

# ENVIRONMENTAL PRODUCT DECLARATION



In accordance with ISO 14025 for:  
**Aluminium profiles**  
**ETEM GESTAMP ALUMINIUM  
EXTRUSIONS S.A.**

**ETEM** | **Gestamp** 

CPC Code:	41532 Bars, rods and profiles of aluminium
EPD registration number:	S-P-01083
Publication date:	2017-10-10
Revision date:	2019-08-01
Valid until:	2022-09-13
Geographical scope:	Global

## PROGRAMME-RELATED INFORMATION AND VERIFICATION

The LCA for this EPD is conducted according to the guidelines of ISO 14040 and ISO 14044 and the requirements given in the Product Category Rules (PCR) document for Construction Products and Construction Services with reference to EN 15804 and the general program guidelines by The International EPD System in accordance with ISO 14025 standards.

The inventory for the LCA study is based on the 2016 production figures for mill-finished aluminium profiles and coated aluminium profiles for building applications, manufactured by Etem Gestamp Aluminium Extrusions S.A. in their production plants in Sofia, Bulgaria.

The LCA study was commissioned using an Excel-based model. Characterization factors used for the life cycle impact assessment are provided by the most recent version of the Ecoinvent database V3.3.

**EPD Programme:**

The International EPD® System

**EPD Programme Operator:**

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**EPD Owner:**

Input data for ETEM

**Declared Unit:**

1 kg of aluminium profile

**Reference year for data:**

2016

**EPD Based on Product Category Rules (PCR):**

The CEN standard EN 15804 serves as the core PCR. The International EPD® System's PCR 2012:01 Construction products and Construction services, Version 2.2, 2017-05-30

**PCR review was conducted by:**

The Technical Committee of the International EPD® System.  
Chair: Massimo Marino  
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**EPD registration number:**

S-P-01083

**Independent verification of the declaration and data, according to ISO 14025:2006:**

☐ Internal

☒ External verification

☐ EPD® process

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EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

For more information about this Environmental Product Declaration or its contents, contact the Quality Manager, Valentina Bocheva at [vbocheva@etemgestamp.com](mailto:vbocheva@etemgestamp.com)

## ABOUT ETEM

ETEM is a leader in aluminium extrusion, The company was founded in 1971 and it is the first integrated designer and producer of architectural systems and aluminium profiles for industrial applications in Greece.

With the production facility in Bulgaria, that operates from 2019 under the Joint Venture Etem Gestamp Aluminium Extrusions S.A., ETEM guarantees continuous, prompt, effective and uninterrupted delivery to all our customers.

Through continuous innovation and investments in infrastructure, cutting-edge equipment and our people, ETEM is an international company with worldwide exports and presence.

ETEM holds a strong position in Southeastern Europe and tirelessly pursues opportunities for penetration and establishment in more countries and emerging markets.

With competent structures and highly skilled people in place, the company meets the strategic goals to understand and cover the needs of each market, thus efficiently assisting our customers to achieve their business goals.

The people offer numerous services to the customers, from training and technical assistance to individual constructors and installers of window and door frames, to complete project support throughout the various stages of a project.

From the birth of an idea, ETEM helps the individual, investor or developer to select the best product or solution to meet their requirements, in the most effective, supportive and cost-efficient of ways.

ETEM actively assists the architect or engineer to define the specifications of the project and can also offer technical support or training to the constructor and installer of company's complete product portfolio.

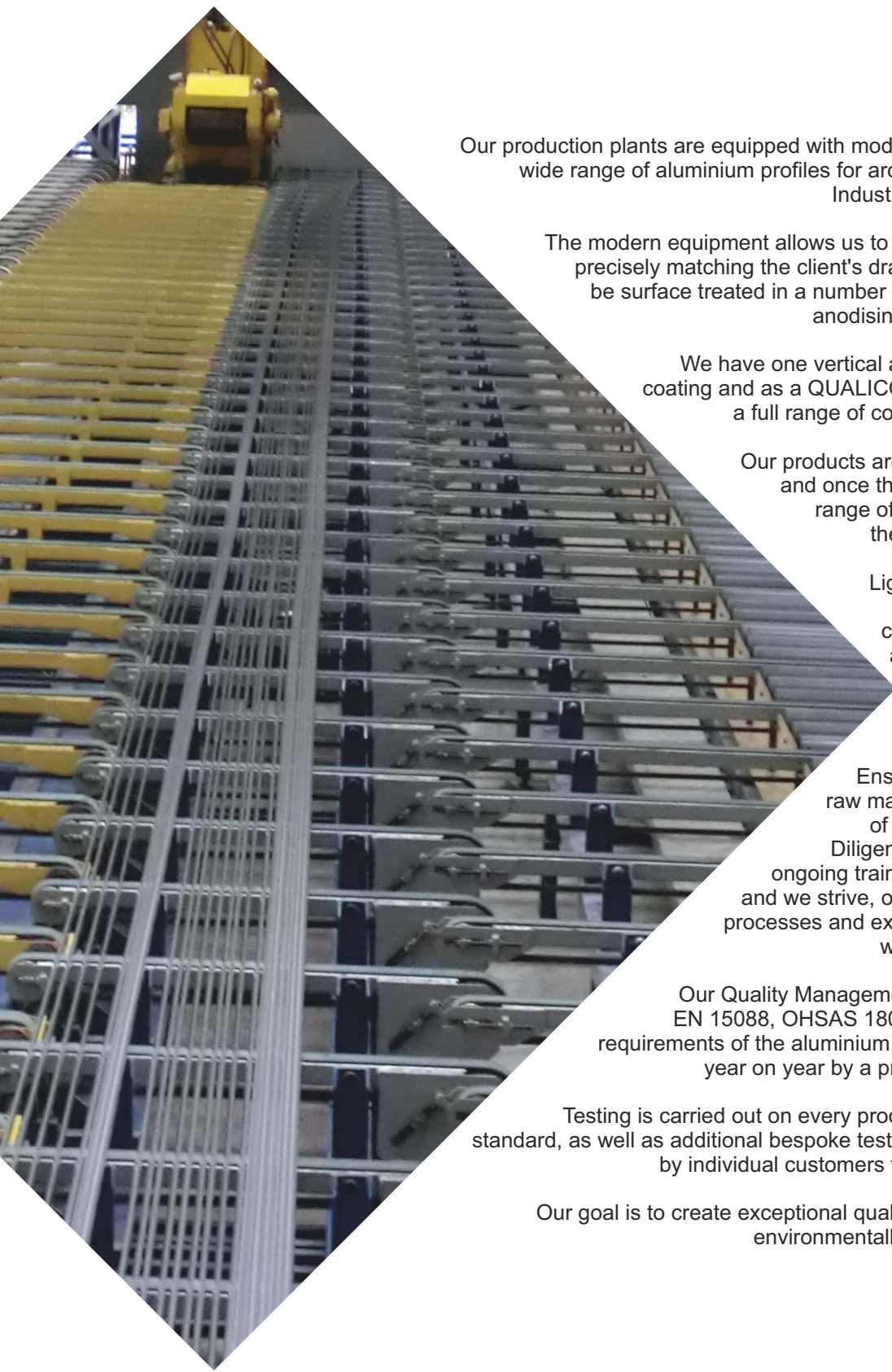
ETEM's main goal is to design and engineer products that help us improve our everyday living, whether in a residential, commercial or work environment.

The company remains loyal to its customers and keeps its promises for continuous innovation, tailor-made solutions, integrated assistance throughout a project, and strategic business thinking, ensuring the customers' commercial success.





## PRODUCTION AND QUALITY



Our production plants are equipped with modern extrusion presses, producing a wide range of aluminium profiles for architectural systems, the automotive Industry and other industrial applications.

The modern equipment allows us to produce high-tech custom profiles, precisely matching the client's drawings. The aluminium profiles can be surface treated in a number of ways, including electrochemical, anodising and organic and powder coating.

We have one vertical and one horizontal lines for powder coating and as a QUALICOAT licensed company, we provide a full range of colour coatings at a very high quality.

Our products are subject to rigorous quality control and once they are ready to dispatch we offer a range of smart logistics solutions to ensure they get to you when you need them.

Lightweight aluminium has distinctive logistics advantages – each truck can carry up to three times as many aluminium parts as steel – allowing us to pass benefits to our customers in terms of cost and environmental impact.

Ensuring high quality standards – from raw materials, to finished product – is one of the company's founding principles. Diligent monitoring, active innovation and ongoing training ensure high standards are met and we strive, on an ongoing basis, to improve our processes and exceed expectations. The excellence we achieve inspires us to go further.

Our Quality Management System (ISO 9001, ISO 14001, EN 15088, OHSAS 18001, QUALICOAT) is tailored to the requirements of the aluminium industry, developed and enhanced year on year by a process of continuous improvement.

Testing is carried out on every product, both to the maximum industry standard, as well as additional bespoke testing and quality checks, as required by individual customers throughout the production process.

Our goal is to create exceptional quality products that are economic and environmentally friendly throughout their lifespan.



# PRODUCT SPECIFICATIONS

The LCA Study presented in this Declaration assesses the potential environmental impacts of Mill-finished Aluminium Profiles and Coated Profiles during their life cycle from raw material supply to the end-of-life stage.

Aluminium Profiles are mainly made of 99.7% purity of aluminium ingots with a high content of recycled aluminium. Aluminium profiles can be produced as standard or custom design. All products groups may also contain other raw materials such as silicon and magnesium. All profiles manufactured by Etem Gestamp Aluminium Extrusions S.A. may be sold as is or powder coated.

This EPD covers all product groups as shown below:

COMPOSITION	AL PROFILE	COATED AL PROFILE
Aluminium ingot, %	93.00 - 99.00	93.00 - 99.00
Magnesium, %	0.35 - 0.90	0.35 - 0.90
Silicon, %	0.30 - 0.60	0.30 - 0.60
Others, %	< 1	< 1
Powder coating, %	-	< 1

No substances included in the Candidate List of Substances of Very High Concern for authorisation under the REACH Regulations are present in the company's profiles, either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

Etem Gestamp Aluminium Extrusions S.A. can operate in profile production of architectural systems as well as industrial profiles, automotive profiles, machinery-manufacturing profiles, heating and cooling profiles, ship and aircraft industries.

Aluminium profiles can produced as standard or customer design.

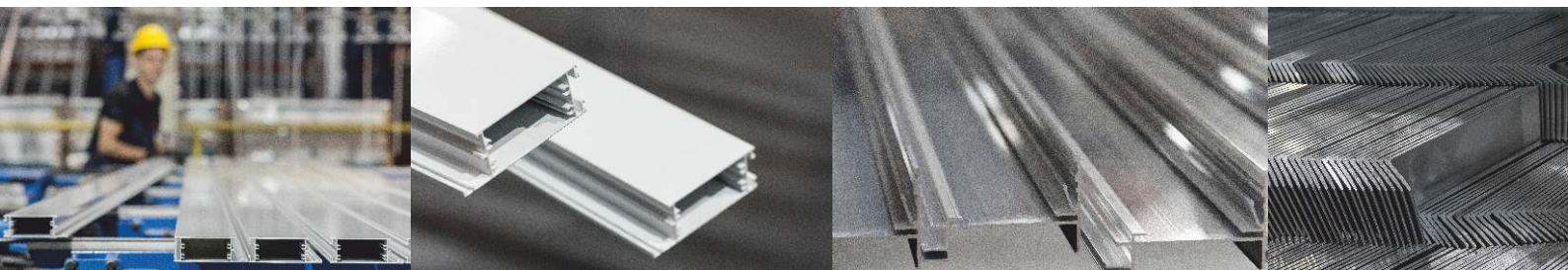
Etem Gestamp Aluminium Extrusions S.A. products are certified to international standards.

## TECHNICAL SPECIFICATIONS:

Density (gr/cm <sup>3</sup> )	2.50 - 2.70
Melting range, °C	585 - 650
Thermal conductivity, W/mK	200 - 220
Thermal expansion, 10 <sup>-6</sup> /K	23.20 - 23.40
Elastic modules, MPa	69 000 - 70 000
Modules of rapture, MPa	26 000 - 26 500

## IN ACCORDANCE WITH:

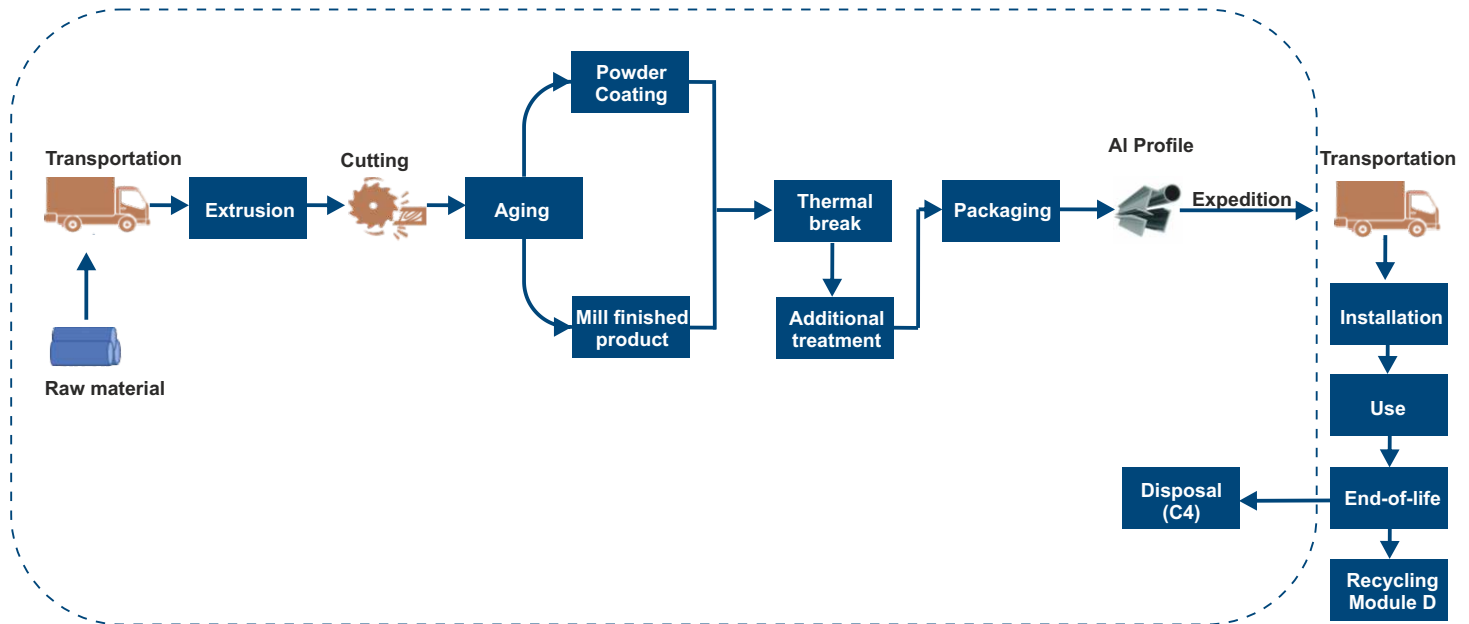
Standard test method based on scientific and technical sources
Standard test method based on scientific and technical sources
ASTM E1225-13
ASTM E831-14
EN ISO 6892-1
EN ISO 6892-1





# SYSTEM BOUNDARY

The scope of the study is set to be “Cradle-to-gate with options”. Processes included in the assessment are presented on the diagram below, followed by a brief description of the reported modules.



## Upstream Processes (A1: Raw Material Supply)

Production starts with raw materials supply mainly. Some of the raw materials are locally sourced while others are transported from different countries in Europe.

## Core Processes (A2: Transportation and A3: Manufacturing)

Transport is relevant for delivery of raw materials to the gate of plant, internally between the production facilities, as well as transportation of wastes to the relevant treatment facilities.

Manufacturing processes include all the production activities within the plant with all the associated impacts. These include melting of aluminium billets, extrusion, cutting, aging, powder coating, thermos-break, additional treatment (if necessary), packaging and storage in the warehouse facilities.

## Downstream processes (C4: Disposal)

According to the European Aluminium Association as much as 90% of the aluminium for building applications is being recycled, while the rest 10% are being disposed/landfilled. This module includes assessment of the environmental impacts associated with the disposal.

## Benefits and loads beyond the product system boundary in information Module D:

Module D consists of avoided burdens related to the potential reuse and/or recycling of the product after its end-of-life stage.



ENVIRONMENTAL PERFORMANCE

Declared Unit	The declared unit is the production of 1 kg of aluminium profile.
Goal and Scope	This EPD evaluates the environmental impacts of 1 kg aluminium profile product from cradle to gate with option (Disposal).
System Boundary	The system boundary covers A1-A3 product stages referred as “Raw material supply”, “Transport” and “Manufacturing”, C4 as Disposal and D as Recycling Potential.
Estimates and Assumptions	Disposal and recycling rates are modelled based on figures on European level reported by the European Aluminium Association.
Cut-Off Rules	For this LCA study, 1% cut off rule applies.
Background Data	The most recent version of Ecoinvent database (V3.3) was used as a source of background data.
Data Quality	Data on raw materials, transportation, energy, waste and water is collected by Etem Gestamp Aluminium Extrusions S.A. on a daily basis. Local data (e.g. energy content of fuels and any other specific data) was obtained by the local suppliers.
Period Under Review	All primary data used in this study is for the entire year 2016.
Allocations	There are no co-products in the production of Aluminium Profiles manufactured by Etem Gestamp Aluminium Extrusions S.A.. Hence, there was no need for co-product allocation.

The system boundaries in tabular form for all modules are shown in the table below.  
Description of the system boundary (X = module included in the LCA; MNA = Module Not Assessed)

Product stage			Construc- tion stage	Use stage								End of life stage				Resource recovery stage
Raw Materials Supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction and 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	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	X	X

The results of the LCA with the indicators as per EPD requirement are given in the following tables, presented as impacts per 1 kg of product, split into the relevant modules (A1, A2, A3), (C4) and (D).  
All energy calculations were obtained using Cumulative Energy Demand methodology, while environmental impacts were calculated with the CML-IA baseline.

# MILL-FINISHED ALUMINIUM PROFILE

## ENVIRONMENTAL IMPACTS PER 1 KG MILL-FINISHED AL PROFILE

Parameter	Unit	A1-A3	C4	D
GWP	kg CO <sub>2</sub> -Eq	9.0980	0.0041	-5.2023
ODP	kg CFC-11	8.84E-07	4.05E-10	-5.23E-07
AP	kg SO <sub>2</sub> -Eq	0.0570	0.0000	-0.0318
EP	kg PO <sub>4</sub> <sup>3-</sup> -Eq	0.0206	0.0000	-0.0086
POCP	kg C <sub>2</sub> H <sub>4</sub> -Eq	0.0047	0.0000	-0.0030
ADPe	kg Sb-Eq	0.0505	0.0000	-0.0274
ADPf	MJ-Eq	89.6588	0.0570	-48.1012

**Legend:** **GWP:** Global Warming Potential; **ODP:** Ozone Depletion Potential; **AP:** Acidification Potential; **EP:** Eutrophication Potential; **POCP:** Formation potential of tropospheric ozone photochemical oxidants; **ADPe:** Abiotic depletion potential for non-fossil resources; **ADPf:** Abiotic depletion potential for fossil resources.

## RESOURCE USE PER 1 KG MILL-FINISHED AL PROFILE

Parameter	Unit	A1-A3	C4	D
PERE	MJ	0.4133	0.0612	-74.9153
PERM	MJ	41.1203	0.0000	0.0000
PERT	MJ	41.5336	0.0612	-74.9153
PENRE	MJ	12.9706	0.0039	-27.4155
PENRM	MJ	118.6672	0.0000	0.0000
PENRT	MJ	131.6378	0.0039	-27.4155
SM	kg	0.2000	0.0000	0.0000
RSF	MJ	0.0000	0.0000	0.0000
NRSF	MJ	0.0000	0.0000	0.0000
FW	m <sup>3</sup>	0.1246	0.0000	-0.0815

**Legend:** **PERE:** Use of renewable primary energy excluding resources used as raw materials; **PERM:** Use of renewable primary energy resources used as raw materials; **PERT:** Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE:** Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials; **PENRM:** Use of non- renewable primary energy resources used as raw materials; **PENRT:** Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM:** Use of secondary material; **RSF:** Use of renewable secondary fuels; **NRSF:** Use of non- renewable secondary fuels; **FW:** Use of net fresh water.

## OUTPUT FLOWS AND WASTE CATEGORIES PER 1 KG MILL-FINISHED AL PROFILE

Parameter	Unit	A1-A3	C4	D
HWD	kg	0.0001	0.0000	0.0000
NHWD	kg	0.0036	0.1000	0.0000
RWD	kg	0.0000	0.0000	0.0000
CRU	kg	-	-	-
MFR	kg	0.2216	0.0000	0.9000
MER	kg	-	-	-
EE	MJ	-	-	-

**Legend:** **HWD:** Hazardous waste disposed; **NHWD:** Non-hazardous waste disposed; **RWD:** Radioactive waste disposed; **CRU:** Components for re-use; **MFR:** Materials for recycling; **MER:** Materials for energy recovery; **EE:** Exported energy.



# COATED ALUMINIUM PROFILE

## ENVIRONMENTAL IMPACTS PER 1 KG COATED AL PROFILE

Parameter	Unit	A1-A3	C4	D
GWP	kg CO <sub>2</sub> -Eq	9.8164	0.0041	-5.2023
ODP	kg CFC-11	9.49E-07	4.05E-10	-5.23E-07
AP	kg SO <sub>2</sub> -Eq	0.0612	0.0000	-0.0318
EP	kg PO <sub>4</sub> <sup>3-</sup> -Eq	0.0224	0.0000	-0.0086
POCP	kg C <sub>2</sub> H <sub>4</sub> -Eq	0.0052	0.0000	-0.0030
ADPe	kg Sb-Eq	0.0561	0.0000	-0.0274
ADPf	MJ-Eq	99.9016	0.0570	-48.1012

**Legend:** **GWP:** Global Warming Potential; **ODP:** Ozone Depletion Potential; **AP:** Acidification Potential; **EP:** Eutrophication Potential; **POCP:** Formation potential of tropospheric ozone photochemical oxidants; **ADPe:** Abiotic depletion potential f

## RESOURCE USE PER 1 KG COATED AL PROFILE

Parameter	Unit	A1-A3	C4	D
PERE	MJ	0.6048	0.0612	-74.9153
PERM	MJ	41.6427	0.0000	0.0000
PERT	MJ	42.2475	0.0612	-74.9153
PENRE	MJ	19.2639	0.0039	-27.4155
PENRM	MJ	124.8398	0.0000	0.0000
PENRT	MJ	144.1037	0.0039	-27.4155
SM	kg	0.2000	0.0000	0.0000
RSF	MJ	0.0000	0.0000	0.0000
NRSF	MJ	0.0000	0.0000	0.0000
FW	m <sup>3</sup>	0.1298	0.0000	-0.0815

**Legend:** **PERE:** Use of renewable primary energy excluding resources used as raw materials; **PERM:** Use of renewable primary energy resources used as raw materials; **PERT:** Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); **PENRE:** Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials; **PENRM:** Use of non- renewable primary energy resources used as raw materials; **PENRT:** Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials); **SM:** Use of secondary material; **RSF:** Use of renewable secondary fuels; **NRSF:** Use of non- renewable secondary fuels; **FW:** Use of net fresh water.

## OUTPUT FLOWS AND WASTE CATEGORIES PER 1 KG COATED AL PROFILE

Parameter	Unit	A1-A3	C4	D
HWD	kg	0.0001	0.0000	0.0000
NHWD	kg	0.0048	0.1000	0.0000
RWD	kg	0.0000	0.0000	0.0000
CRU	kg	-	-	-
MFR	kg	0.2216	0.0000	0.9000
MER	kg	-	-	-
EE	MJ	-	-	-

**Legend:** **HWD:** Hazardous waste disposed; **NHWD:** Non-hazardous waste disposed; **RWD:** Radioactive waste disposed; **CRU:** Components for re- use; **MFR:** Materials for recycling; **MER:** Materials for energy recovery; **EE:** Exported energy.

## RESULTS INTERPRETATION AND OTHER ENVIRONMENTAL INFORMATION

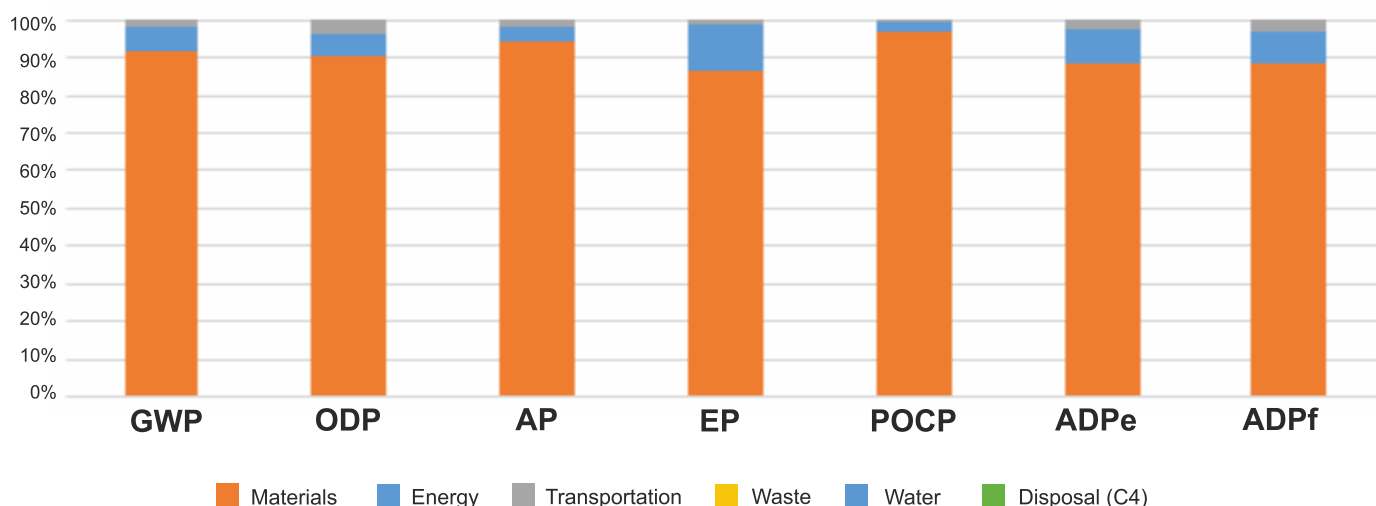
The LCA results clearly show that the dominant life-cycle stage appeared to be the Raw materials supply, responsible for ~70-90% of the total impact within the different impact categories. Second biggest contributor is the energy use during the manufacturing stage, followed by transportation.

Waste management, Water use and Final Disposal stages have relatively low contribution to the overall environmental impact, being responsible for less than 1% of the impact for all impact categories.

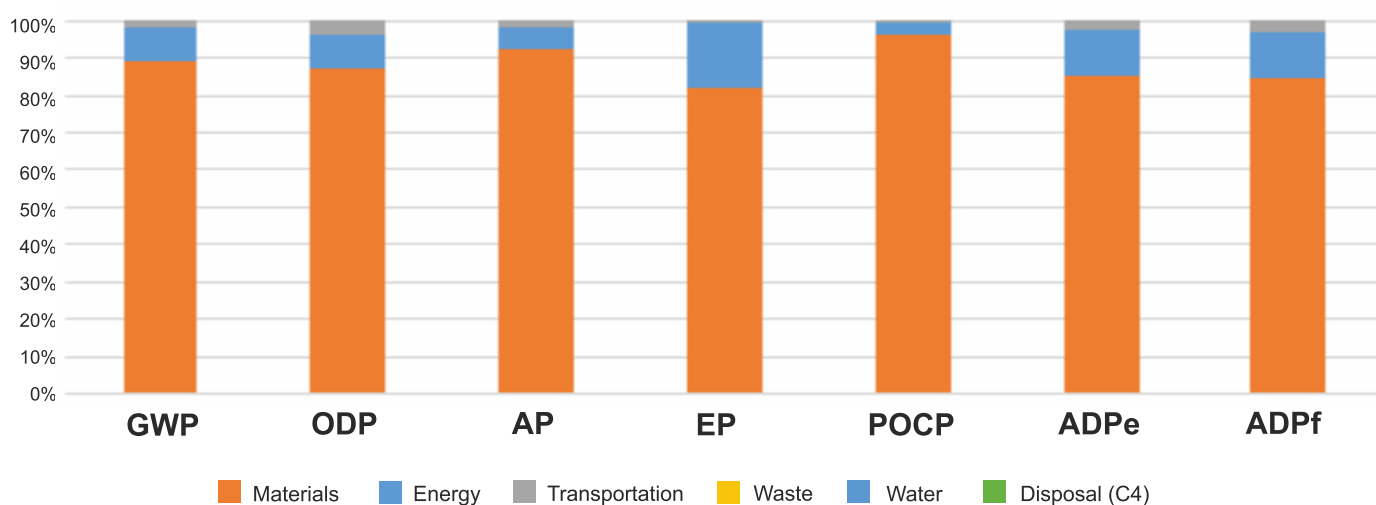
Avoided burdens due to product recycling after its end-of-life stage have the potential to outweigh ~11 up to 27% of the overall impact of the different impact categories (Module D).

Further information is presented in the charts below.

**Share of Environmental Impacts per 1 kg Mill-finished Al profile**



**Share of Environmental Impacts per 1 kg Coated Al profile**



## REFERENCES

**EN 15804/ EN 15804:2012+A1:2013**, Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products

**ISO 14025/ DIN EN ISO 14025:2009-11**: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

**ISO 14040-44/ DIN EN ISO 14040:2006-10**, Environmental management - Life cycle assessment-Principles and framework (ISO 14040:2006) and Requirements and guidelines (ISO 14044:2006)

**BDS EN ISO 9001:2015** Quality management systems - Requirements.

**BDS EN ISO 14001:2015** Environmental management systems - Requirements with guidance for use.

**EN 15088:2005** Aluminium and aluminium alloys. Structural products for construction works. Technical conditions for inspection and delivery

### QUALICOAT

**Ecoinvent / Ecoinvent Centre**, [www.Eco-invent.org](http://www.Eco-invent.org)

**TACKLING RECYCLING ASPECTS IN EN15804** - Christian Leroy, Jean-Sebastien Thomas, Nick Avery, Jan Bollen, Ladji Tikana

**Aluminium Recycling in LCA** – European Aluminium Association

**EPD International (2015)** General Programme Instructions of the International EPD® System. Version 2.5, dated 2015-05-11

**PCR 2012:01**. Construction products and construction services, Version 2.2, dated 2017-05-30

**Central Product Classification (CPC) Version 2.1** - Department of Economic and Social Affairs, UN

## VERIFICATION AND REGISTRATION CONTACTS

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