

# Environmental Product Declaration



In accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021 for:

AIREX T92.100 PET foam

from

3A Composites Core Materials



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
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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](http://www.environdec.com)*



## General information

### Programme information


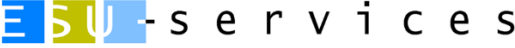

<b>Programme:</b>	The International EPD® System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): Construction products, 2019:14, version 1.2.3, 2022-07-08
PCR review was conducted by:  The Technical Committee of the International EPD® System. A full list of members available on <a href="http://www.environdec.com">www.environdec.com</a> . The review panel may be contacted via <a href="mailto:info@environdec.com">info@environdec.com</a> . Chair of the PCR review: Claudia A. Peña, DDERE Research & Technology
<b>Life Cycle Assessment (LCA)</b>
LCA authors: Samuel Solin, Niels Jungbluth, ESU-services Ltd, <a href="mailto:info@esu-services.ch">info@esu-services.ch</a>
<b>Third-party verification</b>
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:  <input checked="" type="checkbox"/> EPD verification by individual verifier  Third-party verifier: Ruben Carnerero, IK-ingenieria, Cervantes Hiribidea, 51, Edificio, 10, ES-48970 Basauri, <a href="http://www.ik-ingenieria.com/es/">www.ik-ingenieria.com/es/</a>  <b>signature of the third-party verifier</b>  Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier:  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, 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 EN 15804 and ISO 14025

### Contact information

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<p><b>LCA Author</b></p>	 <p>fair consulting in sustainability          ESU-services Ltd  <a href="https://www.esu-services.ch/">https://www.esu-services.ch/</a>          Address: Rheinstrasse 20, CH-8200 Schaffhausen  <b>Author:</b>          Samuel Solin, Niels Jungbluth  <b>Contact</b>          Email: <a href="mailto:info@esu-services.ch">info@esu-services.ch</a></p>
<p><b>Programme Operator</b></p>	 <p>EPD International AB  <a href="mailto:info@environdec.com">info@environdec.com</a></p>

## Company information

### Description of the organisation:

3A Composites Core Materials is a global organizational unit within the 3A Composites Group, part of Schweiter Technologies (SIX Swiss Exchange: SWTQ). 3A Composites Core Materials is a pioneer and a global leader in sandwich composite technology with more than 80 years of experience. The portfolio consists of high-performing, robust, reliable, yet lightweight and sustainable core materials with the main focus on PET foam and balsa wood.

3A Composites Core Materials demonstrates its best practices through regular external certification and compliance with international golden standards.

### Product-related or management system-related certifications:

ISO 9001:2015  
 ISO 14001:2015  
 ISO 45001:2018

### Name and location of production site(s):

Operations located in Europe (Switzerland, Poland), the USA (NC and KY), China (Shanghai and Changzhou), Ecuador and Papua New Guinea.

## Product information

### Product name:

AIREX® T92.100

### Product identification:

AIREX Foams are available in 60-230 kg/m<sup>3</sup> density range and from 5 mm up to 100 mm thickness.

### Product description:

AIREX® T92.100 is a rigid foam based on PET polymer at nominal density of 100 kg/m<sup>3</sup>. It typically is used as composite sandwich core material in structural lightweight applications.

### Technical information:

Information	Test standard	Unit
Density (kg/m <sup>3</sup> )	ISO 845	100 (range 95 to 105)
Compressive strength perpendicular to the plane (N/mm <sup>2</sup> )	ISO 844 ASTM C365	1.75 (minimum 1.4)
Compressive modulus perpendicular to the plane (N/mm <sup>2</sup> )	ASTM C365	90 (minimum 65)
Tensile strength perpendicular to the plane (N/mm <sup>2</sup> )	ASTM C297	2.3 (minimum 1.5)
Tensile modulus perpendicular to the plane (N/mm <sup>2</sup> )	ASTM C297	110 (minimum 90)
Shear strength (N/mm <sup>2</sup> )	ISO 1922	0.9 (minimum 0.75)
Shear modulus (N/mm <sup>2</sup> )	ISO 1922	26
Parallel to welding lines		23 (minimum 19)
Across welding lines		20 (minimum 10)
Shear elongation at break (%)	ISO 1922	20 (minimum 10)
Thermal conductivity at 10°C (W/m.K)	EN 12667	0.034

Standard sheet (mm)	None	
Width		1220 (±5)
Length		2440 (±5)
Thickness		5 to 100 (±0.5)

UN CPC code:

3639, semi-manufactures of plastics

Other codes for product classification:

customs tariff number 39269000

Geographical scope:

Switzerland

**LCA information**

Declared unit:

1 m<sup>3</sup> of Airex core material with a density of 101.63 kg/m<sup>3</sup>, from cradle-to-gate

Time representativeness:

The reference time for the collection of foreground data applied in this study is the first half year of 2022.

Database(s) and LCA software used:

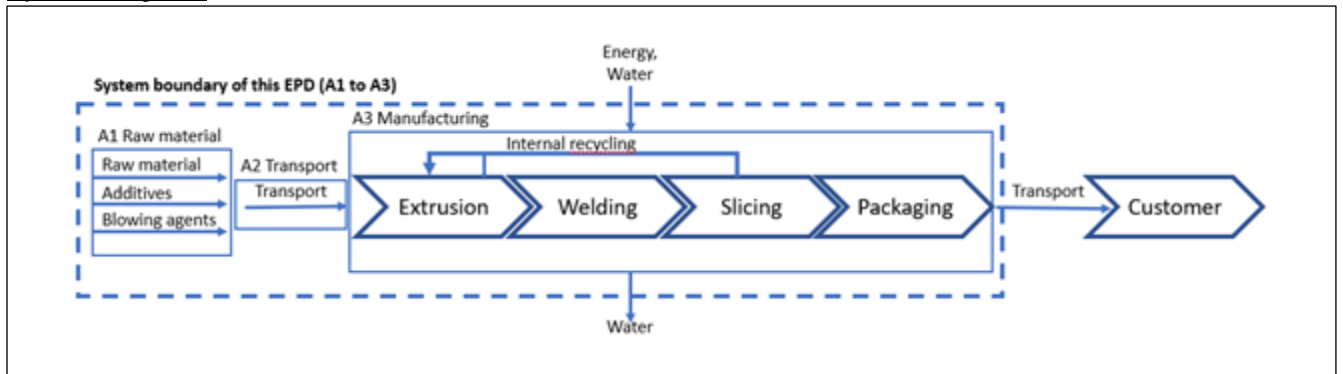
Software: SimaPro 9.4.0.1

Database: Ecoinvent 3.8, system model cut-off

Description of system boundaries:

This study covers the life cycle stages from cradle to gate. That means, that processes from raw material extraction, transportation to the production site and manufacturing of the product are included (Product stages A1 to A3). This study follows the PCR for construction products (type d), since the product doesn't contain biogenic carbon, is no longer identifiable at the end-of-life because of the chemical or physical transformation processes and cannot be separated anymore at their end-of-life. Therefore, the construction process stage (stage A4 and A5), the use stage (module B) and the end-of-life (module C and D) of the product are not included in this LCA.

System diagram:



As per PCR specifications, the following are not included in the system boundary which is not directly consumed by the product:

- Infrastructure of the production process

Assumptions:

For certain additives no datasets were available in ecoinvent. Their overall weight accounts for 2.4% of the overall weight of the core material. For the additives an ecoinvent 2021 proxy dataset was assumed. Blowing agents are used during the production phase. One of them was replaced by a proxy dataset (0.8% of total weight). The direct emissions of the blowing agents into the atmosphere during production was conservatively estimated by Airex AG. Generally, transports were assumed to be performed by Euro 5 class vehicles.

Cut-off rules:

LCI data shall according to EN 15804 include a minimum of 95% of total inflows (mass and energy) per module. In addition, if less than 100% of the inflows are accounted for, proxy data or extrapolation should be used to achieve 100% completeness. Inflows not included in the LCA shall be documented in the EPD.

Data quality

According to PCR 2019 the data quality of primary and secondary data should be assessed. Primary data is defined as process input and output information measured on the production site, while secondary data stem from published source like statistic or databases.

<b>Data Quality</b>	<b>Primary data</b>	<b>Secondary</b>
<b>Time related coverage</b>	Very good: Collected data is from first half year of 2022	Good, all datasets are taken from the latest ecoinvent version published in 2021
<b>Geographical coverage</b>	Very good: Quantities are from the area under study	Good: Datasets representing the conditions in Switzerland and Europe are used. Global datasets were used for the proxy datasets (additives).
<b>Technology coverage</b>	Very good: Processing, transport distances and packaging is known.	
<b>Completeness</b>	Good: All materials and known processing activities are included, for additives proxy datasets were used as described in the PCR.	
<b>Representativeness</b>	The data reflect the conditions defined in the scope of the study as accurate as possible.	
<b>Consistency</b>	The same methodology has been used throughout the study.	
<b>Reproducibility</b>	The results are reproducible with the data provided in this report.	
<b>Data sources</b>	Data collection method is described in the LCI chapter, and all datasets are referenced.	
<b>Data uncertainty</b>	Uncertainty has not been assessed. Uncertainty occurs as described in Assumptions. Next to the use of proxy datasets also emissions from certain raw material inputs were assumed.	

Allocation

In this LCA, only allocation in regard to the hydropower electricity mix had to be applied. Since four different hydropower datasets are used in the Swiss electricity market mix an allocation was assumed as represented in the newest ecoinvent dataset, which was increased to a total hydropower share as presented in the guarantee of origin.

Scenarios

No scenarios were 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			Reuse-Recovery-Recycling-potential
<b>Module</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A4</b>	<b>A5</b>	<b>B1-B7</b>	<b>C1-C4</b>	<b>D</b>
Modules declared	X	X	X	MND	MND	MND	MND	MND
Geography	EU/AS	EU/AS	CH	MND	MND	MND	MND	MND
Variation – products	0%			MND	MND	MND	MND	MND
Variation – sites	0%			MND	MND	MND	MND	MND

Description of the system boundary (X = included in LCA; MND = Module Not Declared)

## Content information

Material	1 m3 AirexT92.100 (in %)	Biogenic material, weight-%
Polymer with possible recycled content	≥ 95%	0%
All other components	≤ 5%	0%
T92.100 density range, kg/m3 (Total)	95-105 kg/m <sup>3</sup>	0%
Packaging material for 1 m <sup>3</sup>	1 m3 AirexT92.100 (in kg)	Weight-% (versus the product, based on average 100 kg/m <sup>3</sup> )
Polymer	0.01 kg	0.0%
Cardboard	1.36 kg	1.4%
Wood(pallets), reused 20 times, weight of one pallet	23 kg	23%

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
No SVHC in product			



## Environmental Information

The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. All results are presented per m<sup>3</sup>.

### Potential environmental impact – mandatory indicators according to EN 15804

Results per declared unit					
Indicator	Unit	A1	A2	A3	Tot.A1-A3
GWP-fossil	kg CO <sub>2</sub> eq.	1.68E+02	2.05E+01	1.09E+01	2.00E+02
GWP-biogenic	kg CO <sub>2</sub> eq.	7.80E+00	1.00E-02	-6.46E-01	7.17E+00
GWP-luluc	kg CO <sub>2</sub> eq.	1.56E-01	1.12E-02	2.93E-02	1.97E-01
GWP-total	kg CO <sub>2</sub> eq.	1.76E+02	2.05E+01	1.03E+01	2.07E+02
ODP	kg CFC 11 eq.	7.55E-04	4.43E-06	9.85E-07	7.60E-04
AP	mol H <sup>+</sup> eq.	6.81E-01	3.45E-01	7.27E-02	1.10E+00
EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	1.38E-02	3.49E-04	5.31E-03	1.94E-02
EP-freshwater	kg P eq.	4.49E-03	1.14E-04	1.73E-03	6.34E-03
EP-marine	kg N eq.	1.29E-01	8.74E-02	3.01E-02	2.47E-01
EP-terrestrial	mol N eq.	1.35E+00	9.70E-01	1.31E-01	2.45E+00
POCP	kg NMVO C eq.	5.11E-01	2.58E-01	3.33E-02	8.02E-01
ADP-minerals&metals*	kg Sb eq.	1.90E-02	5.26E-05	4.87E-04	1.96E-02
ADP-fossil*	MJ	3.94E+03	2.89E+02	4.26E+02	4.65E+03
WDP*	m <sup>3</sup>	8.03E+01	7.32E-01	6.27E+00	8.73E+01
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 mandatory and voluntary indicators

Results per declared unit					
Indicator	Unit	A1	A2	A3	Tot.A1-A3
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	1.63E+02	2.04E+01	1.10E+01	1.95E+02

## Use of resources

Results per declared unit					
Indicator	Unit	A1	A2	A3	Tot.A1-A3
PERE	MJ	1.84E+02	4.82E+00	4.18E+02	6.06E+02
PERM	MJ	0.00E+00	0.00E+00	3.40E+01	3.40E+01
PERT	MJ	1.84E+02	4.82E+00	4.52E+02	6.40E+02
PENRE	MJ	1.96E+03	3.07E+02	4.32E+02	2.70E+03
PENRM	MJ.	2.27E+03	0.00E+00	2.22E-01	2.27E+03
PENRT	MJ	4.23E+03	3.07E+02	4.32E+02	4.97E+03
SM	kg	4.04E+01	0.00E+00	0.00E+00	4.04E+01
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	2.63E-01	6.32E-03	8.29E-02	3.53E-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				

<sup>1</sup> The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Waste production and output flows

As mainly ecoinvent datasets were used, which include the waste treatment in their system boundaries, and the EPD only includes the assessment from cradle-to-gate, in which the PET is internally recycled, the waste production indicators do not include any final waste flows. All results are presented per m<sup>3</sup>.

### Waste production

Results per declared unit					
Indicator	Unit	A1	A2	A3	Tot.A1-A3
Hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### Output flows

Results per declared unit					
Indicator	Unit	A1	A2	A3	Tot.A1-A3
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	3.51E+01	3.51E+01
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### Information on biogenic carbon content

Results per declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in packaging	kg C	1.12E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>.

## References

CEN. (2021). Sustainability of product works - Environmental Product declarations - Core rules for the product category of construction products. Brussels: European Committee for Standardization (CEN).

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Samuel Solin; Niels Jungbluth (2022) Environmental product declaration for Airex core material. ESU-services Ltd. commissioned by Airex AG, Switzerland.

