Type III Environmental Product Declaration No. 733/2024

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Construction membranes & Vapour barrier membranes

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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. 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+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
Service Life: > 25 years
Product standards: EN 13967:2012, EN 13984:2013, EN 14909:2012
PCR: ITB-PCR A (v. 1.6)
Declared unit: 1 kg
Reasons for performing LCA: B2B
Representativeness: Polish, European, 2023

MANUFACTURER

CONKRET Sp. z o.o. is a polyethylene recycler and manufacturer of packaging, construction, agricultural, and industrial products made from recycled materials. As a European market leader and pioneer in recycling, is committed to closing the loop through a circular economy, giving plastic waste a second life. Manufactured products are primarily made from low-density polyethylene (LDPE), with many of them consisting of 100% recycled material. Production plant is located in Wielkie Rychnowo (Poland, Figure 1). The core product range of CONKRET Sp. z o.o. includes:

1. construction membranes (membranes) compliant with the harmonized standard EN 13984:
   - vapor barrier films
2. construction membranes (membranes) compliant with the harmonized standard EN 13967 and EN 14909:
   - waterproofing membranes
   - vertical and horizontal foundation insulation
   - radon-resistant films
3. other
   - agricultural and horticultural membranes
   - packaging membranes available in the form of sleeves, half-sleeves, and tapes

CONKRET Sp. z o.o. has extensive research and development facilities, which enable us to maintain the highest quality standards and ensure consistent product performance.

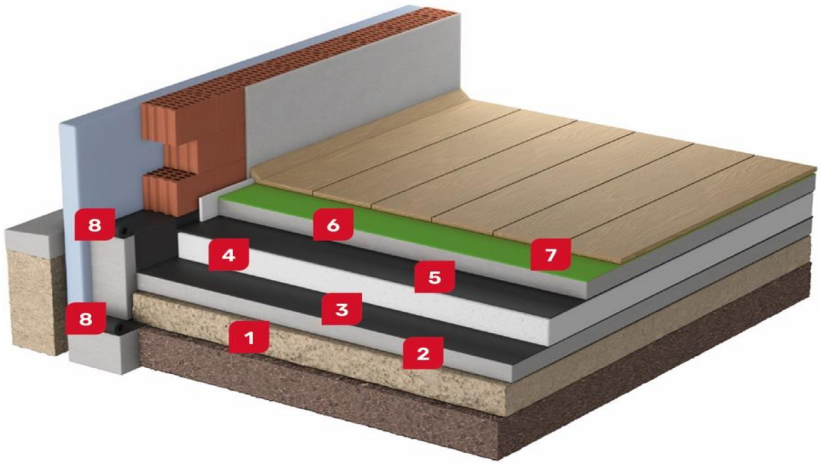
PRODUCT DESCRIPTION AND APPLICATION

CONKRET has many years of experience in the production and sale of construction & vapour barrier membranes. The main material used to manufacture the membranes is polyethylene as „to re-use material". The environmental declaration EPD developed within the scope of this document covers 2 products groups: Construction Membranes and Vapour Barrier Membranes.

Construction membranes

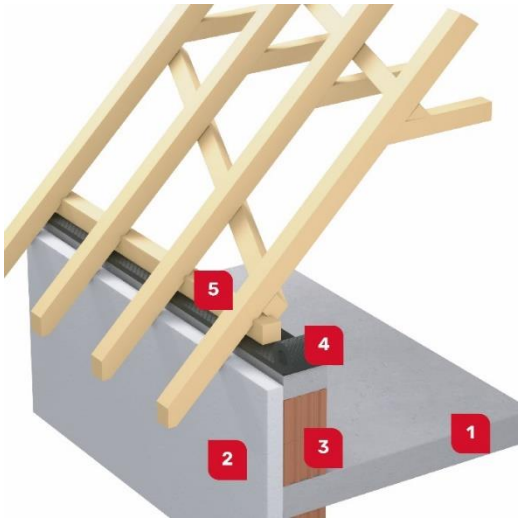
Construction membranes are designated for construction of the damp-proofing layer under floors, floor toppings or screeds. Due to its properties and widths they can be used in all refurbishment and construction works as a layer protecting against damp and dirt. Damp proof courses protects the walls of the building against moisture coming from the ground (capillary moisture), preventing the development of fungi and mold. The construction membranes come in thickness starting from 0,1 mm.

1. Construction membranes according to **EN 14909:2012** (Flexible sheets for waterproofing. Plastic and rubber damp proof courses. Definitions and characteristics).
   1.1 Construction membranes - **construction films** (Figure 2):

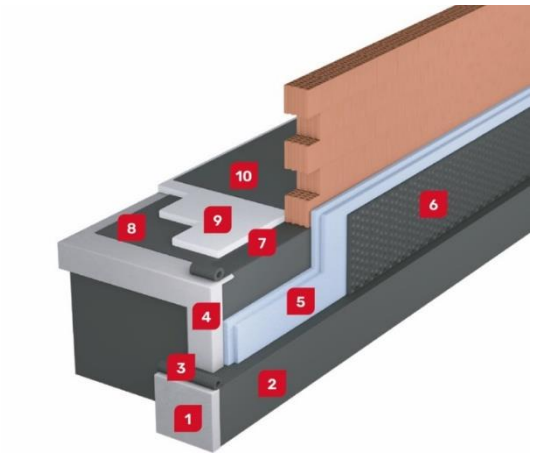


1. Levelling layer
2. Construction layer of lean concrete
3. Construction membrane
4. Thermal insulation of the floor on the ground
5. Polyethylene film
6. Underlay layer, e.g. screed or anhydrite
7. Plastic vapour barrier
8. Horizontal insulation of foundations

1.2 Construction membranes - **horizontal insulations of foundations** (Figure 3-4):

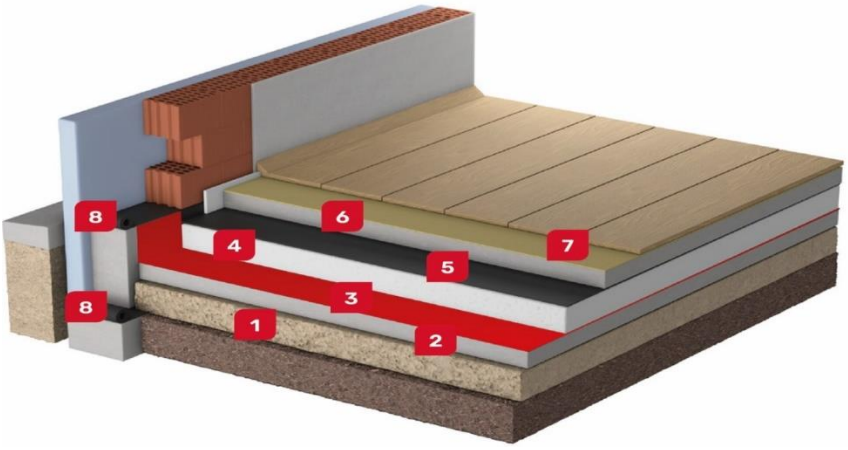


1. Ceiling
2. Thermal insulation of the wall
3. Roof ring beam
4. Horizontal insulation of foundations
5. Wall plate (murlat)



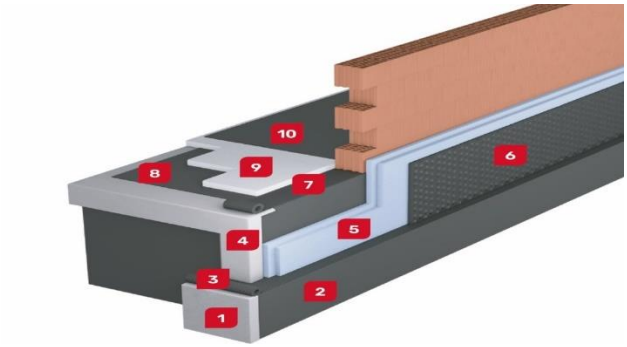
1. Strip footing
2. Vertical waterproofing of foundations
3. Horizontal insulation of foundations
4. Foundation
5. Foundation thermal insulation
6. Vertical insulation of foundations
7. Horizontal insulation of foundations
8. Construction membrane
9. Thermal insulation of the floor on the ground
10. Polyethylene film

2. Construction membranes according to **13967+A1:2017-05** (Flexible sheets for waterproofing - Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet - Definitions and characteristics):
   2.1 Construction membranes - **construction films** (figure 5):



1. Levelling layer
2. Construction layer of lean concrete
3. Construction radon barrier membrane
4. Thermal insulation of the floor on the ground
5. Construction membrane
6. Underlay layer, e.g. screed or anhydrite
7. Polyethylene film
8. Horizontal insulation of foundations

2.2 Construction membranes - **dimpled membranes & damp proof courses** (figure 6):

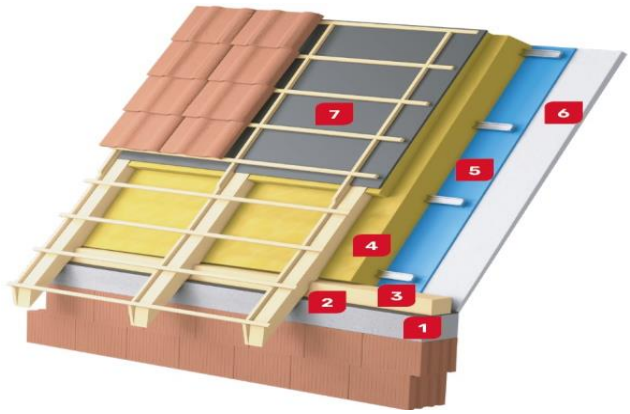


1. Strip footing
2. Vertical waterproofing of foundations
3. Horizontal insulation of foundations
4. Foundation
5. Foundation thermal insulation
6. Vertical insulation of foundations
7. Horizontal insulation of foundations
8. Construction membrane
9. Thermal insulation of the floor on the ground
10. Polyethylene film

Vapour barrier membranes

Vapour barrier membranes are active membranes used as a vapour barrier layers for roofs and walls in case of residential, commercial construction as well as specialized, innovative architectural projects. They come in many colour variations in thickness starting from 0,1 mm. They can be one-two or three layers. Our vapour barrier membranes meet requirements of watertightness at 2 kPa. Mechanical properties, resistance to nail tearing & reaction to fire properties depend on customer preference.

Vapour barrier membranes according to **EN 13984:2013** (Flexible sheets for waterproofing - Plastic and rubber vapour control layers - Definitions and characteristics) (figure 7) :



1. Roof beam
2. Horizontal insulation of foundations
3. Roof plate
4. Roof thermal insulation
5. Vapour barrier membrane
6. Plasterboard
7. Vapour-permeable membrane.

OVERVIEW OF PROPERTIES

Table 1. Overview of properties of CONKRET Construction Membranes

Properties	Values
Thickness	Depends on customer individual preferences – from 0,1 mm up to 1mm
Width & length	Depends on customer individual preferences - from W = 0,1 m up to 12m and L = 10 m up to 220 m
Layers	1 – 3
Watertightness, Durability: - Watertightness after artificial ageing & Durability: - Alkali resistance	Meets requirements at 2 kPa
Reaction to fire	Class F
Resistance to low temperature	-25°C
Tensile properties & resistance to impact	Depends on customer individual preferences – Tensile properties: - longwise: from 130 N/50mm up to 250 N/50mm, - crosswise: from 95 N/50mm up to 200 N/50mm. Elongation at maximum tensile force: - longwise: from 100% up to 400%, - crosswise: from 20% up to 150%. Resistance to impact – from 200 mm up to 300 mm

Table 2. Overview of properties of CONKRET Vapour Barrier Membranes.

Properties	Values
Thickness	Depends on customer individual preferences - from 0,05 mm up to 0,250 mm
Width & length	Depends on customer individual preferences - from W = 1,5 m up to 6m and L = 10 m up to 200 m
Layers	1 – 3
Watertightness	Meets requirements at 2 kPa
Durability: - Chemical resistance & Durability: - Water vapour resistance after artificial ageing	meets requirements
Reaction to fire	Class E or F (depends on customer individual preferences)
Water vapour resistance	Greater than $3,84 \times 10^{11}$ ($m^2 \times s \times Pa$) / kg (depends on membrane thickness)
Tensile properties, resistance to impact & resistance to tearing	Depends on customer individual preferences - Tensile properties (longwise & crosswise): from 75 N/50mm up to 120 N/50mm. Elongation at maximum tensile force (longwise & crosswise): from 390% up to 640%. Resistance to tearing – from 25 N up to 110 N

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Declared Unit
The declared unit is the production of 1 kg of membrane product, of different thickness, width and length, described in the section “Conversion rules”.

Allocation
Allocation in this study was created in accordance with the document: ITB PCR A guideline. The production of all products declared takes place at the plant in Wielkie Rychnowo, Poland. Input data for the production plant have been inventoried. The results obtained are representative mass based average for Construction Membranes and Vapour Barrier Membranes produced by CONKRET.
All data regarding the recovered materials as well as raw materials used in production are allocated to module A1. The energy and fuel consumption as wel as generating waste for the entire production process has been inventoried and included in module A3.

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-to-gate with options) in accordance with EN 15804+A2 and ITB PCR A, v. 1.6. 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 were inventoried and were included in the calculations, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, water consumption and all available emission measurements. At the production plant were inventoried:
- 100% of the input materials;
- 100% of the electricity and fuel consumption.

The assessment takes into account all relevant parameters from the collected production data including: all materials used for production, packaging materials, electricity used, fuels and direct production waste. Substances with a percentage of less than 1 % of total weight were excluded from the calculation. For the purposes oft he analysis it has benn assumed that the total sum of omitted processes does not exceed 0.5% of all impact categories.

Modules A1 and A2: *Raw materials supply and transport*
Granulates, regranulates, dyes, colouring concentrates and others additives used to produce membranes and packaging materials come from local and external suppliers. Raw materials come from Polish and international suppliers. Data on transport of the different products to the manufacturing plant is collected and modelled for factory by assessor. Means of transport include big trucks (>16 t) are applied. Based on data provided by the manufacturer, all input of transport resources was inventoried in details. Raw materials for production, i.e. polyethylene, colour masterbatch, UV stabilisers, packaging materials and accessories such as packaging tapes are transported from different European countries. Recovered polyethylene material which undergoes the recycling in CONKRET is the main material for production adn is transported from different places in Poland. Module A1 presents the impact of production and extraction of raw materials further used in the production of membranes as well as the impact of production based on recovered polyethylene material. Data on the transport of raw material and of recovered polyethylene are recorded by the plant. Means of transport include trucks and ships. European fuel average values have been used for the calculation of module A2.

Module A3: *Production*

The production process of CONKRET membranes is illustrated on the Figure 8. Barriers are produced from recovered polyethylene and from raw material supplied to the plant in Wielkie Rychnowo, Poland. The internal transport to the machines is performed using forklifts and roller conveyors. Finished products are packed, stacked on pallets and then stored in warehouses or delivered to clients.

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

The deconstruction of membranes is assumed to be done with the demolition of the whole structure, so that impacts from the membranes deconstruction are negligibly small. Therefore, no contribution in terms of impact of C1 module is reported. It is assumed that the end-of-life product, 100% of membranes, will be transported to waste treatment plant which is 100 km away, on 16-32 t lorry EURO 5 (module C2). No reuse, energy/material recovery or recycling of membranes is intended. The benefits of using regranulates are included in module A1. In order to avoid double counting of these benefits, C3 module is not reported (equal to 0). After the end of use 100% of the product would end up in landfill. End-of-life scenario was summarized in Table 3. Benefits and potential credits are assessed when substitution of primary raw material takes place. As membranes and their parts are not recyclable this modulus is not declared.

Table 3. End-of-life scenario for the membranes

Material	Waste processing (energy / material recovery)	Landfilling
membranes	0 %	100 %

Data quality

The data for the calculation of modules A1-A3 are derived from verified LCI inventory data from the plant. According to Annex E of PN-EN 15804 + A2 data quality assessment was carried out. For technical representativeness, processes with “very good” quality represent 99% of the values for climate change indicators. For geographical and temporal representativeness, the process rating was “very good”.

Data collection period

Primary data provided by manufacturer covers a period of 01.2023 – 12.2023 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

Assumptions and estimates

The impacts of the representative of membranes were aggregated using average weights. Impacts were inventoried and obtained results are calculated as a representative average for all membranes produced in different thicknesses.

Calculation rules

LCA was performed using OpenLCA tool developed in accordance with EN 15804 + A2.

Databases

The calculation data comes from the Ecoinvent v. 3.10, and from the databases available in the OpenLCA software as well as from EN15804 AddOn. Emission factors for electricity have been supplemented with actual KOBIZE data. Characteristic factors are based on EN 15804+A2.

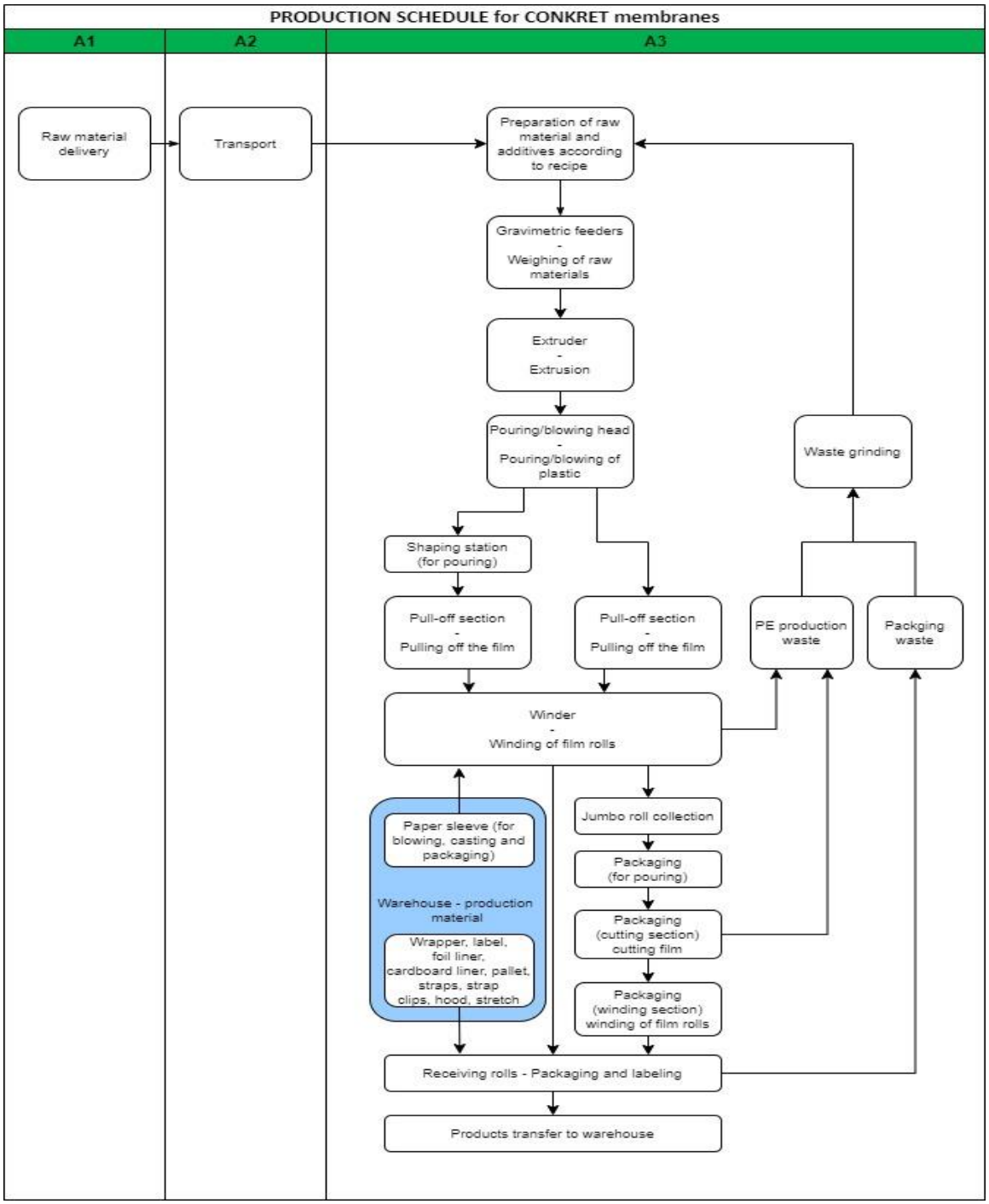


Fig. 8. The scheme of industrial process

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 kg of membranes manufactured by CONKRET Sp. z o. o.

Table 4. System boundaries for the environmental characteristic of membranes production process

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	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**

Conversion rules

Based on the rule, that the raw materials in the production stage represent the main contribution to the results of the environmental balance, and the indicators refer to 1 kg of products, all indicators presented can be recalculated/converted to a $1m^2$ of a product type (Construction Membranes and Vapour Barrier Membranes accordingly) using the following formula:

$$E_i\ (sqm) = E_i\ (1kg) \bullet W\ (sqm)$$

E_i (sqm) - Environmental indicator for $1m^2$ of a product to be calculated
E_i (1kg) - Environmental indicator obtained for 1 kg of a product type (e.g. Potential for creating a greenhouse effect – for 1 kg of material)
W(sqm) - Weigh of $1m^2$ of the product to be calculated

Table 5. Life cycle assessment (LCA) results of the construction membranes manufactured by CONKRET Sp. z o. o. – environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	1.29E+00	4.17E-02	1.22E+00	2.55E+00	0.00E+00	1.80E-02	0.00E+00	1.29E-01	0.00E+00
Greenhouse gas potential - fossil	eq. kg CO_2	1.30E+00	4.16E-02	1.22E+00	2.56E+00	0.00E+00	1.80E-02	0.00E+00	1.29E-01	0.00E+00
Greenhouse gas potential - biogenic	eq. kg CO_2	-1.39E-02	1.42E-04	6.69E-03	-7.11E-03	0.00E+00	6.14E-05	0.00E+00	9.23E-05	0.00E+00
Global warming potential - land use and land use change	eq. kg CO_2	2.41E-03	1.63E-05	9.21E-04	3.34E-03	0.00E+00	7.05E-06	0.00E+00	6.93E-06	0.00E+00
Stratospheric ozone depletion potential	eq. kg CFC 11	3.58E-08	9.62E-09	1.50E-08	6.04E-08	0.00E+00	4.15E-09	0.00E+00	3.12E-10	0.00E+00
Soil and water acidification potential	eq. mol H+	4.70E-03	1.69E-04	5.97E-03	1.08E-02	0.00E+00	7.29E-05	0.00E+00	8.60E-05	0.00E+00
Eutrophication potential - freshwater	eq. kg P	5.09E-04	2.79E-06	9.05E-04	1.42E-03	0.00E+00	1.21E-06	0.00E+00	1.29E-06	0.00E+00
Eutrophication potential - seawater	eq. kg N	1.08E-03	5.09E-05	1.06E-03	2.19E-03	0.00E+00	2.20E-05	0.00E+00	2.86E-04	0.00E+00
Eutrophication potential - terrestrial	eq. mol N	1.04E-02	5.55E-04	9.87E-03	2.08E-02	0.00E+00	2.40E-04	0.00E+00	3.51E-04	0.00E+00
Potential for photochemical ozone synthesis	eq. kg NMVOC	5.93E-03	1.70E-04	3.74E-03	9.84E-03	0.00E+00	7.35E-05	0.00E+00	1.52E-04	0.00E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	8.19E-06	1.47E-07	3.65E-06	1.20E-05	0.00E+00	6.36E-08	0.00E+00	2.72E-08	0.00E+00
Abiotic depletion potential - fossil fuels	MJ	2.84E+01	6.17E-01	1.70E+01	4.60E+01	0.00E+00	2.66E-01	0.00E+00	2.69E-01	0.00E+00
Water deprivation potential	eq. m^3	4.98E-01	2.85E-03	2.69E-01	7.70E-01	0.00E+00	1.23E-03	0.00E+00	1.28E-03	0.00E+00

Table 6. Life cycle assessment (LCA) results of the construction membranes manufactured by CONKRET Sp. z o. o – additional impacts indicators (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	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	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	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	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 7. Life cycle assessment (LCA) results of the construction membranes manufactured by CONKRET Sp. z o. o - environmental information describing waste categories (DU: 1 kg)

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	1.80E+00	8.85E-03	1.12E+00	2.92E+00	0.00E+00	3.82E-03	0.00E+00	4.03E-03	0.00E+00
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	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.80E+00	8.85E-03	1.12E+00	2.92E+00	0.00E+00	3.82E-03	0.00E+00	4.03E-03	0.00E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.64E+01	6.17E-01	1.63E+01	4.34E+01	0.00E+00	2.66E-01	0.00E+00	-4.20E+01	0.00E+00
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.95E+00	0.00E+00	7.03E-01	2.65E+00	0.00E+00	0.00E+00	0.00E+00	4.23E+01	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	2.84E+01	6.17E-01	1.70E+01	4.60E+01	0.00E+00	2.66E-01	0.00E+00	2.69E-01	0.00E+00
Consumption of secondary materials	kg	8.28E-01	2.07E-04	7.65E-01	1.59E+00	0.00E+00	8.93E-05	0.00E+00	9.71E-05	0.00E+00
Consumption of renewable secondary fuels	MJ	2.77E-02	2.28E-06	2.77E-02	5.55E-02	0.00E+00	9.84E-07	0.00E+00	1.82E-06	0.00E+00
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	1.23E-02	7.76E-05	1.83E-02	3.07E-02	0.00E+00	3.35E-05	0.00E+00	-3.99E-03	0.00E+00

Table 8. Life cycle assessment (LCA) results of the construction membranes manufactured by CONKRET Sp. z o. o - environmental aspects related to resource use (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste. neutralized	kg	3.96E-02	6.92E-04	4.27E-02	8.30E-02	0.00E+00	2.99E-04	0.00E+00	4.75E-04	0.00E+00
Non-hazardous waste neutralised	kg	8.90E+00	1.23E-02	2.34E+00	1.13E+01	0.00E+00	5.31E-03	0.00E+00	5.37E+00	0.00E+00
Radioactive waste	kg	2.72E-05	4.60E-08	1.32E-05	4.05E-05	0.00E+00	1.84E-06	0.00E+00	6.64E-08	0.00E+00
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	0.00E+00
Materials for recycling	kg	5.14E-02	1.91E-06	1.25E-05	5.14E-02	0.00E+00	8.25E-07	0.00E+00	4.55E-06	0.00E+00
Materials for energy recovery	kg	1.25E-05	1.54E-08	4.88E-02	4.88E-02	0.00E+00	6.67E-09	0.00E+00	1.86E-08	0.00E+00
Energy exported	MJ	1.49E-02	0.00E+00	3.88E-03	1.88E-02	0.00E+00	2.96E-04	0.00E+00	5.66E-05	0.00E+00

Table 9. Life cycle assessment (LCA) results of the Vapour barrier membranes manufactured by CONKRET Sp. z o. o. – environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	8.96E-01	4.17E-02	8.99E-01	1.84E+00	0.00E+00	1.80E-02	0.00E+00	1.29E-01	0.00E+00
Greenhouse gas potential - fossil	eq. kg CO_2	9.27E-01	4.16E-02	8.93E-01	1.86E+00	0.00E+00	1.80E-02	0.00E+00	1.29E-01	0.00E+00
Greenhouse gas potential - biogenic	eq. kg CO_2	-3.34E-02	1.42E-04	4.28E-03	-2.90E-02	0.00E+00	6.14E-05	0.00E+00	9.23E-05	0.00E+00
Global warming potential - land use and land use change	eq. kg CO_2	2.32E-03	1.63E-05	8.82E-04	3.22E-03	0.00E+00	7.05E-06	0.00E+00	6.93E-06	0.00E+00
Stratospheric ozone depletion potential	eq. kg CFC 11	1.24E-08	9.62E-09	8.01E-09	3.01E-08	0.00E+00	4.15E-09	0.00E+00	3.12E-10	0.00E+00
Soil and water acidification potential	eq. mol H+	3.62E-03	1.69E-04	3.64E-03	7.43E-03	0.00E+00	7.29E-05	0.00E+00	8.60E-05	0.00E+00
Eutrophication potential - freshwater	eq. kg P	4.85E-04	2.79E-06	5.66E-04	1.05E-03	0.00E+00	1.21E-06	0.00E+00	1.29E-06	0.00E+00
Eutrophication potential - seawater	eq. kg N	8.80E-04	5.09E-05	7.35E-04	1.67E-03	0.00E+00	2.20E-05	0.00E+00	2.86E-04	0.00E+00
Eutrophication potential - terrestrial	eq. mol N	8.37E-03	5.55E-04	7.02E-03	1.59E-02	0.00E+00	2.40E-04	0.00E+00	3.51E-04	0.00E+00
Potential for photochemical ozone synthesis	eq. kg NMVOC	2.82E-03	1.70E-04	2.27E-03	5.26E-03	0.00E+00	7.35E-05	0.00E+00	1.52E-04	0.00E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	3.71E-06	1.47E-07	2.52E-06	6.38E-06	0.00E+00	6.36E-08	0.00E+00	2.72E-08	0.00E+00
Abiotic depletion potential - fossil fuels	MJ	1.23E+01	6.17E-01	1.00E+01	2.29E+01	0.00E+00	2.66E-01	0.00E+00	2.69E-01	0.00E+00
Water deprivation potential	eq. m^3	3.25E-01	2.85E-03	1.65E-01	4.93E-01	0.00E+00	1.23E-03	0.00E+00	1.28E-03	0.00E+00

Table 10. Life cycle assessment (LCA) results of the Vapour barrier membranes manufactured by CONKRET Sp. z o. o – additional impacts indicators (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	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	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	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	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 11. Life cycle assessment (LCA) results of the vapour barrier membranes manufactured by CONKRET Sp. z o. o - information describing waste categories (DU: 1 kg)

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	1.61E+00	8.85E-03	6.11E-01	2.23E+00	0.00E+00	3.82E-03	0.00E+00	4.03E-03	0.00E+00
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	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.61E+00	8.85E-03	6.11E-01	2.23E+00	0.00E+00	3.82E-03	0.00E+00	4.03E-03	0.00E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.17E+01	6.17E-01	9.68E+00	2.20E+01	0.00E+00	2.66E-01	0.00E+00	-4.20E+01	0.00E+00
Consumption of non-renewable primary energy resources used as raw materials	MJ	5.59E-01	0.00E+00	3.30E-01	8.88E-01	0.00E+00	0.00E+00	0.00E+00	4.23E+01	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	1.23E+01	6.17E-01	1.00E+01	2.29E+01	0.00E+00	2.66E-01	0.00E+00	2.69E-01	0.00E+00
Consumption of secondary materials	kg	1.04E+00	2.07E-04	9.68E-01	2.00E+00	0.00E+00	8.93E-05	0.00E+00	9.71E-05	0.00E+00
Consumption of renewable secondary fuels	MJ	1.03E-02	2.28E-06	7.05E-03	1.74E-02	0.00E+00	9.84E-07	0.00E+00	1.82E-06	0.00E+00
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	7.77E-03	7.76E-05	7.19E-03	1.50E-02	0.00E+00	3.35E-05	0.00E+00	-3.99E-03	0.00E+00

Table 12. Life cycle assessment (LCA) results of Vapour barrier membranes manufactured by CONKRET Sp. z o. o - environmental aspects related to resource use (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste. neutralized	kg	3.11E-02	6.92E-04	3.03E-02	6.21E-02	0.00E+00	2.99E-04	0.00E+00	4.75E-04	0.00E+00
Non-hazardous waste neutralised	kg	9.83E-01	1.23E-02	2.25E-01	1.22E+00	0.00E+00	5.31E-03	0.00E+00	5.37E+00	0.00E+00
Radioactive waste	kg	1.32E-05	4.60E-08	6.55E-06	1.98E-05	0.00E+00	1.84E-06	0.00E+00	6.64E-08	0.00E+00
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	0.00E+00
Materials for recycling	kg	2.01E-02	1.91E-06	1.38E-02	3.39E-02	0.00E+00	8.25E-07	0.00E+00	4.55E-06	0.00E+00
Materials for energy recovery	kg	4.64E-06	1.54E-08	3.17E-06	7.83E-06	0.00E+00	6.67E-09	0.00E+00	1.86E-08	0.00E+00
Energy exported	MJ	5.61E-03	0.00E+00	8.63E-04	6.47E-03	0.00E+00	2.96E-04	0.00E+00	5.66E-05	0.00E+00

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+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: Karol Sarosiek, M.Sc. Eng. Verification of LCA: Michał Piasecki, PhD. DSc. 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 programmes 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 (2023)
- EN 13967:2012 Flexible sheets for waterproofing - Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet - Definitions and characteristics
- EN 13984:2013 Flexible sheets for waterproofing - Plastic and rubber vapour control layers - Definitions and characteristics
- EN 14909:2012 Flexible sheets for waterproofing - Plastic and rubber damp proof courses - Definitions and characteristics
- 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
- ISO 20915:2018 Life cycle inventory calculation methodology for steel products
- EN 15804:2012+A2:2019 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
- EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- KOBiZE Emissions (CO_2, SO_2, NO_x, CO and total dust) from electricity, 2023

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CERTIFICATE № 733/2024
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Construction membranes & Vapour barrier membranes

Manufacturer:

Conkret Sp. z o.o.
Wielkie Rychnowo 86A, 87-410 Kowalewo Pomorskie, 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 20th December 2024 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, December 2024