ENVIRONMENTAL PRODUCT DECLARATION (EPD) FOR

# MILL FINISHED PROFILE IMPLEMENTED WITH THE AVERAGE BILLET PURCHASED

PRODUCED BY HYDRO EXTRUSION NORWAY A/S – MAGNOR SITE

We are aluminium

**Company:** Hydro Extrusion Norway A/S - Gaustadvegen 136, 2240 Magnor, Norway
**Programme and programme operator:** The International EPD ® System, www.environdec.com - EPD International AB
**PCR:** 2019:14 Construction products, version 1.3.1
**Geographical scope:** Europe
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*The present EPD covers multiple products*
*EPD in accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021*
*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.*

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# 1 PROGRAMME RELATED INFORMATION

| CEN standard EN 15804 served as core PCR | |
|---|---|
| **EPD Programme:** | The International EPD® System, Box 210 60, SE-100 31 Stockholm, Sweden info@environdec.com |
| **GPI and PCR:** | General Programme Instruction 4; PCR "Construction products" 2019:14 version 1.3.1. |
| **PCR review was conducted by:** | The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec/com/contact |
| **EPD Registration no:** | S-P-11243 |
| **EPD validity:** | 5 years |
| **EPD valid within the following geographical area:** | Europe |
| **LCA accountability:** | Francesca Reale, Alessandra Zamagni<br>Ecoinnovazione S.r.l. – spin-off ENEA<br>Via della Liberazione 6, 40128 Bologna<br>www.ecoinnovazione.it |
| **Independent verification of the declaration and data according to ISO 14025:** | EPD verification by accredited certification body |
| **Third party verifier:** | DNV Business Assurance Italia S.r.l.<br>https://www.dnv.it/assurance/index.html |
| **Accredited by:** | ACCREDIA (Registration number 008H rev.01) |
| **Procedure for follow-up during EPD validity involves third party verifier** | Yes |

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 owner has the sole ownership, liability, and responsibility of the EPD.

# 2 PRODUCT RELATED INFORMATION

## 2.1 THE COMPANY

Hydro Extrusion Norway manufactures aluminium profiles. The plant is located in Magnor, near the Swedish border, and was established in 1972. The company has around 100 employees and is equipped with extrusion, packing and surface treatment of aluminium profiles for the building, electronics, offshore and transport markets. It is certified according to several ISO standard, among all ISO 9001, 14001 and 45001.

## 2.2 THE PRODUCT

The studied aluminium profiles are products used in several markets, among all building and construction, industrial and general engineering. Profiles are manufactured starting from billets (externally purchased), which are then extruded in presses. The produced profiles eventually undergo further processing, namely anodising or painting.

The production process of profiles produced in Magnor is schematized in Figure 1. The reference CPC code for all profiles is 415 “Semi-finished products of copper, nickel, aluminium, lead, zinc and tin or their alloys”.

The modelling of electricity purchased by Hydro Extrusion Magnor reflects the residual mix of Norway. The GWP-GHG is 0,055 kg CO2eq/kWh.

**Table 1: energy sources behind the electricity used for the manufacturing steps occurring in Magnor's site**

| Energy sources in the purchased electricity | |
|---|---|
| *biomass* | *1,28* |
| *PV* | *3,89* |
| *wind* | *1,96* |
| *hydro* | *6,68* |
| *nuclear* | *15,78* |
| *hard coal* | *40,52* |
| *lignite* | *0,09* |
| *oil* | *1,52* |
| *gas* | *28,27* |
| *waste* | *0,25* |

The present EPD is an EPD for multiple products, based on the average results of the product group. It covers the mill finished profile implemented with the average billet purchased by Hydro Extrusion Norway A/S, i.e. the “virtual billet” as resulting from the weighted average of billets entering the site.

The present EPD covers only the profiles extruded in Magnor’s presses (extrusion code “M16”).

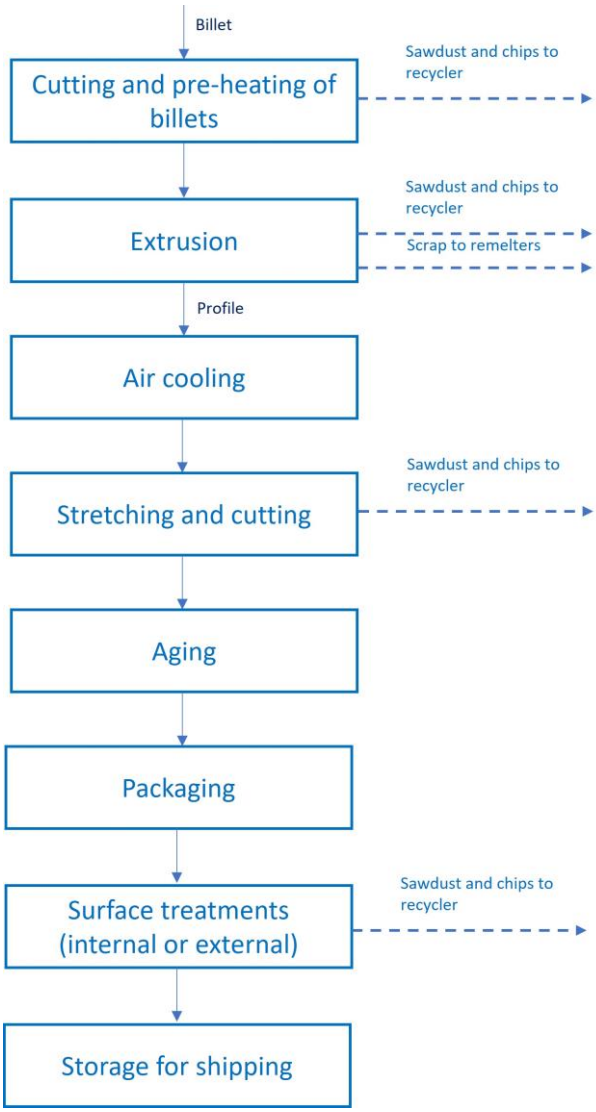



**Figure 1: Production process of the profiles produced in Magnor by Hydro Extrusion Norway A/S**

### 2.2.1 TECHNICAL CHARACTERISTICS OF THE PRODUCT

Profiles are implemented with aluminium billets 6000. Further information on the technical performance of aluminium products by Hydro Extrusion Norway are available in our website and/or can be provided upon request.

### 2.2.2 PRODUCT COMPOSITION

Profiles are made 100% of aluminium billets (input metal), which is sourced from primary production (97%) and/or from remelters (3,32%).

The composition of input metal for the product covered by the present EPD is reported in Table 2 based on the feedstock information available to Hydro Extrusion Norway A/S and/or on information declared in EPDs of incoming billets. The content of SVHC in the products does not exceed 0,1 % of the total weight.

Table 2: Composition of the input metal

| Composition of the input metal* | | |
|---|---|---|
| **Composition (% in weight) of the input metal** | | |
| | **Average** | **Range of variation** |
| *Post-consumer* | 3 | 0 – 81% |
| *Alloys* | 0 – 1 | 0,1 – 1% |
| *Aluminium (excluding post-consumer)* | 96 – 97 | 19,9 - 99% |
| **Packaging of profile (kg per kg of profile)** | | |
| *Plastic* | 1,46E-03 | |
| *Wood* | 1,12E-02 | |
| *Paper* | 1,69E-04 | |
| *Cardboard* | 6,76E-03 | |
| *Metal* | 6,47E-04 | |

** the composition is the results of the weighted average of all billets entering the plants. Billets include Hydro CIRCAL and REDUXA, both covered by EPDs (registered at EPD-Norge with NEPD-5009-4263-EN and NEPD-1840-768-EN, respectively).*

### 2.2.3 PRODUCT REFERENCE SERVICE LIFE

Product Reference Service Life is dependent on product application. Aluminium itself has an infinite lifetime.

### 2.2.4 MARKET

The reference market is Europe. Application sector is mainly, building and construction, industrial and general engineering.

## 3 ENVIRONMENTAL PRODUCT DECLARATION

### 3.1 METHODOLOGY

The study behind the present EPD has been performed according to the state of art of the LCA methodology, with specific reference to the construction sector, in accordance with the following standard and guidelines:

- EN ISO 14040: 2006 Environmental management -- Life cycle assessment -- Principles and framework
- EN ISO 14044:2006 Environmental management -- Life cycle assessment -- Requirements and guidelines
- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products (for additional indicators)
- General Programme Instructions (GPI) for the International EPD® VERSION 4
- The International EPD® System Product Category Rules (PCRs) for construction products, 2019:14 version 1.3.1.

The EPD is mainly addressed to the business-to-business communication. The data elaboration has been performed with the Gabi software, version 10.6.1.35. The database used are the most updated ones implemented in Gabi software. More in detail, main database used is Sphera, European Aluminium and IAI. The LCIA method used is the method EN 15804:2012+A2:2019.

## 3.2 DECLARED UNIT

The declared unit is 1 kg of aluminium profile, plus its packaging.

## 3.3 SYSTEM BOUNDARY

The EPD is a "Cradle to Gate with modules C1-C4 and D and optional modules" (as represented in Table 3 and in showed in Figure 2. Modules A5 and B1 to B7 are excluded as they are strongly dependent on the specific application within the reference market.

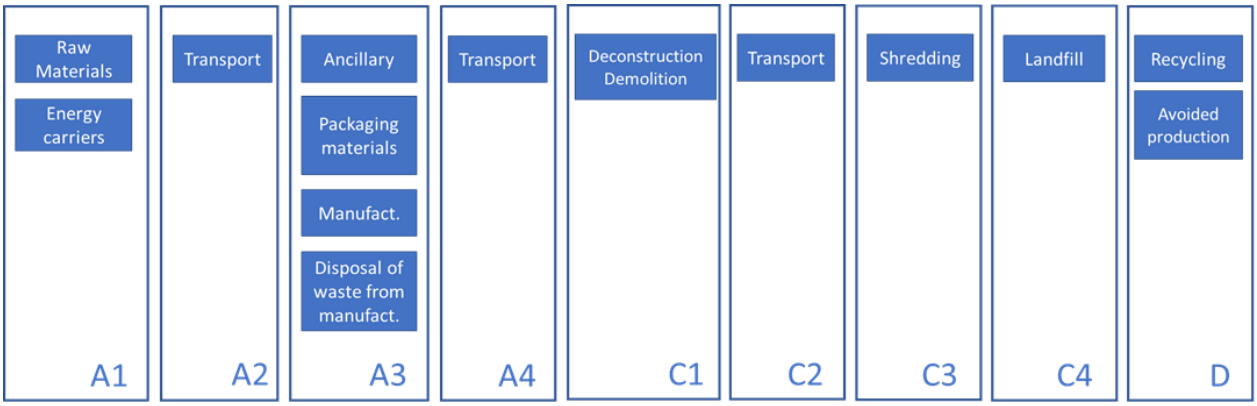
**Table 3: Life cycle stages included in the study for the aluminium profiles by Hydro Extrusion Norway A/S – Magnor site**

| | PRODUCT STAGE | | | CONSTRUCTION PROCESS STAGE | | USE STAGE | END-OF-LIFE STAGE | | | | BENEFITS and LOADS BEYOND SYSTEM BOUNDARY |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A1 | A2 | A3 | A4 | A5 | B1 to B7 | C1 | C2 | C3 | C4 | D |
| | Raw Material Supply | Transport | Manufacturing | Transport | Construction/Installation | Use, Maintenance, Repair, Replacement, Refurbishment, Operational energy use, | Dismantling/De-construction/Demolition | Transport | Waste processing | Disposal | Reuse, Recycling potential |
| | X | X | X | X | NA | NA | X | X | X | X | X |
| Geography | EU, extra-EU, GLO | EU, extra-EU, GLO | EU, NO | GLO, EU | - | - | EU | GLO, EU | EU | EU | EU, GLO |
| Specific data used* | 24% | | | - | - | - | - | - | - | - | - |
| Variation – products | +67% ; -69% | | | - | - | - | - | - | - | - | - |
| Variation – sites | Not applicable | | | - | - | - | - | - | - | - | - |

*Share of GWP-GHG indicator in A1-A3 coming from product-specific LCI data. To this regard:

- The specific GWP-GHG is not an EPD quality indicator and does not concern the representativeness and reliability of declared results.
- The specific GWP-GHG intends to quantify the share of final impacts linked to LCI information (datasets) collected at the sites of company' suppliers.
- The specific GWP-GHG coming from EPD of suppliers, if not declared in the EPD themselves, is based on expert judgment.
- The definition of specific and proxy in the PCR differs from the definition of specific and proxy in the GPI
- The term "specific" (according to the definition of PCR) does not concern the representativeness of datasets.

Figure 2: System boundaries for the study of the aluminium profiles by Hydro Extrusion Norway A/S – Magnor site




The following stages are included in the study:

**Raw Materials supply (A1).** Production of raw materials used in the products. More in detail, A1 includes:

- Production of billets

The production of energy carriers used in the production process is part of A1 as well.

**Transport of raw materials to the factory (A2)**

**Manufacturing of the Hydro aluminium billet (A3).** It includes the following production phases:

- Extrusion

Moreover, in module A3, the production of primary packaging, of the ancillary materials and the treatment of waste generated from the manufacturing processes are accounted for. Since module A5 is excluded, the $CO_2$ stocked the packaging has been balanced with an equal emission of $CO_2$.

**Transport to the user (A4)**

**Dismantling, De-construction or demolition processes (C1)**

**Transport from Dismantling/De-construction/Demolition sites to waste processing and disposal site (C2)**

**Waste processing (C3):** shredding and sorting

**Disposal (C4):** landfill of material fractions not entering the recycling treatment

**Module D:** transport to recycling treatment site (remelter), remelting process and benefit due to the avoided production of primary aluminium.

The reference period of the study is 2022.

## 3.4 MAIN ASSUMPTIONS, CUT-OFFS, BACKGROUND DATA INFORMATION AND SCENARIOS

### 3.4.1 DATA QUALITY

Specific data are used for all of Hydro's processes based on the reference production period. All background data used in the study are from LCI database and are not older than 5 years. Background data, for instance, transport and energy production, are from Sphera.

### 3.4.2 ALLOCATION

The allocation is made in accordance with the provisions of EN 15804. Energy and resources (water and ancillary) in input and waste and emissions in output are allocated to the profile production based on the mass. The production of aluminium included in process scrap is allocated to the main product in which the material is used.

### 3.4.3 CUT-OFFS CRITERIA

Raw and packaging materials are fully included as well as the energy for manufacturing. In the same way, all auxiliaries, manufacturing waste (including hazardous waste) and air emissions are accounted for. Excluded auxiliaries are < 1% in mass of total inflows/outflows.

The construction of the manufacturing site (capital goods) is not included.

### 3.4.4 BACKGROUND DATA INFORMATION

For almost all aluminium billets entering the production site, primary data from producer (EPD) are used. For the remaining materials as well as for the packaging of the finished products a European production is considered.

Raw materials road transport is assumed on a truck Euro 4 (> 32 t).

### 3.4.5 SCENARIOS FOR OPTIONAL MODULES

For the transport towards clients an average distance, based on Hydro's client's location, is considered (Table 3).

**Table 4: Distance and transport mean considered for module A4.**

| Transport information for module A4 | | |
|---|---|---|
| **Transport mean** | **Utilisation ratio - %** | **Distance travelled - km** |
| Diesel truck, Euro IV, > 32 t | 50 | 505 |

The end-of-life scenario is Europe-based and relates to an average application. No impacts of dismantling or demolition processes are allocated to the profiles.

After collection, aluminium is shredded, sorted, and sent to remelting. Material lost at the collection and waste treatment sites is sent to landfill. Collection and waste processing efficiency are reported in Table 5, whereas Table 6 reports transport information.

Table 5: Applied collection and waste processing efficiency for the End-of-life.

| End-of-life - collection and processing efficiency | |
|---|---|
| **Collection efficiency - %** | |
| Aluminium collected | **96** |
| Aluminium lost at the collection site | **4** |
| **Processing efficiency (shredding) - %** | |
| Aluminium sent to recycling after shredding | **95** |
| Aluminium lost in the shredding | **5** |

Table 6: Distance and transport means applied for the End-of-life.

| End-of-life – transport information for modules C and D | | |
|---|---|---|
| **Transport mean** | **Utilisation ratio - %** | **Distance travelled - km** |
| **Materials not collected and sent to landfill (module C2)** | | |
| Diesel truck, Euro IV, > 32 t | 50 | 200 |
| **Material collected and sent to waste processing (module C2)** | | |
| Diesel truck, Euro IV, > 32 t | 50 | 200* |
| **Materials from waste processing to remelter (module D)** | | |
| Diesel truck, Euro IV, > 32 t | 50 | 200 |

*no additional transport is assumed for material which is landfilled after waste processing.

Module D addresses burden and benefit from net output flows leaving the product system, i.e. from flows leaving the product system, lowered of the recycled content (%) initially included in the product. The primary aluminium ingot consumed in Europe is considered for the accounting of benefits from remelted aluminium.

## 3.5 PARAMETERS DESCRIBING THE ENVIRONMENTAL IMPACT ACCORDING EN15804+A2

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

**Table 7 Impacts of mill finished profile implemented with the average billet purchased. Method EN15801+A2**

| Impacts of mill finished profile implemented with the average billet purchased. Method EN15801+A2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Core impacts indicators** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| **Climate Change – total - GWPtot [kg CO2 eq.]** | 7,68E+00 | 5,06E-02 | 0,00E+00 | 1,91E-02 | 1,78E-02 | 5,83E-04 | -7,29E+00 |
| **Climate Change, fossil - GWPf [kg CO2 eq.]** | 7,66E+00 | 5,09E-02 | 0,00E+00 | 1,92E-02 | 1,77E-02 | 6,01E-04 | -7,27E+00 |
| **Climate Change, biogenic - GWPb [kg CO2 eq.]** | 1,88E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,54E-04 | -2,00E-05 | -1,52E-02 |
| **Climate Change, land use and land use change - GWPluc [kg CO2 eq.]** | 5,68E-03 | 4,69E-04 | 0,00E+00 | 1,77E-04 | 6,23E-06 | 1,87E-06 | -1,26E-03 |
| **Ozone depletion - ODP [kg CFC-11 eq.]** | 1,91E-07 | 4,43E-15 | 0,00E+00 | 1,67E-15 | 3,07E-13 | 1,53E-15 | -5,46E-11 |
| **Acidification – AP [Mole of H+ eq.]** | 4,67E-02 | 3,20E-04 | 0,00E+00 | 1,21E-04 | 4,18E-05 | 4,26E-06 | -4,23E-02 |
| **Eutrophication, freshwater – Epfr [kg P eq.]*** | 2,45E-05 | 1,85E-07 | 0,00E+00 | 6,97E-08 | 6,42E-08 | 1,21E-09 | -3,23E-06 |
| **Eutrophication, marine - EPmar [kg N eq.]** | 8,34E-03 | 1,57E-04 | 0,00E+00 | 5,94E-05 | 1,05E-05 | 1,10E-06 | -6,09E-03 |
| **Eutrophication, terrestrial – Epter [Mole of N eq.]** | 9,21E-02 | 1,74E-03 | 0,00E+00 | 6,58E-04 | 1,11E-04 | 1,21E-05 | -6,66E-02 |
| **Photochemical ozone formation, human health – POCP [kg NMVOC eq.]** | 2,47E-02 | 3,03E-04 | 0,00E+00 | 1,14E-04 | 2,79E-05 | 3,32E-06 | -1,84E-02 |
| **Resource use, mineral and metals – ADPe [kg Sb eq.]**** | 3,50E-06 | 3,27E-09 | 0,00E+00 | 1,23E-09 | 2,61E-09 | 2,77E-11 | -1,63E-06 |
| **Resource use, fossils – ADPf [MJ]**** | 9,15E+01 | 6,88E-01 | 0,00E+00 | 2,60E-01 | 3,59E-01 | 8,00E-03 | -8,92E+01 |
| **Water use - WU [$m^3$ world equiv.]**** | 7,40E-01 | 5,84E-04 | 0,00E+00 | 2,20E-04 | 3,71E-03 | 6,60E-05 | -1,08E+00 |
| **Indicators required by the PCR 2019:14** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| **GWP-GHG [kg CO2 eq.]***** | 7,67E+00 | 5,13E-02 | 0,00E+00 | 1,94E-02 | 1,77E-02 | 6,03E-04 | -7,28E+00 |

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.
** 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.
***The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.

Table 8 Impacts of mill finished profile implemented with the average billet purchased. Method EN15801+A2 – variation of impacts within the product group

| Impacts of mill finished profile implemented with the average billet purchased. Method EN15801+A2 – variation of impacts within the product group, with reference to Modules A1 to C4 [%] | | |
|---|---|---|
| **Core impacts indicators** | **Max** | **Min** |
| **Climate Change – total - GWPtot** | 67% | -69% |
| **Climate Change, fossil - GWPf** | 67% | -69% |
| **Climate Change, biogenic - GWPb** | 84% | -74% |
| **Climate Change, land use and land use change - GWPluc** | 694% | -74% |
| **Ozone depletion - ODP** | 153% | -100% |
| **Acidification – AP** | 68% | -72% |
| **Eutrophication, freshwater – Epfr** | 125% | -89% |
| **Eutrophication, marine - EPmar** | 102% | -76% |
| **Eutrophication, terrestrial – Epter** | 102% | -75% |
| **Photochemical ozone formation, human health – POCP** | 95% | -72% |
| **Resource use, mineral and metals – ADPe** | 74% | -79% |
| **Resource use, fossils – ADPf** | 83% | -66% |
| **Water use - WU** | 126% | -60% |
| **GWP-GHG** | 67% | -69% |

## 3.6 PARAMETERS DESCRIBING THE ENVIRONMENTAL IMPACT ACCORDING EN15804+A1

**Table 9 Impacts of mill finished profile implemented with the average billet purchased. Method EN15801+A1**

| Impacts of mill finished profile implemented with the average billet purchased. Method EN15801+A1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Impact category*** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| **Global warming potential (GWP) [kg CO2 eq.]** | 7,55E+00 | 4,92E-02 | 0,00E+00 | 1,86E-02 | 1,74E-02 | 5,68E-04 | -7,23E+00 |
| **Ozone Depletion Potential (ODP) [kg R11 eq.]** | 1,40E-07 | 5,22E-15 | 0,00E+00 | 1,97E-15 | 3,61E-13 | 1,80E-15 | -1,00E-10 |
| **Acidification potential (AP) [kg SO2 eq.]** | 3,86E-02 | 2,17E-04 | 0,00E+00 | 8,21E-05 | 3,33E-05 | 3,39E-06 | -3,60E-02 |
| **Eutrophication potential (EP) [kg Phosphate eq.]** | 3,08E-03 | 5,52E-05 | 0,00E+00 | 2,08E-05 | 4,61E-06 | 3,85E-07 | -2,12E-03 |
| **Photochemical Ozone Creation Potential (POCP) [kg Ethene eq.]*** | 2,02E-03 | -8,41E-05 | 0,00E+00 | -3,18E-05 | 2,36E-06 | 2,55E-07 | -1,97E-03 |
| **Abiotic depletion potential for non fossil resources (ADPE) [kg Sb eq.]** | 2,17E-06 | 3,27E-09 | 0,00E+00 | 1,24E-09 | 2,98E-09 | 2,83E-11 | -1,67E-06 |
| **Abiotic depletion potential for fossil resources (ADPF) [MJ]** | 8,09E+01 | 6,80E-01 | 0,00E+00 | 2,57E-01 | 2,00E-01 | 7,67E-03 | -7,53E+01 |

* Negative impact for Photochemical Ozone Creation Potential (POCP) in modules A4 and C2 is due to the NO emissions from truck.

## 3.7 INDICATORS OF RESOURCES USE, WASTE AND OUTPUT FLOWS, BIOGENIC CONTENT

The LCI indicators are calculated using the methodology implemented in the LCA for Expert software.

| Mill finished profile implemented with the average billet purchased. Method EN15801+A2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Ressource use indicators** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| Use of renewable primary energy (PERE) [MJ] | 4,00E+01 | 4,87E-02 | 0,00E+00 | 1,84E-02 | 2,09E-01 | 1,31E-03 | -4,05E+01 |
| Primary energy resources used as raw materials (PERM) [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total use of renewable primary energy resources (PERT) [MJ] | 4,00E+01 | 4,87E-02 | 0,00E+00 | 1,84E-02 | 2,09E-01 | 1,31E-03 | -4,05E+01 |
| Use of non-renewable primary energy (PENRE) [MJ] | 9,17E+01 | 6,90E-01 | 0,00E+00 | 2,61E-01 | 3,59E-01 | 8,01E-03 | -8,93E+01 |
| Non-renewable primary energy resources used as raw materials (PENRM) [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Total use of non-renewable primary energy resources (PENRT) [MJ] | 9,17E+01 | 6,90E-01 | 0,00E+00 | 2,61E-01 | 3,59E-01 | 8,01E-03 | -8,93E+01 |
| Input of secondary material (SM) [kg] | 2,95E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of renewable secondary fuels (RSF) [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of non renewable secondary fuels (NRSF) [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Use of net fresh water (FW) [m3] | 2,50E-01 | 5,37E-05 | 0,00E+00 | 2,03E-05 | 1,70E-04 | 2,02E-06 | -1,02E-01 |
| **Output flows and waste categories** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| Hazardous waste disposed (HWD) [kg] | 1,16E-02 | 2,55E-12 | 0,00E+00 | 9,64E-13 | -2,69E-11 | 1,74E-13 | -6,29E-08 |
| Non-hazardous waste disposed (NHWD) [kg] | 3,19E+00 | 9,95E-05 | 0,00E+00 | 3,76E-05 | 4,83E-02 | 4,00E-02 | -2,18E+00 |
| Radioactive waste disposed (RWD) [kg] | 9,96E-04 | 8,92E-07 | 0,00E+00 | 3,37E-07 | 5,51E-05 | 9,16E-08 | -5,32E-03 |
| Components for re-use (CRU) [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for Recycling (MFR) [kg] | 2,31E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,12E-01 | 0,00E+00 | 0,00E+00 |
| Material for Energy Recovery (MER) [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported electrical energy (EEE) [MJ] | 3,64E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported thermal energy (EET) [MJ] | 7,02E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| **Biogenic carbon content** | **A1-A3** | **A4** | **C1** | **C2** | **C3** | **C4** | **D** |
| Biogenic carbon content in packaging [kg]* | 7,92E-03 | - | - | - | - | - | - |

*1 kg biogenic carbon is equivalent to 44/12 kg $CO_2$. The mass of biogenic carbon containing materials in the products is less than 5%.

# 4 REFERENCES

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Environmental Product Declaration (EPD) of extrusion billet REDUXA produced by Hydro Aluminium AS. Registered at EPD Norge, NEPD-1840-768-EN

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# 5 ADDITIONAL INFORMATION

## 5.1 ADDITIONAL INFORMATION CONCERNING THE PROGRAMME AND THE EPD

EPDs of construction products may not be comparable if they do not comply with EN 15804.
Environmental product declarations within the same product category from different programs may not be comparable. This EPD and the PCR 2019:14 “Construction products” are available on the website of The International EPD® System (www.environdec.com).

The LCA study and the present EPD have been issued with the technical scientific support of Ecoinnovazione S.r.l., spin-off ENEA (http://ecoinnovazione.it/?lang=en).

The verifier and the Programme Operator do not make any claim nor have any responsibility of the legality of the products included in the present EPD.

## 5.2 ADDITIONAL INFORMATION ON THE PRODUCT AND ON THE COMPANY

For further information on product characteristics, typical applications, technical datasheet and case histories, please visit our website www.hydro.com or contact Peter.Uhrenholt@hydro.com.