Type III Environmental Product Declaration No. 260/2023

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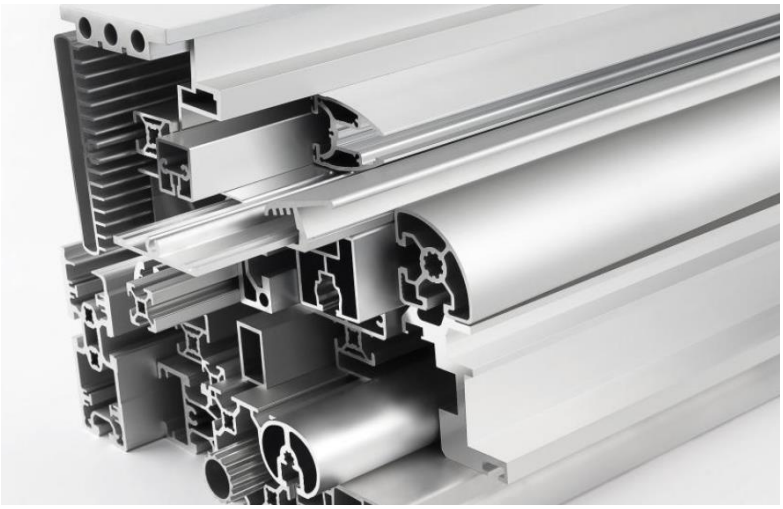
Aluminium profiles



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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-A3, A4, A4-A5, C1-C4 and D modules in accordance with EN 15804 (Cradle-to-Gate with options)

The year of preparing the EPD: 2023

Product standard: EN 573, EN 755, EN 12020

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, European, Global

MANUFACTURER

Extral Sp. z o.o. is an extrusion plant of aluminum profiles which was founded in 2008 in Silesia in Żory (Poland). Aluminum profiles produced by Extral are supplied to customers throughout Europe. Production of profiles takes place on five extrusion presses.

Fig. 1. The view of the extrusion plant of Extral Sp. z o.o. in Żory.

PRODUCTS DESCRIPTION AND APPLICATION

Extruding plant Extral specializes in the production of complex aluminum products based on Clients requirements, technical documentation and manufacturing technologies individually developed under each customer project. Special profiles are made on the basis of individual design solutions. Usually subject to further machining and surface treatment.

The aluminium profiles are produced using the following aluminium alloys: EN AW-1060 (Al 99,6), EN AW-1070A (Al 99,7), EN AW-6060 (Al MgSi), EN AW-6063 (Al Mg0,7Si), EN AW-6005A (Al SiMg(A)), EN AW-6082 (Al Si1MgMn) and EN AW-6463 (Al Mg0,7Si(B)).
Manufacturing of extruded aluminum products is divided into: rods, tubes, sections and extruded profiles. Each of these groups is assigned accordingly to ranges dimensional or wall thickness defined by standards and mechanical properties, fulfilled by the extrusion plant Extral. In cases of non-standard implementations of production on special sections individual mechanical parameters can be agreed in detail with the customer depending on the typology of use of the product and customer expectations.

Table 1. Technical parameters of the aluminium profiles manufactured by Extral Sp. z o.o.

Properties	Test according to	Parameters
Minimal order quantity	1000 kg/profile/length	1000 kg/profile/length
Quantity tolerance	+/-10% of the ordered quantity	
Length tolerance	-0/+10 mm (individual requirement)	-0/+10 mm (individual requirement)
Standard length of profiles (without additional charge)	3000 - 7500 mm	
Maximum profiles length	16 000 mm	
Minimal Wall thickness	0.9 – 1.2 mm	
The maximum weight of profile	7.5 kg/m	
Packaging	Standard Extral or special packaging	Needs individual agreement

The aluminium profiles can be used for buildings and construction, general engineering, transport, automotive, scaffolding, construction, ladders, electrical engineering, interior design, furniture, intermediaries, machining and other applications.

Extral extended its offer for buying of scrap aluminum from the market and from its customers in order to further recycling in accordance with Polish regulations on environmental protection and purchase of waste.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Declared Unit

The declared unit is the production of 1 kg of the aluminium profile, representative for a wide range of products.

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of the aluminium profiles a line process executed by Extral Sp. z o.o. in extrusion plant located in Żory (Poland). Allocation was done on product mass basis. All impacts from raw materials extraction and processing are allocated in module A1 of the LCA. Impacts from the global line production of Extral Sp. z o.o. were inventoried and 100% were allocated to the aluminium profiles extrusion. Water and energy consumption, associated emissions and generated wastes are allocated to module A3. Packaging materials were takien into consideration.

System limits

The life cycle analysis (LCA) of the declared products covers: product stage – modules A1-A3, A4-A5 transport to site and instalation, 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.

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

This modules A1 and A2 represents the extraction and processing of raw materials (ingots) the transport to production site and the manufacture of billets. Aluminium billets, ancillary materials and packaging materials come from both local and foreign suppliers. Means of transport include ships and lorries. For calculation purposes Polish and European fuel averages were applied.

Module A3: *Production*

Production of extruded aluminum products is divided into: rods, tubes and sections extruded profiles. Profiles are extruded from the batch mass coming from our own foundry and processed (shaping, cutting, maturing). Electricity and gas are consumed in the process. Each of these groups is assigned accordingly to ranges dimensional or wall thickness defined by standards and mechanical properties, fulfilled by the extrusion plant Extral. A scheme of the production process is presented in Fig. 2.

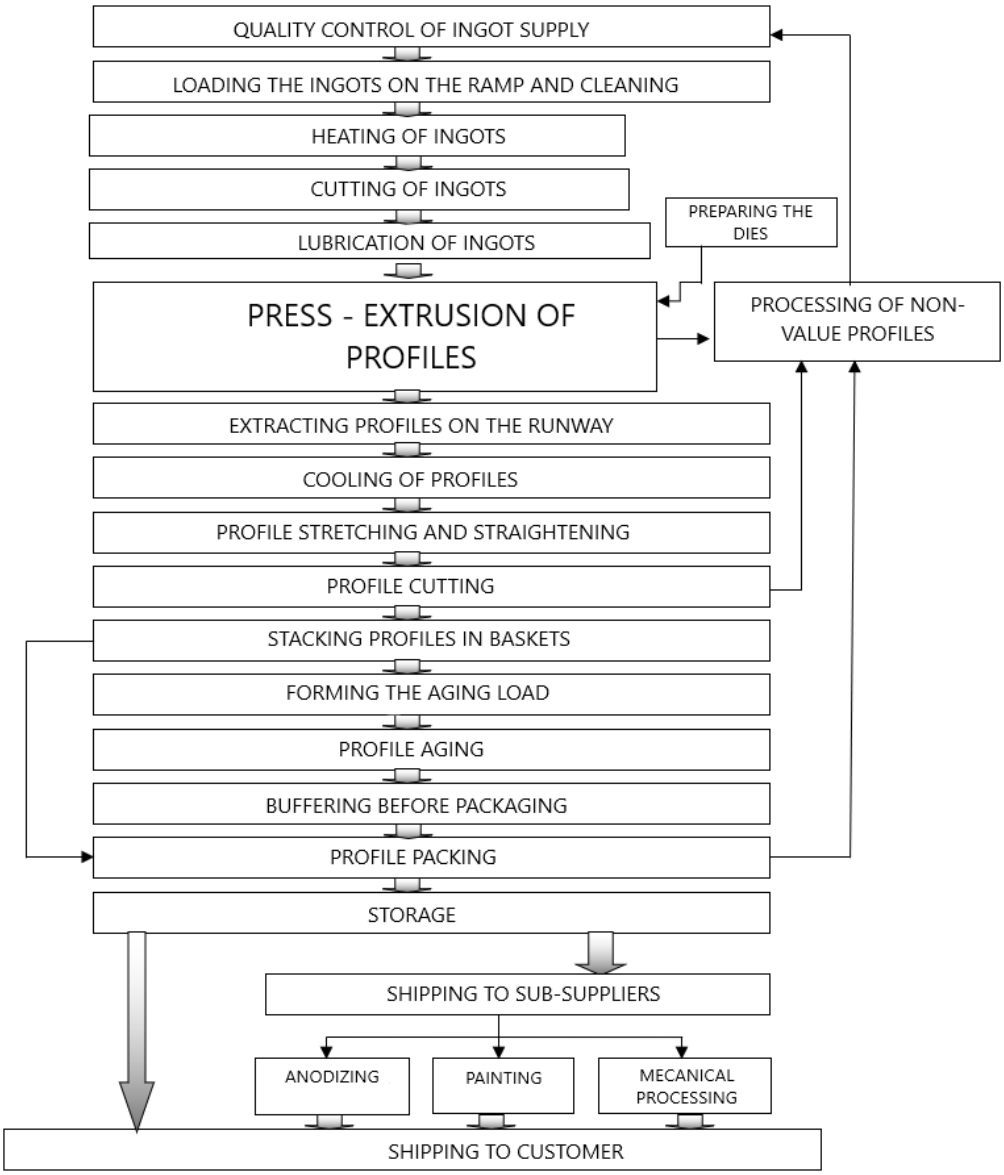

Fig. 2. The scheme of the aluminium profiles production by Extral Sp. z o.o.

Module A4: transport to consumer

Vehicle transport at distance 100 km is considered (emission standard Euro 5) with 100% load capacity.

Modules *C1-C4 and D: End-of-life (EoL)*

It is assumed that at the End-of-Life, the aluminium profiles are dismantled using power tools. Recovered material is transported to waste processing plant distant of about 100 km using > 24t lorry with 85% capacity utilization and fuel consumption of 35 L per 100 km (module C2). About 98% of the resulting aluminium scrap undergo recycling after shredding (C3) while the remaining 2% 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 aluminium 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 aluminium scrap are presented in module D (calculated for the primary aluminium content).

Table 2. End-of-life scenario for the aluminium profiles produced by Extral Sp. z o.o.

Material	Material recovery	Recycling	Landfilling
Aluminium scrap	100%	98%	2%

Data quality

The values determined to calculate A1-A3 originate from verified Process LCI inventory data from manufacturing plant. A1 values were prepared considering input products characteristics and are based on Ecoinvent 3.9.1 data (EF v2). The energy consumption of production and its impact on the production lines (profiles) was inventoried and calculated. For aluminum, the weighted average carbon footprint declared by suppliers was used.In accordance with Annex E of the EN 15804 + A2, a data quality assessment was performed. For technical representativeness, processes with a quality level of "very good" account for 99% of the value for climate change indicator. For geographical and time representativeness, processes level of "very good" is obtained.

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2022 – 31.12.2022 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Assumptions and estimates

The impacts of the representative product were aggregated using a weighted average. Process scrap from extrusion billets is considered that has never fulfilled its purpose as a product and is remelted once more. According to the data adopted for the Ecoinvent 3.9.1 the scrap database, pre-consumer and post-consumer is not burdened with the environmental impacts, however, scrap processing impacts were included. Coverage of profiles (anodizing or painting)with coatings was taken into account as weighted averages for the entire population of products.

Calculation rules

LCA was done in accordance with ITB PCR A document. Characterization factors are CML ver. 4.2 (GWP) and other based on EN 15804+A2. ITB-LCA own algorithms were used for impact calculations. A1 was calculated based on data from the specific data from manufacturing plant and using database (European Area) for resources (primary ingots, oils, mixed alloys). A3 and A2 are calculated based on the specific input data.

Databases

The data for the processes come from the following databases: Ecoinvent v.3.9.1, specific EPDs for ingots producers. Specific data quality analysis was a part of external audit.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 kg of the aluminium profiles produced by Extral Sp. z o.o.

Table 3. System boundaries for the environmental characteristic of the aluminium profiles

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	MD	MND	MND	MND	MND	MND	MND	MND	MD	MD	MD	MD	MD

Table 4. Life cycle assessment (LCA) results of the aluminium profiles produced by Extral Sp. z o.o. – environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	5.66E+00	1.37E-01	3.42E-01	6.14E+00	1.67E-02	5.82E-03	3.49E-03	3.54E-02	5.88E-01	1.06E-04	-1.09E+00
Greenhouse potential - fossil	eq. kg CO_2	5.69E+00	1.36E-01	3.34E-01	6.16E+00	1.66E-02	5.71E-03	3.42E-03	3.52E-02	5.88E-01	1.05E-04	-1.07E+00
Greenhouse potential - biogenic	eq. kg CO_2	1.86E-02	4.66E-04	8.76E-03	2.78E-02	5.68E-05	1.67E-04	1.00E-04	1.20E-04	8.43E-03	2.68E-07	-7.34E-03
Global warming potential - land use and land use change	eq. kg CO_2	1.70E-01	5.35E-05	1.06E-04	1.70E-01	6.52E-06	2.00E-06	1.20E-06	1.38E-05	1.01E-04	9.94E-08	-1.44E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	7.53E-07	3.15E-08	1.26E-08	7.97E-07	3.85E-09	1.17E-10	7.00E-11	8.15E-09	5.90E-09	4.26E-11	-8.09E-08
Soil and water acidification potential	eq. mol H+	7.17E-02	5.53E-04	3.35E-03	7.56E-02	6.75E-05	6.33E-05	3.80E-05	1.43E-04	3.20E-03	9.90E-07	-1.04E-02
Eutrophication potential - freshwater	eq. kg P	4.29E-03	9.16E-06	5.64E-04	4.86E-03	1.12E-06	1.08E-05	6.50E-06	2.37E-06	5.48E-04	9.81E-09	-5.24E-04
Eutrophication potential - seawater	eq. kg N	9.22E-03	1.67E-04	4.92E-04	9.88E-03	2.04E-05	9.17E-06	5.50E-06	4.32E-05	4.64E-04	3.45E-07	-9.86E-04
Eutrophication potential - terrestrial	eq. mol N	9.21E-02	1.82E-03	4.13E-03	9.80E-02	2.22E-04	7.75E-05	4.65E-05	4.71E-04	3.92E-03	3.77E-06	-9.77E-03
Potential for photochemical ozone synthesis	eq. kg NMVOC	3.32E-02	5.58E-04	1.17E-03	3.49E-02	6.80E-05	2.17E-05	1.30E-05	1.44E-04	1.10E-03	1.10E-06	-3.39E-03
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.11E-05	4.83E-07	1.48E-06	2.30E-05	5.89E-08	2.78E-08	1.67E-08	1.25E-07	1.41E-06	2.42E-10	-6.65E-06
Abiotic depletion potential - fossil fuels	MJ	1.27E+02	2.02E+00	5.69E+00	1.34E+02	2.47E-01	9.67E-02	5.80E-02	5.23E-01	4.89E+00	2.89E-03	-1.35E+01
Water deprivation potential	eq. m^3	1.11E+01	9.35E-03	1.06E-01	1.13E+01	1.14E-03	2.00E-03	1.20E-03	2.42E-03	1.01E-01	9.16E-06	-1.09E+00

Table 5. Life cycle assessment (LCA) results of the aluminium profiles produced by Extral Sp. z o.o. – additional impacts indicators (DU: 1 kg)

Indicator	Unit	A1-A5	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 6. Life cycle assessment (LCA) results of the aluminium profiles produced by Extral Sp. z o.o. - the resource use (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	4.32E+01	2.90E-02	3.73E-01	4.36E+01	3.54E-03	7.17E-03	4.30E-03	3.54E-03	7.70E-01	8.54E-05	-4.10E+00
Consumption of renewable primary energy resources used as raw materials	MJ	6.63E-01	0.00E+00	0.00E+00	6.63E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	4.39E+01	2.90E-02	3.74E-01	4.43E+01	3.54E-03	7.17E-03	4.30E-03	3.54E-03	7.70E-01	8.54E-05	-4.10E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.26E+02	2.02E+00	5.04E+00	1.33E+02	2.47E-01	9.70E-02	5.82E-02	2.47E-01	9.10E+00	5.26E-03	-1.35E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.08E+00	0.00E+00	0.00E+00	1.08E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	1.27E+02	2.02E+00	5.77E+00	1.34E+02	2.47E-01	9.70E-02	5.82E-02	2.47E-01	9.10E+00	5.26E-03	-1.35E+01
Consumption of secondary materials	kg	6.00E-01	6.78E-04	5.05E-04	6.01E-01	8.27E-05	8.83E-06	5.30E-06	8.27E-05	3.26E-02	0.00E+00	9.80-01
Consumption of renew. secondary fuels	MJ	1.29E-02	7.47E-06	2.66E-06	1.29E-02	9.11E-07	4.92E-08	2.95E-08	9.11E-07	1.37E-04	0.00E+00	-3.01E-05
Consumption of non-renewable secondary fuels	MJ	1.20E-04	0.00E+00	4.07E-03	4.19E-03	0.00E+00	7.83E-05	4.70E-05	0.00E+00	0.00E+00	0.00E+00	-1.03E-03
Net consumption of freshwater	m^3	2.45E-01	2.55E-04	1.79E-03	2.47E-01	3.10E-05	2.63E-05	1.58E-05	3.10E-05	5.46E-03	7.59E-07	-2.37E-02

Table 7 Life cycle assessment (LCA) results of the aluminium profiles produced by Extral Sp. z o.o. – waste categories (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	2.52E+00	2.27E-03	1.15E-04	2.52E+00	2.77E-04	1.00E-06	6.00E-07	5.87E-04	1.33E-03	3.07E-06	-2.39E-01
Non-hazardous waste	kg	2.28E+00	4.03E-02	3.40E-03	2.32E+00	4.92E-03	5.20E-05	3.12E-05	1.04E-02	0.00E+00	4.32E-05	-1.54E-01
Radioactive waste	kg	4.22E-04	1.51E-07	5.15E-06	4.27E-04	1.84E-08	7.25E-08	4.35E-08	3.90E-08	5.06E-02	1.92E-08	-1.96E-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	2.63E+00	0.00E+00	0.00E+00
Materials for recycling	kg	8.33E-04	6.26E-06	2.64E-05	8.66E-04	7.64E-07	1.00E-07	6.00E-08	1.62E-06	3.67E-06	5.78E-09	-7.61E-05
Materials for energy recovery	kg	2.13E-06	5.07E-08	4.93E-08	2.23E-06	6.18E-09	8.75E-10	5.25E-10	1.31E-08	0.00E+00	6.85E-11	-3.28E-07
Exported Energy	MJ	1.81E+00	0.00E+00	1.53E-02	1.83E+00	0.00E+00	2.88E-04	1.73E-04	0.00E+00	5.06E-06	0.00E+00	-9.73E-03

ANNEX 1. Informative values of environmental impacts for aluminium profiles produced only on the basis of raw material from new Rybnik Plant (EPD no. 763.2025) - producing aluminium only on the basis of recyclate.

Table A1. Life cycle assessment (LCA) results of the aluminium profiles produced by Extral Sp. z o.o. – environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	8.61E-01	1.37E-01	3.42E-01	1.34E+00	1.67E-02	5.82E-03	3.49E-03	1.67E-02	7.60E-01	2.13E-04	-3.68E-02
Greenhouse potential - fossil	eq. kg CO_2	8.76E-01	1.36E-01	3.34E-01	1.35E+00	1.66E-02	5.71E-03	3.42E-03	1.66E-02	7.59E-01	2.10E-04	-3.30E-02
Greenhouse potential - biogenic	eq. kg CO_2	-1.41E-02	4.66E-04	8.76E-03	-4.85E-03	5.68E-05	1.67E-04	1.00E-04	5.68E-05	5.32E-04	2.12E-06	-2.36E-04
Global warming potential - land use and land use change	eq. kg CO_2	2.27E-03	5.35E-05	1.06E-04	2.43E-03	6.52E-06	2.00E-06	1.20E-06	6.52E-06	1.34E-03	2.13E-07	-3.48E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	7.07E-08	3.15E-08	1.26E-08	1.15E-07	3.85E-09	1.17E-10	7.00E-11	3.85E-09	2.27E-08	6.40E-11	-1.17E-09
Soil and water acidification potential	eq. mol H+	7.01E-03	5.53E-04	3.35E-03	1.09E-02	6.75E-05	6.33E-05	3.80E-05	6.75E-05	6.74E-03	1.78E-06	-4.05E-04
Eutrophication potential - freshwater	eq. kg P	8.11E-04	9.16E-06	5.64E-04	1.38E-03	1.12E-06	1.08E-05	6.50E-06	1.12E-06	3.19E-04	6.11E-08	-2.74E-05
Eutrophication potential - seawater	eq. kg N	1.31E-03	1.67E-04	4.92E-04	1.97E-03	2.04E-05	9.17E-06	5.50E-06	2.04E-05	9.84E-04	6.13E-07	-9.75E-05
Eutrophication potential - terrestrial	eq. mol N	1.19E-02	1.82E-03	4.13E-03	1.79E-02	2.22E-04	7.75E-05	4.65E-05	2.22E-04	1.07E-02	6.66E-06	-1.62E-04
Potential for photochemical ozone synthesis	eq. kg NMVOC	5.03E-03	5.58E-04	1.17E-03	6.75E-03	6.80E-05	2.17E-05	1.30E-05	6.80E-05	4.02E-03	1.93E-06	-2.18E-06
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	5.77E-06	4.83E-07	1.48E-06	7.73E-06	5.89E-08	2.78E-08	1.67E-08	5.89E-08	1.68E-05	7.13E-10	-4.85E-07
Abiotic depletion potential - fossil fuels	MJ	3.04E+01	2.02E+00	5.69E+00	3.81E+01	2.47E-01	9.67E-02	5.80E-02	2.47E-01	9.10E+00	4.86E-03	-9.84E-01
Water deprivation potential	eq. m^3	3.85E-01	9.35E-03	1.06E-01	5.00E-01	1.14E-03	2.00E-03	1.20E-03	1.14E-03	2.44E-01	2.82E-05	-1.62E-01

Table A2. Life cycle assessment (LCA) results of the aluminium profiles produced by Extral Sp. z o.o. – additional impacts indicators (DU: 1 kg)

Indicator	Unit	A1-A5	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 A3. Life cycle assessment (LCA) results of the aluminium profiles produced by Extral Sp. z o.o. - the resource use (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.08E+00	2.90E-02	3.73E-01	2.48E+00	3.54E-03	7.17E-03	4.30E-03	3.54E-03	7.70E-01	8.54E-05	-8.81E-01
Consumption of renewable primary energy resources used as raw materials	MJ	1.71E-01	0.00E+00	0.00E+00	1.71E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.74E-03
Total consumption of renewable primary energy resources	MJ	2.25E+00	2.90E-02	3.74E-01	2.66E+00	3.54E-03	7.17E-03	4.30E-03	3.54E-03	7.70E-01	8.54E-05	-8.21E-01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.03E+01	2.02E+00	5.04E+00	3.74E+01	2.47E-01	9.70E-02	5.82E-02	2.47E-01	9.10E+00	5.26E-03	-2.40E+00
Consumption of non-renewable primary energy resources used as raw materials	MJ	2.38E-01	0.00E+00	0.00E+00	2.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.47E-04
Total consumption of non-renewable primary energy resources	MJ	3.05E+01	2.02E+00	5.77E+00	3.83E+01	2.47E-01	9.70E-02	5.82E-02	2.47E-01	9.10E+00	5.26E-03	-1.27E+00
Consumption of secondary materials	kg	1.10E+00	6.78E-04	5.05E-04	1.10E+00	8.27E-05	8.83E-06	5.30E-06	8.27E-05	3.26E-02	0.00E+00	-8.89E-03
Consumption of renew. secondary fuels	MJ	5.82E-03	7.47E-06	2.66E-06	5.83E-03	9.11E-07	4.92E-08	2.95E-08	9.11E-07	1.37E-04	0.00E+00	-1.23E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	4.07E-03	4.07E-03	0.00E+00	7.83E-05	4.70E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater	m^3	2.59E-02	2.55E-04	1.79E-03	2.80E-02	3.10E-05	2.63E-05	1.58E-05	3.10E-05	5.46E-03	7.59E-07	-4.56E-03

Table A4 Life cycle assessment (LCA) results of the aluminium profiles produced by Extral Sp. z o.o. – waste categories (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	7.27E-02	2.27E-03	1.15E-04	7.51E-02	2.77E-04	1.00E-06	6.00E-07	2.77E-04	5.79E-02	7.66E-09	-1.64E-02
Non-hazardous waste	kg	3.80E+00	4.03E-02	3.40E-03	3.84E+00	4.92E-03	5.20E-05	3.12E-05	4.92E-03	1.33E+00	2.01E-02	-2.99E-01
Radioactive waste	kg	4.00E-02	1.51E-07	5.15E-06	4.00E-02	1.84E-08	7.25E-08	4.35E-08	1.84E-08	1.07E-05	2.96E-08	-8.65E-02
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	0.00E+00
Materials for recycling	kg	4.29E-02	6.26E-06	2.64E-05	4.29E-02	7.64E-07	1.00E-07	6.00E-08	7.64E-07	5.91E-02	0.00E+00	-2.26E-03
Materials for energy recovery	kg	5.86E-07	5.07E-08	4.93E-08	6.86E-07	6.18E-09	8.75E-10	5.25E-10	6.18E-09	9.35E-07	0.00E+00	-2.09E-08
Exported Energy	MJ	1.13E-02	0.00E+00	1.53E-02	2.66E-02	0.00E+00	2.88E-04	1.73E-04	0.00E+00	6.44E-03	0.00E+00	-1.80E-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 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.1.3.) ☒ external ☐ internal
External verification of EPD: PhD. Eng. Halina Prejzner LCI audit and input data 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, v1.6)
- 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
- CRU Group. Carbon footprint by cold metal by country - https://www.crugroup.com/about-cru/
- EAA 2020 - Circular Aluminium Action Plan - A strategy for achieving aluminium's full potential for circular economy by 2030.
- European Life Cycle Database. ELCD 3.2. http://eplca.jrc.ec.europa.eu/ELCD3/index.xhtml?stock=default
- Ecoinvent Database. http://www.ecoinvent.org/database/.
- Life-Cycle inventory data for aluminium production and transformation processes in Europe. Environmental Profile Report. February 2018.
- Aluminium Recycling in LCA – European Aluminium Association, 2013.
- https://ecoinvent.org/

LCA,LCI, input data verification
Michał Piasecki, PhD.
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CERTIFICATE № 260/2023
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Aluminium profiles

Manufacturer:

EXTRAL Sp. z o.o.

ul. Wygoda 2, 44-240 Żory, 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 6th October 2023 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, October 2023