

**Environmental  
Product  
Declaration**

According to EN15804+A2 (+indicators A1)

This declaration is for:  
**Mapeplan TM 18 Broof (t1)**

Provided by:  
**Polyglass SpA**



MRPI® registration:  
**1.1.01075.2026**

Program operator:  
**Stichting MRPI®**  
Publisher:  
**Stichting MRPI®**  
[www.mrpi.nl](http://www.mrpi.nl)

Date of first issue:  
**20-2-2026**  
Date of this issue:  
**20-2-2026**  
Expiry date:  
**20-2-2031**

## COMPANY INFORMATION

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## MRPI® REGISTRATION

1.1.01075.2026

## DATE OF THIS ISSUE

20-2-2026

## EXPIRY DATE

20-2-2031

## SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by Branco Schipper, SGS Search. The LCA study has been done by Federica Carollo - Corporate Environmental Sustainability, Mapei SpA. The certificate is based on an LCA-dossier according to EN15804+A2 (+indicators A1). It is verified according to the 'Verification protocol for MRPI LCA project report & EPD 21th of May 2025, V. 5.2'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate list of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

## PROGRAM OPERATOR

Stichting MRPI®  
Kingsfordweg 151  
1043 GR  
Amsterdam

## PRODUCT

Mapeplan TM 18 Broof (t1)

## DECLARED UNIT / FUNCTIONAL UNIT

1 Area (m2)

## DESCRIPTION OF PRODUCT

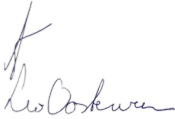
<https://www.polyglass.com/italy/it/prodotti/tutti-i-prodotti/dettaglio/mapeplan-tm-broof>

## VISUAL PRODUCT



## MORE INFORMATION

Mapeplan TM 18 Broof (t1) is a synthetic roofing waterproofing membrane in flexible polyolefin FPO produced in one multi-extrusion coating process, with high quality raw materials, reinforced with polyester net.

|                                                                                                                                                      |                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Ing. L. L. Oosterveen MSc. MBA<br/>Managing Director MRPI</p>  | <p><b>DEMONSTRATION OF VERIFICATION</b></p>                                                                                                                                           |
|                                                                                                                                                      | <p>CEN standard EN15804 serves as the core PCR [1]</p>                                                                                                                                |
|                                                                                                                                                      | <p>Independent verification of the declaration and data according to EN15804+A2 (+indicators A1)</p> <p>Internal: External: X</p>                                                     |
|                                                                                                                                                      | <p>Third party verifier: Branco Schipper, SGS Search</p>  <p>[1] PCR = Product Category Rules</p> |

## DETAILED PRODUCT DESCRIPTION

Mapeplan TM 18 Broof (t1) is a synthetic roofing waterproofing membrane in flexible polyolefin FPO produced in one multi-extrusion coating process, with high quality raw materials, reinforced with polyester net.

Mapeplan TM 18 Broof (t1) is compliant with EN 13956 ("Flexible sheets for waterproofing – Plastic and rubber sheets for roof waterproofing – Definitions and characteristics").

Mapeplan M 18 Broof T1-T3 has a Mass per Unit of 1,98 kg/m<sup>2</sup>

Packaging materials include:

- Wooden pallet
- Cardboard
- LDPE used as wrapping material

The reference service life of the roofing membrane, according to Polyglass experience, is estimated at least 30 years, if professionally installed and properly used.

DETAILED PRODUCT DESCRIPTION PART 2: Mapeplan T M BROOF(t1) is suitable for exposed roof installations and for mechanical fixing. It is resistant to ultraviolet rays and may be exposed to all weather conditions.

Mapeplan T M BROOF(t1) is a high standard quality product; it performs very good mechanical properties, best workability as well as excellent welding characteristics.

- High solar reflectance
- High workability and weldability
- High mechanical resistance
- Excellent flexibility at low temperatures
- Excellent resistance to ageing
- Excellent resistance to UV rays and to weathering
- Vapour permeability
- Formulation without plasticizer

The production process of FPO/TPO roofing membranes is a multi-extrusion coating process. The production plant produces roofing membranes with an internal reinforcing material made of glass mat or polyester net, also a fleece backed with a woven-non-woven polyester.

FPO/TPO granulate is stored in silos and sent to multi-extrusion plant.

The hot melt compound comes out from the extruders where the reinforced material is combined and totally encapsulated.

The membrane is cooled and finally sent to the packaging area, ready to ship.

| Component (> 1%)      | (kg / %) |
|-----------------------|----------|
| FPO/TPO compounds     | 70%-95%  |
| Reinforcing materials | 5%-15%   |
| Pigments              | 0%-5%    |
| Other Additives       | 0%-1%    |

## SCOPE AND TYPE

Mapeplan M 18 Broof T1-T3 is manufactured for the Dutch market by Polyglass SpA (Italy), including packaging of the finished products.

End-of-life geography: Netherlands

Background database - ecoinvent 3.6

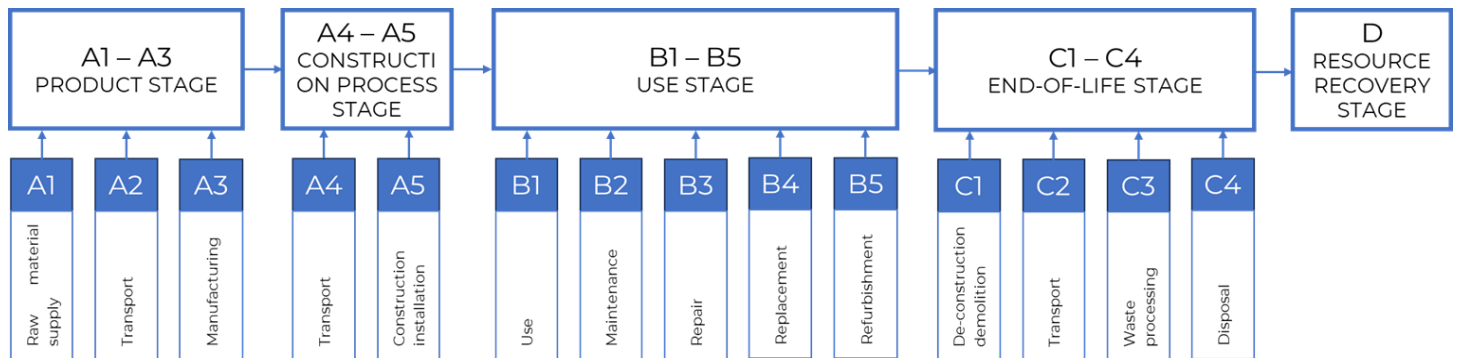
LCA software: LCA for Experts (Sphera) 10.9.3.0

Type of EPD: Specific

| PRODUCT STAGE       |           |               | CONSTRUCTION PROCESS STAGE |          | USE STAGE |             |        |             |               |                        |                       | END OF LIFE STAGE          |           |                  |          | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES |
|---------------------|-----------|---------------|----------------------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|-------------------------------------------------|
| Raw material supply | Transport | Manufacturing | Transport gate to site     | Assembly | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction 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                                               |
| x                   | x         | x             | x                          | x        | x         | x           | x      | x           | x             | ND                     | ND                    | x                          | x         | x                | x        | x                                               |

X = Modules Assessed

ND = Not Declared



## REPRESENTATIVENESS

Mapeplan TM Broof t1 is manufactured in Italy, intended for use within the Dutch market, and its end-of-life scenario is also assessed according to Dutch market conditions.

A1-A2: EU

A3: IT

A4-A5: NL

C1-C2-C3-C4: NL

D: NL

## ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

|      | Unit           | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| ADPE | kg Sb eq.      | 3,21E-05 | 2,00E-06 | 1,69E-06 | 3,58E-05 | 9,71E-06 | 9,11E-08 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,19E-07 | 1,65E-07 | 1,43E-08 | -5,16E-07 |
| ADPF | MJ             | 1,06E+02 | 1,80E+00 | 1,86E+00 | 1,10E+02 | 5,79E+00 | 2,57E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,48E-01 | 2,22E-01 | 4,17E-02 | -2,73E+01 |
| GWP  | kg CO2 eq.     | 3,87E+00 | 1,16E-01 | 1,17E-01 | 4,10E+00 | 3,80E-01 | 4,15E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,60E-02 | 4,89E+00 | 2,39E-02 | -1,58E+00 |
| ODP  | kg CFC11 eq.   | 2,10E-07 | 2,20E-08 | 1,27E-07 | 3,59E-07 | 6,74E-08 | 1,35E-09 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,38E-09 | 3,49E-09 | 4,82E-10 | -1,85E-07 |
| POCP | kg ethene eq.  | 3,86E-03 | 8,34E-05 | 9,54E-05 | 4,04E-03 | 2,85E-04 | 9,27E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,70E-05 | 8,58E-05 | 5,58E-06 | -2,65E-04 |
| AP   | kg SO2 eq.     | 1,29E-02 | 3,81E-04 | 4,48E-04 | 1,37E-02 | 1,67E-03 | 5,18E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,58E-04 | 3,76E-04 | 1,06E-05 | -1,15E-03 |
| EP   | kg (PO4) 3 eq. | 1,48E-03 | 7,09E-05 | 1,33E-04 | 1,69E-03 | 3,31E-04 | 2,16E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,13E-05 | 9,77E-05 | 5,18E-06 | -1,92E-04 |

### Toxicity indicators and ECI (Dutch market)

|       |            |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |           |
|-------|------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| HTP   | kg DCB eq. | 9,08E-01 | 5,41E-02 | 6,35E-02 | 1,03E+00 | 1,60E-01 | 8,27E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,51E-02 | 1,45E-01 | 1,69E-03 | -9,76E-02 |
| FAETP | kg DCB eq. | 4,42E-02 | 2,02E-03 | 4,07E-03 | 5,03E-02 | 6,25E-03 | 6,50E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,92E-04 | 2,64E-02 | 2,08E-03 | -1,21E-03 |
| MAETP | kg DCB eq. | 8,07E+01 | 7,95E+00 | 5,58E+00 | 9,43E+01 | 2,31E+01 | 3,84E+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 | 2,19E+00 | 2,76E-03 | 2,08E+00 | -4,38E+00 |
| TETP  | kg DCB eq. | 1,60E-02 | 5,07E-04 | 1,16E-03 | 1,77E-02 | 1,62E-03 | 1,89E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,54E-04 | 5,47E-04 | 1,74E-05 | -1,39E-03 |
| ECI   | euro       | 3,66E-01 | 1,40E-02 | 1,56E-02 | 3,96E-01 | 4,66E-02 | 3,68E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,42E-03 | 2,61E-01 | 1,72E-03 | -9,73E-02 |
| ADPF  | kg Sb eq.  | 5,10E-02 | 8,65E-04 | 8,96E-04 | 5,27E-02 | 2,78E-03 | 1,23E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,64E-04 | 1,07E-04 | 2,01E-05 | -1,31E-02 |

- ADPE = Abiotic Depletion Potential for non-fossil resources
- ADPF = Abiotic Depletion Potential for fossil resources
- GWP = Global Warming Potential
- ODP = Depletion potential of the stratospheric ozone layer
- POCP = Formation potential of tropospheric ozone photochemical oxidants
- AP = Acidification Potential of land and water
- EP = Eutrophication Potential
- HTP = Human Toxicity Potential
- FAETP = Fresh water aquatic ecotoxicity potential
- MAETP = Marine aquatic ecotoxicity potential
- TETP = Terrestrial ecotoxicity potential
- ECI = Environmental Cost Indicator
- ADPF = Abiotic Depletion Potential for fossil resources

## ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

|                       | Unit                    | A1       | A2       | A3        | A1-A3     | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|-----------------------|-------------------------|----------|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| GWP-total             | kg CO2 eq.              | 4,00E+00 | 1,17E-01 | 5,91E-03  | 4,12E+00  | 3,83E-01 | 1,39E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,63E-02 | 4,89E+00 | 2,80E-02 | -1,60E+00 |
| GWP-fossil            | kg CO2 eq.              | 4,00E+00 | 1,17E-01 | 1,17E-01  | 4,23E+00  | 3,83E-01 | 2,73E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,63E-02 | 4,89E+00 | 2,80E-02 | -1,60E+00 |
| GWP-biogenic          | kg CO2 eq.              | 0,00E+00 | 0,00E+00 | -1,12E-01 | -1,12E-01 | 0,00E+00 | 1,12E-01 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| GWP-luluc             | kg CO2 eq.              | 1,57E-03 | 3,56E-05 | 4,45E-04  | 2,05E-03  | 1,46E-04 | 5,56E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,39E-05 | 9,23E-06 | 4,21E-07 | -1,21E-04 |
| ODP                   | kg CFC11 eq.            | 2,20E-07 | 2,75E-08 | 1,08E-07  | 3,55E-07  | 8,46E-08 | 1,49E-09 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 8,01E-09 | 3,68E-09 | 5,98E-10 | -2,09E-07 |
| AP                    | mol H+ eq.              | 1,56E-02 | 4,92E-04 | 5,89E-04  | 1,66E-02  | 2,22E-03 | 6,82E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,10E-04 | 5,50E-04 | 1,43E-05 | -1,51E-03 |
| EP-fresh water        | kg P eq.                | 8,81E-04 | 8,29E-06 | 3,91E-05  | 9,29E-04  | 3,51E-05 | 7,43E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,32E-06 | 5,39E-06 | 1,78E-07 | -1,79E-05 |
| EP-marine             | kg N eq.                | 2,84E-03 | 1,50E-04 | 1,93E-04  | 3,18E-03  | 7,90E-04 | 4,40E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 7,48E-05 | 2,69E-04 | 9,13E-05 | -4,57E-04 |
| EP-terrestrial        | mol N eq.               | 3,03E-02 | 1,64E-03 | 1,81E-03  | 3,38E-02  | 8,64E-03 | 2,42E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 8,18E-04 | 2,85E-03 | 5,79E-05 | -5,30E-03 |
| POCP                  | kg NMVOC eq.            | 1,37E-02 | 5,27E-04 | 5,13E-04  | 1,47E-02  | 2,47E-03 | 6,77E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,33E-04 | 7,61E-04 | 2,27E-05 | -1,60E-03 |
| ADP-minerals & metals | kg Sb eq.               | 3,21E-05 | 2,00E-06 | 1,69E-06  | 3,58E-05  | 9,71E-06 | 9,11E-08 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,19E-07 | 1,65E-07 | 1,43E-08 | -5,16E-07 |
| ADP-fossil            | MJ, net calorific value | 1,14E+02 | 1,83E+00 | 2,03E+00  | 1,18E+02  | 5,88E+00 | 2,80E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,57E-01 | 2,37E-01 | 4,37E-02 | -2,73E+01 |
| WDP                   | m3 world eq. Deprived   | 2,15E+00 | 8,91E-03 | 5,15E-02  | 2,21E+00  | 3,02E-02 | 7,98E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,86E-03 | 3,81E-02 | 2,32E-03 | -6,61E-02 |

|                       |   |                                                                                     |
|-----------------------|---|-------------------------------------------------------------------------------------|
| GWP-total             | = | Global Warming Potential total                                                      |
| GWP-fossil            | = | Global Warming Potential fossil fuels                                               |
| GWP-biogenic          | = | Global Warming Potential biogenictotal                                              |
| GWP-luluc             | = | Global Warming Potential land use and land use change                               |
| ODP                   | = | Depletion potential of the stratospheric ozone layer                                |
| AP                    | = | Acidification Potential, Accumulated Exceedence                                     |
| EP-freshwater         | = | Eutrophication Potential, fraction of nutrients reaching freshwater end compartment |
| EP-marine             | = | Eutrophication Potential, fraction of nutrients reaching marine end compartment     |
| EP-terrestrial        | = | Eutrophication Potential, Accumulated Exceedence                                    |
| POCP                  | = | Formation potential of tropospheric ozone photochemical oxidants                    |
| ADP-minerals & metals | = | Abiotic Depletion Potential for non-fossil resources [1]                            |
| ADP-fossil            | = | Abiotic Depletion for fossil resources potential [1]                                |
| WDP                   | = | Water (user) deprivation potential, deprivation-weighted water consumption [1]      |

### Disclaimer [1]:

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

## ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

| Unit   |                   | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|--------|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM     | Disease incidence | 1,21E-07 | 1,06E-08 | 1,05E-08 | 1,42E-07 | 3,45E-08 | 5,76E-10 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,26E-09 | 4,36E-09 | 3,00E-10 | -6,57E-09 |
| IRP    | kBq U235 eq.      | 3,68E-01 | 9,28E-03 | 1,16E-02 | 3,89E-01 | 2,78E-02 | 1,49E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,63E-03 | 1,17E-03 | 2,78E-04 | -1,23E-02 |
| ETP-fw | CTUe              | 3,87E+01 | 1,51E+00 | 9,20E+00 | 4,94E+01 | 5,38E+00 | 3,65E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,09E-01 | 1,20E+00 | 3,86E-02 | -3,73E+00 |
| HTP-c  | CTUh              | 1,58E-09 | 3,59E-11 | 9,56E-11 | 1,71E-09 | 1,68E-10 | 1,05E-11 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,59E-11 | 5,90E-10 | 1,06E-12 | -1,25E-10 |
| HTP-nc | CTUh              | 4,41E-08 | 1,44E-09 | 1,66E-09 | 4,72E-08 | 5,12E-09 | 4,52E-10 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,84E-10 | 4,58E-09 | 2,40E-11 | -2,14E-09 |
| SQP    | -                 | 7,99E+00 | 2,08E+00 | 1,32E+01 | 2,32E+01 | 5,00E+00 | 1,16E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,74E-01 | 8,29E-02 | 1,12E-01 | -8,82E+00 |

- PM = Potential incidence of disease due to PM emissions
- IRP = Potential Human exposure efficiency relative to U235 [1]
- ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]
- HTP-c = Potential Comparative Toxic Unit for humans, cancer [2]
- HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]
- SQP = Potential soil quality index [2]

### Disclaimer [1]:

- 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.

### Disclaimer [2]:

- The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

## OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 en A2)

|      | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| HWD  | kg   | 0,00E+00 | 0,00E+00 | 2,56E-03 | 2,56E-03 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| NHWD | kg   | 0,00E+00 | 0,00E+00 | 2,89E-03 | 2,89E-03 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| RWD  | 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 | 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  |
| CRU  | 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 | 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  |
| MFR  | kg   | 0,00E+00 | 0,00E+00 | 1,64E-01 | 1,64E-01 | 0,00E+00 | 3,06E-03 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| MER  | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,02E-01 | 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 | 1,63E+00 | 0,00E+00 | 0,00E+00  |
| EEE  | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,99E-01 | 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 | 6,74E+00 | 0,00E+00 | -7,04E+00 |
| ETE  | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,28E-01 | 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 | 1,20E+01 | 0,00E+00 | -1,25E+01 |

HWD = Hazardous Waste Disposed  
 NHWD = Non Hazardous Waste Disposed  
 RWD = Radioactive Waste Disposed  
 CRU = Components for reuse  
 MFR = Materials for recycling  
 MER = Materials for energy recovery  
 EEE = Exported Electrical Energy  
 ETE = Exported Thermal Energy

## RESOURCE USE per functional unit or declared unit (A1 and A2)

|       | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D         |
|-------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PERE  | MJ   | 3,89E+00 | 2,30E-02 | 9,01E-01 | 4,81E+00 | 7,25E-02 | 1,83E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,86E-03 | 1,20E-02 | 1,73E-03 | -1,73E+00 |
| PERM  | MJ   | 0,00E+00 | 0,00E+00 | 1,03E+00 | 1,03E+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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| PERT  | MJ   | 3,89E+00 | 2,30E-02 | 1,93E+00 | 5,84E+00 | 7,25E-02 | 1,83E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,86E-03 | 1,20E-02 | 1,73E-03 | -1,73E+00 |
| PENRE | MJ   | 1,14E+02 | 1,83E+00 | 1,88E+00 | 1,18E+02 | 5,88E+00 | 2,80E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,57E-01 | 2,37E-01 | 4,37E-02 | -2,73E+01 |
| PENRM | MJ   | 0,00E+00 | 0,00E+00 | 1,46E-01 | 1,46E-01 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| PENRT | MJ   | 1,14E+02 | 1,83E+00 | 2,03E+00 | 1,18E+02 | 5,88E+00 | 2,80E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,57E-01 | 2,37E-01 | 4,37E-02 | -2,73E+01 |
| SM    | 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 | 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  |
| RSF   | 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 | 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  |
| NSRF  | 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 | 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  |
| FW    | m3   | 5,02E-02 | 2,07E-04 | 1,20E-03 | 5,16E-02 | 7,04E-04 | 1,86E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,67E-05 | 8,86E-04 | 5,39E-05 | -1,54E-03 |

|       |   |                                                                                                              |
|-------|---|--------------------------------------------------------------------------------------------------------------|
| PERE  | = | Use of renewable primary energy excluding renewable primary energy used as raw materials                     |
| PERM  | = | Use of renewable primary energy resources used as raw materials                                              |
| PERT  | = | Total use of renewable primary energy resources                                                              |
| PENRE | = | Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials |
| PENRM | = | Use of non-renewable primary energy resources used as raw materials                                          |
| PENRT | = | Total use of non-renewable primary energy resources                                                          |
| SM    | = | Use of secondary materials                                                                                   |
| RSF   | = | Use of renewable secondary fuels                                                                             |
| NSRF  | = | Use of non-renewable secondary fuels                                                                         |
| FW    | = | Use of net fresh water                                                                                       |

## BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 and A2)

|       | Unit | A1       | A2       | A3       | A1-A3    | A4       | A5       | B1       | B2       | B3       | B4       | B5       | B6       | B7       | C1       | C2       | C3       | C4       | D        |
|-------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| BBCpr | kg C | 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 | 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 |
| BCCpa | kg C | 0,00E+00 | 0,00E+00 | 2,59E-02 | 2,59E-02 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

|       |   |                                      |
|-------|---|--------------------------------------|
| BCCpr | = | Biogenic carbon content in product   |
| BCCpa | = | Biogenic carbon content in packaging |

## CALCULATION RULES

The results show the environmental impacts of the products considered in accordance with the requirements of EN15804:2012+A2:2019/AC:2021. The characterization factors are based on the EF 3.0 package. The results refer to the declared unit (see § 2.2). The estimated impacts do not indicate endpoints of the impact categories, nor the exceeding of reference values or risk margins. Allocation rules: In A1 module, the whole annual plant electricity consumption and waste coming from production stage, have been allocated by mass of the product and referred to the declared unit (1sqm of Mapeplan).

Cut-off rules: The following procedure is followed for the exclusion of inputs and outputs:

- All inputs and outputs to a unit process are included in the calculation, for which data are available.
  - Less than 1 % of the total mass inputs / outputs of the unit process A1 and A3, are cut off (see table 2). Input flows are covered for over 99% of the formula.
- Data quality: According to EN15941 Annex C which directly recall EN 15804 §6.3.8.2 "Data quality requirements, all data included in the study refer to a period between 2019 and 2021; the most relevant ones are specific from supplier, while the others (i.e. transport and minor contribution dataset), come from ecoinvent 3.6. All dataset are not more than 10 years old. Primary data concern the year 2021 and represent the whole annual production. The Quality level concerning datasets used in the EPD can be considered as "very good" or "good" according to Annex E (table E1) of the EN 15804 (current version)

Electricity mix: ds: IT:market for electricity, medium voltage [location based approach]

This Electricity mix can be included within the Case 3a according to table 2 in the LCA calculation rules V2.0 of ECOplatform.

Data: market for electricity, medium voltage - 2019 (IT)□

Source: Ecoinvent 3.6□

GWP-GHG: 0,437 kg CO<sub>2</sub>-eqv/kWh

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

The approach is "cradle to gate" (A1–A3) with modules C1-C4 and module D and optional modules (A1-A3 + A4-A5 + C + D):

- A1, A2, A3 (Product stage): extraction and processing of raw materials (A1), transportation up to the factory gate (A2), manufacturing in Polyglass SpA (Italy) of the finished product and packaging (A3).
- A4-A5 (Construction process stage): transport distance of the finished product to final customers is assumed to be 1350 km (Truck distance from Polyglass SpA to Utrecht, Netherlands). The packaging is collected and sent to treatment.
- B1, B2, B3, B4, B5 (Use Stage): no environmental impact take place during use and no regular maintenance or repair is considered in the given RSL.
- C1, C2, C3, C4 (End of Life stage): the demolition phase (C1) includes the electricity for demolition. With a collection rate of 100% as C&D waste, transports are carried out by lorry over 150 km (C2). An energy recovery ratio (C3) of 80% is considered in accordance with the default NMD EoL scenario. The remaining 20% is landfilled (C4).
- D (Resource recovery stage): contains credits from the incineration of the fraction of product in module C3, at the end of life. This module also contains the credit from the incineration of a fraction of packaging waste (A5).

## DECLARATION OF SVHC

The formulation contains no hazardous substances. This product contains no substances of very high concern (SVHC) on the REACH Candidate List/ published by the European Chemicals Agency in a concentration exceeding 0.1 % (by unit weight).

## REFERENCES

EN 15804: SUSTAINABILITY OF CONSTRUCTION WORKS - ENVIRONMENTAL PRODUCT DECLARATIONS - CORE RULES FOR THE PRODUCT CATEGORY OF CONSTRUCTION PRODUCTS  
ISO 14025 ENVIRONMENTAL LABELS AND DECLARATIONS - TYPE III ENVIRONMENTAL DECLARATIONS - PRINCIPLES AND PROCEDURES  
ISO 14044 ENVIRONMENTAL MANAGEMENT – LIFE CYCLE ASSESSMENT – REQUIREMENTS AND GUIDELINES  
NMD, ENVIRONMENTAL PERFORMANCE ASSESSMENT METHOD FOR CONSTRUCTION WORKS V.1.1  
NMD, FORFAITAIRE WAARDEN VOOR VERWERKING-SCENARIO'S EINDE LEVEN BEHORENDE BIJ: BEPALINGSMETHODE MILIEUPRESTATIE BOUWWERKEN