



CETCO[®]



Instytut Techniki Budowlanej

ENVIRONMENTAL PRODUCT DECLARATION TYPE III ITB NO. 268/2021

ISSUANCE DATE: 10.11.2021 | REVISION DATE: 04.07.2022 | VALIDITY DATE: 10.11.2026

ULTRASEAL[®] XP

WATERPROOFING MEMBRANE



CETCO[®]

Owner of the EPD

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ITB is the verified member of
The European Platform
for EPD program
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MANUFACTURER

CETCO is the construction technologies business unit of Minerals Technologies Incorporated, established in 1992. Minerals Technologies Inc. is a manufacturer of minerals-based application technology with operations spanning over 30 countries and 158 locations. Our international team of clay mineralogists, chemists and polymer scientists, transforms ordinary minerals into extraordinary technology. CETCO-Poland, Cetco Sp. z o.o. S.K.A. is the Polish headquarter of the company located in Szczytno where, since 1998, the largest CETCO production plant in Europe and modern research and development laboratory have operated.

PASSION FOR INNOVATION

Our multidisciplinary research and development team creates new products and provides the support our customers need. Our growing portfolio demonstrates our commitment to technological innovation across the markets that we serve.

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, C3, C4 and D in accordance with EN 15804 (Cradle-to-Gate with options)

The year of preparing the EPD:

2021

Product standard:

EN 13967:2012; EN 13491:2004/A1:2006

Service Life:

25 years for standard product

PCR:

ITB-PCR A (PCR based on EN 15804)

Declared unit:

1 m²

Reasons for performing LCA:

B2B

Origin:

Polish product



PRODUCT DESCRIPTION AND APPLICATION

ULTRASEAL® XP active polymer waterproofing membrane features XP technology, the latest innovation in active waterproofing. This advanced polymer technology provides performance in a wide range of ground contaminates, including high-saline conditions. Unlike passive membranes when used alone, the self-sealing ability of the active XP technology enables the ULTRASEAL® XP waterproofing membrane to seal minor cuts or damage to the membrane. And most importantly, it has been proven effective in both hydrostatic and non-hydro static conditions. ULTRASEAL® XP works by forming a low permeability membrane upon contact with water. When hydrated, the unconfined membrane can swell many times its dry volume. When confined by backfill or concrete the swell is controlled, forming a dense, impervious waterproofing membrane. This swelling action can seal small concrete cracks caused by ground settlement and concrete shrinkage.

When concrete is poured against the XP geotextile side, ULTRASEAL® XP forms a mechanical bond. It contains zero VOCs, and can be installed in almost any weather condition directly to green concrete.

Table 1 Properties of the ULTRASEAL® XP

| Parameter | Reference | Typical value |
|---------------------------------|------------------|-----------------------|
| Hydrostatic pressure resistance | ASTM D5385 (Mod. | 70 m |
| Elongation at break | EN ISO 527 | 25% |
| Adhesion to concrete | ASTM D903 (Mod. | 1.7 kN/m |
| Puncture strength | EN ISO 12236 | 3.0 kN |
| Flexibility at low temperature | ASTM D1970 | no changes at -32°C |
| Tensile strength | EN ISO 527 | 8.0 N/mm ² |

Waterproofing membrane ULTRASEAL® XP should be used in strict accordance with the manufacturer's instructions and applying accessories, protections and drainage layers as required. ULTRASEAL® XP should be laid so that the geotextile XP is in direct contact with the concrete structure.

According to the producer, XP technology is resistant to a wide range of factors, including high salinity ground and water conditions, organic solvents, and can be used frequently in brownfields requiring land remediation due to environmental protection.

Delivery and Packaging

ULTRASEAL® XP is available in rolls with dimensions:

1.15 m × 8.7 m = 10 m², 2.3 m × 8.7 m = 20 m² and 2.3 m × 35 m = 80.5 m².

Placing on the market

EN 13491:2004 + EN 13491:2004/A1:2006; EN 13967:2012; can be used as waterproofing barrier as per regulation EU number 305/2011 of 9 March 2011 applies for placing on the market within the European Harmonized Standards listed below.

- EN 13491:2004 + EN 13491:2004/A1:2006 Geosynthetic barriers – Characteristics required for use as a fluid barrier in the construction of tunnels and underground structures
- EN 13967:2012/A1:2016 – Flexible sheets for waterproofing – Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet – Definitions and characteristics

LIFE CYCLE ASSESSMENT (LCA) – GENERAL RULES APPLIED

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of ULTRASEAL® XP is a line process conducted in the factory of CETCO-Poland, Cetco Sp. z o.o. S.K.A. in Korpele (Poland). Allocation was done on product mass basis. All impacts from raw materials extraction and processing are allocated in module A1 of the LCA. Impacts from the global line production of CETCO-Poland, Cetco Sp. z o.o. S.K.A were inventoried and 97% were allocated to ULTRASEAL® XP production. Water and energy consumption, associated emissions and generated wastes are allocated to module A3.

System Limits

The life cycle analysis (LCA) of the declared products covers: product stage – modules A1-A3, end of life – modules C3, C4 and benefits and loads beyond the system boundary – module D (cradle-to-gate with options) in accordance with PN-EN 15804+A1:2014-04 and ITB PCR A. Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculations. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with PN-EN 15804+A1:2014-04, 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 supply and transport geosynthetics, polymers and packaging materials come from both local and foreign suppliers. Bentonite used in the analyzing period of 2020 originated from Turkish and other resources. Means of transport include trucks with load: <10t, 10 – 16t and >16 and ships with load > 3000t. For calculation purposes Polish and European fuel averages are applied.

Module A3: Production

The production process of ULTRASEAL® XP by CETCO-Poland, Cetco Sp. z o.o. S.K.A. is presented in Fig. 1.

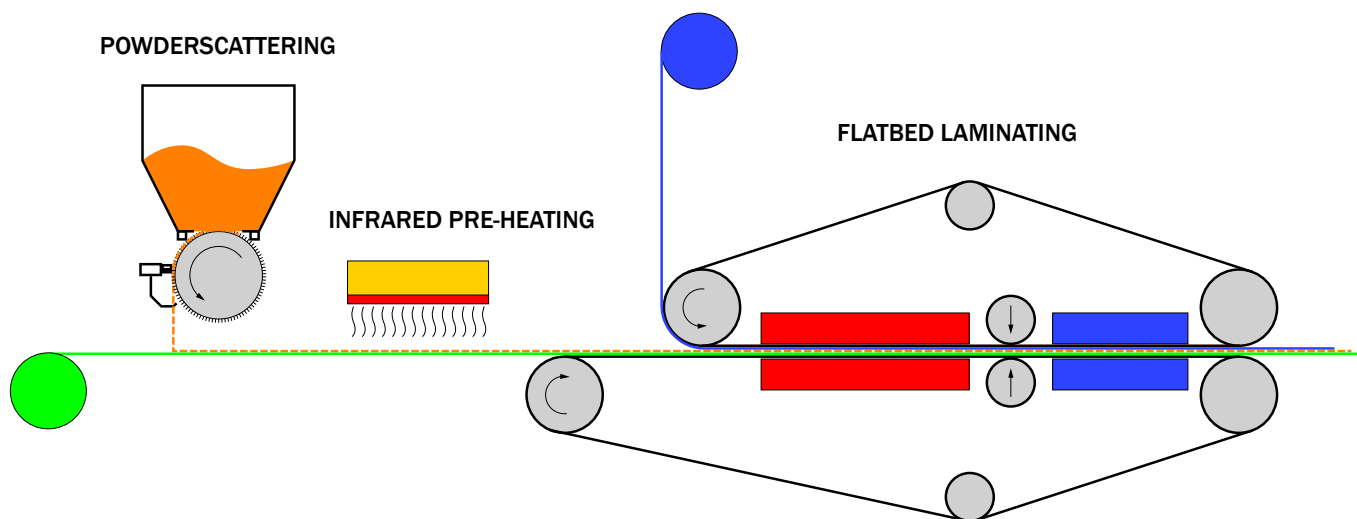


Fig. 1. A schematic of manufacturing ULTRASEAL® XP

Modules C3, C4 and D: End-of-Life (EoL)

It is assumed that at the end of life bentonite-based membranes remain underground, in the place of installation (100% of landfilling). Environmental burdens occurring in module C4 are associated with exchanges to process-specific burdens (energy, land use), emissions to air via landfill gas incineration and landfill leachate. Impacts of packaging materials that constitute less than 1.0% of the total system flows was not taken into consideration.

End-of-Life (modules C and D)

| Material | Material Recovery | Landfilling |
|---------------------|-------------------|-------------|
| Hydrophilic polymer | 0% | 100% |
| Geotextile | 0% | 100% |

LIFE CYCLE ASSESSMENT (LCA) – GENERAL RULES APPLIED

Data Collection Period

The data for manufacture of the declared products refer to period between 01.01.2020 – 31.12.2020 (1 year). The life cycle assessments were prepared for Poland as reference area.

Data Quality

The values determined to calculate the LCA analysis originate from verified CETCO-Poland, Cetco Sp. z o.o. S.K.A. inventory data.

Assumptions and Estimates

The impacts of the representative of ULTRASEAL® XP were aggregated using weighted average. Impacts were inventoried and calculated for all ULTRASEAL XP MEMBRANES system products.

Calculation Rules

LCA was done in accordance with ITB PCR A document.

Databases

The data for the processes come from the following databases: Ecoinvent v.3.6, specific EPDs, ITB Data. Specific data quality analysis was a part of external ISO 14001 audit.

LIFE CYCLE ASSESSMENT (LCA) – RESULTS

Declared Unit

The declaration refers to declared unit (DU) – 1 m² of ULTRASEAL® XP by CETCO-Poland, Cetco Sp. zo.o. S.K.A.

Environmental Assessment Information

(MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)

| | | | |
|---|------------------------------------|----|-----|
| Product stage | Raw material supply | A1 | MD |
| | Transport | A2 | MD |
| | Manufacturing | A3 | MD |
| Construction process | Transport to construction site | A4 | MND |
| | Construction-installation process | A5 | MND |
| Use stage | Use | B1 | MND |
| | Maintenance | B2 | MND |
| | Repair | B3 | MND |
| | Replacement | B4 | MND |
| | Refurbishment | B5 | MND |
| | Operational energy use | B6 | MND |
| | Operational water use | B7 | MND |
| End of life | Deconstruction demolition | C1 | MND |
| | Transport | C2 | MND |
| | Waste processing | C3 | MD |
| | Disposal | C4 | MD |
| Benefits and loads beyond the system boundary | Reuse-recovery-recycling potential | D | MD |

Table 1. System boundaries for the environmental characteristic of the ULTRASEAL® XP manufactured by CETCO-Poland, Cetco Sp. z o.o. S.K.A.

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 PN-EN 15804 and ITB PCR A

| | | |
|---|------------|----------|
| Independent verification corresponding to ISO 14025 (subclause 8.1.3.) | ● external | internal |
| External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: PhD. Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl Verification of LCA: PhD. D.Sc. Eng. Michał Piasecki, m.piasecki@itb.pl | | |

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- 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
- PN-EN 15804:2012+A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- PN-EN 15942:2012 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 Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej. Grudzień 2020
- EN 13967:2012 Flexible sheets for waterproofing - Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet - Definitions and characteristics
- EN 13491:2004/A1:2006 Geosynthetic barriers - Characteristics required for use as a fluid barrier in the construction of tunnels and underground structures





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ITB is the verified member of The European Platform
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