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Acoustic panel BUDAN h500



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Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804 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. Their aspects were verified by the independent body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

Life cycle analysis (LCA): A1-A3, C1-C4 and D modules, in accordance with EN 15804
(Cradle to Gate with options)

The year of preparing the EPD: 2022

Service Life: 30 years, SL shall vary depending on a specific scenario of application

PCR: ITB-PCR A (PCR based on EN 15804)

Declared unit: 1 kg of product (1 m² included)

Reasons for performing LCA: B2B

Representativeness: manufactured in Poland, year 2021

BASIC INFORMATION

BUD-MASZ was established in 1990. Company is a producer of products: trapezoidal sheets, sheet roofing, a complete system of metal gutter and acoustic panels BUDAN h500 covered by this EPD. The location of manufacturing plant is Poland. The machines that manufacture acoustic panels were produced by BUD-MASZ Company, which guarantees the quality of production and services. The production lines consist of two independent production lines, working simultaneously, capable of manufacturing up to 2500 m² of panels a day.



PRODUCTS DESCRIPTION

BUDAN h500 acoustic panels are used in road construction. Noise barriers made of these panels allow to significantly reduce the traffic noise nuisance, which is emitted to the environment by road vehicles. BUDAN h500 acoustic panels can be used near roads of all classes, from motorways to local roads, bridges and overpasses, tunnel entrances and between carriageways. BUDAN h500 acoustic panels are also a material for the construction of noise barriers along railway lines. Modular design and low weight allow for the construction of noise barriers on railway embankments and in hard-to-reach places. Products can be used both near electrified railway lines as well as non-electrified routes, at transshipment sites, sidings and depots. Moreover absorbing panels are a solution for the construction of acoustic casings for industry. BUDAN h500 can be used both outside and inside buildings. They can be mounted near technological installations on roofs, as facades or as partition walls in industrial halls. BUDAN h500 acoustic panels have the following aspects: low construction cost, the efficient acoustic performance, aesthetics and availability in any color, resistance to vandalism (anti-graffiti coating), a minimum lifetime of 30 years, are made of non-combustible materials, have lightweight modular design, resistance to weathering and corrosion, a good support for climbing plants environment protection. Products are easy to install and reach by emergency services in case of any emergency.

BUDANh500 acoustic panels are available in a few versions. The most popular are the following:

- BUDAN h500 STANDARD – absorbing on one side (figure 1)
- BUDAN h500 PA– absorbing on both sides (figure 2)

BUDAN h 500 panels are equipped with own stabilizing seals, due to which they are assembled just by sliding the panel into a previously prepared structure. This solution is the economic way of assembling an acoustic panel or acoustic casing. The small weight of panels assembled in the traditional way facilitates assembling without a crane. The panels are delivered to the building site in tightly secured returnable pallets, which enables their storage or assembling directly from the car. BUDAN h500 standard is acoustic panels absorbing one-sided, with typical dimensions 0.5x5m and smaller, front wall from the noise source side is perforated, pressed aluminum sheet with a structure, rear wall - embossed aluminum sheet with a structure, filling with sound-absorbing material 50 mm thick mineral wool with glass wool veil, riveted side covers with gaskets for assembly in the structure.

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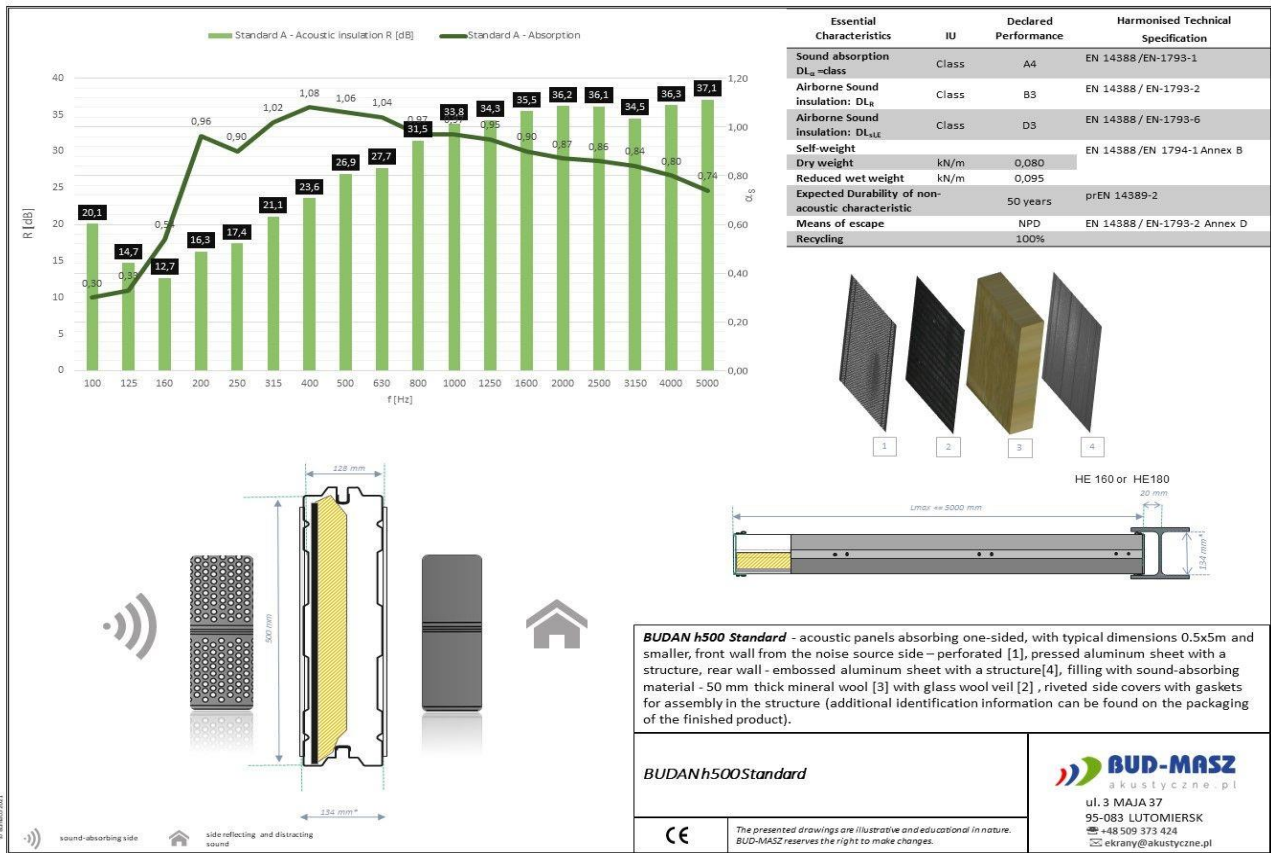


Figure 1. Budan h500 Standard – technical information about product

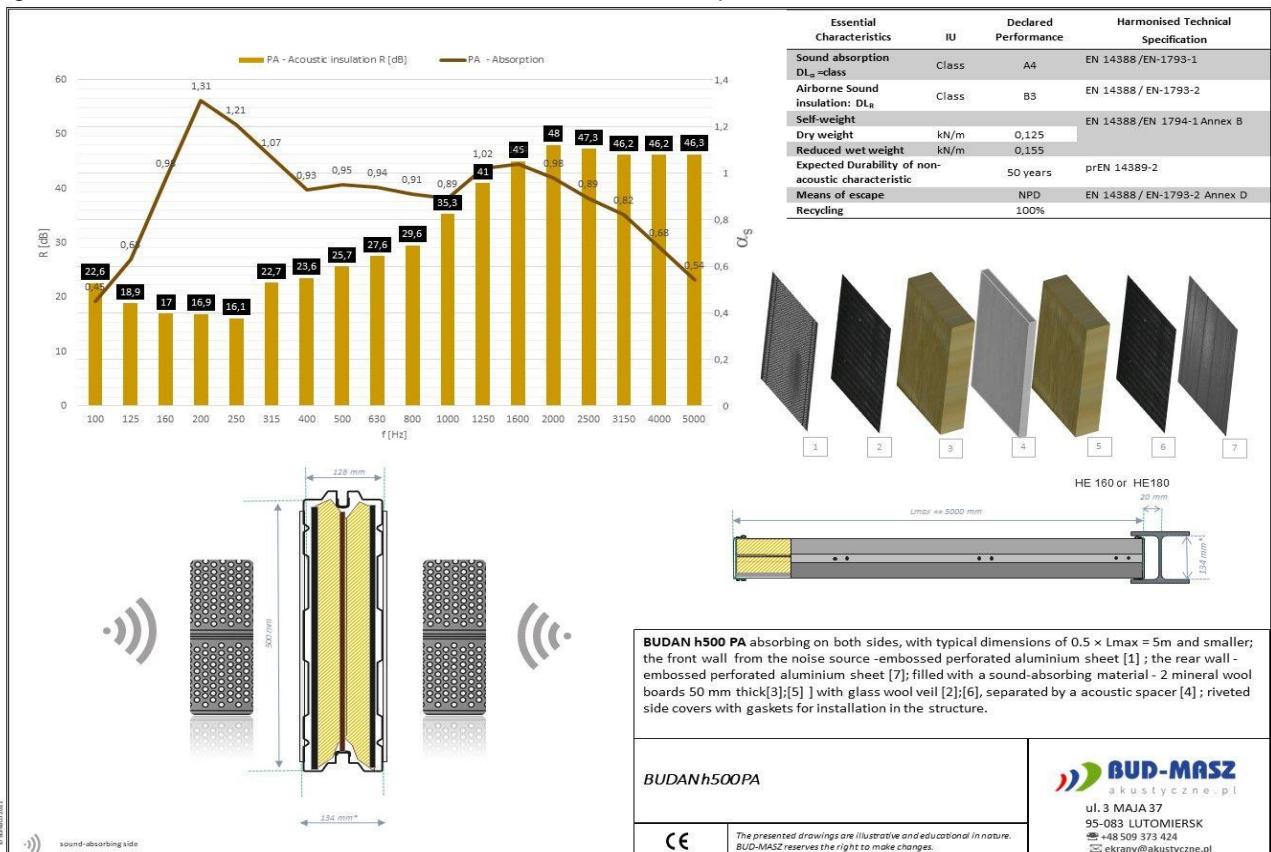


Figure 2. Budan h500 PA– technical information about product

All specific product technical data (ingots and profiles) is available at manufacturer [website](#).

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is the production of 1 kg of product BUDAN h500.

Note: The declaration provides also the impact values of 1 m² of the product.

System boundary

The life cycle analysis of the declared product covers “Product Stage” A1-A3, C1-C4+D modules in accordance with EN 15804 and ITB PCR A (cradle to gate with options).

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. The EPD is representative for all BUDAN h500 products (production impacts are allocated to kg of all products, the same way, mass based). Allocation covers 100% of production. All impacts from aluminium production are allocated in A1 module

System limits

Minimum 99.5% input materials and 100% energy consumption (electricity, gas, LPG) were inventoried in manufacturing plant and were included in the calculation. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation utilized thermal energy, and electric power consumption, direct production waste and available emission measurements. Tires consumption for transport was not taken into account. Substances with a percentage share of less than 0.1% of total mass were excluded from the calculations. It is assumed that the total sum of omitted processes does not exceed 0.5% of all impact categories. All packaging products are excluded in the analysis (considered closed loop). In accordance with EN 15804 machines and facilities required for and during production are excluded, as is transportation of employees.

A1 and A2 Modules: Raw materials supply and transport

The modules A1 and A2 represent the extraction and processing of raw materials, mainly: aluminium and mineral wool and transport to the production site. Production of aluminium is specific data based (representative producer). Packaging (e.g. wooden pallets) circulates almost in a closed cycle (therefore it is not included in LCA). For A2 calculation purposes, manufactured inventory data is analysed and European averages for fuel data are applied. Specific impact for the production of 1 kg of aluminium is considered.

A3: Production

The product specific production process is presented in Figure 3. Aluminium is processed and assembled with mineral wool and seals. Electricity and gas are consumed in the process.

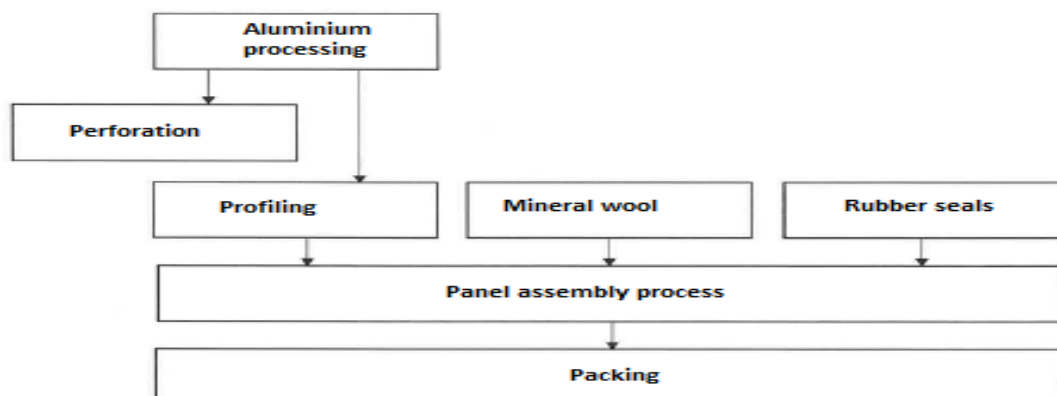


Figure 3. A schematic diagram of the industrial process - A3 module

End of life scenarios (C and D modules)

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The end-of-life scenario for all products has been generalized based on actual state of the art. It is assumed that in the end of life stage (C1), some electric/mechanical energy is needed to remove products from installation place, the transport distance for waste to waste processing (C2) is 50 km on > 10t loaded lorry with 50% capacity utilization and fuel consumption of 20 l per 100 km. At the end of life the panels are dismantled and the materials recycled according to the national treatment practice of waste what is presented in Table 1. When a mineral wool reaches the end of its useful life, it may be landfilled. Aluminium is recycled 100%. The reuse, recovery and recycling stage is considered beyond the system boundaries (D). Net scrap is an amount of aluminium recycled at end-of-life minus scrap input from previous product life cycles. Each scenario assumes that rate % of the material is sent to that scenario (table 1).

Table 1. End of life scenarios for the base materials

Parameter	Material recovery	Energy recovery	Disposal	Recycling
Aluminium	100%	0%	0%	100%
Mineral wool	100%	0%	100%	0%
other e.g. gaskets	100%	0%	100%	0%

Electricity at end-of-life (module C) has been modelled using an average Polish electricity mix as the location where the product reaches end-of-life is unknown.

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2021 – 31.12.2021 (1 year). The life cycle assessments were done for Poland as reference area.

Calculation rules

LCA was done in accordance with ITB PCR a document. Characterization factors are CML ver. 4.2 based. ITB-LCA algorithms were used for impact calculations. A1 was calculated based on data from the database (mineral wool) and specific EPD (aluminium product), A2 and A3 are calculated based on the LCI questionnaire provided by the manufacturer. Emission of greenhouse gases was calculated using the IPCC 2013 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 were all calculated with the CML-IA baseline method

Data quality - production

The values determined to calculate A1-A3 originate from verified process LCI inventory data from each plant. A1 values for inputs excluding aluminium were prepared considering input products characteristics based on Ecoinvent data. The carbon data for input aluminium production is based on valid specific EPD. The energy consumption of production and its impact on the production lines were separately inventoried and calculated. In accordance with Annex E of the EN 15804 + A2, a data quality assessment was performed. For technical representativeness, processes with a quality level of "very good" of the value for climate change indicator.

Assumptions and estimates

According to the data adopted from the Ecoinvent 3.8 database, the post-consumer scrap is not burdened with the environmental impacts, however, scrap processing impacts is eq. ~0.5 kg CO₂/kg (EEA).

Databases

The background data for the processes come from the following databases: Ecoinvent v.3.8 (mineral wool, transport, energy carriers, heat, diesel, gas, gaskets, other) and KOBIZE (Polish electricity mix and combustion factors for fuels). KOBIZE data is supplemented with Ecoinvent data on the Polish electricity mix impact where no specific indicator data is provided. Specific (LCI) data quality analysis was a part of the input data verification. The time related quality of the data used is valid (5 years).

Additional information

Polish electricity mix used is 0.698 kg CO₂/kWh (KOBIZE, 2021).

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to the declared unit DU – 1 kg of panels (Tables 3-6). The following life cycle modules are included in the declaration (Table 2). Tables 7-10 provides the environmental impacts of 1 m² of product.

Table 2. System boundaries (life stage modules included) in a product environmental assessment

Environmental assessment information																
(MA – Module assessed, MNA – Module not assessed, 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
MA	MA	MA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MA	MA	MA	MA	MA

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Table 3. Life cycle assessment (LCA) results of acoustic panel BUDAN h500 – the environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	5.19E+00	5.92E-02	1.04E-01	8.38E-02	2.73E-03	1.19E-01	2.10E-03	-2.57E+00
Greenhouse gas potential - fossil	eq. kg CO ₂	5.19E+00	5.85E-02	1.02E-01	8.22E-02	2.70E-03	1.19E-01	2.10E-03	-2.57E+00
Greenhouse gas potential - biogenic	eq. kg CO ₂	1.38E-02	1.82E-04	2.74E-03	2.40E-03	8.40E-06	1.76E-02	2.08E-05	-3.74E-03
Global warming potential - land use and land use change	eq. kg CO ₂	2.61E-02	2.12E-05	3.32E-05	2.88E-05	9.78E-07	8.79E-06	4.75E-07	-7.34E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	4.63E-07	1.41E-08	3.25E-09	1.68E-09	6.51E-10	3.00E-11	1.05E-09	-2.03E-07
Soil and water acidification potential	eq. mol H+	4.19E-02	2.41E-04	1.05E-03	9.12E-04	1.11E-05	3.04E-04	2.07E-05	-1.49E-02
Eutrophication potential - freshwater	eq. kg P	1.21E-03	3.81E-06	1.78E-04	1.56E-04	1.76E-07	3.45E-05	1.30E-07	-1.12E-03
Eutrophication potential - seawater	eq. kg N	1.95E-03	7.15E-05	1.53E-04	1.32E-04	3.30E-06	2.42E-05	7.85E-06	-5.03E-04
Eutrophication potential - terrestrial	eq. mol N	2.88E-02	7.80E-04	1.30E-03	1.12E-03	3.60E-05	1.24E-04	8.50E-05	-4.98E-03
Potential for photochemical ozone synthesis	eq. kg NMVOC	6.15E-03	2.60E-04	3.64E-04	3.12E-04	1.20E-05	1.60E-05	2.45E-05	-1.73E-03
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	3.46E-04	1.38E-07	4.60E-07	4.01E-07	6.39E-09	1.99E-06	4.16E-09	-8.30E-07
Abiotic depletion potential - fossil fuels	MJ	4.80E+01	9.04E-01	1.73E+00	1.39E+00	4.17E-02	6.35E-01	6.70E-02	-2.72E+01
Water deprivation potential	eq. m ³	1.97E+00	4.16E-03	3.30E-02	2.88E-02	1.92E-04	2.57E-03	2.50E-04	-5.55E-01

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Table 4. Life cycle assessment (LCA) results of of acoustic panel BUDAN h500 – the environmental aspects (DU: 1 kg)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.76E+01	1.17E-02	1.18E-01	1.03E-01	5.40E-04	9.15E-02	1.35E-03	-1.13E+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
Total consumption of renewable primary energy resources	MJ	3.76E+01	1.17E-02	1.18E-01	1.03E-01	5.40E-04	9.15E-02	1.35E-03	-1.13E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	5.41E+01	9.04E-01	1.74E+00	1.40E+00	4.17E-02	7.05E-01	6.70E-02	-3.21E+01
Consumption of non-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
Total consumption of non-renewable primary energy resources	MJ	5.41E+01	9.04E-01	1.74E+00	1.40E+00	4.17E-02	7.05E-01	6.70E-02	-3.21E+01
Consumption of secondary materials	kg	8.91E-03	2.54E-04	1.52E-04	1.27E-04	1.17E-05	1.38E-04	1.39E-05	0.00E+00
Consumption of renewable secondary fuels	MJ	8.01E-05	2.24E-06	8.18E-07	7.09E-07	1.04E-07	1.14E-05	4.35E-07	0.00E+00
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	1.28E-03	1.13E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m ³	1.36E-01	1.17E-04	4.36E-04	3.78E-04	5.40E-06	3.70E-04	8.00E-05	-6.15E-02

Table 5. Life cycle assessment (LCA) results of of acoustic panel BUDAN h500 – the environmental impacts relate to waste management (DU: 1 kg)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous waste, neutralized	kg	4.50E-02	9.75E-04	4.50E-05	1.44E-05	4.50E-05	2.98E-03	5.00E-06	-1.09E-03
Non-hazardous waste, neutralised	kg	4.10E+00	1.69E-02	1.29E-03	7.49E-04	7.80E-04	3.18E-03	5.00E-04	-1.30E+00
Radioactive waste	kg	2.61E-04	6.16E-04	1.19E-06	1.04E-06	2.84E-05	3.91E-07	2.99E-09	-1.31E-04
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
Materials for recycling	kg	1.64E-04	2.93E-06	1.67E-06	1.44E-06	1.35E-07	4.56E-01	1.07E-07	4.91E-01
Materials for energy recovery	kg	1.11E-06	2.07E-08	1.49E-08	1.26E-08	9.57E-10	1.24E-08	1.07E-5	-1.68E-07

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Table 6. Life cycle assessment (LCA) results of of acoustic panel BUDAN h500 – the environmental additional information (DU: 1 kg)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA

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Table 7. Life cycle assessment (LCA) results of acoustic panel BUDAN h500 – the environmental impacts (DU: 1 m²)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	1.04E+02	1.19E+00	2.09E+00	1.68E+00	5.49E-02	2.39E+00	4.22E-02	-5.17E+01
Greenhouse gas potential - fossil	eq. kg CO ₂	1.04E+02	1.18E+00	2.05E+00	1.65E+00	5.43E-02	2.39E+00	4.22E-02	-5.17E+01
Greenhouse gas potential - biogenic	eq. kg CO ₂	2.78E-01	3.66E-03	5.51E-02	4.82E-02	1.69E-04	3.53E-01	4.17E-04	-7.52E-02
Global warming potential - land use and land use change	eq. kg CO ₂	5.25E-01	4.26E-04	6.66E-04	5.79E-04	1.97E-05	1.77E-04	9.55E-06	-1.47E-01
Stratospheric ozone depletion potential	eq. kg CFC 11	9.31E-06	2.84E-07	6.54E-08	3.38E-08	1.31E-08	6.03E-10	2.11E-08	-4.08E-06
Soil and water acidification potential	eq. mol H+	8.42E-01	4.83E-03	2.11E-02	1.83E-02	2.23E-04	6.11E-03	4.15E-04	-2.98E-01
Eutrophication potential - freshwater	eq. kg P	2.42E-02	7.66E-05	3.57E-03	3.14E-03	3.53E-06	6.93E-04	2.61E-06	-2.25E-02
Eutrophication potential - seawater	eq. kg N	3.92E-02	1.44E-03	3.07E-03	2.65E-03	6.63E-05	4.87E-04	1.58E-04	-1.01E-02
Eutrophication potential - terrestrial	eq. mol N	5.78E-01	1.57E-02	2.61E-02	2.24E-02	7.24E-04	2.48E-03	1.71E-03	-1.00E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.24E-01	5.23E-03	7.32E-03	6.27E-03	2.41E-04	3.22E-04	4.92E-04	-3.48E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	6.96E-03	2.78E-06	9.24E-06	8.06E-06	1.28E-07	4.00E-05	8.36E-08	-1.67E-05
Abiotic depletion potential - fossil fuels	MJ	9.64E+02	1.82E+01	3.48E+01	2.80E+01	8.38E-01	1.28E+01	1.35E+00	-5.46E+02
Water deprivation potential	eq. m ³	3.95E+01	8.36E-02	6.64E-01	5.79E-01	3.86E-03	5.16E-02	5.03E-03	-1.12E+01

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Table 8. Life cycle assessment (LCA) results of acoustic panel BUDAN h500 – the environmental aspects (DU: 1 m²)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	7.57E+02	2.35E-01	2.37E+00	2.07E+00	1.09E-02	1.84E+00	2.71E-02	-2.27E+02
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
Total consumption of renewable primary energy resources	MJ	7.57E+02	2.35E-01	2.37E+00	2.07E+00	1.09E-02	1.84E+00	2.71E-02	-2.27E+02
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.09E+03	1.82E+01	3.49E+01	2.81E+01	8.38E-01	1.42E+01	1.35E+00	-6.44E+02
Consumption of non-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
Total consumption of non-renewable primary energy resources	MJ	1.09E+03	1.82E+01	3.49E+01	2.81E+01	8.38E-01	1.42E+01	1.35E+00	-6.44E+02
Consumption of secondary materials	kg	1.79E-01	5.10E-03	3.06E-03	2.56E-03	2.35E-04	2.77E-03	2.78E-04	0.00E+00
Consumption of renewable secondary fuels	MJ	1.61E-03	4.51E-05	1.64E-05	1.43E-05	2.08E-06	2.29E-04	8.74E-06	0.00E+00
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	2.58E-02	2.26E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m ³	2.74E+00	2.35E-03	8.77E-03	7.60E-03	1.09E-04	7.43E-03	1.61E-03	-1.24E+00

Table 9. Life cycle assessment (LCA) results of acoustic panel BUDAN h500 – (DU: 1 m²)- environmental information describing waste categories

Indicator	Unit	A1	A2	A3	A1-A3	C2	C3	C4	D
Hazardous waste, neutralized	kg	9.04E-01	1.96E-02	9.04E-04	2.89E-04	9.05E-04	5.98E-02	1.01E-04	-2.19E-02
Non-hazardous waste, neutralised	kg	8.24E+01	3.40E-01	2.59E-02	1.51E-02	1.57E-02	6.38E-02	1.01E-02	-2.60E+01
Radioactive waste	kg	5.26E-03	1.24E-02	2.40E-05	2.10E-05	5.71E-04	7.86E-06	6.01E-08	-2.63E-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
Materials for recycling	kg	3.31E-03	5.88E-05	3.37E-05	2.89E-05	2.71E-06	9.17E+00	2.15E-06	9.06E+00
Materials for energy recovery	kg	2.23E-05	4.17E-07	2.99E-07	2.53E-07	1.92E-08	2.48E-07	#ARG!	-3.37E-06

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Table 10. Life cycle assessment (LCA) results of acoustic panel BUDAN h500 additional indicators (DU: 1m²)

Indicator	Unit	A1	A2	A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA

VERIFICATION

The process of verification of this EPD was 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 and ITB PCR A	
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.)	
<input checked="" type="checkbox"/> external	internal <input type="checkbox"/>
External verification of EPD: Ph.D. Eng. Halina Prejzner LCA, LCI audit and input data verification: Ph.D, D.Sc.Eng. Michał Piasecki. m.piasecki@itb.pl Verification of LCA: Ph.D. Eng. Justyna Tomaszewska. j.tomaszewska@itb.pl	

The declaration owner has the sole ownership, liability, and responsibility for the declaration. Declarations within the same product category but from different programmes may not be comparable. Declarations of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- 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
- EN 15804+A2 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- CRU Group. Carbon footprint by cold metal by country - <https://www.crugroup.com/about-cru/>
- EAA 2020 - Circular Aluminium Action Plan - A strategy for achieving aluminium's full potential for circular economy by 2030.
- European Life Cycle Database. ELCD 3.2.
<http://epca.jrc.ec.europa.eu/ELCD3/index.xhtml?stock=default>
- Ecoinvent Database. <http://www.ecoinvent.org/database/>.
- Life-Cycle inventory data for aluminium production and transformation processes in Europe. Environmental Profile Report. February 2018.
- Aluminium Recycling in LCA – European Aluminium Association, 2013.
- KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej, 2021
- JRC Technical Report, Sustainability aspects of Bauxite and Aluminium, 2021



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CERTIFICATE No 357/2022
of TYPE III ENVIRONMENTAL DECLARATION

Product:

Acoustic panel BUDAN h500

Manufacturer:

BUD-MASZ Przedsiębiorstwo Wielobranżowe
Maciej Stachlewski

ul. 3 Maja 37, 95-083 Lutomiersk, 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

Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.


This certificate, issued for the first time on 12th August 2022 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics
and Environment Department


Agnieszka Winkler-Skalna, PhD



Deputy Director
for Research and Innovation


Krzysztof Kuczyński, PhD

Warsaw, August 2022