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Lacquered HDF board

Owner of the EPD:
Woodeco MDF sp. z o. o.
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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-A3, C1-C4 and D modules in accordance with EN 15804 + A2 (Cradle-to-Gate with options)
The year of preparing the EPD: 2024
Product standard: EN 622-5
Service Life: > 40 years
PCR: ITB-PCR A, v. 1.6
Electricity mix: market-based approach
Characterisation factors: EF 3.1
Declared unit: 1 m^3
Reasons for performing LCA: B2B
Representativeness: Polish, European

MANUFACTURER

Woodeco is a provider of solutions based on wood-based materials for the furniture, construction and interior finishing industries. The company offers full service to furniture companies, carpenter's workshops, architects and designers as well as companies in the construction industry. On the Polish market, the company's products are available, among others, which includes more than 80 retail outlets, in selected DIY chains or building materials distribution outlets. The company's offer includes a wide range of products in line with the latest trends in the design, construction, finishing and equipment of both private and public buildings.

Fig. 1 A view of Woodeco MDF sp. z o. o. production plant located in Grajewo (Poland).

PRODUCTS DESCRIPTION AND APPLICATION

High-density fibreboard manufactured on the basis of wood fibres, bonded with synthetic resins and other additives. Lacquered HDF board is Raw HDF board coated with 4 paint layers, protected with UV varnish. The product is available in many formats and thicknesses in the range of 2.0 - 5.0 mm. The board is coated with a high-quality varnish in many designs. The portfolio includes one-colour decors, textile decors and wood reproductions. The application is internal use in dry conditions. Panels are sized: 2850x2070 and 2850x1830 or other depends on the agreement with receiver. Manufactured product is free from halogenated compounds or wood preservatives. Product may be used in permanent human dwellings. Lacquered HDF boards are used for the production of furniture, doors, floor and wall panels and decorative elements. Additionally in shop and fair stands finishes, as well as caravan and campervans interior elements. Requirements are specified by internal company standard ZN-5/2025 and EN 622-5. Density depends on the thickness: 800 – 950 kg/m^3. Formaldehyde emission from boards meets the requirements of hygiene class E1, E1 (compliant E1 E05) or CARB/TSCA depending on the order.

More information can be found on Woodeco MDF sp. z o. o. website: https://www.woodeco.eu

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Declared Unit

The declaration refers to declared unit (DU) – 1 m^3 of Lacquered HDF board.
Note: To convert from 1 m^3 to 1 m^2, you need to use the conversion factor from the board thickness (e.g. for a board with a thickness of 0.5 cm, the conversion factor from m^3 will be 0.005).

Allocation

The allocation rules used for this EPD are based on general ITB PCR A, v. 1.6. HDF lacquered board production is a line process with multiple co-products in one factory located in Grajewo (Poland). Allocation is done on product mass basis. All impacts from raw materials extraction and processing are allocated in A1 module of EPD. 99% of impacts from line production were inventoried and allocated to all HDF board production. Municipal waste and waste water of whole factory were allocated to module A3. Energy supply was inventoried for whole production process. Emissions in Woodeco were measured and were allocated to module A3. Packaging materials were taken into consideration. They are recycled in a closed loop.

System limits

The life cycle analysis (LCA) of the declared products covers product stage – modules A1-A3, end of life – modules C1-C4 and benefits and loads beyond the system boundary – module D (cradle-togate with options) in accordance with EN 15804 + A2 and ITB PCR A, v. 1.6. The details of systems limits are provided in product technical report. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. 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.

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

Raw materials such as round wood, wood chips, resins, primers, lacquers UV and hardeners come from local and foreign suppliers. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include 3,5-7,5 t lorry EURO 5, 16-32 t lorry. EURO 5 and train (resin). European standards for average combustion were used for calculations.

Module A3: *Production*

The Fig. 3 shows scheme of Raw HDF board process production by Woodeco. Round wood and wood chips are delivered to factory located in Grajewo, where are manufacturing in a few step process including washing, drying, sifting, forming, pressing, stacking and storing and shipping (Figure 3, HDF production). Then the fiberboard is coated, and lacquered, packaged and then stored prior to the shipment of the final product (Figure 4). The facility is ISO 14001 certified.

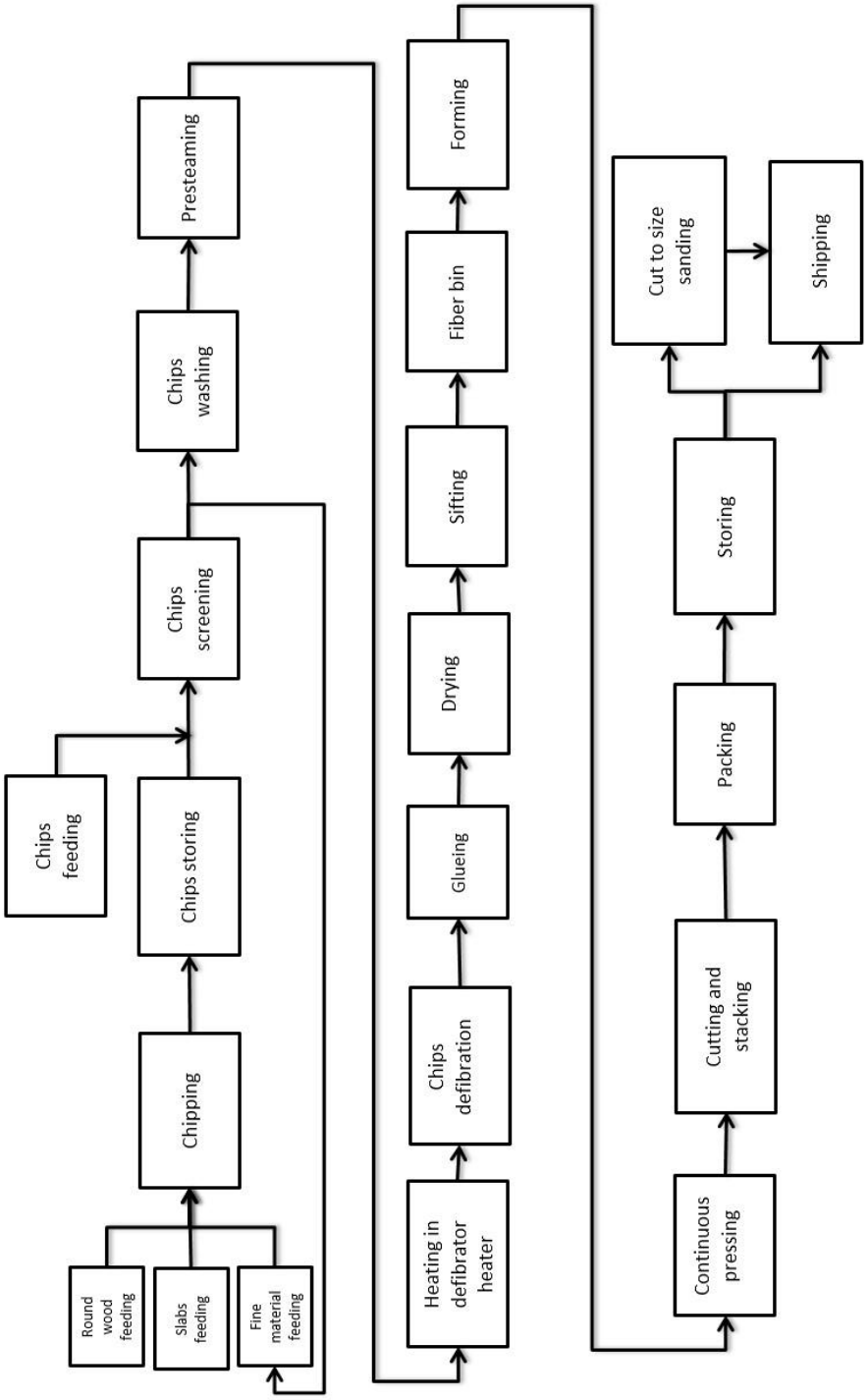

Fig. 2. A scheme of Raw HDF board process production by Woodeco (Poland)

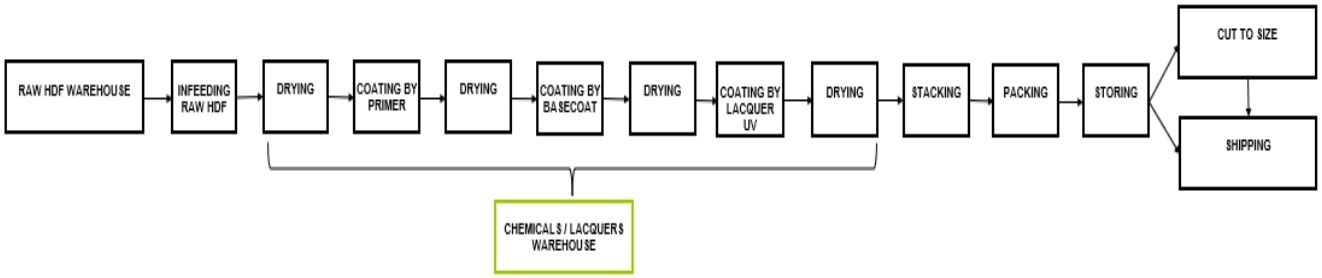

Fig. 3. A scheme of HDF board lacquering process production by Woodeco (Poland)

Modules C1-C4 and D: *End-of-life (EoL)*

In the adapted scenario, deconstruction of the boards is performed with the use of electrical tools (module C1). The resulting waste is transported to a waste processing plant distant about 60 km, on 16-32 t lorry EURO 5 (module C2). It is assumed that at the EoL cycle 90% of the boards is recovered in municipal incineration (module C3) while 10% undergo landfilling (module C4). Module D presents credits resulting from the benefits from avoided thermal energy production in exchange for using waste from plant which were used for own production line.

Data quality

The data selected for LCA originate from ITB-LCI questionnaires completed by Raw HDF board using the inventory data, ITB database, Ecoinvent database v. 3.10 and KOBiZE. No specific data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency are judged as good. Polish electricity was calculated based on Ecoinvent v 3.10 supplemented by actual national KOBiZE data. Polish electricity mix used (production) is 0.685 kg CO_2/kWh (KOBiZE 2023). Data is assessed as very good.

Data collection period

Primary data provided by Woodeco covers a period of 01.05.2022 – 30.04.2023 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Assumptions and estimates

The impacts of the representative of HDF board were aggregated using weighted average. Impacts were inventoried and calculated for all products in HDF board product group and they were presented in Tables 2-5.

Calculation rules

LCA was performed using ITB-LCA tool developed in accordance with EN 15804 + A2. No mass balance approach was used. Biogenic carbon was balanced. Biogenic carbon in final product is 301.6 kgC,, and in packing 12 kgC, conversion factor to CO_2 sequestered is 3.67.

Databases

The data for the processes comes from Ecoinvent v. 3.10 and ITB-Database. Specific data quality analysis was a part of external audit. Polish electricity mix used (production) is 0.685 kg CO_2/kWh (KOBiZE 2023).

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 m^3 of Lacquered HDF board manufactured by Woodeco

Table 1. System boundaries for the environmental characteristic of Lacquered HDF board manufactured by Woodeco

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**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MD**	**MD**	**MD**	**MD**	**MD**

Table 2. LCA results for 1 m^3 of lacquered HDF board - environmental impacts

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	-4.82E+02	3.49E+01	4.01E+02	-4.66E+01	3.43E-01	9.63E+00	1.15E+03	4.12E+01	-1.28E+03
Greenhouse gas potential - fossil	eq. kg CO_2	6.68E+02	3.48E+01	2.35E+02	9.38E+02	3.40E-01	9.62E+00	1.23E+01	5.83E+00	-1.37E+01
Greenhouse gas potential - biogenic	eq. kg CO_2	-1.15E+03	3.58E-02	1.66E+02	-9.85E+02	2.18E-03	8.37E-03	1.15E+03	3.53E+01	-1.26E+03
Global warming potential - land use and land use change	eq. kg CO_2	7.63E-01	1.73E-02	8.21E-02	8.63E-01	1.20E-04	4.75E-03	3.20E-03	3.19E-03	-3.54E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	2.27E-05	7.73E-07	2.42E-06	2.59E-05	2.05E-09	2.09E-07	2.07E-07	2.51E-08	-2.29E-07
Soil and water acidification potential	eq. mol H+	3.68E+00	7.65E-02	2.20E+00	5.96E+00	3.23E-03	2.10E-02	1.26E-01	5.56E-02	-1.40E-01
Eutrophication potential - freshwater	eq. kg P	1.75E-01	2.55E-03	3.58E-01	5.35E-01	5.33E-04	6.83E-04	5.30E-03	6.57E-04	-5.87E-03
Eutrophication potential - seawater	eq. kg N	6.11E-01	1.93E-02	3.60E-01	9.91E-01	4.67E-04	5.30E-03	6.74E-02	1.45E-01	-7.46E-02
Eutrophication potential - terrestrial	eq. mol N	9.03E+00	1.97E-01	3.02E+00	1.22E+01	4.08E-03	5.39E-02	6.46E-01	3.42E-01	-7.15E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	2.67E+00	1.18E-01	1.20E+00	3.99E+00	1.17E-03	3.26E-02	1.64E-01	9.49E-02	-1.82E-01
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	5.72E-03	1.16E-04	2.67E-04	6.10E-03	3.61E-07	3.21E-05	2.40E-05	4.02E-06	-2.66E-05
Abiotic depletion potential - fossil fuels	MJ	1.21E+04	4.98E+02	3.51E+03	1.61E+04	5.20E+00	1.38E+02	1.04E+02	2.07E+01	-1.15E+02
Water deprivation potential	eq. m^3	1.18E+03	2.49E+00	8.50E+01	1.27E+03	9.80E-02	6.83E-01	5.21E+01	8.04E-01	-5.77E+01

Table 4. LCA results for 1 m^3 of lacquered HDF board - the resource use

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	5.75E+03	7.94E+00	-3.54E+03	2.22E+03	5.64E-01	2.15E+00	-1.09E+04	-9.43E+02	-1.21E+04
Consumption of renewable primary energy resources used as raw materials	MJ	6.41E+03	0.00E+00	3.90E+03	1.03E+04	0.00E+00	0.00E+00	1.09E+04	9.44E+02	-1.21E+04
Total consumption of renewable primary energy resources	MJ	1.22E+04	7.94E+00	3.65E+02	1.25E+04	5.64E-01	2.15E+00	2.34E+00	3.47E-01	-2.59E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	9.96E+03	4.98E+02	3.46E+03	1.39E+04	5.20E+00	1.38E+02	1.04E+02	-1.36E+02	-1.15E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	2.16E+03	0.00E+00	0.00E+00	2.16E+03	0.00E+00	0.00E+00	0.00E+00	1.57E+02	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	1.21E+04	4.98E+02	3.51E+03	1.61E+04	5.20E+00	1.38E+02	1.04E+02	2.07E+01	-1.15E+02
Consumption of secondary materials	kg	1.69E+01	2.29E-01	8.00E-01	1.79E+01	5.49E-04	6.28E-02	2.51E-01	1.22E-02	-2.77E-01
Consumption of renewable secondary fuels	MJ	1.86E+01	2.89E-03	3.17E-03	1.86E+01	2.65E-06	8.00E-04	5.85E-04	1.15E-04	-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	0.00E+00
Net consumption of freshwater resources	m^3	3.07E+01	6.06E-02	9.13E+00	3.99E+01	1.35E-02	1.66E-02	-1.75E-01	-6.30E-03	1.94E-01

Table 5. LCA results for 1 m^3 of Lacquered HDF board – additional impacts indicators

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	2.42E-04	2.86E-06	4.60E-06	2.50E-04	5.45E-09	7.92E-07	1.41E-06	1.89E-05	-1.56E-06
Potential human exposure efficiency relative to U235	eg. kBq U235	1.76E+02	6.69E-01	1.05E+01	1.87E+02	1.61E-02	1.81E-01	1.24E-01	1.86E-02	-1.37E-01
Potential comparative toxic unit for ecosystems	CTUe	1.82E+04	1.38E+02	1.26E+03	1.96E+04	1.40E+00	3.80E+01	1.42E+02	6.36E+01	-1.57E+02
Potential comparative toxic unit for humans (cancer effects)	CTUh	5.12E-05	2.56E-07	5.05E-07	5.19E-05	5.94E-10	7.04E-08	2.20E-07	3.84E-08	-2.44E-07
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	2.67E-05	3.29E-07	5.22E-06	3.22E-05	6.34E-09	9.09E-08	1.53E-06	3.18E-07	-1.69E-06
Potential soil quality index	dimensionless	2.78E+05	3.04E+02	8.36E+02	2.79E+05	1.22E+00	8.41E+01	3.01E+01	5.52E+01	-3.34E+01

Table 6. LCA results for 1 m^3 of Lacquered HDF board – waste categories

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	2.77E+01	3.43E-01	5.36E+01	8.17E+01	5.46E-02	9.35E-02	1.40E+00	1.44E-01	-1.55E+00
Non-hazardous waste neutralised	kg	7.77E+02	1.07E+01	2.04E+03	2.83E+03	2.59E+00	2.84E+00	7.57E+00	1.03E+02	-8.39E+00
Radioactive waste	kg	6.29E-03	1.74E-04	2.97E-03	9.44E-03	3.97E-06	4.49E-05	3.01E-05	4.59E-06	-3.34E-05
Components for re-use	kg	0.00E+00	0.00E+00	6.94E-05	6.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.32E-01	3.71E-03	1.69E-01	3.05E-01	2.62E-04	1.02E-03	1.09E-03	1.57E-04	-1.21E-03
Materials for energy recovery	kg	1.62E-03	3.10E-05	5.14E-05	1.70E-03	5.93E-08	8.57E-06	1.52E-05	1.33E-06	-1.68E-05
Energy exported	MJ	2.55E+01	1.93E-01	4.45E+00	3.02E+01	6.69E-03	5.19E-02	3.46E-02	5.44E-03	-3.83E-02

Verification

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

The basis for LCA analysis was EN 15804 + A2 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.1.3) [x] external [ ] internal
External verification of EPD: Halina Prejzner, PhD Eng LCA, LCI audit and input data verification: Mateusz Kozicki, PhD Verification of LCA: 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 within the same product category but from different programs may not be comparable. 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. Depending on the application, a corresponding conversion factor such as the specific weight per surface area must be taken into consideration.

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 (17065/17025 certified). 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 v. 1.6 General Product Category Rules for Construction Products
- EN 622-1:2003 Fibreboards - Specifications - Part 1: General requirements
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- EN 622-5 standard Fibreboards. Technical requirements. Part 5: Requirement for dry-formed panels (MDF) - other requirements.
- 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 + A2: 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
- KOBiZE Wskaźniki emisyjności CO_2, SO_2, NO_x, CO i pyłu całkowitego dla energii elektrycznej, 2023

LCA,LCI, input data verification
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Thermal Physics, Acoustics and Environment Department

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CERTIFICATE № 822/2025
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Lacquered HDF Board

Manufacturer:

Woodeco MDF Sp. z o.o.

ul. Wiórowa 1, 19-203 Grajewo, 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 15th July 2025 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics and Environment Department

Agnieszka Winkler-Skalna, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation

Krzysztof Kuczyński, PhD

Warsaw, July 2025