ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Aluminium GmbH Nachrodt
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ALU-20230408-IBB1-EN
Issue date	14/11/2023
Valid to	13/11/2028

Aluminium extrusion billets

Aluminium GmbH Nachrodt Speedline Aluminium Giesserei GmbH on behalf of Alumet GmbH

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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1. General Information

Aluminium GmbH Nachrodt Speedline Aluminium Giesserei GmbH on behalf of Alu-met GmbH

Programme holder

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

Declaration number

EPD-ALU-20230408-IBB1-EN

This declaration is based on the product category rules:

Products of aluminium and aluminium alloys, 01/08/2021
(PCR checked and approved by the SVR)

Issue date

14/11/2023

Valid to

13/11/2028

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

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

Aluminium extrusion billets

Owner of the declaration

Aluminium GmbH Nachrodt
Hagener Strasse 145
58769 Nachrodt
Germany

Declared product / declared unit

1 kg aluminium extrusion billet

Scope:

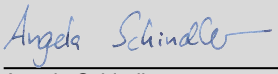
This product declaration refers to a declared unit of 1 kg of aluminium extrusion billets produced at the two foundries in Nachrodt (Germany) and Schlins (Austria).
This is a weighted average of the two plants and represents the total production of Alu-met GmbH.

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



Angela Schindler,
(Independent verifier)

2. Product

2.1 Product description/Product definition

The produced extrusion billets of aluminium alloy 6000 are semi-finished products for the production of aluminium profiles. The extrusion billets can be produced in different diameters. The extrusion billets are manufactured up to a maximum length of 8 meters.
For the use and application of the product, the respective national provisions at the place of use apply, in Germany for example the building codes of the federal states and the corresponding national specifications.

2.2 Application

Aluminium extrusion billets are further processed in the extrusion plants into aluminium profiles. The application, therefore depends on the further processing and the design of the end product.

2.3 Technical Data

The physical properties correspond to aluminium of alloy 6000. The listed values are to be seen as a guideline, as the measured values of the different alloys may vary depending on customer requirements. The specification EN AW-6060 serves as a basis.

Constructional data

Name	Value	Unit
Gross density (DIN 66137-2)	2700	kg/m^3
Melting point	660	°C
Electrical conductivity at 20 °C	28-34	m/Ωmm^2
Thermal conductivity (ISO 7345)	200	W/(mK)
Coefficient of thermal expansion (ISO 6892-2)	23.4	10^{-6}K^{-1}
Modulus of elasticity (ISO 6892-1)	70000	N/mm^2
Shear modulus	27000	N/mm^2
Tensile strength (ISO 6892-1)	200	N/mm^2

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

2.4 Delivery status

The aluminium extrusion billets are delivered in desired diameter and length. For this purpose, the billets are bound into bundles of at least 2 pieces onto beech squared timber with a plastic band.

2.5 Base materials/Ancillary materials

The chemical composition of the various aluminium alloys can be found in the *EN 573-3* (D) standard. The aluminium content is always over 95 %.

The most important basic material is aluminium. In the production of the extrusion billets, 70-80 % aluminium scrap and about 20-30 % primary aluminium are used.
As further basic materials, alloying elements such as magnesium, manganese and silicon are used.

This product/article/at least one partial article contains substances listed in the *candidate list* (13.01.2020) exceeding 0.1 percentage by mass: **no.**

This product/article/at least one partial article contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: **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) *Ordinance on Biocide Products* No. 528/2012): **no.**

2.6 Manufacture

Charge make up - The metal mix for the required specification/alloy is created.

Melting - The melting furnace is filled with aluminium scrap according to the charge.

Transfer - The liquid aluminium is transferred to the casting furnace.

Alloying - The alloy is checked in the casting furnace. If necessary, missing alloying elements are added.

Casting - The aluminium is fed onto a so-called casting table. On this table, depending on the billet diameter, there is a corresponding number of moulds. The liquid aluminium flows through these and freezes within the mould. Through a continuous lowering of the solidified aluminium, the extrusion billets are formed.

Inspection - Once the casting is finished, the billets are pulled out of the casting pit and subjected to an ultrasonic inspection to be able to exclude possible defects and inclusions.

Homogenization - In the next work step, the extrusion billets are subjected to a heat treatment to obtain a uniform structure within the aluminium.

Sawing - The extrusion billets are sawn to the length required by the customer.

Packaging - The billets are tied together in bundles of at least two and are ready for dispatch.

The entire manufacturing process is monitored by a certified quality management system *(ISO 9001*).

2.7 Environment and health during manufacturing

Both foundries have an environmental management system in accordance with *ISO 14001* to ensure environmental protection in production. Key parameters such as minimizing energy consumption, dross and air emissions, which are well below the limit values, are continuously evaluated and monitored.

2.8 Product processing/Installation

Aluminium extrusion billets are semi-finished products whose processing/installation depends on the application context.

2.9 Packaging

The billets are tied together on squared lumber with plastic straps. The number of billets per bundle can be adjusted on customer request.

The plastic straps and the wood can be recycled by the customer.

2.10 Condition of use

The extruded billets represent an alloy of aluminium and the alloying constituents mentioned. The ingredients correspond to the basic materials specified in *EN 573-3* with the specified proportions.

There are no special features of the material composition for the period of use.

2.11 Environment and health during use

Hazards to water, air and soil cannot arise if aluminium extrusion billets are used as intended.

The products are semi-finished products and not end products. The environmental impact during use, therefore, depends on the design of the end product.

2.12 Reference service life

No reference service life (RSL) is declared for aluminium extrusion billets since they are semi-finished products for which there are many applications.

2.13 Extraordinary effects

Fire

Aluminium extrusion billets meet the requirement of building material class A "non-combustible" according to *DIN 4102-4*.
The melting point of aluminium is approx. 660 °C.
Toxicity of fire gases: not applicable.

Fire protection

Name	Value
Building material class	A1
Burning droplets	not relevant
Smoke gas development	not relevant

Water

Exposure of the aluminium extrusion billets to water does not alter the product and has no negative impact on the environment.

Mechanical destruction

Unforeseen mechanical destruction of the aluminium extrusion billets is not relevant.

2.14 Re-use phase

Aluminium extrusion billets are 100 % recyclable without any loss of quality. The process scrap generated during production and further processing can be reprocessed into extrusion billets without losses.

2.15 Disposal

The disposal code is based on the end product in accordance with the *European Waste Catalog (EWC)*.

Due to the high value of the raw material and the very good recyclability of aluminium, scrap is usually fed into the recycling process. If aluminium is nevertheless sent to a landfill, no environmental impacts are to be expected.

2.16 Further information

Further product-relevant information can be found at https://www.alu-met.com/.

3. LCA: Calculation rules

3.1 Declared Unit

This Environmental Product Declaration refers to a declared unit of 1 kg of aluminium extrusion billets.

Declared unit

Name	Value	Unit
Declared unit	1	kg
Conversion factor to 1 kg	1	-

This EPD declares the environmental impacts of aluminium extrusion billets produced at the two Alu-met GmbH sites:

- Aluminium GmbH Nachrodt in Nachrodt (Germany)
- Speedline Aluminium GmbH in Schlins (Austria)

This is a production-weighted average of the two sites.

3.2 System boundary

The life cycle assessment of aluminium extrusion billets refers to a cradle-to-gate analysis of the environmental impacts with modules C1–C4 and module D (A1–A3 + C + D).
The following life cycle phases are part of the analysis:

Module A1–A3 | Production stage

The production stage includes the upstream burdens of raw materials (primary aluminium, alloying elements, operating materials, etc.), the transports of all raw materials including the aluminium scrap used, and the environmental burdens from the foundries at the sites in Schlins (AT) and Nachrodt (DE). Secondary aluminium used is considered burden free in the calculation. Environmental impacts of the remelting process at the site are considered. Thermal energy is supplied at the site via natural gas and electrical energy from the regional power grid. The production of the packaging of the extrusion billets is also included in modules A1–A3.

Module C1 | Deconstruction and demolition

It is assumed that the product is not connected with other materials and can therefore be dismantled. Associated efforts are negligible, no environmental impacts from the deconstruction of the products are declared.

Module C2 | Transport to disposal

The transport to the disposal of the material is estimated declaring a 50 km radius to the waste processing.

Module C3 | Waste processing

Product flows that reach Module D for recycling leave the product system in C3. Environmental impacts resulting from the grinding and sorting of aluminium scrap are not included due to the negligible expected environmental impact.

Module C4 | Disposal

Module C4 declares the environmental impacts resulting from landfilling (5 % of the product).

Module D | Benefits and loads beyond the system boundary

The potential for substituting primary aluminium with a recycling scenario (95 % of the product) is outlined in Module D.

3.3 Estimates and assumptions

All assumptions are supported by detailed documentation and correspond to the best possible representation of reality in terms of the available database.

In addition to secondary aluminium, a smaller proportion of primary aluminium is used for the production of the extrusion billets. The modelling of the supply chain of the primary aluminium used is based on the complete listing of all suppliers including the supplier-specific transport routes.
Due to the lack of supplier-specific information, the country- or region-specific data sets implemented in the *GaBi database* by *IAI (2017)* were selected.

The regional applicability of the remaining background data sets used refers to average data for the European or

German/Austrian region from the *GaBi-database*.

3.4 Cut-off criteria

The LCA model covers all available input and output flows, which can be represented based on robust data and from which a significant contribution can be expected. Data gaps are filled with conservative assumptions of average data or generic data if available and are documented accordingly.
Only data with a contribution of less than 1 % were cut off. Thus, no data were neglected, of which a substantial impact is to be expected. All relevant data were collected comprehensively.
Cutoff material and energy flows were chosen carefully based on their expected quantitative contribution as well as potential environmental impacts.

Thus, it can be assumed that the sum of all neglected input flows does not account for more than 5 % of the total material and energy flows.

3.5 Background data

This study uses generic background data for the evaluation of upstream environmental impacts from *GaBi*-database 2020.02 and is modelled in *GaBi*-software version 10.

3.6 Data quality

Data collection is based on product-specific questionnaires. It follows an iterative process of clarifying questions via e-mail, telephone calls or in personal/web meetings. Intensive discussions between the Alu-met GmbH and Daxner & Merl result in an accurate mapping of product-related material and energy flows between the production sites. This leads to a high quality of foreground data collected. Data collection relies on a consistent process according to *ISO 14044*.The technological, geographical and time-related representativeness of the database was kept in mind when selecting background data. Whenever specific data were missing, either generic datasets or representative average data were used instead. The implemented *GaBi*-background datasets refer to the latest versions available (not older than six years) and are carefully chosen.

3.7 Period under review

Foreground data were collected for the sites in Nachrodt and Schlins for the production year 2020. Data from 01.01. to 31.12.2020 were evaluated. The data are based on the volumes produced on an annual basis.

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: EU-27 Member States

3.9 Allocation

The by-product dross was neglected due to its low contribution to operating income (cut-off).
To calculate the net flows, the mass used as external aluminium scrap in A1–A3 is subtracted from the total mass of the product.

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.
The *GaBi* background database was used to calculate the LCA (*GaBi* 10; 2020.02)

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The declared product does not contain any biogenic carbon.

Installation in building (A5)

The end-of-life of the packaging materials is not declared in Module A5.
The following values refer to the declared unit of 1 kg of aluminium extrusion billets.

Name	Value	Unit
Product packaging for waste treatment on the construction site (PET-strap)	0.25	g
Product packaging for waste treatment on the construction site (wood)	4.58	g

The carbon uptake of the squared timber was not considered in modules A1–A3.

End-of-life (C1–C4)

The end-of-life scenario used in this LCA study is based on the following assumptions and thus complies with the default scenario for aluminium products published in *ökobaudat 2019*.

Name	Value	Unit
Collected separately waste type (Aluminium)	1	kg
Recycling (95 %)	0.95	kg
Landfilling (5 %)	0.05	kg

The scenario includes collection losses for recycling of 5 %.
The externally purchased scrap for use in the production of the extrusion billets (modules A1–A3) is offset against the amount of aluminium scrap for recycling ("net flow").

5. LCA: Results

The following table contains the LCA results for a declared unit of 1 kg of aluminium extrusion billet.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = 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	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg aluminium extrusion billet

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	1.9E+00	0	3.03E-03	0	2.47E-03	-9.67E-01
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	1.89E+00	0	2.99E-03	0	2.47E-03	-9.65E-01
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	5.73E-03	0	9.57E-03	0	0	-1.92E-03
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	6.9E-04	0	2.41E-05	0	2.4E-06	-3.51E-04
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	3.31E-15	0	5.46E-19	0	5.47E-18	-7.81E-16
Acidification potential of land and water (AP)	mol H^+ eq	1.07E-02	0	1.01E-05	0	7.92E-06	-5.01E-03
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	1.5E-06	0	9.07E-09	0	1.89E-09	-3.6E-07
Eutrophication potential aquatic marine (EP-marine)	kg N eq	1.76E-03	0	4.56E-06	0	1.93E-06	-6.24E-04
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	1.92E-02	0	5.1E-05	0	2.11E-05	-6.8E-03
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	5.2E-03	0	8.97E-06	0	6.1E-06	-1.95E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	7.35E-07	0	2.41E-10	0	1.67E-10	-1.11E-07
Abiotic depletion potential for fossil resources (ADPF)	MJ	1.85E+01	0	3.97E-02	0	3.53E-02	-1.21E+01
Water use (WDP)	m^3 world eq deprived	5.91E-01	0	2.9E-05	0	-2.66E-05	-1.5E-01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg aluminium extrusion billet

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	1.62E+01	0	2.3E-03	0	2.47E-03	-5.62E+00
Renewable primary energy resources as material utilization (PERM)	MJ	8.08E-02	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	1.63E+01	0	2.3E-03	0	2.47E-03	-5.62E+00
Non renewable primary energy as energy carrier (PENRE)	MJ	1.86E+01	0	3.99E-02	0	3.53E-02	-1.21E+01
Non renewable primary energy as material utilization (PENRM)	MJ	0	0	0	0	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	1.86E+01	0	3.99E-02	0	3.53E-02	-1.21E+01
Use of secondary material (SM)	kg	8.26E-01	0	0	0	0	0
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	4.98E-02	0	2.68E-06	0	4.72E-07	-1.45E-02

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg aluminium extrusion billet

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	3.68E-08	0	1.84E-09	0	1.6E-10	-6.84E-09
Non hazardous waste disposed (NHWD)	kg	8.3E-01	0	6.32E-06	0	5.01E-02	-2.92E-01
Radioactive waste disposed (RWD)	kg	1.78E-04	0	7.35E-08	0	4.18E-07	-7.25E-04
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	1.24E-01	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 kg aluminium extrusion billet

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	ND	ND	ND	ND	ND	ND

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

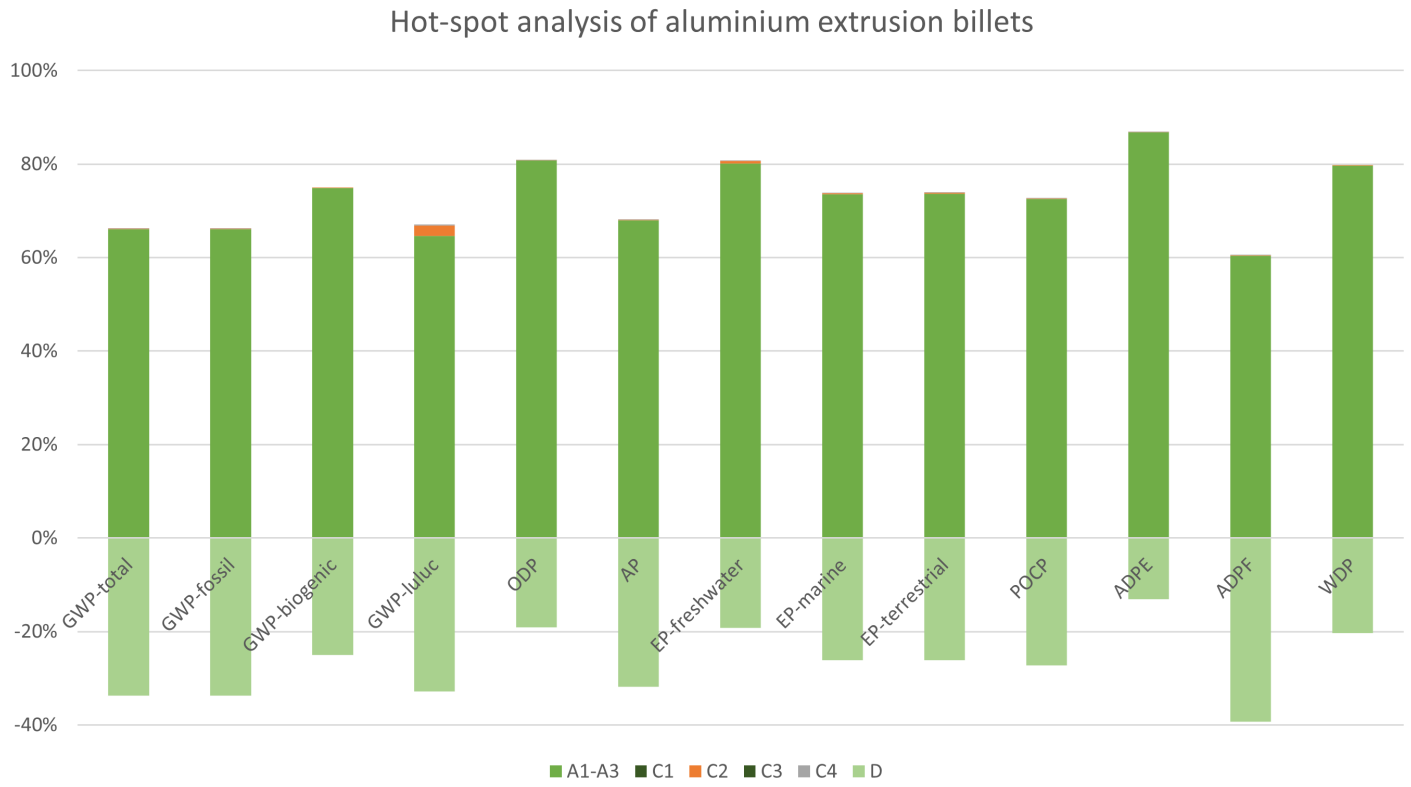
The additional and optional impact categories according to *EN 15804+*A2 are not declared, as the uncertainty of these indicators is to be classified as high.

Disclaimer 1 – for the indicator 'Potential Human exposure efficiency relative to U235'.
This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – 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.

6. LCA: Interpretation

The following interpretation contains a summary of the LCA results referencing a declared unit of 1 kg aluminium extrusion billets.



A comparison of the individual lifecycle phases results in a clear dominance of the production phase (Modules A1–A3). The environmental effects in the **production phase** are mainly dominated by the supply chain of the purchased primary aluminium.

As a result of product recyclability, the material removed at the **end of life** can substitute primary aluminium. Module D shows the recycling potential of aluminium at the end of its product life. This results in credits from the substitution of primary aluminium.

The loads and potentials of the depletion potential of the stratospheric ozone layer (**ODP**) are strongly dependent on the electricity input in the remelting process. This was modelled via corrected background data from the European aluminium industry from 2015. Due to the age of the data, the informative value of this result value is limited.
For the calculation of the substitution potentials, only the primary material share in the product was taken into account (net flow).

The environmental impact of the landfilling of the losses in the reprocessing at the end of life (C4), contribute to a small extent to the environmental impact of the product.
The comparison of the results of the previous EPD for aluminium extrusion billets *(EPD: Aluminium extrusion billets*) shows a reduction of the environmental impacts of the updated results in all categories considered. In particular, the potential contribution to climate change of the extrusion billets was

reduced by 42 % compared to the previous year. This is mainly due to the increased sourcing of primary aluminium from suppliers whose production is based on renewable energy sources.

7. Requisite evidence

The product under consideration is a semi-finished product. The application, therefore, depends on the further processing and the design of the end product. Evidence can therefore only be provided for the specific areas of application in question.

8. References

Standards

DIN 4102-4
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.

DIN 66137-2
DIN 66137-2:2019-03, Determination of solid state density - Part 2: Gaspycnometry.

EN 573-3
DIN EN 573-3:2009, Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products.

EN 15804
DIN EN 15804:2012+A2:2019, Sustainability of construction works Environmental Product Declarations Core rules for the product category of construction products.

ISO 6892-1
EN ISO 6892-1:2019-08-15, Metallic materials - Tensile testing - Part 1: Method of test at room temperature.

ISO 6892-2
ÖNORM EN ISO 6892-2:2018-10-01**,** Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature.

ISO 7345
EN ISO 7345:2018, Thermal performance of buildings and building components - Physical quantities and definitions.

ISO 9001
DIN EN ISO 9001:2015, Quality management systems Requirements.

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

ISO 14025
DIN EN ISO 14025:2011-10, Environmental labels and declarations Type III environmental declarations Principles and procedures.

ISO 14044
DIN EN ISO 14044:2006-10. Environmental management Life cycle assessment Requirements and guidelines.

Further references

Candidate List
Candidate List of Substances of Very High Concern (ECHA Candidate List) of 14.01.2020, published in accordance with Article 59 (10) of the REACH Regulation Helsinki: European Chemicals Agency.

European Waste Catalog (EWC)
Regulation on the European Waste Catalogue.

EPD: Aluminium extrusion billets
Environmental Product Declaration: Aluminium GmbH Nachrodt. Speedline Aluminium Giesserei GmbH im Auftrag der Alu-met GmbH, EPD-ALU-20200021-IBB1-DE. Berlin: Institut Bauen und Umwelt e.V. (Hrsg.), 04.03.2020.

GaBi
GaBi 10, Software System and Database for Life Cycle Engineering. DB 2020.2. Sphera, 1992-2020. Verfügbar in: http://documentation.gabi-software.com.

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International Aluminium Institute, 2017. Life cycle inventory data and environmental metrics for the primary aluminium industry. 2015 data.

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General Programme Instructions for the preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 1.1 Institut Bauen und Umwelt e.V., 2016, Berlin. www.ibuepd. com.

ökobaudat 2019
ökobaudat, 2019. EN 15804 and BNB-compliant data for more than 700 building products. Federal Ministry of the Interior, Building and Community.

Ordinance on Biocide Products
Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.

PCR Part A
Product category rules for building-related products and services. Part A: Calculation rules for the life cycle assessment and requirements on the project report according to EN 15804+A2:2019. Version 1.0. Berlin: Institut Bauen und Umwelt e.V., 2020.

PCR: Products of aluminium and aluminium alloys
Product category rules for building-related products and services. Part B: Requirements of the EPD for products of aluminium and aluminium alloys. Version v5. Berlin: Institut Bauen und Umwelt e.V. (Hrsg.), 2023.

Publisher

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