

# ENVIRONMENTAL PRODUCT DECLARATION (EPD<sup>®</sup>)

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

**NOTEX<sup>®</sup> GLASS range**

EPD of multiple products based on the  
average results of the product group :  
NOTEX<sup>®</sup> GLASS 50/50-40N;  
NOTEX<sup>®</sup> GLASS 100/100-40N

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

Programme operator: EPD International AB

EPD registration number: EPD-IES-0013017

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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)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): Construction products, 2019:14, Version 1.3.3

PCR review was conducted by the Technical Committee of the International EPD System. See [www.environdec.com](http://www.environdec.com) for a list of members. Review chair: Claudie A. Peña, University of Concepcion, Chile. The review panel may be contacted via the Secretariat.

## Life Cycle Assessment (LCA)

LCA accountability: So-What srl

## Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via :  EPD verification by individual verifier

Third party verifier:

Ugo Pretato - Studio Fieschi & Soci Srl

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 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.

### Owner of the EPD®:

AFITEXINOV

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Name and location of production site:

AFITEXINOV, Cessieu (38) - France

# ABOUT AFITEXINOV



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.

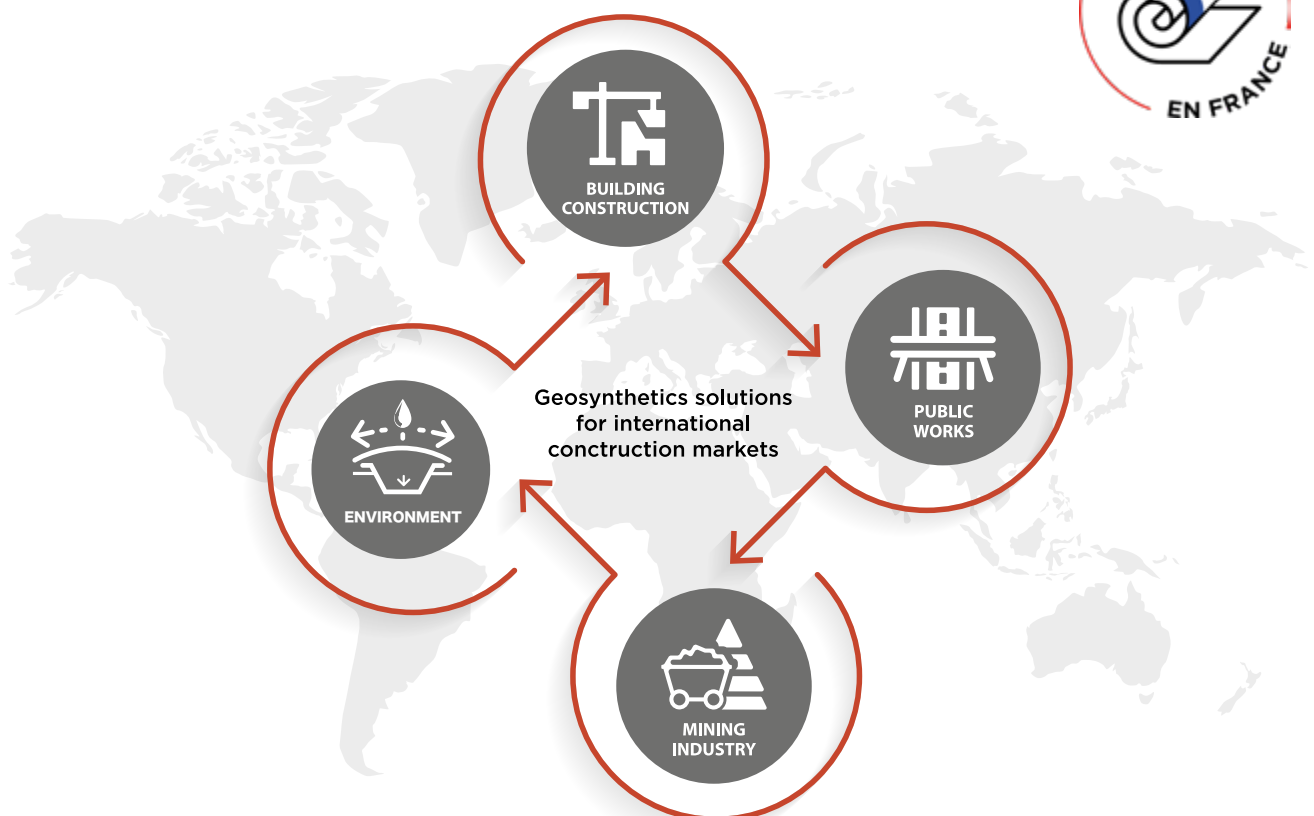
With a real French presence, near Paris and near Lyon, the company extends over two industrial production sites of 15,000 m<sup>2</sup>; and so transforms basic textiles into technical geocomposite products. Strong of its experience and its various knowledge, AFITEXINOV puts today on its two major trump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



# 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 provides 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 an 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 geosynthetics from the NOTEX® GLASS range:



- NOTEX® GLASS 50/50-40N

- NOTEX® GLASS 100/100-40N

## PRODUCTS CLASSIFICATION

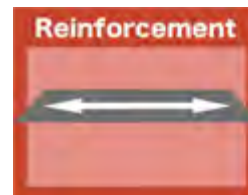
CPC code: 369 / Other plastics products

HS code: 5407.71.00.00

## GEOGRAPHICAL SCOPE

Manufacturing site: Cessieu (38110), France

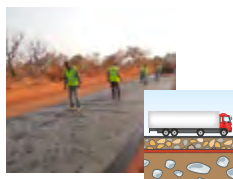
Supply chain & reference markets: global



NOTEX® GLASS is a geosynthetic reinforcement which provides an effective and sustainable solution for:

- Rehabilitation of roads, platforms, and runways
- Construction of new pavements
- Widening works

NOTEX® GLASS stops cracks from rising thanks to its high resistance and its positioning as close as possible to the area at risk. This product is bi-directional, meaning that it offers tensile strength in both directions. The high strength and reinforcement performance of NOTEX® GLASS geogrids are obtained by combining glass cables with a non-woven PET mesh.



*Pavement reinforcement*



*Rehabilitation of damaged pavement, cracks control/mitigation*



*Trench, road widening*

# TECHNICAL SPECIFICATIONS

## COMPOSITION

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

The EPD results represent the average of all products weighted on the 2023 year sales per m<sup>2</sup>. See Interpretation chapter for more information.

	NOTEX® GLASS	
	50/50 - 40 N	100/100 - 40 N
Mass per unit area (g/m <sup>2</sup> )	223	414
Average weight considered for the EPD results	410 g/m <sup>2</sup>	

Table 1: Mass per unit area and composition of the NOTEX® GLASS products

## CONTENT INFORMATION

PRODUCT COMPONENTS	Weight, g/m <sup>2</sup>	Post-consumer material, weight -%	Biogenic material, weight-% and kg C/kg
PET fibre	25	0%	n/a
Glass fibre	385	0%	n/a
<b>TOTAL</b>	410	0%	n/a
PACKAGING MATERIALS	Weight g/m <sup>2</sup>	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Plastic Tube	11.3	2.76%	n/a
Scotch	0.03	<0%	n/a
Plastic film	5.6	1.38%	n/a
<b>TOTAL</b>	17	4.15%	n/a

Table 2: Packaging elements and weight

No dangerous substances from the candidate list of SVHC for Authorisation are present in the product or packaging.

	<b>NOTEX® GLASS</b>		
	<b>50/50 - 40 AN</b>	<b>100/100 - 40 AN</b>	<b>UNIT</b>
<b>Yarn count EN 1049-2</b>	3.94/4.18	7.87/8.25	Yarn
<b>Linear density of yarns EN ISO 2060</b>	24000/ 24000	24000/ 24000	dtex
<b>Masse per unit area EN ISO 9864</b>	221	415	g/m <sup>2</sup>
<b>Tensile strength (MD) EN ISO 10319</b>	50	100	kN/m
<b>Tensile strength (CMD) EN ISO 10319</b>	50	100	kN/m
<b>Strain at nominal tensile strength (MD) EN ISO 10319</b>	3	3	%
<b>Strain at nominal tensile strength (CMD) EN ISO 10319</b>	3	3	%

Table 3: Technical specification of the NOTEX® GLASS products



# LIFE CYCLE ASSESSMENT (LCA)

## SCOPE OF THE STUDY

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

The LCA follows a cradle to gate (A1-A3) approach including end of life (Module C and D), meaning that all the steps from resources extraction to the production of the finished geotextile at the AFITEXINOV plant are included, as well as forecasts of the potential end of life treatment of the product. It is discouraged to use only A1-A3 results without considering the results of module C.

<b>Functional unit</b>	1 m <sup>2</sup> of packed product Conversion to mass: 410 g/m <sup>2</sup>
<b>Reference service life</b>	100 years
<b>Time representativeness</b>	The data represent the full calendar year 2023
<b>Database and LCA software used</b>	Ecoinvent 3.10 version EN 15804; reference package based on EF 3.1
<b>Description of system boundaries</b>	Cradle to gate with modules C1-C4 and module D (A1-A3+C+D)

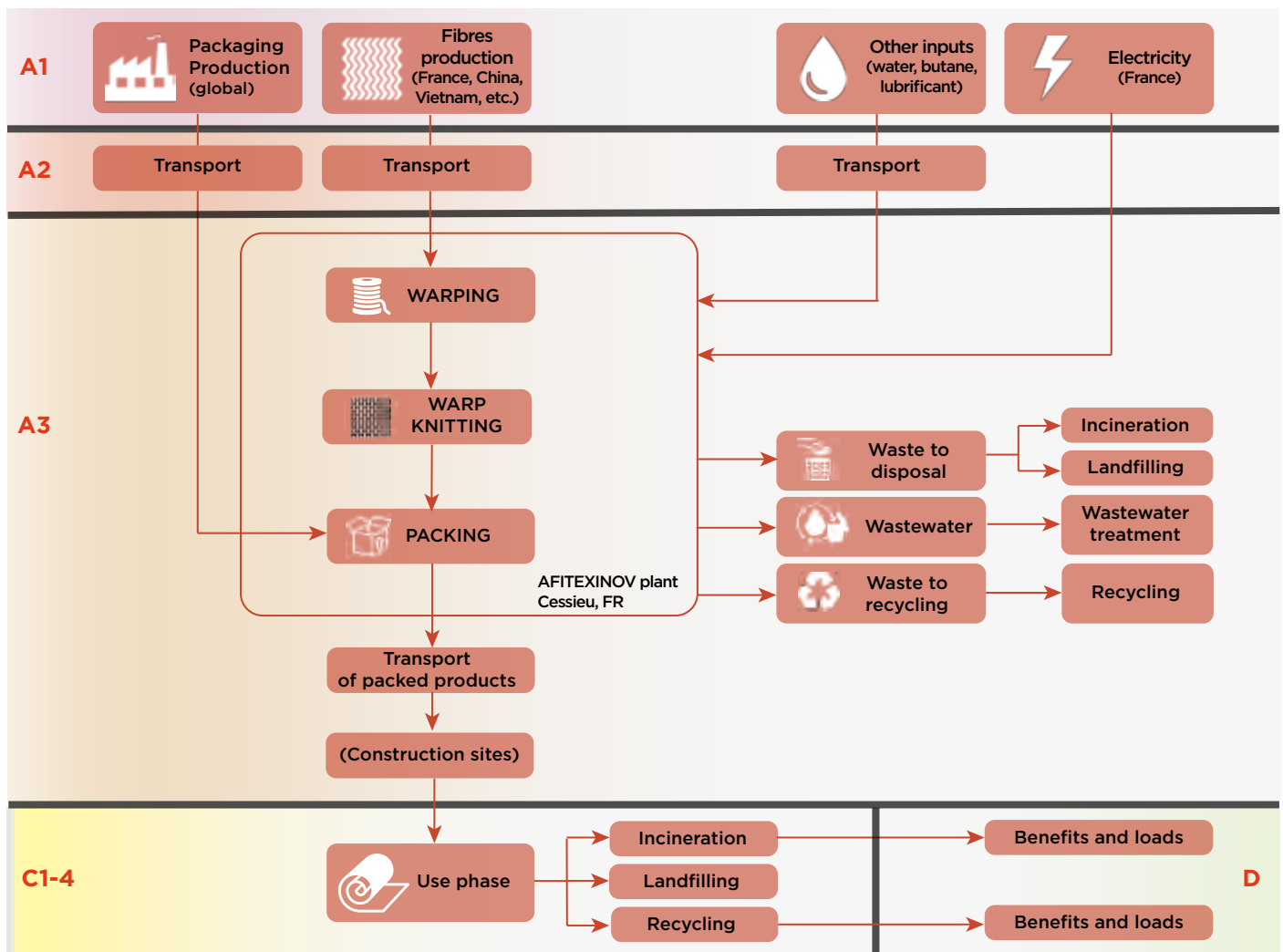


Figure 1: Process flow diagram of the production of the NOTEX® GLASS products



## Modules A1 - A3

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

The modules include the transportation of the raw materials to the AFITEXINOV plant in Cessieu. It includes all the production processes necessary to produce the NOTEX® GLASS: warping of the PET yarns, warp knitting of the PET and GLASS cables 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).

The electricity is sourced from the national mix and the dataset used from ecoinvent is “electricity, medium voltage, residual mix; FR; electricity, medium voltage” with an emission factor of: 187 gCO<sub>2</sub>/kWh (GWP-GHG).

## Modules C and D

The downstream processes include the different steps of decommissioning, treatment

and disposal of the product at the end of life in a global average context. Only a portion of the product plastic fibres are supposed to be recycled at the end of life according to data retrieved from EuRic (leading voice for a competitive European recycling industry, see references) on the actual recovery of plastics waste in the construction sector, namely 3% recycled, 28% Energy recovery. The impacts of the energy recovery are attributed to module C3, the exported energy accounted in this module are then reported in Module D. The energy substitution considered in module D is based on heat (Natural gas) and electricity (Global or European) based on net energy produced in the incineration plant. The recycled materials is supposed to substitute virgin polymer considering an average recycling efficiency of about 80%.

Treatment	Construction waste - miscellaneous polymer (Euric 2020)
Recycling	3%
Energy recovery	28%
Landfill	69%

The glass fibre portion of the product is supposed to not be recycled at the end of life, the actual end of life of glass part is therefore redistributed on the energy recovery and landfill only. No exported energy is considered for the glass going to energy recovery.

## DATA COLLECTION

Primary data on the production processes at the AFITEXINOV plant were collected for 2023. Secondary data on upstream and downstream production were collected from literature. Fibre production was 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, gas 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.

## MODULES DECLARED, GEOGRAPHICAL SCOPE, SHARE OF SPECIFIC DATA (IN GWP-GHG RESULTS) AND DATA VARIATION (IN GWP-GHG RESULTS):

	Product stage			Construction process stage		Use stage							End of life stage			Resource recovery stage	
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy Use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse - Recovery - Recycling - potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	FR	X	X	X	X	X	X	X	X	X	GLO	GLO	GLO	GLO	GLO
Specific data used	3% (Energy)			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation products	Variation of GHG-GWP indicator from the declared average result 100/100-40N ; 1% ; 50/50 ; -37% ; 50/50-40N ; -39% ;			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation sites	n/a			-	-	-	-	-	-	-	-	-	-	-	-	-	-

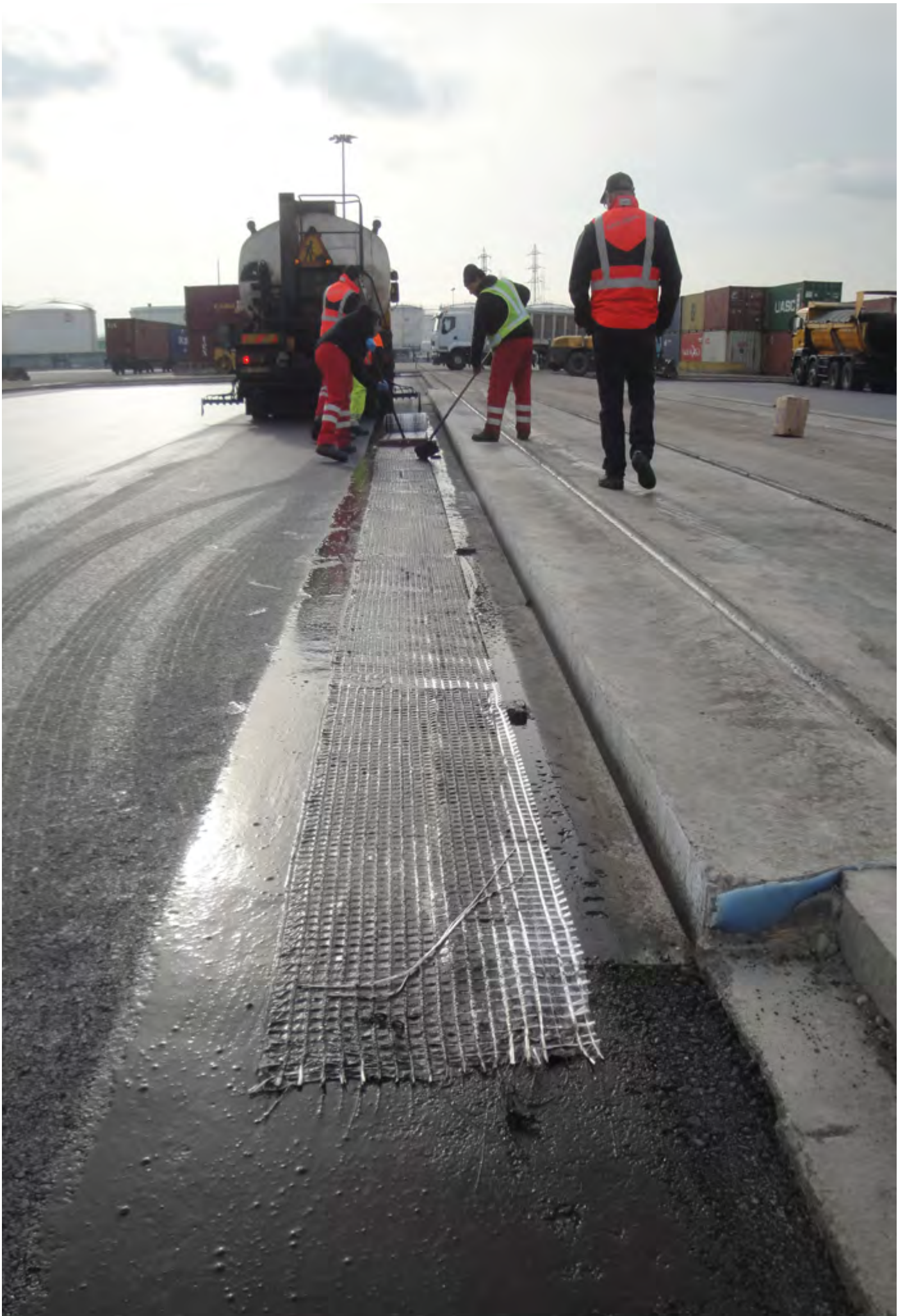
Table 4: Modules declared, geographical scope, share of specific data and data variation

ND: not declared

GLO: global

FR: France

Variation due to the physical correlation between the included products of the product group (different densities, g/m<sup>2</sup>) ; the same variations are observed also for the rest of the examined impact indicators.



# ENVIRONMENTAL PERFORMANCE

The environmental performance of the analyzed products include the potential environmental impacts, the use of resources and the quantification of waste production and output flows for each modules.

The results are expressed per 1m<sup>2</sup> of average product, average density 410 g/m<sup>2</sup>.

			A1-A3	C1	C2	C3	C4	D
<b>MANDATORY IMPACT CATEGORY INDICATORS ACCORDING TO EN 15804</b>								
<b>Global Warming Potential (GWP)</b>	<b>Fossil</b>	<b>[kg CO<sub>2</sub> eq.]</b>	1.21E+00	2.37E-04	1.57E-02	2.61E-02	7.50E-03	-7.77E-03
	<b>Biogenic</b>	<b>[kg CO<sub>2</sub> eq.]</b>	1.54E-02	0.00E+00	4.76E-08	9.65E-07	1.28E-04	1.29E-04
	<b>Land use and land use change (luluc)</b>	<b>[kg CO<sub>2</sub> eq.]</b>	1.06E-03	2.68E-07	6.39E-06	1.59E-05	7.66E-06	-6.39E-06
	<b>Total</b>	<b>[kg CO<sub>2</sub> eq.]</b>	<b>1.23E+00</b>	<b>2.37E-04</b>	<b>1.57E-02</b>	<b>2.61E-02</b>	<b>7.64E-03</b>	<b>-7.65E-03</b>
<b>Depletion potential of the stratospheric ozone layer (ODP)</b>			4.22E-07	1.33E-12	2.33E-10	7.76E-11	1.42E-10	-9.01E-09
<b>Acidification potential, Accumulated Exceedance (AP)</b>			7.85E-03	1.15E-06	3.60E-05	6.03E-05	3.80E-05	-3.00E-05
<b>Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)</b>			3.34E-04	9.39E-08	1.24E-06	5.14E-06	6.89E-07	-2.09E-06
<b>Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)</b>			1.61E-03	2.33E-07	8.35E-06	1.33E-05	5.15E-05	-5.98E-06
<b>Eutrophication potential, Accumulated Exceedance (EP-terrestrial)</b>			1.70E-02	2.38E-06	9.02E-05	1.31E-04	1.53E-04	-6.23E-05
<b>Formation potential of tropospheric ozon (POCP)</b>			5.83E-03	7.01E-07	5.04E-05	3.80E-05	5.44E-05	-2.45E-05
<b>Abiotic depletion for non fossil resources (ADP-minerals &amp; metals*)</b>			1.21E-04	2.26E-10	5.25E-08	1.13E-08	1.63E-08	-2.14E-08
<b>Abiotic depletion for fossil resources potential (ADP-fossil*)</b>			2.18E+01	2.85E-03	2.21E-01	1.55E-01	1.23E-01	-1.21E-01
<b>Water (user) deprivation potential, deprivation-weighted water consumption (WDP*)</b>			3.81E-01	4.34E-05	1.00E-03	2.79E-03	6.83E-04	-1.41E-03
<p>* 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. 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.</p>								
<b>ADDITIONAL MANDATORY AND VOLUNTARY IMPACT CATEGORY INDICATORS</b>								
<b>Global Warning Potential GreenHouse Gases (GWP-GHG<sup>1</sup>)</b>			1.21E+00	2.37E-04	1.57E-02	2.61E-02	7.53E-03	-7.72E-03
<p><sup>1</sup> 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 CO<sub>2</sub> is set to zero.</p>								

	A1-A3	C1	C2	C3	C4	D
<b>RESOURCE USE INDICATORS</b>						
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE) [MJ]	1.68E+00	3.07E-04	2.94E-03	1.85E-02	1.91E-03	-6.77E-03
Use of renewable primary energy resources used as raw materials (PERM) [MJ]	1.64E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT) [MJ]	<b>1.68E+00</b>	<b>3.07E-04</b>	<b>2.94E-03</b>	<b>1.85E-02</b>	<b>1.91E-03</b>	<b>-6.77E-03</b>
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE) [MJ]	2.07E+01	2.85E-03	2.21E-01	1.55E-01	1.10E-01	-1.07E-01
Use of non-renewable primary energy resources used as raw materials (PENRM) [MJ]	1.18E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-02	-1.36E-02
Total use of non-renewable primary energy re-sources (PENRT) [MJ]	<b>2.18E+01</b>	<b>2.85E-03</b>	<b>2.21E-01</b>	<b>1.55E-01</b>	<b>1.23E-01</b>	<b>-1.21E-01</b>
Use of secondary material (SM) [kg]	4.82E-03	1.47E-06	1.00E-04	1.82E-05	1.35E-04	9.07E-04
Use of renewable secondary fuels (RSF) [MJ]	6.73E-04	1.97E-09	1.28E-06	8.21E-08	1.77E-06	-1.11E-07
Non-Renewable secondary fuel (NRSF) [MJ]	5.49E-03	1.47E-06	1.02E-04	1.83E-05	1.37E-04	9.07E-04
Use of net fresh water (FW) [m <sup>3</sup> ]	1.07E-02	1.12E-06	2.95E-05	7.52E-05	-9.77E-04	-3.61E-05
<b>WASTE INDICATORS</b>						
Hazardous waste disposed [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed [kg]	9.81E-03	0.00E+00	0.00E+00	0.00E+00	4.02E-01	0.00E+00
Radioactive waste disposed [kg]	1.68E-05	1.74E-09	1.34E-08	1.12E-07	8.40E-09	-3.90E-08
<i>Disclaimer: hazardous and not hazardous waste are calculated considering only foreground system data. Radioactive waste are calculated according to background information (database information only).</i>						
<b>OUTPUT FLOWS INDICATORS</b>						
Components for reuse [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling [kg]	0.00E+00	0.00E+00	0.00E+00	7.41E-04	0.00E+00	0.00E+00
Materials for energy recovery [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity [MJ]	0.00E+00	0.00E+00	0.00E+00	2.05E-02	0.00E+00	0.00E+00
Exported energy, thermal [MJ]	0.00E+00	0.00E+00	0.00E+00	4.02E-02	0.00E+00	0.00E+00

Table 5: Environmental performance NOTEX® GLASS

# ADDITIONAL ENVIRONMENTAL INFORMATION

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

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

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

## FOCUS ON THE GLOBAL WARMING POTENTIAL (GWP) INTERPRETATION

Being an EPD of multiple products, the declared quantities represent a weighted average on the sales of the reference year 2023. The difference between products is reported in the following chart for the GHG-GWP indicator.

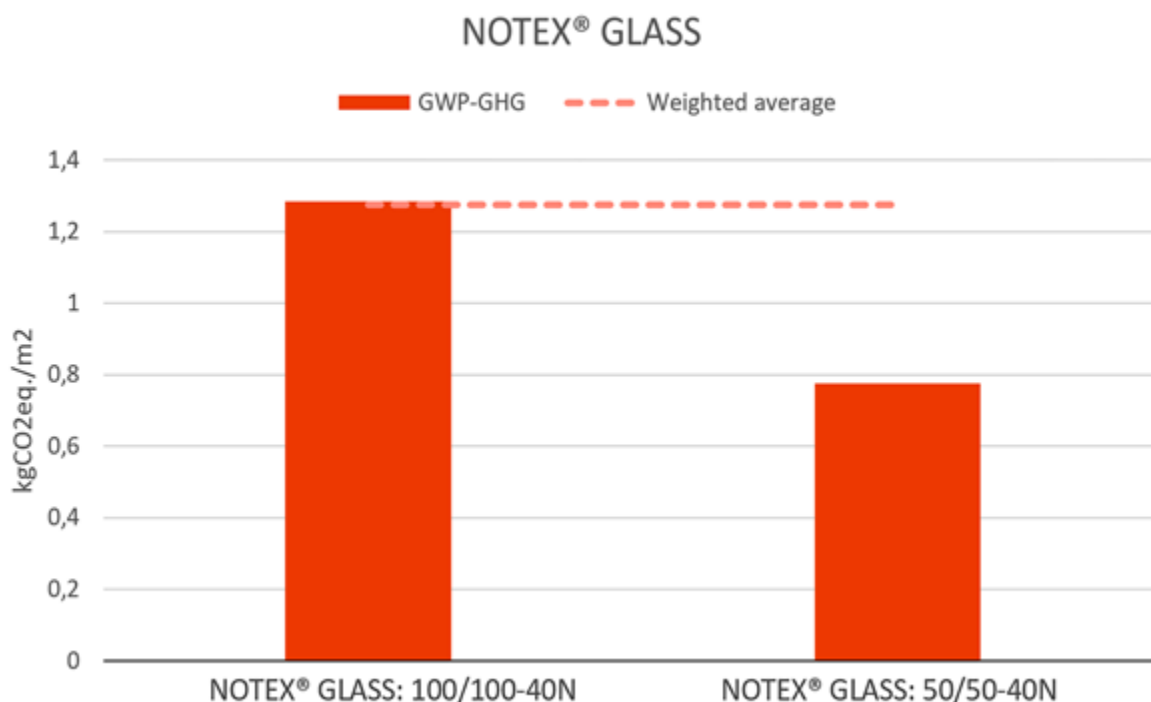


Figure 2: Contribution of the processes to the Global Warming Potential of the NOTEX® GLASS products.

The majority of the impacts are generated at the manufacturing of the fibres (A1-A3), as reported in the following chart, for all the key indicators. The general rule is that the higher is the density per m<sup>2</sup> the higher are the potential impacts.

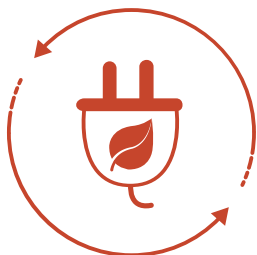


Figure 3: Contribution of life cycle steps to the Global Warming Potential of the upstream processes



# PRODUCTION TECHNOLOGY

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

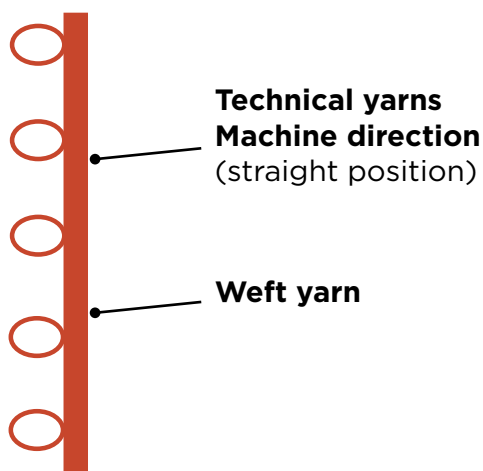


We have established a solid base by innovating on our products and improving our production technologies. Our process of production is based on the ability to work with several kind of straight cables (PET, PVA, etc.) including a unique warp knitting technology, to ensure instant tensioning of cables.

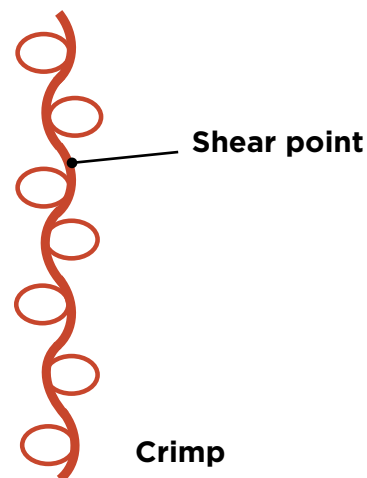
This technology enables the use of 100% of mechanical characteristics of raw material. The tension capacity is immediate because of a knitting without undulations.

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.



# REFERENCES

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