

aliplast
aluminium extrusion



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ALUMINIUM PROFILES



Owner of the EPD

Aliplast Extrusion Sp. z o. o.
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EPD Program Operator

Instytut Techniki Budowlanej (ITB)
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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 and verified according to ISO 14025 by an external auditor. It contains the information on the environmental impacts of the declared construction materials. 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, C4 and D according to EN 15804 (Cradle to Gate with options)

The year of preparing the EPD: 2021

Product standard: EN 573, EN 755, EN 12020

Reference Service Life: 25 years for standard product

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

Declared unit: 1 tonne

Reasons for performing LCA: B2B

Representativeness: Polish products

Type III Environmental Product Declaration ITB No. 209/2021

MANUFACTURER

Aliplast Extrusion Sp. z o.o. offers aluminium profiles intended for window, door, curtain walls, roof systems. The pressing plant located in Lublin is equipped with three process lines with a pressure of 2200T, 2400 and 2800 T. Aliplast Extrusion Sp. z o.o. belongs to the internationally renowned Corialis Group, established in 1984 with its headquarters in Lokeren, Belgium.



Fig 1. A view of Aliplast Extrusion Sp. z o.o. plant located in Lublin (Poland).

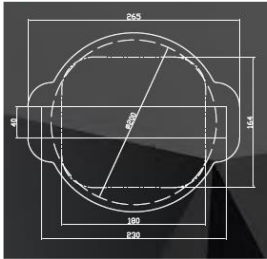
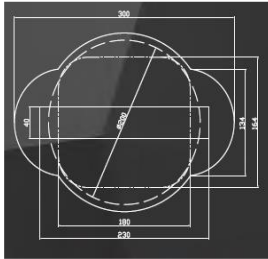
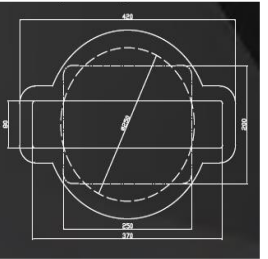
PRODUCT DESCRIPTION AND APPLICATION

Aliplast Extrusion Sp. z o. o. offers production of custom aluminium profiles made of EN AW 1050, 6060, 6063, 6005A and 6082 to meet individual customer need. The portfolio (available on the website: www.aliplastextrusion.pl) contains not only standard profiles, but also special section design for individual customer use. Aluminium systems are accompanied by documents of approval for use in the construction industry. Technical approvals, hygiene certificates, ITT testing confirm compliance of Aliplast products with European standards.

Table 1. Types of profiles offered by Aliplast Extrusion Sp. z o. o.

Standard profiles	Special sections
<ul style="list-style-type: none"> profiles: equal L-profiles, non-equal L-profiles, U-profiles, T-profiles tubes: round, square, rectangular bars: rectangular, square, round 	<ul style="list-style-type: none"> profiles for: elevation; trailers and semi-trailers, polycarbonates, air conditioning, advertising, photovoltaics, tents and other

Table 2. Specification of aluminium extrusion presses used by Aliplast Extrusion Sp. z o. o.

Feature	Press 8"	Press 8"	Press 9"
Aluminium alloys	EN AW 1050, 6060, 6063, 6005A	EN AW 1050, 6060, 6063, 6005A	EN AW 1050, 6060, 6063, 6005A, 6082
Pressure	2200 T	2400 T	2800 T
Min. weight of profile	0.3 kg/m	0.3 kg/m	0.9 kg/m
Max. weight of profile	230	230	370
Standard profile length	4000-7000 mm	4000-7000 mm	4000-7000 mm
Max. profile length	7000 mm	14000 mm	14000 mm
			

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The aluminium profiles are intended for façades, windows, doors, furniture, lighting profiles, bathroom equipment, internal equipment, railings and building systems, equipment for shops, display units, roofs, sunrooms, gates, balustrade posts, shutters, guide bars, as well as components for the automotive, telecommunication and electronic industries.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation: The allocation rules used for this EPD are based on a product mass basis in accordance with ITB PCR A. Extrusion of the aluminium profiles is a line process in the pressing plant of Aliplast Extrusion Sp. z o. o. located in Lublin (Poland). All impacts from raw materials extraction and processing were allocated in module A1 of the LCA. All impacts from Aliplast Extrusion Sp. z o. o. line production were inventoried and 100% was allocated to the production of the aluminium profiles (module A3). Module A2 includes transport of raw materials from their suppliers to the pressing plant of Aliplast Extrusion Sp. z o. o. located in Lublin (Poland). Water and energy consumption, as well as associated emissions and generated wastes were allocated to module A3.

System boundary: The life cycle analysis (LCA) of the declared product covers modules A1-A3, C4 and D (Cradle to Gate with options) in accordance with EN 15804:2012+A1:2013 and ITB PCR A. The details of the system limits are provided in the background report. Energy and water consumption, emissions to air and water 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 15804:2012+A1:2013, capital goods (e.g. machines and facilities) required for the production and transportation of employees were not included in LCA.

Raw materials supply and transport (A1 and A2 modules): Primary aluminium ingots, sodium hydroxide, wood and packaging materials (plastic foil, carton boxes) come from both Polish and foreign suppliers. Means of transport include trucks with load: <10t, 10 – 16t and >16t. For calculation purposes Polish and European fuel averages were applied.

Production (A3 module): Extrusion of aluminum profiles is carried out on an automated technological line consisting of: a) four-zones gas furnace for heating ingots – aluminum ingots are heated to temperatures of 420 – 520°C and cut into tickets; b) hydraulic press for extruding; c) double puller of which one part is equipped with a saw – the profile coming out of the press is grasped by the puller, the saw cuts off the lengths of tickets (max 52 m); d) stretcher; e) saw and stacker – the profiles are cut to lengths and placed in technological baskets; f) gas aging furnace with forced air circulation – the input in the form of technological baskets is subjected to final heat treatment (aging). The extrusion process of aluminium profiles in pressing plant of Aliplast Extrusion Sp. z o. o. is presented in Fig. 2.

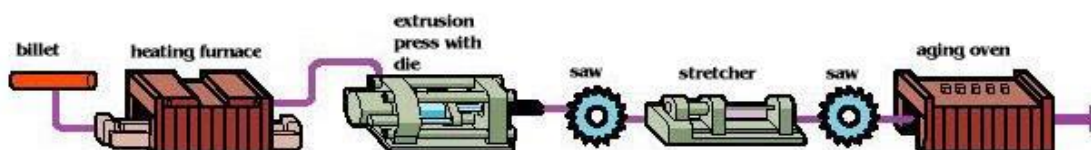


Fig. 2. A scheme of aluminium profiles production process in pressing plant of Aliplast Extrusion Sp. z o. o. in Lublin (Poland).

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End-of-life (C4 and D modules): It is assumed that at the end-of-life 99% of aluminium profiles undergo recycling after collecting and shredding while the remaining 1% of the product is forwarded to landfill in the form of mixed construction and demolition waste. Environmental burdens declared in module C4 are associated with treatment of aluminium scrap, prepared for recycling at refiner and waste-specific emissions to air and groundwater via landfill gas incineration and landfill leachate. A potential credit resulting from the recycling of the aluminium scrap are presented in module D.

Table 3. End-of-life scenario for the aluminium profiles produced by Aliplast Extrusion Sp. z o. o.

Material	Material recovery	Recycling	Landfilling
Aluminium scrap	100%	99%	1%

Data collection period: The inventoried data refer to the period between 01.01.2019 and 31.12.2019 (1 year). The life cycle assessments were prepared for Poland as reference area.

Estimates and assumptions: The LCA required only limited use of estimates and assumptions. Averages and best-estimates were used to fill in minor data gaps, such as the source of ingots for some facilities. Other estimates and assumptions are discussed in detail in the LCA background report.

Data quality: The values used to calculate the LCA originate from verified Aliplast Extrusion Sp. z o. o. inventory data and were audited by ITB.

Calculation rules: LCA was done in accordance with ITB PCR A document.

Databases: The data for the processes come: Ecoinvent database v. 3.7, specific EPDs and ITB-LCI database. Specific data quality analysis was a part of external ISO 14001 audit.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The LCA indicators refer to declared unit (DU) – 1 tonne of the aluminium profiles produced by Aliplast Extrusion Sp. z o. o.

Table 4. System boundaries for the environmental characteristic of the aluminium profiles produced by Aliplast Extrusion Sp. z o. o.

Environmental assessment information (MNA – Module not assessed. MD – Module Declared. INA – Indicator Not Assessed)																	
Product stage			Construction press		Use stage							End of life			Benefits and loads beyond the system boundary		
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation processes	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	MD	MD

ALUMINIUM PROFILES

Environmental impacts: (DU) 1 tonne							
Indicator	Unit	A1	A2	A3	A1-A3	C4	D
Global warming potential	kg CO ₂ eq.	1.68E+04	3.82E+01	5.75E+02	1.74E+04	3.83E-01	-8.36E+03
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	6.84E-04	0.00E+00	0.00E+00	6.84E-04	3.34E-08	-5.14E-04
Acidification potential of soil and water	kg SO ₂ eq.	9.78E+01	5.26E-01	3.49E+00	1.02E+02	2.07E-03	-5.21E+01
Formation potential of tropospheric ozone	kg Ethene eq.	5.66E+00	3.84E-02	2.27E-05	5.69E+00	1.41E-04	-1.34E+00
Eutrophication potential	kg (PO ₄) ³⁻ eq.	4.18E+01	9.29E-02	5.93E-01	4.25E+01	6.00E-04	-2.32E+01
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	2.86E+00	0.00E+00	2.13E-03	2.86E+00	8.73E-07	-2.57E+00
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	2.28E+05	5.21E+02	6.02E+03	2.35E+05	6.32E+00	-9.62E+04
Environmental aspects on resource use: (DU) 1 tonne							
Indicator	Unit	A1	A2	A3	A1-A3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4.27E+04	3.65E+01	4.18E+02	4.32E+04	7.11E-01	-2.41E+04
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.40E+05	5.47E+02	6.32E+03	2.46E+05	5.56E+00	-1.02E+05
Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	2.73E+01	0.00E+00	2.73E+01	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	INA	INA	INA	INA	INA	INA
Other environmental information describing waste categories: (DU) 1 tonne							
Indicator	Unit	A1	A2	A3	A1-A3	C4	D
Hazardous waste disposed	kg	9.12E+00	5.54E-05	2.01E+01	2.92E+01	5.34E-06	-6.49E+00
Non-hazardous waste disposed	kg	2.99E+03	2.48E-02	3.64E-01	2.99E+03	1.02E+01	-5.71E+02
Radioactive waste disposed	kg	4.74E-01	1.43E-04	0.00E+00	4.74E-01	0.00E+00	2.43E-01
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	7.65E-01	7.65E-01	0.00E+00	0.00E+00
Materials for energy recover	kg	1.04E-04	0.00E+00	0.00E+00	1.04E-04	0.00E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA

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Verification

The process of this EPD verification 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 this validity period, 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: Ph.D. Eng. Halina Prejzner Input data verification, LCI audit, LCA: Ph.D. Eng. Justyna Tomaszewska. j.tomaszewska@itb.pl Verification of LCA: Ph.D. 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.
- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- EN 15942:2012 Sustainability of construction works - Environmental product declarations - Communication format business-to-business.
- EN 573-3:2019 Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products
- EN 755-1:2016 Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 1: Technical conditions for inspection and delivery
- EN 755-2:2016 Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties
- EN 755-3:2019 Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products
- EN 755-4:2008 Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 4: Square bars, tolerances on dimensions and form
- EN 755-5:2008 - Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 5: Rectangular bars, tolerances on dimensions and form
- EN 755-6:2008 - Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 6: Hexagonal bars, tolerances on dimensions and form
- EN 755-7:2016 - Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 7: Seamless tubes, tolerances on dimensions and form
- EN 755-8:2016 - Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 8: Porthole tubes, tolerances on dimensions and form
- EN 755-9:2008 - Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 9: Profiles, tolerances on dimensions and form
- EN 12020-2:2017 - Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 - Part 2: Tolerances on dimensions and form
- KOBIZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej. grudzień 2020.



Instytut Techniki Budowlanej

00-611 Warsaw, Filtrów 1

Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

**CERTIFICATE No 209/2021
of TYPE III ENVIRONMENTAL DECLARATION**

Product:

Aluminium profiles

Manufacturer:

Aliplast Extrusion Sp. z o.o.

Wacława Moritza 3, 20-276 Lublin, 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

Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 30th March 2021 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Acting Head of the Thermal Physics, Acoustics
and Environment Department


Agnieszka Winkler-Skałna, PhD



Deputy Director
for Research and Innovation


Krzysztof Kulczyński, PhD

Warsaw, March 2021