ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Gartner Extrusion GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-GAR-20230466-IBA1-EN
Issue date	14.12.2023
Valid to	13.12.2028

Aluminum profiles – mechanically processed

Gartner Extrusion GmbH

Institut Bauen und Umwelt e.V.

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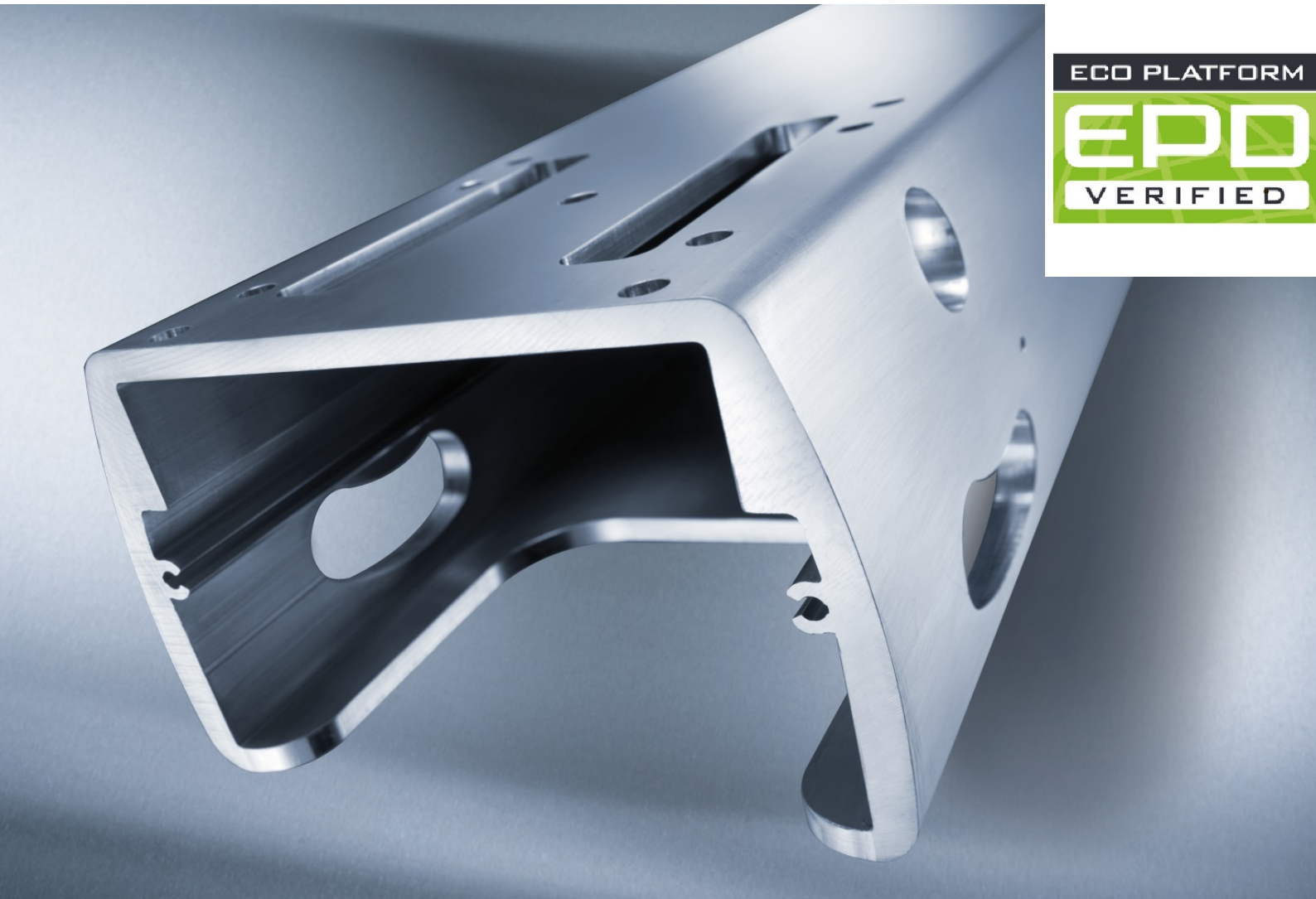


1. General Information

Gartner Extrusion GmbH

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-GAR-20230466-IBA1-EN

This declaration is based on the product category rules:

Building metals, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

14.12.2023

Valid to

13.12.2028

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Aluminum profiles – mechanically processed

Owner of the declaration

Gartner Extrusion GmbH
Peterswörther Straße 1a
89423 Gundelfingen
Germany

Declared product / declared unit

1 kg aluminum profile – mechanically processed

Scope:

The EPD is based on annual production data for 2020 at the Gundelfingen site.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Dr. Eva Schmincke,
(Independent verifier)

2. Product

2.1 Product description/Product definition

The aluminium profiles produced are primarily used in the construction industry, mechanical engineering, the automotive industry, electrical engineering and medical technology. The starting materials are aluminium alloys made from the light metal aluminium (Al) and various alloying elements such as silicon, manganese, iron, magnesium etc. Depending on customer requirements, the aluminium profiles can be supplied surface-treated (anodised or powder-coated), mechanically-processed and/or thermally-broken.

Applicable standards:
Depending on whether aluminium profiles are load-bearing in their end application or not (e.g. window frames, support beams), they may or may not be subject to harmonisation regulations. As aluminium profiles are intermediate products, it is often not possible to make a clear statement about their final applications. For this reason, both standards ('Profiles and constructions according to CPR' and 'Profiles not subject to EU harmonisation regulations') are listed below. This covers the range of possible final applications.

Aluminium profiles and constructions according to CPR (hEN)
(EU) Directive No. 305/2011 (CPR) applies for placing the product on the market in the EU/EFTA (with the exception of Switzerland). The product requires a Declaration of Performance taking consideration of the following standards:

- *DIN EN 15088:2006-03, Aluminium and aluminium alloys – Structural products for construction works – Technical for inspection and delivery*

Use is governed by the respective national regulations.

Aluminium products which are not subject to any EU harmonisation guidelines
Application of the product is subject to the respective national guidelines at the place of use:

- *DIN EN 755-1:2016-10, Aluminium and aluminium alloys – Extruded rods/bars, tubes and profiles – Part 1: Technical conditions for inspection and delivery*
- *DIN EN 12020-1:2022-05, Aluminium and aluminium alloys – Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 – Part 1: Technical conditions for inspection and delivery*

2.2 Application

Due to their versatile properties, aluminium profiles can be used in a wide variety of areas. In the construction sector, aluminium profiles can be used for the production of facades, windows, doors, substructures etc.; in the automotive industry, for example, as frames for sliding roofs or as roof rails; and in mechanical engineering, for example, as pneumatic profiles.

2.3 Technical Data

Physical properties of aluminium:

Technical construction data

Name	Value	Unit
Density	2700	kg/m^3
Melting point	660	°C
Electrical conductivity at 20 °C	28–34	m/Ω*mm^2
Thermal conductivity	200–240	W/(mK)
Modulus of elasticity	70000	N/mm^2
Thrust module	27000	N/mm^2
Specific thermal capacity	0,9–0,92	kJ/kgK
Hardness	40–100	HB
Yield strength Rp 0.2	60–300	N/mm^2
Tensile strength Rm	90–350	N/mm^2
Elongation at break	6–30	%

Aluminium profiles and constructions according to CPR (hEN)
Performance values of the product according to the Declaration of Performance in terms of its essential characteristics in accordance with:

- *DIN EN 15088:2006-03, Aluminium and aluminium alloys – Structural products for construction works – Technical delivery conditions*

Profiles which are not subject to any EU harmonisation legalisation guidelines
Product performance values in terms of its characteristics following the relevant technical determination (no CE marking).

2.4 Delivery status

The aluminium profiles are supplied in accordance with *EN 755-1* or *EN 12020-1*. The chemical composition of the alloys is based on *EN 573-3*.
The packaging of the aluminium profiles is based on the customer's requirements. Reusable customer racks are just as conceivable as packaging made of cardboard, wood, plastic film etc.

2.5 Base materials/Ancillary materials

The chemical composition of the aluminium alloys used for aluminium profiles can be found in the *EN 573-3* standard. The aluminium content is more than 90%.

The product / At least one sub-product contains substances from the ECHA list of candidates of Substances of Very High Concern (SVHC) (12.2023) exceeding 0.1% by mass: no

The product / At least one sub-product contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1% by mass in at least one sub-product: no

Biocide products were added to this construction product, or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Regulation on Biocide Products No. 528/2012): no

Explanation of aluminium (Al) as a material:
Aluminium is a silver-white light metal with a melting point of 660 °C.
Aluminium is covered by a natural, thin oxide layer and is therefore protected from decomposition by air, water or certain chemicals. This makes the material highly corrosion-resistant and durable.
The properties of aluminium also make it possible to produce profiles with complex shapes and contours. In addition,

aluminium is not only very corrosion-resistant, weldable and bendable, it is also a good heat conductor, a good electrical conductor, and can be easily machined. Aluminium also has good casting properties.

2.6 Manufacture

Heating in the billet furnace: The aluminium billet is heated to 460 °C to 530 °C to enable the metal to reach its plastic state.

Extrusion moulding: In an extrusion plant, the heated aluminium billet is pressed through a preheated pressing tool with pressing forces of over 10 MN. This produces the various contours of the aluminium profiles agreed with the customer.

Cooling the aluminium profiles: The profiles produced are cooled directly after extrusion. There are various options for this: air, water or spray mist. Cooling the aluminium profiles affects the strength of the product, among other things.

Stretching the aluminium profiles: After extrusion and cooling, the aluminium profiles are stretched. The profiles are usually stretched beyond their elastic limit and thus straightened.

Cutting the aluminium profiles to length: The aluminium profiles are cut to length to meet customer requirements using a cold saw.

Artificial ageing: Subsequent heat treatment of the aluminium profiles in artificial ageing furnaces (different temperature ranges with coordinated duration) ensures that the required mechanical properties are achieved.

Surface treatment: Surface treatment of the aluminium profiles (coating with powder paint or electrical oxidation, i.e. anodising) ensures that the appearance and corrosion requirements meet the customer's demands.

Thermal breaking: Building profiles in particular must fulfil high thermal requirements. This is achieved by separating or connecting the inner and outer profiles with one or more plastic bars (with or without additional insulation between the inner and outer profiles).

Mechanical processing: Using state-of-the-art equipment, all mechanical processing operations agreed with the customer are carried out on the aluminium profiles so that they can be used by the customer as planned.

Remelting production scrap: The production scrap incurred during the manufacture of aluminium profiles is remelted directly on site in a remelting plant at approx. 750 °C. The extrusion billets produced in this way are reused in the existing extrusion lines. This ensures a closed scrap cycle at the site, combined with all the energy benefits.

Packaging: Customised packaging of the aluminium profiles takes place at the end of the production process. The aluminium profiles are then ready for dispatch.

All processes relating to the production of aluminium profiles and the remelting of the resulting profile remnants are monitored by certified quality management systems (e.g. ISO 9001, IATF 16949 etc.) with regard to qualitative product requirements in accordance with standards.

2.7 Environment and health during manufacturing

During the entire manufacturing process described above, all legal obligations regarding occupational safety, health and safety, energy and the environment are complied with. This is confirmed by the relevant employers' liability insurance association, other authorities etc. on the one hand and by management systems such as *ISO 14001*, *ISO 50001* etc. on the other, and is continuously monitored by accredited certification companies.

2.8 Product processing/Installation

Aluminium profiles are normally semi-finished products. This means that processing to the end product is carried out by the respective customer and depends primarily on the intended application of the individual customer.

2.9 Packaging

All aluminium profiles are packaged in accordance with agreed customer requirements. The packaging variants used range from reusable customer racks to untreated wooden crates and cardboard packaging.
The separate packaging of the individual aluminium profiles, e.g. using cardboard interlayers, polyethylene (PE) film, paper etc., is designed to provide optimum protection for the aluminium profiles so that they do not incur any damage during transport.
The packaging materials used can be recycled by the customer.

2.10 Condition of use

The aluminium profiles are alloys with the specified alloy components. The ingredients correspond to the basic materials specified in *EN 573-3* with their respective mass percentages. There are no special features of the material composition for the period of use. For surface-treated aluminium profiles (anodised or powder-coated), the information/instructions/specifications of the respective quality associations (e.g. GSB, Qualicoat, Qualanod) and the specifications of the manufacturers of the powder coatings used must be observed (e.g. regarding corrosion resistance, UV radiation etc.).

2.11 Environment and health during use

When the aluminium profiles are used as intended, no hazards can arise for water, air/atmosphere and soil.
The requirements for use and maintenance are not based on the semi-finished products manufactured, but on the specific design and application of the end product.

2.12 Reference service life

The reference service life (RSL) for aluminium profiles is not declared, as these are semi-finished products with a wide range of possible applications. Use and further processing by the manufacturer of the finished product are the decisive factors here. A natural oxide layer that forms on the surface permanently protects the aluminium from the effects of weathering and ageing.

2.13 Extraordinary effects

Fire

Uncoated aluminium profiles comply with the requirements of building material class A 'non-combustible', in accordance with DIN 4102-4. The melting point for aluminium is 660 °C.

- Smoke gas development: no smoke gas development occurs with bare aluminium profiles
- Burning droplets: not applicable
- Fire gas toxicity: not applicable

Water

The effects of water on the aluminium profiles do not lead to any changes in the product or any other negative environmental impact.

Mechanical destruction

Mechanical destruction is not of relevance for aluminium

profiles.

2.14 Re-use phase

Bare aluminium profiles in particular are 100% recyclable without any loss of quality. Coated scrap and scrap from demolition, conversion or refurbishment can be easily separated and fed into the recycling process (via the recycling industry).

2.15 Disposal

According to the European Waste Catalogue (EWC), waste classification (waste code) is based on the respective end product.
Due to its high value, aluminium scrap is recycled as a raw material and fed into an established cycle for reuse.
The energy consumption during the recycling of aluminium profiles corresponds to only approx. 5% of the original energy consumption required for the production of primary aluminium.
If aluminium profiles are nevertheless sent to landfill, there is no environmental impact.

2.16 Further information

Please refer to www.gutmann.de.

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit refers to aluminium profiles produced by Gartner Extrusion GmbH in Gundelfingen, Germany.
This EPD specifies the declared unit as 1 kg of aluminium profiles in the 'mechanically processed' finishing stage.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	kg

The products analysed are almost identical in terms of their basic composition and processing. The declared results are therefore highly representative.

3.2 System boundary

The analysis is designed as a 'cradle-to-gate with options' approach. In particular, the production from the raw materials to the finished product ('cradle-to-gate') is taken into account. In addition, the expenses for recycling are included for disposal at the end of the life cycle. Any credits incurred for the secondary product from material recycling are shown separately. The transport of the profiles ex works, any further processing as well as installation, dismantling and return transport are not included in the analysis.

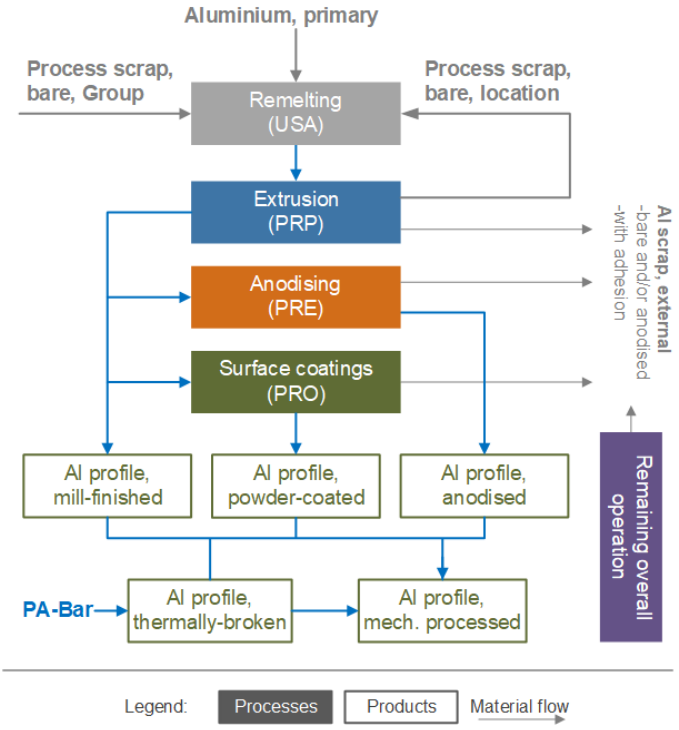
The following aluminium profile production processes are taken into account in modules A1–A3:

- Provision of raw, ancillary and operating materials and energy
- Transport of materials to the plant and removal of residual materials
- Disposal of residual materials
- Directly occurring emissions

Particular attention is paid to:

- the external production of purchased aluminium billets, profiles and ingots
- the manufacturing processes of the aluminium profiles in the plant – depending on the aluminium profile product class, including surface finishing and mechanical post-processing
- the consumption of other operating materials (tools, cleaning agents, industrial gases)
- the consumption of packaging materials (foils, cardboard, steel straps and wooden pallets)
- the assumption of closed-loop recycling in the melting furnace for the aluminium production waste generated at the site (direct reuse as raw material possible, as the scrap does not suffer any loss of quality)

The following figure schematically shows the sub-processes considered for **A1 to A3**: remelting, extrusion, anodising and surface coating. This analysis is supplemented with data on the remaining overall operation. Five types of aluminium profiles are produced at the Gundelfingen site: mill-finished, anodised, powder-coated, thermally-broken and mechanically processed.



Due to the low environmental impact of the packaging, its disposal is not taken into account in Module A5.
At the end of the life cycle of the aluminium profiles, the following processes are taken into account for the disposal stage:

- **C3:** Shredding of the aluminium scrap. The end-of-waste property is reached after shredding.
- **D:** The shredded scrap is remelted into secondary aluminium. The environmental credit for the net scrap quantity is offset against the expenses saved by substituting primary aluminium.

3.3 Estimates and assumptions

In the absence of a representative underlying data set, estimates and assumptions are used for modelling purposes. These are documented accordingly.

3.4 Cut-off criteria

The LCA model contains all relevant input and output data for which information is available. Data gaps were filled with conservative assumptions (average data or generic data) where data was available.
Only material flows with a contribution of less than 1% of the mass input in relation to the respective sub-process step were cut off, but only on the condition that the anticipated effect is likely to be insignificant.

No processes, materials or emissions were neglected that make a significant contribution to the environmental impact of the products analysed. The total sum of the neglected input and output flows in relation to the total quantity of aluminium used (17,000 tonnes) is no more than 0.5% by mass.

3.5 Background data

The LCA for Experts (GaBi) software system is used to model the life cycle of the products under consideration. The data required for both upstream and downstream processes is taken from the Sphera LCA databases, version 2023.1 (*Sphera 2023*).

3.6 Data quality

For the life cycle inventory of the **primary data**, the annual quantities used and produced and the consumption of energy and the required raw materials and supplies at the Gundelfingen site were recorded. Further questions were clarified in the subsequent iterative process. The material and energy flows for the production site are realistically mapped thanks to in-depth discussions between the life cycle assessor bifa Umweltinstitut GmbH and Gartner Extrusion GmbH.

Due to the detailed data collection (metre and ERP system, balance sheet data) and the review process, it can be assumed that the primary data collected is of very high quality.

When selecting the **background data**, care was taken to ensure technical, geographical and time-related representativeness. Missing data was approximated using generic data sets or representative average values. The underlying data sets used are not older than ten years.

3.7 Period under review

Data for the 2020 production year was used for data collection.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Germany

3.9 Allocation

An allocation of co-products was avoided. Quantities of aluminium dross and aluminium hydroxide are included in the analysis by extending the system boundary in the corresponding remelting and anodising sub-process steps. The environmental impacts of the remelting and extrusion sub-processes are allocated to the respective downstream process steps via the mass fractions of the material quantities. The allocation of resources (material and energy use) for the remaining overall operation is carried out for the end products based on their mass share of the total product quantity.
Multi-input processes are not relevant for this analysis.
In order to determine the net flows of aluminium into material recycling, the quantity of external aluminium scrap used in A1 to A3 is deducted from the total quantity of end-of-life products in accordance with the requirements of *PCR, Part B*.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. See point 3.5 for details of the calculation.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The product aluminium profile – mechanically processed does not contain any biogenic carbon.
The proportion of biogenic carbon in the associated packaging is 0.016 kg.
The following technical information forms the basis for the declared modules or can be used for developing specific scenarios in the context of a building evaluation if modules are not declared (MND).

Construction installation process (A5)

The use of packaging material is balanced in module A3 for the declared product, but disposal of the packaging material is not declared in module A5. The following table shows the balanced quantities of packaging materials as technical information for module A5.

Name	Value	Unit
Wood packaging	0,022	kg
PE foil packaging	0,002	kg
Cardboard packaging	0,017	kg

As the aluminium profiles are semi-finished products, the reference service life is not declared (see section 2.12).

End of Life (C1-C4)

Name	Value	Unit
Collected separately waste type	1	kg
Recycling	0.96	kg
Landfilling	0.04	kg

For extruded aluminium profiles, it is assumed that 96% by mass will be recycled at their end of life.

Reuse, recovery and recycling potential (D), relevant scenario details

Name	Value	Unit
Recycling efficiency Al remelting	0,98	kg

The declared products are semi-finished products whose end of life depends heavily on their use as end products. This is therefore a consistent assumption in the context of building certification. Primary aluminium is substituted when the product is recycled.

5. LCA: Results

For a declared unit of **1 kg of aluminium profile – mechanically processed**, the indicators for the Life Cycle Inventory and impact assessment in accordance with *EN 15804* are listed below. The additional impact categories according to *EN 15804+A2* (optional) are not shown.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg Aluminum profiles – mechanically processed

Parameter	Unit	A1-A3	C3	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	5.3E+00	8.49E-03	-3.38E+00
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	5.31E+00	8.39E-03	-3.36E+00
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	-1.3E-02	9.12E-05	-1.08E-02
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	1.36E-03	9.05E-07	-6.63E-04
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	3.31E-11	1.53E-13	-2.78E-11
Acidification potential of land and water (AP)	mol H^+ eq	1.72E-02	1.77E-05	-1.32E-02
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	3.62E-06	3.11E-08	-1.7E-06
Eutrophication potential aquatic marine (EP-marine)	kg N eq	2.96E-03	4.24E-06	-1.87E-03
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	3.22E-02	4.43E-05	-2.03E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	8.83E-03	1.13E-05	-5.79E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	1.01E-06	1.29E-09	-9.37E-07
Abiotic depletion potential for fossil resources (ADPF)	MJ	7.41E+01	1.74E-01	-4.85E+01
Water use (WDP)	m^3 world eq deprived	2.39E-01	1.83E-03	-1.47E-01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg Aluminum profiles – mechanically processed

Parameter	Unit	A1-A3	C3	D
Renewable primary energy as energy carrier (PERE)	MJ	2.89E+01	1.04E-01	-2.35E+01
Renewable primary energy resources as material utilization (PERM)	MJ	1.73E-01	0	0
Total use of renewable primary energy resources (PERT)	MJ	2.91E+01	1.04E-01	-2.35E+01
Non renewable primary energy as energy carrier (PENRE)	MJ	7.41E+01	1.74E-01	-4.85E+01
Non renewable primary energy as material utilization (PENRM)	MJ	2.45E-02	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	7.42E+01	1.74E-01	-4.85E+01
Use of secondary material (SM)	kg	4.24E-01	0	0
Use of renewable secondary fuels (RSF)	MJ	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0
Use of net fresh water (FW)	m^3	4.88E-02	8.39E-05	-4.09E-02

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg Aluminum profiles – mechanically processed

Parameter	Unit	A1-A3	C3	D
Hazardous waste disposed (HWD)	kg	4E-08	2.18E-11	-3.09E-08
Non hazardous waste disposed (NHWD)	kg	1.17E+00	1.28E-04	-1.01E+00
Radioactive waste disposed (RWD)	kg	6.24E-03	2.77E-05	-5.54E-03
Components for re-use (CRU)	kg	0	0	0
Materials for recycling (MFR)	kg	0	9.6E-01	0
Materials for energy recovery (MER)	kg	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0
Exported thermal energy (EET)	MJ	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 kg Aluminum profiles – mechanically processed

Parameter	Unit	A1-A3	C3	D

Incidence of disease due to PM emissions (PM)	Disease incidence	ND	ND	ND
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND
Soil quality index (SQP)	SQP	ND	ND	ND

Disclaimer – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption', 'potential comparative toxic unit for ecosystems', 'potential comparative toxic unit for humans – cancerogenic', 'Potential comparative toxic unit for humans - not cancerogenic', 'potential soil quality index'. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator. This EPD was created using a software tool.

6. LCA: Interpretation

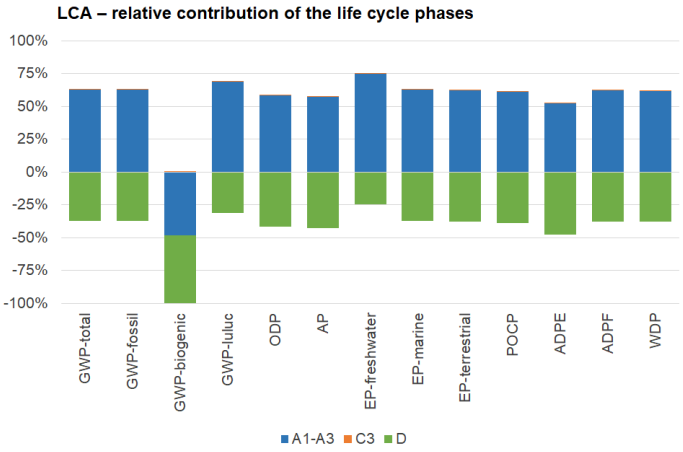
The following interpretation summarises the results of the Life Cycle Assessment for a defined quantity of **1 kg aluminium profile – mechanically processed**.

The production phase (modules A1–A3) of the aluminium profiles dominates the results in relation to the individual phases. The environmental impacts are mainly influenced by the upstream processes for the aluminium ingots, billets and profiles used. In the biogenic climate change category, this influence is more than compensated for by the storage of carbon in the wood used for the packaging and the overall result shows an environmental relief (negative). If the wooden packaging is thermally utilised after use in module A5, the resulting CO_2 emissions must be included accordingly.

As other EPDs for aluminium products also show, the environmental impact in module C is negligible compared to A1–A3. The waste treatment by shredding shown at the end of the product life cycle (module C3) only contributes very little to the overall environmental impact of the products.

Due to the very good recyclability of aluminium, the material can replace primary aluminium after recycling. Module D shows the potential for recycling aluminium at the end of the product life cycle. As a high proportion of secondary aluminium is already used in the primary products of aluminium profiles, the net flow into module D is reduced by these quantities. The potential for substituting primary aluminium (credits) was adjusted accordingly.

The results of the sectoral analyses carried out show that the effects from production of the additional primary aluminium required through the purchase of aluminium ingots, billets and profiles contribute significantly to how environmentally friendly the aluminium profiles described are. The statement applies accordingly to the recycling potential of remelting aluminium.



7. Requisite evidence

As semi-finished products offer a wide range of possible applications, the design for use in further processing is the responsibility of the manufacturer of the final product.

8. References

Standards:

DIN 4102
DIN 4102-4:2016-05, Fire behaviour of building materials and building components – Part 4: Synopsis and application of classified building materials, components and special components

EN 573-3
DIN EN 573-3:2019-10, Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 3: Chemical composition and product forms

EN 755-1
DIN EN 755-1:2016-10, Aluminium and aluminium alloys – Extruded rods/bars, tubes and profiles – Part 1: Technical delivery conditions

EN 12020-1
DIN EN 12020-1:2022-05, Aluminium and aluminium alloys – Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 – Part 1: Technical delivery conditions

EN 15088
DIN EN 15088:2006-03, Aluminium and aluminium alloys – Structural products for construction works – Technical delivery conditions

EN 15804
EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

IATF 16949
Requirements on quality management systems for serial and spare parts production in the automotive industry

ISO 9001
EN ISO 9001:2015, Quality management systems – Requirements

ISO 14001
EN ISO 14001:2015, Environmental management systems – Requirements with guidance for use

ISO 14025
EN ISO 14025:2011, Environmental designations and declarations – Type III environmental declarations – Basic principles and processes

ISO 14040
EN ISO 14040:2006+A1:2020, Environmental management – Life cycle assessment – Principles and framework

ISO 14044
EN ISO 14044:2006+A1:2018+A2:2020, Environmental management – Life cycle assessment – Requirements and guidelines

ISO 50001
EN ISO 50001:2018, Environmental management systems – Requirements with guidance for use

Other literature:

EA 2018
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