

# ENVIRONMENTAL PRODUCT DECLARATION (EPD®)

In accordance with  
ISO 14025 for :  
**GEOTER® FPET range**

Programme : The International EPD® System,  
[www.environdec.com](http://www.environdec.com)

Programme operator : EPD International AB

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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).



## PROGRAMME INFORMATION

### Programme

The International EPD® System

EPD International AB - Box 210 60 - SE-100 31 Stockholm - Sweden  
www.environdec.com - info@environdec.com

### Product category rules (PCR)

Woven, knitted or crocheted fabrics (of synthetic fibres)

### Product category classification

UN CPC 267, 281. 2012:14, v2.12

### PCR review was conducted by

Lars-Gunnar Lindfors, Senior Advisor, IVL Swedish Environmental Research Institute Ltd., Sweden. The review panel and chair of the PCR review may be contacted via info@environdec.com

### Independent third-party verification of the declaration and data, according to ISO 14025 : 2006

EPD process certification  EPD verification

### Third party verifier

Ugo Pretato - Studio Fieschi & Soci Srl - Torino, Italy

### Approved by

The International EPD® System

### Procedure for follow-up of data during EPD validity involves third party verifier

Yes  No

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable.

### Owner of the EPD® :

AFITEXINOV  
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Contact person : Mathilde RIOT - mathilde.riot@afitex.com

Name and location of production site :  
AFITEXINOV, Saint-Didier de La Tour

# ABOUT AFITEXINOV

**afitexinov**  
GEOSYNTHETICS

For more than 30 years, industrial AFITEXINOV from AFITEX Group is specialized in three sectors: drainage, earth retaining and lining systems to the point to stand out as one of the leaders of the activity today. AFITEXINOV realizes the conception, the manufacturing and the marketing of geosynthetic materials mainly for the construction markets.

With a real French presence, near Paris and near Lyon, the company extends over two industrial production sites of 15,000 m<sup>2</sup>; and so transforms basic textiles into technical geocomposite products. Strong of its experience and its various knowledge, AFITEXINOV puts today on its two major trump cards : the quality of service and the innovation.

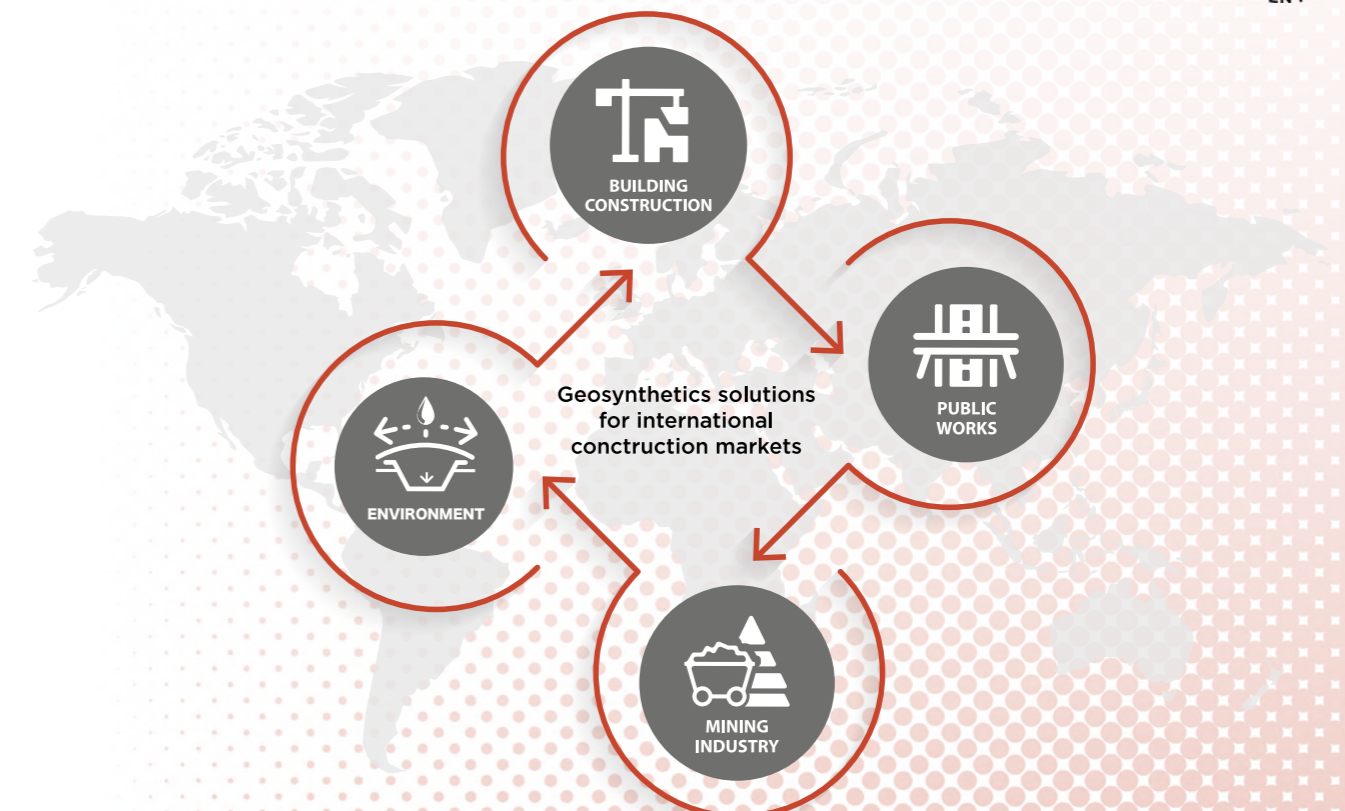
In addition, highlighting our majority of French production and respect of

environmental requirements are the ambitious objective we've set for ourselves with our geosynthetics products.

The priorities of AFITEXINOV - which knows how to adapt to the specific constraints of the universe of construction - are to understand and to anticipate the needs of its customers, building constructions companies and specialized materials retailers.

Willing to keep its advance and to enable its customers to enjoy the variety of its technical knowledge, the company develops technical software and invests every year to obtain certificates and official technical approvals.

Product-related or management system-related certifications : ISO 9001



# WHAT IS AN EPD® ?



## AN ENVIRONMENTAL PRODUCT DECLARATION (EPD®) DOCUMENT FOR TRANSPARENCY ON ENVIRONMENTAL PERFORMANCES OF GEOSYNTHETICS PRODUCTS.

An EPD® is an official document, which contains detailed, quantitative and verified information based on the LCA of the products.

Our EPD® transcribes the environmental and health aspects of the GEOTER® FPET range from AFITEXINOV according to rules established in a standardized way for LCA, called Product Category Rules (PCR). This provide a common basic normative structure for all EPD®s, with requirements on the presentation and interpretation of inventoried data.

### ENVIRONMENTAL AND HEALTH ASPECTS

An EPD® - also called a type III declaration - is a independently verified and registered document that provides transparent and comparable information on the environmental performance of a product. It includes for example the impacts associated with production, such as raw material, energy acquisition, use and efficiency, content of materials and chemicals, packing, emissions to air, land and water, transport and waste generation.

The relevant standard for Environmental Product Declarations is ISO 14025. We are already certified within this same ISO-fourteen thousand series for the quality and security management systems.

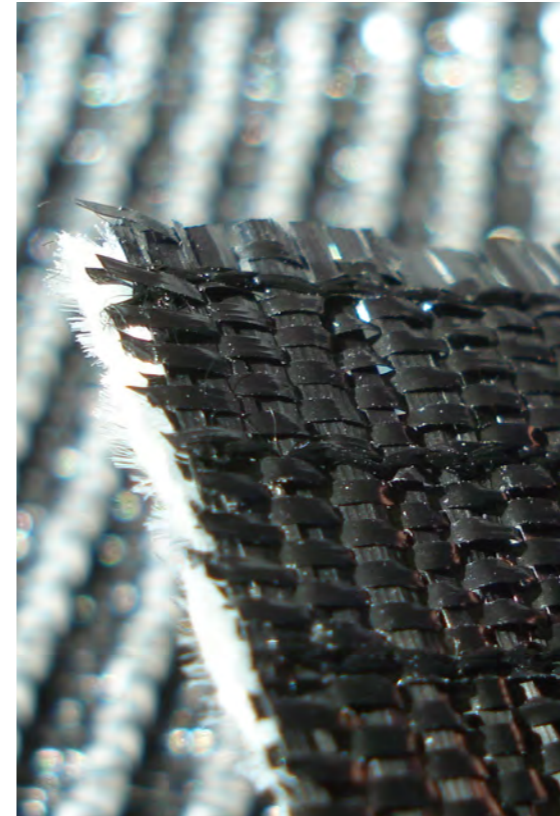
Our EPD is thus an additional level of certification to give you the trust and transparency needed by procurement professionals, product designers and others, in the environmental field.

All registered EPD® documents in the international EPD® system are publicly available and free to download on: [www.environdec.com](http://www.environdec.com)



# PRODUCT INFORMATION

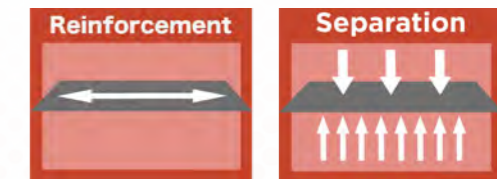
This EPD covers reinforcement geocomposites from the GEOTER® FPET range :



- GEOTER® FPET 100
- GEOTER® FPET 200/50
- GEOTER® FPET 450/10
- GEOTER® FPET 1400
- GEOTER® FPET 1400/200
- GEOTER® FPET 1600/200

### PRODUCTS CLASSIFICATION

CPC code: 267  
HS code: 5407.61.30.00



The GEOTER® FPET products are patented associations of woven & high tenacity reinforcement yarns.

They combine the woven fabric with high tenacity polyester yarns, which ensure strong mechanical properties for the construction, low elongations and high tensile strength up to 2000 kN.

The GEOTER® FPET range is used in thanks to the immediate tension capacity of the technical yarns. The woven fabric protects the cables and provides also a good puncture resistance.

Moreover, the woven fabric with its small opening size prevents fine soil particles migrating. Its usage is recommended for :



Sinkholes

Embankment on soft soils and platforms

Embankment on low bearing capacity soils, road and railway

# TECHNICAL SPECIFICATIONS

## COMPOSITION

All products are made of polyethylene terephthalate (PET) and polypropylene (PP) with different mass per unit area. The PET is received at the production plant in the form of fibres while the PP is received in the form of woven fabric. To ensure the technical requirements of the geotextiles, no recycled material is incorporated into the product.

		GEOTER® FPET					
		100	200/50	450/10	1400	1400/200	1600/200
<b>Mass per unit area (g/m<sup>2</sup>)</b>		235	477	789	2196	2467	2855
<b>Composition</b>	<b>Polyethylene terephthalate (PET) - fibres</b>	64.5%	82.5%	90.0%	96.5%	96.9%	97.3%
	<b>Polypropylene (PP) - woven fabric</b>	35.5%	17.5%	10.0%	3.5%	3.1%	2.7%

Table 1: Mass per unit area and composition of the GEOTER® FPET products

The products do not contain hazardous substances as defined by national and international regulations and specifications. They comply with the regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH regulation, No 1907/2006) and the regulation on classification, labelling and packaging of substances and mixtures (No 1272/2008).

## PACKAGING

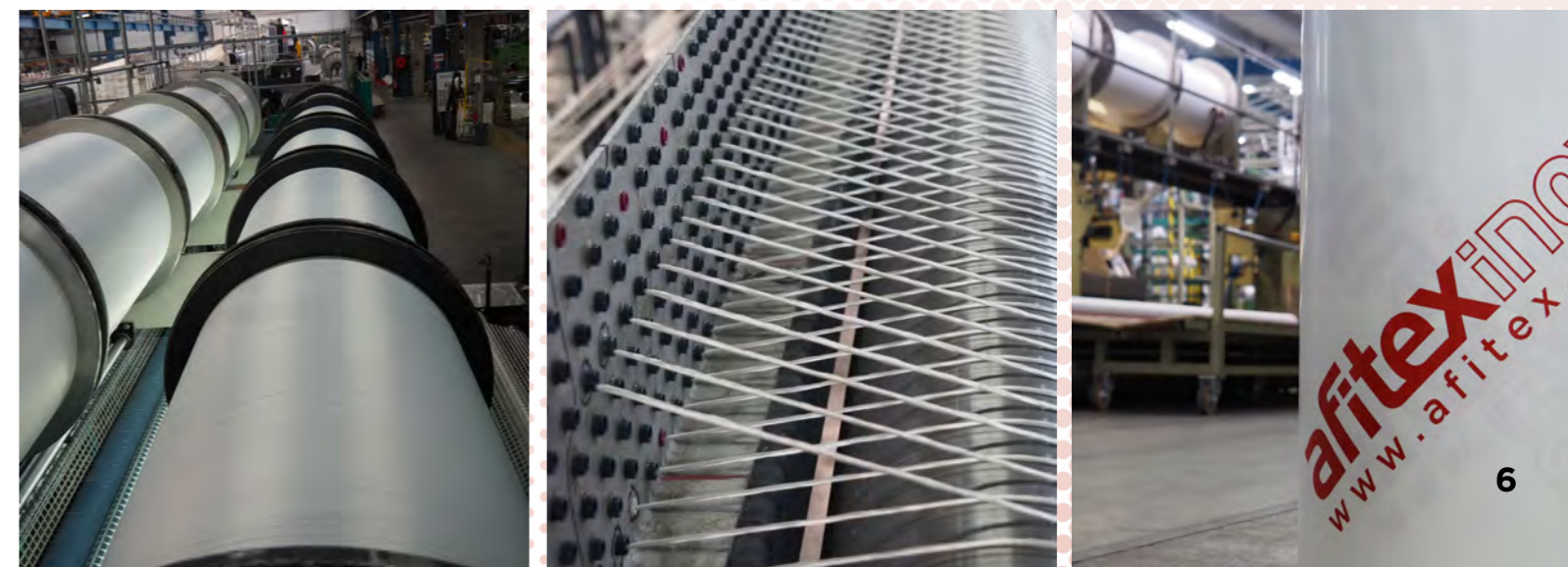
The average amount of packaging elements for packing the final products is presented below.

	QUANTITY	UNIT
<b>PP tube</b>	10.6	g/m <sup>2</sup>
<b>Steel staple</b>	7	mg/m <sup>2</sup>
<b>Tape</b>	0.2	g/m <sup>2</sup>
<b>HDPE sheath</b>	5.7	g/m <sup>2</sup>

Table 2: Packaging elements and weight of the final geotextiles

	GEOTER® FPET						Unit
	100	200/50	450/10	1400	1400/200	1600/200	
<b>Yarn count EN 1049-2</b>	23.6	23.6/32	23.6/15.2	23.6	23.6/42.5	23.6/42.5	Yarn
<b>Linear density of yarns EN ISO 2060</b>	5500/0	12100/2200	26400/2200	83600/0	83600/6600	96800/6600	dtex
<b>Masse per unit area EN ISO 9864</b>	235	477	789	2196	2467	2855	g/m <sup>2</sup>
<b>Tensile strength (MD) EN ISO 10319</b>	100	200	450	1400	1400	1600	kN/m
<b>Tensile strength (CMD) EN ISO 10319</b>	0	50	10	0	200	200	kN/m
<b>Strain at nominal tensile strength (MD) EN ISO 10319</b>	≤ 10%	≤ 10%	≤ 10%	≤ 10%	≤ 10%	≤ 10%	%
<b>Strain at nominal tensile strength (CMD) EN ISO 10319</b>	≤ 10%	≤ 10%	≤ 10%	≤ 10%	≤ 10%	≤ 10%	%
<b>Weathering resistance EN 12224</b>	15 days	1 month	1 month	1 month	1 month	1 month	-
<b>Dynamic perforation EN ISO 11058</b>	< 15	< 14	< 14	< 14	< 10	< 13	mm
<b>Static puncture test (CBR test) EN ISO 12236</b>	> 4	> 4	> 5	> 18	> 18	> 21	kN
<b>Permeability EN ISO 11058</b>	> 30x10 <sup>-3</sup>	> 30x10 <sup>-3</sup>	> 30x10 <sup>-3</sup>	> 30x10 <sup>-3</sup>	> 30x10 <sup>-3</sup>	> 30x10 <sup>-3</sup>	m/s
<b>Opening size EN ISO 12956</b>	< 200	< 200	<200	<200	<200	<200	µm

Table 3: Technical specification of the GEOTER® FPET products



# LIFE CYCLE ASSESSMENT (LCA)

## SCOPE OF THE STUDY

The Life Cycle Assessment has been conducted for 1 m<sup>2</sup> of packed geotextile.

The LCA follows a cradle-to-gate with distribution approach, meaning that all the steps from resources extraction to the production of the finished geotextile at the AFITEXINOV plant and the delivery to the customers are included in the assessment.

### UPSTREAM

The upstream processes include the production processes of all raw materials included in the geotextiles production process. It includes the production of the polymers (PET and PP) and their transformation into PET fibres and woven PP fabric. It also includes the production of their delivery packaging. The production of the packaging of the finished geotextile products is also included in the upstream processes.

### CORE

The core processes include the transportation of the raw materials to the AFITEXINOV plant in Saint-Didier-de-la-Tour. It includes all the production processes necessary to produce the GEOTER® FPET: threading of the PET fibres, weaving of the PET threads and woven PP fabric and packing of the finished geotextiles. The core processes also include the treatment of waste sent to disposal and the impact of the production of energy, fuels and other process inputs necessary for the functioning of the plant (e.g., lubricating oil for the machines).

### DOWNSTREAM

The downstream processes include the transport steps from the AFITEXINOV plant to the clients. In 2019, each product was sold to one specific client in Europe. Consequently, each product was transported to a single country.

### ADDITIONAL INFORMATION

<b>Functional unit</b>	1 m <sup>2</sup> of geotextile
<b>Scope</b>	Cradle-to-gate with distribution
<b>Reference year</b>	2019
<b>Geographical scope</b>	Europe & Asia
<b>Database</b>	Ecoinvent v3.5
<b>Software</b>	VERTECH GROUP in-house LCA software
<b>LCA practitioner</b>	Sophie Sfez & Luca Petruccelli VERTECH GROUP 11 rue Delfy 06000 NICE, FRANCE www.vertech-group.com

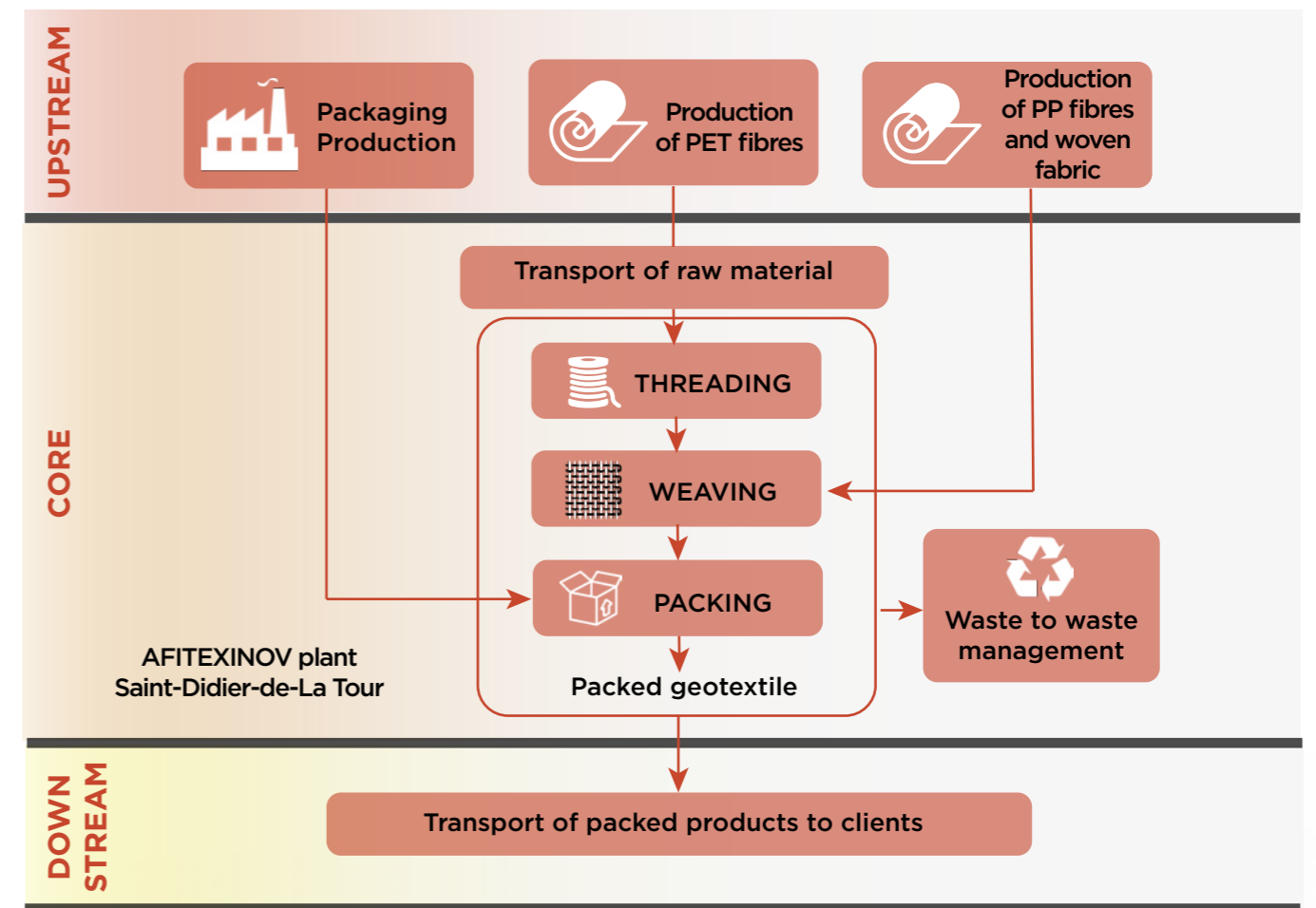


Figure 1: Process flow diagram of the production of the GEOTER® FPET products

The production of the geotextiles at the AFITEXINOV plant starts with the threading of the PET fibres received from four suppliers. The fibres are then weaved together with the PP fabric, received from a supplier located in Greece. The input necessary for those two steps is mainly electricity, completed by gas consumption for handling machines, machinery lubricating oil and water and electricity used in offices. The finished products are then packed and delivered to the customers, located in France, Russia, Slovakia and Lithuania (countries of delivery for 2019).

### DATA COLLECTION

Primary data on the production processes at the AFITEXINOV plant were collected for 2019. Secondary data on fibres and woven PP production as well as packaging production and waste treatment were collected from literature. PET fibres and woven PP production were modelled in accordance with the supplier's countries, considering specific electricity mixes and transport distances from the suppliers to the AFITEXINOV plant. When not known, percentages of industrial waste sent to incineration and landfilling were taken from French national statistics on waste.

### ALLOCATION

Allocation was applied to the electricity, fuel and water consumed and the wastewater and other industrial waste generated by the production plant. The partitioning of those inputs and outputs was conducted based on the area of geotextiles produced.

### CUT-OFF RULES

The cut-off rules follow the rules stated in the PCR, i.e., elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts are included.

### DATA QUALITY

Primary data on geotextiles production was used whenever possible. Raw materials production was mainly based on secondary data but adapted as much as possible based on specific information related to the product range (e.g., suppliers' country). Whenever possible, specific information on the fate of waste produced by the production plant was considered and completed by French national statistics when unknown.

# ENVIRONMENTAL PERFORMANCE

The environmental performance of the six analyzed products include the potential environmental impacts, the use of resources and the quantification of waste production and output flows for the upstream and core processes<sup>1</sup>.

PHASE		GEOTER® FPET 100			
		UPSTREAM	CORE	DOWN STREAM	TOTAL
<b>ENVIRONMENTAL IMPACT</b>					
Global Warming Potential	Biogenic [kg CO <sub>2</sub> eq]	1.25E-03	1.83E-05	1.41E-06	<b>1.27E-03</b>
	Fossil [kg CO <sub>2</sub> eq]	9.17E-01	1.10E-01	1.88E-02	<b>1.05E+00</b>
	Land use [kg CO <sub>2</sub> eq]	3.87E-04	6.83E-06	3.46E-07	<b>3.94E-04</b>
	Total [kg CO <sub>2</sub> eq]	<b>9.19E-01</b>	<b>1.10E-01</b>	<b>1.88E-02</b>	<b>1.05E+00</b>
Abiotic Depletion - Element [kg Sb eq]		2.04E-08	7.30E-09	3.72E-11	<b>2.78E-08</b>
Abiotic Depletion - Fossil fuels [MJ]		2.09E+01	1.52E+00	2.71E-01	<b>2.26E+01</b>
Acidification Potential [kg SO <sub>2</sub> eq]		3.22E-03	1.06E-03	3.01E-05	<b>4.31E-03</b>
Eutrophication Potential [kg PO <sub>4</sub> <sup>3-</sup> ]		9.70E-04	1.39E-04	4.07E-06	<b>1.11E-03</b>
Photochemical Ozone Creation Potential [kg NMVOC]		2.78E-03	7.49E-04	2.26E-05	<b>3.56E-03</b>
Ozone Depletion Potential [kg kg CFC11]		4.30E-08	3.21E-08	3.51E-09	<b>7.86E-08</b>
Water Scarcity [m <sup>3</sup> eq]		3.20E-01	2.12E-02	5.36E-04	<b>3.42E-01</b>
<b>RESSOURCE USE</b>					
Primary energy resources - non-renewable	Used as energy carrier [MJ]	1.33E+01	3.36E+00	2.89E-01	<b>1.69E+01</b>
	Used as raw materials [MJ]	1.09E+01	0.00E+00	0.00E+00	<b>1.09E+01</b>
	Total [MJ]	<b>2.42E+01</b>	<b>3.36E+00</b>	<b>2.89E-01</b>	<b>2.78E+01</b>
Primary energy resources renewable	Used as energy carrier [MJ]	5.46E-01	8.24E-02	6.96E-04	<b>6.30E-01</b>
	Used as raw materials [MJ]	4.03E-02	0.00E+00	0.00E+00	<b>4.03E-02</b>
	Total [MJ]	<b>5.87E-01</b>	<b>8.24E-02</b>	<b>6.96E-04</b>	<b>6.70E-01</b>
Secondary material [kg]		4.79E-03	0.00E+00	0.00E+00	<b>4.79E-03</b>
Renewable secondary fuels [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-Renewable secondary fuel [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Net use of freshwater [m <sup>3</sup> ]		8.30E-03	5.80E-04	2.82E-05	<b>8.90E-03</b>
<b>WASTE PRODUCTION</b>					
Hazardous waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-hazardous waste disposed [kg]		0.00E+00	8.56E-03	0.00E+00	<b>8.56E-03</b>
Radioactive waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
<b>OUTPUT FLOWS</b>					
Components for reuse [kg]		0.00E+00	5.88E-03	0.00E+00	<b>5.88E-03</b>
Materials for recycling [kg]		9.89E-03	1.67E-02	0.00E+00	<b>2.66E-02</b>
Materials for energy recovery [kg]		0.00E+00	1.96E-03	0.00E+00	<b>1.96E-03</b>
Exported energy, electricity [MJ]		0.00E+00	1.75E-03	0.00E+00	<b>1.75E-03</b>
Exported energy, thermal [MJ]		0.00E+00	3.54E-03	0.00E+00	<b>3.54E-03</b>

9 Table 4 : Environmental performance GEOTER® FPET 100

<sup>1</sup> Remark: The waste produced and the output flows are those from the foreground system and do not account for waste or output flows generated along the supply chain of the input processes used by the foreground system.

PHASE		GEOTER® FPET 200/50			
		UPSTREAM	CORE	DOWN STREAM	TOTAL
<b>ENVIRONMENTAL IMPACT</b>					
Global Warming Potential	Biogenic [kg CO <sub>2</sub> eq]	2.59E-03	2.65E-05	1.05E-05	<b>2.63E-03</b>
	Fossil [kg CO <sub>2</sub> eq]	1.87E+00	2.23E-01	1.40E-01	<b>2.24E+00</b>
	Land use [kg CO <sub>2</sub> eq]	8.59E-04	9.42E-06	2.57E-06	<b>8.71E-04</b>
	Total [kg CO <sub>2</sub> eq]	<b>1.88E+00</b>	<b>2.23E-01</b>	<b>1.40E-01</b>	<b>2.24E+00</b>
Abiotic Depletion - Element [kg Sb eq]		3.99E-08	7.53E-09	2.77E-10	<b>4.78E-08</b>
Abiotic Depletion - Fossil fuels [MJ]		4.05E+01	3.15E+00	2.02E+00	<b>4.56E+01</b>
Acidification Potential [kg SO <sub>2</sub> eq]		6.65E-03	2.79E-03	2.24E-04	<b>9.66E-03</b>
Eutrophication Potential [kg PO <sub>4</sub> <sup>3-</sup> ]		1.92E-03	2.90E-04	3.03E-05	<b>2.24E-03</b>
Photochemical Ozone Creation Potential [kg NMVOC]		5.55E-03	1.96E-03	1.68E-04	<b>7.68E-03</b>
Ozone Depletion Potential [kg kg CFC11]		9.09E-08	5.31E-08	2.61E-08	<b>1.70E-07</b>
Water Scarcity [m <sup>3</sup> eq]		6.92E-01	2.65E-02	3.99E-03	<b>7.22E-01</b>
<b>RESSOURCE USE</b>					
Primary energy resources - non-renewable	Used as energy carrier [MJ]	2.70E+01	5.10E+00	2.15E+00	<b>3.43E+01</b>
	Used as raw materials [MJ]	1.99E+01	0.00E+00	0.00E+00	<b>1.99E+01</b>
	Total [MJ]	<b>4.70E+01</b>	<b>5.10E+00</b>	<b>2.15E+00</b>	<b>5.42E+01</b>
Primary energy resources renewable	Used as energy carrier [MJ]	1.14E+00	8.58E-02	5.18E-03	<b>1.23E+00</b>
	Used as raw materials [MJ]	1.04E-01	0.00E+00	0.00E+00	<b>1.04E-01</b>
	Total [MJ]	<b>1.24E+00</b>	<b>8.58E-02</b>	<b>5.18E-03</b>	<b>1.34E+00</b>
Secondary material [kg]		1.23E-02	0.00E+00	0.00E+00	<b>1.23E-02</b>
Renewable secondary fuels [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-Renewable secondary fuel [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Net use of freshwater [m <sup>3</sup> ]		1.80E-02	7.47E-04	2.10E-04	<b>1.90E-02</b>
<b>WASTE PRODUCTION</b>					
Hazardous waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-hazardous waste disposed [kg]		0.00E+00	8.60E-03	0.00E+00	<b>8.60E-03</b>
Radioactive waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
<b>OUTPUT FLOWS</b>					
Components for reuse [kg]		0.00E+00	1.51E-02	0.00E+00	<b>1.51E-02</b>
Materials for recycling [kg]		1.76E-02	4.06E-02	0.00E+00	<b>5.82E-02</b>
Materials for energy recovery [kg]		0.00E+00	1.97E-03	0.00E+00	<b>1.97E-03</b>
Exported energy, electricity [MJ]		0.00E+00	1.78E-03	0.00E+00	<b>1.78E-03</b>
Exported energy, thermal [MJ]		0.00E+00	3.61E-03	0.00E+00	<b>3.61E-03</b>

Table 5 : Environmental performance GEOTER® FPET 200/50

PHASE		GEOTER® FPET 450/100			
		UPSTREAM	CORE	DOWN STREAM	TOTAL
<b>ENVIRONMENTAL IMPACT</b>					
Global Warming Potential	Biogenic [kg CO <sub>2</sub> eq]	4.33E-03	3.73E-05	1.18E-05	<b>4.38E-03</b>
	Fossil [kg CO <sub>2</sub> eq]	3.12E+00	3.69E-01	1.58E-01	<b>3.64E+00</b>
	Land use [kg CO <sub>2</sub> eq]	1.49E-03	1.28E-05	2.90E-06	<b>1.50E-03</b>
	Total [kg CO <sub>2</sub> eq]	<b>3.12E+00</b>	<b>3.69E-01</b>	<b>1.58E-01</b>	<b>3.65E+00</b>
Abiotic Depletion - Element [kg Sb eq]			7.83E-09	3.12E-10	<b>7.34E-08</b>
Abiotic Depletion - Fossil fuels [MJ]			5.28E+00	2.27E+00	<b>7.33E+01</b>
Acidification Potential [kg SO <sub>2</sub> eq]			5.08E-03	2.52E-04	<b>1.64E-02</b>
Eutrophication Potential [kg PO <sub>4</sub> <sup>3-</sup> ]			4.90E-04	3.41E-05	<b>3.67E-03</b>
Photochemical Ozone Creation Potential [kg NMVOC]			3.58E-03	1.90E-04	<b>1.29E-02</b>
Ozone Depletion Potential [kg kg CFC11]			8.06E-08	2.95E-08	<b>2.63E-07</b>
Water Scarcity [m <sup>3</sup> eq]			3.36E-02	4.50E-03	<b>1.21E+00</b>
<b>RESSOURCE USE</b>					
Primary energy resources - non-renewable	Used as energy carrier [MJ]	4.48E+01	7.36E+00	2.43E+00	<b>5.46E+01</b>
	Used as raw materials [MJ]	3.15E+01	0.00E+00	0.00E+00	<b>3.15E+01</b>
	Total [MJ]	<b>7.63E+01</b>	<b>7.36E+00</b>	<b>2.43E+00</b>	<b>8.60E+01</b>
Primary energy resources renewable	Used as energy carrier [MJ]	1.92E+00	9.02E-02	5.84E-03	<b>2.01E+00</b>
	Used as raw materials [MJ]	1.88E-01	0.00E+00	0.00E+00	<b>1.88E-01</b>
	Total [MJ]	<b>2.10E+00</b>	<b>9.02E-02</b>	<b>5.84E-03</b>	<b>2.20E+00</b>
Secondary material [kg]			0.00E+00	0.00E+00	<b>2.23E-02</b>
Renewable secondary fuels [kg]			0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-Renewable secondary fuel [kg]			0.00E+00	0.00E+00	<b>0.00E+00</b>
Net use of freshwater [m <sup>3</sup> ]			9.64E-04	2.36E-04	<b>3.20E-02</b>
<b>WASTE PRODUCTION</b>					
Hazardous waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-hazardous waste disposed [kg]		0.00E+00	8.44E-03	0.00E+00	<b>8.44E-03</b>
Radioactive waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
<b>OUTPUT FLOWS</b>					
Components for reuse [kg]		0.00E+00	2.74E-02	0.00E+00	<b>2.74E-02</b>
Materials for recycling [kg]		2.73E-02	7.21E-02	0.00E+00	<b>9.95E-02</b>
Materials for energy recovery [kg]		0.00E+00	1.93E-03	0.00E+00	<b>1.93E-03</b>
Exported energy, electricity [MJ]		0.00E+00	1.63E-03	0.00E+00	<b>1.63E-03</b>
Exported energy, thermal [MJ]		0.00E+00	3.31E-03	0.00E+00	<b>3.31E-03</b>

Table 6 : Environmental performance GEOTER® FPET 450/100

PHASE		GEOTER® FPET 1400			
		UPSTREAM	CORE	DOWN STREAM	TOTAL
<b>ENVIRONMENTAL IMPACT</b>					
Global Warming Potential	Biogenic [kg CO <sub>2</sub> eq]	1.21E-02	8.56E-05	1.32E-05	<b>1.22E-02</b>
	Fossil [kg CO <sub>2</sub> eq]	8.69E+00	1.03E+00	1.76E-01	<b>9.89E+00</b>
	Land use [kg CO <sub>2</sub> eq]	4.25E-03	2.80E-05	3.24E-06	<b>4.28E-03</b>
	Total [kg CO <sub>2</sub> eq]	<b>8.71E+00</b>	<b>1.03E+00</b>	<b>1.76E-01</b>	<b>9.91E+00</b>
Abiotic Depletion - Element [kg Sb eq]		1.79E-07	9.15E-09	3.48E-10	<b>1.88E-07</b>
Abiotic Depletion - Fossil fuels [MJ]		1.80E+02	1.48E+01	2.54E+00	<b>1.97E+02</b>
Acidification Potential [kg SO <sub>2</sub> eq]		3.10E-02	1.52E-02	2.82E-04	<b>4.65E-02</b>
Eutrophication Potential [kg PO <sub>4</sub> <sup>3-</sup> ]		8.67E-03	1.38E-03	3.81E-05	<b>1.01E-02</b>
Photochemical Ozone Creation Potential [kg NMVOC]		2.52E-02	1.07E-02	2.12E-04	<b>3.61E-02</b>
Ozone Depletion Potential [kg kg CFC11]		4.33E-07	2.04E-07	3.28E-08	<b>6.69E-07</b>
Water Scarcity [m <sup>3</sup> eq]		3.34E+00	6.52E-02	5.02E-03	<b>3.41E+00</b>
<b>RESSOURCE USE</b>					
Primary energy resources - non-renewable	Used as energy carrier [MJ]	1.25E+02	1.75E+01	2.71E+00	<b>1.45E+02</b>
	Used as raw materials [MJ]	8.39E+01	0.00E+00	0.00E+00	<b>8.39E+01</b>
	Total [MJ]	<b>2.09E+02</b>	<b>1.75E+01</b>	<b>2.71E+00</b>	<b>2.29E+02</b>
Primary energy resources renewable	Used as energy carrier [MJ]	5.38E+00	1.10E-01	6.51E-03	<b>5.50E+00</b>
	Used as raw materials [MJ]	5.58E-01	0.00E+00	0.00E+00	<b>5.58E-01</b>
	Total [MJ]	<b>5.94E+00</b>	<b>1.10E-01</b>	<b>6.51E-03</b>	<b>6.06E+00</b>
Secondary material [kg]		6.64E-02	0.00E+00	0.00E+00	<b>6.64E-02</b>
Renewable secondary fuels [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-Renewable secondary fuel [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Net use of freshwater [m <sup>3</sup> ]		8.77E-02	1.94E-03	2.64E-04	<b>8.99E-02</b>
<b>WASTE PRODUCTION</b>					
Hazardous waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-hazardous waste disposed [kg]		0.00E+00	8.44E-03	0.00E+00	<b>8.44E-03</b>
Radioactive waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
<b>OUTPUT FLOWS</b>					
Components for reuse [kg]		0.00E+00	8.16E-02	0.00E+00	<b>8.16E-02</b>
Materials for recycling [kg]		7.21E-02	2.12E-01	0.00E+00	<b>2.84E-01</b>
Materials for energy recovery [kg]		0.00E+00	1.93E-03	0.00E+00	<b>1.93E-03</b>
Exported energy, electricity [MJ]		0.00E+00	1.63E-03	0.00E+00	<b>1.63E-03</b>
Exported energy, thermal [MJ]		0.00E+00	3.30E-03	0.00E+00	<b>3.30E-03</b>

Table 7 : Environmental performance GEOTER® FPET 1400

PHASE		GEOTER® FPET 1400/200			
		UPSTREAM	CORE	DOWN STREAM	TOTAL
<b>ENVIRONMENTAL IMPACT</b>					
Global Warming Potential	Biogenic [kg CO <sub>2</sub> eq]	1.36E-02	9.46E-05	7.39E-05	<b>1.38E-02</b>
	Fossil [kg CO <sub>2</sub> eq]	9.75E+00	1.15E+00	9.85E-01	<b>1.19E+01</b>
	Land use [kg CO <sub>2</sub> eq]	4.76E-03	3.08E-05	1.81E-05	<b>4.81E-03</b>
	Total [kg CO <sub>2</sub> eq]	<b>9.77E+00</b>	<b>1.15E+00</b>	<b>9.85E-01</b>	<b>1.19E+01</b>
Abiotic Depletion - Element [kg Sb eq]			9.40E-09	1.95E-09	<b>2.12E-07</b>
Abiotic Depletion - Fossil fuels [MJ]			1.66E+01	1.42E+01	<b>2.33E+02</b>
Acidification Potential [kg SO <sub>2</sub> eq]			1.71E-02	1.58E-03	<b>5.35E-02</b>
Eutrophication Potential [kg PO <sub>4</sub> <sup>3-</sup> ]			1.54E-03	2.14E-04	<b>1.15E-02</b>
Photochemical Ozone Creation Potential [kg NMVOC]			1.20E-02	1.19E-03	<b>4.15E-02</b>
Ozone Depletion Potential [kg kg CFC11]			2.27E-07	1.84E-07	<b>8.97E-07</b>
Water Scarcity [m <sup>3</sup> eq]			7.11E-02	2.82E-02	<b>3.85E+00</b>
<b>RESSOURCE USE</b>					
Primary energy resources - non-renewable	Used as energy carrier [MJ]	1.40E+02	1.94E+01	1.52E+01	<b>1.75E+02</b>
	Used as raw materials [MJ]	9.42E+01	0.00E+00	0.00E+00	<b>9.42E+01</b>
	Total [MJ]	<b>2.34E+02</b>	<b>1.94E+01</b>	<b>1.52E+01</b>	<b>2.69E+02</b>
Primary energy resources renewable	Used as energy carrier [MJ]	6.04E+00	1.14E-01	3.65E-02	<b>6.19E+00</b>
	Used as raw materials [MJ]	6.27E-01	0.00E+00	0.00E+00	<b>6.27E-01</b>
	Total [MJ]	<b>6.67E+00</b>	<b>1.14E-01</b>	<b>3.65E-02</b>	<b>6.82E+00</b>
Secondary material [kg]			0.00E+00	0.00E+00	<b>7.45E-02</b>
Renewable secondary fuels [kg]			0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-Renewable secondary fuel [kg]			0.00E+00	0.00E+00	<b>0.00E+00</b>
Net use of freshwater [m <sup>3</sup> ]			2.12E-03	1.48E-03	<b>1.02E-01</b>
<b>WASTE PRODUCTION</b>					
Hazardous waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-hazardous waste disposed [kg]		0.00E+00	8.66E-03	0.00E+00	<b>8.66E-03</b>
Radioactive waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
<b>OUTPUT FLOWS</b>					
Components for reuse [kg]		0.00E+00	9.16E-02	0.00E+00	<b>9.16E-02</b>
Materials for recycling [kg]		8.10E-02	2.38E-01	0.00E+00	<b>3.19E-01</b>
Materials for energy recovery [kg]		0.00E+00	1.98E-03	0.00E+00	<b>1.98E-03</b>
Exported energy, electricity [MJ]		0.00E+00	1.84E-03	0.00E+00	<b>1.84E-03</b>
Exported energy, thermal [MJ]		0.00E+00	3.73E-03	0.00E+00	<b>3.73E-03</b>

Table 8 : Environmental performance GEOTER® FPET 1400/200

PHASE		GEOTER® FPET 1600			
		UPSTREAM	CORE	DOWN STREAM	TOTAL
<b>ENVIRONMENTAL IMPACT</b>					
Global Warming Potential	Biogenic [kg CO <sub>2</sub> eq]	1.58E-02	1.08E-04	8.56E-05	<b>1.60E-02</b>
	Fossil [kg CO <sub>2</sub> eq]	1.13E+01	1.33E+00	1.14E+00	<b>1.38E+01</b>
	Land use [kg CO <sub>2</sub> eq]	5.54E-03	3.50E-05	2.10E-05	<b>5.60E-03</b>
	Total [kg CO <sub>2</sub> eq]	<b>1.13E+01</b>	<b>1.33E+00</b>	<b>1.14E+00</b>	<b>1.38E+01</b>
Abiotic Depletion - Element [kg Sb eq]		2.32E-07	9.77E-09	2.26E-09	<b>2.44E-07</b>
Abiotic Depletion - Fossil fuels [MJ]		2.33E+02	1.92E+01	1.65E+01	<b>2.69E+02</b>
Acidification Potential [kg SO <sub>2</sub> eq]		4.03E-02	2.00E-02	1.83E-03	<b>6.21E-02</b>
Eutrophication Potential [kg PO <sub>4</sub> <sup>3-</sup> ]		1.13E-02	1.79E-03	2.47E-04	<b>1.33E-02</b>
Photochemical Ozone Creation Potential [kg NMVOC]		3.27E-02	1.40E-02	1.37E-03	<b>4.81E-02</b>
Ozone Depletion Potential [kg kg CFC11]		5.63E-07	2.61E-07	2.13E-07	<b>1.04E-06</b>
Water Scarcity [m <sup>3</sup> eq]		4.35E+00	7.99E-02	3.26E-02	<b>4.47E+00</b>
<b>RESSOURCE USE</b>					
Primary energy resources - non-renewable	Used as energy carrier [MJ]	1.62E+02	2.22E+01	1.76E+01	<b>2.02E+02</b>
	Used as raw materials [MJ]	1.09E+02	0.00E+00	0.00E+00	<b>1.09E+02</b>
	Total [MJ]	<b>2.71E+02</b>	<b>2.22E+01</b>	<b>1.76E+01</b>	<b>3.10E+02</b>
Primary energy resources renewable	Used as energy carrier [MJ]	7.00E+00	1.19E-01	4.23E-02	<b>7.16E+00</b>
	Used as raw materials [MJ]	7.31E-01	0.00E+00	0.00E+00	<b>7.31E-01</b>
	Total [MJ]	<b>7.73E+00</b>	<b>1.19E-01</b>	<b>4.23E-02</b>	<b>7.90E+00</b>
Secondary material [kg]		8.69E-02	0.00E+00	0.00E+00	<b>8.69E-02</b>
Renewable secondary fuels [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-Renewable secondary fuel [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Net use of freshwater [m <sup>3</sup> ]		1.14E-01	2.39E-03	1.71E-03	<b>1.18E-01</b>
<b>WASTE PRODUCTION</b>					
Hazardous waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
Non-hazardous waste disposed [kg]		0.00E+00	8.47E-03	0.00E+00	<b>8.47E-03</b>
Radioactive waste disposed [kg]		0.00E+00	0.00E+00	0.00E+00	<b>0.00E+00</b>
<b>OUTPUT FLOWS</b>					
Components for reuse [kg]		0.00E+00	1.07E-01	0.00E+00	<b>1.07E-01</b>
Materials for recycling [kg]		9.31E-02	2.77E-01	0.00E+00	<b>3.70E-01</b>
Materials for energy recovery [kg]		0.00E+00	1.94E-03	0.00E+00	<b>1.94E-03</b>
Exported energy, electricity [MJ]		0.00E+00	1.66E-03	0.00E+00	<b>1.66E-03</b>
Exported energy, thermal [MJ]		0.00E+00	3.36E-03	0.00E+00	<b>3.36E-03</b>

Table 9 : Environmental performance GEOTER® FPET 1600



# ADDITIONAL INFORMATION

The environmental impact of the GEOTER® FPET products is highly dependent on the product mass per unit area. The higher the mass per unit area, the more raw materials are consumed to produce the geotextile.

The amount of raw materials is defined based on the technical requirements calculated for the specific application it is produced. One specificity of the GEOTER® FPET range is that each product is designed to fulfill the reinforcement needs of each client.

Therefore, the amount of fibres is tailored to the clients' needs, allowing optimizing the raw materials consumption, and consequently optimizing the environmental footprint of each GEOTER® FPET product.

## FOCUS ON THE GLOBAL WARMING POTENTIAL (GWP)

The upstream processes of the GEOTER® FPET products are the main contributors of the GWP.

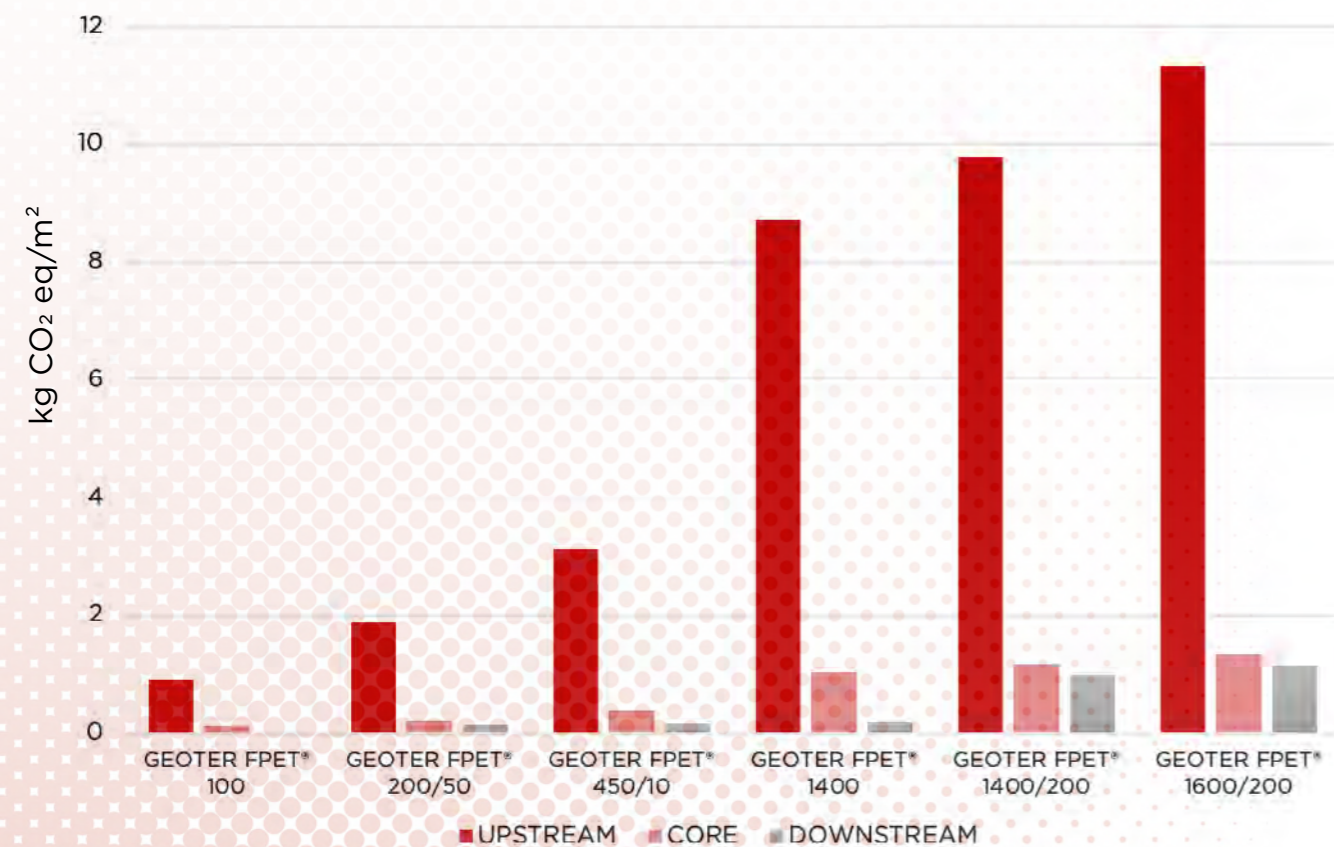


Figure 2 : Contribution of the upstream and core processes to the Global Warming Potential of the GEOTER® FPET products.

Looking in detail at the contributors to the impact of the upstream processes, Figure 3 shows that the production of **PET fibres represents 57 to 79%** of their impact and the production of **the woven PP fabric from 2 to 26%**. The higher the resistance of the geotextile, the larger the contribution of the PET fibres.

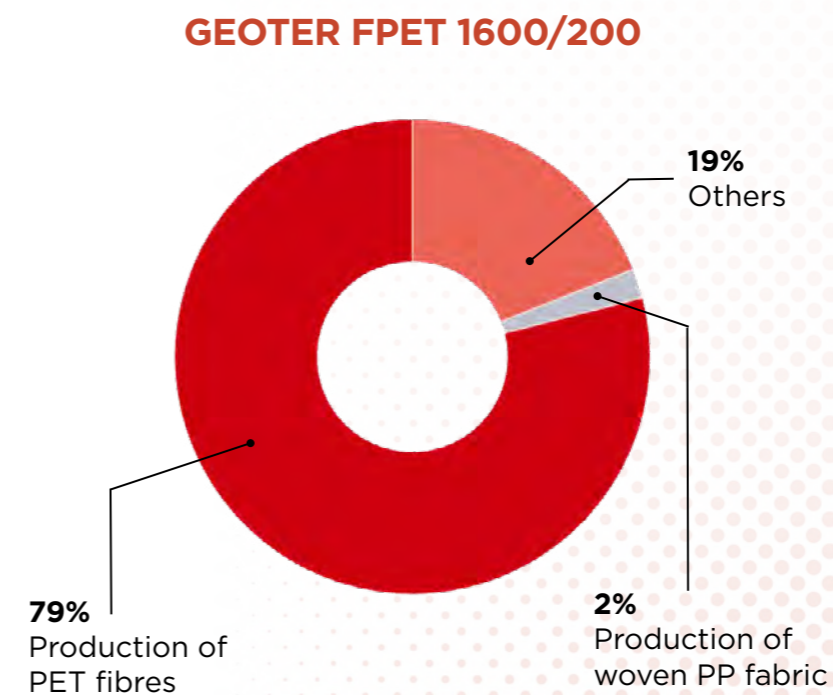
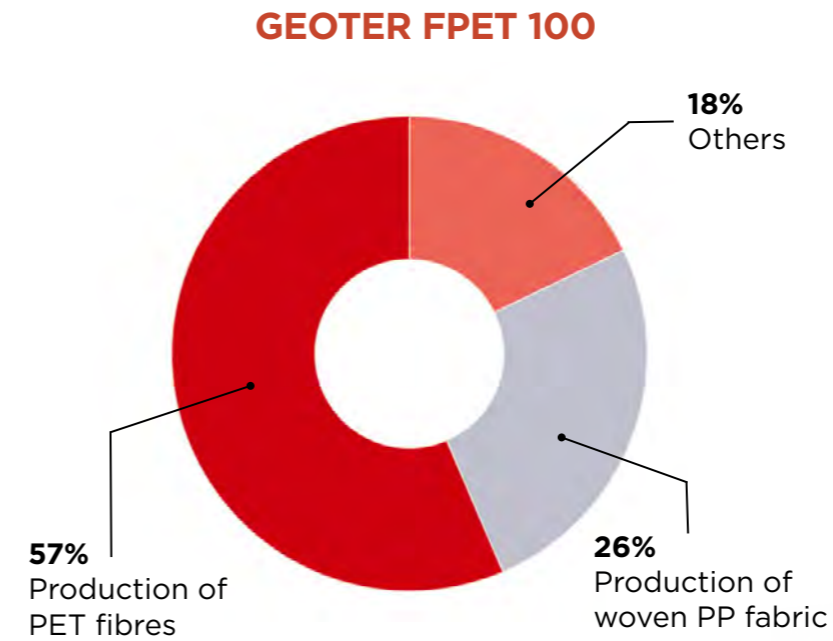
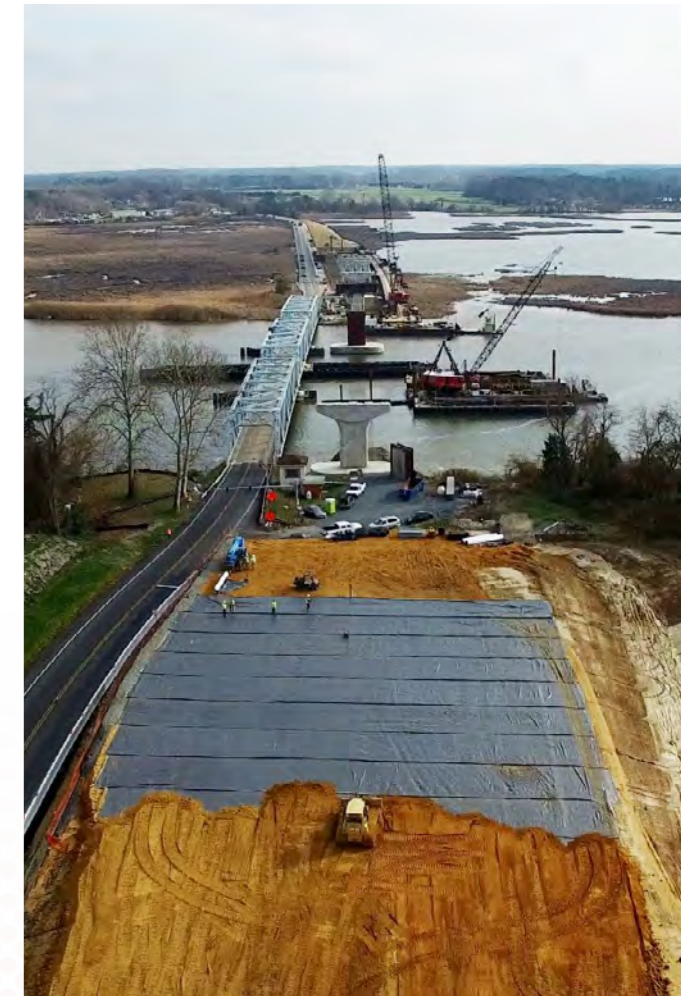


Figure 3 : Contribution of life cycle steps to the Global Warming Potential of the upstream processes

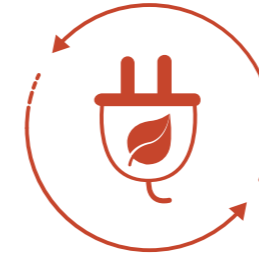


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# PRODUCTION TECHNOLOGY

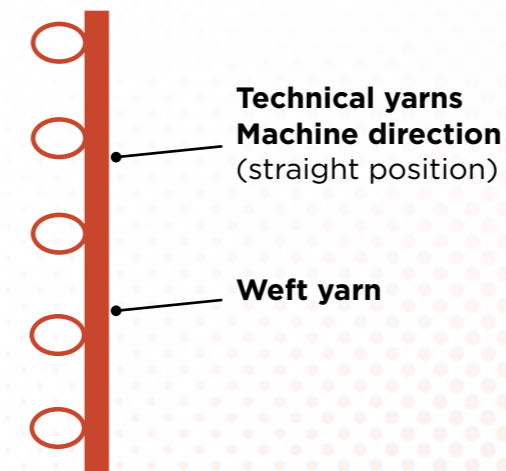
In addition to the environmental performance of our GEOTER® FPET Range, AFITEXINOV continuously strives to make improvements with a production process always more innovative.



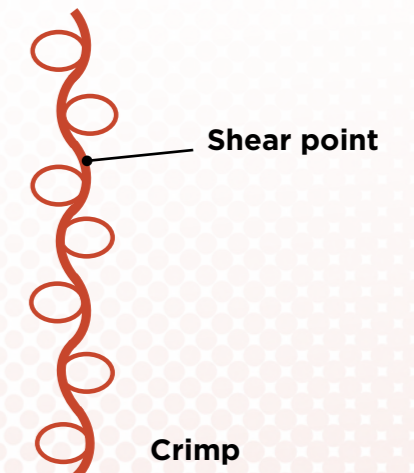
We have established a solid base by innovating on our products and improving our production technologies. Our process of production is based on the ability to work with several kind of straight cables (PET, PVA, etc.) including a unique warp knitting technology, to ensure instant tensioning of cables.

This technology enables the use of 100% of mechanical characteristics of raw material. The tension capacity is immediate because of a knitting without ondulations. So, the straight cables provide a high tensile strength at low deformation and allows to obtain a high level of reinforcement characteristics.

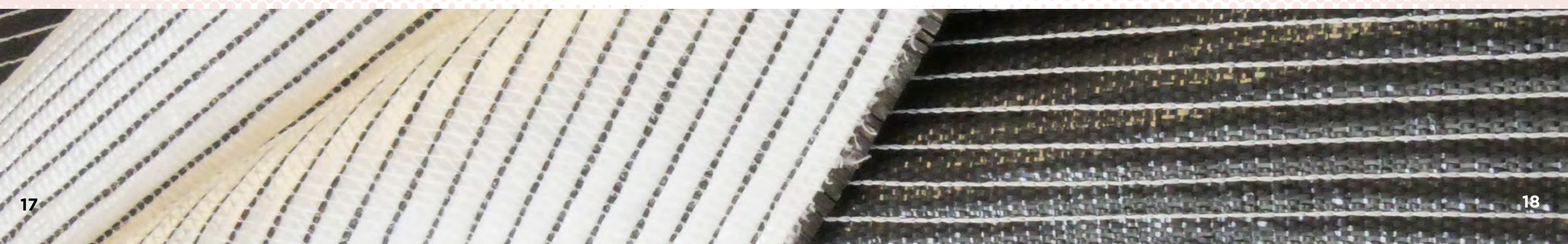
**Afitexinov production process**



**Standard weaving**



This already has had a positive effect on the environmental impact of our production process. Continued improvements on different assets ensure we keep on contributing to a better world.





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