Environmental Product Declaration

THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

FOR HYDRO RECYCLED ALUMINIUM PROFILES PRODUCED BY HYDRO EXTRUSION IBERIA

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

Hydro

EPD Program	The International EPD® System, www.environdec.com
Programme operator	EPD International AB
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Representativeness	Europe

Hydro

Hydro is a fully integrated aluminium company with 32,000 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, 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.

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

Wee 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 IBERIA
In Spain-Portugal, Hydro manufactures and markets extruded aluminium profiles in four plants: Navarra, La Roca, La Selva and Avintes. Hydro offers surface treatment and other added-value operations to transform the profiles into the solutions according to requested requirements. With extensive experience in complex product development, Hydro knows how to produce profiles with stable, controlled and reliable processes delivering solutions for transportation, automotive, and general industry applications.

The production processes in the site include casting of aluminum billets, extrusion of profiles and fabrication of pieces. A large variety of alloys are used to cover a wide range of customer needs.

Facilities in Spain-Portugal are certified ISO 9001, ISO 14001, ISO 50001 and IATF 16949; and also ASI Performance Standard and ASI Chain of custody that covers critical issues for the entire aluminum value chain, including greenhouse gas emissions, waste management, material stewardship, biodiversity and human rights.

Product information

Product description
Hydro Recycled Aluminium profile is an average product manufactured by Hydro Extrusion Iberia in Spain (Navarra, La Selva - Tarragona and La Roca - Barcelona) and Portugal (Avintes).

The products considered in this declaration is mill finished aluminium profile. It excludes downstream fabrication operations such as anodizing, powder coating, machining and assembly due to the wide diversity of such operations.

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 according to bibliography (6xxx alloy, tempers T1-T6), which is the predominant production at Hydro (see below).

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 aluminium profiles with a composition 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 (coating, anodizing or thermal improvement), assembly and/or installation of extruded aluminum products are outside the scope of this EPD.

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

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

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.

Based on metal feedstock information of these sources colleted for Hydro Extrusion Iberia, the metal composition is shown in the following table.

Aluminium profile composition	**1 kg**
Aluminium	93-96%
Magnesium	0.5-1.5%
Silicon	0.5-1.5%
Others	<0.2%
Source of inputs	
Post-consumer scrap	31.8%
Pre-consumer scrap	48.1%
Primary aluminium	20.1%
Renewable material	0%
Biogenic carbon dioxide	0%
Packaging	**0.029 kg**
Wood	0.023 kg - 2.3% (*)
Cardboard	0.0055 kg - 0.5% (*)
Polyester	0.0006 kg - 0.06% (*)
Plastic film	0.0006 kg - 0.06% (*)
Biogenic carbon dioxide	0.045 kg


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Hydro

LCA Information

Declared unit
The declared unit is the production of 1 kg of mill finished aluminium profile, plus its packaging.

Goal and scope
This EPD evaluates the environmental impacts of 1 kg aluminium profile product from cradle to gate with modules C1-C4 and module D. 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 plants has been adapted to specific power mix supply with total emissions of 0.435 kg CO_2 eq/kWh for spanish plants and 0.508 kg CO_2 eq/kWh for Avintes.

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.

C1 - Dismantling
It has been assumed that dismantling operations at the end of life of products made of extruded aluminium profiles are manual and therefore have no environmental impact.

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
This module includes the preparation of post-consumer scrap before it is sent to remelters: shredding, sink and float, cutting and baling, drying and de-oiling and de-laquering.

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.

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
Primary data used in this EPD are based on the production data for aluminium profiles manufactured by HYDRO in their facilities: 2020-2021 average data for significant

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	>98%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	n.a.			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - plants	n.a.			-	-	-	-	-	-	-	-	-	-	-	-	-	-

ND - Not declared

environmental aspects (Bill of Materials and their transport, energy and packaging) and 2017-2018-2019 average data for remaining environmental aspects. The contribution of the environmental aspects updated with 2020-2021 average data represents between 96% and 97% of the indicators related to climate change.

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 v3.8 database has been adapted for primary aluminium consumed in plants under study. Data were modelled to specific aluminium provider of Hydro. Other LCI datasets were also sourced from Ecoinvent v3.8.

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 by HYDRO. 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 98.9% of the value for climate change indicator. For geographical and time representativeness, processes with a quality level of "very good" account for 98.6% and 98.1% respectively.

Estimates and Assumptions

Post-consumer scrap was modeled as burden free when entering the system althought it was included transport to plants. Process or pre-consumer 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, i.e. mix of primary aluminium imported from outside Europe, primary aluminium produced in Europe and produced from post-consumer scrap (Hydro approach). In order to calculate process scrap burdens, 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

It was not possible to distinguish the consumption of electricity and natural gas between the production stages of profiles. Based on the total energy consumption in the plants, electricity and natural gas used in the different stages was estimated under the criteria of the technical staff of plants. Total energy consumption was attributed entirely to billet production and extrusion. The contribution of packaging to electricity consumption is not relevant (but it is included in the rest of processes).

Once the energy consumption was attributed to these processes it was apportioned among the total production of semi-finished products for each stage. It has proceeded in the same way for raw materials and waste generation.

In the extrusion process an allocation has been made between the useful profile and the process scrap (according to Hydro approach). 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.

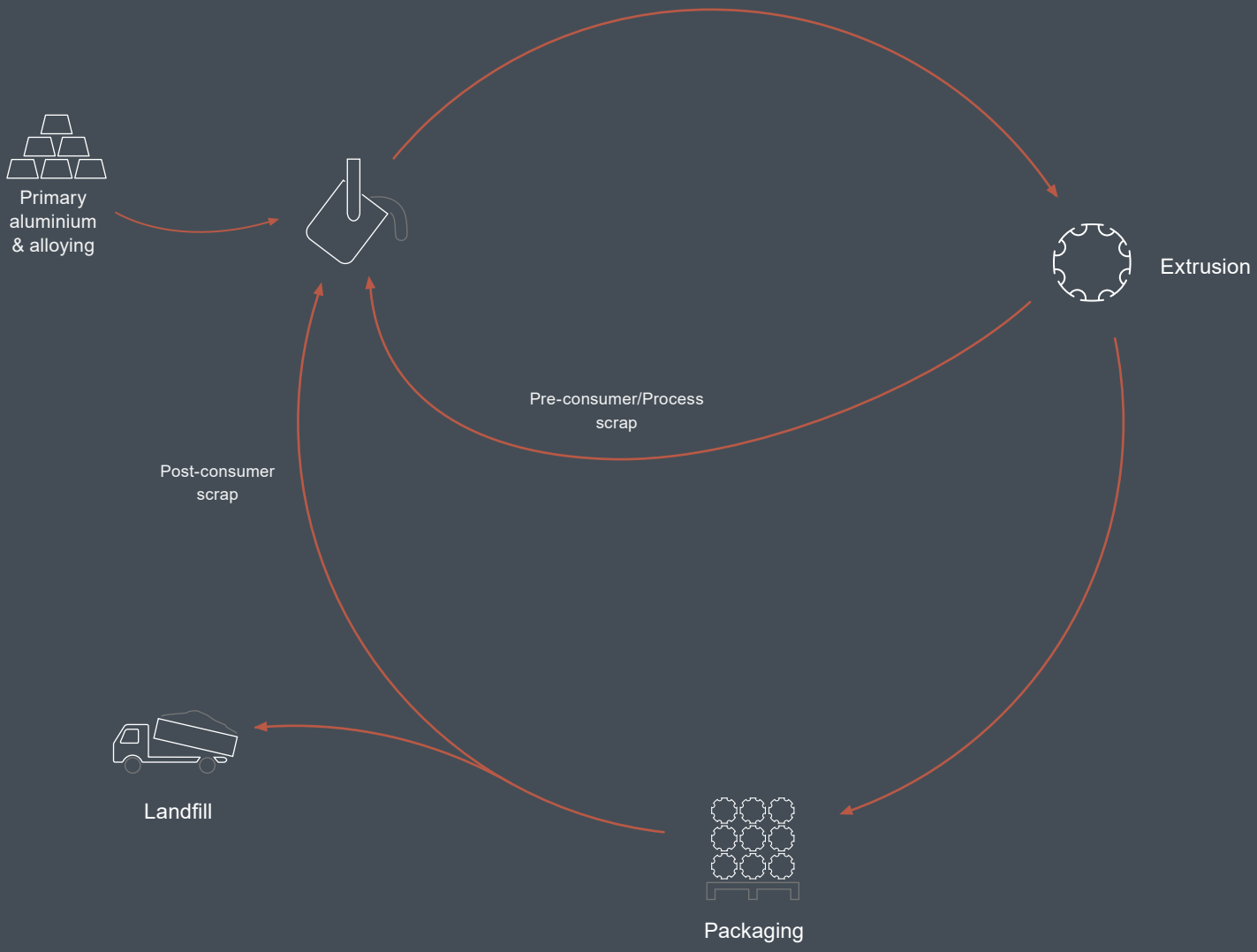
Cut-off criteria

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) and air emissions are 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.

Environmental impacts

The EN 15804:2012+A2:2019 has aligned its methodology with the EF 3.0 method, except for the approach on biogenic carbon. According to the this standard, biogenic carbon emissions cause the same amount of Climate Change as fossil carbon, but can be neutralized by removing this carbon from the atmosphere again.



A4 module parameters	
Transport by road	Transport, freight, lorry >32 metric
Diesel consumption (l/km)	0.35
Weighted distance (km)	920
Mass capacity utilisation	67%
Transport by sea	Transport, freight, sea, container ship
Weighted distance (km)	200

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 - Recycled (Hydro approach)

Environmental Impacts	Units	A1-3	C1	C2	C3	C4	D
CC-2013	kg CO_2 eq	5,48E+00	0	2,19E-02	2,94E-01	7,24E-04	-4,56E+00
CC-total	kg CO_2 eq	5,60E+00	0	2,50E-02	2,97E-01	8,11E-04	-4,57E+00
CC-fossil	kg CO_2 eq	5,59E+00	0	2,50E-02	2,96E-01	8,11E-04	-4,57E+00
CC-biogenic	kg CO_2 eq	7,60E-03	0	0	1,79E-03	0	-1,09E-03
CC-luluc	kg CO_2 eq	2,65E-03	0	0	1,49E-04	0	-8,49E-04
OD	kg CFC-11 eq	2,34E-07	0	7,52E-09	2,04E-08	1,19E-11	-6,42E-11
A	mol H^+ eq	3,55E-02	0	9,51E-05	1,28E-03	3,23E-06	-2,67E-02
EAF	kg P eq	2,87E-03	0	1,72E-05	8,46E-06	2,00E-05	-1,54E-03
EMF	kg N eq	4,65E-03	0	1,93E-05	2,15E-04	2,18E-06	-3,88E-03
ET	mol N eq	5,05E-02	0	2,10E-04	2,52E-03	1,28E-05	-4,22E-02
POF	kg NMVOC eq	1,46E-02	0	8,06E-05	7,06E-04	3,53E-06	-1,16E-02
AD-non fossil (1)	kg Sb eq	8,83E-06	0	9,13E-07	5,19E-06	3,39E-11	-2,26E-06
AD-fossil (1)	MJ	6,06E+01	0	5,00E-01	2,20E+00	7,79E-03	-4,76E+01
WU (1)	m^3 eq	1,08E+02	0	1,42E-03	2,01E-02	1,94E-04	-4,89E-01
PM (1)	disease inc.	4,19E-07	0	2,11E-09	1,57E-08	1,37E-11	-3,74E-07
IR (2)	kBq U235 eq	7,18E-01	0	2,58E-03	9,41E-03	1,88E-05	-6,43E-01
EF (1)	CTUe	3,33E+01	0	4,03E-01	7,21E+00	7,28E-03	-2,03E-01
HT - cancer (1)	CTUh	6,92E-07	0	1,12E-11	1,68E-10	1,71E-10	-7,37E-09
HT - non cancer (1)	CTUh	6,61E-07	0	4,24E-10	7,37E-09	1,34E-10	-1,90E-07
LU (1)	Pt	2,92E+01	0	3,50E-01	2,15E+00	0	-1,07E+00
Resource use							
PERE	MJ	3,22E+01	0	0	2,43E-01	1,67E-04	-2,56E+01
PERM	MJ	0	0	0	0	0	0
PERT	MJ	3,22E+01	0	0	0,243	1,67E-04	-25,6
PENRE	MJ	6,79E+01	0	5,31E-01	2,35E+00	7,79E-03	-5,63E+01
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	6,79E+01	0	5,31E-01	2,35E+00	7,79E-03	-5,63E+01
SM	kg	3,16E-01	0	0	0	0	1
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3 eq	2,84E+00	0	0	6,29E-01	0	-2,00E-01
Waste categories							
HWD	kg	2,11E-01	0	0	6,60E-03	1,95E-08	-2,96E-01
NHWD	kg	1,04E+00	0	0	7,95E-02	8,65E-05	-1,38E+00
RWD	kg	2,49E-03	0	0	1,04E-05	0	-3,36E-03
Output Flows							
CRU	kg	0	0	0	0	0	0
MFR	kg	4,13E-01	0	0	9,50E-01	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.

(1) The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

(2) This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Supplement information

1) Analysis for Hydro approach
The table below shows the environmental impacts related to 1kg of aluminium (without taking into account the extrusion losses, as for funtional unit) for billet production, transport to extrusion and extrusion of the aluminium profiles (Hydro approach).

Mill finished aluminium profile - Recycled (Hydro Approach)

Environmental Impacts	Units	Billet	Transport to extrusion	Extrusion
CC-2013	kg CO_2 eq	5,01E+00	1,17E-02	4,58E-01
CC-total	kg CO_2 eq	5,09E+00	1,27E-02	4,96E-01
OD	kg CFC-11 eq	1,66E-07	4,46E-09	6,30E-08
A	mol H^+ eq	3,21E-02	5,84E-05	3,28E-03
EAF	kg P eq	2,29E-03	1,03E-05	5,67E-04
EMF	kg N eq	4,15E-03	1,30E-05	4,87E-04
ET	mol N eq	4,55E-02	1,43E-04	4,92E-03
POF	kg NMVOC eq	1,30E-02	5,60E-05	1,47E-03
AD-non fossil (1)	kg Sb eq	7,15E-06	3,23E-07	1,35E-06
AD-fossil (1)	MJ	5,16E+01	2,95E-01	8,76E+00
WU (1)	m^3 eq	1,08E+02	9,57E-04	4,20E-04

2) Additional approach for process scrap modelling
In this EPD, processed scrap and post-consumer scrap are not equalized. 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. These considerations constitute the *Hydro approach*.

However, other EPD published for aluminium billets/profiles have been obtained considering that process scrap is equal to the post-consumer scrap, i.e., burden free. This constitutes *Additional approach* to the modelling of process scrap according to EN 15804:2012+A2:2019. The table below shows the EPD results taking into account this other approach.

Mill finished aluminium profile - Recycled (additional approach)

Environmental Impacts	Units	A1-3	C1	C2	C3	C4	D
CC-2013	kg CO_2 eq	2,85E+00	0	2,19E-02	2,94E-01	7,24E-04	-4,56E+00
CC-total	kg CO_2 eq	2,99E+00	0	2,50E-02	2,97E-01	8,11E-04	-4,57E+00
CC-fossil	kg CO_2 eq	2,98E+00	0	2,50E-02	2,96E-01	8,11E-04	-4,57E+00
CC-biogenic	kg CO_2 eq	8,85E-03	0	0	1,79E-03	0	-1,09E-03
CC-luluc	kg CO_2 eq	2,64E-03	0	0	1,49E-04	0	-8,49E-04
OD	kg CFC-11 eq	3,10E-07	0	7,52E-09	2,04E-08	1,19E-11	-6,42E-11
A	mol H^+ eq	2,18E-02	0	9,51E-05	1,28E-03	3,23E-06	-2,67E-02
EAF	kg P eq	2,38E-03	0	1,72E-05	8,46E-06	2,00E-05	-1,54E-03
EMF	kg N eq	2,42E-03	0	1,93E-05	2,15E-04	2,18E-06	-3,88E-03
ET	mol N eq	2,62E-02	0	2,10E-04	2,52E-03	1,28E-05	-4,22E-02
POF	kg NMVOC eq	8,10E-03	0	8,06E-05	7,06E-04	3,53E-06	-1,16E-02
AD-non fossil (1)	kg Sb eq	9,67E-06	0	9,13E-07	5,19E-06	3,39E-11	-2,26E-06
AD-fossil (1)	MJ	3,29E+01	0	5,00E-01	2,20E+00	7,79E-03	-4,76E+01
WU (1)	m^3 eq	1,43E+02	0	1,42E-03	2,01E-02	1,94E-04	-4,89E-01
PM (1)	disease inc.	2,08E-07	0	2,11E-09	1,57E-08	1,37E-11	-3,74E-07
IR (2)	kBq U235 eq	3,37E-01	0	2,58E-03	9,41E-03	1,88E-05	-6,43E-01
EF (1)	CTUe	4,41E+01	0	4,03E-01	7,21E+00	7,28E-03	-2,03E-01
HT - cancer (1)	CTUh	9,13E-07	0	1,12E-11	1,68E-10	1,71E-10	-7,37E-09
HT - non cancer (1)	CTUh	7,01E-07	0	4,24E-10	7,37E-09	1,34E-10	-1,90E-07
LU (1)	Pt	3,48E+01	0	3,50E-01	2,15E+00	0	-1,07E+00
Resource use							
PERE	MJ	1,87E+01	0	0	2,43E-01	1,67E-04	-2,56E+01
PERM	MJ	0	0	0	0	0	0
PERT	MJ	1,87E+01	0	0	0,243	1,67E-04	-25,6
PENRE	MJ	3,46E+01	0	5,31E-01	2,35E+00	7,79E-03	-5,63E+01
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	3,46E+01	0	5,31E-01	2,35E+00	7,79E-03	-5,63E+01
SM	kg	1,06E+00	0	0	0	0	1
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3 eq	3,57E+00	0	0	6,29E-01	0	-2,00E-01
Waste categories							
HWD	kg	4,04E-03	0	0	6,60E-03	1,95E-08	-2,96E-01
NHWD	kg	9,54E-02	0	0	7,95E-02	8,65E-05	-1,38E+00
RWD	kg	5,33E-05	0	0	1,04E-05	0	-3,36E-03
Output Flows							
CRU	kg	0	0	0	0	0	0
MFR	kg	4.40E-01	0	0	9.50E-01	0	0
MER	kg	0	0	0	0	0	0
EE	MJ	0	0	0	0	0	0

The table below shows the environmental impacts related to 1kg of aluminium (without taking into account the extrusion losses, as for funtional unit) for billet production, transport to extrusion and extrusion of the aluminium profiles (additional approach).

Mill finished aluminium profile - Recycled (additional approach)

Environmental Impacts	Units	Billet	Transport to extrusion	Extrusion
CC-2013	kg CO_2 eq	1,68E+00	1,17E-02	4,53E-01
CC-total	kg CO_2 eq	1,74E+00	1,27E-02	4,92E-01
OD	kg CFC-11 eq	1,66E-07	4,46E-09	6,28E-08
A	mol H^+ eq	1,31E-02	5,84E-05	3,26E-03
EAF	kg P eq	1,22E-03	1,03E-05	5,57E-04
EMF	kg N eq	1,33E-03	1,30E-05	4,81E-04
ET	mol N eq	1,47E-02	1,43E-04	4,86E-03
POF	kg NMVOC eq	4,58E-03	5,60E-05	1,45E-03
AD-non fossil (1)	kg Sb eq	5,57E-06	3,23E-07	1,38E-06
AD-fossil (1)	MJ	1,58E+01	2,95E-01	8,68E+00
WU (1)	m^3 eq	1,08E+02	9,57E-04	5,04E-04

Contacts

EPD Program	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Third-Party Verifier	Lorena Pereda Centro Tecnológico de Miranda de Ebro www. ctme.es lpereda@ctme.es
EPD Owner	Hydro Extrusion Iberia Orense 34, Planta 9 28020, Madrid Spain www.hydro.com
EPD Author	IDNÓVAM Innovación y desarrollo para el ambiente Ferranz 56, Bajo 28008 Madrid, Spain info@idnovam.com

References

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- 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
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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 15804:2012+A2:2019) and the general programme guidelines by The International EPD® System. The results shown in this EPD are based on the LCA for HYDRO products according to standard 14044.

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison."

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-10762
EPD owner	Hydro Extrusion Iberia
Declared unit	1 kg of mill finished aluminium profile
System boundaries	Cradle to gate with options
Published	2023 - 09 - 19
Valid until	2028 - 09 - 19
Reference year for data	2020-2021 average for significant data and 2017-2018-2019 average for remaining data
Geographical scope	Europe
Product group classification	UN CPC Code: 41532 Bars, rods and profiles, of aluminium
Product Category Rules	PCR 2019:14 Construction products, version 1.2.5. Based on CEN standard EN 15804:2012+A2:2019
PCR review was conducted by	The Technical Committee of The International EPD® System. For a list of members see www.environdec.com/TC Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat (www.environdec.com/contact)
Independent verification of the declaration and data, according to ISO 14025:2006	X External Internal EPD Process
Third-party verifier	Individual verifier approved by The International EPD® System: Lorena Pereda Centro Tecnológico de Miranda de Ebro lpereda@ctme.es

Hydro Extrusion Iberia
Orense 34, Planta 9
28020, Madrid Spain
www.hydro.com

T +34 948 50 71 00
F +34 948 50 71 30

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. In addition to production of primary aluminium, rolled and extruded products and recycling, Hydro also extracts bauxite, refines alumina and generates energy to be the only 360° company of the global aluminium industry. Hydro is present within all market segments for aluminium, with sales and trading activities throughout the value chain serving more than 30,000 customers. Based in Norway and rooted in more than a century of experience in renewable energy, technology and innovation, Hydro is committed to strengthening the viability of its customers and communities, shaping a sustainable future through innovative aluminium solutions.