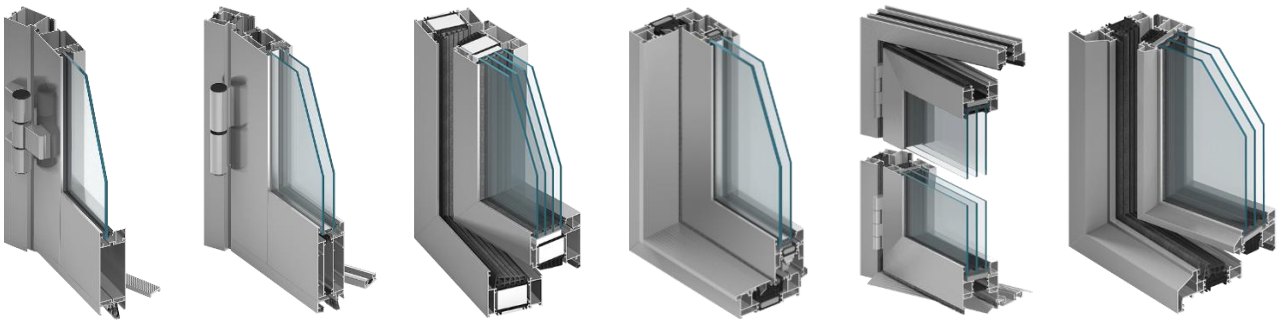

Fig. 2. Window and door systems manufactured by Aluprof S.A.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of the window and door systems is a line process in a factory of Aluprof S.A. in Bielsko-Biała (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 window and door systems). 100% of impacts from line production of Aluprof were inventoried and 60% were allocated to the window and door systems. Municipal waste and waste water of Bielsko-Biała 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 PCR A. 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-Biała 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-Biała (Poland).

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 window and door systems were aggregated using weighted average. Impacts were inventoried and calculated for all products of window and door 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 window and door systems manufactured by Aluprof S.A.

Table 1. System boundaries for the environmental characteristic of window and door 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 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	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

WINDOW AND DOOR SYSTEMS

Environmental impacts: (FU) 1 kg					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.]	7.65E+00	8.54E-03	4.50E-01	8.11E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2.82E-07	0.00E+00	0.00E+00	2.82E-07
Acidification potential of soil and water	[kg SO_2 eq.]	3.70E-02	6.03E-05	2.05E-05	3.71E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.84E-03	4.11E-06	0.00E+00	3.85E-03
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1.22E-02	1.06E-05	2.90E-06	1.22E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2.40E-04	0.00E+00	1.67E-06	2.41E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.07E+02	1.55E-03	5.16E+00	1.12E+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]	3.00E+01	1.08E-04	2.23E-01	3.02E+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]	8.73E+01	1.62E-03	5.41E+00	9.27E+01
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	8.11E-05	0.00E+00	8.11E-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]	2.37E-03	6.46E-07	1.48E-02	1.72E-02
Non-hazardous waste disposed	[kg]	1.08E+00	6.00E-04	3.50E-02	1.11E+00
Radioactive waste disposed	[kg]	1.38E-04	0.00E+00	0.00E+00	1.38E-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.) [x] external [ ] 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 CO_2. SO_2. NO_x. CO i pyłu całkowitego dla energii elektrycznej. grudzień 2017
- PN-EN 14351-1+A2:2016-10 Okna i drzwi -- Norma wyrobu. właściwości eksploatacyjne -- Część 1: Okna i drzwi zewnętrzne

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CERTIFICATE № 088/2019
of TYPE III ENVIRONMENTAL DECLARATION

Product:

Window and door 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 Physic, Acoustics and Environment Department
Michał Piasecki, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, May 2019