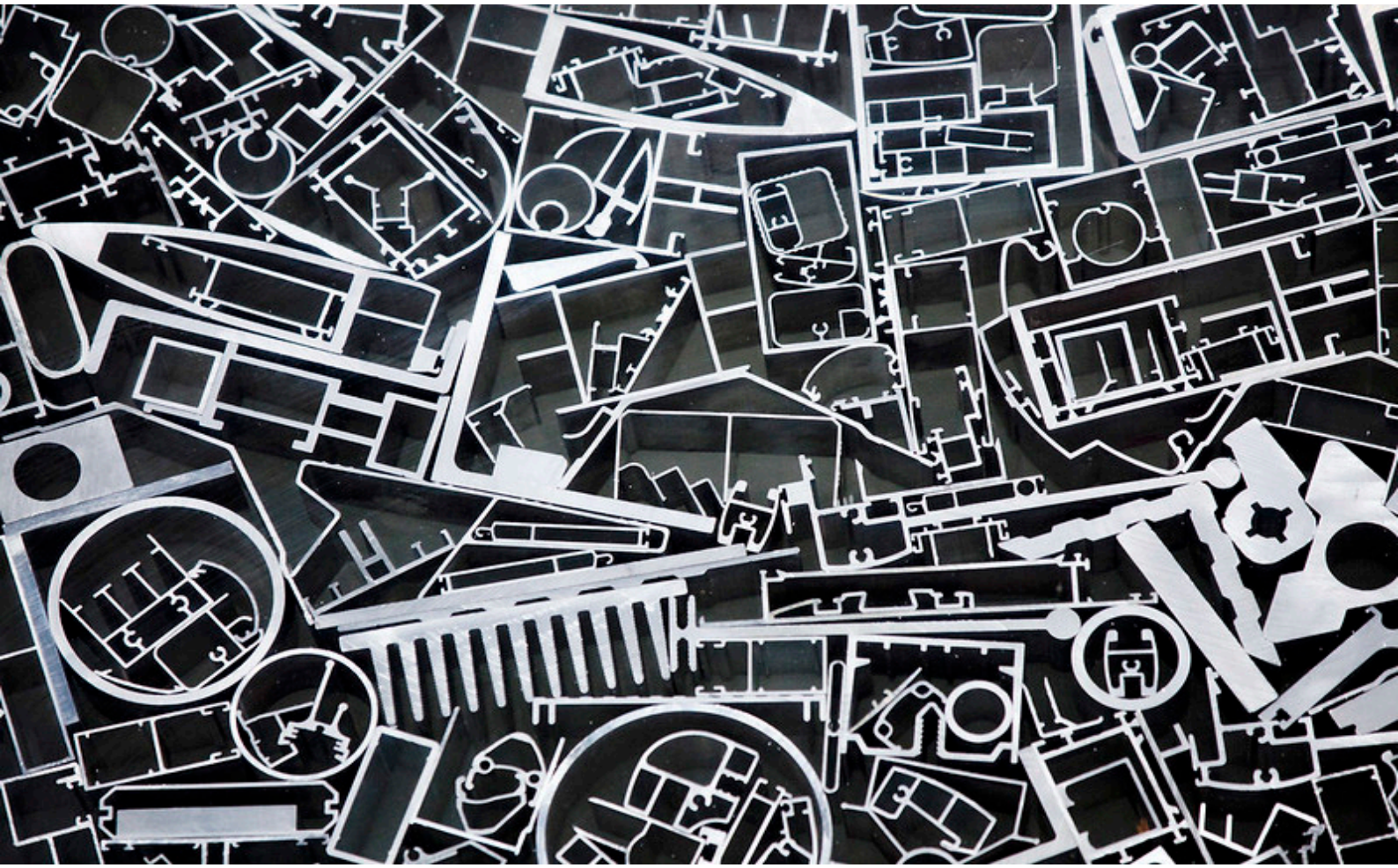
Environmental Product Declaration

S-P-03014

FOR ALUMINIUM PROFILES PRODUCED BY HYDRO EXTRUSION SPAIN S.A.U. LA SELVA

In accordance with ISO 14025 and EN 15804:2012+A2:2019



EPD Program	The International EPD® System, www.environdec.com
Programme operator	EPD International AB
CPC Code	41532 Bars, rods and profiles, of aluminium
Based on	PCR 2019:14 v1.11 Construction products
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Market coverage	Europe

Hydro

Hydro is a fully integrated aluminium company with 35,000 employees in 40 countries on all continents, combining local expertise, worldwide reach and unmatched capabilities in R&D. Hydro is present within all market segments for aluminium, with sales and trading activities throughout the value chain serving more than 30,000 customers.

Our purpose and core values
The *Hydro Way* is our way of doing what we do; it expresses who we are and aspire to be. It has been forged and shaped through more than 100 years of continually finding new and better ways of working. And this is how we will continue to develop innovative products and solutions that benefit our customers and society, now and in the future. We are constantly evolving. But the essence of everything we do remains the same, even though the way we express it may change.

Our purpose is to create a more viable society by developing natural resources into products and solutions in innovative and efficient ways. And these are the values we build on:

- Care: we act with respect for people and the environment and place safety at the heart of our operations.

- Courage: we break new ground and take measured risks with agility, accountability and foresight.

- Collaboration: we work as partners internally and externally to unite competencies and create win-win opportunities.

Products and services
Hydro produces primary aluminium, rolled and extruded products and recycling. In addition, Hydro extracts bauxite, refines alumina and generates energy also offer a variety of services to be the only 360° company of the global aluminium industry.

Hydro provides products and services in industries such as the automobile, transportation, building & construction, infrastructure, industrial design, electronics, Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC), solar and energy or general engineering.

Extruded solutions
In the area of extrusion, Hydro performes both custom high-quality extrusions and ready-made aluminium products and systems.

We provide custom extrusion design and manufacturing including:

- Product development support
- Solutions that are energy-efficient
- Solutions that meet environmental requirements and reduce environmental impact
- Solutions that utilize the strengths of aluminium
- Solutions that satisfy and surpass your expectations

For all cases, our products can be delivered with several surface treatment that strengthen the advantages of aluminium and add a beautiful finish to products.

Hydro Extrusion Spain
In La Selva del Camp (Tarragona), Hydro has a plant specialized in micro-extrusion. These are small profiles that provide great solutions for difficult and critical profile parts, keeping high surface quality.

Clearly focused on customer needs, La Selva offers resources and logistical capabilities to supply domestic and European customers and delivers micro-extrusion and precision profiles for furniture, automotive (roof rails and trims), lighting, shower cabins, and more.

Facilities in La Selva are certified ISO 9001, ISO 14001, IATF 16949 and ASI Performance Standard that covers critical issues for the entire aluminium value chain, including greenhouse gas emissions, waste management, material stewardship, biodiversity and human rights.

Product information

Product description
This EPD covers a wide range of aluminum extrusion products manufactured by Hydro in the form of rod, bar, pipe with standard and innovative shapes.

The products considered in this declaration are as follows:

- Mill finished aluminium profile
- Anodized aluminium profile
- Coated aluminium profile
- High gloss aluminium profile

It excludes downstream fabrication operations such as machining and assembly due to the wide diversity of such operations.

The results are an average representative of all aluminium profiles produced for Hydro in La Selva. Averages are obtained through the production and total consumption in Hydro facilities.

Applications
From customized extrusions to fully fabricated components, aluminium profiles are used in multiple sectors: automobile, transportation, building & construction, infrastructure, industrial design, electronics, HVAC, solar and energy or general engineering. Tailored and finished produtcs are applied in windows, doors, electronics, transportation and thousands of product areas in between.

Technical data
Technical data is representative of 6000 series aluminium alloys (6xxx alloy, tempers T1-T6), which is the predominant production at Hydro.

Composition
Aluminium profiles can be produced as standard or customer design so there is a wide variety of profiles. Therefore, the composition of the final product can also be very different between designs. This EPD covers four product groups with an average composition as shown below.

Hydro is dedicated to serving you by providing high quality extruded products that meet all applicable regulations, including REACH Regulation (EC) 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals. And directive 2011/65/EU of the European Parliament and of the Council (RoHS 2 Directive) which lays down rules on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) with a view to contributing to the protection of human health and the environment, including the environmentally sound recovery and disposal of waste EEE.

Hydro is committed to the ethical sourcing of any minerals used in its production process and particularly to the sourcing of the so-called conflict minerals (ores and concentrates containing tin, tantalum or tungsten, and gold, mined or produced in areas in a state of armed conflict or fragile post-conflict as well as areas witnessing weak or non-existent governance and security). In addition to this commitment, Hydro must meet regulatory obligations and specific customer requirements.

Packaging
Aluminium profiles are packaged using lumber, plastic film, plastic strapping and cardboard. Packaging is often per customer specification. All packaging materials are recyclable and/or reusable following delivery to the customer. Packaging materials are included in the scope of this EPD; packaging disposal and raw materials packaging, however, are outside the scope.

Reference service life and use phase
Service life for products will vary depending on the final application, but is typically long due to aluminium´s high corrosion resistance. It can accept a service life of 50 years according to bibliography. Similarly, further processing (other than coating, anodizing or thermal improvement), assembly and/or installation of extruded aluminum products are outside the scope of this EPD.

Property		
Young's modulus	68 - 80 GPa	UNE-EN ISO 6892
Yield strength (elastic limit)	95 - 610 Mpa	UNE-EN ISO 6892
Tensile strength	180 - 620 Mpa	UNE-EN ISO 6892
Hardness - Vickers	60 - 160 HV	UNE-EN ISO 6507
Fatigue strength (10^7 cycles)	57 - 210 Mpa	UNE 7118
Density		2550 – 2900 kg/m^3
Melting point		495 - 640 °C
Thermal conductivity		118 - 174 W/m.°C
Specific heat capacity		890 - 1020 J/kg.°C

Recycling and disposal

Aluminium products are highly recyclable. During aluminium profile production, all post-industrial scrap (extrusion drop-offs from cutting, unfit material and discards, etc.) is fed back into the billet production process.

In the same way, when an aluminium product reaches the end of its life, it is systematically and selectively collected and sent to recycling facilities for secondary billet production. For example, a collection rate for aluminium products next to 95% is well documented in construction sector.

In both cases recycling rate depends on smelting yield that includes metal losses during scrap preparation and melting. Smelting yield is highy influenced by the presence of non aluminium material (as TBB and/or coating) and the origin of the scrap (post-industrial or post-consumer).

Hence, aluminium supply at the beginning of the product system has a content of recycled material with the consequent reduction of environmental burdens. In module D are reported only the net benefits of recycling, i.e. the recycling benefits at the end of life minus the benefits already considered in the module A1 due to secondary aluminium content. In this EPD, the scrap not collected at the end of life is sent to landfill.

The sources of aluminium billet are:

Recycling plants (remelters)	53.4 %
Primary smelters	46.6 %

Based on metal feedstock information of these sources colleted for La Selva, the metal composition is shown in the following table.

	High gloss	Mill finished/Anodized	Coated
Aluminium profile	**100%**	**100%**	**95.4%**
Aluminium		93-96%	
Magnesium		0.5-1.5%	
Silicon		0.5-1.5%	
Others		<0.2%	
Post-consumer scrap	0 %		18.1%
Pre-consumer scrap	0 %		24.4%
Renewable material	0 %		0%
Biogenic carbon dioxide	0 %		0%
Coating (polyester)	**-**	**-**	**4.6%**
Post-consumer material	**-**	-	0%
Renewable material	**-**	-	0%
Packaging		**0.042 kg**	
Wood		0.014 kg - 1.4% (*)	
Cardboard		0.025 kg - 2.5% (*)	
Polyester		0.0013 kg - 0.13% (*)	
Plastic film		0.0013 kg - 0.13% (*)	
Biogenic carbon dioxide		0.060 kg	

(*) Versus product

Hydro
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Hydro

LCA Information

Declared unit
The declared unit is the production of 1 kg of aluminium profile including the surface treatment (coating or anodization).

To obtain the environmental information referred to a 1 meter of profile, conversion factors are provided for 4 products: mill finished and anodized profiles, 0.295 kg/m; coated profile, 0.332 kg/m.

Goal and scope
This EPD evaluates the environmental impacts of 1 kg aluminium profile product from cradle to gate with option (disposal). This EPD is the basis for B2B communication. Intended use clients and relevant stakeholders within the value chain of aluminium products.

System boundaries
This EPD provides information on the production stage of the aluminium profiles (raw material supply, transport to plants and manufacturing) and their end-of-life. Recycling potential of aluminium with burdens saving due to use in a second product systems is also reported. The information is presented in a modular way separated in the following stages.

A1-3 - Cradle to gate
This module represents the extraction and processing of raw materials, the transport to production sites and the manufacture and packaging of aluminium profiles.

The electricity consumed at plant has been adapted to specific power mix supply with total emissions of 0.425 kg CO_2 eq/kWh.

The aggregation of the modules A1, A2 and A3 is allowed by EN 15804. This rule is applied in this EPD and denoted by A1-3.

A4 - Distribution
For the transport towards clients a weighted distance, based on Hydro's clients location, has been considered.

C1 - Dismantling
No information was found in the life cycle databases consulted for the dismantling operations of elements nor was there a bibliography regarding the inputs or residues generated during these operations. Then, there is no contribution on impact categories of this module.

C2 - Transport to waste processing
A distance of 200 km has been assumed for the transport to scrap dealers. Transport is calculated on the basis of a scenario with the parameters described in the attached table.

C3 - Waste processing for reuse, recovery and/or recycling
It has been assumed that during the scrapping operations the same electricity is consumed as during the assembly of a window of 1.23 mx 1.48 m with a profile thickness between 45 and 70 mm.

C4 - Final disposal
Recovery rates for aluminium during building dismantling are modelled based on figures reported by the European Aluminium Association (see references). It was assumed a 95% for recovery rate while the remaining 5% goes to landfill. Similar, or ever higher figures for recovery rates can be achieved in other sectors.

Stage	Production			Construction		Use							End-of-life				Resource recovery
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Module	Raw materials supply	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Dismantling	Transport	Waste processing	Disposal	Reuse, recovery or recycling potentials
Declared module	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	EU	-	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data	90.6%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	+0.3% / -0.7%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

ND - Not declared

D - Benefits and loads beyond the product system
In order to obtain the net post-consumer scrap output from the product system, the input of post-consumer scrap is subtracted from post-consumer scrap to be recycled at end of life. Module D reports the burdens and benefits of the recycling of this remaining net scrap. Benefits are assessed at the point of functional equivalence, i.e. where the substitution of primary aluminium takes place. In the recycling process, smelting yield for post-consumer scrap was also taken into account.

In order to make the results tables lighter, will be shown only declared modules with a non-zero contribution to the impact categories declared in this EPD.

Time representativeness
All primary data used in this EPD are based on the 2017, 2018 and 2019 production data for aluminium profiles manufactured by HYDRO in their facilities.

Database(s) and LCA software used
The data for primary aluminium consumed in Europe and for post-consumer scrap remelting are based on LCI dataset published by European Aluminium in february 2018 and are the best available. These dataset have been used to characterize the average of environmental burdens for process scrap and for processess involved in module D. Ecoinvent v3.3 database has been adapted for primary aluminium consumed in La Selva. Data were modelled to specific aluminium provider of Hydro. Other LCI datasets were also sourced from Ecoinvent v3.3.

The LCA study was performed using an excel-based model. The impact assessment results were calculated using characterization factors obtained from Simapro software.

Data Quality
In order to achieve precision, consistency and representativeness and to ensure reliable results, first-hand industry data were used. All foreground data were collected from HYDRO for their facilities using customized data collection templates. It was created representative production inventories. These inventories are intended to represent average of aluminium profile production for building by HYDRO in La Selva.. The age of these data is less than three years. As for bibliographic data, none has been used with a year of publication lower than 2011.

Regionally specific datasets were used to model the energy consumption (electricity, natural gas or diesel). For the processes of transport, production of raw materials or end-of-life, datasets were chosen according to their technological and geographical representation of the actual process.

In accordance with Annex E of the EN 15804 + A2, a data quality assessment was perfomed. For technical representativeness, processes with a quality level of "very good" account for 95.1% of the value for climate change indicator. For geographical and time representativeness, processes with a quality level of "very good" account for 91.3% and 83.6% respectively.

Estimates and Assumptions
Post-consumer scrap was modeled as burden free when entering the system althought it was included transport to plant. Process scrap is considered as aluminium that has never fullfilled its purpose as a product and is remelted once more. So that process scrap is given the same burdens of aluminium mix consumed in Europe. In order to calculate them, LCI dataset published by European Aluminium for primary (European production and imports) and secondary aluminium have been used.

In module D are reported only the burdens and benefits of the net output flow of post-consumer scrap. These figures are based on LCI dataset published by European Aluminium for remelting scrap and the sustitution of aluminium consumed in Europe

Disposal and recovery rates are modelled based on figures reported by the European Aluminium (see references) for building & construction sector. It was assumed a 95% for recovery rate while the remaining 5% goes to landfill.

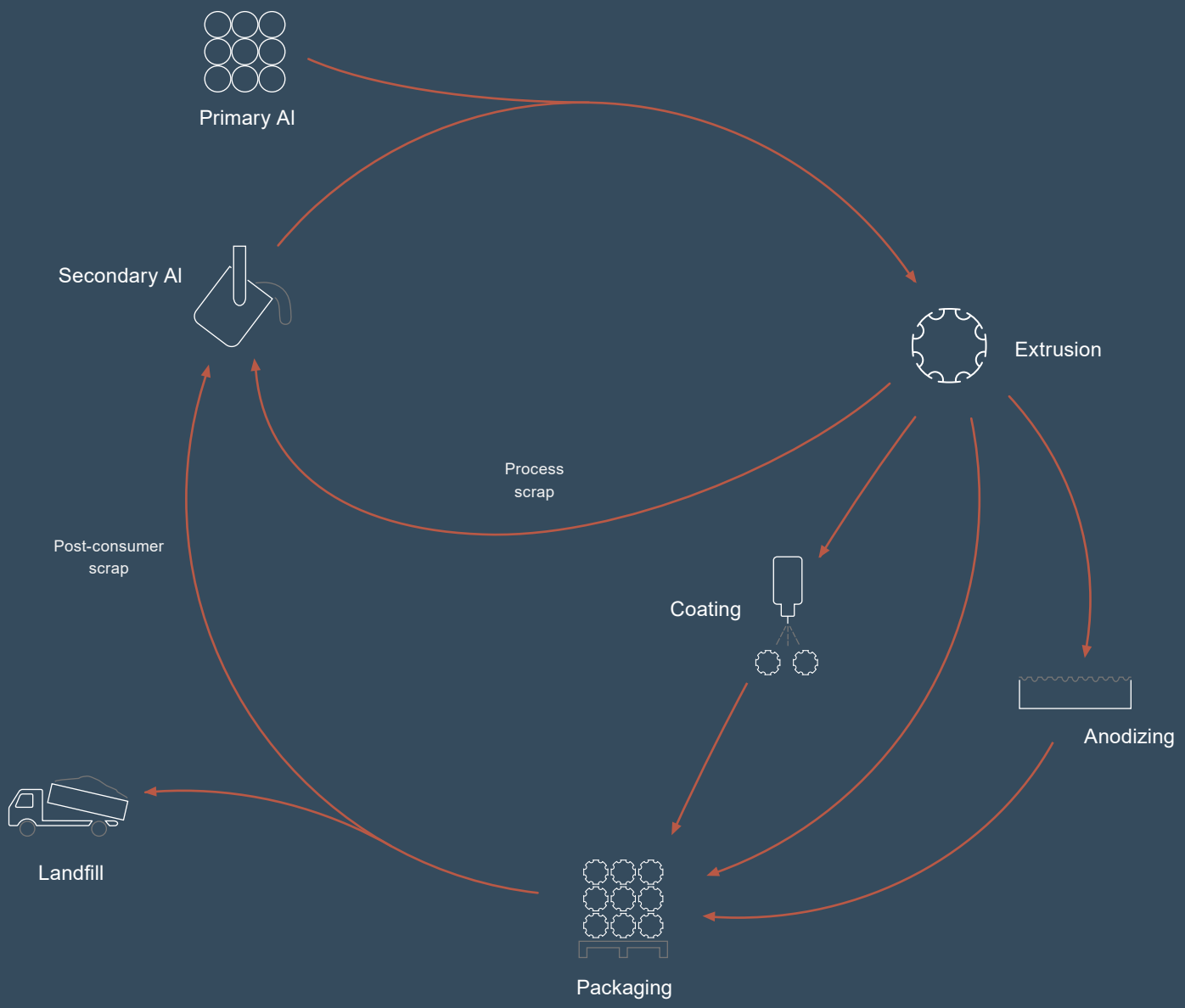
Allocation
Energy consumption in extrusion process was apportioned among the total production of extruded profiles. It has proceeded in the same way for raw materials and waste generation.

Because tens of different chemicals are used for surface treatments before coating and anodizing, their consumption were modeled based on the surface of an average profile. The surface treatments chosen are the most complete and those that require the use of the greatest amount of chemicals per square meter of treated surface, thus attending to a conservative assumption.

In the extrusion process an allocation has been made between the useful profile and the process scrap. This allocation is consistent with the fact that the process scrap used in billet production shares burdens of the original billet from which it is produced.

Cut-off criteria
All raw materials and packaging are included in the analysis as well as the energy for manufacturing. In the same way, all manufacturing waste (including hazardous waste) is accounted for.

The construction of the manufacturing site (capital goods) in not included. The modules A4, A5, and from B1 to B7 are excluded as they are dependent of the specific product application.



A4 module parameters	
Transport by road	Transport, freight, lorry >32 metric
Diesel consumption (l/km)	0.35
Weighted distance (km)	1765
Mass capacity utilisation	67%

C2 module parameters	
Transport by road	Transport, freight, lorry
Diesel consumption (l/km)	0.221
Distance (km)	200
Mass capacity utilisation	67%

C3 module parameters	
Energy carrier	Electricity, low voltage {ES}
Consumption (kWh)	0.0245
Waste (landfill)	0.05 kg

Environmental Information

Mill finished aluminium profile

Environmental Impacts	Units	A1-3	A4	C2	C3	C4	D
CC-2013	kg CO_2 eq	6,28	1,91E-01	2,17E-02	1,07E-02	9,95E-04	-5,67
CC-total	kg CO_2 eq	6,42	2,18E-01	2,47E-02	1,14E-02	1,12E-03	-5,70
CC-fossil	kg CO_2 eq	6,41	2,18E-01	2,47E-02	1,13E-02	1,12E-03	-5,69
CC-biogenic	kg CO_2 eq	3,55E-03	0	0	9,86E-06	0	-1,46E-03
CC-luluc	kg CO_2 eq	2,16E-03	0	0	4,18E-05	0	-1,06E-03
OD	kg CFC-11 eq	2,16E-07	6,56E-08	7,43E-09	1,32E-09	1,05E-10	-8,00E-11
A	mol H^+ eq	4,38E-02	8,29E-04	9,39E-05	8,84E-05	4,41E-06	-3,33E-02
EAF	kg PO_4^{-3} eq	2,88E-03	1,50E-04	1,70E-05	1,39E-05	2,02E-05	-1,77E-03
EMF	kg N eq	3,05E-03	1,68E-04	1,90E-05	1,23E-05	2,42E-06	-4,83E-03
ET	mol N eq	3,28E-02	1,83E-03	2,08E-04	1,26E-04	1,54E-05	-5,26E-02
POF	kg NMVOC eq	9,90E-03	7,02E-04	7,96E-05	3,52E-05	4,53E-06	-1,45E-02
AD-non fossil	kg Sb eq	1,09E-05	7,96E-06	9,02E-07	7,59E-09	1,13E-08	-2,81E-06
AD-fossil	MJ	72,8	4,359	0,494	0,213	1,40E-02	-59,3
WU	m^3 eq	57	1,23E-02	1,40E-03	0	2,12E-04	-0,609
PM	disease inc.	5,09E-07	1,84E-08	2,08E-09	1,77E-10	3,97E-11	-4,65E-07
IR	kBq U235 eq	0,956	2,25E-02	2,55E-03	4,79E-03	5,06E-05	-0,801
EF	CTUe	20,5	3,511	0,398	7,69E-02	1,23E-02	-0,253
HT - cancer	CTUh	4,07E-07	9,78E-11	1,11E-11	3,64E-10	1,72E-10	-9,18E-09
HT - non cancer	CTUh	5,46E-07	3,70E-09	4,19E-10	1,60E-09	1,40E-10	-2,36E-07
LU	Pt	23,7	3,05E+00	0,345	8,30E-02	4,32E-03	-1,33
Resource use							
PERE	MJ	38,2	6,24E-02	7,07E-03	3,31E-02	2,55E-04	-31,9
PERM	MJ	0	0	0	0	0	0
PERT	MJ	38,2	6,24E-02	7,07E-03	3,31E-02	2,55E-04	-31,9
PENRE	MJ	89,2	4,628	0,524	0,217	1,43E-02	-70,1
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	89,2	4,628	0,524	0,217	1,43E-02	-70,1
SM	kg	0,181	0	0	0	0	0,697
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3 eq	1,69	0	0	7,12E-02	0	-0,249
Waste categories							
HWD	kg	0,347	0	0	0	1,95E-08	-0,369
NHWD	kg	1,402	0	0	0	8,65E-05	-1,71
RWD	kg	6,28E-03	0	0	0	0	-4,19E-03
Output Flows							
CRU	kg	0	0	0	0	0	0
MFR	kg	0,446	0	0	0	0	0
MER	kg	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0

Anodized aluminium profile

Environmental Impacts	Units	A1-3	A4	C2	C3	C4	D
CC-2013	kg CO_2 eq	7,57	1,91E-01	2,17E-02	1,07E-02	9,95E-04	-5,66
CC-total	kg CO_2 eq	7,78	2,18E-01	2,47E-02	1,14E-02	1,12E-03	-5,69
CC-fossil	kg CO_2 eq	7,77	2,18E-01	2,47E-02	1,13E-02	1,12E-03	-5,68
CC-biogenic	kg CO_2 eq	4,93E-03	0	0	9,86E-06	0	-1,46E-03
CC-luluc	kg CO_2 eq	4,99E-03	0	0	4,18E-05	0	-1,06E-03
OD	kg CFC-11 eq	4,77E-07	6,56E-08	7,43E-09	1,32E-09	1,05E-10	-7,98E-11
A	mol H^+ eq	6,30E-02	8,29E-04	9,39E-05	8,84E-05	4,41E-06	-3,33E-02
EAF	kg PO_4^{-3} eq	5,22E-03	1,50E-04	1,70E-05	1,39E-05	2,02E-05	-1,77E-03
EMF	kg N eq	4,27E-03	1,68E-04	1,90E-05	1,23E-05	2,42E-06	-4,82E-03
ET	mol N eq	4,51E-02	1,83E-03	2,08E-04	1,26E-04	1,54E-05	-5,25E-02
POF	kg NMVOC eq	1,41E-02	7,02E-04	7,96E-05	3,52E-05	4,53E-06	-1,45E-02
AD-non fossil	kg Sb eq	2,60E-05	7,96E-06	9,02E-07	7,59E-09	1,13E-08	-2,80E-06
AD-fossil	MJ	95,0	4,359	0,494	0,213	1,40E-02	-59,2
WU	m^3 eq	57	1,23E-02	1,40E-03	0	2,12E-04	-0,608
PM	disease inc.	5,52E-07	1,84E-08	2,08E-09	1,77E-10	3,97E-11	-4,64E-07
IR	kBq U235 eq	1,277	2,25E-02	2,55E-03	4,79E-03	5,06E-05	-0,799
EF	CTUe	44,6	3,511	0,398	7,69E-02	1,23E-02	-0,253
HT - cancer	CTUh	4,77E-07	9,78E-11	1,11E-11	3,64E-10	1,72E-10	-9,16E-09
HT - non cancer	CTUh	1,44E-06	3,70E-09	4,19E-10	1,60E-09	1,40E-10	-2,36E-07
LU	Pt	32,4	3,05E+00	0,345	8,30E-02	4,32E-03	-1,33
Resource use							
PERE	MJ	40,7	6,24E-02	7,07E-03	3,31E-02	2,55E-04	-31,8
PERM	MJ	0	0	0	0	0	0
PERT	MJ	40,7	6,24E-02	7,07E-03	3,31E-02	2,55E-04	-31,8
PENRE	MJ	112,1	4,628	0,524	0,217	1,43E-02	-69,9
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	112,1	4,628	0,524	0,217	1,43E-02	-69,9
SM	kg	0,183	0	0	0	0	0,696
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3 eq	7,72	0	0	7,12E-02	0	-0,248
Waste categories							
HWD	kg	0,351	0	0	0	1,95E-08	-0,368
NHWD	kg	1,769	0	0	0	8,65E-05	-1,71
RWD	kg	6,32E-03	0	0	0	0	-4,18E-03
Output Flows							
CRU	kg	0	0	0	0	0	0
MFR	kg	0,459	0	0	0	0	0
MER	kg	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0

Coated aluminium profile

Environmental Impacts	Units	A1-3	A4	C2	C3	C4	D
CC-2013	kg CO_2 eq	6,80	1,91E-01	2,17E-02	1,07E-02	1,95E-03	-5,37
CC-total	kg CO_2 eq	6,97	2,18E-01	2,47E-02	1,14E-02	2,15E-03	-5,39
CC-fossil	kg CO_2 eq	6,97	2,18E-01	2,47E-02	1,13E-02	2,15E-03	-5,39
CC-biogenic	kg CO_2 eq	4,08E-03	0	0	9,86E-06	3,08E-07	-1,38E-03
CC-luluc	kg CO_2 eq	4,92E-03	0	0	4,18E-05	7,62E-08	-1,00E-03
OD	kg CFC-11 eq	2,83E-07	6,56E-08	7,43E-09	1,32E-09	1,30E-10	-7,57E-11
A	mol H^+ eq	4,67E-02	8,29E-04	9,39E-05	8,84E-05	5,15E-06	-3,15E-02
EAF	kg PO_4^{-3} eq	3,76E-03	1,50E-04	1,70E-05	1,39E-05	3,09E-05	-1,67E-03
EMF	kg N eq	3,64E-03	1,68E-04	1,90E-05	1,23E-05	3,82E-06	-4,57E-03
ET	mol N eq	3,87E-02	1,83E-03	2,08E-04	1,26E-04	1,79E-05	-4,97E-02
POF	kg NMVOC eq	1,21E-02	7,02E-04	7,96E-05	3,52E-05	5,29E-06	-1,37E-02
AD-non fossil	kg Sb eq	1,65E-05	7,96E-06	9,02E-07	7,59E-09	1,15E-08	-2,66E-06
AD-fossil	MJ	80,2	4,359	0,494	0,213	1,54E-02	-56,1
WU	m^3 eq	55	1,23E-02	1,40E-03	0	2,03E-04	-0,576
PM	disease inc.	5,15E-07	1,84E-08	2,08E-09	1,77E-10	4,93E-11	-4,40E-07
IR	kBq U235 eq	1,006	2,25E-02	2,55E-03	4,79E-03	5,92E-05	-0,757
EF	CTUe	26,2	3,511	0,398	7,69E-02	2,19E-01	-0,240
HT - cancer	CTUh	4,47E-07	9,78E-11	1,11E-11	3,64E-10	1,92E-10	-8,68E-09
HT - non cancer	CTUh	6,59E-07	3,70E-09	4,19E-10	1,60E-09	2,28E-09	-2,24E-07
LU	Pt	28,3	3,05E+00	0,345	8,30E-02	7,68E-03	-1,26
Resource use							
PERE	MJ	37,8	6,24E-02	7,07E-03	3,31E-02	3,36E-04	-30,1
PERM	MJ	0	0	0	0	0	0
PERT	MJ	37,8	6,24E-02	7,07E-03	3,31E-02	3,36E-04	-30,1
PENRE	MJ	96,5	4,628	0,524	0,217	1,59E-02	-66,3
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	96,5	4,628	0,524	0,217	1,59E-02	-66,3
SM	kg	0,176	0	0	0	0	0,659
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3 eq	3,42	0	0	7,12E-02	0	-0,235
Waste categories							
HWD	kg	0,353	0	0	0	1,87E-08	-0,349
NHWD	kg	1,474	0	0	0	2,37E-03	-1,62
RWD	kg	6,08E-03	0	0	0	0	-3,96E-03
Output Flows							
CRU	kg	0	0	0	0	0	0
MFR	kg	0,447	0	0	0	0	0
MER	kg	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0

High gloss aluminium profile

Environmental Impacts	Units	A1-3	A4	C2	C3	C4	D
CC-2013	kg CO_2 eq	14,6	0,191	2,17E-02	1,07E-02	9,95E-04	-7,18
CC-total	kg CO_2 eq	15,0	0,218	2,47E-02	1,14E-02	1,12E-03	-7,21
CC-fossil	kg CO_2 eq	15,0	0,218	2,47E-02	1,13E-02	1,12E-03	-7,20
CC-biogenic	kg CO_2 eq	1,45E-03	0	0	9,86E-06	0	-1,85E-03
CC-luluc	kg CO_2 eq	2,17E-03	0	0	4,18E-05	0	-1,34E-03
OD	kg CFC-11 eq	1,08E-06	6,56E-08	7,43E-09	1,32E-09	1,05E-10	-1,01E-10
A	mol H^+ eq	7,44E-02	8,29E-04	9,39E-05	8,84E-05	4,41E-06	-4,22E-02
EAF	kg PO_4^{-3} eq	1,16E-02	1,50E-04	1,70E-05	1,39E-05	2,02E-05	-2,24E-03
EMF	kg N eq	1,06E-02	1,68E-04	1,90E-05	1,23E-05	2,42E-06	-6,11E-03
ET	mol N eq	0,115	1,83E-03	2,08E-04	1,26E-04	1,54E-05	-6,66E-02
POF	kg NMVOC eq	3,76E-02	7,02E-04	7,96E-05	3,52E-05	4,53E-06	-1,83E-02
AD-non fossil	kg Sb eq	3,82E-05	7,96E-06	9,02E-07	7,59E-09	1,13E-08	-3,55E-06
AD-fossil	MJ	201	4,359	0,494	0,213	1,40E-02	-75,0
WU	m^3 eq	1,07	1,23E-02	1,40E-03	0	2,12E-04	-0,771
PM	disease inc.	7,43E-07	1,84E-08	2,08E-09	1,77E-10	3,97E-11	-5,89E-07
IR	kBq U235 eq	0,339	2,25E-02	2,55E-03	4,79E-03	5,06E-05	-1,01
EF	CTUe	252	3,511	0,398	7,69E-02	1,23E-02	-0,321
HT - cancer	CTUh	3,73E-08	9,78E-11	1,11E-11	3,64E-10	1,72E-10	-1,16E-08
HT - non cancer	CTUh	4,32E-07	3,70E-09	4,19E-10	1,60E-09	1,40E-10	-2,99E-07
LU	Pt	33,0	3,05	0,345	8,30E-02	4,32E-03	-1,69
Resource use							
PERE	MJ	2,91	6,24E-02	7,07E-03	3,31E-02	2,55E-04	-40,3
PERM	MJ	0	0	0	0	0	0
PERT	MJ	2,91	6,24E-02	7,07E-03	3,31E-02	2,55E-04	-40,3
PENRE	MJ	219	4,63	0,524	0,217	1,43E-02	-88,7
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	219	4,63	0,524	0,217	1,43E-02	-88,7
SM	kg	0	0	0	0	0	0,882
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3 eq	1,05	0	0	7,12E-02	0	-0,315
Waste categories							
HWD	kg	3,94E-04	0	0	0	1,95E-08	-0,467
NHWD	kg	2,872	0	0	0	8,65E-05	-2,17
RWD	kg	1,84E-04	0	0	0	0	-5,30E-03
Output Flows							
CRU	kg	0	0	0	0	0	0
MFR	kg	0,418	0	0	0	0	0
MER	kg	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0

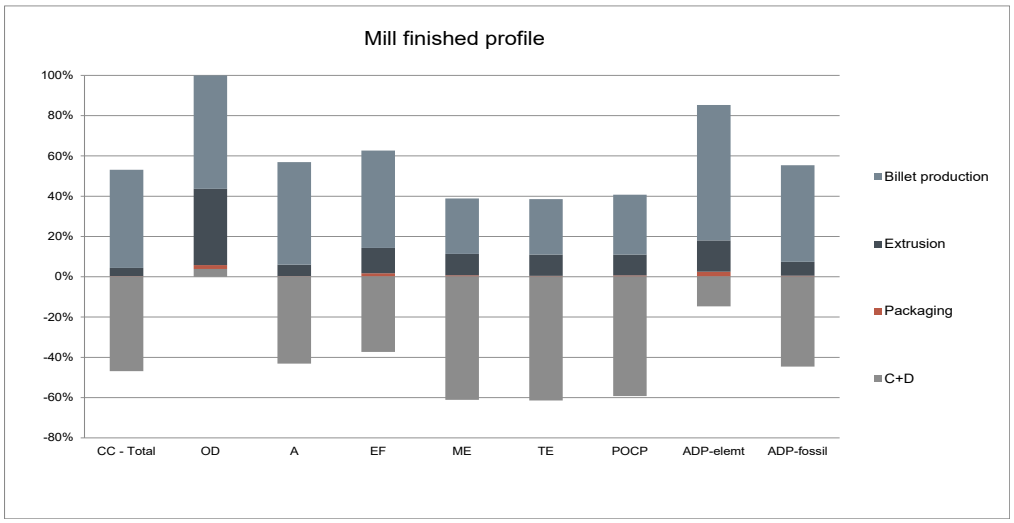
ENVIRONMENTAL IMPACTS - CC-2013: Climatic Change according to EN 15804:2012+A1:2013; CC-total: Climatic Change - total; CC-fossil: Climatic Change - fossil; CC-biogenic: Climate change - biogenic; CC-luluc: Climate change - land use and land use change; OD: Ozone depletion; A: Acidification ; EAF: Eutrophication aquatic freshwater; EAM: Eutrophication aquatic marine; ET: Eutrophication terrestrial; POF: Photochemical ozone formation; AD- non fossil: Abiotic resource depletion - minerals and metals; AD-fossil: Abiotic resource depletion - fossils; WU: Water use; PM: Particulate matter emissions; IR: Ionising radiation; EF: Ecotoxicity - freshwater; HT-cancer: Human toxicity, cancer effects; HT-non cancer: Human toxicity, non-cancer effects; LU: Land use.

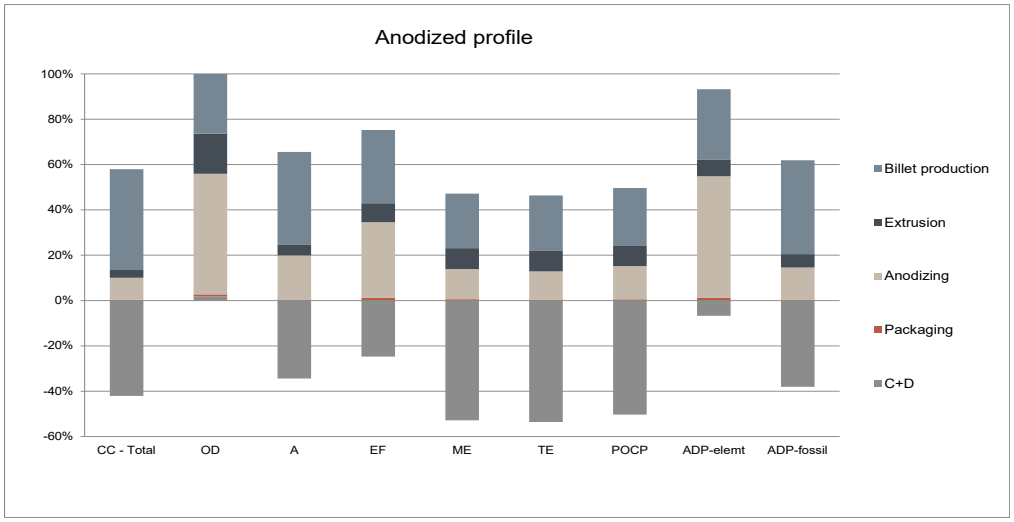
RESOURCE USE - PERE: Renewable primary energy as energy carrier; PERM: Renewable primary energy resource as material utilization; PERT: Total use of renewable primary energy resources; PENRE: Non-renewable primary energy as energy carrier; PENRM: Non-renewable primary energy as material utilization; PENRT: Total use of non-renewable primary energy resources; SM: Use of secondary materials; RSF: Use of renewable secondary fuels; NRSF: Use of non-renewable secondary fuels; FW: Use of net fresh water.

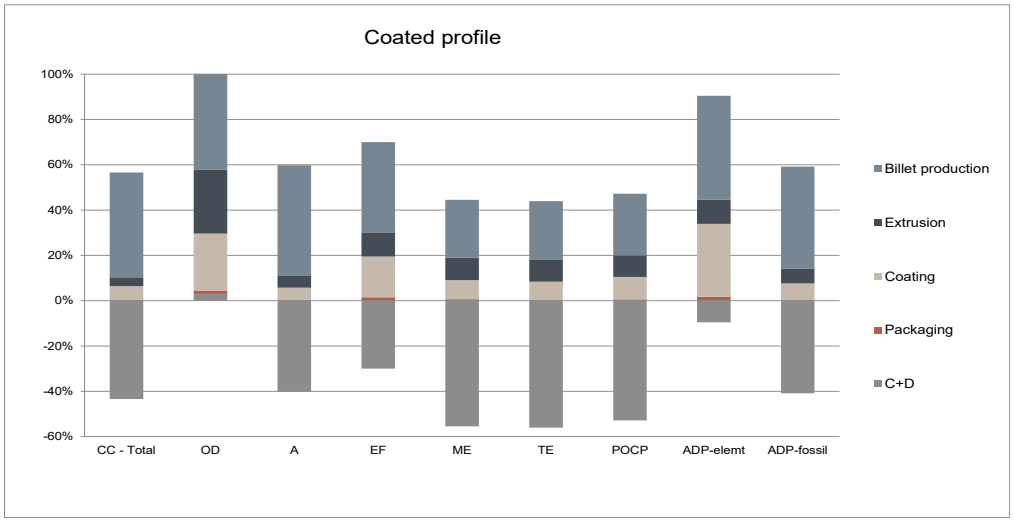
WASTE CATEGORIES - HWD: Hazardous waste disposed; NHWD: Non-hazardous waste disposed; RWD: Radioactive waste disposed.

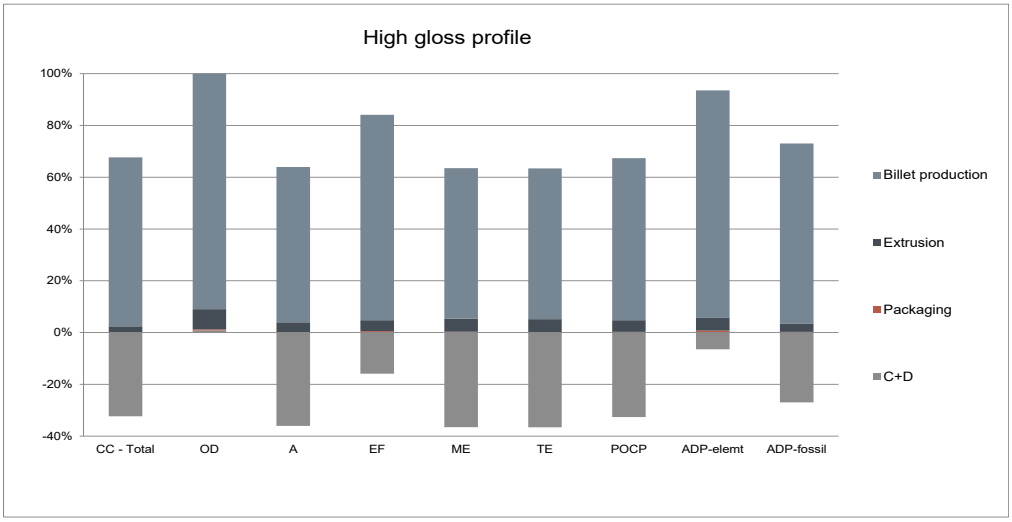
OUTPUT FLOWS - CRU: Components for re-use. MFR: Materials for recycling. MER: Materials for energy recovery; EE Exported energy per energy carrier.

Supplement information









The figures show the contribution of each product stage for the aluminium profiles under study in this EPD.

Additional relevant information

Processed scrap and post-consumer scrap are not matched in this EPD. Process scrap arises during processing of aluminium billets (such as e.g. extruded profiles, cullets, etc.) and it is considered as an aluminium flow that has never fulfilled its purpose as a product, and thus carries the same burdens of the original aluminium billet from which it is produced. Post-consumer scrap, on the other hand, has fulfilled its purpose in its first life cycle, is starting its second life cycle, and has thus no historical burdens attached to it.

Contacts

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EPD Author	IDNÓVAM Innovación y desarrollo para el ambiente Ferranz 56, Bajo 28008 Madrid, Spain info@idnovam.com

References

- General Programme Instructions of The International EPD® System. Version 3.0.
- PCR 2019:14 v1.0 Construction products and construction services
- EN 15804:2012+A2:2019, Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products
- ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental
- ISO 14040-44/ DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment-Principles
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- Aluminium Recycling in LCA – European Aluminium Association, 2013.

Programme Information

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025 and the requirements given in the product category rules document for Construction Products and Construction Services (EN 15804) and the general program guidelines by The International EPD® System. The results shown in this EPD are based on the LCA for HYDRO products according to standard 14044.

This EPD is not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages or are based on different Product Category Rules. EPDs of construction products may not be comparable if they do not comply with EN 15804. The EPD owner is responsible for its content, as well as to preserve supporting documentation during the period of validity that justifies the data and statements that are included.

EPD Program	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com
EPD registration number	S-P-03014
EPD owner	Hydro Extrusion Spain S.A.U.
Functional unit	1 kg of anodized/coated aluminium profile and mill finished aluminium profile
System boundaries	Cradle to gate with options
Published	2021- 03 - 19
Valid until	2026 - 03- 19
Reference year for data	2017-2018-2019
Geographical scope	Worldwide
Product group classification	UN CPC Code: 41532 Bars, rods and profiles, of aluminium
Product Category Rules	PCR 2019:14 v1.11 Construction products. Based on CEN standard EN 15804
PCR review was conducted by	Technical Committee of The International EPD® System www.environdec.com info@environdec.com
Independent verification of the declaration and data, according to ISO 14025:2006	X External Internal EPD Process
Third-party verifier	Eva Martinez Herrero Centro Tecnológico de Miranda de Ebro www. ctme.es evamtz@ctme.es

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