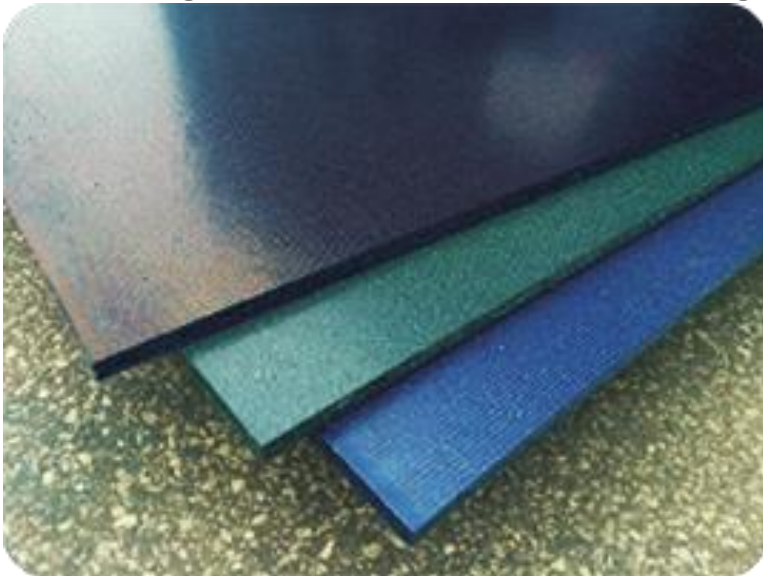




Issuance date: 16.03.2022  
Validity date: 16.03.2027

## EKOply board made in recycling technology



### Owner of the EPD:

Plastinvest Sp. z o.o.  
Address: Fabryczna 5  
26-130 Suchedniów, Poland  
w.biesaga@ekoply.com  
www.ekoply.com

### EPD Program Operator:

Instytut Techniki Budowlanej (ITB)  
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ITB is the verified member of The European Platform for EPD program operators and LCA practitioner



### 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 modules in accordance with EN 15804 (Cradle-to-Gate)

**The year of preparing the EPD:** 2022

**Product standard:** EN 15860, EN ISO 9054

**Service Life:** Under normal conditions a board made of recycled polymer has reference service life (RSL) up to last 10 years

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

**Declared unit:** 1 tonne

**Reasons for performing LCA:** B2B

**Representativeness:** Polish, European

### MANUFACTURER

PLASTINVEST Sp. z o.o. produces EKOpoly board which nearly consists of 99% of recycled material. EKOpoly is a product made entirely in recycling technology. EKOpoly manufacturer - Plastinvest was established in 2011 and decided to invest in a processing line that complements the philosophy of processing waste plastics and create entirely new products. EKOpoly board covers different building applications including: insulation of pitched roof, agriculture, small architecture, shoring, roof and floor covering. Manufacturing building is shown in Fig. 1.



*Fig. 1. Plastinvest Sp. z o.o. manufacturing plant located in Suchedniów (Poland).*

### PRODUCT DESCRIPTION AND APPLICATION

EKOpoly boards made in recycling technology are resistant to moisture, water, most of chemical substances as well as UV radiation. EKOpoly boards are intended for the exterior and interior applications, in the various branches of the industry such as construction, furniture or agriculture. The products are made by means of thermal bonding and forming of secondary raw materials – polyethylene (PE) and polypropylene (PP) – as unified with distinctly isolated outer layers (skin) and the inner layer (core). EKOpoly STANDARD ANTI-SLIP 20 is a product possessing antislip surface layer on one side. The boards are available in three different colours: Grey (standard), Blue and Green. An example of EKOpoly STANDARD 19 is shown in Fig. 2. The specification of the product is presented in Table 1.



*Fig. 2. An example of the EKOpoly board produced by Plastinvest Sp. z o. o.*

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Table 1. Specification of the EKOply boards offered by PLASTINVEST Sp. z o. o.

Collection	Thickness, mm	Dimensions, mm	Weight, kg	Colour
EKOply STANDARD 19	19	2440x1220	ca. 33	grey, blue, green
EKOply STANDARD ANTI-SLIP 20	20	2440x1220	ca. 33	grey, blue, green
EKOply STANDARD 12,5	12,5	2440x1220	ca. 25	grey, blue, green

EKOply boards can be used as:

- alternative to plywood - they are durable, lighter than standard plywood, resistant to weather conditions;
- furniture surfaces, such as table tops, alternative to MDF or plywood;
- flooring in trucks as protection for metal floor and noise reduction;
- small architecture in the gardens: houses, fences, kennels, simple furniture and toolboxes;
- security applications: protection against wind and rain, on construction sites, concerts, festivals and other events.



Fig. 3. Example applications of EKOPly boards.

### LIFE CYCLE ASSESSMENT (LCA) – general rules applied

#### Allocation

The allocation rules used for this EPD are based on general ITB PCR A. The EKOpły board production is a line process with multiple raw materials in one factory in Suchedniów. Allocation was done on product mass basis. All impacts from raw materials extraction are allocated in A1 module of EPD. Base materials as polypropylene and polyethylene comes from recycling process. 100% of impacts from line production were inventoried and allocated to all EKOpły board types production. Municipal waste and waste water of whole factory were allocated to module A3. Energy supply was inventoried for whole production process. Emissions in Plastinvest are not measured, because this type of production is not obliged to measure these indicators, hence emission impacts come from energy carrier characterization factors, and are presented in A3 module.

#### System limits

The life cycle analysis of the examined products covers “Product Stage”, A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB PCR A. 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. It can be assumed that the total sum of omitted processes does not exceed 1% of all impact categories. In accordance with EN 15804, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

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

Raw materials for EKOpły board production come from local suppliers and more distant locations. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include trucks and Polish and European fuel averages are applied.

#### Module A3: Production

The Fig. 4 shows the working process during the production of EKOpły boards. The raw materials (polyethylene, polypropylene) are mixed with BA (baking powder), pigments and processed for homogenisation. Recycled content in EKOpły board production is 98.9% calculated on the mass basis. The raw materials are thermally bonded in matrix at high temperature, typically 200°C. Ready boards are cut into desired format and packed for shipping. The off cuts from cutting process are recycled and after shredding recirculated in the process.

#### Data quality

The values determined to calculate the LCA originate from verified Plastinvest Sp. z o.o. inventory data.

#### Data collection period

The data for manufacture of the examined products refer to period between 10.2020 – 09.2021 (one year). The life cycle assessments were prepared for Poland as reference area.

#### Assumptions and estimates

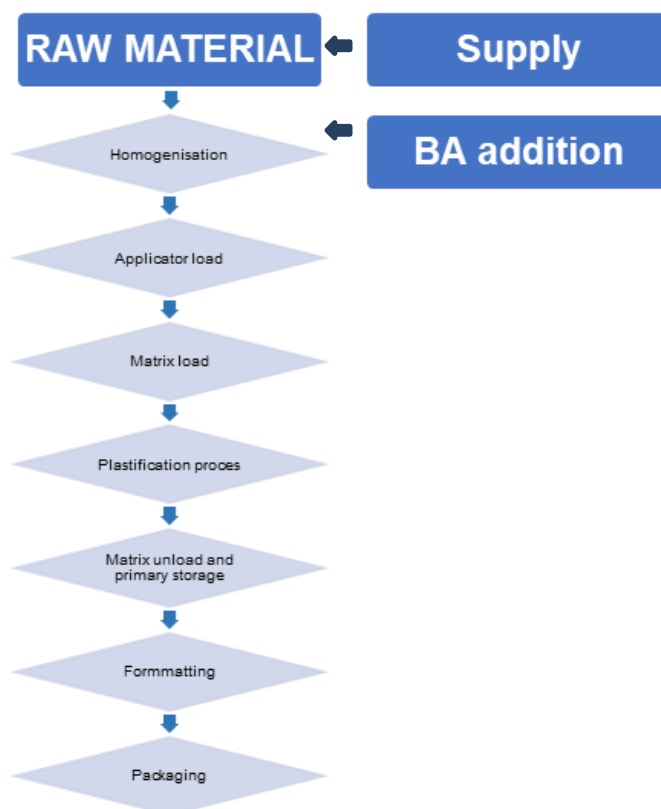
The impacts of the representative EKOpły products were aggregated using weighted average. Impacts were inventoried and calculated for all products in EKOpły product group. Specific assumption was made for PP and PE delivered to the factory. Although they are recycled, they needed to be shredded, so estimated impacts were added to module A1.

#### Calculation rules

LCA was done in accordance with ITB PCR A document.

## Databases

The data for the processes come from the following databases: Ecoinvent, Ullmann's, ITB Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.8.



*Fig. 4. EKOply boards production scheme in Suchedniów (Poland).*

## LIFE CYCLE ASSESSMENT (LCA) – Results

### Declared unit

The declaration refers to functional unit (FU) - 1 tonne of EKOply boards produced by Plastinvest Sp. z o.o.

Table 2. System boundaries for the environmental characteristic of the EKOply boards

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

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Table 3. Results of the life cycle (LC) analysis of EKOply panels manufactured by Plastinvest Sp. z o.o.

Environmental impacts: (DU) 1 tonne					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	kg CO <sub>2</sub> eq.	7.70E+02	5.12E+01	5.44E+02	1.37E+03
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	7.46E-05	0.00E+00	9.79E-08	7.47E-05
Acidification potential of soil and water	kg SO <sub>2</sub> eq.	2.74E+00	4.74E-01	2.08E-01	3.43E+00
Formation potential of tropospheric ozone	kg Ethene eq.	2.05E-01	3.45E-02	3.12E-03	2.42E-01
Eutrophication potential	kg (PO <sub>4</sub> ) <sup>3-</sup> eq.	2.44E+00	8.36E-02	3.78E-02	2.57E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	8.32E-03	0.00E+00	2.02E-03	1.03E-02
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	7.88E+03	6.98E+02	7.71E+03	1.63E+04
Environmental aspects on resource use: (DU) 1 tonne					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.17E+03	4.88E+01	4.68E+02	2.69E+03
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	1.10E+04	7.33E+02	8.10E+03	1.98E+04
Use of secondary material	kg	9.90E+02	0.00E+00	0.00E+00	9.90E+02
Use of renewable secondary fuels	MJ	8.31E-04	3.66E+01	0.00E+00	3.66E+01
Use of non-renewable secondary fuels	MJ	4.59E-07	0.00E+00	0.00E+00	4.59E-07
Net use of fresh water	m <sup>3</sup>	2.65E+00	3.25E-04	1.17E-01	2.77E+00
Other environmental information describing waste categories: (DU) 1 tonne					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	1.38E-02	3.44E-07	0.00E+00	1.38E-02
Non-hazardous waste disposed	kg	2.63E+02	1.33E-02	1.93E+01	2.82E+02
Radioactive waste disposed	kg	5.05E-02	9.62E-07	0.00E+00	5.05E-02
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	4.12E-03	0.00E+00	2.18E+00	2.18E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ per energy carrier	0.00E+00	0.00E+00	0.00E+00	0.00E+00



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

### Normative references

- ITB PCR A General Product Category Rules for Construction Products
- EN 15860:2018 - Plastics. Thermoplastic semi-finished products for machining. Requirements and test methods
- 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+A1:2013, Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products
- EN15942:2011, Sustainability of construction works. Environmental product declarations. Communication format business-to-business
- Department for Business, Energy & Industrial Strategy. Calorific values and density of fuels, 2021. <https://www.gov.uk/>
- KOBIZE 2021, Wskaźniki emisyjności CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO i pyłu całkowitego dla energii elektrycznej

KIEROWNIK  
Zakładu Fizyki Ciepłoty, Akustyki i Środowiska  
*dr inż. Agnieszka Winkler-Skalna*



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**Thermal Physics, Acoustics and Environment Department**

02-656 Warsaw, Ksawerów 21

**CERTIFICATE No 297/2022**  
**of TYPE III ENVIRONMENTAL DECLARATION**

Product:

**EKOply board made in recycling technology**

Manufacturer:

**Plastinvest Sp. z o.o.**

Fabryczna 5, 26-130 Suchedniów, Poland

confirms the correctness of the data included in the development of  
Type III Environmental Declaration and accordance with the requirements of the standard

**PN EN 15804+A1**

Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 16<sup>th</sup> March 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*  
Agnieszka Winkler-Skalna, PhD



Deputy Director  
for Research and Innovation

*Krzysztof Kuczyński*  
Krzysztof Kuczyński, PhD

Warsaw, March 2022