

# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025



**Product name:**

Polystyrene film for thermoforming

**Producer:**

ML FOIL Sp. Z o.o. Sp.k.

**Address:**

ul. Zachodnia 7,  
62-060 Stęszew, Polska



Issued on 23 June 2025  
Valid until 23 June 2030

# GENERAL INFORMATION

## EPD OWNER

<b>Manufacturer / EPD Holder</b>	ML FOIL Sp. Z o.o. Sp.k.
<b>Address</b>	ul. Zachodnia 7, 62-060 Stęszew, Polska
<b>Contact details</b>	Contact: biuro@mlfoil.pl
<b>Website</b>	<a href="https://www.mlfoil.pl/">https://www.mlfoil.pl/</a>

## PRODUCT IDENTIFICATION

<b>Product name</b>	Polystyrene film for thermoforming
<b>Place(s) of production</b>	Stęszew, Polska

## EPD INFORMATION

<b>EPD Poland program operator</b>	Multicert Sp. z o.o. Ul. Mydlarska 47, 04-690 Warszawa, Poland <a href="http://www.epd.org.pl">www.epd.org.pl</a> , <a href="mailto:epd@epd.org.pl">epd@epd.org.pl</a>
<b>EPD standards</b>	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
<b>Product category rules</b>	The CEN standard EN 15804+A2 serves as the core PCR.
<b>EPD verification</b>	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
<b>EPD verifier</b>	Daniel Wałach, Ph.D.
<b>EPD number</b>	EPD-P 09.06.2025
<b>Registration:</b>	EPD Polska <a href="http://www.epd.org.pl">www.epd.org.pl</a>
<b>Publishing date</b>	23 June 2025
<b>EPD valid until</b>	23 June 2030
<b>Reasons for performing LCA</b>	B2B
<b>Accountability</b>	The EPD Holder is responsible for the information provided and evidence. Multicert Sp. z o.o. does not hold responsibility for the manufacturer information, life cycle assessment data nor supporting evidence.

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

# COMPANY INFORMATION

## HOLDER OF THE EPD

ML FOIL Sp. Z o.o. Sp.k.  
ul. Zachodnia 7,  
62-060 Stęszew, Polska

## COMPANY PROFILE

ML FOIL Sp. z o.o. Sp.k. is a Polish family-owned company specializing in the production of thermoformed plastic films. The company was registered in the National Court Register on April 28, 2022, as a limited partnership. The enterprise operates based on modern film extrusion technologies using the cast film method, utilizing 100% secondary raw materials.

The company is characterized by an innovative approach to zero-waste production, where all production waste is ground and reused in the manufacturing process. The facility is equipped with 5-ton plastic mixers ensuring homogeneous mixtures and laboratories for raw material quality testing.

As a family business, ML FOIL places great emphasis on product quality and builds long-term relationships with customers based on mutual trust and cooperation

# PRODUCT INFORMATION

## PRODUCT DESCRIPTION

The polystyrene film manufactured by ML FOIL is a high-quality thermoformed material produced entirely from recycled polystyrene (PS). The product is characterized by the following technical parameters:

- Thickness range: 0.2 mm to 2.8 mm
- Width: up to 1200 mm
- Production method: Cast film extrusion
- Raw material: 100% secondary polystyrene (PS regranulate)
- Customization: Individual polymer blend systems tailored to customer requirements.

The film exhibits high mechanical strength, rigidity, and ease of thermoforming. The product also demonstrates resistance to moisture and salt solutions, as well as low thermal conductivity. Each product batch undergoes quality control testing in the company's laboratory, ensuring consistent parameters and high quality of delivered films.

## PRODUCT APPLICATION

The polystyrene films are suitable for thermoforming applications in various industrial sectors:

### **Primary applications:**

- Building sector: Thermal and acoustic insulation materials, decorative elements, protective coverings during construction works, ventilation system components.

### **Secondary applications:**

- Horticultural sector: Protective covers and tunnel films, irrigation system elements, thermoformed containers and pots.
- Automotive sector: Interior finishing elements, decorative panels and covers, thermoformed automotive components.
- Food sector: Food packaging through thermoforming, disposable trays and containers, packaging line components.

## PRODUCT STANDARDS

- EN 13163:2012+A2:2016 - Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products – Specification. (where applicable for insulation use).

## ADDITIONAL TECHNICAL INFORMATION

### Environmental Innovation Features:

- 100% secondary raw material utilization eliminating virgin polymer consumption
- Zero waste production system with complete reintegration of production waste
- Customized polymer blend systems optimizing product performance characteristics
- Local production reducing transportation-related emissions
- Energy-optimized manufacturing processes

### Environmental Benefits:

- Reduced CO<sub>2</sub> emissions through secondary material utilization
- Decreased waste volume directed to landfills
- Support for circular economy principles in plastics industry
- Localized supply chain minimizing carbon footprint
- End-of-life recyclability maintaining material value chain

### Quality Assurance:

All incoming raw materials are tested using laboratory equipment to ensure consistent quality. The production process includes continuous monitoring of key parameters including thickness uniformity, mechanical properties, and optical characteristics. Products are supplied with material certificates documenting compliance with specified technical requirements.

## PRODUCT RAW MATERIAL COMPOSITION

Material	Amount % (by weight)
Plastic regranulate (Polystyrene, PS)	100 %

## SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1% (1000 ppm).

# PRODUCT LIFE-CYCLE

## MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered in the product stage (A1–A3) include the production and supply of raw materials, packaging materials and other ancillary inputs, as well as electricity and water consumption during manufacturing. The treatment of waste generated on site and emissions associated with these processes are also included.

The declared product is a polystyrene (PS) film manufactured using 100% recycled polystyrene granulate, sourced from external suppliers. This material is considered a secondary raw material that has reached end-of-waste status prior to entering the system boundaries. No virgin polymer is used in the product. The manufacturing process includes internal handling of the material, processing in the production line, and shaping and packaging of the final product. Production processes are powered by electricity sourced from the national grid. Water is used in limited quantities for technical purposes.

Packaging materials used to prepare the product for distribution are included within the system boundaries. These materials (such as wooden pallets and stretch film) are delivered to the production site, with transport parameters based on data provided by the manufacturer.

Production waste generated during the manufacturing stage is sent to external municipal waste incineration facilities with energy recovery. The system accounts for potential environmental benefits from recovered thermal and electrical energy, which are included in module D.

## END OF LIFE (C1, C2, C3, C4, D)

At the end-of-life, during the deconstruction stage, 100% of the product is expected to be manually removed as separated waste designated for recycling, with no energy or material usage accounted for in this phase (C1). Although film can potentially be 100% recyclable, due to the limited number of PS processing facilities, a scenario based on statistical data on plastic waste management in the EU was adopted. Based on this, it was assumed that 25% of the waste will be landfilled, 43% will undergo energy recovery, and 32% will be recycled. The product is assumed to be transported 100 km to a waste facility (C2). As mentioned, 32% of the product is collected and sent to recycling plants, where it undergoes mechanical processes such as washing, shredding, melting, and pelletizing to produce recycled granulate (C3). The remaining 25% of the product is assumed to be sent to landfill, while 43% is incinerated with energy recovery. However, since the total energy recovery efficiency of the incineration process is below 60% under EN 15804 and is therefore entirely reported in Module C4.

Due to the 100% recycled content of the product, no benefits are claimed in Module D for avoided virgin material production, in order to prevent double counting. However, Module D includes benefits related to the energy recovery from incineration of packaging materials, which displace conventional electricity and heat production.

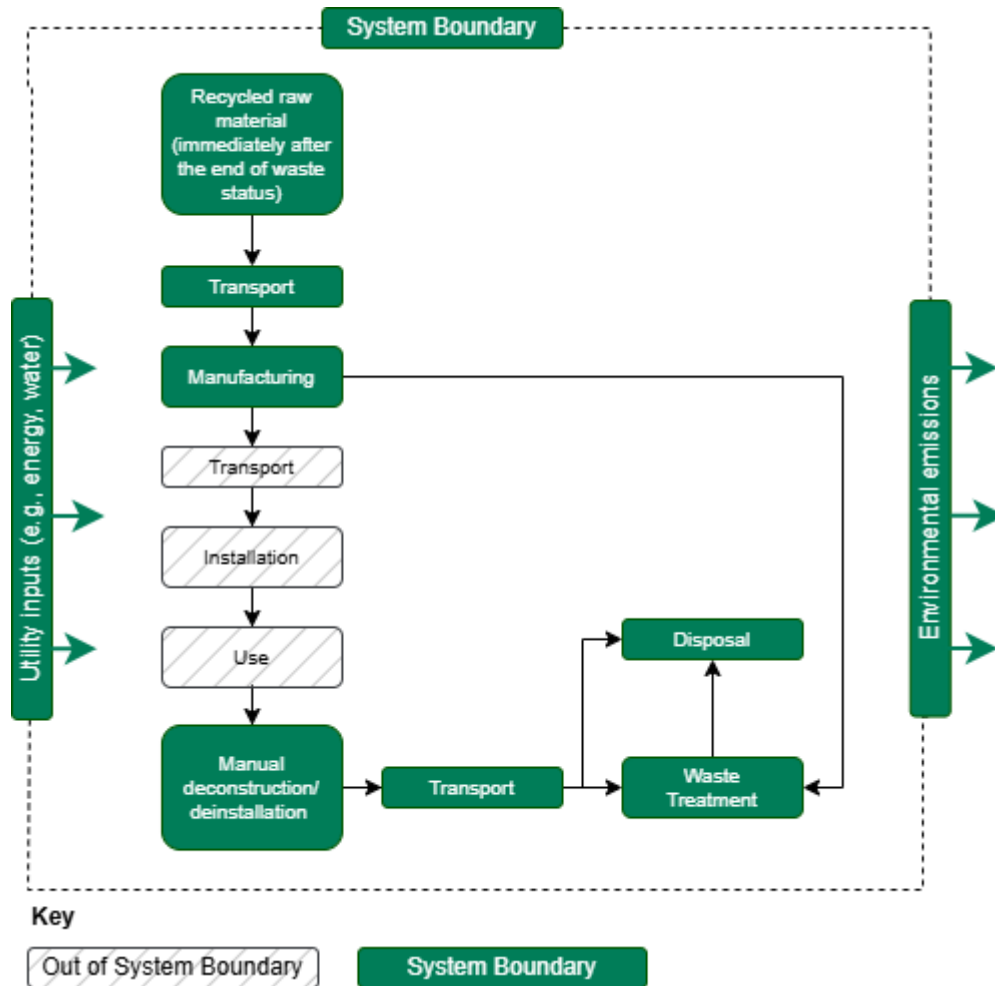


Figure 1 – System Boundary Diagram for Polystyrene Film

# LIFE-CYCLE ASSESSMENT

## LIFE-CYCLE ASSESSMENT INFORMATION

Period for data 2024 year

## DECLARED AND FUNCTIONAL UNIT

Declared unit 1 kg

## BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0.001

## SYSTEM BOUNDARY

The scope of the EPD is cradle to gate with modules C1-C4 and D. The modules A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), C1 (Deconstruction/Demolition), C2 (Waste Transport), C3 (Waste Processing), C4 (Waste Disposal) and D are included in the study.

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

Modules not declared = MND. Modules not relevant = MNR.



## CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the *EN 15804:2012+A2:2019*. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes which data are available for are included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass.

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

## ESTIMATES AND ASSUMPTIONS

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below:

- **Module (A1-A3):** All relevant data provided by the manufacturer have been included in the assessment. The product is entirely made from 100% recycled polystyrene granulate, which has reached end-of-waste status before entering the system boundary. The average transport distances for each input material were calculated based on supplier locations and allocated to the declared unit. Electricity from the national grid is used to power the production processes. Waste generated on site is sent for municipal waste incineration with energy recovery. Benefits from recovered energy are accounted for in Module D.
- **Module (C1):** Polystyrene film at the end of their service life are dismantled without requiring additional equipment or energy.
- **Module (C2):** 100 kms of distance is taken as an average for the transportation of waste to the treatment facilities.
- **Module (C3):** It is assumed that 32% of the products are collected and sent to recycling plants, where they undergo mechanical processes such as washing, shredding, melting, and pelletizing to produce recycled granulate.
- **Module (C4):** It is presumed that 25 % products are sent directly to landfills and 43% is directed to incineration with energy recovery (total energy recovery efficiency of the incineration process is below 60%).
- **Module (D):** Benefits are reported in Module D for energy recovery from incineration of packaging materials used in the product stage. No credits are claimed for the substitution of virgin PS granulate or energy recovery from the product itself, in order to avoid double counting, as the product is entirely made from recycled material.

## **ALLOCATION**

The allocation is carried out in accordance with the provisions of EN 15804. The information provided for the year 2024 includes all films produced at ML FOIL 's facilities during that year. The allocation included the following data: LPG, water, electricity, waste, and packaging. For the listed inputs and outputs, the data was compiled by the manufacturer collectively for the entire factory. Due to the similarity in the production processes of other products, a mass allocation approach was used to inventory data for individual products.

## **Data Quality**

For foreground data, the LCA study relies on high-quality primary data gathered by ML FOIL Sp. Z o.o. Sp.k. All relevant background data sets have been sourced from the LCA for Experts, version 10.9.1.17 – software's database Sphera Managed LCA Content Databases v2025 and from available EPD.

## **Geographic Representativeness**

The specified land or region where the product system is manufactured and managed is Poland, Europe.

# ENVIRONMENTAL IMPACT DATA

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Acidification	mol H+e	3,69E-04	MND	MND	MND	0,00E+00	1,56E-05	1,43E-04	1,74E-04	-2,01E-07
Climate change – total	kg CO <sub>2</sub> e	2,13E-01	MND	MND	MND	0,00E+00	8,44E-03	1,05E-01	1,46E+00	-1,27E-04
Climate change – fossil	kg CO <sub>2</sub> e	2,13E-01	MND	MND	MND	0,00E+00	8,54E-03	1,04E-01	1,46E+00	-1,26E-04
Climate change – biogenic	kg CO <sub>2</sub> e	-9,24E-04	MND	MND	MND	0,00E+00	-1,89E-04	7,05E-04	3,84E-05	-1,88E-07
Climate change – LULUC	kg CO <sub>2</sub> e	4,20E-04	MND	MND	MND	0,00E+00	8,77E-05	1,78E-05	3,20E-05	-2,48E-08
Abiotic depletion of fossil resources	MJ	2,29E+00	MND	MND	MND	0,00E+00	1,09E-01	1,47E+00	2,83E-01	-1,47E-03
Eutrophication, aquatic freshwater	kg PO <sub>4</sub> e	2,86E-07	MND	MND	MND	0,00E+00	2,30E-08	1,04E-06	4,22E-06	-1,01E-10
Eutrophication, aquatic marine	kg Ne	9,77E-05	MND	MND	MND	0,00E+00	6,64E-06	3,78E-05	3,86E-05	-5,38E-08
Eutrophication, terrestrial	mol Ne	1,06E-03	MND	MND	MND	0,00E+00	7,09E-05	3,99E-04	7,17E-04	-5,98E-07
Abiotic depletion, minerals & metals	kg Sbe	2,22E-08	MND	MND	MND	0,00E+00	5,67E-10	2,39E-08	1,36E-09	-9,03E-12
Ozone depletion	kg CFC11e	1,37E-11	MND	MND	MND	0,00E+00	1,41E-15	1,38E-12	1,01E-13	-1,04E-15
Photochemical ozone formation	kg NMVOCe	2,49E-04	MND	MND	MND	0,00E+00	1,40E-05	1,01E-04	1,16E-04	-1,46E-07
Water use	m <sup>3</sup> e depr.	-3,69E-03	MND	MND	MND	0,00E+00	3,90E-05	2,07E-02	1,18E-01	-9,51E-07

MND abbreviation stands for Module Not Declared, MNR stands for Module Not Relevant

EN 15804+A2 disclaimer for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

## ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Eco-toxicity (freshwater)	CTUe	1,20E+00	MND	MND	MND	0,00E+00	1,42E-01	4,53E-01	3,44E-01	-3,74E-04
Human toxicity, cancer effects	CTUh	2,98E-11	MND	MND	MND	0,00E+00	1,92E-12	2,39E-11	1,18E-11	-1,62E-14
Human toxicity, non-cancer effects	CTUh	9,81E-10	MND	MND	MND	0,00E+00	1,07E-10	5,06E-10	1,09E-10	-4,26E-13
Ionizing radiation, human health	kBq U235e	5,04E-04	MND	MND	MND	0,00E+00	2,96E-05	3,34E-02	1,69E-03	-1,27E-07
Particulate matter	Incidence	3,41E-09	MND	MND	MND	0,00E+00	1,30E-10	1,22E-09	1,21E-09	-1,75E-12

MND abbreviation stands for Module Not Declared, MNR stands for Module Not Relevant

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

## USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Total use of non-renewable PER	MJ	2,29E+00	MND	MND	MND	0,00E+00	1,09E-01	1,47E+00	2,83E-01	-1,47E-03
Total use of renewable PER	MJ	9,32E-01	MND	MND	MND	0,00E+00	8,23E-03	9,23E-01	6,42E-02	-5,05E-04
Use of net fresh water	m <sup>3</sup>	3,73E-04	MND	MND	MND	0,00E+00	4,07E-06	7,98E-04	2,78E-03	-1,64E-07
Use of renewable secondary fuels	MJ	0,00E+00	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary materials	kg	1,00E+00	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

PER abbreviation stands for primary energy resources

MND abbreviation stands for Module Not Declared, MNR stands for Module Not Relevant

## END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	kg	4,58E-09	MND	MND	MND	0,00E+00	4,38E-12	4,62E-08	1,14E-10	-8,64E-13
High Level Radioactive waste	kg	3,50E-06	MND	MND	MND	0,00E+00	2,06E-07	0,00E+00	1,09E-05	-1,01E-09
Non-hazardous waste	kg	1,63E-03	MND	MND	MND	0,00E+00	1,52E-05	4,04E-02	2,54E-01	-8,78E-07

## END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	kg	0,00E+00	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	MND	MND	MND	0,00E+00	0,00E+00	3,20E-01	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	3,59E-04	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	2,61E+00	-3,59E-04

## SCENARIO DOCUMENTATION

### Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, medium voltage, production mix (Reference product: electricity, medium voltage), Poland, 2023
Electricity CO <sub>2</sub> / kWh	0.669 kg CO <sub>2</sub> / kWh

### End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	0.32
Recovery process – kg for energy recovery	0.43
Disposal (total) – kg for final deposition	0.25
Scenario assumptions for transportation	End-of-life product is transported 100 km with Truck, Euro mix, 24.7t payload capacity

## BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

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Plastic Europe, The circular economy for plastic – A European Overview, Available at: <https://plasticseurope.org/>. [Accessed:18.06.2025]

## EPD VERIFICATION:

The verification procedure for this Environmental Product Declaration (EPD) has been carried out in accordance with the requirements of ISO 14025 standards. Once the verification process is complete, the EPD remains valid for a period of 5 years. There is no need to recalculate the parameters contained in the EPD after this period, provided that the data underlying the declaration have not changed substantially.

## EPD CONTRIBUTORS

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**Manufacturer representative**

Małgorzata Hauser-Cykowiak

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**EPD verifier**

Daniel Wałach, Ph.D.

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**Note:** The sole ownership, liability, and liability of this declaration are with the owner. Construction product declarations may not be comparable if they do not comply with EN 15804. For detailed information on comparability, please refer to EN 15804 and ISO 14025.



## EPD Poland Certificate



Reg. No. EPD-P 09.06.2025

# CERTIFICATE

## EPD TYPE III DECLARATION

(ENVIRONMENTAL PRODUCT DECLARATION)

This document confirms that the Environmental Product Declaration (EPD) developed by **ML FOIL Sp. z o.o. Sp.k.** for **polystyrene film for thermoforming**,

a product manufactured in accordance with

**EN 13163:2012+A2:2016**,

complies with the requirements of

**EN 15804+A2 and ISO 14025**,

and that the data contained therein has been correctly prepared.



Verification carried out by:

*Daniel Wafach*  
Daniel Wafach, Ph.D



*Grzegorz Suwara*  
Program Manager

Grzegorz Suwara

This document is valid until June 23, 2030, or until EPD is deregistered and its publication on the website [www.epd.org.pl](http://www.epd.org.pl) is discontinued.

EPD Polska Registration Office,  
Warsaw, June 23, 2025

[www.epd.com.pl](http://www.epd.com.pl)