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Panels for acoustic screens



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ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www.eco-platform.org

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-A4, C1-C4 and D modules in accordance with EN 15804
(Cradle-to-Gate with options)

Product standards: EN 14388:2005, EN 14388:2005/AC:2008

The year of preparing the EPD: 2025

Service Life: 30 years for standard product

PCR: ITB-PCR A

Declared unit: 1 m²

Reasons for performing LCA: B2B

Representativeness: Poland, European, 2023

MANUFACTURER

Maxito Sp. z o.o. Sp.K. is a Polish company specializing in the production of panels for acoustic screens for the roads, railway, and industrial sectors, offering innovative solutions for noise protection in the road, railway, and industrial sectors. Their noise control solutions help to reduce noise generated by traffic or industrial activity, improving the quality of life for residents and road users. Their products meet the highest quality standards, and their effectiveness has been confirmed by laboratory tests. The company's two production and warehouse facilities are located in Krzepice. The main production facility is located at 17 Skłodowska Street in Krzepice. For certain products (aluminium panels, steel components), the prefabrication process takes place at Production Facility 2 at 15 Rolnicza Street, on premises of Polmet B. Sawicki, Maxito Sp. z o.o. Sp. J. These facilities enable the integrated production of acoustic screen components, including transparent and aluminium panels, as well as door modules, ensuring full process control and consistent product quality.



Figure 1. View from the street of the Maxito Sp. z o.o. Sp.K. in Poland

PRODUCTS DESCRIPTION AND APPLICATION

Maxito Sp. z o.o. Sp. K. specialises in the production of panels for acoustic screen, offering solutions in several product groups tailored to different technical and operational requirements.

Transparent acoustic panels

Transparent panels used in noise barriers combine effective noise protection with visual transparency. They are manufactured from high-quality mineral glass, solid polycarbonate, and acrylic – in both reinforced and unreinforced versions. These solutions provide sound reflection while ensuring resistance to weathering and aging. Available variants include:

- MAXITO PC UVP – solid polycarbonate with UV protection, resistant to weathering and aging,
- MAXITO PLEX PMMA XT – unreinforced acrylic sheet, lightweight and durable,
- MAXITO PLEX PMMA REINFORCED – reinforced acrylic sheet, offering increased mechanical strength,
- MAXITO GLASS ESG – tempered safety glass,
- MAXITO GLASS ESG VSG – laminated safety glass with enhanced durability.

Aluminum acoustic panels

The second product group includes aluminium panels used as screen infills. They are highly effective in noise reduction – by reflecting sound and, in the perforated variants, also by absorbing it. The Polmet line includes:

- Polmet Z 1S / Z 1SR – single-sided systems,
- Polmet Z 2S / Z 2SR – double-sided systems,
- Polmet Z – universal noise protection panels,
- Polmet DF – perforated panels with increased sound absorption performance.

Complementary elements

The product portfolio is completed by additional elements that ensure full functionality of acoustic screen systems:

- Maxito Doors – doors and gates that allow safe passage or access, in compliance with technical and building regulations concerning public roads,
- Octagonal crowns – elements improving noise reduction efficiency in the upper part of screens.

More specific product technical data is available at [manufacture's website](#).

For the purposes of the EPD, representative acoustic panels and supplementary components were selected for each of the product groups under consideration, and the mass composition of components per square meter was determined for each group:

- **Maxito PC panel 12 mm** – the panel construction diagram is shown in Fig. 2, component materials in Table 1;
- **Maxito XT panel 12 mm** – the panel construction diagram is shown in Fig. 3, component materials in Table 2;
- **Maxito Glass ESG panel 12 mm** – the panel construction diagram is shown in Fig. 4, component materials in Table 3;
- **Maxito Polmet Z 1S panel** – the panel construction diagram is shown in Fig. 5, component materials in Table 4;
- **Maxito Polmet Z 2S panel** – the panel construction diagram is shown in Fig. 6, component materials in Table 5;
- **Maxito Doors (with aluminium panels)** – the doors construction diagram is shown in Fig. 7, component materials in Table 6.

The reference products listed will be subjected to a life cycle assessment as representative.

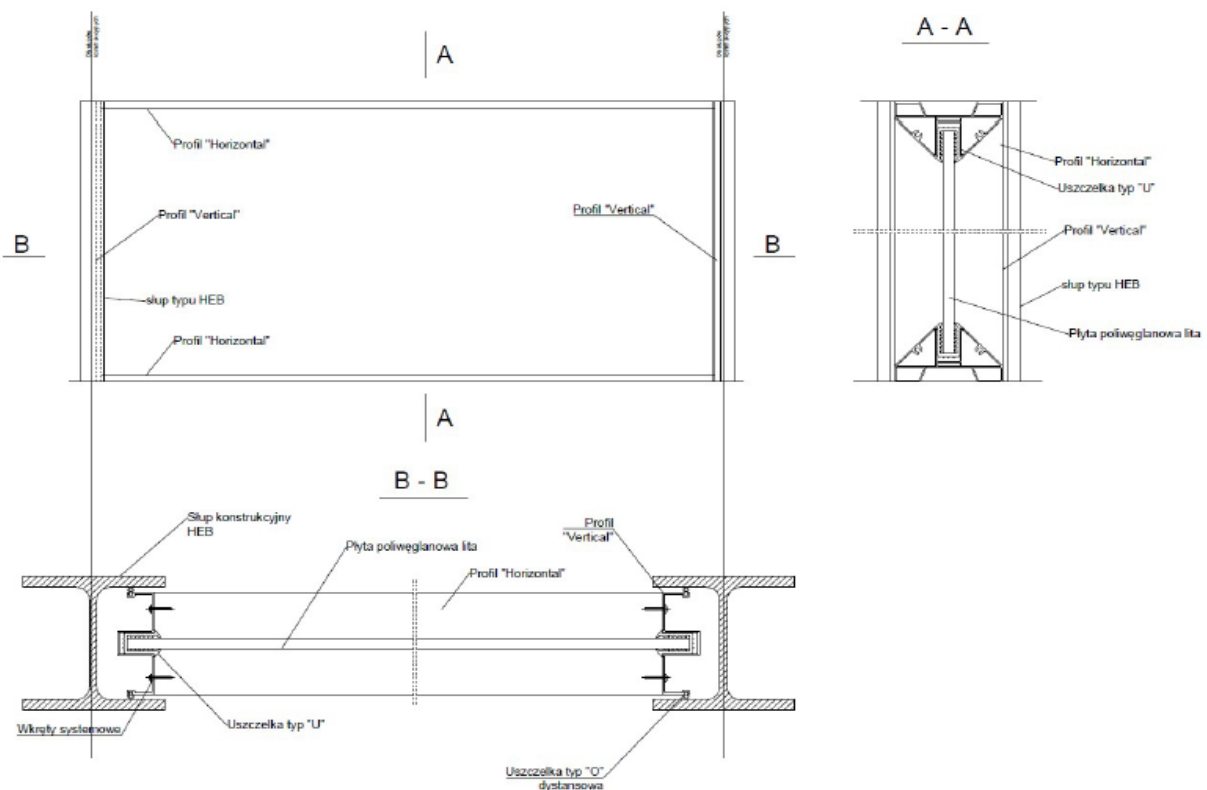


Figure 2. Maxito PC panel construction diagram

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Table 1. Mass percentage of components per unit area

Maxito PC panel 12 mm	
Materials / Components	[kg/m ²]
Solid polycarbonate 12 mm	13,459
Aluminium profiles	3,676
System seals	1,063

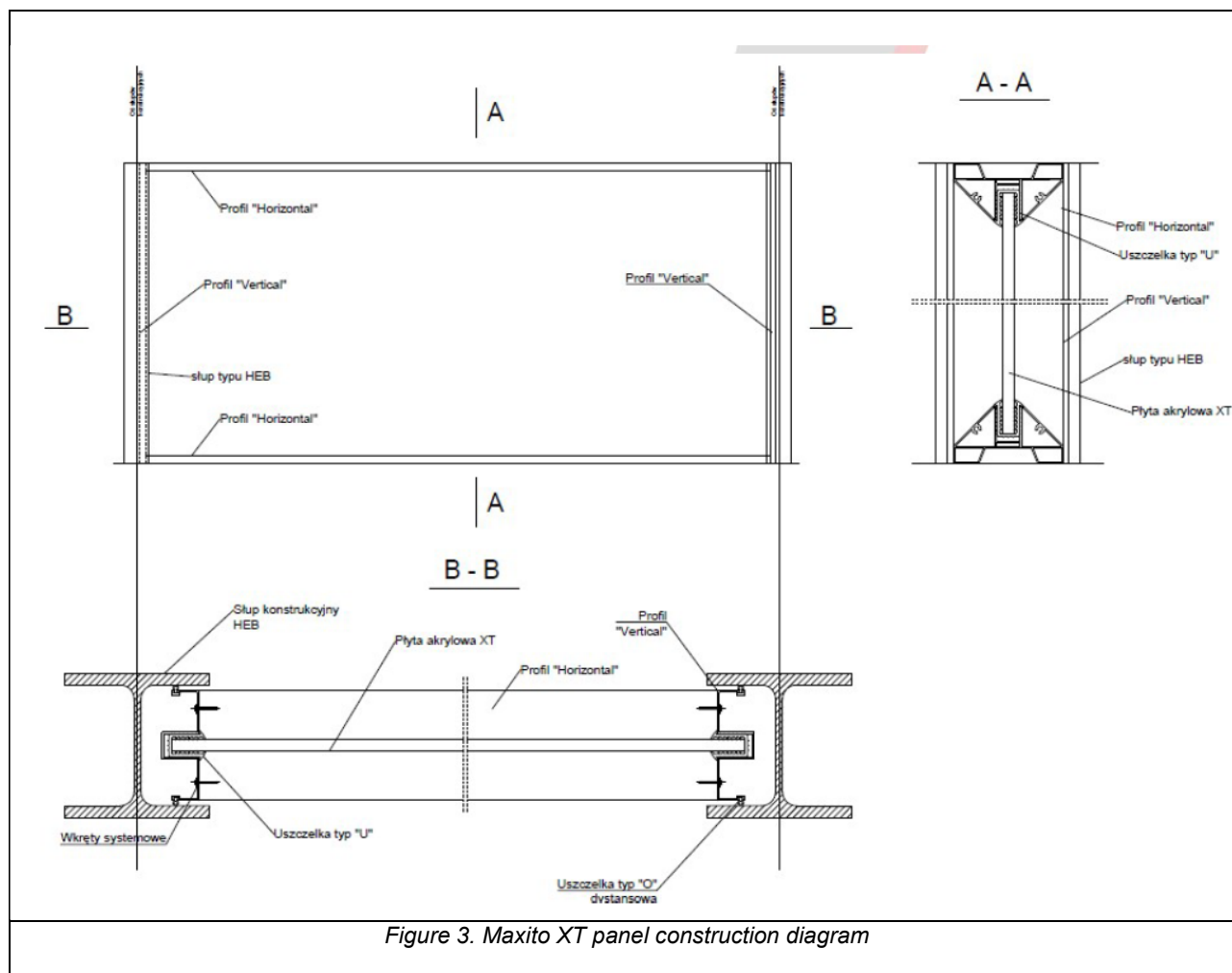


Table 2. Mass percentage of components per unit area

Maxito XT panel 12 mm	
Materials / Components	[kg/m ²]
Acrylic plates	13,347
Aluminium profiles	3,676
System seals	1,063

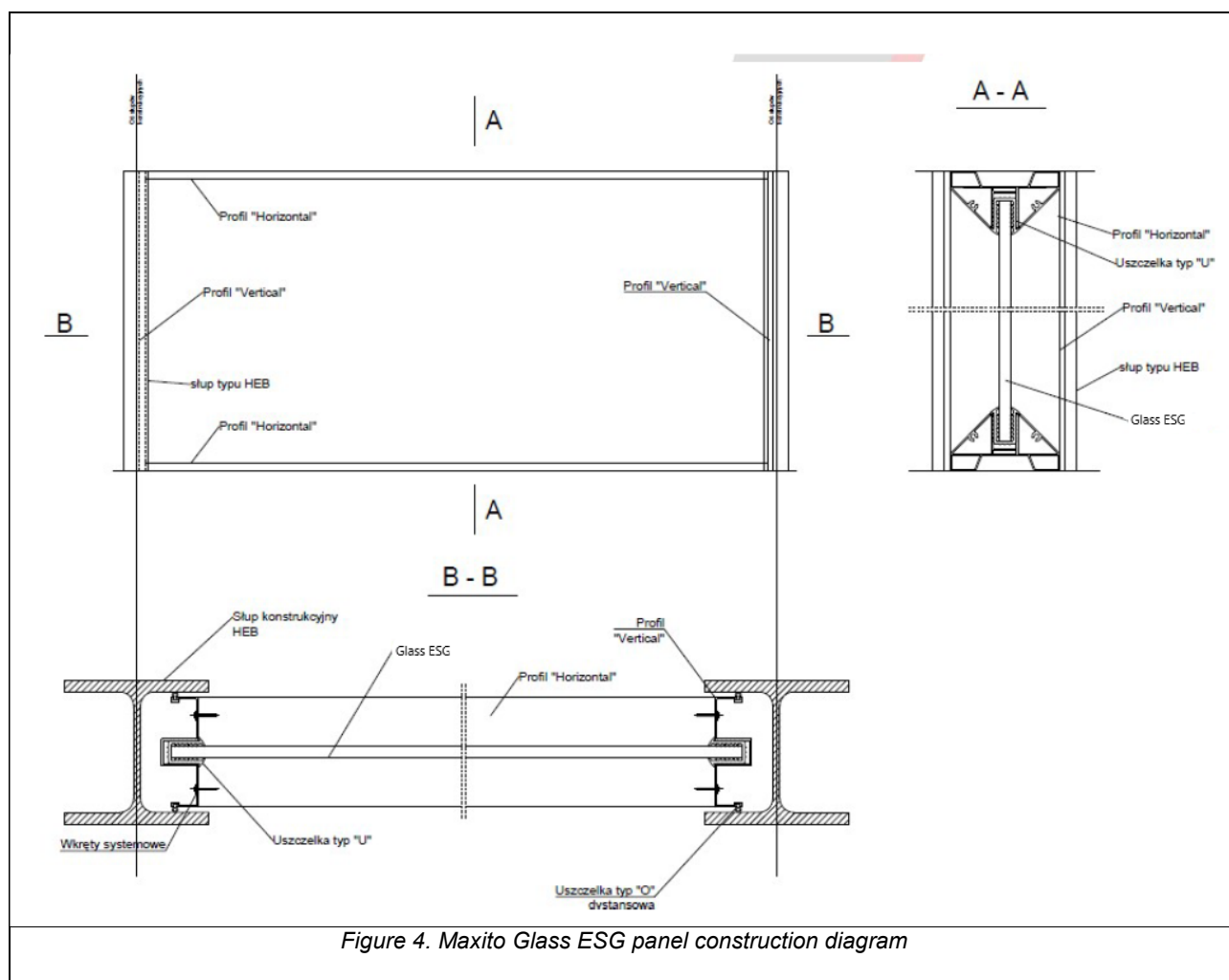


Table 3. Mass percentage of components per unit area

Maxito Glass ESG panel 12 mm	
Materials / Components	[kg/m ²]
Tempered glass ESG 12 mm	28,264
Aluminium profiles	3,676
System seals	1,063

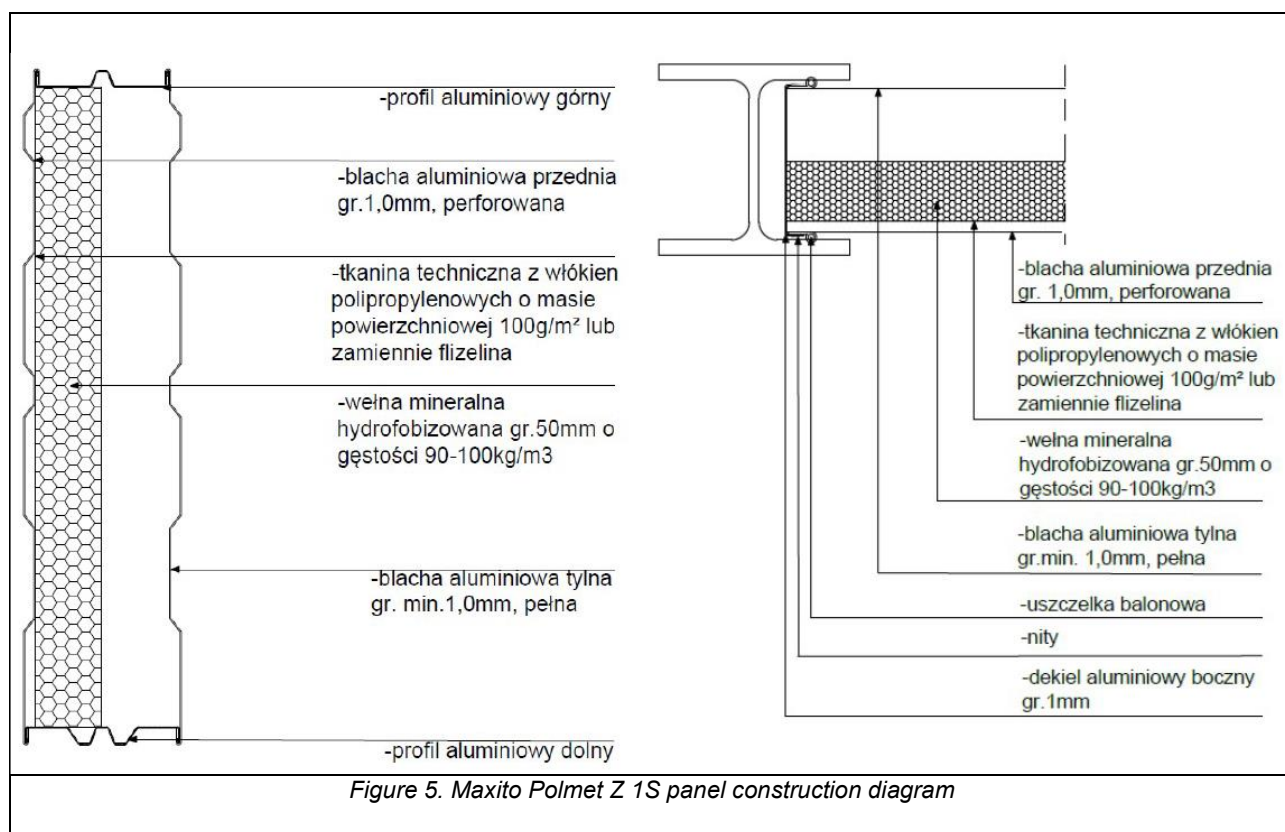


Table 4. Mass percentage of components per unit area

Maxito Polmet Z 1S panel	
Materials / Components	[kg/m²]
Rock wool	4,900
Aluminium profiles	7,000
System seals	1,000

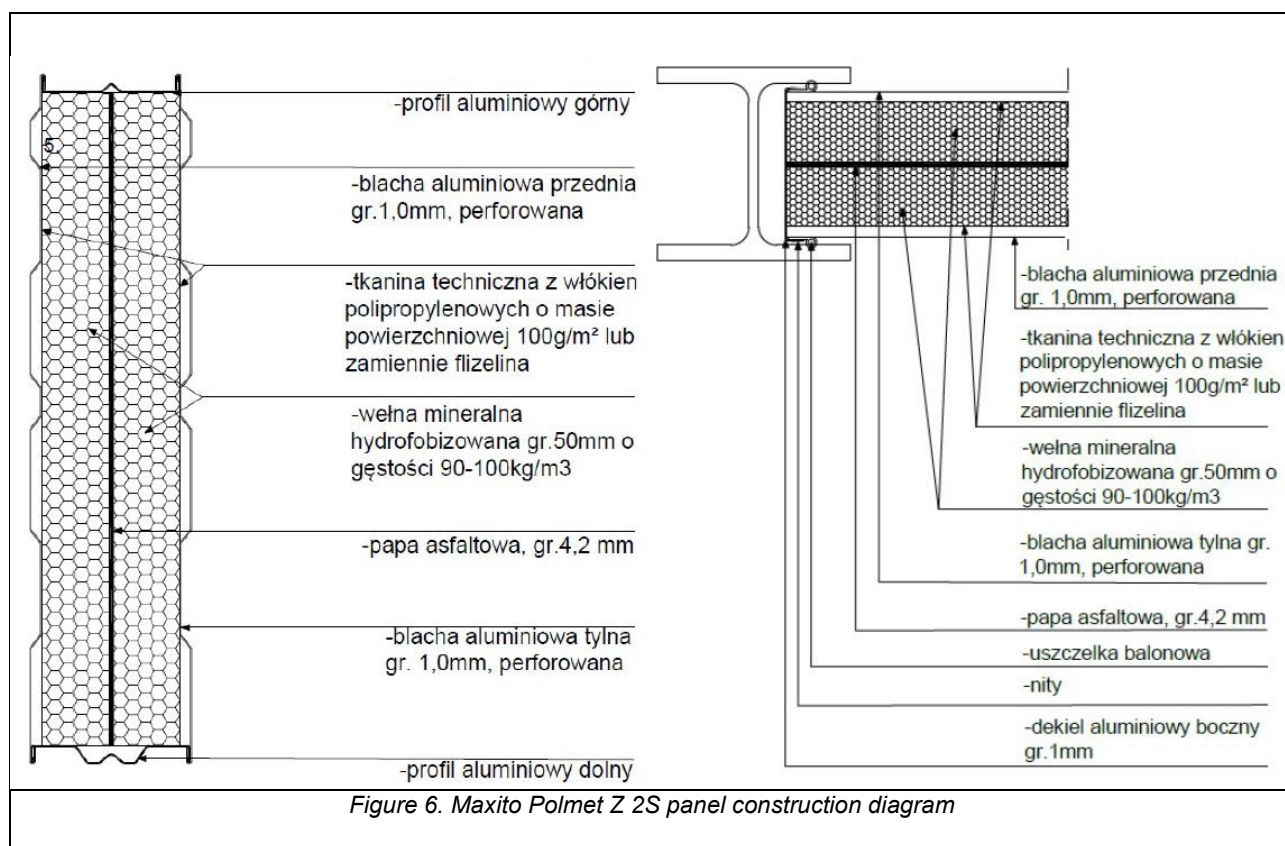


Table 5. Mass percentage of components per unit area

Maxito Polmet Z 2S panel	
Materials / Components	[kg/m ²]
Rock wool	3,800
Aluminium profiles	6,160
System seals	0,100
Asphalt felt	4,400

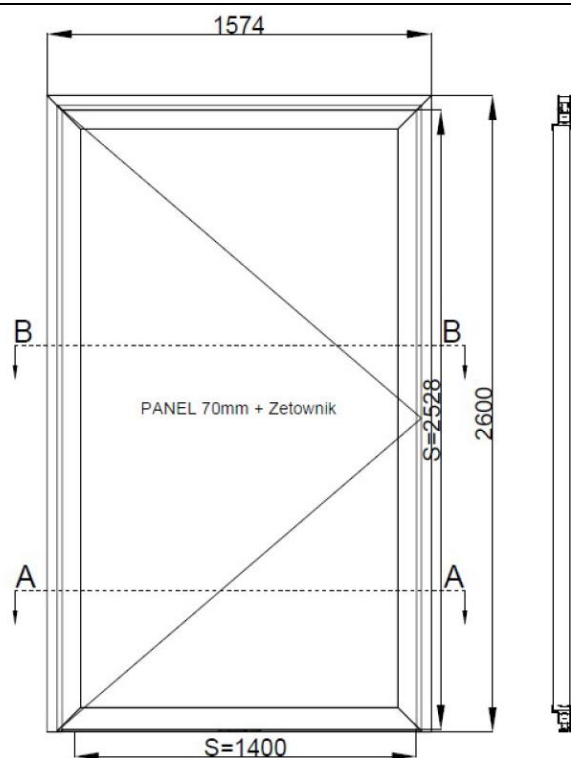


Figure 7. Maxito Doors (with aluminium panels) construction diagram

Table 6. Mass percentage of components per unit area

Maxito Doors (with aluminium panels)	
Materials / Components	[kg/m ²]
Rock wool	3,400
Aluminium profiles	17,17
System seals	0,230

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 m² of reference product. LCA results are provided for each reference product separately.

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 applied for this EPD follow the general ITB's PCR A document. The production of panels for acoustic screens, presented in Figure 2, is carried out in the manufacturing plants located in Krzepice, Poland. The system boundaries include the preparation and delivery of input materials, their receipt and verification, material processing into semi-finished products in both plants, the transport of aluminium semi-products from Plant 2 to Plant 1, the final assembly of semi-products into the finished product, as well as packing and shipment to the customer. Input and output data from both plants are inventoried and allocated to production on a mass basis. The declaration covers all transparent and aluminium panels manufactured in the Krzepice plants. Since their production resources and processing stages are basically similar, it is possible to average the production by product weight.

System limits

Minimum 99.0% input materials and 100% energy consumption (electricity, gas, LPG, other) were inventoried in a processing plants and were included in the calculation. In the assessment, all available data from production have been considered, i.e. all raw materials/elements used as per formulation process, utilised thermal energy for heating, and electric power consumption. Thus, material and energy flows contributing less than 1 % of mass or energy have not been considered. It can be assumed that the total sum of neglected processes does not exceed 1 % of energy usage and mass per modules A or D. Machines and facilities required during production are neglected. The packaging products are included.

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

Modules A1 and A2 represent the extraction and processing of raw materials (mainly aluminium products and materials for panel infills) as well as their transport to the production site. Aluminium coils, profiles, gaskets, rock wool, polycarbonate, PMMA and glass sheets are the main semi-finished products used in the production of acoustic panel infills. The aluminium used originates from both primary and secondary production routes. Raw materials, additives, auxiliary materials and packaging are sourced from both local and foreign suppliers. Module A2 (transport) includes truck transport and is based on Polish and European average fuel data.

Module A3: Production

The production process takes place at the MAXITO Sp. z o. o. Sp.K. manufacturing plants in Krzepice, where panels for acoustic screens are prefabricated. The main production stages include preparation and verification of delivered raw materials, material processing into semi-finished products (e.g. aluminium profiles, infills, gaskets, rock wool layers), and final assembly of semi-products into the finished panels. After passing quality control, the products are packed and prepared for shipment to the customer. A flowchart of the production process is shown in Figure 2.

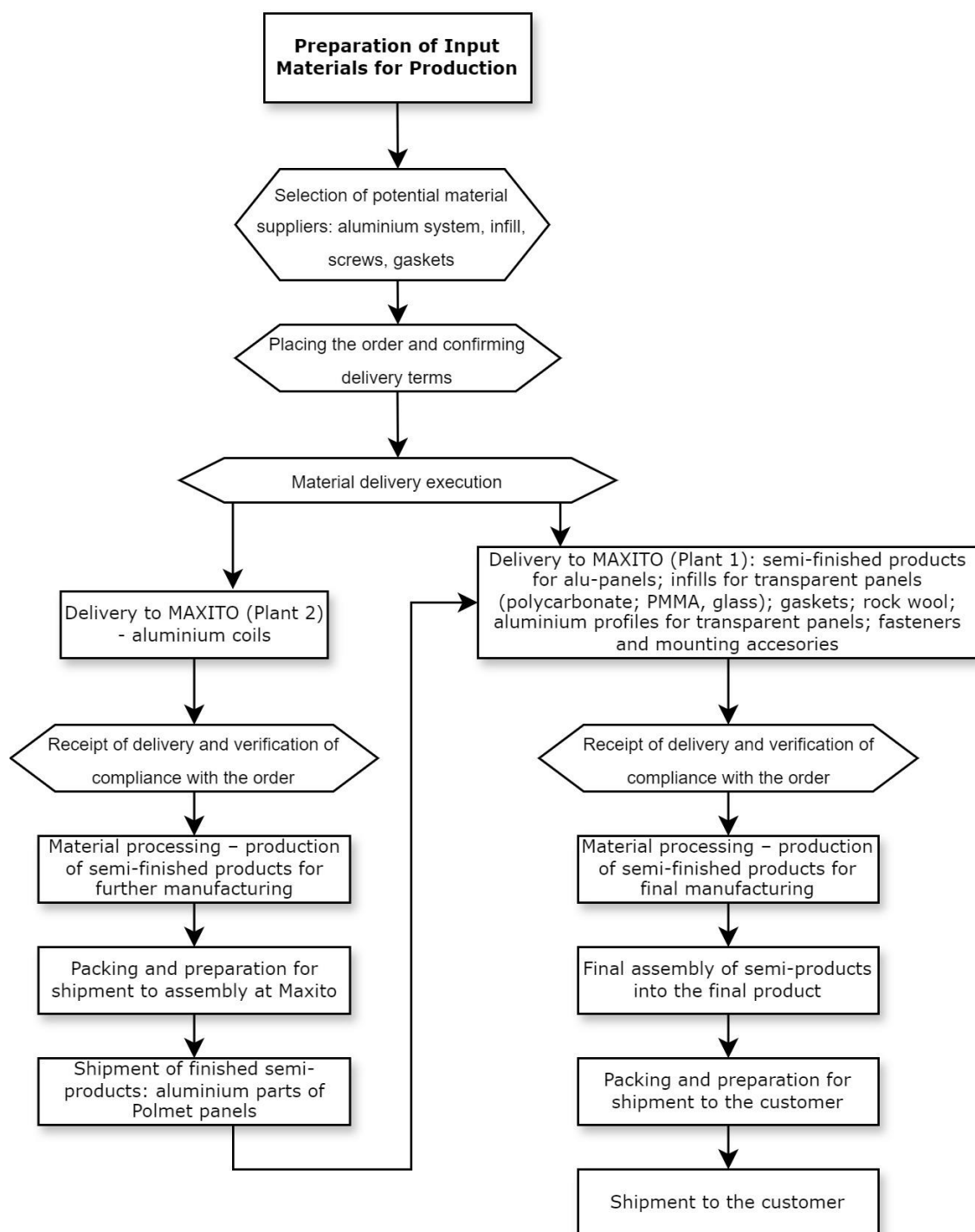


Figure 8. Diagram of the manufacturing process of panels for acoustic screen in Maxito Sp z o.o. Sp. K. in Krzepice, Poland

Module A4 and A5: *Transport to consumer and installation*

Transport of the panels for acoustic panel from the manufacturing plant to the construction site is carried out using specialised trucks. A transport distance of 100 km is considered (emission standard: Euro 5) with 100% load capacity. 4,5 MJ of primary energy is used for installation of 1 m².

Modules C and D: *End-of-life (EOL)*

Due to the fact that the declaration covers a wide range of panels for acoustic screens for various purposes and usage scenarios, it is not possible to directly specify the de-construction technology and the amount of energy for disassembly in C1 module (so this module is very generic based on literature).

In the adapted end-of-life scenario, the de-constructed panels are segregated. The aluminium components are the primary metal fraction destined for recycling. This transport to the recycling facilities (e.g., aluminium mill) is assumed to occur over a distance of 100 km via a >16t lorry meeting EURO 5 emission standards.

In Module C3 (Waste Processing for Recycling), the aluminium components are processed as scrap. The recycling potential for aluminium is high due to its inherent recyclability. It is assumed that 98% of the aluminium mass from the products enters the recycling stream. Other materials, such as polycarbonate, acrylic, and glass, may also be recycled where local infrastructure and market conditions allow, but due to a lack of specific data, a conservative scenario is adopted for these materials (table 7, scenarios).

Consequently, in Module C4 (Disposal), it is assumed that the remaining 2% of the aluminium, along with other non-recyclable components (such as mixed seals, contaminated mineral wool, and composite fragments), will be sent to a landfill.

Module D presents the net benefits and loads beyond the system boundary, including credits resulting from the recycling of the aluminium scrap. These credits, which account for the avoided burden of primary aluminium production, are calculated using relevant, conservative datasets for aluminium recycling. This module reflects the potential resource recovery from the product system at its end-of-life

Table 7. End-of-life scenario for the panels for acoustic screen

Material	Material recovery	Recycling	Landfilling
Aluminium	100%	98%	2%
Glass	100%	70%	30%
Mineral Wool	100%	30%	70%
Plastics	100%	50%	50%

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2023 – 31.12.2023 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Data quality

The data selected for LCA originate from ITB-LCI questionnaires completed by Maxito. Sp. z o. o. Sp.K. 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

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consistency is judged as good. The background data for the processes come from the following resources database Ecoinvent v.3.11 and specific suppliers (EPDs). 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.

Calculation rules

LCA was performed using ITB-LCA tool developed in accordance with EN15804+A2. Emission of greenhouse gases was calculated using the IPCC 2023 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 significant biogenic carbon content in a product.

Additional information

Polish electricity (Ecoinvent v 3.11 supplemented by actual national KOBIZE data) emission factor used is 0.597 kg CO₂/kWh (National data). As a general rule, no particular environmental or health protection measures other than those specified by law are necessary.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The following life cycle modules (Table 8) were included in the analysis.

The declaration refers to declared unit (DU) of 1 m² for:

- Maxito PC panel 12 mm manufactured in Poland, the life cycle environmental impact of selected modules (A1-A5+C1-C4+D) is presented in Tables 9-12;
- Maxito XT panel 12 mm manufactured in Poland, the life cycle environmental impact of selected modules (A1-A5+C1-C4+D) is presented in Tables 13-16;
- Maxito Glass ESG panel 12 mm manufactured in Poland, the life cycle environmental impact of selected modules (A1-A5+C1-C4+D) is presented in Tables 17-20;
- Maxito Polmet Z 1S panel manufactured in Poland, the life cycle environmental impact of selected modules (A1-A5+C1-C4+D) is presented in Tables 21-24;
- Maxito Polmet Z 2S panel manufactured in Poland, the life cycle environmental impact of selected modules (A1-A5+C1-C4+D) is presented in Tables 25-28;
- Maxito Doors (with aluminium panels) manufactured in Poland, the life cycle environmental impact of selected modules (A1-A5+C1-C4+D) is presented in Tables 29-32;

Table 8 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	NMD	MND	MD	MD	MD	MD	MD

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Table 9 Life cycle assessment (LCA) results of Maxito PC panel 12 mm – environmental impacts (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	1.27E+02	2.45E+00	2.21E+00	1.32E+02	3.04E-01	2.50E-02	1.25E-01	3.04E-01	5.14E+00	8.70E-01	-1.61E+01
Greenhouse potential - fossil	eq. kg CO ₂	1.27E+02	2.45E+00	2.21E+00	1.32E+02	3.03E-01	2.49E-02	1.25E-01	3.03E-01	4.70E+00	8.70E-01	-1.53E+01
Greenhouse potential - biogenic	eq. kg CO ₂	-9.81E-02	1.56E-03	3.13E-03	-9.34E-02	1.03E-03	6.72E-05	3.36E-04	1.03E-03	4.34E-01	6.22E-04	-5.03E-01
Global warming potential - land use and land use change	eq. kg CO ₂	5.91E-01	8.12E-04	2.32E-04	5.92E-01	1.19E-04	3.90E-06	1.95E-05	1.19E-04	8.49E-03	4.68E-05	-3.23E-01
Stratospheric ozone depletion potential	eq. kg CFC ₁₁	4.95E-06	5.33E-08	2.40E-08	5.02E-06	7.00E-08	1.37E-10	6.85E-10	7.00E-08	1.16E-07	2.16E-09	-4.28E-07
Soil and water acidification potential	eq. mol H ⁺	5.89E-01	7.86E-03	2.47E-02	6.22E-01	1.23E-03	2.64E-04	1.32E-03	1.23E-03	3.37E-02	5.80E-04	-9.62E-02
Eutrophication potential - freshwater	eq. kg P	3.24E-02	1.67E-04	3.76E-03	3.63E-02	2.03E-05	4.30E-05	2.15E-04	2.03E-05	2.30E-03	8.73E-06	-8.82E-03
Eutrophication potential - seawater	eq. kg N	9.39E-02	2.65E-03	3.24E-03	9.98E-02	3.71E-04	3.73E-05	1.87E-04	3.71E-04	6.15E-03	1.92E-03	-2.13E-02
Eutrophication potential - terrestrial	eq. mol N	9.72E-01	2.88E-02	2.76E-02	1.03E+00	4.04E-03	3.26E-04	1.63E-03	4.04E-03	6.13E-02	2.36E-03	-1.43E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	4.44E-01	1.19E-02	8.78E-03	4.64E-01	1.24E-03	9.37E-05	4.69E-04	1.24E-03	1.36E-02	1.03E-03	-4.62E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	9.44E-04	8.43E-06	8.99E-07	9.53E-04	1.07E-06	9.40E-09	4.70E-08	1.07E-06	7.83E-05	1.84E-07	-4.71E-05
Abiotic depletion potential - fossil fuels	MJ	2.31E+03	3.47E+01	4.28E+01	2.39E+03	4.49E+00	3.94E-01	1.97E+00	4.49E+00	6.96E+01	1.81E+00	-2.45E+02
Water deprivation potential	eq. m ³	5.93E+01	1.82E-01	8.36E-01	6.03E+01	2.08E-02	7.53E-03	3.76E-02	2.08E-02	1.69E+00	8.60E-03	-2.06E+01

Table 10 Life cycle assessment (LCA) results of the product – additional impacts indicators (DU: 1 m²)

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

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Table 11 Life cycle assessment (LCA) results of the Maxito PC panel 12 mm - 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	2.82E+02	5.65E-01	3.00E+00	2.85E+02	6.44E-02	3.24E-02	1.62E-01	6.44E-02	1.05E+01	2.71E-02	-9.06E+01
Consumption of renewable primary energy resources used as raw materials	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	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	2.82E+02	5.65E-01	3.00E+00	2.85E+02	6.44E-02	3.24E-02	1.62E-01	6.44E-02	1.05E+01	2.72E-02	-9.04E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.92E+03	3.47E+01	3.78E+01	1.99E+03	4.49E+00	3.94E-01	1.97E+00	4.49E+00	3.39E+02	-2.83E+02	-5.47E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.06E+01	0.00E+00	4.98E+00	1.56E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.69E+02	2.84E+02	-2.69E+02
Total consumption of non-renewable primary energy resources	MJ	1.93E+03	3.47E+01	4.28E+01	2.01E+03	4.49E+00	3.94E-01	1.97E+00	4.49E+00	6.96E+01	1.81E+00	-2.73E+02
Consumption of secondary materials	kg	1.25E+00	1.55E-02	3.00E-03	1.26E+00	1.51E-03	3.42E-05	1.71E-04	1.51E-03	7.81E+00	6.53E-04	-7.71E+00
Consumption of renew. secondary fuels	MJ	2.28E-01	2.03E-04	1.24E-05	2.28E-01	1.66E-05	1.73E-07	8.64E-07	1.66E-05	4.60E-04	1.22E-05	-6.47E-04
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	2.66E-04	0.00E+00	-2.66E-04
Net consumption of freshwater	m ³	2.42E+00	4.19E-03	2.46E-02	2.45E+00	5.65E-04	1.13E-03	5.65E-03	5.65E-04	4.44E-02	-2.68E-02	-4.90E-01

Table 12 Life cycle assessment (LCA) results of Maxito PC panel 12 mm – waste categories (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	6.89E+00	4.97E-02	3.66E-01	7.31E+00	5.04E-03	3.05E-03	1.53E-02	5.04E-03	3.10E-01	3.19E-03	-1.73E+00
Non-hazardous waste	kg	2.05E+02	1.07E+00	1.85E+01	2.25E+02	8.95E-02	2.06E-01	1.03E+00	8.95E-02	1.42E+01	3.61E+01	-4.26E+01
Radioactive waste	kg	3.34E-03	1.02E-05	4.10E-06	3.36E-03	3.35E-07	5.91E-08	2.95E-07	3.35E-07	1.91E-04	4.76E-07	-7.70E+00
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	9.58E-02	4.15E-04	8.42E-01	9.39E-01	1.39E-05	2.64E-06	1.32E-05	1.39E-05	2.05E-01	3.06E-05	-1.60E-02
Materials for energy recovery	kg	5.56E-05	2.20E-06	1.12E-01	1.12E-01	1.12E-07	4.25E-09	2.12E-08	1.12E-07	4.42E-06	1.25E-07	-5.54E-06

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Exported Energy	MJ	3.42E+00	1.52E-02	1.17E-02	3.45E+00	0.00E+00	1.26E-03	6.30E-03	0.00E+00	1.23E-01	3.81E-04	-1.61E-01
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Table 13 Life cycle assessment (LCA) results of Maxito XT panel 12 mm – environmental impacts (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	5.57E+01	2.43E+00	2.20E+00	6.03E+01	3.02E-01	2.48E-02	1.24E-01	3.02E-01	5.14E+00	8.70E-01	-1.61E+01
Greenhouse potential - fossil	eq. kg CO ₂	5.52E+01	2.43E+00	2.20E+00	5.98E+01	3.01E-01	2.48E-02	1.24E-01	3.01E-01	4.70E+00	8.70E-01	-1.53E+01
Greenhouse potential - biogenic	eq. kg CO ₂	-2.61E-02	1.55E-03	3.11E-03	-2.15E-02	1.03E-03	6.68E-05	3.34E-04	1.03E-03	4.34E-01	6.22E-04	-5.03E-01
Global warming potential - land use and land use change	eq. kg CO ₂	5.40E-01	8.07E-04	2.31E-04	5.41E-01	1.18E-04	3.87E-06	1.94E-05	1.18E-04	8.50E-03	4.68E-05	-3.23E-01
Stratospheric ozone depletion potential	eq. kg CFC ₁₁	2.03E-06	5.30E-08	2.38E-08	2.11E-06	6.96E-08	1.36E-10	6.81E-10	6.96E-08	1.16E-07	2.16E-09	-4.28E-07
Soil and water acidification potential	eq. mol H ⁺	3.64E-01	7.81E-03	2.46E-02	3.96E-01	1.22E-03	2.62E-04	1.31E-03	1.22E-03	3.37E-02	5.80E-04	-9.62E-02
Eutrophication potential - freshwater	eq. kg P	1.14E-02	1.66E-04	3.74E-03	1.53E-02	2.02E-05	4.27E-05	2.14E-04	2.02E-05	2.30E-03	8.73E-06	-8.82E-03
Eutrophication potential - seawater	eq. kg N	4.80E-02	2.63E-03	3.22E-03	5.39E-02	3.68E-04	3.71E-05	1.86E-04	3.68E-04	6.16E-03	1.92E-03	-2.13E-02
Eutrophication potential - terrestrial	eq. mol N	5.13E-01	2.86E-02	2.74E-02	5.69E-01	4.02E-03	3.24E-04	1.62E-03	4.02E-03	6.14E-02	2.36E-03	-1.43E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.88E-01	1.18E-02	8.73E-03	2.09E-01	1.23E-03	9.31E-05	4.66E-04	1.23E-03	1.36E-02	1.03E-03	-4.62E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.02E-04	8.38E-06	8.93E-07	2.12E-04	1.07E-06	9.34E-09	4.67E-08	1.07E-06	7.84E-05	1.84E-07	-4.71E-05
Abiotic depletion potential - fossil fuels	MJ	7.46E+02	3.45E+01	4.25E+01	8.23E+02	4.46E+00	3.91E-01	1.96E+00	4.46E+00	6.96E+01	1.81E+00	-2.45E+02
Water deprivation potential	eq. m ³	3.55E+01	1.81E-01	8.31E-01	3.65E+01	2.06E-02	7.48E-03	3.74E-02	2.06E-02	1.69E+00	8.60E-03	-2.06E+01

Table 14 Life cycle assessment (LCA) results of Maxito XT panel 12 mm – additional impacts indicators (DU: 1 m²)

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

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Table 15 Life cycle assessment (LCA) results of the Maxito XT panel 12 mm - 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	1.84E+02	5.61E-01	2.99E+00	1.87E+02	6.40E-02	3.22E-02	1.61E-01	6.40E-02	1.05E+01	2.71E-02	-9.06E+01
Consumption of renewable primary energy resources used as raw materials	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	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.84E+02	5.61E-01	2.99E+00	1.87E+02	6.40E-02	3.22E-02	1.61E-01	6.40E-02	1.05E+01	2.72E-02	-9.04E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	7.13E+02	3.45E+01	3.76E+01	7.86E+02	4.46E+00	3.91E-01	1.96E+00	4.46E+00	3.39E+02	-2.83E+02	-5.47E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	5.37E+01	0.00E+00	4.94E+00	5.87E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.69E+02	2.84E+02	-2.69E+02
Total consumption of non-renewable primary energy resources	MJ	7.67E+02	3.45E+01	4.25E+01	8.44E+02	4.46E+00	3.91E-01	1.96E+00	4.46E+00	6.96E+01	1.81E+00	-2.73E+02
Consumption of secondary materials	kg	9.16E-01	1.54E-02	2.98E-03	9.34E-01	1.50E-03	3.40E-05	1.70E-04	1.50E-03	7.81E+00	6.53E-04	-7.71E+00
Consumption of renew. secondary fuels	MJ	1.78E-02	2.02E-04	1.23E-05	1.80E-02	1.65E-05	1.72E-07	8.59E-07	1.65E-05	4.61E-04	1.22E-05	-6.47E-04
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	2.66E-04	0.00E+00	-2.66E-04
Net consumption of freshwater	m ³	1.87E+00	4.17E-03	2.44E-02	1.90E+00	5.61E-04	1.12E-03	5.62E-03	5.61E-04	4.45E-02	2.68E-02	-4.90E-01

Table 16 Life cycle assessment (LCA) results of Maxito XT panel 12 mm – waste categories (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	4.07E+00	4.94E-02	3.64E-01	4.49E+00	5.01E-03	3.03E-03	1.52E-02	5.01E-03	3.10E-01	3.19E-03	-1.73E+00
Non-hazardous waste	kg	6.19E+01	1.06E+00	1.84E+01	8.13E+01	8.89E-02	2.04E-01	1.02E+00	8.89E-02	1.42E+01	3.61E+01	-4.26E+01
Radioactive waste	kg	1.04E-04	1.01E-05	4.08E-06	1.05E-04	3.33E-07	5.87E-08	2.94E-07	3.33E-07	1.91E-04	4.76E-07	-7.70E-03
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	4.54E-02	4.13E-04	8.37E-01	8.83E-01	1.38E-05	2.63E-06	1.31E-05	1.38E-05	2.06E-01	3.06E-05	-1.60E-02
Materials for energy recovery	kg	2.17E-05	2.19E-06	1.11E-01	1.11E-01	1.12E-07	4.22E-09	2.11E-08	1.12E-07	4.42E-06	1.25E-07	-5.54E-06
Exported Energy	MJ	1.03E+00	1.51E-02	1.16E-02	1.06E+00	0.00E+00	1.25E-03	6.26E-03	0.00E+00	1.23E-01	3.81E-04	-1.61E-01

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Table 17 Life cycle assessment (LCA) results of Maxito Glass ESG panel 12 mm – environmental impacts (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	5.57E+01	4.44E+00	4.01E+00	6.42E+01	5.51E-01	4.53E-02	2.27E-01	5.51E-01	3.07E+00	9.63E-02	-1.37E+01
Greenhouse potential - fossil	eq. kg CO ₂	5.52E+01	4.44E+00	4.01E+00	6.36E+01	5.49E-01	4.52E-02	2.26E-01	5.49E-01	3.03E+00	9.52E-02	-1.33E+01
Greenhouse potential - biogenic	eq. kg CO ₂	-2.61E-02	2.84E-03	5.68E-03	-1.76E-02	1.87E-03	1.22E-04	6.09E-04	1.87E-03	3.37E-02	9.61E-04	-1.01E-01
Global warming potential - land use and land use change	eq. kg CO ₂	5.40E-01	1.47E-03	4.21E-04	5.42E-01	2.15E-04	7.07E-06	3.53E-05	2.15E-04	5.01E-03	9.65E-05	-3.20E-01
Stratospheric ozone depletion potential	eq. kg CFC 11	2.03E-06	9.67E-08	4.35E-08	2.17E-06	1.27E-07	2.49E-10	1.24E-09	1.27E-07	8.20E-08	2.90E-08	-3.91E-07
Soil and water acidification potential	eq. mol H ⁺	3.64E-01	1.42E-02	4.49E-02	4.23E-01	2.23E-03	4.78E-04	2.39E-03	2.23E-03	2.54E-02	8.04E-04	-8.61E-02
Eutrophication potential - freshwater	eq. kg P	1.14E-02	3.03E-04	6.83E-03	1.85E-02	3.69E-05	7.79E-05	3.90E-04	3.69E-05	1.23E-03	2.77E-05	-7.68E-03
Eutrophication potential - seawater	eq. kg N	4.80E-02	4.80E-03	5.87E-03	5.87E-02	6.72E-04	6.77E-05	3.39E-04	6.72E-04	4.10E-03	2.77E-04	-1.87E-02
Eutrophication potential - terrestrial	eq. mol N	5.13E-01	5.22E-02	5.01E-02	6.15E-01	7.33E-03	5.91E-04	2.95E-03	7.33E-03	4.46E-02	3.02E-03	-1.20E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.88E-01	2.16E-02	1.59E-02	2.26E-01	2.25E-03	1.70E-04	8.50E-04	2.25E-03	1.55E-02	8.73E-04	-4.63E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.02E-04	1.53E-05	1.63E-06	2.19E-04	1.94E-06	1.70E-08	8.52E-08	1.94E-06	5.90E-05	3.23E-07	-2.71E-05
Abiotic depletion potential - fossil fuels	MJ	7.46E+02	6.29E+01	7.76E+01	8.87E+02	8.14E+00	7.14E-01	3.57E+00	8.14E+00	3.77E+01	2.20E+00	-2.09E+02
Water deprivation potential	eq. m ³	3.55E+01	3.30E-01	1.52E+00	3.73E+01	3.76E-02	1.36E-02	6.82E-02	3.76E-02	1.18E+00	1.28E-02	-1.99E+01

Table 18 Life cycle assessment (LCA) results of Maxito Glass ESG panel 12 mm – additional impacts indicators (DU: 1 m²)

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

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Table 19 Life cycle assessment (LCA) results of the Maxito Glass ESG panel 12 mm - 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	1,84E+02	1,02E+00	5,45E+00	1,90E+02	1,17E-01	5,87E-02	2,94E-01	1,17E-01	3,40E+00	0,00E+00	-8,33E+01
Consumption of renewable primary energy resources used as raw materials	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	0,00E+00	0,00E+00
Total consumption of renewable primary energy resources	MJ	1,84E+02	1,02E+00	5,45E+00	1,90E+02	1,17E-01	5,87E-02	2,94E-01	1,17E-01	3,40E+00	3,87E-02	-8,31E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	7,13E+02	6,30E+01	6,86E+01	8,45E+02	8,14E+00	7,14E-01	3,57E+00	8,14E+00	5,74E+01	2,38E+00	-2,60E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	5,37E+01	0,00E+00	9,02E+00	6,27E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,97E+01	0,00E+00	-1,86E+01
Total consumption of non-renewable primary energy resources	MJ	7,67E+02	6,30E+01	7,76E+01	9,08E+02	8,14E+00	7,14E-01	3,57E+00	8,14E+00	3,77E+01	2,38E+00	-2,37E+02
Consumption of secondary materials	kg	9,16E-01	2,81E-02	5,45E-03	9,49E-01	2,73E-03	6,21E-05	3,10E-04	2,73E-03	6,74E-01	0,00E+00	-5,40E-01
Consumption of renew. secondary fuels	MJ	1,78E-02	3,69E-04	2,24E-05	1,82E-02	3,01E-05	3,13E-07	1,57E-06	3,01E-05	4,82E-04	0,00E+00	-6,48E-04
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	1,94E-05	0,00E+00	-1,83E-05
Net consumption of freshwater	m ³	1,87E+00	7,61E-03	4,45E-02	1,92E+00	1,02E-03	2,05E-03	1,03E-02	1,02E-03	2,74E-02	3,43E-04	-4,66E-01

Table 20 Life cycle assessment (LCA) results of Maxito Glass ESG panel 12 mm – waste categories (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	4.07E+00	9.02E-02	6.65E-01	4.83E+00	9.14E-03	5.53E-03	2.77E-02	9.14E-03	2.24E-01	3.47E-06	-1.62E+00
Non-hazardous waste	kg	6.19E+01	1.93E+00	3.35E+01	9.73E+01	1.62E-01	3.73E-01	1.86E+00	1.62E-01	5.55E+00	9.07E+00	-3.35E+01
Radioactive waste	kg	1.04E-04	1.85E-05	7.44E-06	1.06E-04	6.08E-07	1.07E-07	5.36E-07	6.08E-07	5.21E-05	1.34E-05	-7.70E-03
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	4.54E-02	7.53E-04	1.53E+00	1.57E+00	2.52E-05	4.79E-06	2.40E-05	2.52E-05	1.96E-01	0.00E+00	-1.04E-02
Materials for energy recovery	kg	2.17E-05	3.99E-06	2.03E-01	2.03E-01	2.04E-07	7.70E-09	3.85E-08	2.04E-07	3.53E-06	0.00E+00	-4.37E-06
Exported Energy	MJ	1.03E+00	2.75E-02	2.12E-02	1.08E+00	0.00E+00	2.28E-03	1.14E-02	0.00E+00	1.19E-02	0.00E+00	-4.67E-02

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Table 21 Life cycle assessment (LCA) results of Maxito Polmet Z 1S panel – environmental impacts (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	9.23E+01	1.74E+00	1.57E+00	9.56E+01	2.15E-01	1.77E-02	8.86E-02	2.15E-01	5.20E+00	5.26E-02	-2.63E+01
Greenhouse potential - fossil	eq. kg CO ₂	9.14E+01	1.73E+00	1.57E+00	9.47E+01	2.14E-01	1.77E-02	8.84E-02	2.14E-01	5.17E+00	5.20E-02	-2.55E+01
Greenhouse potential - biogenic	eq. kg CO ₂	-1.39E-01	1.11E-03	2.22E-03	-1.35E-01	7.33E-04	4.76E-05	2.38E-04	7.33E-04	1.83E-02	5.25E-04	-1.65E-01
Global warming potential - land use and land use change	eq. kg CO ₂	1.02E+00	5.76E-04	1.65E-04	1.02E+00	8.42E-05	2.76E-06	1.38E-05	8.42E-05	8.66E-03	5.27E-05	-6.09E-01
Stratospheric ozone depletion potential	eq. kg CFC 11	3.57E-06	3.78E-08	1.70E-08	3.63E-06	4.96E-08	9.72E-11	4.86E-10	4.96E-08	5.34E-07	1.58E-08	-7.56E-07
Soil and water acidification potential	eq. mol H ⁺	6.07E-01	5.57E-03	1.75E-02	6.30E-01	8.70E-04	1.87E-04	9.35E-04	8.70E-04	4.55E-02	4.39E-04	-1.66E-01
Eutrophication potential - freshwater	eq. kg P	1.86E-02	1.18E-04	2.67E-03	2.14E-02	1.44E-05	3.05E-05	1.52E-04	1.44E-05	2.05E-03	1.51E-05	-1.47E-02
Eutrophication potential - seawater	eq. kg N	8.14E-02	1.88E-03	2.30E-03	8.56E-02	2.63E-04	2.65E-05	1.32E-04	2.63E-04	1.53E-02	1.51E-04	-3.58E-02
Eutrophication potential - terrestrial	eq. mol N	9.11E-01	2.04E-02	1.96E-02	9.51E-01	2.87E-03	2.31E-04	1.15E-03	2.87E-03	8.55E-02	1.65E-03	-2.31E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	3.00E-01	8.45E-03	6.22E-03	3.15E-01	8.78E-04	6.64E-05	3.32E-04	8.78E-04	2.91E-02	4.76E-04	-8.94E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.64E-04	5.98E-06	6.37E-07	2.71E-04	7.60E-07	6.66E-09	3.33E-08	7.60E-07	1.07E-04	1.76E-07	-5.30E-05
Abiotic depletion potential - fossil fuels	MJ	1.11E+03	2.46E+01	3.03E+01	1.17E+03	3.18E+00	2.79E-01	1.40E+00	3.18E+00	5.90E+01	1.20E+00	-4.00E+02
Water deprivation potential	eq. m ³	5.71E+01	1.29E-01	5.93E-01	5.78E+01	1.47E-02	5.33E-03	2.67E-02	1.47E-02	1.57E+00	6.98E-03	-3.79E+01

Table 22 Life cycle assessment (LCA) results of Maxito Polmet Z 1S panel – additional impacts indicators (DU: 1 m²)

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

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Table 23 Life cycle assessment (LCA) results of the Maxito Polmet Z 1S panel - 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	3,35E+02	4,00E-01	2,13E+00	3,37E+02	4,57E-02	2,30E-02	1,15E-01	4,57E-02	5,12E+00	2,11E-02	-1,58E+02
Consumption of renewable primary energy resources used as raw materials	MJ	2,75E+04	0,00E+00	0,00E+00	2,75E+04	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	2,78E+04	4,00E-01	2,13E+00	2,78E+04	4,57E-02	2,30E-02	1,15E-01	4,57E-02	5,12E+00	2,11E-02	-1,58E+02
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1,14E+03	2,46E+01	2,68E+01	1,20E+03	3,18E+00	2,79E-01	1,40E+00	3,18E+00	5,32E+01	1,30E+00	-4,79E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	2,18E+02	0,00E+00	3,53E+00	2,22E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,75E+00	0,00E+00	-1,86E+01
Total consumption of non-renewable primary energy resources	MJ	1,36E+03	2,46E+01	3,03E+01	1,42E+03	3,18E+00	2,79E-01	1,40E+00	3,18E+00	5,90E+01	1,30E+00	-4,53E+02
Consumption of secondary materials	kg	1,64E+00	1,10E-02	2,13E-03	1,65E+00	1,07E-03	2,43E-05	1,21E-04	1,07E-03	4,71E-01	0,00E+00	-5,49E-01
Consumption of renew. secondary fuels	MJ	1,75E-02	1,44E-04	8,77E-06	1,77E-02	1,18E-05	1,22E-07	6,12E-07	1,18E-05	8,63E-04	0,00E+00	-1,27E-03
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	9,17E-06	0,00E+00	-1,83E-05
Net consumption of freshwater	m ³	3,29E+00	2,97E-03	1,74E-02	3,31E+00	4,00E-04	8,01E-04	4,01E-03	4,00E-04	3,56E-02	1,87E-04	-8,88E-01

Table 24 Life cycle assessment (LCA) results of Maxito Polmet Z 1S panel – waste categories (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	6.49E+00	3.52E-02	2.60E-01	6.79E+00	3.57E-03	2.16E-03	1.08E-02	3.57E-03	3.69E-01	1.89E-06	-3.10E+00
Non-hazardous waste	kg	7.05E+01	7.56E-01	1.31E+01	8.43E+01	6.34E-02	1.46E-01	7.28E-01	6.34E-02	8.76E+00	4.95E+00	-6.36E+01
Radioactive waste	kg	1.64E-03	7.24E-06	2.91E-06	1.65E-03	2.38E-07	4.19E-08	2.09E-07	2.38E-07	7.42E-05	7.31E-06	-1.47E-03
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	7.93E-02	2.94E-04	5.97E-01	6.77E-01	9.85E-06	1.87E-06	9.37E-06	9.85E-06	3.73E-01	0.00E+00	-1.94E-02
Materials for energy recovery	kg	1.25E-05	1.56E-06	7.93E-02	7.93E-02	7.97E-08	3.01E-09	1.50E-08	7.97E-08	5.96E-06	0.00E+00	-8.45E-06
Exported Energy	MJ	1.97E-01	1.08E-02	8.29E-03	2.16E-01	0.00E+00	8.93E-04	4.46E-03	0.00E+00	3.13E-01	0.00E+00	-8.51E-02

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Table 25 Life cycle assessment (LCA) results of Maxito Polmet Z 2S panel – environmental impacts (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	7.95E+01	1.95E+00	1.76E+00	8.32E+01	2.41E-01	1.98E-02	9.91E-02	2.41E-01	6.15E+00	7.59E-02	-2.42E+01
Greenhouse potential - fossil	eq. kg CO ₂	7.90E+01	1.94E+00	1.76E+00	8.27E+01	2.40E-01	1.98E-02	9.91E-02	2.40E-01	5.87E+00	7.50E-02	-2.36E+01
Greenhouse potential - biogenic	eq. kg CO ₂	-1.08E-01	1.24E-03	2.49E-03	-1.05E-01	8.22E-04	5.34E-05	2.67E-04	8.22E-04	2.71E-01	7.57E-04	-1.20E-01
Global warming potential - land use and land use change	eq. kg CO ₂	8.97E-01	6.45E-04	1.85E-04	8.98E-01	9.43E-05	3.10E-06	1.55E-05	9.43E-05	1.01E-02	7.60E-05	-5.37E-01
Stratospheric ozone depletion potential	eq. kg CFC 11	3.49E-06	4.24E-08	1.90E-08	3.55E-06	5.56E-08	1.09E-10	5.45E-10	5.56E-08	4.56E-07	2.28E-08	-7.28E-07
Soil and water acidification potential	eq. mol H ⁺	5.18E-01	6.24E-03	1.97E-02	5.44E-01	9.76E-04	2.10E-04	1.05E-03	9.76E-04	4.70E-02	6.33E-04	-1.57E-01
Eutrophication potential - freshwater	eq. kg P	1.57E-02	1.33E-04	2.99E-03	1.89E-02	1.62E-05	3.42E-05	1.71E-04	1.62E-05	2.57E-03	2.18E-05	-1.32E-02
Eutrophication potential - seawater	eq. kg N	7.03E-02	2.10E-03	2.57E-03	7.50E-02	2.94E-04	2.97E-05	1.48E-04	2.94E-04	1.43E-02	2.18E-04	-3.25E-02
Eutrophication potential - terrestrial	eq. mol N	7.84E-01	2.29E-02	2.19E-02	8.29E-01	3.21E-03	2.59E-04	1.29E-03	3.21E-03	8.95E-02	2.38E-03	-2.21E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	2.83E-01	9.47E-03	6.98E-03	2.99E-01	9.84E-04	7.45E-05	3.72E-04	9.84E-04	2.57E-02	6.87E-04	-8.45E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.08E-04	6.70E-06	7.14E-07	2.15E-04	8.52E-07	7.47E-09	3.73E-08	8.52E-07	1.09E-04	2.54E-07	-5.85E-05
Abiotic depletion potential - fossil fuels	MJ	1.13E+03	2.76E+01	3.40E+01	1.19E+03	3.57E+00	3.13E-01	1.56E+00	3.57E+00	7.58E+01	1.73E+00	-3.64E+02
Water deprivation potential	eq. m ³	4.80E+01	1.45E-01	6.65E-01	4.89E+01	1.65E-02	5.98E-03	2.99E-02	1.65E-02	1.92E+00	1.01E-02	-3.36E+01

Table 26 Life cycle assessment (LCA) results of Maxito Polmet Z 2S panel – additional impacts indicators (DU: 1 m²)

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

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Table 27 Life cycle assessment (LCA) results of the Maxito Polmet Z 2S panel - 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	2.91E+02	4.49E-01	2.39E+00	2.94E+02	5.12E-02	2.57E-02	1.29E-01	5.12E-02	9.23E+00	3.04E-02	-1.40E+02
Consumption of renewable primary energy resources used as raw materials	MJ	2.13E+04	0.00E+00	0.00E+00	2.13E+04	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	2.16E+04	4.49E-01	2.39E+00	2.16E+04	5.12E-02	2.57E-02	1.29E-01	5.12E-02	9.23E+00	3.04E-02	-1.39E+02
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	9.74E+02	2.76E+01	3.01E+01	1.03E+03	3.57E+00	3.13E-01	1.56E+00	3.57E+00	2.31E+02	1.87E+00	-4.18E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	3.52E+02	0.00E+00	3.95E+00	3.56E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.55E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	1.33E+03	2.76E+01	3.40E+01	1.39E+03	3.57E+00	3.13E-01	1.56E+00	3.57E+00	7.58E+01	1.87E+00	-4.11E+02
Consumption of secondary materials	kg	1.45E+00	1.23E-02	2.39E-03	1.47E+00	1.20E-03	2.72E-05	1.36E-04	1.20E-03	4.96E+00	0.00E+00	-2.01E-02
Consumption of renew. secondary fuels	MJ	3.30E-03	1.62E-04	9.84E-06	3.47E-03	1.32E-05	1.37E-07	6.86E-07	1.32E-05	7.74E-04	0.00E+00	-1.28E-03
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	1.65E-04	0.00E+00	0.00E+00
Net consumption of freshwater	m ³	2.85E+00	3.33E-03	1.95E-02	2.87E+00	4.49E-04	8.98E-04	4.49E-03	4.49E-04	4.72E-02	2.71E-04	-7.89E-01

Table 28 Life cycle assessment (LCA) results of Maxito Polmet Z 2S panel – waste categories (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	5.39E+00	3.95E-02	2.91E-01	5.72E+00	4.00E-03	2.42E-03	1.21E-02	4.00E-03	3.99E-01	2.73E-06	-2.81E+00
Non-hazardous waste	kg	5.97E+01	8.47E-01	1.47E+01	7.52E+01	7.11E-02	1.63E-01	8.17E-01	7.11E-02	1.36E+01	7.15E+00	-5.72E+01
Radioactive waste	kg	1.39E-03	8.11E-06	3.26E-06	1.40E-03	2.66E-07	4.69E-08	2.35E-07	2.66E-07	1.58E-04	1.05E-05	-1.29E-03
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	6.92E-02	3.30E-04	6.69E-01	7.39E-01	1.10E-05	2.10E-06	1.05E-05	1.10E-05	3.38E-01	0.00E+00	-1.68E-02
Materials for energy recovery	kg	1.13E-05	1.75E-06	8.89E-02	8.89E-02	8.93E-08	3.37E-09	1.69E-08	8.93E-08	6.09E-06	0.00E+00	-8.41E-06
Exported Energy	MJ	1.07E-01	1.21E-02	9.29E-03	1.28E-01	0.00E+00	1.00E-03	5.00E-03	0.00E+00	3.16E-01	0.00E+00	-8.62E-02

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Table 29 Life cycle assessment (LCA) results of Maxito Doors (with aluminium panels) – environmental impacts (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	2.07E+02	2.80E+00	2.53E+00	2.12E+02	3.47E-01	2.86E-02	1.43E-01	3.47E-01	1.26E+01	3.02E-02	-6.47E+01
Greenhouse potential - fossil	eq. kg CO ₂	2.05E+02	2.80E+00	2.53E+00	2.10E+02	3.46E-01	2.85E-02	1.42E-01	3.46E-01	1.26E+01	2.99E-02	-6.29E+01
Greenhouse potential - biogenic	eq. kg CO ₂	-2.76E-01	1.79E-03	3.58E-03	-2.70E-01	1.18E-03	7.68E-05	3.84E-04	1.18E-03	1.55E-02	3.01E-04	-3.38E-01
Global warming potential - land use and land use change	eq. kg CO ₂	2.57E+00	9.28E-04	2.65E-04	2.57E+00	1.36E-04	4.46E-06	2.23E-05	1.36E-04	2.20E-02	3.03E-05	-1.49E+00
Stratospheric ozone depletion potential	eq. kg CFC 11	8.67E-06	6.10E-08	2.74E-08	8.76E-06	8.00E-08	1.57E-10	7.83E-10	8.00E-08	6.40E-07	9.09E-09	-1.88E-06
Soil and water acidification potential	eq. mol H ⁺	1.35E+00	8.98E-03	2.83E-02	1.39E+00	1.40E-03	3.02E-04	1.51E-03	1.40E-03	1.12E-01	2.52E-04	-4.11E-01
Eutrophication potential - freshwater	eq. kg P	4.20E-02	1.91E-04	4.30E-03	4.65E-02	2.32E-05	4.91E-05	2.46E-04	2.32E-05	5.21E-03	8.67E-06	-3.60E-02
Eutrophication potential - seawater	eq. kg N	1.84E-01	3.02E-03	3.70E-03	1.91E-01	4.24E-04	4.27E-05	2.13E-04	4.24E-04	2.23E-02	8.70E-05	-8.79E-02
Eutrophication potential - terrestrial	eq. mol N	2.01E+00	3.29E-02	3.16E-02	2.07E+00	4.62E-03	3.72E-04	1.86E-03	4.62E-03	1.86E-01	9.46E-04	-5.73E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	6.73E-01	1.36E-02	1.00E-02	6.96E-01	1.42E-03	1.07E-04	5.36E-04	1.42E-03	6.80E-02	2.74E-04	-2.22E-01
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	5.22E-04	9.64E-06	1.03E-06	5.33E-04	1.23E-06	1.07E-08	5.37E-08	1.23E-06	2.74E-04	1.01E-07	-1.34E-04
Abiotic depletion potential - fossil fuels	MJ	2.46E+03	3.97E+01	4.89E+01	2.54E+03	5.13E+00	4.50E-01	2.25E+00	5.13E+00	1.49E+02	6.90E-01	-9.82E+02
Water deprivation potential	eq. m ³	1.35E+02	2.08E-01	9.56E-01	1.36E+02	2.37E-02	8.60E-03	4.30E-02	2.37E-02	3.98E+00	4.01E-03	-9.29E+01

Table 30 Life cycle assessment (LCA) results of Maxito Doors (with aluminium panels) – additional impacts indicators (DU: 1 m²)

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

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Table 31 Life cycle assessment (LCA) results of the Maxito Doors (with aluminium panels) - 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	8.26E+02	6.46E-01	3.43E+00	8.31E+02	7.36E-02	3.70E-02	1.85E-01	7.36E-02	1.26E+01	1.21E-02	-3.88E+02
Consumption of renewable primary energy resources used as raw materials	MJ	1.91E+04	0.00E+00	0.00E+00	1.91E+04	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	1.99E+04	6.46E-01	3.43E+00	1.99E+04	7.36E-02	3.70E-02	1.85E-01	7.36E-02	1.26E+01	1.21E-02	-3.87E+02
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.56E+03	3.97E+01	4.32E+01	2.64E+03	5.13E+00	4.50E-01	2.25E+00	5.13E+00	1.43E+02	7.46E-01	-1.14E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.47E+02	0.00E+00	5.69E+00	1.52E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.16E+00	0.00E+00	-3.71E+00
Total consumption of non-renewable primary energy resources	MJ	2.70E+03	3.97E+01	4.89E+01	2.79E+03	5.13E+00	4.50E-01	2.25E+00	5.13E+00	1.49E+02	7.46E-01	-1.11E+03
Consumption of secondary materials	kg	4.09E+00	1.77E-02	3.43E-03	4.11E+00	1.72E-03	3.91E-05	1.96E-04	1.72E-03	6.52E-01	0.00E+00	-1.54E-01
Consumption of renew. secondary fuels	MJ	6.66E-03	2.33E-04	1.41E-05	6.91E-03	1.90E-05	1.97E-07	9.87E-07	1.90E-05	2.22E-03	0.00E+00	-3.20E-03
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	4.22E-06	0.00E+00	-3.67E-06
Net consumption of freshwater	m ³	8.10E+00	4.79E-03	2.81E-02	8.13E+00	6.46E-04	1.29E-03	6.46E-03	6.46E-04	8.93E-02	1.08E-04	-2.18E+00

Table 32 Life cycle assessment (LCA) results of Maxito Doors (with aluminium panels) – waste categories (DU: 1 m²)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.45E+01	5.68E-02	4.19E-01	1.50E+01	5.76E-03	3.49E-03	1.74E-02	5.76E-03	9.43E-01	1.09E-06	-7.64E+00
Non-hazardous waste	kg	1.50E+02	1.22E+00	2.11E+01	1.73E+02	1.02E-01	2.35E-01	1.17E+00	1.02E-01	2.18E+01	2.85E+00	-1.56E+02
Radioactive waste	kg	3.87E-03	1.17E-05	4.69E-06	3.89E-03	3.83E-07	6.75E-08	3.38E-07	3.83E-07	1.77E-04	4.20E-06	-3.60E+01
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	1.94E-01	4.75E-04	9.63E-01	1.16E+00	1.59E-05	3.02E-06	1.51E-05	1.59E-05	9.61E-01	0.00E+00	-4.67E-02
Materials for energy recovery	kg	1.80E-05	2.52E-06	1.28E-01	1.28E-01	1.28E-07	4.85E-09	2.43E-08	1.28E-07	1.52E-05	0.00E+00	-2.11E-05
Exported Energy	MJ	2.21E-01	1.74E-02	1.34E-02	2.52E-01	0.00E+00	1.44E-03	7.20E-03	0.00E+00	2.16E-01	0.00E+00	-2.00E-01

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Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. 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.)	
☒ 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
- PN-EN 14388:2005 Road traffic noise reducing devices - Specifications
- PN-EN 14388:2005/AC:2008 Road traffic noise reducing devices - Specifications
- 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
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- ISO 20915:2018 Life cycle inventory calculation methodology for steel products
- KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej. December 2023
- World Steel Association 2017 Life Cycle inventory methodology report for steel products
- <https://ecoinvent.org/>

LCA, LCI audit and input data verification
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Head of Thermal Physic, Acoustic and Environment Department
Agnieszka Winkler-Skalna, PhD. C.E. Eng.
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CERTIFICATE No 846/2025 of TYPE III ENVIRONMENTAL DECLARATION

Products:

Panels for acoustic screens

Manufacturer:

Maxito Sp. z o.o. Sp.K

Jana Kilińskiego 72/74 apt. 5, 42-218 Częstochowa, 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 10th October 2025 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physics, Acoustics
and Environment Department

Agnieszka Winkler-Skalna, PhD



Deputy Director
for Research and Innovation

Krzysztof Kuczyński, PhD

Warsaw, October 2025