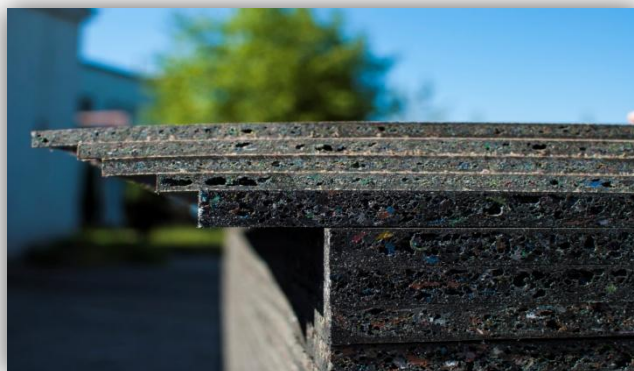


EKOply board made in recycling technology



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Validity date: 09.02.2022

EPD program operator:

Building Research Institute (ITB), 00-611 Warsaw, Poland, Filtrowa 1, www.itb.pl

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

Manufacturer:

Plastinvest.Sp. z o.o.

Address: Fabryczna 5, 26-130 Suchedniów, Poland

Telephone number: +48 41 243 63 63

Website: www.ekoply.com

Technical support:

Waldemar Biesaga w.biesaga@plastinvest.com.pl



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: 2017

Declared durability: Under normal conditions, a board made of recycled polymer has reference service life (RSL) up to last 10 years

Product standard: EN 15860 - Plastics. Thermoplastic semi-finished products for machining. Requirements and test methods, EN ISO 9054:2001 - Cellular plastics, rigid - Test methods for self-skinned, high-density materials

PCR: PCR A (PCR based on EN 15804)

Declared unit: tonne of produced board

Reasons for performing LCA: B2B

Representativeness: Polish product

Manufacturer and Product Information

PLASTINVEST Sp. z o.o. produces EKOpoly board which nearly consists of 99% of recycled material. EKOpoly board covers different building applications including: insulation of pitched roof, agriculture, small architecture, shoring, roof and floor covering. EKOpoly sheets 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,
- floors, for example in trucks as protection for a 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.



All EKOpoly sheets are resistant to moisture and water as well as to most substances and chemicals on the market. They have increased resistance to UV radiation. EKOpoly sheets are used in the construction industry, furniture, agriculture, outside and inside buildings. All products are available in five different colours: blue, green, earth brown, white fleck and standard grey.

The polymer EKOpoly sheet made in the technology of thermal bonding and forming substances apart from binder, totally obtained from recycling (polyethylene and polypropylene) as unified with distinctly isolated outer layers (skin) and the inner layer (core). Example of EKOpoly STANDARD ANTI-SLIP 19 is shown in Fig. 1.

Sheet's weight with 2440 mm x 1220 mm dimensions and 19 mm thickness is about 33kg. Specification of the product is shown in Table 1.

Table 1. Specification of EKOpoly board produced by PLASTINVEST Sp. z o.o.

| EKOpoly: colour, anti-slip | |
|----------------------------|---------------------------------------|
| Thickness [mm] | 10, 19, 21 |
| Dimensions [mm] | 2440 x 1220 |
| Weight [kg] | 33 |
| Colour | blue, green, earth brown, grey, white |



Fig. 1. EKOpoly STANDARD ANTI-SLIP 19 produced in Suchedniów factory (Poland)

The EKOpoly board does not contain dangerous substances according to REACH (1907/2006)

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB-PCR A. The EKOpoly 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 EKOpoly 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.

A1 and A2 Modules: Raw materials supply and transport

Raw materials for EKOpoly 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.

A3: Production

The Fig. 2 shows the working process during the production of EKOpoly board. The raw materials (polyethylene, polypropylene) are mixed with BA (baking powder) pigments and processed for homogenisation. Recycled content in EKOpoly board production is 98,8% calculated on the mass basis. The raw materials are thermally bonded in matrix at high

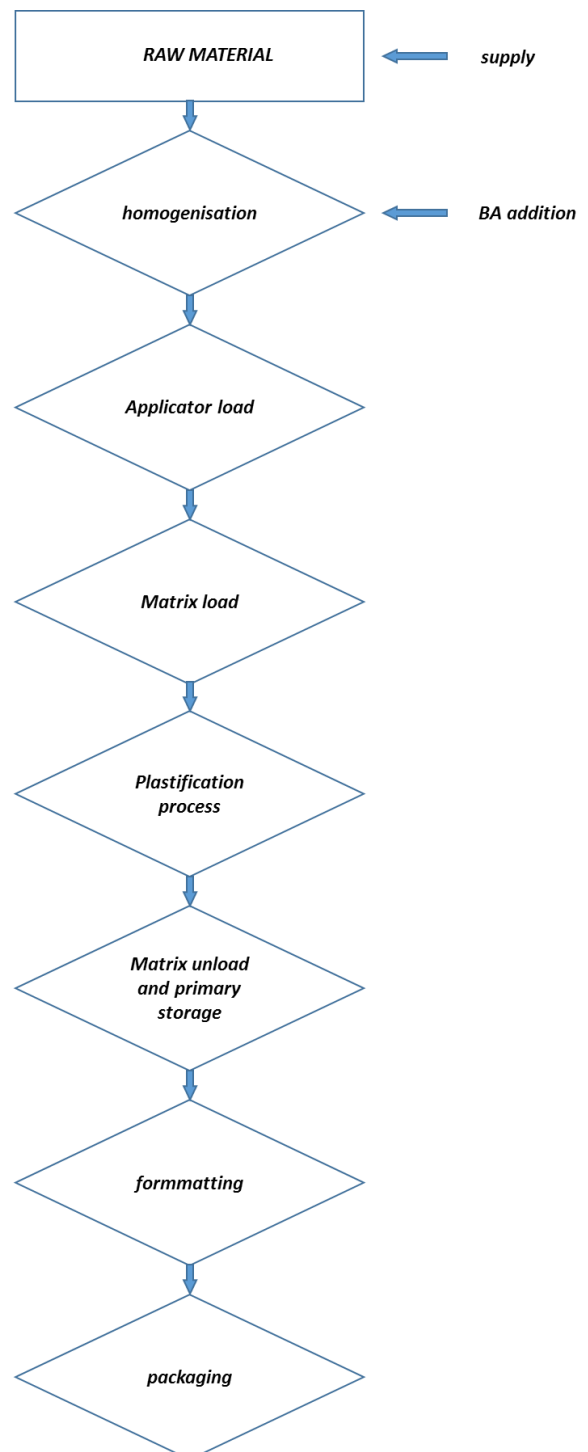


Fig. 2. EKOpoly board production scheme in Suchedniów factory (Poland)



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 collection period

The data for manufacture of the examined products refer to period between 1.01.2016-31.12.2016. The life cycle assessments were prepared for Poland as reference area.

Data quality

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

Assumptions and estimates

The impacts of the representative EKOpoly products were aggregated using weighted average. Impacts were inventoried and calculated for all products in EKOpoly 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 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. 4.2 based on EN 15804:2013+A1 version. (PN EN 15804+A1:2014-04)

LIFE CYCLE ASSESSMENT (LCA) - Results

Declared unit

The declaration refers to functional unit (FU) - 1 tone of EKOpoly board

Table 2. System boundaries for environmental characteristic for EKOpoly board

| Environmental assessment information (MNA – Module not assessed, MD – Module 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 | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA |

EKOply board made in recycling technology

| Environmental impacts: (FU) 1 tone | | | | | |
|---|---|----------|----------|----------|----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 |
| Global warming potential | [kg CO ₂ eq.] (100 years) | 43,04 | 41,36 | 394,26 | 478,67 |
| Depletion potential of the stratospheric ozone layer | [kg CFC 11 eq.] | 1,34E-06 | 0,00E+00 | 0,00E+00 | 1,34E-06 |
| Acidification potential of soil and water | [kg SO ₂ eq.] | 1,59E-01 | 2,12E-01 | 1,09E+00 | 1,46E+00 |
| Formation potential of tropospheric ozone | [kg Ethene eq.] | 2,13E-02 | 1,90E-02 | 0,00E+00 | 4,02E-02 |
| Eutrophication potential | [kg (PO ₄) ³⁻ eq.] | 2,40E-02 | 3,71E-02 | 6,46E-02 | 1,26E-01 |
| Abiotic depletion potential (ADP-elements) for non-fossil resources | [kg Sb eq.] | 3,55E-01 | 0,00E+00 | 1,46E-03 | 3,57E-01 |
| Abiotic depletion potential (ADP-fossil fuels) for fossil resources | [MJ] | 375,87 | 1117,48 | 1526,58 | 3019,93 |
| Environmental aspects on resource use: (FU) 1 tone | | | | | |
| Indicator | Unit | | | | |
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials | [MJ] | 278,89 | 78,22 | 289,00 | 278,89 |
| Use of renewable primary energy resources used as raw materials | [MJ] | 0,00 | 0,00 | 0,00 | 0,00 |
| Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) | [MJ] | 278,89 | 78,22 | 289,00 | 278,89 |
| 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] | 460,20 | 0,00 | 1869,10 | 460,20 |
| Use of secondary material | [kg] | 0,00 | 0,00 | 988,00 | 0,00 |
| Use of renewable secondary fuels | [MJ] | 0,00 | 0,00 | 0,00 | 0,00 |
| Use of non-renewable secondary fuels | [MJ] | 0,00 | 0,00 | 0,00 | 0,00 |
| Net use of fresh water | [dm ³] | 0,61 | 0,04 | 0,11 | 0,61 |
| Other environmental information describing waste categories: (FU) 1 tone | | | | | |
| Indicator | Unit | A1 | A2 | A3 | A1-A3 |
| Hazardous waste disposed | [kg] | 3,74E-05 | INA | 9,88E-02 | 9,89E-02 |
| Non-hazardous waste disposed | [kg] | 36,20 | INA | 113,04 | 149,25 |
| Radioactive waste disposed | [kg] | INA | INA | INA | INA |
| Components for re-use | [kg] | INA | INA | INA | INA |
| Materials for recycling | [kg] | 5,64 | INA | 2,45 | 8,09 |
| Materials for energy recover | [kg] | INA | INA | INA | INA |
| Exported energy | [MJ per energy carrier] | INA | INA | INA | INA |

Verification

The process of verification of this EPD is in accordance with EN 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 & 8.3.1. <input checked="" type="checkbox"/> external <input type="checkbox"/> internal |
| External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: M.Sc. Eng. Dominik Bekierski, d.bekierski@itb.pl Verification of LCA: PhD Eng. Michał Piasecki, m.piasecki@itb.pl |

Normative references

- ITB PCR A- General Product Category Rules for Construction Products
- EN 15860 - Plastics. Thermoplastic semi-finished products for machining. Requirements and test methods,
- EN ISO 9054:2001 - Cellular plastics, rigid - Test methods for self-skinned, high-density materials
- ISO 14025:2006, Environmental management – Type III environmental declarations – Principles and procedure
- ISO 21930:2007, Sustainability in building and construction – Environmental declaration of building products
- ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2000, Buildings and constructed assets — Service life planning — Part 1: General principles
- ISO 15686-8:2008, Buildings and constructed assets – Service life planning – Part 8: Reference service life
- EN 15804:2012+A1:2013, Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
- EN15942:2011, Sustainability of construction- Environmental product declarations. Communication format business-to-business



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dr inż. Michał Piasecki



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Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

CERTIFICATE No 059/2017 of TYPE III ENVIRONMENTAL DECLARATION

Product:

EKOply board made in recycling technology

Manufacturer:

Plastinvest Sp. z o.o.

26-130 Suchedniów, Fabryczna 5

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+A1:2014-04

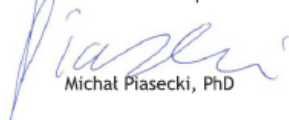
Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 9th February 2017 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics
and Environment Department



Michał Piasecki, PhD



Deputy Director
for Research and Innovation



Krzysztof Kuczyński, PhD

Warsaw, February 2017