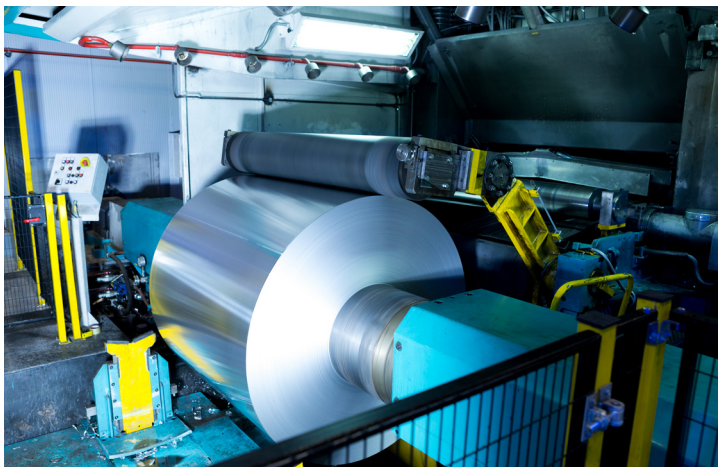
ENVIRONMENTAL
PRODUCT DECLARATION

In accordance with ISO 14025:2006 for:

Aluminium Foil

from

Assan Alüminyum



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

PROGRAMME OPERATOR
EPD® International AB & EPD Turkey

EPD REGISTRATION NUMBER
EPD-IES-0017784

VALID UNTIL
2029-11-30

PUBLICATION DATE
2024-11-30

REVISION DATE
2025-02-26

Programme Information

Programme Information

Programme: The International EPD® System
Address: EPD® International AB Box 21060 SE-100 31 Stockholm, Sweden
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Information about verification and reference PCR:

Product category rules (PCR)
Basic Aluminium Products and Special Alloys Product Category Classification, 2022:08, version 1.0
UN CPC 4153

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: Hüdai Kara. 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
SimaPro partners for India & Sri Lanka, SIPL Pvt Ltdy

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
Umraniye / Istanbul Turkey
www.semtrio.com

Assan Alüminyum has the sole ownership, liability, and responsibility for the EPD.
EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see ISO 14025.

Disclaimer: Additional deviations within the EPDs may exist that have not been identified by the Secretariat of the EPD International AB. The responsibility for verifying EPDs lies with independent third-party verifiers, EPD International AB is not accountable for detecting each potential deviation that passes through the EPD verification process.

Company Information

Owner of the EPD

Assan Alüminyum Sanayi ve Ticaret A.Ş.

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Assan Alüminyum, one of the world's leading manufacturers in the flat-rolled aluminium (FRP) industry, producing coil & sheet, foil and pre-painted aluminium products since 1988, offering its products to a variety of sectors such as packaging, distribution, construction, consumer durables, automotive and HVAC. Assan Alüminyum, a subsidiary of Kibar Holding, has an installed annual capacity of 360 thousand tons in its production facilities, with the highest continuous casting capacity in all of Europe and Americas. The company is currently one of the 2 largest aluminium foil manufacturers in Europe, with an aluminium foil production capacity of 130 thousand tons.

Assan Alüminyum Creates the Future Together with its business partners. With its core values of reliability, flexibility, innovation and sustainability, the company provides customized solutions for its customers. Assan Alüminyum's vision is based on creating long-lasting value by being more sustainable, in environmental, governance and social terms. Assan Alüminyum received the Aluminium Stewardship Initiative (ASI) Performance Standard Certificate for all of facilities. ASI framework is essential for the company to manage all of its business processes according to global sustainability standards. With the clean energy that the company produces at its Manavgat Renewable Energy Power Plant, it generates and procures I-RECs (International Renewable Energy Certificate) that allow it to fully offset its market-based Scope 2 emissions. The 100% and infinitely recyclable aluminium is recycled at its integrated recycling facility, which helps reduce the carbon footprint of the company.

Assan Alüminyum, a global pioneer in the continuous casting technology, creates value by developing innovative, tailor-made solutions for its business partners at its officially registered R&D Center.

With its global culture, 1700 dedicated employees, Assan Alüminyum exports to more than 70 countries around the world, particularly to West Europe and North America. Kibar Americas, the wholly-owned North American subsidiary of Assan Alüminyum in Chicago, aims to perform the ambitious plans for growth in North America.

NAME AND LOCATION OF PRODUCTION SITES

Tuzla Plant
Yayla Mahallesi Rüya Sokak No:2 34940
Tuzla – İstanbul/Turkey

Dilovası Plant
Dilovası Organize Sanayi Bölgesi 1. Kısım Dicle sok. No 40 41455 / Kocaeli/Turkey

Product Information

Product Name:
Aluminium Foil

Flat rolled aluminium is produced by casting aluminium through the melting of aluminium ingots / t-bars. The cast coils are then rolled down to the desired thickness in cold rolling mills. Aluminium foil is produced by rolling mill-finished coils in foil rolling mills down to thicknesses of 0.2 mm or thinner gauges. Aside from foil rolling, the foil production process may also include the annealing, separating, slitting and packaging processes.

The foil production process begins with the re-melting of unwrought aluminum, aluminum scrap and alloying elements in the melting furnaces to produce a given alloy chemical composition and casting of coils on twin roll continuous casting lines.

Cast coils are reduced in thickness in successive stages on cold rolling mills to the desired thickness and heat-treated in annealing furnaces as required by the metallurgical process to produce foil stock.

Foil stock coils are reduced in thickness in successive stages on foil rolling mills and after the rolling, the coils are slit to the final width. For thinner gauge foil, the last rolling pass is done on two layers of foil at once, and the doubled layers are separated at the slitting step. Such products have one bright and one matte surface, whereas singly rolled products have two bright surfaces. The coils are annealed after slitting to achieve the desired temper and to remove rolling oil. For products that are lubricated, the order of slitting and annealing operations is reversed, and lubrication is applied during slitting. For a very small portion of products intermediate annealing in between rolling passes is required.

Finishing operations are performed on slitting, separating, and packaging lines as needed. Slitting lines are used to reduce the coil width or to slit it into strips. Separator lines are used to separate the layers and slitting at the same time.

Intended Use of Product

Aluminium foil has superior qualities, such as lightness, impermeability, high-conductivity, high corrosion resistance and infinite recyclability, which make it the product of choice for various different applications and industries. Aluminium foil is primarily used in packaging, heat exchanger, insulation, HVAC-R and automotive applications.

Technical Specifications

Technical specification	Test Method	Unit	Value
Density	NA	(kg/m3) x 103	2.70-2.73
Melting point (Typical)	NA	^{0}C	630-657
Electrical conductivity (Typical) at 20^{0}C/at 68 ^{0}F	EN 14121:2009	MS/m (0.58*%IACS)	20-36
Thermal conductivity (Typical) at 25^{0}C/at 77 ^{0}F	NA	W/(m.K)	160-230
Average Coefficient of thermal expansion (Typical) 20^{0}C to 100^{0}C /68^{0}F to 212 ^{0}F	NA	per ^{0}C	23.2-23.9mm/m
Modulus of elasticity (Typical)	NA	MPa x 103	69-70 GPA
Hardness (typical)	NA	HB	NA
Yield strength (min)	EN 546-2	MPa	15
Ultimate tensile strength (min)	EN 546-2	MPa	35
Breaking elongation (min) (50 mm&4D)	EN 546-2	%	1
Chemical composition	EN 573-3	% by mass	Varying alloy by alloy, Al 95.00 – 99.6

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

LCA Information

Declared Unit

1 kg of Aluminium Foil ready to delivery at the factory gate.

Reference Service Life

Not applicable.

Time Representativeness

The production data in this LCA study represents the period of 1 January - 31 December 2023.

Database(s) and LCA software used

SimaPro LCA v9.6.0.1 software with Ecoinvent v3.9.1

Description of System Boundaries

Cradle to gate with, upstream processes and core processes according to PCR section 4.3.

Data Quality and Data Collection

Specific data was used for module Core Processes (Processes the manufacturer has influence over) and was gathered from the Assan Alüminyum Tuzla and Dilovası Manufacturing Plant. Specific data includes actual product weights, amounts of raw materials used, product content, energy consumption, transport figures, water consumption and amounts of wastes. For Upstream and Core Processes modules, according to ISO 14044, generic data was applied and was obtained from Ecoinvent v3.9.1

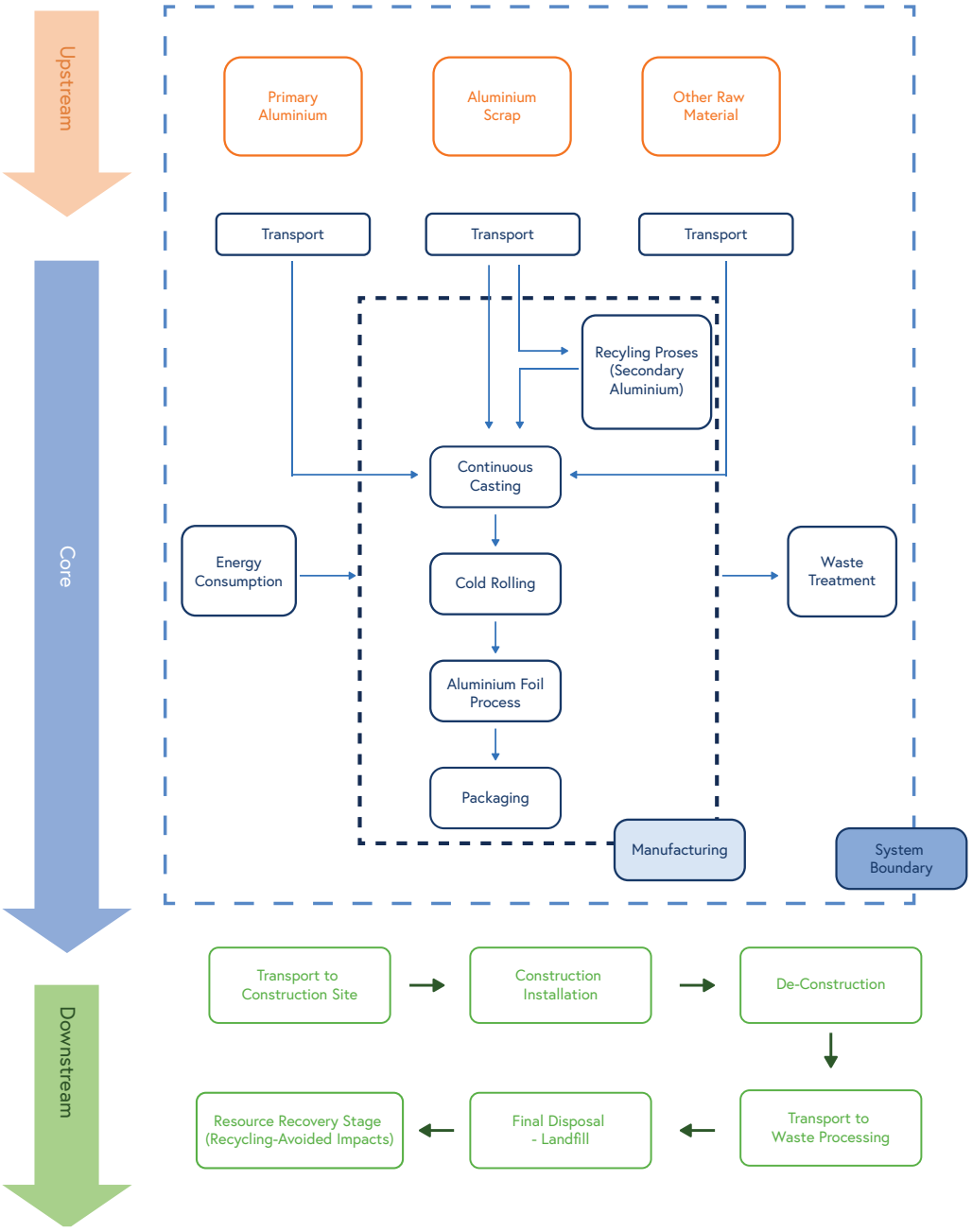
Allocation

Allocation was avoided by dividing the unit process into two or more sub-processes and collecting the environmental data related to these sub-processes.

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.

System Diagram



Description of Declared Modules

Upstream

The upstream module covers the extraction and procurement of raw materials used for the product. At this stage, only activities related to the production of raw materials are evaluated. The raw materials used include primary aluminium, aluminium scrap (post consumer and pre-consumer) and other raw materials. This process represents the start of the product's life cycle, where the first environmental impacts occur.

Core

The core module covers the transportation of raw materials, processing, production processes, energy use, process emissions, waste management, and product packaging. This stage is the critical process where the environmental impacts of production and other facility activities are evaluated. Production processes such as recycling, continuous casting, cold rolling in our production line are included in this stage. In addition, electricity, transportation processes, natural gas consumption, and packaging materials used in the core stage are also considered.

Downstream

The downstream module covers the stages of product use, reuse, recycling, and disposal after it reaches the end-user. However, the Environmental Product Declaration (EPD) for this module excludes these processes, following a "cradle-to-gate" approach instead of a "gate-to-grave" evaluation. As a result, downstream processes are not included in this assessment.

Content Declaration Including Packaging

Material	Percentage, %
Aluminium, primer ingot	40-50
Post-consumer material	0-10
Pre-consumer material	40-50
Iron	<1
Manganese	<1
Others	<1
Renewable material	0
Biogenic carbon	0

Material	Percentage, %	Biogenic carbon, %
Wooden Pellet	0-5	0-5
PE film	0-5	-
Cardboard	0-5	0-5
Recycled material	0	-

Environmental Information

Potential Environmental Impact

Parameter		Unit	Upstream	Core	Total
Global warming potential (GWP)	Fossil	kg CO_2 eq.	6.82	0.65	7.46
	Biogenic	kg CO_2 eq.	5.06E-03	-0.07	-0.07
	Land use and land transformation	kg CO_2 eq.	0.05	8.78E-05	0.05
	Total	kg CO_2 eq.	6.87	0.57	7.44
Ozone layer depletion (ODP)		kg CFC 11 eq.	5.99E-08	1.49E-04	1.49E-04
Acidification potential (AP)		mol H^+ eq.	0.05	5.61E-04	0.05
Eutrophication potential (EP)	Aquatic freshwater	3.34E-05	2.67E-03	3.34E-05	2.67E-03
	Aquatic marine	1.49E-04	6.65E-03	1.49E-04	6.65E-03
	Aquatic terrestrial	1.47E-03	0.07	1.47E-03	0.07
Photochemical oxidant creation potential (POCP)		kg NMVOC eq.	0.02	1.77E-03	0.02
Abiotic depletion potential (ADP)*	Metals and minerals	3.74E-07	1.44E-05	3.74E-07	1.44E-05
	Fossil resources	0.25	40.6	0.25	40.9
Water deprivation potential (WDP)*		m^3 world eq. deprived	2.13	-4.76E-03	2.13

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-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; 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.

* 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.

Potential Environmental Impact – Additional Voluntary Indicators

Impact category	Unit	Upstream	Core	Total
Eutrophication	kg PO4 eq	0.01	1.79E-04	0.01
Human toxicity	kg 1,4-DB eq	14.2	0.67	14.9
Fresh water aquatic ecotox.	kg 1,4-DB eq	8.77	0.08	8.85
Marine aquatic ecotoxicity	kg 1,4-DB eq	2.83E04	2.28E03	3.06E04
Terrestrial ecotoxicity	kg 1,4-DB eq	0.07	3.31E-03	0.08

Environmental Information

Potential Environmental Impact – *Resource Use Indicators*

Parameter		Unit	Upstream	Core	Total
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	17.9	4.25	22.2
	Used as raw materials	MJ, net calorific value	0	0	0
	Total	MJ, net calorific value	17.9	4.25	22.2
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	42.7	0.26	43.0
	Used as raw materials	MJ, net calorific value	0	0	0
	Total	MJ, net calorific value	42.7	0.26	43.0
Secondary material		kg	0.55	0	0.55
Renewable secondary fuels		MJ, net calorific value	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0
Net use of fresh water		m^3	0.30	0	0.30

Waste Indicators

Impact category	Unit	Up Stream	Core	Total
Hazardous waste disposed	kg	0	0	0
Non-hazardous waste disposed	kg	0	0	0
Radioactive waste disposed	kg	0	0	0

Output Flows Indicators

Impact category	Unit	Up Stream	Core	Total
Components for reuse	kg	0	0	0
Material for recycling	kg	0	0	0
Materials for energy recovery	kg	0	0	0
Exported energy, electricity	MJ per energy carrier	0	0	0
Exported energy, thermal	MJ per energy carrier	0	0	0

References

- **ISO 14040** 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 14021** 2016 Environmental labels and declarations
- **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 v5.0.0 https://www.environdec.com/resources/documentation#generalprogrammeinstructions
- **The International EPD® System** PCR 2022:08, Basic Aluminium Products and Special Alloys, version 1.0
- **Ecoinvent 3.9.1** www.ecoinvent.org
- **SimaPro LCA Software** www.simapro.com
- **Assan Alüminyum** www.assanaluminyum.com/en/
- **Aluminium Recycling in LCA** European Aluminium Association, 2013

Contact

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SIPL Sustainability
LCA, GHG and ESG Consultants

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