

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with: ISO 14025:2006, EN 15804:2012+A2:2019/AC:2021

EPD Owner:

AKPA ALÜMİNYUM SAN. VE TİC. A.Ş

Programme:

International EPD System, www.environdec.com

Programme Operator:

EPD International AB

Licensee:

EPD Türkiye

EPD Registration Number:

EPD-IES-0027257

Version Date:

2026-02-02

Validity Date:

2031-02-01

AKPA®
ALÜMİNYUM SANAYİ VE TİC. A.Ş.

ALUMINIUM BILLET



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.



PROGRAM INFORMATION

Programme:	International EPD System	Licensee:	EPD Türkiye
Website:	www.environdec.com	Website:	www.epdturkey.org
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)			
Product Category Rules (PCR):	PCR 2019:14 Construction products (EN 15804+A2) (2.0.1)		
PCR review was conducted by:	The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/support .		

Third-party Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

Individual EPD verification without a pre-verified LCA/EPD tool

Third-party verifier: Agnieszka Pikus, Greenwise

Approved by: International EPD System

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

Yes ☐ No ☒

Life Cycle Assessment (LCA): Jyoti Jyotsana, Yıldırım Yılmaz; Metsims Sustainability Consulting, info@metsims.com

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

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EPD Owner:	AKPA ALÜMİNYUM SAN. VE TİC. A.Ş
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Factory location:	Kargalı Hanbaba OSM Mah. Organize Sanayi 3. Sok. No:5 Hendek, Sakarya / Türkiye

Description and Organization of the EPD Owner

Since 1986, Akpa has been active in the aluminium industry, producing aluminium billets, aluminium extrusion profiles for architectural and industrial applications, and aluminium composite panels under the Primebond, Durabond, and Rallbond brands. Thanks to its strong R&D efforts, innovative architectural system designs, and hardware solutions offered under the Forza brand, Akpa is a trusted business partner both in Türkiye and around the world.

Placing innovation and quality at its core, Akpa manufactures to world-class standards with a growth-oriented approach. With its high-technology production facilities, robust R&D activities, and project-specific innovative designs, the company continues to add value to the sector. Today, Akpa Aluminium exports to more than 80 countries across five continents, maintaining customer satisfaction as a top priority while advancing into the future with the same strength through its sustainability initiatives.

Since 1986, Akpa Aluminium has been a trusted partner in the aluminium industry, specializing in billet, profile, and composite panel production. At its state-of-the-art 174,000 m² production facility in Sakarya, the company operates eight extrusion presses capable of producing profiles with diameters ranging from 6 to 10 inches, along with two foundries, two vertical powder-coating lines, an anodizing line, a wood-grain transfer line, and a composite panel line, ensuring production at the highest quality standards.

PRODUCT INFORMATION

Product name	Aluminium Billet	
Product identification	Finished aluminium billet to be used as the main input for extrusion process.	
Product description	Aluminum billet is a semi-finished product in cylindrical form, used as an input material in the production of aluminum profiles, aluminum billets, and other extruded aluminum products. The product is manufactured by melting primary aluminum and/or recycled aluminum together with alloying elements, adjusting the chemical composition under controlled process conditions, and shaping it through continuous or semi-continuous casting methods. During the production process, the internal homogeneity, grain structure, and surface quality of the billets are monitored and controlled to ensure suitability for the extrusion process. Aluminum billets are produced within specified diameter and length tolerances and may undergo further processes such as heat treatment and homogenization, before being dispatched for use in aluminum extrusion presses.	
Technical purpose of product	The primary technical purpose of the aluminium billet is to serve as the raw material for aluminium extrusion processes. Extruded products derived from aluminium billets are widely used in architectural, industrial, transportation, automotive, energy and machinery applications due to aluminium's favorable properties such as low density, high corrosion resistance, good formability, thermal conductivity and recyclability.	
Manufacturing description	Aluminum billets are produced by melting primary aluminum ingots together with non-hazardous aluminum scrap generated on-site and sourced externally. The charged materials are fed into the furnace using charging equipment and melted at temperatures of approximately 650–700 °C. During melting, aluminum and slag separate naturally, and the slag is removed. Alloying elements such as silicon, magnesium, copper, and other additives are introduced to achieve the required alloy composition. Following alloying, degassing is performed to remove hydrogen from the molten aluminum using nitrogen and argon gas injection. The melt is then cast into billets, with AlTiB added during casting for grain refinement. After casting, billet ends are cut, and the billets undergo homogenization at approximately 580 °C to ensure structural stability. The billets are subsequently cooled, palletized, and prepared for use in extrusion processes.	
Material properties	Specific weight: 2.71 gr/cm ³ Expansion Coefficient: 23.4 (20-100 °C) Elasticity Module: 6.89 GPa	Elongation: 6% (Delta L/L*100, 50 mm length) Hardness: 70 Brinell (HB) Flow strenght: 170 MPa
Manufacturing site	Kargalı Hanbaba OSM Mah. Organize Sanayi 3. Sok. No:5 Hendek, Sakarya / Türkiye	
UN CPC code	4153, Semi-finished products of aluminium or aluminium alloys.	
Geographical scope	A1: Global, A2: Global, A3: Republic of Türkiye, C1-C4 & D: Global	
Hazardous and toxic substances	The product does not contain any substances from the SVHC candidate list in concentrations exceeding 0.1% of its weight.	

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CONTENT DECLARATION

Content name	*Weight, %	Post-consumer recycled material, weight-% of product	Biogenic material, weight-% of product	Biogenic material ¹ , kg C/declared unit
Aluminium	99-100	24.2	0	0
Alloys	< 1	0	0	0
Total	100	24.2	0	0
¹ 1 kg biogenic carbon is equivalent to 44/12 kg of CO ₂				

*Product composition is presented as percentages rather than specific weights to maintain confidentiality while transparently communicating the relative proportions of each component.

Because the billets are supplied directly to the extrusion line without requiring additional packaging, the environmental impacts related to packaging were not considered within the system boundaries of this EPD.

LCA INFORMATION

Data period	01.01.2024 - 31.12.2024
Declared unit and reference flow	1 kg aluminium billet
Data sources used for this EPD	ecoinvent 3.11 database
LCA Software	SimaPro Craft 10.2
Version of the EN 15804 reference package	EF Reference Package 3.1
Allocation	Energy consumption and raw material transportation were weighted according to production figures in data period.
Cut-off Rules	The criteria for exclusion were set so that individual input flows of less than 1% of the total, with a cumulative limit of less than 5%, could be omitted. This was contingent upon confirming that these excluded flows did not significantly alter the reported data, with "significant" defined as affecting the total by less than 5%.
REACH	No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).
Scrap (recycled material) inputs contribution level	Less than 10% of the GWP-GHG results in modules A1-A3 come from scrap inputs
Infrastructure and capital goods	Excluded

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LCA INFORMATION

Description of data quality assessment and reference years: The Life Cycle Assessment (LCA) for this Environmental Product Declaration (EPD) is based on both primary and secondary data. Primary data were collected directly from the manufacturer’s production processes and site-specific operations for the reference year 2024. The quality and representativeness of all data used for the EPD have been evaluated in terms of time, geography, and technology according to the principles outlined in EN 15804:2012+A2:2019, Annex E, and the data quality requirements specified in EN 15941:2010 for life cycle data. All relevant datasets were reviewed for completeness, consistency, and reliability, and the assessment confirmed that no data were classified as “poor” or “very poor” in quality.

Process name	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1- A3
Manufacturing	Collected	EPD Owner	2024	Primary	5.9
Upstream Transportation	Collected	EPD Owner	2024	Primary	1.7
Other processes	Databases	Ecoinvent 3.11	2024	Secondary	0

7.6 %

Total share of primary data, of GWP-GHG results for A1-A3	
Note	The share of primary data is calculated based on GWP GHG results. It is a simplified indicator for data quality that supports the use of more primary data to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Electricity Used in the Manufacturing Process in A3

Type of electricity mix:	Residual electricity mix on the market		Method used to calculate residual electricity mix
Energy sources	Imported coal	40.5%	The market consumption data for Türkiye is modified to exclude all the renewable sources as there is no 'secondary data' on the residual market mix for Türkiye.
	Natural gas	35%	
	Lignite	22.1%	
	Hard coal	1.84%	
	Asphaltite	0.55%	
Climate impact (GWP-GHG):	0.91 kg CO ₂ eq. / kWh		

SYSTEM BOUNDARY

Description of the System boundary a) Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

Excluded modules

B modules are excluded due to not being relevant for the product. A4 and A5 are excluded since the product is mainly fed into the extrusion lines for profile making without packaging and/or installation-related impacts.

	Product stage			Construction process stage		Use stage							End of life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport to site	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse- Recovery- Recycling- potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	Global		TR	-									Global				
Share of specific data	7.6%			-													
Variation - products	0%			-													
Variation - sites	0%			-													

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SYSTEM BOUNDARY

A1 - Raw Material

This stage covers the extraction and processing of primary aluminium as well as the collection and preparation of recycled aluminium scrap. It includes mining, refining and smelting of bauxite for primary aluminium, and sorting, cleaning and pre-treatment of secondary aluminium. All upstream energy consumption, auxiliary materials and related emissions are included. Transportation of raw materials within the supply chain up to the aluminium production facility is also considered.

A2 - Raw Material Transport

The A2 stage includes the transportation of primary aluminium, recycled aluminium scrap and alloying elements from suppliers to the billet manufacturing plant. It accounts for fuel consumption, transport distances, load factors and vehicle types used. All emissions and energy use related to transport operations are included in this stage.

A3 - Manufacturing

Aluminium billet production involves melting primary aluminium or recycled aluminium alloys in a controlled furnace, followed by precise alloying to achieve the required chemical composition. The molten metal is then degassed, filtered, and cast—typically using direct chill (DC) casting—into cylindrical billets. After solidification, the billets are homogenized through heat treatment to improve microstructural uniformity, enhance mechanical properties, and ensure consistent extrudability. Finally, the billets are cut to specified lengths, surface-inspected, and prepared for downstream processes such as extrusion.

C1 - Deconstruction, demolition

End-of-life processes are largely influenced by project-specific factors such as the type of structure, dismantling method (manual or mechanical), and the nature of the final product (extruded profile). Therefore, a generic calculation following the PCR 2019:14 v.2.0.1 is used where 1.1 kWh diesel consumption is assumed per ton of product.



Raw Material Supply

Aluminium ingots, secondary aluminium & alloying elements



Raw Material Transport

Transport of raw materials to the manufacturing site via trucks, ships



Manufacturing

Secondary melting, degassing, filtering, casting into billet, homogenization, heat treatment



Deconstruction

Deconstruction activities of the discarded product

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C2 - Transport

After dismantling, the aluminium parts are transported to scrap collection and recycling centres. In the absence of specific data, transportation assumptions are based on the default scenario where 80 km average distance using a Euro 5 lorry with 50% load factor is considered.

C3 - Waste Processing

In this phase, recovered aluminium scrap is subjected to sorting, cleaning, and necessary pre-treatment steps before being reintegrated into the recycling cycle. Thanks to aluminium's ability to be recycled multiple times with minimal loss in quality, the majority of the material is anticipated to be re-melted and reused in the production of secondary aluminium. The environmental burdens linked to these recycling operations—including energy use and emissions—are incorporated into the assessment. Aligned with the latest PEF Guidance issued by the European Commission, it is assumed that 95% of the collected scrap, primarily originating from building elements such as doors and windows, is effectively recycled. Efforts taken during the waste processing stage are considered with default impacts as highlighted in the relevant PCR.

C4 - Disposal

Owing to factors such as mechanical separation losses, material degradation, contamination, and limitations in collection systems, a 5% loss rate is assumed during the end-of-life phase. This unrecoverable fraction is treated as inert waste and directed to landfill disposal. The environmental impacts linked to this final disposal route are included in the assessment at this stage.

D - Reuse, recovery, recycling potential

At the end of the product's life, it is assumed that 95% of the aluminium is successfully collected and recycled. This benefit is quantified by considering the avoided impacts of primary aluminium production, following the EN 15804+A2 standard to prevent any double counting.



Waste ransport

Transport of waste/discarded product to the processing site(s)



Waste processing

Waste processing of the discarded product such as seperating, sorting, cutting, etc.



Disposal

Disposal of the none-recycled portion of the discarded product



Benefits

Benefits of recycled portion of the discarded product

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The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Mandatory environmental performance indicators according to EN 15804

Module	Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO ₂ eq.	1.22E+01	3.75E-04	2.45E-02	2.57E-03	5.45E-04	-4.45E+00
Climate change - fossil	GWP-fossil	kg CO ₂ eq.	1.21E+01	3.75E-04	2.45E-02	2.52E-03	5.45E-04	-4.30E+00
Climate change - biogenic	GWP-biogenic	kg CO ₂ eq.	2.62E-02	6.58E-08	5.33E-06	3.59E-05	9.58E-08	-2.78E-02
Climate change - land use and land-use change	GWP-luluc	kg CO ₂ eq.	1.01E-01	1.54E-08	3.88E-07	1.34E-05	2.24E-08	-1.16E-01
Ozone depletion	ODP	kg CFC-11 eq.	6.83E-08	5.70E-12	5.57E-10	2.34E-11	8.29E-12	-7.26E-08
Acidification	AP	mol H+ eq.	8.17E-02	3.46E-06	6.33E-05	1.69E-05	5.03E-06	-2.92E-02
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	4.77E-03	3.13E-09	1.26E-07	1.91E-06	4.55E-09	-2.67E-03
Eutrophication aquatic marine	EP-marine	kg N eq.	1.37E-02	1.63E-06	2.42E-05	4.62E-06	2.38E-06	-3.67E-03
Eutrophication terrestrial	EP-terrestrial	mol N eq.	1.41E-01	1.79E-05	2.64E-04	4.65E-05	2.60E-05	-3.48E-02
Photochemical ozone formation	POCP	kg NMVOC eq.	4.59E-02	5.34E-06	1.05E-04	1.42E-05	7.76E-06	-1.52E-02
Depletion of abiotic resources - minerals and metals	ADP- minerals & metals ¹	kg Sb eq.	9.21E-07	1.31E-11	6.39E-10	9.32E-11	1.91E-11	-3.63E-07
Depletion of abiotic resources - fossil fuels	ADP-fossil ¹	MJ, net calorific value	1.27E+02	4.90E-03	3.26E-01	3.00E-02	7.13E-03	-6.83E+01
Water use	WDP ¹	m ³ world eq. deprived	2.31E+00	6.17E-06	2.59E-04	4.73E-04	8.98E-06	-8.62E+00

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

General disclaimer

It is discouraged to use the results of modules A1-A3 without considering the results of module C.

Disclaimer 1

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

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Additional mandatory environmental performance indicators

Module	Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Climate change GWP-GHG	GWP-GHG ¹	kg CO ₂ eq.	1.22E+01	3.75E-04	2.45E-02	2.57E-03	5.45E-04	-4.45E+00
Acronyms	GWP-GHG = Global warming potential greenhouse gas.							
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.							
Disclaimer 1	The GWP-GHG indicator is termed GWP-IOBC/GHG in the ILCD+EPD+ data format. The indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO ₂ is set to zero.							

Resource use indicators according to EN 15804

Module	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ, net calorific value	3.59E+01	1.07E-05	8.13E-04	7.65E-03	1.55E-05	-3.01E+01
PERM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ, net calorific value	3.59E+01	1.07E-05	8.13E-04	7.65E-03	1.55E-05	-3.01E+01
PENRE	MJ, net calorific value	1.27E+02	4.90E-03	3.26E-01	3.00E-02	7.13E-03	-6.83E+01
PENRM	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, net calorific value	1.27E+02	4.90E-03	3.26E-01	3.00E-02	7.13E-03	-6.83E+01
SM	kg	2.46E-01	9.86E-09	1.68E-07	3.10E-08	1.43E-08	-2.84E-03
RSF	MJ, net calorific value	1.99E-04	1.71E-09	1.39E-08	5.16E-09	2.48E-09	-1.74E-05
NRSF	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	8.78E-02	1.48E-07	6.31E-06	1.32E-05	2.16E-07	-2.09E-01
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.						
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.						

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Waste indicators according to EN 15804

Module	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	2.71E+00	5.14E-07	1.24E-05	1.16E-04	7.48E-07	-1.23E+00
NHWD	kg	2.14E+01	1.76E-05	1.05E-03	9.22E-03	2.56E-05	-1.21E+01
RWD	kg	1.02E-04	2.29E-10	1.97E-08	2.40E-09	3.32E-10	-3.46E-04
Acronyms	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed.						
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.						

Output flow indicators according to EN 15804

Module	Unit	A1-A3	C1	C2	C3	C4	D
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	9.50E-01	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acronyms	CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.						
General disclaimer	It is discouraged to use the results of modules A1-A3 without considering the results of module C.						

ABBREVIATIONS

Abbreviation	Definition
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification
SVHC	Substances of Very High Concern
ND	Not Declared
CO ₂ eq.	Carbon Dioxide Equivalents

Version History

Original version of the EPD, 2026-02-02.

REFERENCES

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

PCR 2019:14 (ver. 2.0.1) Construction products (EN 15804:A2)

ISO 14020:2000 "Environmental Labels and Declarations — General principles"

ISO 14040:2021 "Environmental management - Life cycle assessment - Principles and framework"

ISO 14044:2018 "Environmental management - Life cycle assessment - Requirements and guidelines"

ISO 14025:2006 "Environmental labels and declarations - Type III environmental declarations - Principles and procedures"

General Program Instructions of International EPD System, (Ver. 5.0.1) 2025-02-27 "General Programme Instructions for the International EPD System".

Ecoinvent database (v3.11) - www.ecoinvent.org

SimaPro Craft 10.2 SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

AKPA Aluminium www.akpaas.com.tr

Metsims www.metsims.com

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ADDITIONAL LCA RESULTS

In compliance with the PCR requirements, 100% end-of-life scenarios have been modelled for the product. Tables below present the results for modules C3, C4 and D, based on these scenarios, covering all mandatory impact indicators as specified in EN 15804.

100% recycling scenario

Impact category	Indicator	Unit	C3	C4	D
Climate change - total	GWP-total	kg CO ₂ eq.	2.57E-03	0.00E+00	-4.68E+00
Climate change - fossil	GWP-fossil	kg CO ₂ eq.	2.52E-03	0.00E+00	-4.53E+00
Climate change - biogenic	GWP-biogenic	kg CO ₂ eq.	3.59E-05	0.00E+00	-2.93E-02
Climate change - land use and land-use change	GWP-luluc	kg CO ₂ eq.	1.34E-05	0.00E+00	-1.22E-01
Ozone depletion	ODP	kg CFC-11 eq.	2.34E-11	0.00E+00	-7.64E-08
Acidification	AP	mol H+ eq.	1.69E-05	0.00E+00	-3.07E-02
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	1.91E-06	0.00E+00	-2.82E-03
Eutrophication aquatic marine	EP- marine	kg N eq.	4.62E-06	0.00E+00	-3.87E-03
Eutrophication terrestrial	EP-terrestrial	mol N eq.	4.65E-05	0.00E+00	-3.67E-02
Photochemical ozone formation	POCP	kg NMVOC eq.	1.42E-05	0.00E+00	-1.60E-02
Depletion of abiotic resources-minerals and metals	ADP - minerals & metals	kg Sb eq.	9.32E-11	0.00E+00	-3.83E-07
Depletion of abiotic resources-fossil fuels	ADP-fossil	MJ, net calorific value	3.00E-02	0.00E+00	-7.19E+01
Water use	WDP	m ³ world eq. deprived	4.73E-04	0.00E+00	-9.07E+00

ADDITIONAL LCA RESULTS

In compliance with the PCR requirements, 100% end-of-life scenarios have been modelled for the product. Tables below present the results for modules C3, C4 and D, based on these scenarios, covering all mandatory impact indicators as specified in EN 15804.

100% landfill scenario

Impact category	Indicator	Unit	C3	C4	D
Climate change - total	GWP-total	kg CO ₂ eq.	2.57E-03	1.47E-02	0.00E+00
Climate change - fossil	GWP-fossil	kg CO ₂ eq.	2.52E-03	1.46E-02	0.00E+00
Climate change - biogenic	GWP-biogenic	kg CO ₂ eq.	3.59E-05	8.46E-05	0.00E+00
Climate change - land use and land-use change	GWP-luluc	kg CO ₂ eq.	1.34E-05	1.52E-05	0.00E+00
Ozone depletion	ODP	kg CFC-11 eq.	2.34E-11	3.15E-10	0.00E+00
Acidification	AP	mol H ⁺ eq.	1.69E-05	9.23E-05	0.00E+00
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	1.91E-06	1.61E-06	0.00E+00
Eutrophication aquatic marine	EP- marine	kg N eq.	4.62E-06	4.01E-05	0.00E+00
Eutrophication terrestrial	EP-terrestrial	mol N eq.	4.65E-05	3.84E-04	0.00E+00
Photochemical ozone formation	POCP	kg NMVOC eq.	1.42E-05	1.25E-04	0.00E+00
Depletion of abiotic resources- minerals and metals	ADP - minerals & metals	kg Sb eq.	9.32E-11	2.87E-09	0.00E+00
Depletion of abiotic resources- fossil fuels	ADP-fossil	MJ, net calorific value	3.00E-02	2.89E-01	0.00E+00
Water use	WDP	m ³ world eq. deprived	4.73E-04	-1.62E-01	0.00E+00

**Programme &
Programme Operator**

Licensee

**Owner of the
declaration**

**LCA Consultant &
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