

Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2



MACCAFERRI

MACTEX N

MACTEX PN

Maccaferri TEX AP

Nonwoven needlepunched polypropylene geotextile

| | |
|----------------------|----------------------------|
| Registration number: | EPD-Kiwa-EE-000494-EN |
| Issue date: | 19.05.2026 |
| Valid until: | 19.05.2031 |
| Declaration owner: | Officine Maccaferri S.p.A. |
| Publisher: | Kiwa-Ecobility Experts |
| Program operator: | Kiwa-Ecobility Experts |
| Status: | verified |



1 General information

1.1 PRODUCT

MACTEX N, MACTEX PN, and Maccaferri TEX AP are nonwoven geotextiles made from high-tenacity white polypropylene fibers. They are needle-punched, free of resins and adhesives, and UV-treated.

| Product | Unit weight (g/m ²) |
|--|---------------------------------|
| MACTEX N, MACTEX PN, Maccaferri TEX AP | fom 120 to 1500 |

The declared product represents a product family commercially available within the above-mentioned unit weight range. Individual grammages are not reported separately in this EPD.

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-000494-EN

1.3 VALIDITY

Issue date: 19.05.2026

Valid until: 19.05.2031

1.4 PROGRAM OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
Germany



Raoul Mancke
(Head of program operations,
Kiwa-Ecobility Experts)



Onur Üzüm
(Verification body, Kiwa-
Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: Officine Maccaferri S.p.A.

Address: Via Alberico Albricci, 9, 20122 Milano, Italy

E-mail: info.hq@maccaferri.com

Website: <https://www.maccaferri.com/>

Production location: Padova, Italy

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804:2012+A2:2019 serves as the core PCR.

Internal External



Dr. Ing. Morteza Nikravan
(Third party verifier)

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The program operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-EE GPI R.4.0

Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, Program EE 1201 (18.12.2025)

Kiwa-EE GPI R.4.0 Annex B1

Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, Program EE 1203 (18.12.2025)]

Product Category Rules (PCR): PCR 2019:14 Construction products and construction services (v2.0.1.)

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPDs programs may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2 (5.3 Comparability of EPD for construction products) and ISO 14025 (6.7.2 Requirements for comparability).

1.10 CALCULATION BASIS

LCA method: EN15804+A2

LCA software: SimaPro 10.2.0.1

Characterization method: the characterisation method has been aligned with the project report by explicitly referring to **EN 15804+A2** and **JRC EF3.1 characterisation factors**

LCA database profiles: Ecoinvent

Version database: 3.10, 2024

1.11 PROJECT REPORT

This EPD is generated on the basis of the following report: LCA_TVA_2025-1240-1

2 Product

2.1 PRODUCT DESCRIPTION

MACTEX N, MACTEX PN, and Maccaferri TEX AP are nonwoven geotextiles made from high-tenacity white polypropylene fibers. They are needle-punched, free of resins and adhesives, and UV-treated.

Product specification

The composition of the product is described in the following table:

| Materials | Weight [m-%] |
|---------------|--------------|
| Polypropylene | 100% |

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

MACTEX N, MACTEX PN and Maccaferri TEX AP are used in a wide range of civil engineering applications, including roads, railways, landfills, retaining walls, hydraulic works, and embankments. They perform essential functions such as filtration, separation, and protection, contributing to the long-term stability and durability of the project.

The products are CE marked and comply with EN 13249, EN 13250, EN 13251, EN 13252, EN 13253, EN 13254, EN 13255, EN 13256, EN 13257 and EN 13265.

2.3 REFERENCE SERVICE LIFE (RSL)

RSL PRODUCT

The value is consistent with the expected service life of geotextiles used in civil engineering applications, assuming correct installation and standard use conditions.

USED RSL (YR) IN THIS CALCULATION

100 years comply with EN ISO 13438 and as stated in the products' DOPs

2.4 TECHNICAL DATA

For further information on these products please visit the webpage under the following link: www.maccaferri.com. Further performance characteristics are detailed in DoP.

| Description | Unit | Value |
|--------------------------------------|------|----------------|
| Tensile strength – MD (UNI EN 10319) | kN/m | From 8,5 to 90 |

2.5 SUBSTANCES OF VERY HIGH CONCERN

The product does not contain substances included in the “Candidate list of substances of very high concern (SVHC) for authorization”.

2.6 DESCRIPTION PRODUCTION PROCESS

Nonwoven polypropylene geotextiles are produced by mechanically opening and blending polypropylene staple fibres supplied in bales. The fibres are carded and laid into a web using a cross-lapping system to form a fibre batt, which is then mechanically consolidated by needlepunching. The finished nonwoven fabric is then trimmed, cut, wound into rolls, and packaged.

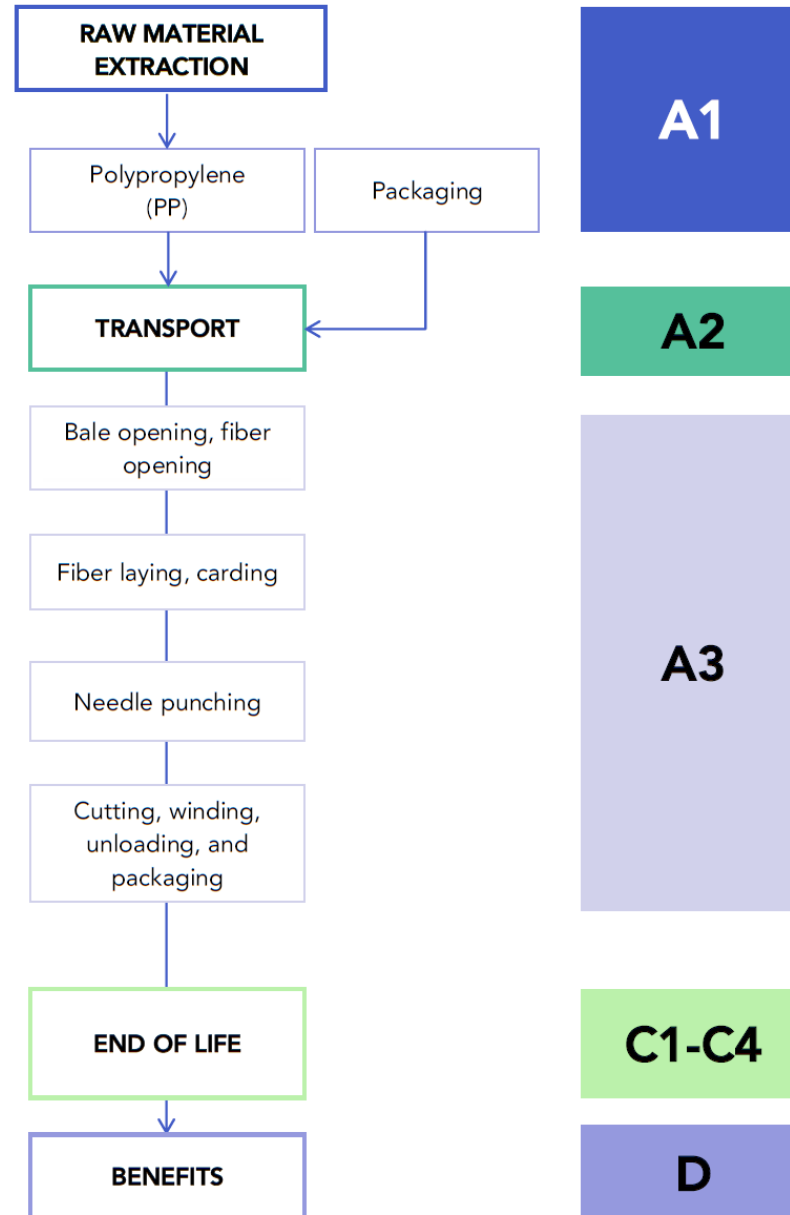


Figure 1: Process flow diagram

3 Calculation rules

3.1 DECLARED UNIT

1 tonne of MACTEX N, MACTEX PN, Maccaferri TEX AP nonwoven polypropylene geotextile

3.2 CONVERSION FACTORS

| Description | Value | Unit |
|---------------------------|-------|------|
| Reference unit | 1000 | kg |
| Weight per reference unit | - | kg |
| Conversion factor to 1 kg | 1 | - |

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

The system boundary is defined as cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

The life cycle stages included are as shown below:

(X = module declared, ND = module not declared)

| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| X | X | X | ND | ND | ND | ND | ND | ND | ND | ND | ND | X | X | X | X | X |

The modules of the EN 15804+A2 contain the following:

| | |
|---------------------------------|------------------------------------|
| Module A1 = Raw material supply | Module B5 = Refurbishment |
| Module A2 = Transport | Module B6 = Operational energy use |
| Module A3 = Manufacturing | Module B7 = Operational water use |
| Module A4 = Transport | Module C1 = Deconstruction / |

| | |
|---|--|
| | Demolition |
| Module A5 = Construction - Installation process | Module C2 = Transport |
| Module B1 = Use | Module C3 = Waste Processing |
| Module B2 = Maintenance | Module C4 = Disposal |
| Module B3 = Repair | Module D = Benefits and loads beyond the product system boundaries |
| Module B4 = Replacement | |

3.4 REPRESENTATIVENESS

This is a manufacturer-specific average product EPD, representative of the product family MACTEX N, MACTEX PN, Maccaferri TEX AP, produced by Officine Maccaferri S.p.A.

Manufacturer specific EPD - Average product

Italy; Global

3.5 CUT-OFF CRITERIA

The LCA model includes at least 99% of total mass and energy inputs per unit process and at least 95% of total mass, energy and environmental relevance per aggregated module, in accordance with EN 15804 and PCR 2019:14.

Only flows considered environmentally not significant and below the applied cut-off relevance threshold were excluded. These include labels used during packaging and shipping, cylinders used for nylon welding during packaging, and office-related consumption.

3.6 ALLOCATION

In the LCA study, mass allocation was applied to ensure a consistent distribution of environmental impacts with respect to activity data such as electricity, natural gas, water, diesel fuel, auxiliary materials, waste, and incoming raw materials. The allocation is performed in accordance with the provisions of EN 15804. Incoming energy, water, and in-house waste production are equally allocated among all products using a power output allocation method. For the end-of-life allocation of background data (energy and materials), the "allocation cut-off by classification" model, as specified in the ISO standard, is applied. Specific details regarding allocations within the background data can be found in the documentation of theecoinvent datasets.

3.7 DATA COLLECTION & REFERENCE TIME PERIOD

Primary data including all raw materials, packaging materials, energy consumption and ancillary materials was comprehensively collected for the reference year from 2024-01-01 to 2024-12-31.

3.8 ESTIMATES AND ASSUMPTIONS

- Predicted to be durable for 100 years in natural soils with $4 \leq \text{pH} \leq 9$ and soil temperatures $\leq 25^\circ\text{C}$ (EN ISO 13438). The use stage is not included within the system boundary of this study. Consequently, modules B1–B7 are reported as MND (Module Not Declared). The product's reference service life is assumed to coincide with the declared durability of 100 years in natural soils ($4 \leq \text{pH} \leq 9$, soil temperature $\leq 25^\circ\text{C}$, EN ISO 13438).
- The declared unit is 1 tonne of geotextile.
- Primary manufacturing data refer to the Padova production site and to the reference period 01.01.2024–31.12.2024.
- Annual site electricity data were converted into specific electricity consumption per declared unit for LCA modelling.
- In the absence of product-specific end-of-life data, modules C1, C2, C3 and C4 were modelled using the default scenario provided in Table 4 of PCR 2019:14 Construction products v2.0.1.
- The reference end-of-life scenario assumes landfill disposal; therefore, module D is reported as zero.
- No guarantees of origin (GO) were available for purchased electricity

3.9 DATA QUALITY

The data supporting this EPD were collected directly from the manufacturing site and refer to the reference year 2024. For the life cycle modules A1–A3, the dataset includes a primary data share of 75%, ensuring a high level of representativeness of site-specific processes. The overall quality of the data has been assessed as very good, based on completeness, consistency, and temporal and geographical relevance.

| Quality requirement | Specific requirement | Data quality level | Notes |
|-------------------------------------|--|--------------------|--|
| Time-related coverage | Age of data and minimum time period for data collection. | Very Good | 2024 data |
| Geographical coverage | Upstream: Unit process for raw material should be collected for respective geographic region | Very Good | Data specific to the geographical area of supply |
| | Core: Unit process for production should represent the real site. | Very Good | Data specific to the geographical area of supply |
| Technical representativeness | Downstream: End-of-life disposal should represent the region of disposal. | Very Good | Data specific to the geographical area of supply |
| | Qualitative assessment of the degree to which the data set reflects the true population of interest (technology) | Very Good | Data derived from the manufacturing plant; secondary data were used to model the production of raw materials, auxiliaries, and packaging |

3.10 POWER MIX

The electricity data reported below refer to the annual electricity balance of the Padova manufacturing site for the reference year 2024. These values are provided for transparency and are not expressed per declared unit. For LCA modelling, the annual site electricity data were converted into specific electricity consumption per declared unit (1 tonne of product). The modelled values are 245.64 kWh/tonne of purchased electricity and 40.96 kWh/tonne of self-produced photovoltaic electricity.

| Source | Annual Site Electricity (2024) | UoM |
|-------------------|--------------------------------|------------|
| Purchased | 2.632.037,60 | kWh |
| Self-produced | 589.766,00 | kWh |
| Self-consumed | 438.915,00 | kWh |
| Fed into the grid | 150.851,00 | kWh |
| Total | 3.070.952,60 | kWh |

- In SimaPro, these consumptions were modelled using the following Ecoinvent database processes:

- o Electricity, medium voltage {IT}| electricity, medium voltage, residual mix | Cut-off, S for electricity purchased from the grid;
- o Electricity, low voltage {IT}| electricity production, photovoltaic, 3kWp slanted-roof installation, single-Si, panel, mounted | Cut-off, U for electricity self-produced by the photovoltaic system.

- No Guarantees of Origin (GOs) were available for purchased electricity, and no GO-based claim was applied to the electricity fed into the national grid.

- The climate impact associated with the electricity purchased for manufacturing processes in module A3 has been calculated as 6.39E-01 kg CO₂ eq/kWh, using the GWP-GHG indicator.

4 Scenarios and additional technical information

The declared product system includes modules A1-A3 + C1-C4 + D.

4.1 RAW MATERIAL SUPPLY (A1)

A1 Raw material supply includes the production and supply of polypropylene staple fibres and packaging materials used for the declared product.

4.2 TRANSPORT (A2)

A2 Transport includes the transport of raw materials and packaging materials from suppliers to the manufacturing site in Padova, Italy. The modelling is based on the actual origin of the materials and the corresponding transport routes.

4.3 MANUFACTURING (A3)

A3 Manufacturing includes the manufacturing processes at the Padova plant, including fibre opening and blending, carding, cross-lapping, needlepunching, thermal treatment where applicable, cutting, winding and packaging. Module A3 also includes electricity use, thermal energy use, waste generation and direct emissions to air where applicable.

4.4 DE-CONSTRUCTION, DEMOLITION (C1)

In the absence of product-specific end-of-life data, modules C1-C4 were modelled according to the default scenario provided in Table 4 of PCR 2019:14 Construction products v2.0.1.

C1 Deconstruction/demolition was modelled as mechanical removal of the geotextile.

4.5 TRANSPORT END-OF-LIFE (C2)

C2 Transport was modelled as transport to disposal by truck according to the PCR default scenario.

4.6 END OF LIFE (C3, C4)

C3 Waste processing includes sorting-related operations according to the PCR default scenario.

C4 Disposal was modelled with landfill as the reference end-of-life destination.

4.7 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

Module D is declared as 0, since the adopted end-of-life scenario does not include reuse, recycling or energy recovery processes generating benefits beyond the system boundary.

5 Results

For the impact assessment, the characterization factors of the LCIA method EN 15804 +A2 Method v1.0 are used. Long-term emissions (>100 years) are not considered in the impact assessment. The results of the impact assessment are only relative statements that do not make any statements about endpoints of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER 1 tonne of MACTEX N, MACTEX PN, Maccaferri TEX AP

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

| Abbreviation | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|--------------|---------------------------|-----------|----------|----------|----------|----------|----------|
| AP | mol H ⁺ eqv. | 7,57E+00 | 3,58E-03 | 9,69E-02 | 1,22E-02 | 5,21E-03 | 0,00E+00 |
| GWP-total | kg CO ₂ eqv. | 2,35E+03 | 3,97E-01 | 3,10E+01 | 2,37E+00 | 5,77E-01 | 0,00E+00 |
| GWP-b | kg CO ₂ eqv. | -3,99E+01 | 4,34E-05 | 2,12E-02 | 1,84E-02 | 6,31E-05 | 0,00E+00 |
| GWP-f | kg CO ₂ eqv. | 2,39E+03 | 3,97E-01 | 3,10E+01 | 2,35E+00 | 5,77E-01 | 0,00E+00 |
| GWP-luluc | kg CO ₂ eqv. | 1,28E+00 | 3,45E-05 | 1,01E-02 | 1,96E-04 | 5,01E-05 | 0,00E+00 |
| EP-m | kg N eqv. | 1,66E+00 | 1,66E-03 | 3,23E-02 | 4,61E-03 | 2,41E-03 | 0,00E+00 |
| EP-fw | kg P eqv. | 4,02E-02 | 1,40E-06 | 2,38E-04 | 2,59E-05 | 2,03E-06 | 0,00E+00 |
| EP-T | mol N eqv. | 1,80E+01 | 1,82E-02 | 3,55E-01 | 5,07E-02 | 2,64E-02 | 0,00E+00 |
| ODP | kg CFC 11 eqv. | 2,47E-05 | 6,07E-09 | 6,16E-07 | 4,45E-08 | 8,83E-09 | 0,00E+00 |
| POCP | kg NMVOC eqv | 6,31E+00 | 5,42E-03 | 1,52E-01 | 1,64E-02 | 7,89E-03 | 0,00E+00 |
| ADP-f | MJ | 8,28E+04 | 5,19E+00 | 4,35E+02 | 3,30E+01 | 7,55E+00 | 0,00E+00 |
| ADP-mm | kg Sb-eqv. | 1,01E-02 | 1,42E-07 | 9,90E-05 | 1,81E-06 | 2,06E-07 | 0,00E+00 |
| WDP | m ³ world eqv. | 4,21E+02 | 1,12E-02 | 1,78E+00 | 3,80E-01 | 1,64E-02 | 0,00E+00 |

AP=Acidification (AP) | **GWP-total**=Global warming potential (GWP-total) | **GWP-b**=Global warming potential - Biogenic (GWP-b) | **GWP-f**=Global warming potential - Fossil (GWP-f) | **GWP-luluc**=Global warming potential - Land use and land use change (GWP-luluc) | **EP-m**=Eutrophication marine (EP-m) | **EP-fw**=Eutrophication, freshwater (EP-fw) | **EP-T**=Eutrophication, terrestrial (EP-T) | **ODP**=Ozone depletion (ODP) | **POCP**=Photochemical ozone formation - human health (POCP) | **ADP-f**=Resource use, fossils (ADP-f) | **ADP-mm**=Resource use, minerals and metals (ADP-mm) | **WDP**=Water use (WDP)

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

| Abbreviation | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|--------------|-------------------|----------|----------|----------|----------|----------|----------|
| ETP-fw | CTUe | 3,07E+03 | 7,36E-01 | 1,17E+02 | 3,90E+00 | 1,07E+00 | 0,00E+00 |
| PM | Disease incidence | 4,17E-05 | 1,02E-07 | 2,42E-06 | 2,57E-07 | 1,48E-07 | 0,00E+00 |
| HTP-c | CTUh | 2,30E-06 | 1,55E-09 | 2,16E-07 | 5,86E-09 | 2,26E-09 | 0,00E+00 |
| HTP-nc | CTUh | 9,29E-06 | 6,42E-10 | 2,71E-07 | 6,53E-09 | 9,34E-10 | 0,00E+00 |
| IR | kBq U-235 eqv. | 3,65E+01 | 9,04E-04 | 1,98E-01 | 2,13E-02 | 1,31E-03 | 0,00E+00 |
| SQP | Pt | 7,16E+03 | 3,65E-01 | 2,59E+02 | 2,28E+00 | 5,31E-01 | 0,00E+00 |

ETP-fw=Ecotoxicity, freshwater (ETP-fw) | **PM**=Particulate Matter (PM) | **HTP-c**=Human toxicity, cancer (HTP-c) | **HTP-nc**=Human toxicity, non-cancer (HTP-nc) | **IR**=Ionising radiation, human health (IR) | **SQP**=Land use (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

| ILCD classification | Indicator | Disclaimer |
|------------------------------------|---|------------|
| ILCD type / level 1 | Global warming potential (GWP) | None |
| | Depletion potential of the stratospheric ozone layer (ODP) | None |
| | Potential incidence of disease due to PM emissions (PM) | None |
| ILCD type / level 2 | Acidification potential, Accumulated Exceedance (AP) | None |
| | Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater) | None |
| | Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine) | None |
| | Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | None |
| | Formation potential of tropospheric ozone (POCP) | None |
| ILCD type / level 3 | Potential Human exposure efficiency relative to U235 (IRP) | 1 |
| | Abiotic depletion potential for non-fossil resources (ADP-minerals&metals) | 2 |
| | Abiotic depletion potential for fossil resources (ADP-fossil) | 2 |
| | Water (user) deprivation potential, deprivation-weighted water consumption (WDP) | 2 |
| | Potential Comparative Toxic Unit for ecosystems (ETP-fw) | 2 |
| | Potential Comparative Toxic Unit for humans (HTP-c) | 2 |
| | Potential Comparative Toxic Unit for humans (HTP-nc) | 2 |
| Potential Soil quality index (SQP) | 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 disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

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 experienced with the indicator.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI) PER 1 tonne of MACTEX N, MACTEX PN, Maccaferri TEX AP

PARAMETERS DESCRIBING RESOURCE USE

| Abbreviation | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|--------------|----------------|----------|----------|----------|----------|----------|----------|
| PERE | MJ | 8,61E+03 | 3,10E-02 | 7,14E+00 | 4,01E-01 | 4,51E-02 | 0,00E+00 |
| PERM | MJ | 4,37E+03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 1,30E+04 | 3,10E-02 | 7,14E+00 | 4,01E-01 | 4,51E-02 | 0,00E+00 |
| PENRE | MJ | 4,99E+04 | 5,19E+00 | 4,35E+02 | 3,30E+01 | 7,55E+00 | 0,00E+00 |
| PENRM | MJ | 3,31E+04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 8,29E+04 | 5,19E+00 | 4,35E+02 | 3,30E+01 | 7,55E+00 | 0,00E+00 |
| SM | kg | 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 |
| NRSF | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m ³ | 1,64E+01 | 3,71E-04 | 5,96E-02 | 1,14E-02 | 5,40E-04 | 0,00E+00 |

PERE=renewable primary energy ex. raw materials | PERM=renewable primary energy used as raw materials | PERT=renewable primary energy total | PENRE=non-renewable primary energy ex. raw materials | PENRM=non-renewable primary energy used as raw materials | PENRT=non-renewable primary energy total | SM=use of secondary material | RSF=use of renewable secondary fuels | NRSF=use of non-renewable secondary fuels | FW=use of net fresh water

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

| Abbreviation | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------|----------|----------|
| HWD | kg | 6,38E-01 | 4,73E-05 | 1,08E-02 | 3,15E-04 | 6,89E-05 | 0,00E+00 |
| NHWD | kg | 9,21E+01 | 3,17E-03 | 2,06E+01 | 3,53E-02 | 4,62E-03 | 0,00E+00 |
| RWD | kg | 7,74E-01 | 5,70E-07 | 1,39E-04 | 1,47E-05 | 8,30E-07 | 0,00E+00 |

HWD=hazardous waste disposed | NHWD=non-hazardous waste disposed | RWD=radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

| Abbreviation | Unit | A1-A3 | C1 | C2 | C3 | C4 | D |
|--------------|------|----------|----------|----------|----------|----------|----------|
| CRU | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR | kg | 2,31E+01 | 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 | 0,00E+00 |
| EET | MJ | 6,14E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EEE | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

CRU=Components for re-use | MFR=Materials for recycling | MER=Materials for energy recovery | EET=Exported Energy Thermic | EEE=Exported Energy Electric

5.3 INFORMATION ON BIOGENIC CARBON CONTENT AT THE FACTORY GATE PER 1 tonne of MACTEX N, MACTEX PN, Maccaferri TEX AP

| Product content | Mass, kg | Post-consumer recycled material, mass-% of product | Biogenic material, mass-% of product | Biogenic material, kg C/product or declared unit |
|-----------------|----------|--|--------------------------------------|--|
| Polypropylene | 1,00E+03 | - | - | - |
| TOTAL | 1,00E+03 | - | - | - |

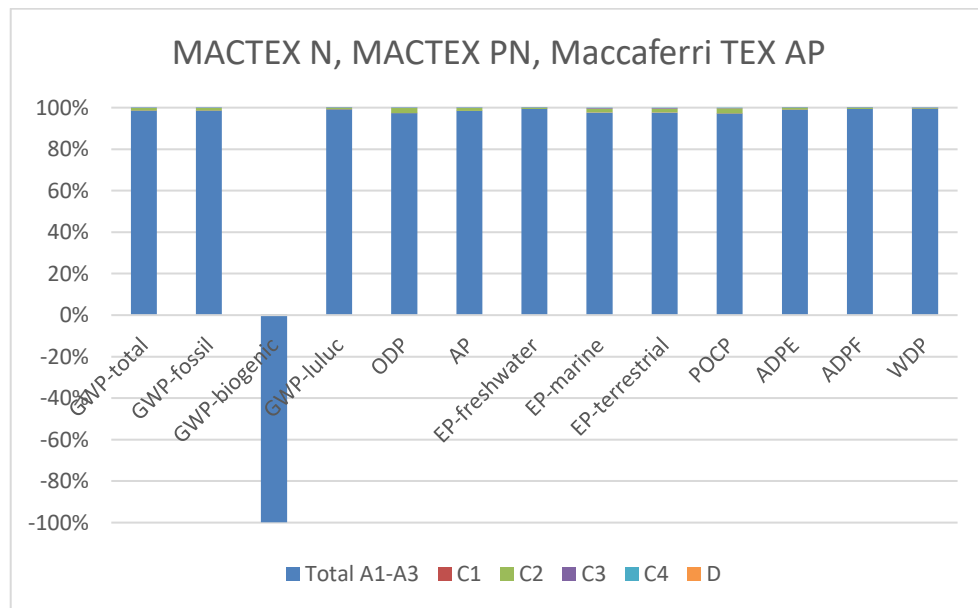
| Packaging materials | Mass, kg | Mass-% (versus the product) | Biogenic carbon content at the factory gate for 1 declared unit: 1 tonne of MACTEX N, MACTEX PN, Maccaferri TEX AP |
|---------------------|----------|-----------------------------|--|
| Pallet | 1,20E+01 | 1,2% | 0,471 KgC/declared unit |
| Cardboard tubes | 3,00E+01 | 3% | 0,453 KgC/declared unit |
| Nylon film | 8,00E+00 | 0,8% | - |
| Plastic strapping | 1,00E+00 | 0,1% | - |
| TOTAL | 5,10E+01 | 5,1% | 0,924 KgC/declared unit |

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO₂

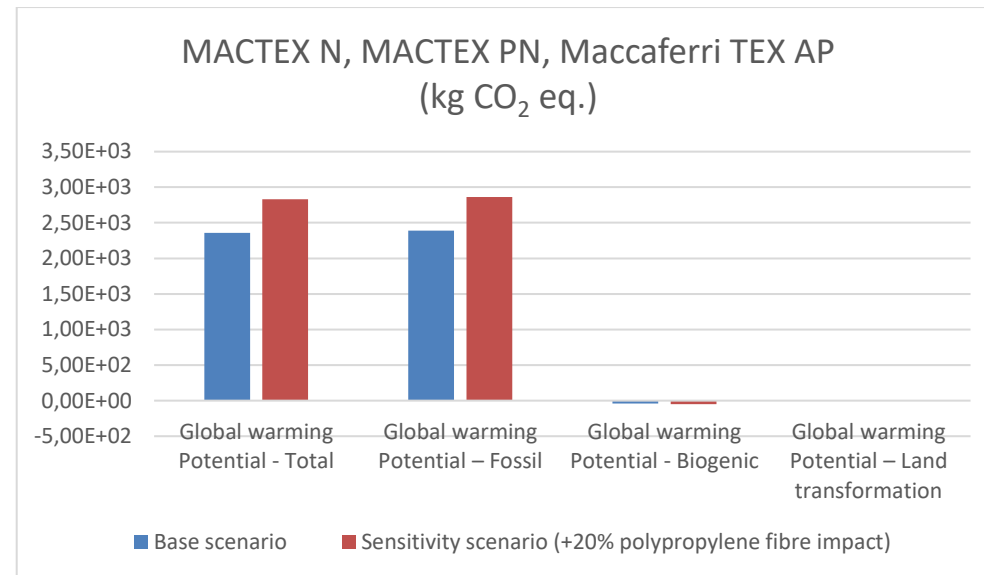
6 Interpretation of results

6.1 CONTRIBUTION ANALYSIS

For all environmental indicators, the impact contribution is dominated by module A1–A3 (production). End-of-life modules C1–C4 provide marginal contributions compared to the total, while module D shows no environmental benefits or burdens.



6.2 SENSITIVITY ANALYSES



The sensitivity analysis compares the base scenario with an alternative scenario in which the environmental profile of the purchased polypropylene fibre is assumed to be 20% higher. Under this assumption, the Global Warming Potential increases from 2.43E+03 to 2.92E+03 kg CO₂ eq. per declared unit, showing that the result is strongly influenced by the environmental profile of the polypropylene fibre supplier.

7 References

ISO 14040

ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044

ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

ISO 14025

ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2

EN 15804+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

Kiwa-EE GPI R. 4.0

Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, Program EE 1201 (18.12.2025)

Kiwa-EE GPI R. 4.0 Annex B1




Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, Program EE 1203 (18.12.2025)

Background database

ecoinvent version 3.10

NMD Determination Method V1.1 (March 2022)

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