GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION

AENOR

PolyAl

Environmental Product Declaration

EN ISO 14025:2010
PCR 2010:16

Alier

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PCR 2010:16. Plastics in primary forms. V 4.0.1.
Independent verification of the declaration and data in accordance with EN ISO 14025:2010 ☐ Internal ☒ External
Verification body AENOR

1. General information

1.1. The organisation

ALIER, S.A. is an industrial company specialized in the recovery and valorization of recovered materials. Historically, its core business has been the production of recycled paper from recovered fibres. Since 2024, the company has also been engaged in the recovery and recycling of pulping residues generated during the recycling of used beverage cartons (cartons), producing recycled PolyAl pellets.

PolyAl is produced at ALIER's plastics recycling plant, which is integrated within the same industrial site where fibre recycling operations are carried out. This integrated configuration enables the recovery of material streams generated during the pulping process and their conversion into a recycled product intended for industrial applications.

Since the end of 2024, ALIER, S.A. has operated a plastics recycling plant that recovers the pulping residues generated during the processing of used beverage cartons. The facility includes a pre-treatment stage, two washing lines and two extrusion lines that convert the recovered material into recycled pellets. The plant has a design capacity of 15,000 tonnes per year of finished product in pellet form.

The company operates a Quality Management System and an Environmental Management System certified in accordance with the requirements of UNE-EN ISO 9001:2015 and UNE-EN ISO 14001:2015, respectively. In addition, ALIER holds PEFC and FSC Chain of Custody certifications for forest-based products.

ALIER is B Corp Certified and is also an approved recovery and recycling company certified by ECOEMBES S.A. for paper and cardboard packaging, including beverage and food cartons collected through selective collection systems.

ALIER, S.A. has also implemented an Energy Management System in accordance with the requirements of UNE-EN ISO 50001:2018

1.2. Scope of the Declaration

This Environmental Product Declaration (EPD) reports the environmental performance associated with the cradle-to-gate life cycle of PolyAl manufactured by ALIER, S.A. at its production facility located in Roselló (Lleida, Spain)

1.3. Life cycle and compliance.

This EPD has been developed and verified in accordance with EN ISO 14025:2010 and the Product Category Rule.

Table 1-1. Product Category Rule

Title	Plastics in primary forms.
Register / Version	PCR 2010:16 versión 4.0.1
Issuing date	2025-09
Administrator	The International EPD® System

Table 1-2 System boundaries. Information modules considered

Upstream	Procurement of raw materials, auxiliaries and packaging
Core Process	Transport to the plant, power generation, product manufacturing and waste management and production landfill.

This EPD may not be comparable with EPDs developed under other programme operators or in accordance with different reference documents. In particular, it may not be comparable with EPDs that have not been developed and verified in accordance with the same Product Category Rules (PCR).

Likewise, EPDs may not be comparable if they are based on different data sources (e.g. different databases), do not include all relevant information modules, or are not based on the same scenarios.

1.4. Differences with previous versions of this EPD.

Revision 1 of this EPD is issued to extend the inventory data from 6 to 12 months.

The SimaPro version changes from 10.3.0.1 to 10.5.0.3 in this revision

2. The product

2.1. Product identification.

ALIER's PolyAl is a 100% recycled material obtained through the recovery and recycling of residues from used beverage cartons.

The intended use of the product covered by this study is the manufacture of injection-moulded products, such as pallets, household and kitchenware items, construction materials (either as complementary components or reinforcement elements), as well as additives for materials and compound formulations.

CPC Code: 34740 – Polyacetals, other polyethers and epoxy resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms.

2.2. Product composition

The product covered by this EPD consists of 100% plastic recovered from used beverage cartons, classified under waste code L030307 (Pulper Plastic).

The manufacturer declares that the material does not contain, nor are any substances included in the European Chemicals Agency (ECHA) Candidate List of Substances of Very High Concern (SVHC) intentionally added during its manufacture, in accordance with the authorization requirements of the REACH Regulation (EC) No. 1907/2006.

2.3. Packaging

The primary packaging used in the shipment of the product (distribution packaging) has been included in the study:

Table 2-1. Packaging

Material	kg / declared unit
PP	1.97E-03
Wood	2.53E-02
PE	1.22E-03

2.4. Product performance

The technical specifications of the products included in this EPD are shown in the following table.

Standard	Name	Units	Value	Acceptable range
UNE-EN ISO 1133-1	Melt Mass-Flow Rate (MFR)	g/10min	3	MIN 1.5- MAX 4
UNE-EN ISO 1183-1	Density	g/cm³	1.005	MIN 950 - MAX 1050
UNE-EN ISO 3451-1	Ash Content	%	10	MENOR A 13
UNE-EN ISO 527-1	Tensile Modulus	MPa	600	MIN 400 - MAX 800
UNE-EN ISO 527-1	Yield Strength	MPa	12	MIN 7 - MAX 14
UNE-EN ISO 527-1	Maximum Tensile Strength	MPa	12	MIN 10 - MAX 16
UNE-EN ISO 527-1	Tensile Strength at Break	MPa	12.5	MIN 9 - MAX 16
UNE-EN ISO 527-1	Tensile Strength at Break	%	30	MIN 20 - MAX 50
UNE-EN ISO 11357-2	Differential Scanning Calorimetry (LDPE)	%	69	MAYOR A 67
UNE-EN ISO 179-2	Charpy Impact Strength	Kj/m²	9.5	MIN 6 - MAX 13
UNE-EN ISO 178	Flexural Strain	mm	13.5	MIN 12 - MAX 15
UNE-EN ISO 178	Flexural Strength	MPa	14	MIN 11 - MAX 16
UNE-EN ISO 178	Flexural Modulus	MPa	400	MIN 200 - MAX 500
UNE-EN ISO 306	Vicat Softening Temperature (VST)	ºC	95	MIN 92- MAX 97
	Moisture Content	%	0.08	UNDER A 0.15

3. LCA Information

3.1. Life Cycle Analysis

The Life Cycle Assessment (LCA) Report supporting the Environmental Product Declaration (EPD) for ALIER, S.A.'s PolyAl, dated september 2026, was prepared by Abaleo S.L.

The characterization factors are based on Environmental Footprint (EF) 3.1.

The LCA study was carried out in accordance with the recommendations and requirements of the international standards ISO 14040:2006 and ISO 14044:2006, as well as PCR 2010:16.

3.2. Scope of the study.

The scope of this EPD covers the cradle-to-gate production of PolyAl manufactured by ALIER, S.A. at its production facility in Roselló, Lleida, Spain.

The product is manufactured in Spain; however, the LCA was carried out using a European reference context.

3.3. Study limitations.

The following were not included in the LCA:

- The production of the aerobic and anaerobic sludge used in the WWTP, which accounts for 0.004% by weight of the total products consumed at the facility; its transport from the supplier to Alier is considered.
- All equipment with a service life of more than 3 years.
- The construction of the plant buildings, or other capital goods.
- Staff business travel, or staff commuting to and from work.
- Research and development activities.
- Long-term emissions.

3.4. Declared unit.

The declared unit is one kilogram (1 kg) of product, plus its distribution packaging.

3.5. Reference service life.

Reference Service Life (RSL): Not applicable, since the use stage is outside the system boundaries established by the PCR.

3.6. Allocation criteria.

In accordance with the criteria of the reference standard, the inputs and outputs of the system have been assigned on a mass basis. This allocation criterion has been applied to all general plant consumption, transport, waste, and disposal.

The quantities of the different materials used and produced in the manufacturing process come from measurements carried out at the plant itself.

It has not been necessary to apply economic allocation criteria.

3.7. Cut-off criteria.

The LCA includes the gross weight/volume of all materials used in the manufacturing process, so that at least 99% of the environmental impacts are obtained.

There has been no exclusion of energy consumption.

3.8. Manufacturing process.

The plant is divided into three processing stages: pre-treatment, washing and extrusion. The raw material used is the pulping residue generated during the recycling of used beverage cartons. This material enters the first stage of the process (pre-treatment), where it is homogenized and purified before being transferred to the washing stage. During this stage, residual contaminants are removed and the remaining impurities are separated. The material is then dried to achieve a moisture content of less than 10%.

Finally, the clean, dry material is extruded to produce recycled pellets approximately 4 mm in size. The pellets are then packed into bags and stored pending shipment.

3.9. Representativeness, quality and selection of data.

To model the manufacturing process of the product under study, site-specific production data from ALIER's facility in Roselló (Lleida, Spain) were used, covering a twelve-month period May 2025 to May 2026. The following data were collected from the plant: raw material and energy consumption, transportation, and waste generation. Data for the WWTP is available from january to december 2025.

The study was carried out using the Ecoinvent 3.11 database (March 2025 release) and SimaPro 10.5.0.3 software.

The following criteria were applied in selecting the most representative background processes:

- The data must be representative of the technological development actually applied in the manufacturing processes. If no information was available, data representative of an average technology were selected.
- The data must be as geographically close as possible and, where applicable, average regionalized data.
- The data must be as up to date as possible.

To assess the quality of the primary data used in the LCA, the semi-quantitative data quality assessment criteria recommended by the European Commission's Product Environmental Footprint (PEF) Method were applied. The following results were obtained:

- Very good integrity. Score 1.
- Good methodological suitability and consistency. Score 2.
- Reasonable temporal representativeness. Score 2.
- Good technological representativeness. Score 2.
- Very good geographical representativeness. Score 1.
- Low data uncertainty. Score 2.

Based on these results, the Data Quality Rating (DQR) is 1.67, indicating that the overall data quality is very good.

4. System boundaries, scenarios and additional technical information.

Upstream.

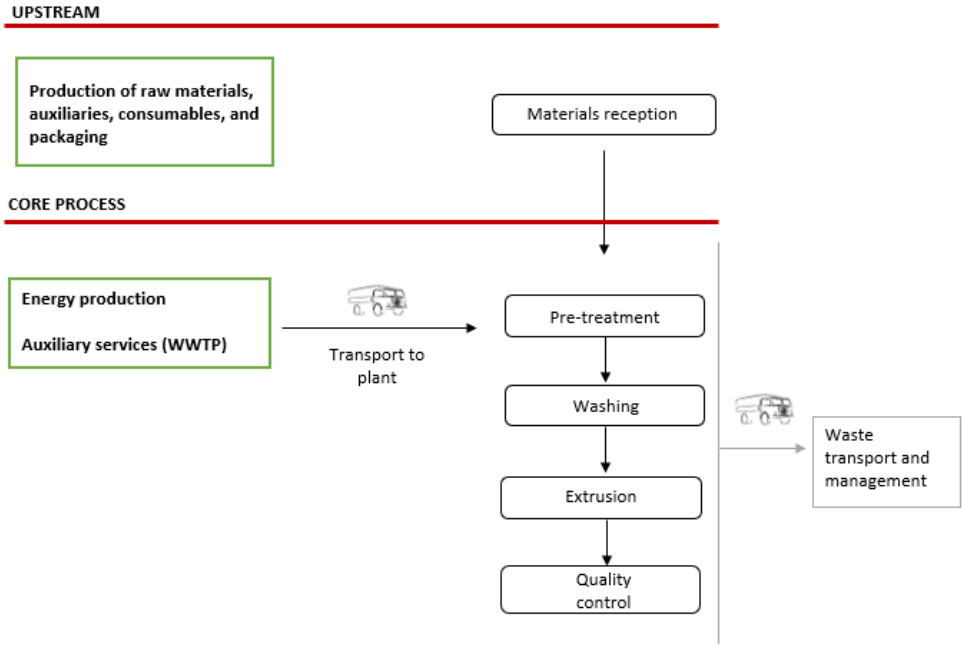
This phase includes the processes of:

- All material and energy inputs to upstream processes, including cooling water, compressed air, and other utilities.
- All emissions to air, water and soil from upstream processes.
- The treatment of waste and wastewater generated by all upstream processes.
- The transportation of products to the manufacturing plant for use in the upstream stage.
- The extraction of raw materials and the manufacture of auxiliary additives incorporated into the final product.
- All inputs to the upstream stage arising from the plant's general services (utilities and site operations).
- The packaging materials used for the final product.

Core Process

This module includes:

- The transportation of all materials used in the main manufacturing process to the ALIER production plant.
- The manufacturing processes carried out at the ALIER plant, including:
  - The extrusion process, in which the raw materials and the various additives are processed to produce PolyAl pellets.
  - Storage and handling of materials.
  - Auxiliary services (wastewater treatment plant) supporting the different stages of the manufacturing process. These services are included within the system boundaries, and the environmental burdens associated with the services they provide are allocated to the corresponding stages of the PolyAl pellet production process.



5. Declaration of LCA and LCI environmental parameters.

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

Environmental Impacts

Parameter	Units	Upstream	Core process	Total
GWP-total	kg CO_2 eq	1.85E-02	5.71E-02	7.56E-02
GWP-fossil	kg CO_2 eq	1.84E-02	5.71E-02	7.55E-02
GWP-biogenic	kg CO_2 eq	2.93E-05	2.41E-05	5.34E-05
GWP-luluc	kg CO_2 eq	3.76E-05	1.91E-05	5.67E-05
ODP	kg CFC11 eq	5.41E-10	1.22E-07	1.22E-07
AP	mol H+ eq	7.66E-05	2.00E-04	2.76E-04
EP-freshwater	kg PO4 eq	4.10E-06	1.58E-05	1.99E-05
EP-marine	kg N eq	1.76E-05	1.69E-04	1.87E-04
EP-terrestrial	mol N eq	1.83E-04	3.73E-04	5.56E-04
POCP	Kg NMVOC eq	1.00E-04	1.46E-04	2.47E-04
ADP-minerals& metals	kg Sb eq	5.29E-09	2.01E-08	2.54E-08
ADP-fossil	MJ	4.18E-01	7.86E-01	1.20E+00
WDP	m^3 depriv.	1.38E-02	-1.38E+00	-1.37E+00

GWP-total: Global Warming Potential – total; GWP-fossil: Global Warming Potential – fossil; GWP-biogenic: Global Warming Potential – biogenic; GWP-luluc: Global Warming Potential – land use and land use change; ODP: Stratospheric Ozone Depletion Potential; AP: Acidification Potential, Accumulated Exceedance; EP-freshwater: Eutrophication Potential, fraction of nutrients reaching the freshwater end compartment; EP-marine: Eutrophication Potential, fraction of nutrients reaching the marine end compartment; EP-terrestrial: Eutrophication Potential, Accumulated Exceedance; POCP: Photochemical Ozone Formation Potential; ADP-minerals&metals: Abiotic Resource Depletion Potential for non-fossil resources (minerals and metals); ADP-fossil: Abiotic Resource Depletion Potential for fossil resources; WDP: Water Deprivation Potential (user), deprivation-weighted water consumption.

The biogenic CO_2 balance contained in the packaging is accounted for at the packaging manufacturing stage, since the end-of-life of these materials is not included within the system boundaries.

Use of resources

Parameter	Units	Upstream	Core process	Total
PERE	MJ	4.59E-01	2.75E+00	3.21E+00
PERM*	MJ	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	4.59E-01	2.75E+00	3.21E+00
PENRE	MJ	4.18E-01	7.86E-01	1.20E+00
PENRM*	MJ	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	4.18E-01	7.86E-01	1.20E+00
SM	kg	2.20E+00	0.00E+00	2.20E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00
FW	m3	3.60E-04	-1.82E-02	-1.78E-02

PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM: Use of renewable primary energy used as raw materials; PERT: Total use of renewable primary energy; PENRE: Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials; PENRM: Use of non-renewable primary energy used as raw materials; PENRT: Total use of non-renewable primary energy; SM: Use of secondary materials; RSF: Use of renewable secondary fuels; NRSF: Use of non-renewable secondary fuels; FW: Net use of running water resources.

*The energy used as raw material is declared according to option A of PCR 2019:14.

Waste categories

Parameter	Units	Upstream	Core process	Total
HWD	kg	5.21E-06	7.57E-06	1.28E-05
NHWD	kg	1.53E-04	4.34E-01	4.34E-01
RWD	kg	3.57E-07	3.68E-07	7.25E-07

HWD: Hazardous Waste Disposed; NHWD: Non-hazardous waste disposed; RWD: Radioactive waste disposed.

Output flows

Parameter	Units	Upstream	Core process	Total
CRU	kg	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00

CRU: Components for reuse; MFR: Materials for recycling; MER: Materials for energy recovery; EEE: Electrical energy exported; EET: Thermal energy exported

6. Additional Environmental Information.

6.1. Other indicators.

The energy content of the PolyAl pellets covered by this study, calculated using the gross calorific value (higher heating value, HHV) of the PolyAl material, is 34.706 MJ/kg.

The PolyAl pellets contain no biogenic material.

6.2. Indoor air emissions.

The manufacturer declares that the product under study does not generate emissions into indoor air during its useful life.

6.3. Emissions to soil and water.

The manufacturer declares that the product under study does not generate significant emissions to the soil or water during its useful life.

6.4. Biogenic carbon content.

The biogenic carbon content of the product and packaging is declared in the table below.

Table 6-1. Biogenic carbon

Parameter	Kg C biogenic / declared unit
Product	0
Packaging	1.11E-02

6.5. Electricity mix.

To represent the production of the electricity consumed in the plant, the GoO certificate issued by the CNMC for the year to which the data correspond has been considered:

- Eolic: 0.07%
- Solar photovoltaic: 50.25%
- Solar thermoelectric: 49.68%.

Table 6-2. Electricity mix

Mix - GWP - g CO_2 eq/kWh	
Average Mix	17.024

References

[1] PCR 2010:16. Plastics in primary forms. Versión 4.0.1.

[2] General Programme Instructions of GlobalEPD 3rd revision (09-10-2023).

[3] EN ISO 14025:2010 Environmental labels and declarations Tpye III engironmental delcarations. Principles and procedures (ISO 14025:2006).

[4] EN ISO 14040:2006/A1:2021. Environmental management. Life cycle assessment. Principles and framework. Amendment 1. (ISO 14040:2006/ Amd 1:2020).

[5] EN ISO 14044:2006/A2:2021. Environmental management.Life cycle assessment. Requirements and guidelines. Amendment 2. (ISO 14044:2006/Amd 2:2020).

[6] Life Cycle Assessment Report for the Environmental Product Declaration of PolyAl, for ALIER, S.A., prepared by Abaleo S.L., september 2026. Version 2.

[7] Environmental impact assessment databases and methodologies applied using SimaPro 10.5.0.3.

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A verified environmental declaration

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