



# ENVIRONMENTAL PRODUCT DECLARATION



# ALUTHERMO QUATTRO

Programme:  
Programme operator:  
EPD registration number:  
Publication date:  
Valid until:


The International EPD® System, [www.environdec.com](http://www.environdec.com)  
EPD International AB  
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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
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): <i>PCR 2019:14 Construction Products, version 1.0; C-PCR-005 Thermal insulation products (EN 16783:2017)</i>
PCR review was conducted by: <i>The Technical Committee of the International EPD® System. See <a href="http://www.environdec.com/TC">www.environdec.com/TC</a> for a list of members. Review chair: Claudia A Pena, Univerity of Concepcion, Chile. The review panel may be contacted via <a href="mailto:info@environdec.com">info@environdec.com</a>.</i>
Independent third-party verification of the declaration and data, according to ISO 14025:2006:  <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: <i>Certiquality S.r.l. Via G. Giardino, 4 - 20123 Milano E-mail: <a href="mailto:certiquality@certiquality.it">certiquality@certiquality.it</a></i>  Accredited by: <i>CERTIQUALITY srl, Via G.Gardino n.4, Milano , Accredited by: ACCREDIA, n°003Hrev.15</i>
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 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: Aluthermo s.a./n.v.

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Description of the organisation: Aluthermo SA is a Belgian company created in 1999 and specialized in the production of insulators for thermal insulation. In 2004 a European patent was issued for Aluthermo Quattro®. Its production was the result of several years of research conducted within the company and developed in close collaboration with the scientific world. Since then, it has remained the only thin multilayer insulation system with pure aluminum and all surfaces thermally welded together. Over the years the company has also expanded through export and today Aluthermo® is distributed in over 20 mostly European countries.

Since their beginning, Aluthermo products have attracted the interest of other sectors than construction, such as the pharmaceutical, transport and automobile industries, due to its highly efficient thermal insulation characteristics in combination with a limited thickness

Over the years the company has also expanded through exportation. Today Aluthermo® is distributed in more than 20 countries.

Name and location of production site: Aluthermo QUATTRO ® is produced in Anzegem (Belgium).

## Product information

Product name: Aluthermo QUATTRO®

Product description: Aluthermo QUATTRO® is a semi-rigid complex composed of the following successive layers:

- a film of pure aluminium, 30 microns thick, treated against oxidation
- a layer of bubbles of dry air enclosed in self-extinguishing polyethylene
- a film of pure aluminium treated against oxidation
- a foam of fire-retarding and waterproofed polyethylene
- a film of pure aluminium treated against oxidation
- a layer of bubbles of dry air enclosed in self-extinguishing polyethylene
- a film of pure aluminium, 30 microns thick, treated against oxidation

The air trapped in the bubble film and polyethylene foam is dry and stable. Aluthermo QUATTRO® provides very efficient thermal insulation in combination with limited thickness. Its exceptional properties of flexibility make placement very easy.

Aluthermo QUATTRO® can therefore be used in practically all imaginable thermal insulation areas, such as on the roof from the outside, on the roof from the inside, on the walls as cladding, on the walls from the inside, for floors.

UN CPC code: 3633 Plates, sheets, film, foil and strip, of plastics, not self-adhesive, non-cellular and not reinforced, laminated, supported or similarly combined with other materials.

## LCA information

Functional unit / declared unit: 1 m<sup>2</sup> of thermal insulation product (including packaging)

Reference service life: The RSL or durability of AluthermoQUATTRO® is as long as the lifetime of the building equipment in which it is used.

Time representativeness: The reference year is 2019.

Geographical scope: Europe.

Database(s) and LCA software used: Ecoinvent 3.6 and SimPro 9.1

Description of system boundaries: Cradle to gate with modules C1–C4 and module D

The product stages include:

- A1 Extraction and processing of raw materials (e.g. mining processes);
- A1 Generation of electricity, steam and heat from primary resources, also including their extraction, refining and transport;
- A2 Transportation up to the factory gate and internal transport;
- A3 Production of ancillary materials or pre-products;
- A3 Manufacturing of products and co-products;
- A3 Manufacturing of packaging;
- A3 Processing up to the end-of-waste state or disposal of final residues;
- C1 De-construction, demolition;
- C2 Transport to waste processing;
- C3 Waste processing for reuse, recovery and/or recycling;
- C4 Disposal.

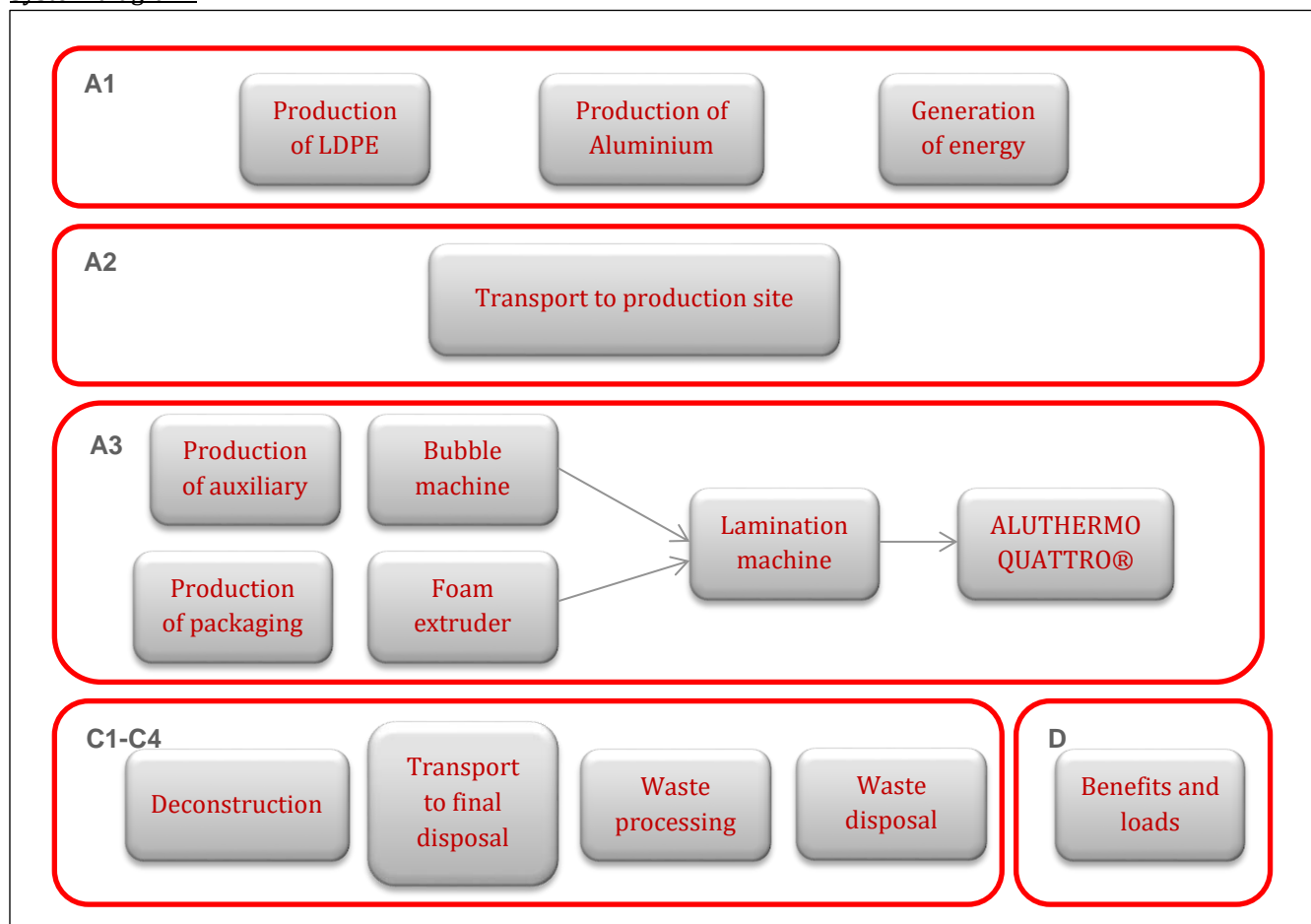
Module D includes reuse, recovery and/or recycling potentials, expressed as net impacts and benefits.

As there are no possibilities to separate the insulation product, phase C1 (de-construction and demolition) is irrelevant; moreover, the product is only disposed, so phase C3 (waste treatment for reuse, recovery and / or recycling) is equal to zero. The result of phase D is also equal to zero, because there are no benefits deriving from the end of life.

#### Technical characteristics:

Description	Value	Reference
Weight (g/m <sup>2</sup> )	750	-
Thickness (mm)	10	-
Average density (Kg/m <sup>3</sup> )	75	-
Core Thermal resistance (m <sup>2</sup> *K)/ W	0.279	EN 12667
Emissivity of the outer faces	0.05	EN 16012
Thermal resistance installed between 2 air gaps in horizontal heat flux ((m <sup>2</sup> *K)/ W)	1.579	EN 16012
Equivalent thermal performance ((m <sup>2</sup> *K)/ W)	up to 5.7	WLK report
Fire	Euroclasse B-s1-d0	EN 13501-1
Operating limits (°C)	da -55 a +80	
Water vapour resistance ((m <sup>2</sup> *s*Pa)/kg)	> 33000 (+- 7000)	EN 13984
Permissible load with 10% deformation (kg/m <sup>2</sup> )	543	EN 826
Bursting resistance (kg/m <sup>2</sup> )	2423	EN 826
Attenuation of impact noise ΔLw (dB)	22	EN ISO 140-6

#### System diagram:



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	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	BE, IT	EU	BE	-	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data	<90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

Data quality:

Site-specific production data has been retrieved for 2019 from the production sites. The upstream and downstream processes have been modelled based on data from Ecoinvent 3.6 database. The contribution of generic data on the final results is less than 1% for each impact category. Packaging of raw materials and auxiliaries, methane consumption for heating, infrastructure and business travel are excluded.

Other information:

All raw materials for the manufacturing of the declared product, the required energy, water consumption and the resulting emissions are considered into the LCA.

The climate impact of the electricity in Belgium is 249 g CO<sub>2</sub> eq./kWh (residual mix from Association of Issuing Bodies, European Residual Mixes 2019, Version 1.0, 2020-05-29).

More information:

[www.aluthermo.com](http://www.aluthermo.com)

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## Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Polyethylene	0.525	0%	0%
Aluminium	0.213	100%	0%
Other	0.012	0%	0%
<b>TOTAL</b>	<b>0.750</b>	<b>28.4%</b>	<b>0%</b>
Packaging materials	Weight, kg	Weight-% (versus the product)	
Polyethylene film	0.015	2%	
<b>TOTAL</b>	<b>0.015</b>	<b>2%</b>	

Aluthermo QUATTRO not contains substances that are listed in the “Candidate List of Substances of Very High Concern for authorisation” in concentrations greater than 0,1%.

## Environmental Information

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

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO <sub>2</sub> eq.	1.77E+00	5.78E-02	7.35E-02	1.90E+00	0.00E+00	5.18E-03	0.00E+00	7.98E-02	0.00E+00
GWP-biogenic	kg CO <sub>2</sub> eq.	1.31E-02	2.37E-05	-9.55E-04	1.21E-02	0.00E+00	2.12E-06	0.00E+00	5.92E-04	0.00E+00
GWP-luluc	kg CO <sub>2</sub> eq.	9.86E-04	4.58E-07	3.69E-05	1.02E-03	0.00E+00	4.10E-08	0.00E+00	2.69E-06	0.00E+00
GWP-total	kg CO <sub>2</sub> eq.	1.78E+00	5.79E-02	7.26E-02	1.91E+00	0.00E+00	5.18E-03	0.00E+00	8.04E-02	0.00E+00
ODP	kg CFC 11 eq.	9.32E-08	1.34E-08	3.07E-09	1.10E-07	0.00E+00	1.20E-09	0.00E+00	8.85E-10	0.00E+00
AP	mol H <sup>+</sup> eq.	7.21E-03	2.00E-04	2.85E-04	7.70E-03	0.00E+00	1.79E-05	0.00E+00	4.76E-05	0.00E+00
EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq.	5.58E-04	2.90E-07	1.45E-05	5.73E-04	0.00E+00	2.60E-08	0.00E+00	1.41E-06	0.00E+00
EP-marine	kg N eq.	1.23E-03	6.43E-05	5.52E-05	1.35E-03	0.00E+00	5.76E-06	0.00E+00	2.60E-04	0.00E+00
EP-terrestrial	mol N eq.	1.30E-02	7.07E-04	5.63E-04	1.43E-02	0.00E+00	6.33E-05	0.00E+00	2.00E-04	0.00E+00
POCP	kg NMVOC eq.	6.36E-03	1.93E-04	5.19E-04	7.07E-03	0.00E+00	1.73E-05	0.00E+00	7.30E-05	0.00E+00
ADP-minerals&metals*	kg Sb eq.	1.05E-05	3.41E-09	5.21E-08	1.06E-05	0.00E+00	3.05E-10	0.00E+00	2.89E-09	0.00E+00
ADP-fossil*	MJ	5.17E+01	8.19E-01	1.89E+00	5.45E+01	0.00E+00	7.34E-02	0.00E+00	8.01E-02	0.00E+00
WDP	m <sup>3</sup>	1.52E+00	-1.80E-04	9.86E-02	1.62E+00	0.00E+00	-1.62E-05	0.00E+00	3.09E-04	0.00E+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									

\* 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

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG <sup>1</sup>	kg CO <sub>2</sub> eq.	1.77E+00	5.78E-02	7.36E-02	1.90E+00	0.00E+00	5.18E-03	0.00E+00	7.98E-02	0.00E+00

## Use of resources

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	5.53E+01	8.70E-01	2.03E+00	5.82E+01	0.00E+00	7.79E-02	0.00E+00	8.47E-02	0.00E+00
PERM	MJ	3.89E-03	2.36E-06	2.97E-04	4.19E-03	0.00E+00	2.11E-07	0.00E+00	3.70E-05	0.00E+00
PERT	MJ	5.53E+01	8.70E-01	2.03E+00	5.82E+01	0.00E+00	7.79E-02	0.00E+00	8.48E-02	0.00E+00
PENRE	MJ	1.90E+00	1.15E-03	6.94E-02	1.97E+00	0.00E+00	1.03E-04	0.00E+00	7.46E-03	0.00E+00
PENRM	MJ.	6.84E-01	3.21E-04	3.85E-02	7.23E-01	0.00E+00	2.87E-05	0.00E+00	1.45E-03	0.00E+00
PENRT	MJ	2.58E+00	1.47E-03	1.08E-01	2.69E+00	0.00E+00	1.31E-04	0.00E+00	8.91E-03	0.00E+00
SM	kg	2.13E-01	0.00E+00	0.00E+00	2.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	2.68E-02	1.23E-06	2.37E-03	2.92E-02	0.00E+00	1.10E-07	0.00E+00	3.51E-05	0.00E+00

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 equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

## Waste production and output flows

### Waste production

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	7.78E-03	3.65E-05	1.70E-04	7.99E-03	0.00E+00	3.27E-06	0.00E+00	2.10E-05	0.00E+00
Non-hazardous waste disposed	kg	2.07E-02	2.50E-05	1.00E-03	2.18E-02	0.00E+00	2.24E-06	0.00E+00	7.66E-01	0.00E+00
Radioactive waste disposed	kg	8.72E-05	5.94E-06	1.51E-06	9.47E-05	0.00E+00	5.32E-07	0.00E+00	5.33E-07	0.00E+00

### Output flows

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0

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

## Differences versus previous versions

This is the first version of EPD.

## References

General Programme Instructions of the International EPD® System. Version 3.01.

PCR 2019:14 Construction products; version 1.0 valid until 2024.12.20

C-PCR-005 Thermal insulation products

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

EN 16783:2017 Thermal insulation products – Product category rules (PCR) for factory made and in –situ formed products for preparing environmental product declarations

ISO 14040:2006 Environmental management – Life cycle assessment - Principles and Framework

ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and provides guidelines for life cycle assessment (LCA)

Association of Issuing Bodies, European Residual Mixes 2019, Version 1.0, 2020-05-29

LCA study report of Aluthermo QUATTRO®, rev00 2020-06-22

