Type III Environmental Product Declaration No. 885/2025

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ArmaComfort® AB AL PUR

Owner of the EPD:

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Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

Life cycle analysis (LCA): A1-A5. C1-C4, D in accordance with EN 15804+A2 (Cradle-to-Gate)
The year of preparing the EPD: 2025
Product standard: EN 14304
Service Life: N/A
PCR: ITB-PCR A
Declared unit: 1 m^2 (4 kg/m^2)
Reasons for performing LCA: B2B
Representativeness: Italy, European, 2024

MANUFACTURER

Armacell Italia S.r.l. is the Italian subsidiary of Armacell International S.A., a global leader in flexible foam insulation and engineered foam solutions. As part of the Armacell Group, Armacell Italia contributes to the development and distribution of high-performance thermal and acoustic insulation materials for technical equipment. The company's product portfolio includes noise-control materials, which are integral to various industries such as construction, transportation (automotive, marine, rail, truck, ...) and light industry. In 2018, Armacell Italia expanded its capabilities by acquiring Guarto S.r.l., an Italian manufacturer specializing in non-flammable thermoplastic acoustic insulation products. This acquisition enhanced Armacell's presence in Italy and strengthened its position in the growing acoustic insulation market. Leini, Italy, is home to a key Armacell manufacturing plant, a leading global producer of flexible foam insulation and engineered foams for energy efficiency, with this specific facility recognized for sustainability achievements like receiving a silver medal in sustainability assessments. Armacell specializes in technical insulation for HVAC, plumbing, and industrial needs, offering solutions for energy savings, fire protection, and acoustic insulation, with their Leini site contributing to their overall mission of enhancing energy efficiency.

PRODUCTS DESCRIPTION

ArmaComfort multilayered product covered by this EPD (ArmaComfort AB AL PUR) is designed to mitigate noise from technical equipment in buildings, industrial environments, vehicles, and marine vessels. Armacell offers a complete range of acoustic insulation products with superior sound reduction qualities. ArmaComfort® AB range combines thin acoustic multilayer solutions with flexible acoustic barriers and different damping or insulation materials in one product with fire performance. These easy-to-install noise control solutions are especially suitable for insulating sanitary wastewater and rainwater pipes, and also fan coil and duct lagging.

ArmaComfort AB AL PUR:
Multi-layer acoustic insulation material consisting of an aluminum covered EPM-EVA barrier of 2 mm thickness and 4 kg/m² of weight and a decoupling polyurethane foam of 10 mm thickness. Euroclass of this acoustic multilayer: B-s1, d0

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 m^2 of ArmaComfort AB AL PUR.

System boundary

The life cycle analysis (LCA) of the declared products covers: product stage – modules A1-A5, end of life – modules C1-C4 and benefits and loads beyond the system boundary – module D (cradle-to-gate with options) in accordance with EN 15804+A2 and ITB PCR A . Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculations. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

Allocation

The allocation rules used for this EPD are based on general ITB's document PCR A (EN 15804+A2). Input and output data from the production is inventoried and allocated to the production on the mass basis. The declared product's recipes were used for the calculations, based on specific substances included in the production.

System limits

All materials and energy consumption inventoried in factory were included in calculation. Office impacts were not taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements.

Modules A1 and A2: *Raw materials supply and transport*

Typically, the products covered by this EPD contain the following base materials and auxiliaries: Polyolefin, Rubber EVA, Rubber SBR, ATH, Calcium carbonate, Barium sulphate, processing aids, technical layers – aluminium, PUR Foams. Raw materials come from local and international suppliers. Data on transport of the different products to the manufacturing plant is collected and modelled for factory by assessor. Means of transport include trucks - European fuel averages are applied. More detailed information is available in the respective manufacturer's documentation (e.g. product data sheets). All transport distances inventoried for the reference year were used.

Module A3: *Production*

The production takes place in stages. In the stages (mixing and compounding, granulation, extrusion and bonding, cut and packing) as presented in Figure 1. Afterwards ready-to-use product is prepared for transport to Customer. In the process electricity is used.

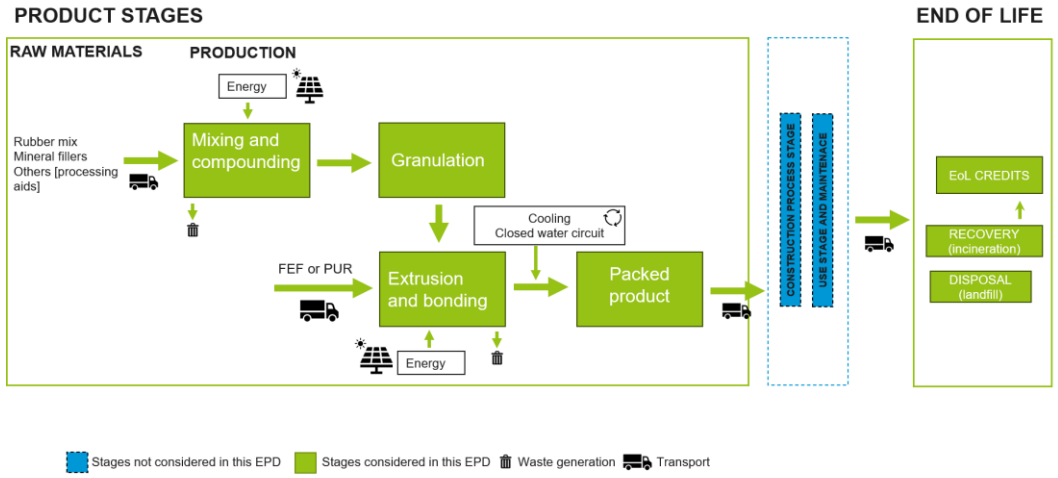

Figure 1. Manufacturing process scheme

A4: Transport

ArmaComfort AB products are delivered to European construction sites. An average distance of 750 km from the factory gate to a construction site was assumed. Means of transport include 24t loaded lorry with 100% capacity utilization and fuel consumption of 35 L per 100 km (EURO 6).

A5: Construction-installation process

Considered environmental burdens are associated with the use of ancillary materials such as a cleaning agent. an adhesive and hand tools recommended by Producer (see the producer's manual). Generation of off-cuts amounting to 0.5% of the product is assumed.

C1-C4: End of Life

At the end-of-life ArmaComfort AB products are deconstructed with the use of electrical tools C1. It is assumed that 98% of the product is recovered (Table 1), of which 30% undergo recycling. 30% is subjected to thermal utilization while the remaining material is forwarded to landfill in the form of mixed construction and demolition wastes. In module C2 transport distance of 75 km on 16 t loaded lorry with 100% capacity utilization and fuel consumption of 25 L per 100 km is considered (Euro 5). Environmental burdens declared in module C4 are associated with waste-specific emissions to air and groundwater via landfill gas incineration and landfill leachate. Benefits resulting from the recycling of the mechanical recycling and thermal energy production (alternative for fuel oil) are included in module D. Aluminium recycling is also considered. The caloric value of 6 MJ/kg has been adopted.

Table 1. End-of-life scenario for the ArmaComfort AB products

Material	Material recovery	Recycling	Energy recovery	Landfilling
Waste materials	98%	30%	30%	40%

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2024 – 31.12.2024 (1 year). The life cycle assessments were prepared for Italy and Europe as reference area.

Data quality

The data selected for LCA originate from ITB-LCI questionnaires completed by Armacell and verified during data audit. No data collected is older than five years and no generic datasets used are older

than ten years. The representativeness, completeness, reliability, and consistency is judged as very good. The background data for the processes come from the following resources database Ecoinvent v.3.11. Specific (LCI) data quality analysis was a part of the input data verification.

Assumptions and estimates

The impacts of the representative products were aggregated using weighted average. The compositions for the external products were averaged on the basis of recipes.

Calculation rules

LCA was performed using ITB-LCA tool developed in accordance with EN15804+A2. Emission of greenhouse gases was calculated using the IPCC GWP method with a 100-year horizon. Emission of acidifying substances, emission of substances to water contributing to oxygen depletion, emission of gases that contribute to the creation of ground-level ozone, abiotic depletion, and ozone depletion emissions where all calculated with the EF 3.1 method. No mass balance method used. No biogenic content in material.

Additional information

Italian electricity (Ecoinvent v 3.11) emission factor used is 0.385 kg CO_2/kWh and 0.1 kg CO_2/kWh for renewable electricity used local PV based. As a general rule, no particular environmental or health protection measures other than those specified by law are necessary. The time related quality of the data used is valid (5 years). No mass balance approach was used. Product doesn't contain biogenic carbon more than 5%. Products do not contain CFCs, HCFCs.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 m^2 of ArmaComfort AB product manufactured in Italy. The following life cycle modules (Table 2) were included in the analysis. The following Tables show the environmental impacts of the life cycle of selected modules (A1-A5, C1-C4, D) for specific product types.

Table 2. System boundaries for the environmental characteristic of the product.

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MD	MD	MND	MND	MND	MND	MND	MND	MND	MD	MD	MD	MD	MD

Table 3. Life cycle assessment (LCA) results for specific product ArmaComfort AB AL PUR – environmental impacts (DU: 1 m^2)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	4.31E+00	2.43E-01	6.86E-01	5.24E+00	5.01E-01	2.74E-02	1.10E-02	3.34E-02	2.45E+00	1.58E-01	-1.35E+00
Greenhouse potential - fossil	eq. kg CO_2	4.32E+00	2.43E-01	6.54E-01	5.22E+00	4.99E-01	2.74E-02	1.10E-02	3.32E-02	2.34E+00	1.58E-01	-1.27E+00
Greenhouse potential - biogenic	eq. kg CO_2	-2.66E-02	1.60E-04	3.22E-02	5.69E-03	1.70E-03	7.39E-05	2.95E-05	1.14E-04	1.05E-01	1.13E-04	-7.90E-02
Global warming potential - land use and land use change	eq. kg CO_2	2.91E-03	8.09E-05	1.74E-04	3.16E-03	1.96E-04	4.28E-06	1.71E-06	1.30E-05	7.60E-04	8.46E-06	-1.07E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.09E-07	4.83E-09	1.86E-08	1.33E-07	1.15E-07	1.51E-10	6.03E-11	7.69E-09	3.12E+00	3.82E-10	-2.68E-08
Soil and water acidification potential	eq. mol H+	2.06E-02	5.06E-04	2.33E-03	2.34E-02	2.02E-03	2.90E-04	1.16E-04	1.35E-04	4.08E-02	1.05E-04	-3.94E-03
Eutrophication potential - freshwater	eq. kg P	1.01E-03	1.65E-05	1.70E-04	1.20E-03	3.35E-05	4.72E-05	1.89E-05	2.23E-06	2.25E-04	1.58E-06	-2.48E-04
Eutrophication potential - seawater	eq. kg N	4.12E-03	1.22E-04	4.25E-04	4.67E-03	6.11E-04	4.10E-05	1.64E-05	4.07E-05	2.70E-02	3.49E-04	-8.81E-04
Eutrophication potential - terrestrial	eq. mol N	3.97E-02	1.31E-03	4.45E-03	4.54E-02	6.66E-03	3.58E-04	1.43E-04	4.44E-04	2.29E-01	4.29E-04	-8.21E-03
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.72E-02	8.42E-04	1.79E-03	1.98E-02	2.04E-03	1.03E-04	4.12E-05	1.36E-04	5.50E-02	1.86E-04	-2.23E-03
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	3.63E-05	8.09E-07	3.77E-06	4.09E-05	1.77E-06	1.03E-08	4.13E-09	1.18E-07	3.97E-06	3.33E-08	-4.26E-06
Abiotic depletion potential - fossil fuels	MJ	8.26E+01	3.42E+00	1.11E+01	9.71E+01	7.40E+00	4.33E-01	1.73E-01	4.93E-01	7.32E+00	3.28E-01	-1.85E+01
Water deprivation potential	eq. m^3	1.45E+00	1.67E-02	4.17E-01	1.88E+00	3.42E-02	8.27E-03	3.31E-03	2.28E-03	1.82E-01	1.56E-03	-1.96E-01

Table 4. Life cycle assessment (LCA) results for specific product ArmaComfort AB AL PUR– additional impacts indicators (DU: 1 m^2)

Indicator	Unit	A1-A3	A4-A5	C1-C4	D
Particulate matter	disease incidence	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA

Table 5. Life cycle assessment (LCA) results for specific product ArmaComfort AB AL PUR - the resource use (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	5.29E+00	5.87E-02	5.57E+00	1.09E+01	1.06E-01	3.56E-02	1.42E-02	7.08E-03	1.43E+00	4.92E-03	1.57E+00
Consumption of renewable primary energy resources used as raw materials	MJ	3.62E-01	0.00E+00	0.00E+00	3.62E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	5.65E+00	5.87E-02	5.57E+00	1.13E+01	1.06E-01	3.56E-02	1.42E-02	7.08E-03	1.43E+00	4.92E-03	1.57E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	6.31E+01	3.42E+00	1.09E+01	7.74E+01	7.40E+00	4.33E-01	1.73E-01	4.93E-01	4.76E+01	-5.14E+01	6.75E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	2.22E+01	0.00E+00	2.15E-01	2.24E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.12E+01	5.17E+01	4.90E+01
Total consumption of non-renewable primary energy resources	MJ	8.53E+01	3.42E+00	1.11E+01	9.98E+01	7.40E+00	4.33E-01	1.73E-01	4.93E-01	7.32E+00	3.29E-01	1.85E+01
Consumption of secondary materials	kg	9.80E-02	1.59E-03	2.37E-03	1.02E-01	2.48E-03	3.76E-05	1.50E-05	1.65E-04	1.40E+00	1.19E-04	1.40E+00
Consumption of renew. secondary fuels	MJ	1.03E-02	2.01E-05	4.16E-05	1.04E-02	2.73E-05	1.90E-07	7.60E-08	1.82E-06	1.49E-06	2.22E-06	4.46E-06
Consumption of non-renewable secondary fuels	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	4.84E-05	0.00E+00	6.94E-05
Net consumption of freshwater	m^3	3.83E-02	4.60E-04	9.38E-03	4.82E-02	9.31E-04	1.24E-03	4.97E-04	6.21E-05	4.95E-03	-4.88E-03	5.59E-03

Table 6. Life cycle assessment (LCA) results for specific product ArmaComfort AB AL PUR – waste categories and output flows (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	9.72E-01	4.99E-03	2.01E-02	9.97E-01	8.31E-03	3.35E-03	1.34E-03	5.54E-04	2.09E-02	5.81E-04	2.74E-02
Non-hazardous waste	kg	6.63E+00	1.05E-01	8.41E-01	7.57E+00	1.47E-01	2.26E-01	9.04E-02	9.83E-03	1.82E+00	6.56E+00	1.84E+00
Radioactive waste	kg	1.77E-02	1.10E-06	1.87E-05	1.77E-02	5.53E-07	6.49E-08	2.60E-08	3.68E-08	2.94E-05	8.11E-08	3.37E-05
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	0.00E+00	0.00E+00
Materials for recycling	kg	1.31E-03	2.60E-05	1.39E-03	2.73E-03	2.29E-05	2.90E-06	1.16E-06	1.53E-06	1.11E-03	5.55E-06	1.13E-03
Materials for energy recovery	kg	2.71E-06	2.20E-07	2.04E-07	3.14E-06	1.85E-07	4.67E-09	1.87E-09	1.24E-08	2.50E-07	2.27E-08	3.18E-07
Exported Energy	MJ	5.71E-02	1.44E-03	2.34E-03	6.09E-02	0.00E+00	1.38E-03	5.54E-04	0.00E+00	2.69E-01	6.92E-05	2.33E-02

Verification

The process of verification of this EPD is in accordance with ISO 14025. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804+A2 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.1.3.) [x] external [ ] internal
External verification of EPD: Halina Prejzner, PhD. Eng. LCI audit and verification: Filip Poznański, M.Sc. Eng. LCA, LCI audit and input data verification: Michał Piasecki, PhD., D.Sc., Eng.

Note 1: The declaration owner has the sole ownership, liability, and responsibility for the information provided and contained in EPD. Declarations of construction products may not be comparable if they do not comply with EN 15804+A2. For further information about comparability, see EN 15804+A2 and ISO 14025.

Note 2: ITB is a public Research Organization and Notified Body (EC Reg. no 1488) to the European Commission and to other Member States of the European Union designated for the tasks concerning the assessment of building products' performance. ITB acts as the independent, third-party verification organization (ISO 17025/17065/17029). ITB-EPD program is recognized and registered member of The European Platform - Association of EPD program operators and ITB-EPD declarations are registered and stored in the international ECO-PORTAL.

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- EN 14304:2015 Thermal insulation products for building equipment and industrial installations - Factory made flexible elastomeric foam (PEF) products - Specification
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- https://ecoinvent.org/

LCA, LCI audit and input data verification
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CERTIFICATE № 885/2025
of TYPE III ENVIRONMENTAL DECLARATION

Products:

ArmaComfort® AB AL PUR

Manufacturer:

Armacell Poland Sp. z o.o.
Targowa 2, 55-300 Środa Śląska, Poland

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

EN 15804+A2

Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

This certificate, issued on 18th December 2025 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics and Environment Department
Agnieszka Winkler-Skalna, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, December 2025