

# Environmental Product Declaration



THE INTERNATIONAL EPD® SYSTEM



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC 2021 for:

## HIPERTEX and HIPERTEX Z

HIPERTEX: POLYPROPYLENE NONWOVEN GEOTEXTILE, NEEDLE PUNCHED AND THERMOCALANDERED

HIPERTEX Z: POLYPROPYLENE NONWOVEN GEOTEXTILE, NEEDLE PUNCHED

from

**TESSILBRENTA SPA**



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0016237
Publication date:	2025-02-04
Valid until:	2030-02-03



This is an EPD of multiple products, based on the average results of the product group. Products included: HIPERTEX and HIPERTEX Z.

An EPD should provide current information and may be updated if conditions change.

The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com).

## General information

### Programme information

<b>Programme:</b>	The International EPD <sup>®</sup> System
<b>Address:</b>	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
<b>Website:</b>	<a href="http://www.environdec.com">www.environdec.com</a>
<b>E-mail:</b>	<a href="mailto:info@environdec.com">info@environdec.com</a>

<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products and construction services (v1.3.4)
PCR review was conducted by: The Technical Committee of the International EPD <sup>®</sup> System. See <a href="http://www.environdec.com/TC">www.environdec.com/TC</a> for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat <a href="http://www.environdec.com/contact">www.environdec.com/contact</a> .
<b>Life Cycle Assessment (LCA)</b>
LCA accountability: Spin Life S.r.l – Spinoff dell’Università di Padova, via Cerato 14, Padova
<b>Third-party verification</b>
Independent third-party verification of the declaration and data, according to ISO 14025:2010, via:  <input checked="" type="checkbox"/> EPD verification by accredited certification body  Third-party verification: <i>DNV Business Assurance Italy S.r.l. - Via Energy Park, 14 - 20871 Vimercate (MB) Italy - <a href="http://www.dnv.it">www.dnv.it</a></i> . It is an approved certification body accountable for the third-party verification.  The certification body is accredited by: <i>ACCREDIA - Accreditation certification n 0015VV rev.1</i>
Procedure for follow-up of data during EPD validity involves third party verifier:  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

This is an EPD of multiple products and for each indicator the results are referred to an average product. This product has an average composition based on the actual production of the reference year. Results are also calculated for two other cases, one called “best”, which has the lowest impact for GWP-GHG category (HIPERTEX Z, non-thermally treated), and one called “worst”, which has the highest impact for GWP-GHG category (HIPERTEX, thermally treated). The maximum difference between these two cases and the average impact is reported in the results.

## Company information

Owner of the EPD: Tessilbrenta S.p.A. – Via Torino 2 - 36020 Pove del Grappa (VI) - Italy

Contact: Renzo Rossi [renzo.rossi@tessilbrenta.com](mailto:renzo.rossi@tessilbrenta.com)

Technical support: Spin Life S.r.l – Spinoff dell'Università di Padova, via Cerato 14, Padova

Description of the organization: Founded in 1980, Tessilbrenta S.p.A. (hereinafter referred to as Tessilbrenta) soon became the technological reference for the development and design of non-woven fabrics with industrial, civil engineering and furnishing applications.

Through technological innovation, geographic expansion and targeted diversification, Tessilbrenta today offers a wide range of products, from geotextiles to geo-containers for applications in civil and environmental engineering, to nonwovens for roofing and furniture.

Tessilbrenta currently conducts business in more than 20 countries. The emerging markets of North Africa and the Middle East have progressively joined the established European markets.

Management system-related certifications:

UNI EN ISO 9001:2015 Quality management - certificate n° CERT-01650-97-AQ-VEN-SINCERT

UNI EN ISO 45001:2015 Occupational health and safety management - certificate n° 10000457012-MSC-ACCREDIA-ITA

Name and location of the production site: Tessilbrenta S.p.A. – Via Torino 2 - 36020 Pove del Grappa (VI) - Italy



*Tessilbrenta S.p.A production plant – Pove del Grappa (VI)*

## Product information

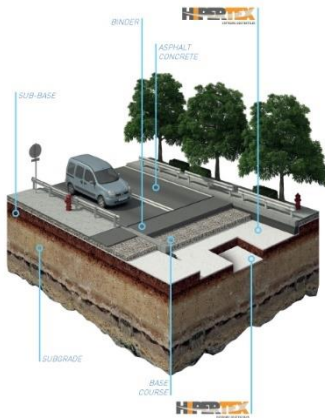
Product Name: HIPERTEX and HIPERTEX Z

Products description: HIPERTEX geotextile is the perfect solution for present civil engineering works and tomorrow building challenges. Hipertex is made with very high tenacity fibers of polypropylene and designed to comply with the modern design requirements. Its mechanical and hydraulic properties are at the top on the geotextiles market. HIPERTEX is a non-woven polypropylene geotextile, produced via extrusion, needle-punching and thermocalendering of thermoplastic polymers. The products can also be non-thermally treated (HIPERTEX Z).



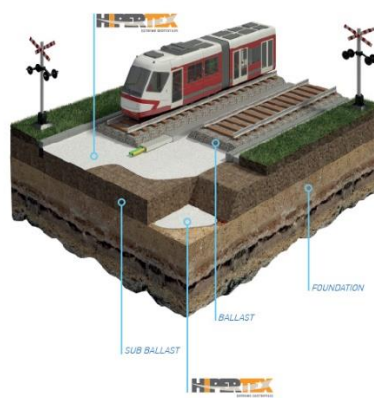
**Applications:** The products under study are used where separation, filter and/or drainage are needed.

### ROADS AND HIGHWAYS



**EN 13249.** In the design phase of a road, HIPERTEX geotextile can be added to perform the function of separation and drainage. By doing this, it is possible to improve the overall bearing capacity, reducing the permanent deformation and retards of the cracks development.

### RAILWAYS



**EN 13250.** HIPERTEX geotextile can be placed on the foundation to separate soils of different quality and to compensate the insufficient shear strength of the soil by absorbing the tensile stresses generated along the sliding surfaces and transferring them to the stable part of the embankment.

### DEWATERING TRENCHES



**EN 13252.** Hipertex<sup>®</sup> has replaced the classic gravel filters drainage into dewatering trenches, along the river banks, in the reservoirs, foundation walls, and athletic facilities. Our articles are designed to allow liquids to pass while avoiding the migration of the finer particles into the drainage.

**UN CPC code:** 36950.

**Geographical area:** Italy for primary data, global otherwise.

The performances were calculated with reference to the Tessilbrenta plant in Pove del Grappa (VI). The reference market is international.

## LCA information

**Declared unit:** 1 kg of geotextile, plus its packaging.

The family includes HIPERTEX and HIPERTEX Z products. These products can also be identified with the additional code ANR/5501 and ATC/5501 within the Tessilbrenta data sheets.

An average product, in terms of total mass of 2022 actual finished thermo-treated and non-thermo-treated products, has been chosen for the impact assessment. This average product is not existing. All environmental performance indicators have been calculated taking the above-mentioned product as a reference. The impact range of the whole family is declared with reference to the average product. The products that represent the extremes of the family are a real HIPERTEX product and a real HIPERTEX Z product.

**Time representativeness:** The primary data cover a period of 12 months, reference year 2022.

**Used database and software:** Ecoinvent 3.8 database; SimaPro software version 9.3.0.2.

**System boundaries and process units excluded:** b) Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3+C+D and additional modules). A5 is included for the “balancing-out reporting” only.



The table below shows a detail of the modelling of the various modules.

*Modelling of the various modules*

Module	Scenario
A1	This phase includes extraction and processing of raw materials, generation of electricity and heat, processing up to the end-of-waste state or disposal of final residues.
A2	This phase includes transportation up to the factory gate and internal transport.
A3	This phase includes manufacturing of the products and their packaging.
A5	This phase is included for the “balancing-out reporting” only, with reference to the packaging.
C1	This phase includes the removal of the products from the installation site, assuming a civil scenario. An excavation hydraulic digger is considered.
C2	This phase includes the transportation of the discarded products. Average distance from the demolition site to the waste treatment is assumed to be 100km for landfill disposal.
C3	This phase includes the end-of-life recovery of the product. In this case it is equal to zero.
C4	This phase includes the end-of-life disposal of the product. It is assumed that 100% of the product is disposed in landfill.
D	This module contains the potential impacts and benefits related to the recycling of the products. In this case it is equal to zero.

In case of insufficient input data or data gaps for a unit process, a 1% cut-off criterion has been applied (1 % of primary energy usage and 1 % of the total mass input of that unit process). The total of neglected input flows per module is less than 5 % of energy usage and mass.

The method chosen to evaluate the potential environmental impacts of the product subject of this study is the method provided by the standard EN 15804:2012+A2:2019 (CEN, 2019).

Electricity modelling (Module A1): The modelling of electricity consumption in module A1 was carried out using the residual Italian national mix, using the AIB 2022 report as data source and the Ecoinvent database for the specific modelling. The breakdown of the energy sources used is shown below. The emission factor for 1 kWh is equal to 0,626 kg CO<sub>2</sub>eq.

*Electricity modelling*

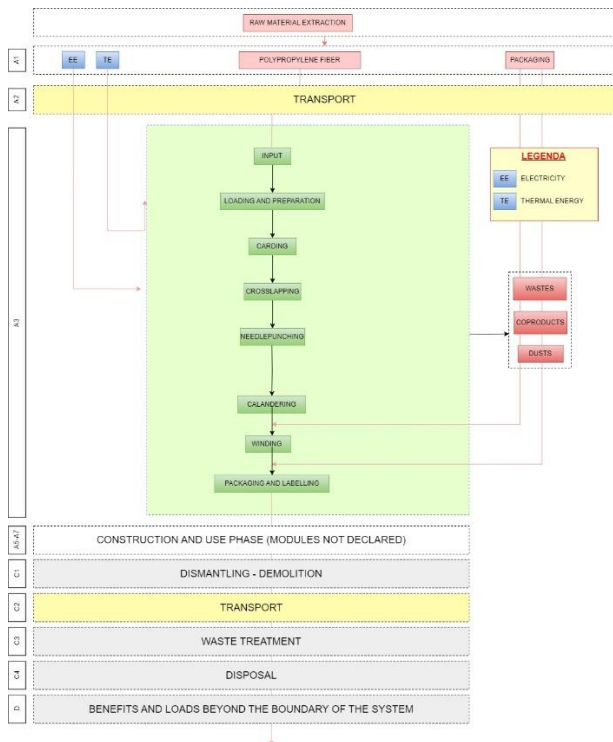
Source	Residual Mix 2022
Renewables Unspecified	0,01%
Solar	5,97%
Wind	0,84%
Hydro&Marine	0,54%
Geothermal	0,00%
Biomass	1,68%
Nuclear	2,62%
Fossil Unspecified	2,74%
Lignite	0,02%
Hard Coal	12,20%
Gas	68,92%
Oil	4,47%
TOTAL	100,00%

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results)

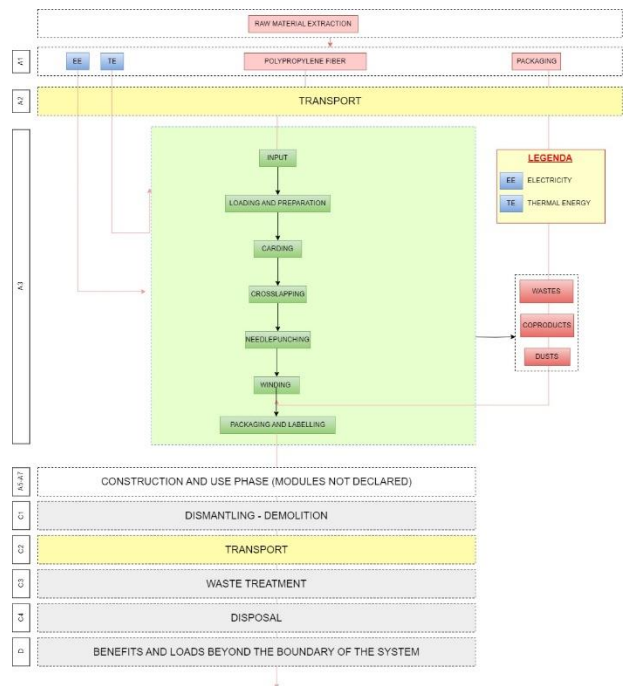
	Product Stage					Construction Stage		Use stage							End of life stage				Benefits beyond system boundaries
	Raw Materials Supply	Transport	Manufacturing	Transport to site	On site processes	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/Demolition	Transport	Waste processing	Disposal	Reuse/Recovery/Recycling		
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
Modules Declared	X	X	X	ND	X*	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X		
Geography	GLO	GLO	IT		GLO								GLO	GLO	GLO	GLO	GLO		
Specific data used	>60%																		
Variation - products	<10%																		
Variation - sites	Not relevant																		

\*A5 is included for the "balancing-out reporting" only.

System diagram (HIPERTEX)



System diagram (HIPERTEX Z)



## Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Polypropylene	1,00E0	-	-
TOTAL	1,00E0	-	-
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
External LDPE film	6,00E-03	0,6%	-
Cardboard core	1,80E-02	1,8%	7,75E-03
PVC core	1,80E-02	1,8%	-
Wood support	2,20E-02	2,2%	1,09E-02
TOTAL	6,40E-02	6,4%	1,87E-02

### Dangerous substances from the candidate list of SVHC for Authorisation

The product does not contain substances included in the "Candidate list of substances of very high concern (SVHC) for authorization" in a percentage greater than 0.1%.

## Results of the environmental performance indicators

### Mandatory impact category indicators according to EN 15804

Parameter	Unit	Results per declared unit					
		A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	3,07E+00	2,65E-02	2,11E-02	0,00E+00	1,08E-01	0,00E+00
GWP-fossil	kg CO2 eq	7,26E-03	4,89E-06	7,51E-06	0,00E+00	7,07E-05	0,00E+00
GWP-biogenic	kg CO2 eq	2,00E-03	3,32E-06	1,00E-05	0,00E+00	1,09E-05	0,00E+00
GWP-luluc	kg CO2 eq	3,08E+00	2,65E-02	2,11E-02	0,00E+00	1,08E-01	0,00E+00
ODP	kg CFC11 eq	1,69E-07	5,71E-09	4,82E-09	0,00E+00	3,21E-09	0,00E+00
AP	mol H+ eq	1,14E-02	2,72E-04	1,04E-04	0,00E+00	9,10E-05	0,00E+00
EP-freshwater	kg P eq	6,66E-04	1,29E-06	1,61E-06	0,00E+00	1,56E-06	0,00E+00
EP-marine	kg N eq	2,16E-03	1,19E-04	3,45E-05	0,00E+00	4,08E-04	0,00E+00
EP-terrestrial	mol N eq	2,22E-02	1,31E-03	3,77E-04	0,00E+00	3,37E-04	0,00E+00
POCP	kg NMVOC eq	6,55E-03	3,60E-04	1,08E-04	0,00E+00	1,24E-04	0,00E+00
ADP – mineral&metals*	kg Sb eq	2,18E-05	1,94E-08	9,77E-08	0,00E+00	3,53E-08	0,00E+00
ADP – fossil*	MJ	9,50E+01	3,66E-01	3,20E-01	0,00E+00	2,50E-01	0,00E+00
WDP*	m <sup>3</sup> world eq. depriv.	2,61E+00	7,42E-04	1,04E-03	0,00E+00	1,08E-02	0,00E+00

**GWP-total:** Global Warming Potential total; **GWP-fossil:** Global Warming Potential fossil; **GWP-biogenic:** Global Warming Potential biogenic; **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; **ADP-minerals&metals:** Abiotic depletion potential for non fossil resources\*; **ADP-fossil:** Abiotic depletion for fossil sources potential\*; **WDP:** Water (user) deprivation potential, deprivation-weighted water consumption.

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

Since module C is included in the EPD, the use of the results of modules A1-A3 without considering the results of module C is discouraged.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The variation between any of the included products is lower than 10% for the results of all environmental impact indicators, unless for ODP (ozone depletion).

## Additional mandatory and voluntary impact category indicators

Results per declared unit							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG*	kg CO2 eq	3,08E+00	2,65E-02	2,11E-02	0,00E+00	1,08E-01	0,00E+00

\* This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

## Resource use indicators

Results per declared unit							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	4,11E+00	3,05E-03	5,40E-03	0,00E+00	4,53E-03	0,00E+00
PERM	MJ	5,23E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	4,63E+00	3,05E-03	5,40E-03	0,00E+00	4,53E-03	0,00E+00
PENRE	MJ	5,85E+01	3,66E-01	3,20E-01	0,00E+00	2,50E-01	0,00E+00
PENRM	MJ	3,65E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	9,49E+01	3,66E-01	3,20E-01	0,00E+00	2,50E-01	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	m3	5,16E-02	2,61E-05	4,05E-05	0,00E+00	2,63E-04	0,00E+00

**PERE:** Use of renewable primary energy excluding resources used as raw materials; **PERM:** Use of renewable primary energy resources used as raw materials; **PERT:** Total use of renewable primary energy; **PENRE:** Use of non-renewable primary energy excluding 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; **SM:** Secondary material; **RSF:** Renewable secondary fuels; **NRSF:** Non-renewable secondary fuels; **FW:** Net use of fresh water.

The results of the primary energy use indicators are calculated by adopting the option B (as described in the Annex 3 of the PCR) for the separation of the use of primary energy into energy used as raw material and energy used as energy carrier.

## Waste indicators

Results per declared unit							
Parameter	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	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	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

**HWD:** Hazardous waste disposed; **NHWD:** Non-hazardous waste disposed; **RWD:** Radioactive waste disposed.

## Output flow indicators

Results per declared unit							
Parameter	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	7,53E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	2,49E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**CRU:** Components for reuse; **MFR:** Material for recycling; **MER:** Materials for energy recovery; **EE:** Exported energy.



## Type and source of data

Primary data collected at Tessilbrenta through a campaign of measurements were privileged while choosing the data to be used for the LCA study. The primary data cover a period of 12 months, from January 2022 to December 2022 and concern:

- the transport of incoming materials for the production of the analyzed products (distance traveled, type of fuel, Euro class of vehicles, flow rate);
- the raw materials used (quantity and type);
- the production process at Tessilbrenta (mass balance and energy/water consumption);
- the waste produced at Tessilbrenta (quantity and destination).

If primary data or models for calculating such data were not available, secondary data obtained by consulting internationally recognized databases were used, preferring where possible the use of the most up-to-date ones. The secondary data in particular concern:

- The combustion processes of vehicles: emissions, maintenance, use of the road network, fuel consumption (data sets Ecoinvent version 3.8);
- Operating machines: emissions (Ecoinvent 3.8 data sets);
- Electricity: distribution network, losses (Ecoinvent 3.8 data sets);
- The productions of the materials used (Ecoinvent 3.8 data sets).

Data proxies are less than 10% as required by the program rules.

## References

- General Programme Instructions of the International EPD® System. Version 4.0
- PCR construction Products and construction services 2019:14 version 1.3.4 valid until 2025-06-20
- European Residual Mixes. Results of the calculation of Residual Mixes for the calendar year 2022. AIB, 2022
- LCA Report “Studio di Life Cycle Assessment dei geotessili non-tessuti delle famiglie Hipertex e Geotess di Tessilbrenta S.p.A.” rev.1 del 30/08/2024

## Standard

- ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework + AMD 1:2020 (Amendment 1);
- ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines + AMD 1:2017 (Amendment 1) and AMD 2:2020 (Amendment 2);
- ISO 14025:2010 Environmental labels and declarations — Type III environmental declarations — Principles and procedures;
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction works.

