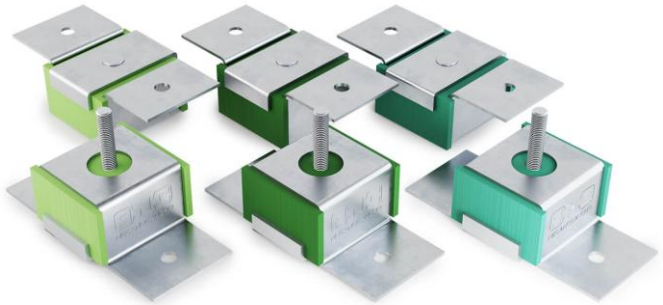
ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804:2012+A2:2019/AC:2021

Akustik+Sylomer®
APLICACIONES MECANICAS DEL CAUCHO SA



EPD HUB, EPD number HUB-4240
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Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.1 (05 December 2023) and JRC characterization factors EF 3.1.

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GENERAL INFORMATION

MANUFACTURER

Manufacturer	APLICACIONES MECANICAS DEL CAUCHO SA
Address	Polígono Industrial, Zona A, Parcela 35, 20159, Asteasu (Guipúzcoa). Spain
Contact details	Adelgado@amcsa.es
Website	https://www.mecanocaucho.com/es-ES/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Irene Pelegrín Carballo - Bureau Veritas Inspection and Testing
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Sergio Ballen Zamora, as an authorised verifier acting for EPD Hub Limited

PRODUCT

Product name	Akustik+Sylomer®
Additional labels	-
Product reference	-
Place(s) of raw material origin	Spain, Austria
Place of production	Asteasu, Guipuzkoa, Spain
Place(s) of installation and use	-
Period for data	2024
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	44,7

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of Akustik+Sylomer® The declared unit for the Akustik+Sylomer® product range of acoustic hangers is one complete unit rather than 1 kg. This deviation is justified because the product is designed to function as an individual acoustic hanger, and its performance and environmental impact are best evaluated on a per-unit basis. Declaring the unit by weight would not accurately reflect its real-world application or the way it is sold and installed. The environmental impact assessment for this product is conducted based on one functional unit, ensuring that the declared unit provides a meaningful and accurate representation of its environmental performance.
Declared unit mass	0,152 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	5,23E-01
GWP-total, A1-A3 ($kgCO_2e$)	4,86E-01
Secondary material, inputs (%)	31,5
Secondary material, outputs (%)	73,6
Total energy use, A1-A3 (kWh)	2,88
Net freshwater use, A1-A3 (m^3)	0

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

AMC Mecanocaucho, officially known as Aplicaciones Metálicas del Caucho S.A., is a Spanish company established in 1969.With over five decades of experience, AMC specializes in designing and manufacturing anti-vibration mounts and noise insulation composites for various sectors, including industrial machinery, construction, and transportation. Their product range encompasses solutions combining rubber, metal, springs, and Sylomer - a microcellular polyurethane material renowned for its vibration isolation properties.

PRODUCT DESCRIPTION

The declared product is an anti-vibration mount manufactured by AMC MecanoCaucho. Each unit has a declared mass of 0.152 kg and consists of:

- Sylomer® polymer (polyurethane-based elastomer), supplied in sheet form and cut to the required dimensions.
- Low-alloyed hot-rolled steel inserts, delivered pre-shaped to final dimensions by local suppliers.

The product is assembled by mechanically combining the polymer and steel parts. The references included are: Akustik 1 Lateral + Sylomer; Akustik 1 Low + Sylomer; Akustik 1 Nonius + Sylomer; Akustik 1 + Sylomer; Akustik 3 High + Sylomer; Akustik 3 + Sylomer; Akustik 4 High + Sylomer; Akustik 4 + Sylomer; Akustik GB Nonius + Sylomer; Akustik GB + Sylomer; Akustik Lateral Nonius + Sylomer; Akustik Rapid + Sylomer; Akustik Saw + Sylomer; Akustik Sierra + Sylomer; Akustik Super T + Sylomer; Akustik Super + Sylomer; Akustik T + Sylomer; EP.

No adhesives, coatings, primers, or ancillary materials are used in the production process. The function of the product is to provide vibration and noise isolation when installed in ceilings, walls, or machinery structures. Installation is performed mechanically using screws, without the need for additional materials.

Further information can be found at:
https://www.mecanocaucho.com/es-ES/

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	83,56	Spain
Minerals	-	-
Fossil materials	16,44	Austria
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of Akustik+Sylomer®
Mass per declared unit	0,152 kg
Functional unit	1 unit
Reference service life	50

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = ND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

A1 - Raw material extraction and processing

a) Processes covered

Module A1 includes the extraction and processing of all raw and packaging materials used in the declared unit. The product consists of:

- Sylomer® polymer (microcellular polyurethane), supplied from Austria.
- Steel inserts (low-alloyed, hot-rolled), supplied from Gipuzkoa, Spain.
- Packaging materials: corrugated cardboard box (primary packaging), LDPE stretch film (secondary packaging for shipments over four boxes), and EUR-flat wooden pallets (secondary packaging).
- - No adhesives, coatings, ancillary materials or other components are used in the production of the declared unit.

b-i) System boundary to nature

The system boundary extends from the extraction of natural resources to the point where materials enter the technosphere:

- Polymer: crude oil extraction and chemical transformation into polyols and isocyanates, production of microcellular polyurethane.
- Steel: extraction of iron ore, alloying elements, and hot rolling into the required dimensions.
- Packaging: forestry operations for pulp and paper used in corrugated cardboard, crude oil extraction and polymerisation for LDPE film, and timber harvesting for wooden pallets.

Emissions to air, water, and soil during these upstream processes are included via Ecoinvent datasets.

b-ii) Use of secondary materials, secondary fuels, and waste

- Secondary materials: No recycled or secondary material content is declared by suppliers for Sylomer, steel, or packaging; therefore, recycled content is considered 0%.
- Secondary fuels: None are used. All fuels in A1 are those inherent to upstream processes and included in background datasets. Waste produced: No direct waste is generated at AMC in A1. Upstream wastes (e.g., slag from steelmaking, offcuts from polymer production,

wood residues from pallet production) are accounted for within the datasets.

b-iii) Material losses in production
No material losses occur at the raw material supply stage. Materials are delivered to AMC in the exact dimensions and specifications required, and are fully used in the manufacturing stage (A3).

A2 – Transport to factory gate
a) Processes covered
Module A2 covers the transport of raw and packaging materials to the AMC plant in Asteasu (Gipuzkoa, Spain):
Sylomer polymer: 1,376 km by 16–32 t Euro 5 diesel lorry from Austria.
Steel inserts: 22 km by 16–32 t Euro 5 diesel lorry within Gipuzkoa.
Packaging materials: assumed to be regionally sourced within Spain, with default transport distances applied according to the PCR.

b-i) System boundary to nature
Includes extraction of crude oil, refining and distribution of diesel fuel, and combustion in Euro 5 trucks. Road infrastructure impacts and tailpipe emissions are included in the transport datasets.

b-ii) Use of secondary materials, secondary fuels, and waste
Secondary materials: not applicable to transport.
Secondary fuels: not used; all fuel is conventional diesel.
Waste produced: no waste is generated during transport.

b-iii) Material losses in production
No material losses occur during transport. All material dispatched from suppliers is delivered to the factory gate.

Additional transport: Internal transportation is negligible and has not been modelled as a separate process.
Upstream supplier deliveries are covered under A2.
Onsite handling (forklifts, pallet trucks) is assumed negligible and included implicitly in site energy use (A3).
No inter-site transport exists.
This approach follows the cut-off and materiality principles of EN 15804+A2, ensuring that no significant impacts are omitted while avoiding artificial inflation of results.

A3 - Manufacturing waste and wastewater
a) Processes covered
Module A3 covers the manufacturing processes at AMC MecanoCaucho's Asteasu plant. For this product, production consists of cutting Sylomer® polymer sheets to the exact dimensions required and assembling them with pre-shaped steel inserts delivered by suppliers. No adhesives, coatings, or additional treatments are used.
No water or energy-intensive processing is required beyond standard plant operations. There is no wastewater associated with the manufacturing process.

b-i) End-of-waste state
No waste arises in A3. Packaging waste is not generated during manufacturing but rather at the installation stage (A5). Product waste occurs only at end-of-life (C1–C4). Therefore, no materials leave A1–A3 as waste, and the concept of an "end-of-waste state" is not applicable in this module.

b-ii) Correlation of waste with production losses
No material losses occur in A3. All incoming raw materials (Sylomer sheets, pre-cut steel parts) are used directly in the final product. Hence, there is no

discrepancy between modelled waste and real production losses: both are zero.

b-iii) Assignment of end-of-life output indicators
Since no waste flows originate in A3, no life-cycle inventory end-of-life output indicators are assigned in this module.

Description of the manufacturing process:
a) Description of the core processes
The manufacturing of the declared product takes place entirely at AMC's facility in Asteasu (Gipuzkoa, Spain). The production involves two simple core steps: Cutting of Sylomer® polymer sheets: Sylomer® is delivered as large blocks/sheets from the supplier in Austria.
At the Asteasu plant, sheets are cut into the exact dimensions required for each unit. The cutting process is optimized to avoid off-cuts, meaning no production waste is generated. Assembly with steel inserts: The steel parts (low-alloyed, hot-rolled steel) are supplied already machined to their final dimensions by local suppliers in Gipuzkoa. These inserts are directly assembled with the pre-cut Sylomer® parts. No adhesives, primers, welding, or other bonding processes are required. Assembly is purely mechanical.
No other processing steps are required. The entire product is formed by combining the pre-cut polymer and the pre-shaped steel inserts.

b) Final treatments
No final treatment is applied to the product at the AMC plant. There is no coating, painting, galvanising, or surface treatment performed.The product leaves the factory in its as-assembled form (Sylomer + steel inserts).

c) Packaging process
Once assembled, the products are packaged at the Asteasu plant for shipment to customers.
Packaging depends on order size:
- Primary packaging: corrugated cardboard boxes are used for normal shipments.
- Secondary packaging: when shipments exceed four boxes, products are placed on EUR-flat pallets and secured with LDPE stretch film.

This ensures safe handling and transport but does not involve additional materials.
the factory.

Biogenic carbon content in product and packaging:
Product:
The declared product consists exclusively of Sylomer® polymer (polyurethane) and low-alloyed steel inserts. Both materials are fully fossil-based and mineral in origin.
Biogenic carbon content in the product = 0%.
Packaging:
Packaging includes corrugated cardboard boxes, wooden EUR-flat pallets, and LDPE stretch film.
Corrugated cardboard and wooden pallets are of biogenic origin (cellulose and timber).
LDPE film is fossil-based and contains no biogenic carbon.
Threshold check (5%):
While cardboard and wood are biogenic, the mass of packaging per declared unit is well below 5% of the total product mass (0.152 kg). Therefore, the declared product and its packaging do not exceed the 5% biogenic content threshold requiring explicit reporting under EN 15804.

A3 - Manufacturing of packaging
The declared product is packaged using corrugated cardboard boxes (primary packaging), LDPE stretch film (secondary packaging for palletised shipments), and EUR-flat wooden pallets (tertiary packaging).

The upstream manufacturing of packaging has been modelled in A1, including:

- Corrugated cardboard: pulp and corrugation processes based on Ecoinvent datasets, recycled content not declared by suppliers.
- LDPE stretch film: polymerisation of ethylene into LDPE, extrusion into film, based on Ecoinvent datasets.
- Wooden pallets: sawn timber production and pallet assembly, modelled as new pallets for conservative allocation.
- Packaging is used only for distribution and is not present in the installed product. No packaging waste is generated during manufacturing (A3). Packaging waste is reported in A5 (installation), where treatment scenarios (recycling, landfill, incineration) follow average European conditions.

A3 - Production of ancillary materials

Recycled content in packaging materials is unknown and has therefore been modelled as virgin material.

For this product, the manufacturing process consists only of cutting Sylomer® sheets to size and assembling them with pre-shaped steel inserts.

This process does not require adhesives, primers, coatings, lubricants, oils, solvents, or mold release agents.

No cleaning or surface treatment chemicals are used.

The only consumables used at the factory are general-purpose utilities (electricity, compressed air), which are reported under A3 energy inputs, not as ancillary materials.

No ancillary materials are consumed in the production of the declared product.

Therefore, no upstream processes, secondary material content, or waste flows from ancillary materials are included in the model.

The use of green energy in manufacturing is demonstrated through contractual instruments (GOs, RECs, etc.), and its use is ensured throughout the validity period of this EPD.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Finished products are packed into standard cardboard boxes, each containing 100 units. Orders larger than four boxes are consolidated onto pallets and secured using plastic film wrap. Transport to clients predominantly occurs via road transport (95.1% of shipments). Distances to customers were calculated based on sales data from 2024:

- Spain: 47.4%
- Italy: 13.1%
- France: 12.2%
- Germany: 8.7%
- Sweden: 3.0%
- Finland: 2.5%
- Belgium: 2.1%
- UK: 2.0%
- Austria: 1.6%

This detailed analysis yielded an accurate average transportation distance reflecting actual market distribution.

Product installation involves basic procedures using a power drill for fixing units onto ceilings or walls. The installation generates minimal waste—limited exclusively to negligible quantities of dust particles resulting from the drilling process. Therefore, waste production is considered negligible.

A5 - Installation of the product

Module A5 covers the activities at the installation site, including:

- Unpacking of the product.
- Handling and fixing of the unit into the ceiling or support surface.
- Disposal of packaging waste.
- Any energy or water use during installation.

Materials:

The installation is purely mechanical: the product is fixed to the ceiling or support structure using screws and standard tools.
No adhesives, primers, or ancillary materials are required.
All incoming materials are incorporated into the product; no material losses occur during installation.

Energy:

Installation requires only manual or electric tools (e.g. drilling).
The energy use per declared unit is negligible and has not been modelled separately.
No secondary fuels are consumed.

Water:

No water is used during installation.
Consequently, no wastewater is generated.

Losses and waste:

Product waste: none. All supplied material is installed.
Packaging waste: all packaging used to transport and protect the product is removed at the installation site. This includes:
Corrugated cardboard box:
LDPE stretch film (if palletised)
Wooden EUR-flat pallet (if palletised)
Packaging waste is modelled according to average European treatment routes (default in Ecoinvent/OneClick):
Corrugated cardboard → recycling
Wooden pallet → recycling or reuse (assumed recycling if not reused)
LDPE stretch film → recycling and/or incineration with energy recovery
Waste transport is modelled using default PCR assumptions (e.g. 50 km by 16–32 t lorry to waste treatment facility).

System boundary implications

All environmental impacts in A5 derive from packaging waste treatment.
No material losses of the product occur.
No biogenic carbon is stored in the installed product. Biogenic carbon in packaging (cardboard, wood) is accounted for in the packaging datasets and released at end-of-life (recycling/incineration).

A4-A5 Transportation and installation (Declaration of Assumptions)

Installation consists of drilling and screwing the unit to the ceiling. Energy demand is negligible (<0.01 kWh/unit) and therefore modelled as zero in line with EPD Hub PCR 5.3.2 and CEN/TR 15941:2010, which allow exclusion of insignificant flows. Installation consists of drilling and screwing the unit to the ceiling. Energy demand is negligible (<0.01 kWh/unit) and therefore modelled as zero in line with EPD Hub PCR 5.3.2 and CEN/TR 15941:2010, which allow exclusion of insignificant flows.
Packaging waste treatment follows European averages as modelled in Ecoinvent v3.x datasets (cardboard → recycling, wooden pallets → recycling/reuse, LDPE film → recycling and incineration with energy recovery). This is consistent with Eurostat 2023 waste statistics for packaging in Spain/EU.Packaging waste treatment follows European averages as modelled in Ecoinvent v3.x datasets (cardboard → recycling, wooden pallets → recycling/reuse, LDPE film → recycling and incineration with energy

recovery). This is consistent with Eurostat 2023 waste statistics for packaging in Spain/EU.

A5 - Installation waste

Installation does not generate any product waste or wastewater. The only waste generated at the installation stage (A5) is packaging waste (corrugated cardboard, LDPE stretch film, and EUR-flat pallets).

• The quantities of packaging waste in A5 correspond exactly to the packaging production modelled in A1–A3, ensuring consistency.
• No material losses of the product occur during installation.
• End-of-life output indicators are correctly assigned:
• Corrugated cardboard → recycling,
• Wooden pallets → reuse/recycling,
• LDPE stretch film → recycling/incineration with energy recovery.

These treatment routes are based on Ecoinvent v3.11 datasets for European waste management, consistent with Eurostat 2023 statistics for packaging waste. Installation does not generate any product waste or wastewater. The only waste generated at the installation stage (A5) is packaging waste (corrugated cardboard, LDPE stretch film, and EUR-flat pallets).

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• No material losses of the product occur during installation.
• End-of-life output indicators are correctly assigned:
• Corrugated cardboard → recycling,
• Wooden pallets → reuse/recycling,
• LDPE stretch film → recycling/incineration with energy recovery.
These treatment routes are based on Ecoinvent v3.11 datasets for European waste management, consistent with Eurostat 2023 statistics for packaging waste.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At building demolition, product disposal was analyzed, yielding the following waste treatment routes:

• Sylomer® Disposal:

- Recycling: 7.5%
- Incineration: 65.5%
- Landfill: 27%

• Steel Disposal:

- Recycling: 85%
- Landfill: 15%

Recycling of steel provides environmental benefits as secondary material input, potentially offsetting impacts associated with virgin steel production. Sylomer® recycling, though minimal, contributes similarly on a smaller scale. These benefits are explicitly accounted for within module D.

C1 - Deconstruction / Demolition

End-of-life deconstruction (C1) involves the manual/mechanical removal of the product from the ceiling or structural element. The process consists of unscrewing the fixing screws and detaching the Sylomer–steel unit.

• Materials: no additional materials are required for removal.

• Energy: energy demand is negligible (<0.01 kWh/unit), equivalent to the use of hand-held electric tools. Modelled as zero in line with EPD Hub PCR 5.3.2 and CEN/TR 15941:2010, which allow omission of insignificant flows.

• Waste generated: none at this stage; product remains intact and is sent to C2 (transport to waste processing).

End-of-life deconstruction (C1) involves the manual/mechanical removal of the product from the ceiling or structural element.

The process consists of unscrewing the fixing screws and detaching the Sylomer–steel unit.

• Materials: no additional materials are required for removal.

• Energy: energy demand is negligible (<0.01 kWh/unit), equivalent to the use of hand-held electric tools. Modelled as zero in line with EPD Hub PCR 5.3.2 and CEN/TR 15941:2010, which allow omission of insignificant flows.

• Waste generated: none at this stage; product remains intact and is sent to C2 (transport to waste processing).

C2 - End of life

At end of life, the dismantled product is transported to waste processing facilities.
• Distance: 50 km one-way (default assumption per PCR when specific distances are not available).

• Load factor: 80% average, with empty return assumed.

• Waste transported: the whole product (Sylomer polymer + steel inserts).

Assumptions are consistent with conservative, average European practice

C3 - Waste processing

At the waste treatment facility, product fractions are separated:

• Steel inserts: sorted, pressed, and fully recycled. Dataset: C2–C4 Steel, Construction (World Steel Association, 2020).

• Sylomer polymer (polyurethane): treated as PU foam. Dataset: C2–C4 PU Foam, Insulation (Plastics Europe, 2020).

• Processing: sorting, municipal incineration with energy recovery (export of electricity + heat), and landfill for residues.

• End-of-life output indicators: correctly assigned to “recycling,” “energy recovery,” and “disposal.”

C4 – Disposal

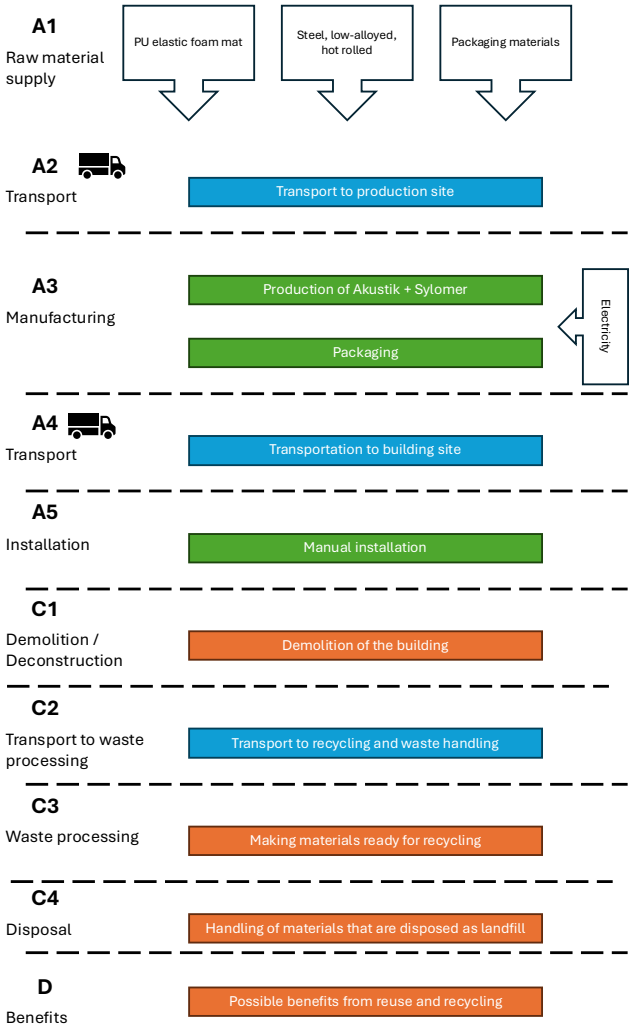
Disposal covers the fraction of the polymer that cannot be recycled.

• Treatment: sanitary landfill of residual polyurethane after incineration. Dataset: Treatment of waste polyurethane, sanitary landfill (Ecoinvent).

• Steel fraction: fully recycled; no disposal required.

• Timeframe: landfill impacts modelled for 100 years in line with EN 15804.

SYSTEM DIAGRAM



The flow diagram with the system boundaries of the entire life cycle of the Akustik + Sylomer is divided into the relevant modules with the following color coding:

- White: inputs to the system,
- blue: transport,
- green: production and installation (A modules),
- orange: modules after installation (B, C and D modules).

LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

To facilitate modeling and due to limitations in precision:

- Components <0.1% mass (such as certain screws) are excluded.
- Capital goods, infrastructure, and construction activities.
- Maintenance and operational activities related to capital goods.
- Administrative energy and water usage related to personnel activities.

These exclusions are compliant with standard EPD modeling practice, ensuring accuracy and relevance without compromising overall transparency or validity of the environmental assessment.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	Allocated by mass or volume
Packaging material	Allocated by mass or volume
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	-

This EPD is product and factory specific.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

ENVIRONMENTAL IMPACT DATA

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

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	3,92E-01	7,28E-03	8,62E-02	4,86E-01	3,23E-02	4,09E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,18E-03	4,69E-02	7,96E-04	-6,26E-01
GWP – fossil	kg CO_2e	3,92E-01	7,27E-03	1,24E-01	5,23E-01	3,23E-02	1,23E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,18E-03	4,69E-02	7,96E-04	-6,24E-01
GWP – biogenic	kg CO_2e	0,00E+00	3,69E-09	-3,97E-02	-3,97E-02	0,00E+00	3,97E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,34E-06	-8,52E-06	-4,99E-07	-7,74E-04
GWP – LULUC	kg CO_2e	2,46E-04	2,63E-06	2,02E-03	2,27E-03	1,45E-05	9,07E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,68E-06	3,57E-06	1,67E-07	-6,45E-04
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	1,78E-09	1,41E-10	2,44E-09	4,36E-09	4,77E-10	1,16E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,01E-11	7,35E-11	5,62E-12	-4,24E-09
Acidification potential	mol H^+e	1,37E-03	2,29E-05	5,40E-04	1,93E-03	1,10E-04	4,20E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,05E-05	7,59E-05	1,69E-06	-3,51E-03
EP-freshwater[2)]	kg Pe	1,21E-04	4,89E-07	2,18E-05	1,43E-04	2,52E-06	2,12E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,73E-07	1,82E-06	2,72E-08	-1,88E-04
EP-marine	kg Ne	3,20E-04	7,69E-06	1,34E-04	4,62E-04	3,62E-05	5,31E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,66E-06	6,45E-05	1,41E-04	-6,27E-04
EP-terrestrial	mol Ne	3,31E-03	8,36E-05	1,28E-03	4,68E-03	3,94E-04	1,56E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,24E-05	3,34E-04	6,90E-06	-6,69E-03
POCP ("smog")[3)]	kg NMVOCe	1,25E-03	3,55E-05	4,57E-04	1,75E-03	1,62E-04	5,39E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,88E-05	8,36E-05	2,30E-06	-2,14E-03
ADP-minerals & metals[4)]	kg Sbe	1,84E-06	2,38E-08	4,64E-07	2,33E-06	9,02E-08	3,97E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,03E-08	1,81E-07	4,00E-10	-1,62E-05
ADP-fossil resources	MJ	5,21E+00	1,02E-01	3,99E+00	9,30E+00	4,69E-01	1,02E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,67E-02	5,86E-02	4,94E-03	-6,81E+00
Water use[5)]	m^3e depr.	1,34E-01	5,00E-04	7,74E-02	2,12E-01	2,32E-03	2,84E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,04E-04	3,76E-03	2,56E-05	-1,81E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	2,62E-08	5,74E-10	3,60E-09	3,03E-08	3,24E-09	6,69E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,90E-10	1,25E-09	3,37E-11	-4,99E-08
Ionizing radiation[6)]	kBq U235e	1,22E-02	1,26E-04	1,38E-01	1,51E-01	4,08E-04	4,18E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,42E-05	3,06E-04	6,39E-06	-3,11E-02
Ecotoxicity (freshwater)	CTUe	1,23E+00	1,36E-02	3,31E-01	1,57E+00	6,63E-02	1,54E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,35E-02	1,34E-01	3,18E-02	-1,80E+00
Human toxicity, cancer	CTUh	3,88E-10	1,24E-12	5,33E-11	4,43E-10	5,33E-12	5,36E-13	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,05E-12	1,12E-11	1,06E-13	-5,62E-10
Human tox. non-cancer	CTUh	5,22E-09	6,42E-11	8,66E-10	6,15E-09	3,04E-10	2,84E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,43E-11	3,00E-10	1,71E-11	-1,24E-08
SQP[7)]	-	9,27E-01	6,13E-02	2,75E+00	3,74E+00	4,72E-01	8,80E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,17E-02	6,95E-02	9,74E-03	-3,21E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	6,01E-01	1,73E-03	1,13E+00	1,73E+00	6,43E-03	-3,73E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,22E-03	6,76E-03	9,09E-05	-1,64E+00
Renew. PER as material	MJ	3,00E-02	0,00E+00	3,44E-01	3,74E-01	0,00E+00	-3,44E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-3,00E-02	0,00E+00
Total use of renew. PER	MJ	6,31E-01	1,73E-03	1,47E+00	2,11E+00	6,43E-03	-7,17E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,22E-03	6,76E-03	-2,99E-02	-1,64E+00
Non-re. PER as energy	MJ	4,57E+00	1,02E-01	3,97E+00	8,64E+00	4,69E-01	-1,90E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,67E-02	-4,91E-01	-2,04E-01	-6,81E+00
Non-re. PER as material	MJ	6,42E-01	0,00E+00	2,61E-02	6,68E-01	0,00E+00	-2,61E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-6,42E-01	5,52E-03
Total use of non-re. PER	MJ	5,21E+00	1,02E-01	3,99E+00	9,31E+00	4,69E-01	-2,80E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,67E-02	-4,91E-01	-8,46E-01	-6,80E+00
Secondary materials	kg	4,79E-02	4,67E-05	1,27E-02	6,06E-02	2,00E-04	1,09E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,90E-05	5,07E-05	1,41E-06	7,27E-02
Renew. secondary fuels	MJ	3,00E-05	5,90E-07	7,68E-03	7,71E-03	2,54E-06	8,13E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,96E-07	2,23E-06	2,70E-08	-1,71E-04
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,31E-03	1,37E-05	1,83E-03	4,16E-03	6,93E-05	-1,85E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,15E-05	8,11E-05	-2,21E-05	-5,53E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,10E-01	1,49E-04	6,31E-03	1,16E-01	7,95E-04	1,08E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,48E-04	1,01E-03	8,13E-06	-6,08E-01
Non-hazardous waste	kg	1,23E+00	3,11E-03	1,11E-01	1,34E+00	1,47E-02	3,63E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,81E-03	2,83E-02	3,41E-02	-1,26E+00
Radioactive waste	kg	1,80E-05	3,14E-08	3,26E-05	5,06E-05	1,00E-07	1,06E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,82E-08	7,83E-08	1,56E-09	-7,48E-06

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	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	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,38E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,12E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	6,13E-02	0,00E+00	0,00E+00	6,13E-02	0,00E+00	2,70E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,90E-01	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	1,13E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	8,00E-02	0,00E+00	0,00E+00
Exported energy –	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,57E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,10E-01	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	2,91E-01	7,23E-03	1,26E-01	4,24E-01	3,21E-02	2,63E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,15E-03	4,67E-02	7,67E-04	-6,22E-01
Ozone depletion Pot.	kg CFC_{-11}e	1,47E-09	1,12E-10	1,97E-09	3,55E-09	3,81E-10	9,41E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,19E-11	6,13E-11	4,48E-12	-3,59E-09
Acidification	kg SO_2e	9,74E-04	1,74E-05	4,35E-04	1,43E-03	8,42E-05	3,16E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,57E-05	5,56E-05	1,23E-06	-2,92E-03
Eutrophication	kg PO_4^3e	2,04E-04	4,41E-06	2,48E-04	4,56E-04	2,05E-05	2,54E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,83E-06	1,98E-05	5,38E-06	-4,09E-04
POCP (“smog”)	kg C_2H_4e	1,21E-04	1,65E-06	3,11E-05	1,53E-04	7,50E-06	5,84E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,41E-06	3,73E-06	1,89E-07	-1,77E-04
ADP-elements	kg Sbe	1,77E-06	2,32E-08	4,53E-07	2,25E-06	8,79E-08	3,87E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,98E-08	1,80E-07	3,90E-10	-1,61E-05
ADP-fossil	MJ	2,90E+00	1,00E-01	1,66E+00	4,66E+00	4,63E-01	9,49E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,55E-02	5,33E-02	4,84E-03	-6,35E+00

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	3,92E-01	7,28E-03	1,26E-01	5,26E-01	3,23E-02	1,23E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,18E-03	4,69E-02	7,96E-04	-6,25E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Market for electricity, medium voltage (Reference product: electricity, medium voltage) - Spain
Electricity CO2e / kWh	0,2
District heating data source and quality	-
District heating CO2e / kWh	-

Transport scenario documentation A4

Scenario parameter	Value
Fuel and vehicle type. Eg, electric truck, diesel powered truck	Market for transport, freight lorry >32 metric ton, EURO 5
Average transport distance, km	1698,3
Capacity utilization (including empty return) %	100
Bulk density of transported products	0,1768
Volume capacity utilization factor	1

Installation scenario documentation A5 Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	0
Water use / m³	0
Other resource use / kg	0
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	0
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	0,0003kg plastic packaging 0,0129kg wood packaging 0,0116kg cardboard packaging
Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg	0,00012kg of plastic goes to recycling 0,00011kg of plastic goes to incineration 0,000069 of plastic goes to landfill 0,0041kg of wood goes to recycling 0,0039kg of wood goes to incineration 0,0049kg of wood goes to landfill 0,0096kg goes to recyling 0,00093kg goes to incineration 0,001kg goes to landfill
Direct emissions to ambient air, soil and water / kg	0

Scenario information	Value
Collection process – kg collected separately	0
Collection process – kg collected with mixed construction waste	0,152
Recovery process – kg for re-use	0
Recovery process – kg for recycling	0,1119
Recovery process – kg for energy recovery	0
Disposal (total) – kg for final deposition	0,0401
Scenario assumptions e.g. transportation	50km - landfill; 250km - recycling; 150km - incineraton. Transport freight lorry 16-32 metric ton, EURO 5

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15802+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Sergio Ballen Zamora, as an authorised verifier acting for EPD Hub Limited
24.10.2025

VERIFIED ISO 14025