# Environmental Product Declaration

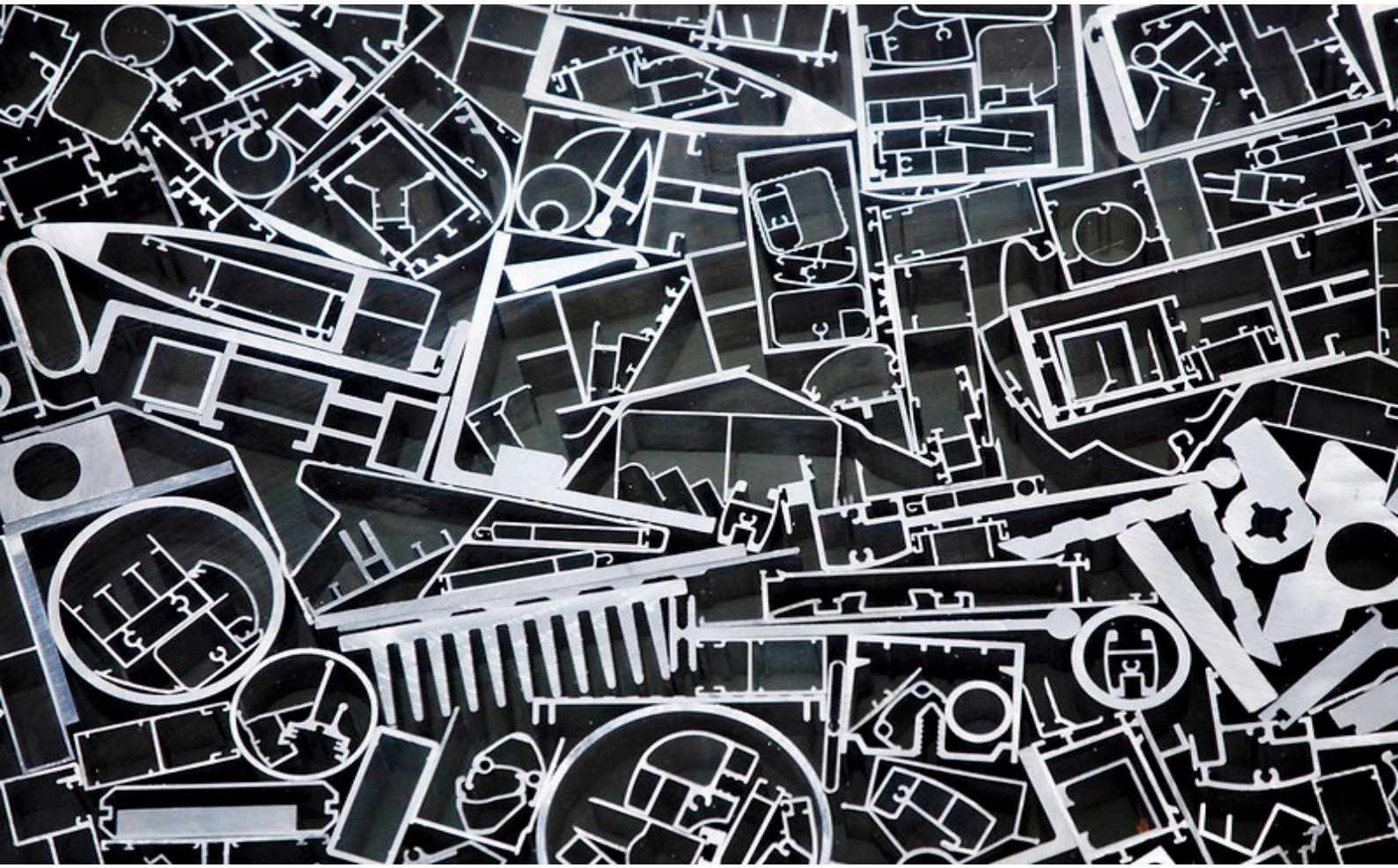
EPD®
S-P-03015

ECO PLATFORM EPD EN 15804 VERIFIED

## FOR ALUMINIUM PROFILES PRODUCED BY HYDRO ALUMINIUM EXTRUSION PORTUGAL HAEP S.A. AVINTES

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

Hydro



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|---|---|
| EPD Program | The International EPD® System, www.environdec.com |
| Programme operator | EPD International AB |
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# 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 Aluminium Extrusion Portugal**
In Avintes, Hydro manufactures and markets extruded aluminum profiles and Thermal broken profiles and machined pieces. Hydro offers surface treatment and other added-value operations to transform the profiles into the solutions that meet customer specifications.

Founded in 1982 and with more than 130 employees, the Avintes plant brings all its resources and more than 30 years of experience in aluminum solutions supply.

The production processes occurring in Avintes include the production of billets for different aluminium alloys and the production of profiles through the extrusion of these billets, including eventual additional manufacturing steps and treatment such as the such the profile aging processes, surface treatment and the thermal break.

Facilities in Avintes are certified ISO 9001, ISO 14001, ISO 50001, IATF 16949, Alu+C- label and ASI Performance Standard that covers critical issues for the entire aluminum value chain, including greenhouse gas emissions, waste management, material stewardship, biodiversity and human rights. Avintes is also certified QB 49 for thermal break profiles.

# 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
- Thermal break mill finished aluminium profile
- Thermal break anodized aluminium profile
- Thermal break coated 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 Avintes. 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 six 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

| 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 |

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 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) | 92.9 % |
| Primary smelters | 7.1 % |

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

| | Mill finished/Anodized | Coated | Mill finished/Anodized (TBB) | Coated (TBB) |
|---|---|---|---|---|
| **Aluminium profile** | **100%** | **95.4%** | **89.5%** | **84.9%** |
| Aluminium | | 93-96% | | |
| Magnesium | | 0.5-1.5% | | |
| Silicon | | 0.5-1.5% | | |
| Others | | <0.2% | | |
| Post-consumer scrap | | 28.6 % | | |
| Pre-consumer scrap | | 41.4% | | |
| Renewable material | | 0% | | |
| Biogenic carbon dioxide | | 0% | | |
| **Coating (polyester)** | **-** | **4.6%** | **-** | **4.6%** |
| Post-consumer material | | 0% | | |
| Renewable material | | 0% | | |
| **Thermal Break** | **-** | **-** | **10.5%** | **10.5%** |
| Polyamide | - | - | 75% | 75% |
| Glass fiber | - | - | 25% | 25% |
| Post-consumer material | | 0 % | | |
| Renewable material | | 0 % | | |
| **Packaging** | | **0.060 kg** | | |
| Wood | | 0.032kg - 3.2% (*) | | |
| Cardboard | | 0.025kg - 2.5% (*) | | |
| Polyester | | 0.0012kg - 0.12% (*) | | |
| Plastic film | | 0.0012kg - 0.12% (*) | | |
| Biogenic carbon dioxide | | 0.090 kg | | |

(*) Versus product


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# LCA Information

**Declared unit**
The declared unit is the production of 1 kg of aluminium profile including the surface treatment (coating or anodization) and the optional thermal bridge break.

To obtain the environmental information referred to a 1 meter of profile, conversion factors are provided for products: mill finished and anodized profiles, 0.592 kg/m; and 0.550 kg/m; coated profile, 0.631 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 0.508 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** | 91.5% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Variation - products** | +0.3% / -0.3% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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 Avintes. 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 Avintes. 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 97.5% of the value for climate change indicator. For geographical and time representativeness, processes with a quality level of "very good" account for 93.3% and 83.2% 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.

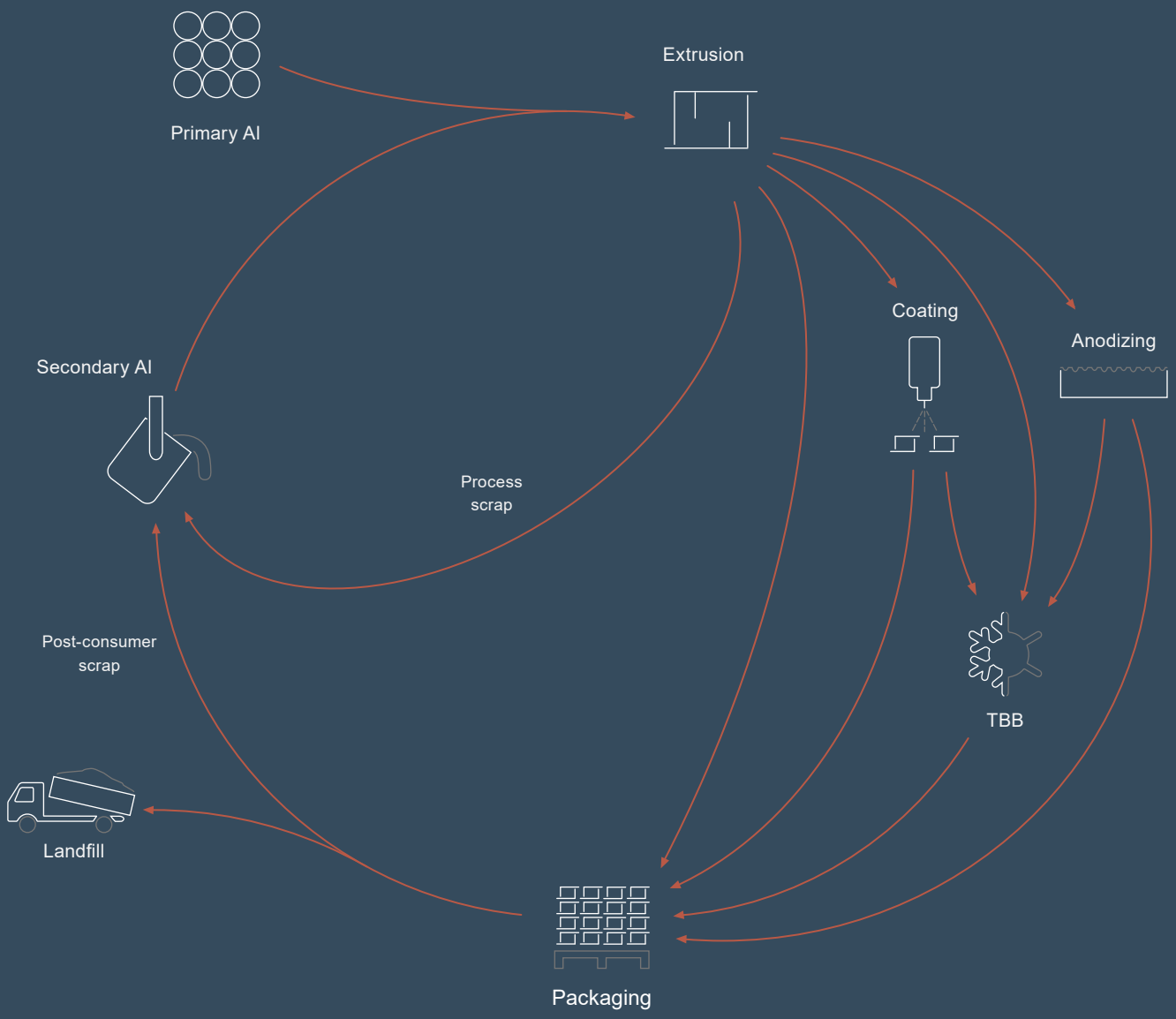
**Allocation**
It was not possible to distinguish the consumption of electricity and natural gas between the production stages of profiles. Based on the total energy consumption in the plants, electricity and natural gas used in the different stages was estimated under the criteria of the technical staff 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.
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) 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.




| A4 module parameters | |
|---|---|
| Transport by road | Transport, freight, lorry >32 metric |
| Diesel consumption (l/km) | 0.35 |
| Weighted distance (km) | 850 |
| 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 | 5,58 | 9,19E-02 | 2,17E-02 | 1,24E-02 | 9,95E-04 | -4,81 |
| CC-total | kg $CO_2$ eq | 5,72 | 1,05E-01 | 2,47E-02 | 1,31E-02 | 1,12E-03 | -4,83 |
| CC-fossil | kg $CO_2$ eq | 5,71 | 1,05E-01 | 2,47E-02 | 1,30E-02 | 1,12E-03 | -4,82 |
| CC-biogenic | kg $CO_2$ eq | 4,98E-03 | 0 | 0 | 1,55E-05 | 0 | -1,24E-03 |
| CC-luluc | kg $CO_2$ eq | 4,20E-03 | 0 | 0 | 6,69E-05 | 0 | -8,96E-04 |
| OD | kg CFC-11 eq | 2,19E-07 | 3,15E-08 | 7,43E-09 | 1,09E-09 | 1,05E-10 | -6,78E-11 |
| A | mol $H^+$ eq | 3,70E-02 | 3,98E-04 | 9,39E-05 | 1,02E-04 | 4,41E-06 | -2,82E-02 |
| EAF | kg $PO_4^{-3}$ eq | 3,36E-03 | 7,20E-05 | 1,70E-05 | 1,48E-05 | 2,02E-05 | -1,50E-03 |
| EMF | kg N eq | 4,14E-03 | 8,06E-05 | 1,90E-05 | 1,25E-05 | 2,42E-06 | -4,09E-03 |
| ET | mol N eq | 4,45E-02 | 8,81E-04 | 2,08E-04 | 1,34E-04 | 1,54E-05 | -4,46E-02 |
| POF | kg NMVOC eq | 1,34E-02 | 3,38E-04 | 7,96E-05 | 3,72E-05 | 4,53E-06 | -1,23E-02 |
| AD-non fossil | kg Sb eq | 6,80E-06 | 3,82E-06 | 9,02E-07 | 9,25E-09 | 1,13E-08 | -2,38E-06 |
| AD-fossil | MJ | 59,1 | 2,094 | 0,494 | 0,165 | 1,40E-02 | -50,2 |
| WU | $m^3$ eq | 121 | 5,93E-03 | 1,40E-03 | 0 | 2,12E-04 | -0,516 |
| PM | disease inc. | 4,06E-07 | 8,83E-09 | 2,08E-09 | 2,19E-10 | 3,97E-11 | -3,94E-07 |
| IR | kBq U235 eq | 0,591 | 1,08E-02 | 2,55E-03 | 1,19E-03 | 5,06E-05 | -0,678 |
| EF | CTUe | 33,9 | 1,687 | 0,398 | 8,46E-02 | 1,23E-02 | -0,215 |
| HT - cancer | CTUh | 8,07E-07 | 4,70E-11 | 1,11E-11 | 4,04E-10 | 1,72E-10 | -7,78E-09 |
| HT - non cancer | CTUh | 7,55E-07 | 1,78E-09 | 4,19E-10 | 1,93E-09 | 1,40E-10 | -2,00E-07 |
| LU | Pt | 36,5 | 1,46E+00 | 0,345 | 2,59E-01 | 4,32E-03 | -1,13 |
| **Resource use** | | | | | | | |
| PERE | MJ | 34,9 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 2,55E-04 | -27,0 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 34,9 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 2,55E-04 | -27,0 |
| PENRE | MJ | 67,0 | 2,224 | 0,524 | 0,170 | 1,43E-02 | -59,4 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 67,0 | 2,224 | 0,524 | 0,170 | 1,43E-02 | -59,4 |
| SM | kg | 0,286 | 0 | 0 | 0 | 0 | 0,590 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | $m^3$ eq | 4,17 | 0 | 0 | 1,08E-01 | 0 | -0,211 |
| **Waste categories** | | | | | | | |
| HWD | kg | 0,224 | 0 | 0 | 0 | 1,95E-08 | -0,313 |
| NHWD | kg | 0,979 | 0 | 0 | 0 | 8,65E-05 | -1,45 |
| RWD | kg | 2,88E-03 | 0 | 0 | 0 | 0 | -3,55E-03 |
| **Output Flows** | | | | | | | |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0,440 | 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 | 6,93 | 9,19E-02 | 2,17E-02 | 1,24E-02 | 9,95E-04 | -4,79 |
| CC-total | kg $CO_2$ eq | 7,13 | 1,05E-01 | 2,47E-02 | 1,31E-02 | 1,12E-03 | -4,81 |
| CC-fossil | kg $CO_2$ eq | 7,12 | 1,05E-01 | 2,47E-02 | 1,30E-02 | 1,12E-03 | -4,81 |
| CC-biogenic | kg $CO_2$ eq | 6,62E-03 | 0 | 0 | 1,55E-05 | 0 | -1,23E-03 |
| CC-luluc | kg $CO_2$ eq | 8,38E-03 | 0 | 0 | 6,69E-05 | 0 | -8,92E-04 |
| OD | kg CFC-11 eq | 4,56E-07 | 3,15E-08 | 7,43E-09 | 1,09E-09 | 1,05E-10 | -6,75E-11 |
| A | mol $H^+$ eq | 5,41E-02 | 3,98E-04 | 9,39E-05 | 1,02E-04 | 4,41E-06 | -2,81E-02 |
| EAF | kg $PO_4^{-3}$ eq | 5,53E-03 | 7,20E-05 | 1,70E-05 | 1,48E-05 | 2,02E-05 | -1,49E-03 |
| EMF | kg N eq | 5,33E-03 | 8,06E-05 | 1,90E-05 | 1,25E-05 | 2,42E-06 | -4,08E-03 |
| ET | mol N eq | 5,69E-02 | 8,81E-04 | 2,08E-04 | 1,34E-04 | 1,54E-05 | -4,44E-02 |
| POF | kg NMVOC eq | 1,75E-02 | 3,38E-04 | 7,96E-05 | 3,72E-05 | 4,53E-06 | -1,22E-02 |
| AD-non fossil | kg Sb eq | 1,97E-05 | 3,82E-06 | 9,02E-07 | 9,25E-09 | 1,13E-08 | -2,37E-06 |
| AD-fossil | MJ | 78,1 | 2,094 | 0,494 | 0,165 | 1,40E-02 | -50,0 |
| WU | $m^3$ eq | 122 | 5,93E-03 | 1,40E-03 | 0 | 2,12E-04 | -0,514 |
| PM | disease inc. | 4,47E-07 | 8,83E-09 | 2,08E-09 | 2,19E-10 | 3,97E-11 | -3,93E-07 |
| IR | kBq U235 eq | 0,711 | 1,08E-02 | 2,55E-03 | 1,19E-03 | 5,06E-05 | -0,676 |
| EF | CTUe | 54,8 | 1,687 | 0,398 | 8,46E-02 | 1,23E-02 | -0,214 |
| HT - cancer | CTUh | 8,76E-07 | 4,70E-11 | 1,11E-11 | 4,04E-10 | 1,72E-10 | -7,75E-09 |
| HT - non cancer | CTUh | 1,50E-06 | 1,78E-09 | 4,19E-10 | 1,93E-09 | 1,40E-10 | -2,00E-07 |
| LU | Pt | 54,4 | 1,46E+00 | 0,345 | 2,59E-01 | 4,32E-03 | -1,13 |
| **Resource use** | | | | | | | |
| PERE | MJ | 38,7 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 2,55E-04 | -26,9 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 38,7 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 2,55E-04 | -26,9 |
| PENRE | MJ | 86,6 | 2,224 | 0,524 | 0,170 | 1,43E-02 | -59,2 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 86,6 | 2,224 | 0,524 | 0,170 | 1,43E-02 | -59,2 |
| SM | kg | 0,288 | 0 | 0 | 0 | 0 | 0,588 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | $m^3$ eq | 12,02 | 0 | 0 | 1,08E-01 | 0 | -0,210 |
| **Waste categories** | | | | | | | |
| HWD | kg | 0,227 | 0 | 0 | 0 | 1,95E-08 | -0,312 |
| NHWD | kg | 1,343 | 0 | 0 | 0 | 8,65E-05 | -1,45 |
| RWD | kg | 2,91E-03 | 0 | 0 | 0 | 0 | -3,53E-03 |
| **Output Flows** | | | | | | | |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0,453 | 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 | 6,09 | 9,19E-02 | 2,17E-02 | 1,24E-02 | 1,95E-03 | -4,53 |
| CC-total | kg $CO_2$ eq | 6,25 | 1,05E-01 | 2,47E-02 | 1,31E-02 | 2,15E-03 | -4,54 |
| CC-fossil | kg $CO_2$ eq | 6,24 | 1,05E-01 | 2,47E-02 | 1,30E-02 | 2,15E-03 | -4,54 |
| CC-biogenic | kg $CO_2$ eq | 5,49E-03 | 0 | 0 | 1,55E-05 | 3,08E-07 | -1,17E-03 |
| CC-luluc | kg $CO_2$ eq | 7,05E-03 | 0 | 0 | 6,69E-05 | 7,62E-08 | -8,43E-04 |
| OD | kg CFC-11 eq | 2,68E-07 | 3,15E-08 | 7,43E-09 | 1,09E-09 | 1,30E-10 | -6,38E-11 |
| A | mol $H^+$ eq | 4,00E-02 | 3,98E-04 | 9,39E-05 | 1,02E-04 | 5,15E-06 | -2,66E-02 |
| EAF | kg $PO_4^{-3}$ eq | 4,18E-03 | 7,20E-05 | 1,70E-05 | 1,48E-05 | 3,09E-05 | -1,41E-03 |
| EMF | kg N eq | 4,65E-03 | 8,06E-05 | 1,90E-05 | 1,25E-05 | 3,82E-06 | -3,85E-03 |
| ET | mol N eq | 4,97E-02 | 8,81E-04 | 2,08E-04 | 1,34E-04 | 1,79E-05 | -4,20E-02 |
| POF | kg NMVOC eq | 1,54E-02 | 3,38E-04 | 7,96E-05 | 3,72E-05 | 5,29E-06 | -1,16E-02 |
| AD-non fossil | kg Sb eq | 1,05E-05 | 3,82E-06 | 9,02E-07 | 9,25E-09 | 1,15E-08 | -2,24E-06 |
| AD-fossil | MJ | 65,6 | 2,094 | 0,494 | 0,165 | 1,54E-02 | -47,3 |
| WU | $m^3$ eq | 117 | 5,93E-03 | 1,40E-03 | 0 | 2,03E-04 | -0,486 |
| PM | disease inc. | 4,11E-07 | 8,83E-09 | 2,08E-09 | 2,19E-10 | 4,93E-11 | -3,71E-07 |
| IR | kBq U235 eq | 0,623 | 1,08E-02 | 2,55E-03 | 1,19E-03 | 5,92E-05 | -0,639 |
| EF | CTUe | 38,3 | 1,687 | 0,398 | 8,46E-02 | 2,19E-01 | -0,202 |
| HT - cancer | CTUh | 8,32E-07 | 4,70E-11 | 1,11E-11 | 4,04E-10 | 1,92E-10 | -7,33E-09 |
| HT - non cancer | CTUh | 8,59E-07 | 1,78E-09 | 4,19E-10 | 1,93E-09 | 2,28E-09 | -1,89E-07 |
| LU | Pt | 41,4 | 1,46E+00 | 0,345 | 2,59E-01 | 7,68E-03 | -1,06 |
| **Resource use** | | | | | | | |
| PERE | MJ | 34,7 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 3,36E-04 | -25,4 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 34,7 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 3,36E-04 | -25,4 |
| PENRE | MJ | 73,5 | 2,224 | 0,524 | 0,170 | 1,59E-02 | -55,9 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 73,5 | 2,224 | 0,524 | 0,170 | 1,59E-02 | -55,9 |
| SM | kg | 0,277 | 0 | 0 | 0 | 0 | 0,556 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | $m^3$ eq | 6,05 | 0 | 0 | 1,08E-01 | 0 | -0,198 |
| **Waste categories** | | | | | | | |
| HWD | kg | 0,234 | 0 | 0 | 0 | 1,87E-08 | -0,295 |
| NHWD | kg | 1,064 | 0 | 0 | 0 | 2,37E-03 | -1,37 |
| RWD | kg | 2,79E-03 | 0 | 0 | 0 | 0 | -3,34E-03 |
| **Output Flows** | | | | | | | |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0,441 | 0 | 0 | 0 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| EE | MJ | 0 | 0 | 0 | 0 | 0 | 0 |

# Thermal break mill finished aluminium profile

| Environmental Impacts | Units | A1-3 | A4 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| CC-2013 | kg $CO_2$ eq | 5,81 | 9,19E-02 | 2,17E-02 | 1,24E-02 | 2,98E-03 | -4,66 |
| CC-total | kg $CO_2$ eq | 5,98 | 1,05E-01 | 2,47E-02 | 1,31E-02 | 3,26E-03 | -4,68 |
| CC-fossil | kg $CO_2$ eq | 5,97 | 1,05E-01 | 2,47E-02 | 1,30E-02 | 3,26E-03 | -4,68 |
| CC-biogenic | kg $CO_2$ eq | 5,08E-03 | 0 | 0 | 1,55E-05 | 6,40E-07 | -1,20E-03 |
| CC-luluc | kg $CO_2$ eq | 3,94E-03 | 0 | 0 | 6,69E-05 | 1,58E-07 | -8,69E-04 |
| OD | kg CFC-11 eq | 2,06E-07 | 3,15E-08 | 7,43E-09 | 1,09E-09 | 1,56E-10 | -6,57E-11 |
| A | mol $H^+$ eq | 3,70E-02 | 3,98E-04 | 9,39E-05 | 1,02E-04 | 5,96E-06 | -2,74E-02 |
| EAF | kg $PO_4^{-3}$ eq | 3,64E-03 | 7,20E-05 | 1,70E-05 | 1,48E-05 | 4,24E-05 | -1,45E-03 |
| EMF | kg N eq | 4,81E-03 | 8,06E-05 | 1,90E-05 | 1,25E-05 | 5,33E-06 | -3,97E-03 |
| ET | mol N eq | 4,58E-02 | 8,81E-04 | 2,08E-04 | 1,34E-04 | 2,07E-05 | -4,32E-02 |
| POF | kg NMVOC eq | 1,40E-02 | 3,38E-04 | 7,96E-05 | 3,72E-05 | 6,11E-06 | -1,19E-02 |
| AD-non fossil | kg Sb eq | 6,82E-06 | 3,82E-06 | 9,02E-07 | 9,25E-09 | 1,18E-08 | -2,31E-06 |
| AD-fossil | MJ | 65,1 | 2,094 | 0,494 | 0,165 | 1,69E-02 | -48,7 |
| WU | $m^3$ eq | 110 | 5,93E-03 | 1,40E-03 | 0 | 1,93E-04 | -0,501 |
| PM | disease inc. | 3,86E-07 | 8,83E-09 | 2,08E-09 | 2,19E-10 | 5,96E-11 | -3,82E-07 |
| IR | kBq U235 eq | 0,548 | 1,08E-02 | 2,55E-03 | 1,19E-03 | 6,85E-05 | -0,658 |
| EF | CTUe | 32,7 | 1,687 | 0,398 | 8,46E-02 | 4,42E-01 | -0,208 |
| HT - cancer | CTUh | 7,61E-07 | 4,70E-11 | 1,11E-11 | 4,04E-10 | 2,14E-10 | -7,55E-09 |
| HT - non cancer | CTUh | 7,10E-07 | 1,78E-09 | 4,19E-10 | 1,93E-09 | 4,59E-09 | -1,94E-07 |
| LU | Pt | 36,3 | 1,46E+00 | 0,345 | 2,59E-01 | 1,13E-02 | -1,10 |
| **Resource use** | | | | | | | |
| PERE | MJ | 32,1 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 4,23E-04 | -26,2 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 32,1 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 4,23E-04 | -26,2 |
| PENRE | MJ | 72,5 | 2,224 | 0,524 | 0,170 | 1,75E-02 | -57,6 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 72,5 | 2,224 | 0,524 | 0,170 | 1,75E-02 | -57,6 |
| SM | kg | 0,261 | 0 | 0 | 0 | 0 | 0,573 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | $m^3$ eq | 4,12 | 0 | 0 | 1,08E-01 | 0 | -0,204 |
| **Waste categories** | | | | | | | |
| HWD | kg | 0,204 | 0 | 0 | 0 | 1,77E-08 | -0,303 |
| NHWD | kg | 0,892 | 0 | 0 | 0 | 4,83E-03 | -1,41 |
| RWD | kg | 2,63E-03 | 0 | 0 | 0 | 0 | -3,44E-03 |
| **Output Flows** | | | | | | | |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0,407 | 0 | 0 | 0 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| EE | MJ | 0 | 0 | 0 | 0 | 0 | 0 |

# Thermal break Anodized aluminium profile

| Environmental Impacts | Units | A1-3 | A4 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| CC-2013 | kg $CO_2$ eq | 7,04 | 9,19E-02 | 2,17E-02 | 1,24E-02 | 2,98E-03 | -4,65 |
| CC-total | kg $CO_2$ eq | 7,27 | 1,05E-01 | 2,47E-02 | 1,31E-02 | 3,26E-03 | -4,67 |
| CC-fossil | kg $CO_2$ eq | 7,25 | 1,05E-01 | 2,47E-02 | 1,30E-02 | 3,26E-03 | -4,66 |
| CC-biogenic | kg $CO_2$ eq | 6,57E-03 | 0 | 0 | 1,55E-05 | 6,40E-07 | -1,20E-03 |
| CC-luluc | kg $CO_2$ eq | 7,74E-03 | 0 | 0 | 6,69E-05 | 1,58E-07 | -8,66E-04 |
| OD | kg CFC-11 eq | 4,22E-07 | 3,15E-08 | 7,43E-09 | 1,09E-09 | 1,56E-10 | -6,55E-11 |
| A | mol $H^+$ eq | 5,25E-02 | 3,98E-04 | 9,39E-05 | 1,02E-04 | 5,96E-06 | -2,73E-02 |
| EAF | kg $PO_4^{-3}$ eq | 5,62E-03 | 7,20E-05 | 1,70E-05 | 1,48E-05 | 4,24E-05 | -1,45E-03 |
| EMF | kg N eq | 5,90E-03 | 8,06E-05 | 1,90E-05 | 1,25E-05 | 5,33E-06 | -3,96E-03 |
| ET | mol N eq | 5,71E-02 | 8,81E-04 | 2,08E-04 | 1,34E-04 | 2,07E-05 | -4,31E-02 |
| POF | kg NMVOC eq | 1,77E-02 | 3,38E-04 | 7,96E-05 | 3,72E-05 | 6,11E-06 | -1,19E-02 |
| AD-non fossil | kg Sb eq | 1,86E-05 | 3,82E-06 | 9,02E-07 | 9,25E-09 | 1,18E-08 | -2,30E-06 |
| AD-fossil | MJ | 82,4 | 2,094 | 0,494 | 0,165 | 1,69E-02 | -48,6 |
| WU | $m^3$ eq | 111 | 5,93E-03 | 1,40E-03 | 0 | 1,93E-04 | -0,499 |
| PM | disease inc. | 4,23E-07 | 8,83E-09 | 2,08E-09 | 2,19E-10 | 5,96E-11 | -3,81E-07 |
| IR | kBq U235 eq | 0,657 | 1,08E-02 | 2,55E-03 | 1,19E-03 | 6,85E-05 | -0,656 |
| EF | CTUe | 51,7 | 1,687 | 0,398 | 8,46E-02 | 4,42E-01 | -0,208 |
| HT - cancer | CTUh | 8,24E-07 | 4,70E-11 | 1,11E-11 | 4,04E-10 | 2,14E-10 | -7,52E-09 |
| HT - non cancer | CTUh | 1,39E-06 | 1,78E-09 | 4,19E-10 | 1,93E-09 | 4,59E-09 | -1,94E-07 |
| LU | Pt | 52,6 | 1,46E+00 | 0,345 | 2,59E-01 | 1,13E-02 | -1,09 |
| **Resource use** | | | | | | | |
| PERE | MJ | 35,6 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 4,23E-04 | -26,1 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 35,6 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 4,23E-04 | -26,1 |
| PENRE | MJ | 90,3 | 2,224 | 0,524 | 0,170 | 1,75E-02 | -57,4 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 90,3 | 2,224 | 0,524 | 0,170 | 1,75E-02 | -57,4 |
| SM | kg | 0,262 | 0 | 0 | 0 | 0 | 0,571 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | $m^3$ eq | 11,27 | 0 | 0 | 1,08E-01 | 0 | -0,204 |
| **Waste categories** | | | | | | | |
| HWD | kg | 0,207 | 0 | 0 | 0 | 1,77E-08 | -0,302 |
| NHWD | kg | 1,223 | 0 | 0 | 0 | 4,83E-03 | -1,40 |
| RWD | kg | 2,65E-03 | 0 | 0 | 0 | 0 | -3,43E-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 |

# Thermal break Coated aluminium profile

| Environmental Impacts | Units | A1-3 | A4 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|
| CC-2013 | kg $CO_2$ eq | 6,27 | 9,19E-02 | 2,17E-02 | 1,24E-02 | 3,93E-03 | -4,73 |
| CC-total | kg $CO_2$ eq | 6,46 | 1,05E-01 | 2,47E-02 | 1,31E-02 | 4,29E-03 | -4,75 |
| CC-fossil | kg $CO_2$ eq | 6,45 | 1,05E-01 | 2,47E-02 | 1,30E-02 | 4,29E-03 | -4,75 |
| CC-biogenic | kg $CO_2$ eq | 5,55E-03 | 0 | 0 | 1,55E-05 | 9,48E-07 | -1,22E-03 |
| CC-luluc | kg $CO_2$ eq | 6,54E-03 | 0 | 0 | 6,69E-05 | 2,35E-07 | -8,82E-04 |
| OD | kg CFC-11 eq | 2,51E-07 | 3,15E-08 | 7,43E-09 | 1,09E-09 | 1,81E-10 | -6,67E-11 |
| A | mol $H^+$ eq | 3,96E-02 | 3,98E-04 | 9,39E-05 | 1,02E-04 | 6,71E-06 | -2,78E-02 |
| EAF | kg $PO_4^{-3}$ eq | 4,39E-03 | 7,20E-05 | 1,70E-05 | 1,48E-05 | 5,30E-05 | -1,48E-03 |
| EMF | kg N eq | 5,28E-03 | 8,06E-05 | 1,90E-05 | 1,25E-05 | 6,74E-06 | -4,03E-03 |
| ET | mol N eq | 5,05E-02 | 8,81E-04 | 2,08E-04 | 1,34E-04 | 2,33E-05 | -4,39E-02 |
| POF | kg NMVOC eq | 1,58E-02 | 3,38E-04 | 7,96E-05 | 3,72E-05 | 6,86E-06 | -1,21E-02 |
| AD-non fossil | kg Sb eq | 1,02E-05 | 3,82E-06 | 9,02E-07 | 9,25E-09 | 1,20E-08 | -2,34E-06 |
| AD-fossil | MJ | 70,9 | 2,094 | 0,494 | 0,165 | 1,83E-02 | -49,4 |
| WU | $m^3$ eq | 107 | 5,93E-03 | 1,40E-03 | 0 | 1,85E-04 | -0,508 |
| PM | disease inc. | 3,91E-07 | 8,83E-09 | 2,08E-09 | 2,19E-10 | 6,91E-11 | -3,88E-07 |
| IR | kBq U235 eq | 0,577 | 1,08E-02 | 2,55E-03 | 1,19E-03 | 7,71E-05 | -0,668 |
| EF | CTUe | 36,7 | 1,687 | 0,398 | 8,46E-02 | 6,49E-01 | -0,211 |
| HT - cancer | CTUh | 7,84E-07 | 4,70E-11 | 1,11E-11 | 4,04E-10 | 2,34E-10 | -7,66E-09 |
| HT - non cancer | CTUh | 8,04E-07 | 1,78E-09 | 4,19E-10 | 1,93E-09 | 6,73E-09 | -1,97E-07 |
| LU | Pt | 40,8 | 1,46E+00 | 0,345 | 2,59E-01 | 1,47E-02 | -1,11 |
| **Resource use** | | | | | | | |
| PERE | MJ | 32,0 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 5,03E-04 | -26,6 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 32,0 | 3,00E-02 | 7,07E-03 | 5,73E-02 | 5,03E-04 | -26,6 |
| PENRE | MJ | 78,4 | 2,224 | 0,524 | 0,170 | 1,90E-02 | -58,4 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 78,4 | 2,224 | 0,524 | 0,170 | 1,90E-02 | -58,4 |
| SM | kg | 0,252 | 0 | 0 | 0 | 0 | 0,581 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | $m^3$ eq | 5,84 | 0 | 0 | 1,08E-01 | 0 | -0,207 |
| **Waste categories** | | | | | | | |
| HWD | kg | 0,213 | 0 | 0 | 0 | 1,68E-08 | -0,308 |
| NHWD | kg | 0,969 | 0 | 0 | 0 | 7,11E-03 | -1,43 |
| RWD | kg | 2,54E-03 | 0 | 0 | 0 | 0 | -3,49E-03 |
| **Output Flows** | | | | | | | |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0,408 | 0 | 0 | 0 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 0 |
| EE | MJ | 0 | 0 | 0 | 0 | 0 | 0 |

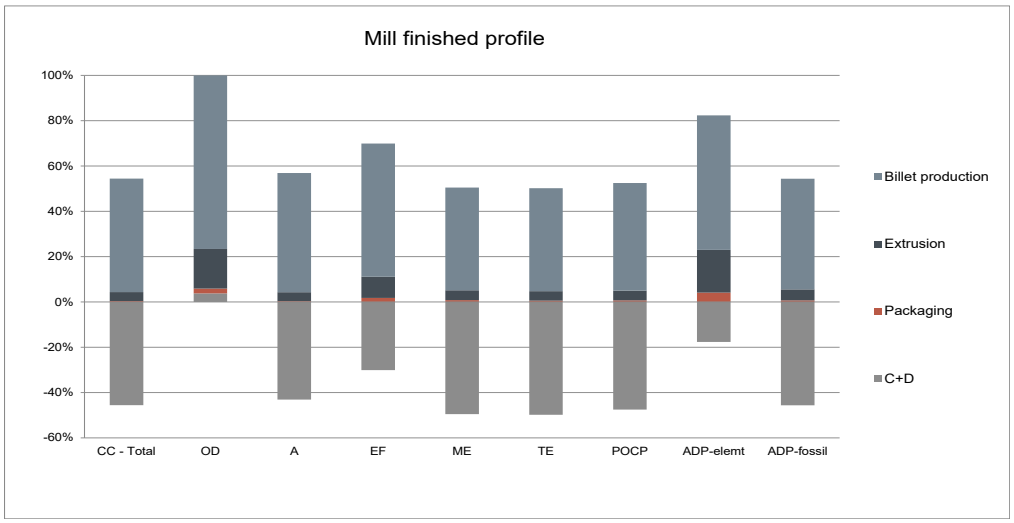
**ENVIRONMENTAL IMPACTS** - CC-2013: Climatic Change according to EN 15804:2012+A1:2013; CC-total: Climatic Change - total; CC-fossil: Climatic Change - fossil; CC-biogenic: Climate change - biogenic; CC-luluc: Climate change - land use and land use change; OD: Ozone depletion; A: Acidification ; EAF: 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.

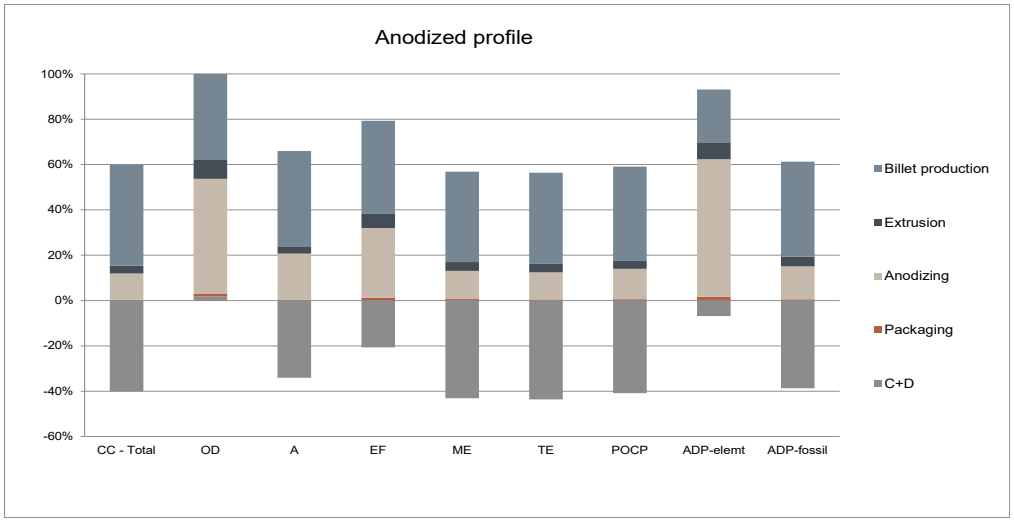
**RESOURCE USE** - PERE: Renewable primary energy as energy carrier; PERM: Renewable primary energy resource as material utilization; PERT: Total use of renewable primary energy resources; PENRE: Non-renewable primary energy as energy carrier; PENRM: Non-renewable primary energy as material utilization; 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.

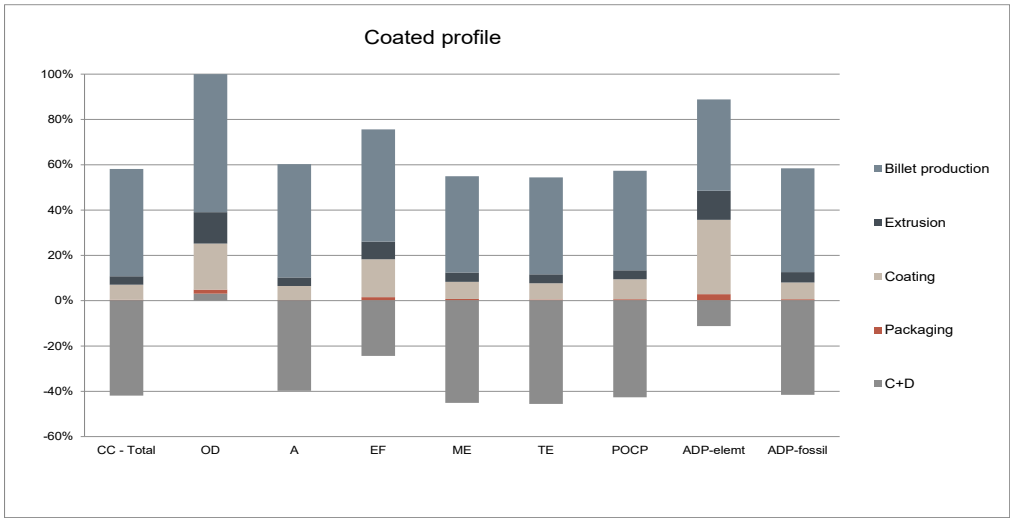
**WASTE CATEGORIES** - HWD: Hazardous waste disposed; NHWD: Non-hazardous waste disposed; RWD: Radioactive waste disposed.

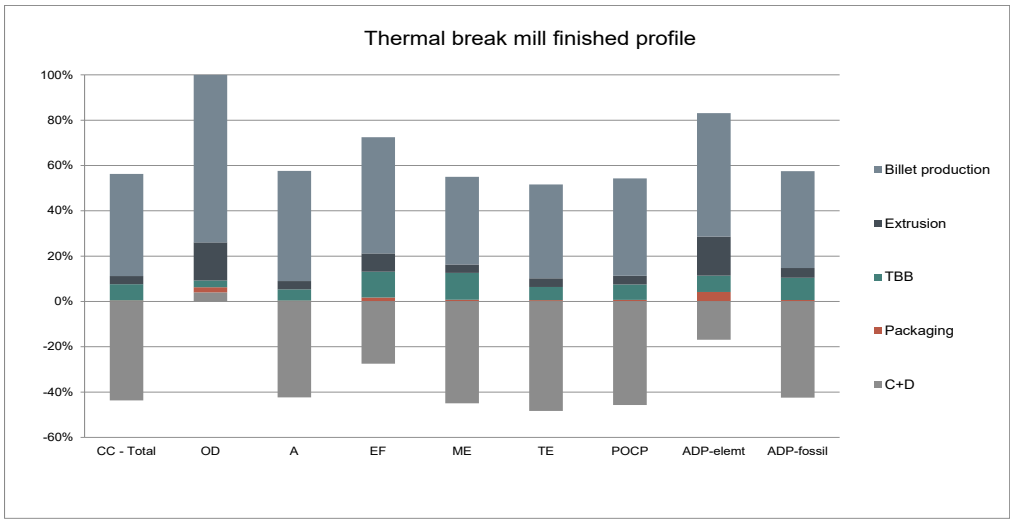
**OUTPUT FLOWS** - CRU: Components for re-use. MFR: Materials for recycling. MER: Materials for energy recovery; EE Exported energy per energy carrier.

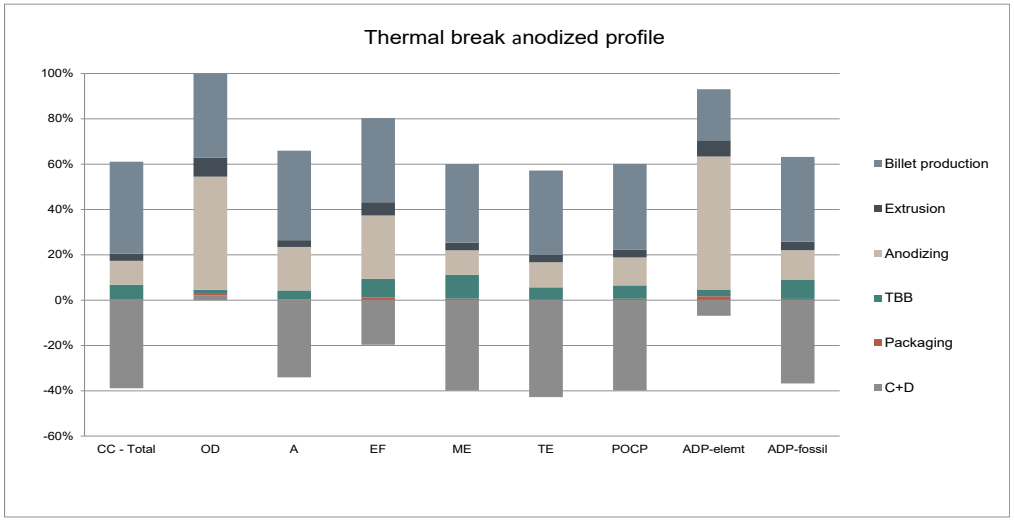
# Supplement information

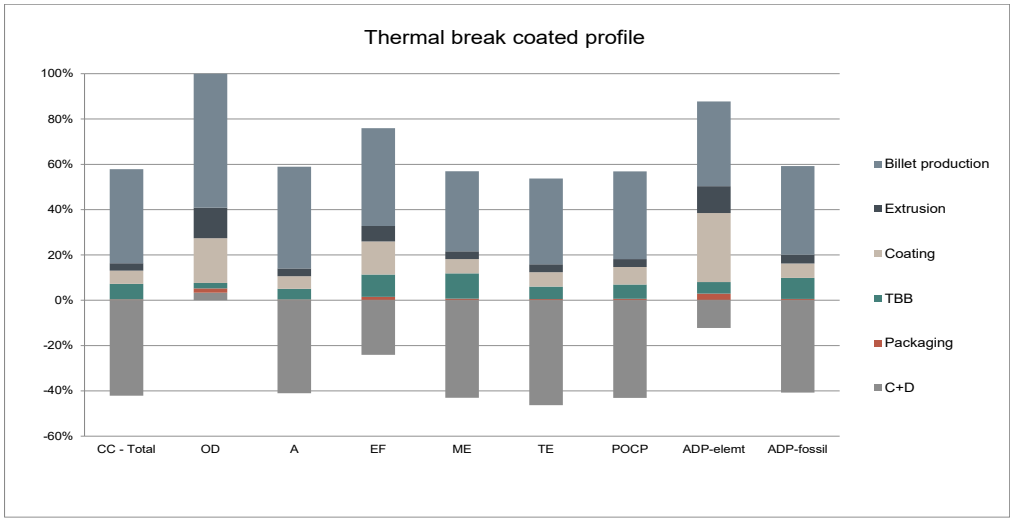





The figures show the contribution of each product stage for the aluminium profiles under study in this EPD.

**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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# References


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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) 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.

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| EPD Program | The International EPD® System<br>EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden<br>www.environdec.com info@environdec.com |
| EPD registration number | S-P-03015 |
| EPD owner | Hydro Aluminium Extrusion Portugal HAEP S.A. |
| Functional unit | 1 kg of anodized/coated aluminium profile, mill finished aluminium profile, thermal break anodized/coated aluminium profile and thermal break 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<br>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<br>Centro Tecnológico de Miranda de Ebro<br>www. ctme.es<br>evamtz@ctme.es |

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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.