ASAŞ

ENVIRONMENTAL PRODUCT DECLARATION

Aluminium Foil

TURKEY EPD®
ENVIRONMENTAL PRODUCT DECLARATIONS

EPD®
THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

PROGRAMME
The International EPD® System, www.environdec.com
EPD® Turkey, www.epdturkey.org

PROGRAMME OPERATOR
EPD® International AB & EPD Turkey

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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

Programme Information

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Programme: The International EPD® System
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Information about verification and reference PCR:

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR)
PCR 2019:14 Construction products (EN 15804:A2) Version 1.1

PCR review was conducted by
The Technical Committee of the International EPD® System. See www.environdec.com/TC 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.

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

☐ EPD process verification ☑ EPD verification

Third party verifier
Vladimír Kočí, PhD
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Approved by
The International EPD® System Technical Committee, supported by the Secretariat

Procedure for follow-up of data during EPD validity involves third party verifier:

☐ Yes ☑ No

LCA Study & EPD Design Conducted by
Semtrio Sustainability Consulting
BUDOTEK Teknopark, No 8/27
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www.semtrio.com

ASAŞ Alüminyum Sanayi ve Ticaret A.Ş. has the sole ownership, liability, and responsibility for the EPD.
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 further information about comparability, see EN 15804 and ISO 14025.

Company Information

Owner of the EPD

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Based on its stable financial growth trend since its establishment in 1990, ASAŞ is one of the leading manufacturers in Europe and exports to more than 90 countries across 6 continents. With over 3000 employees, ASAŞ provides services for its clients at its Aluminium Extrusion Profile, Aluminium Composite Panel, Aluminium Flat Rolled Products, PVC Profile and Roller Shutter production facilities which are located in a total of 923.000 m² area, of which 300.000 m² is enclosed, in Turkey. Company offers the advantage of keeping all processes under control both in terms of quality & cost and getting service from a single point with its fully integrated manufacturing facilities which combines all the production functions that customers needed in the supply chain. ASAS GmbH, sub company of ASAŞ, serves as a logistics and service center with 72.793m² closed area in neighboring Koblenz city of Neuwied, Germany.

Passion of "Adding Value" to every job it does, the sector and the society in which it operates and sustainability is at the heart of ASAŞ's business philosophy. Corporate social responsibility projects are carried out with this philosophy to strengthen the society. ASAŞART, which is positioned as an "Art Production Center, operates as a learning+ sharing+ designing+ production platform that brings art and design students together with academics and professionals. Within ASAŞART, special projects are developed to support young talents in their art carrier; aluminium sculpture contest, training programs with universities, international workshops and art exhibitions are organized. Children are at the center of ASAS' corporate social responsibility projects. Company established ASAS Basketball Club so as to support children to be successful individuals in the future with sports as well as social and educational activities.

ASAŞ positions itself as a solution partner with a passion of trying to foresee the future trends by following the innovations and always offering the best for its customers by investing in technology. Therefore, while making investments company adopts the principles of "continuous investment in sustainability, technology, integration and innovation" to always serve its customers better. With this perspective, company established the first R & D Center in aluminium sector in Turkey. Alloy development, process development and product development studies are carried out under the umbrella of R&D Center. Company develops projects to use its resources more efficiently and grows with environment friendly investments. Besides these, ASAŞ takes part in international projects to contribute the development of new processes that helps to minimize the environmental impact of the production processes and increase the energy efficiency.

ASAŞ produces wide range of value-added products for various sectors like automotive, railway, commercial vehicles, energy, packaging, construction, consumer products, maritime etc. worldwide. Finished and semi-finished products are produced to meet its customers' needs in their own projects. Besides this, the company enrich its knowledge in the field of production with design & product development studies and offers its high-quality products to the market under its own brands. Aluminium architectural systems (door, window, and curtain wall systems), aluminum composite panels, u-PVC door and window systems, aluminum design products (aluminum flag and lighting poles, aluminum furniture etc.), roller shutter systems, garage doors and motor control systems are product groups that the company sells with its own brand.

Product Information

Product Name:
Aluminium Foil

Aluminium Flat Products Production Facilities were established in Sakarya - Karapürçek in 2014 within the body of ASAŞ in order to meet the growing demand for high quality products in the Turkish and world markets. The facility provides services in a total area of 310,000 m², of which 135,000 m² is closed, with a total flat product capacity of 120,000 tons, of which 45,000 tons are painted annually. In the facility, aluminium coated, and uncoated coil, sheet, strip and foils are produced (1000-3000-5000-8000 alloy series with different tempers) in requested sizes and surface properties (plain, embossed, tread, coated, laminated coated).

Intended Use of Product

Aluminium sheet has a thickness below 0.2 mm is considered as aluminium foil. Aluminium foils are used in various products such as container foil, household foil, cable foil, fin stock, candle containers, flexible packaging foil, etc. 1XXX, 3XXX and 8XXX series alloys are mainly used to produce aluminium foil products. Thickness range of aluminium products is between 6.35 µm and 0.2 mm.

Production

In the flat rolled production plant, the process starts with induction, casting, cold rolling, plate annealing, plate stretching and cutting. Cast rolled aluminium is produced by mixing primary aluminium, secondary aluminium, and pre-consumer recycled materials with other additives in the casting process

The cast rolled aluminium is after sent to cold rolling and annealing processes. Cast rolled aluminium is treated flattened into different thicknesses in cold rolling mill. Electricity, water, and some lubricants are consumed in this stage. After passing through the cold rolling mill, aluminium sheet is subjected to the annealing for softening the aluminium sheet. As the last process before cutting, the coils are stretched to make the coil product smoother.

After the cutting process is completed, the flat rolled sheet goes to the foil rolling process. Electricity, natural gas, and some additives are used in this process. The rolled foil is then sent to the cutting process, electricity is consumed in this process. Then, the foil is subjected to annealing. There is also electricity and natural gas consumption in the foil annealing process. In addition, auxiliary materials are also used in this process. In conclusion, the final aluminium foil is ready and packaged to be delivered to customers as the final product.

Technical Specifications

Product	Production Standards	Sub Standards	Description
Aluminium Foil	TS EN 546	TS EN 546-1	Aluminium and aluminium alloys - Foil - Part 1: Technical conditions for inspection and delivery
		TS EN 546-2: 2010	Aluminium and aluminium alloys - Foil - Part 2: Mechanical properties
		TS EN 546-3	Aluminium and aluminium alloys - Foil - Part 3: Tolerances on dimensions
		TS EN 546-4	Aluminium and aluminium alloys - Foil - Part 4: Special property requirements
		ASTM B479-06	Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications

UN CPC Code : 41535 – Foil, of aluminium, of a thickness not exceeding 0.2 mm

LCA Information

Declared Unit

The declared unit is 1 kg aluminium foil made ready for delivery at the factory door. According to the Packaging PCR 2019:13, the declared unit is chosen for “cradle-to-gate” system boundary.

Reference Service Life

Not applicable.

Time Representativeness

The inventory for the LCA study is based on the period of 1st January 2021 and 30st June 2021

Database(s) and LCA software used

SimaPro LCA v9.2.0.2 software with Ecoinvent v3.7.1

Description of System Boundaries

Cradle to gate with options, modules, C1-C4, D (A1–A3 + C + D)

Data Quality and Data Collection

According to Packaging PCR, Section 4.10 Other Calculation Rules and Scenarios, site-specific data was used for module A3 (Processes the manufacturer has influence over) and was gathered from the manufacturing plant.

There is two manufacturing plant in Sakarya and Akyazı, Turkey. However, aluminium foil products are manufactured in Sakarya. The manufacturing data (specific) are monitored and recorded by Asaş Aluminium Foil manufacturing responsible people. Specific energy and chemical consumption values and raw materials/ chemicals are collected from Asaş.

For A1 and A2 modules, generic data was applied and was obtained from Ecoinvent v3.7.1.

Data collection for this LCA study has been carried out in accordance with data requirement stated in ISO 14040-44, ISO 14025, ISO 14020, and the requirements given in the General Program Instructions v3.0; PCR Packaging products 2019:13, version 1.1 by The International EPD® System.

Specific data used in this LCA study is less than 1 year old. Generic data used in the study was obtained from Ecoinvent v3.7.1 which is less than 10 years old.

All manufacturing data in core processes has been gathered from the manufacturing plant. The production data in this LCA study represents the period of 1st January 2021 and 30st June 2021. Cut-off criteria for the upstream generic data is at least 99%, according to the General Programme Requirement in terms of the energy, the mass, and the overall environmental relevance of the flows. Inventory data covers all elementary flows and are obtained from Ecoinvent v3.7.1.

Allocation

Waste and packaging data are allocated to cold rolled aluminium sheet, painted aluminium sheet and aluminium foil, taking into account the total amount in the relevant time period.

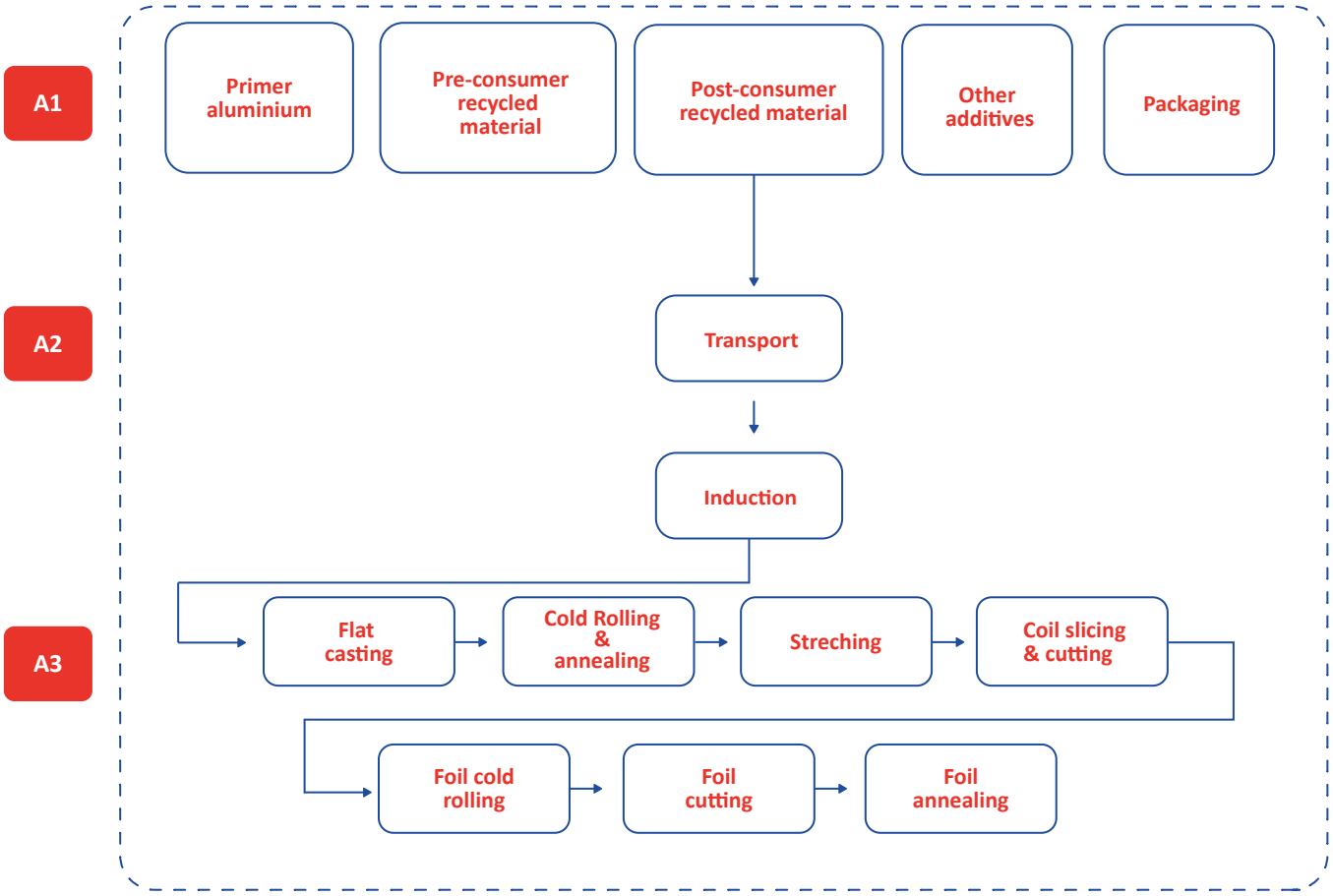
Cut-off Rules

Life Cycle Inventory data for a minimum of 99 % of total inflows to the three life cycle stages have been included and a cut-off rule of 1% regarding energy, mass, and environmental relevance was applied.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				RESOURCE RECOVERY STAGE
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintanence	Repair	Replacement	Refurbishment	Operaitional energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Recycling Potential
MODULES	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Module declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	TR	-	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	>99%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation-products	Not Relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation-sites	Not Relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

System Diagram



System Boundaries

Description of Declared Modules

A1 - Raw Materials Supply

This module takes into account the extraction and processing of the raw material by the raw material producer and the energy consumed in these processes.

A2 - Transport to the Manufacturer

This module represents the external transportation of the raw materials from supplier to the manufacturing plant. Transportation types are considered as seaway and roadway.

Parameters C2 Module	
Transport by road*	Lorry, 16-32 metric ton
Distance (km)	200
Database	Ecoinvent v3.7.1

A3 - Manufacturing

This module includes energy and water consumption and waste generation during. Internal transport in the manufacture area of the EPD owner is also considered in this module. Additionally, packaging materials are covered in this module.

Followed production processes are as follow;

- Induction
- Casting
- Cold Rolling
- Annealing
- Foil Cold Rolling
- Cutting
- Foil Annealing
- Packaging

Information on which life cycle stages are not considered

This EPD only covers the Cradle to Gate with options, modules from A1 to A3 approach.

Content Declaration

Content Declaration by mass%, *1 kg of Painted Aluminium Sheet*

Product

Materials / chemical substances	Weight, %	Environmental / hazardous properties
Primer Aluminium	60-70	-
Post-consumer recycled material	10-15	-
Pre-consumer recycled material	20-25	-
Additives	0-5	-

Packaging

Distribution Packaging: The products are packaged using wooden pallets.
Consumer Packaging: Products are covered with a film and wrapped with nylon. In this way, the products are made resistant to external factors.

Aluminium Foil	Weight, %
LDPE	0.1 - 0.5
Paper	0.1 - 0.5
Wood	1 - 5
Metal	0.1 - 1

Recycled material

Recycled products will not be reported here according to the PCR guidance.

Product	Post-consumer recycled materials, kg	Pre-consumer recycled materials, kg
Aluminium Foil	0.1-0.5	0.1-0.5

Disclaimer: There are no SVHC compounds in the products which is declared in the report.

Environmental Performance

Potential Environmental Impact *Mandatory Indicators According to EN 15804*

Results for 1 kg of Aluminium Foil				
Indicator	**Unit**	**Upstream Processes**	**Core Processes**	**Total**
GWP-fossil	kg CO_2 eq	14.7	0.976	15.7
GWP -biogenic	kg CO_2 eq	0.1	0.003	0.106
GWP-luluc	kg CO_2 eq	0.1	1.93E-04	0.149
GWP-total	kg CO_2 eq	14.9	0.980	15.9
ODP	kg CFC 11eq	0.0	1.62E-07	8.34E-07
AP	kg SO2 eq	0.1	0.002	0.092
EP	kg PO_4^{3-} eq	0.0	2.31E-04	0.008
POCP	kg NMVOC eq	0.0	0.002	0.052
ADP-minerals & metals*	kg Sb eq	0.0	1.28E-06	4.13E-05
ADP-fossil*	MJ	143.0	15.0	158
WDP	m^3	2.9	0.035	2.94

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Acronyms

GWP-fossil = Global Warming Potential fossil fuels; **GWP-biogenic =** Global Warming Potential biogenic; **GWP-luluc =** Global Warming Potential land use and land use change; **ODP =** Depletion potential of the stratospheric ozone layer; **AP =** Acidification potential, Accumulated Exceedance; **EP =** Eutrophication potential; **POCP =** Formation potential of tropospheric ozone; **ADP-minerals&metals =** Abiotic depletion potential for non-fossil resources; **ADP-fossil =** Abiotic depletion for fossil resources potential; **WDP =** Water (user) deprivation potential, deprivation-weighted water consumption

Use of Resources

Results according to N 15804+A2 for 1 kg of Aluminium Foil				
Indicator	**Unit**	**Upstream Processes**	**Core Processes**	**Total**
PERE	MJ	51.0	5.27	56.3
PERM	MJ	0	0	0
PERT	MJ	51.0	5.27	56.3
PENRE	MJ	162	16.4	178
PENRM	MJ	0	0	0
PENRT	MJ	162	16.4	178
SM	kg	0.413	0	0.413
RSF	MJ	0	0	0
NRSF	MJ	0	0	0
FW	m^3	0.635	0.008	0.643

Acronmys

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; **PERM =** Use of renewable primary energy resources used as raw materials; **PERT =** Total use of renewable primary energy resources; **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; **SM =** Use of secondary material; **RSF =** Use of renewable secondary fuels; **NRSF =** Use of non-renewable secondary fuels; **FW =** Use of net fresh water

Waste Production

Results according to EN 15804+A2 for 1 kg of Aluminium Foil				
Indicator	**Unit**	**Upstream Processes**	**Core Processes**	**Total**
Hazardous waste disposed	kg	0.017	0	0.017
Non-hazardous waste disposed	kg	0	0.001	0.001
Radioactive waste disposed	kg	0	0	0

Output Flows

Results according to EN 15804+A2 for 1 kg of Aluminium Foil				
Indicator	**Unit**	**Upstream Processes**	**Core Processes**	**Total**
Components for re-use	kg	0	0	0
Materials for recycling	kg	0	0.004	0.004
Materials for energy recycling	kg	0	0	0
Exported energy, electricity	MJ	0	0	0
Radioactive waste disposed	MJ	0	0	0

References

- **ISO 14040** 2006 Environmental management - Life cycle assessment - Principles and framework
- **ISO 14044** 2006 Environmental management - Life cycle assessment - Requirements and guidelines
- **ISO 14025** 2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- **ISO 14020** 2000 Environmental labels and declarations - General principles
- **EN 15804:2012+A2:2019** Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- **The International EPD® System** www.environdec.com
- **The International EPD® System** The General Programme Instructions v3.01
- **The International EPD® System** PCR 2029:14 Construction products v1.1 (EN 15804:A2)
- **Ecoinvent 3.7** www.ecoinvent.org
- **SimaPro LCA Software** www.simapro.com
- **Asas Aluminyum Sanayi ve Ticaret A.Ş.** www.asastr.com

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