Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Drefon® ST and Drefon® S

Polypropylene nonwoven geotextiles

from

MANIFATTURA FONTANA SPA

Product category rules (PCR): *PCR 2019:14 (v1.11)*

Geographical area: The performances are calculated with reference to the Manifattura Fontana plants - Valbrenta (VI) and Romano d'Ezzelino (VI) - Italy. The market is international.

Programme:	The International EPD® System, 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.

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): *PCR 2019:14 Construction products and construction services (v1.11)* *EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction works* PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: SGS Italia S.p.A. via Caldera, 21, 20153 – Milano T +39 02 73 931 - www.it.sgs.com *Accreditation certification n 006H* Accredited by: *ACCREDIA*
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. EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019.

Company information

EPD owner: Manifattura Fontana S.p.A. – Via Fontoli 10 - 36020 Valbrenta (VI) - Italy

Reference person: Francesco Fontana, f.fontana@drefon.com
Technical support: Spin Life S.r.l – Spin-off dell'Università di Padova, via Cerato 14, Padova

Description of the organization: Manifattura Fontana S.p.a (hereinafter referred to as Manifattura Fontana) produces and distributes nonwoven fabrics of synthetic fibers. The production sites are located in Valbrenta (VI) and Romano d'Ezzelino (VI) and include a series of departments for the various manufacturing processes: extrusion, carding, folding, needling, calendaring, cutting, printing and packing.
Manifattura Fontana was born in 1932, starting with the transformation of cotton fibers for technical and sanitary uses. Since 1963 Manifattura Fontana has been a leading player in the market of nonwoven fabrics and geotextiles. Since 2016 Manifattura Fontana has become partner of Sioen group, a leader in the production of yarns, technical fabrics and protective clothing. Manifattura Fontana is a leader in geotextiles market thanks to an accurate raw material choice and a continuous search for new solutions for product development, combining its experience with the solidity of a consolidated multinational group.

Figure 1: Manifattura Fontana S.p.A
Production plant – Valbrenta (VI)

Figure 2: Manifattura Fontana S.p.A
Production plant – Romano d'Ezzelino (VI)

Management system-related certifications:
UNI EN ISO 9001:2015 Quality management - certificate n° IT00/0149
UNI EN ISO 14001:2015 Environmental management - certificate n° IT16/0119
UNI ISO 45001:2018 Occupational health and safety management - certificate n° IT06/1375

Name and location of the production sites:
Manifattura Fontana S.p.A – Via Fontoli 10 - 36020 Valbrenta (VI) – Italy
Manifattura Fontana S.p.A – Via Monte Tomba, 16 - 36060 Romano d'Ezzelino (VI) – Italy

Product information

Product Name: Drefon® ST and Drefon® S

Products description:

Polypropylene nonwoven technical textiles for industrial uses, civil engineering works, agricultural applications.
These products are divided in two families: Drefon® ST (90-500 g/m²) and Drefon® S (120-2000 g/m²).

For each family, an average product has been chosen for the impact assessment (average Drefon® ST: 191 g/m² - average Drefon® S: 556 g/m²).
All environmental performance indicators have been calculated taking the above-mentioned products as a reference.
The impact range of both families is declared with reference to the average products.

UN CPC code: 36950

Geographical area: Italy

The performances were calculated with reference to the Manifattura Fontana plants - Valbrenta (VI) and Romano d'Ezzelino (VI). The reference market is international.

Table 1: Technical data of the Drefon® ST product family and Drefon® S product family.

ST Products	Unit weight (g/m²)	Tensile Strength (kN/m)	S Products	Unit weight (g/m²)	Tensile Strength (kN/m)
Drefon ST	90	5,85	Drefon S	120	7,3
Drefon RST1	90	6,08	Drefon S	150	9,35
Drefon ST	100	6,35	Drefon S	180	12,15
Drefon VST1	100	6,05	Drefon S	200	12,95
Drefon ST	120	8,35	Drefon S	250	16,35
Drefon RST2	125	10,13	Drefon S	300	19,8
Drefon VST2	135	10,1	Drefon S	350	24
Drefon ST	140	10,15	Drefon S	400	27,25
Drefon ST	150	11,15	Drefon S	500	32,65
Drefon RST3	175	15,03	Drefon S	600	41,75
Drefon VST3	190	15,15	Drefon S	700	49,5
Drefon ST	200	14,9	Drefon S	800	53,5
Drefon ST	230	18,8	Drefon S	1000	62
Drefon RST4	235	20,03	Drefon S	1200	75,5
Drefon ST	250	20,03	Drefon S	1500	78,95
Drefon VST4	250	20	Drefon S	2000	100
Drefon ST	280	20,35			
Drefon ST	300	22,45			
Drefon RST5	310	26,01			
Drefon VST5	330	26,35			
Drefon ST	400	30,5			
Drefon ST	500	37			

LCA information

Declared unit: 1 kg of nonwoven geotextile, with its packaging (the packaging is not included in the declared kg)

Time representativeness: The primary data cover a period of 12 months, reference year 2020.
Used database and software: Ecoinvent 3.8 database; SimaPro software version 9.1.1.1.

System boundaries and process units excluded: The system boundaries include the mandatory modules A1, A2, A3, C1, C2, C3, C4 and D required by Standard EN 15804 (CEN, 2019), as reported in the following table according to a "from cradle to gate with module C1-C4 and module D" type application. It is emphasized that the construction, maintenance and decommissioning of infrastructures, understood as buildings, and the occupation of industrial land were not considered, since it is believed that their contribution to the environmental impact of the declared unit is negligible. The consumption of products for machine maintenance is excluded. It is also emphasized that the deployment, installation and maintenance phases are not included in the study.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation are presented below.

Note: primary data was collected from both plants, which are similar with respect to the production process.

	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	Maintence	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	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU 27	EU 27	IT										EU 27	EU 27	EU 27	EU 27	EU 27
Specific data used	> 90%																
Variation - products	< 10%																
Variation - sites	Not relevant																

ND=Non declared

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

Module	Scenario
A1	This phase includes extraction and processing of raw materials (polypropylene), 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 geotextiles and their packaging.
C1	This phase includes the removal of the geotextiles from the construction having assumed a civil scenario. An excavation hydraulic digger is considered.
C2	This phase includes the transportation of the discarded geotextiles. Average distance from the demolition site to the waste treatment is assumed to be 100km for landfill disposal. The transport was modeled with trucks > 32 t, EURO 4.
C3	This phase includes disassembly for recycling of the geotextiles. In this case it is equal to zero.
C4	This phase includes disposal in the final stage of the life of the product. It is assumed that 100% of the material is disposed in landfills.
D	This module contains the potential impacts and benefits related to the recycling of the product. In this case it is equal to zero.

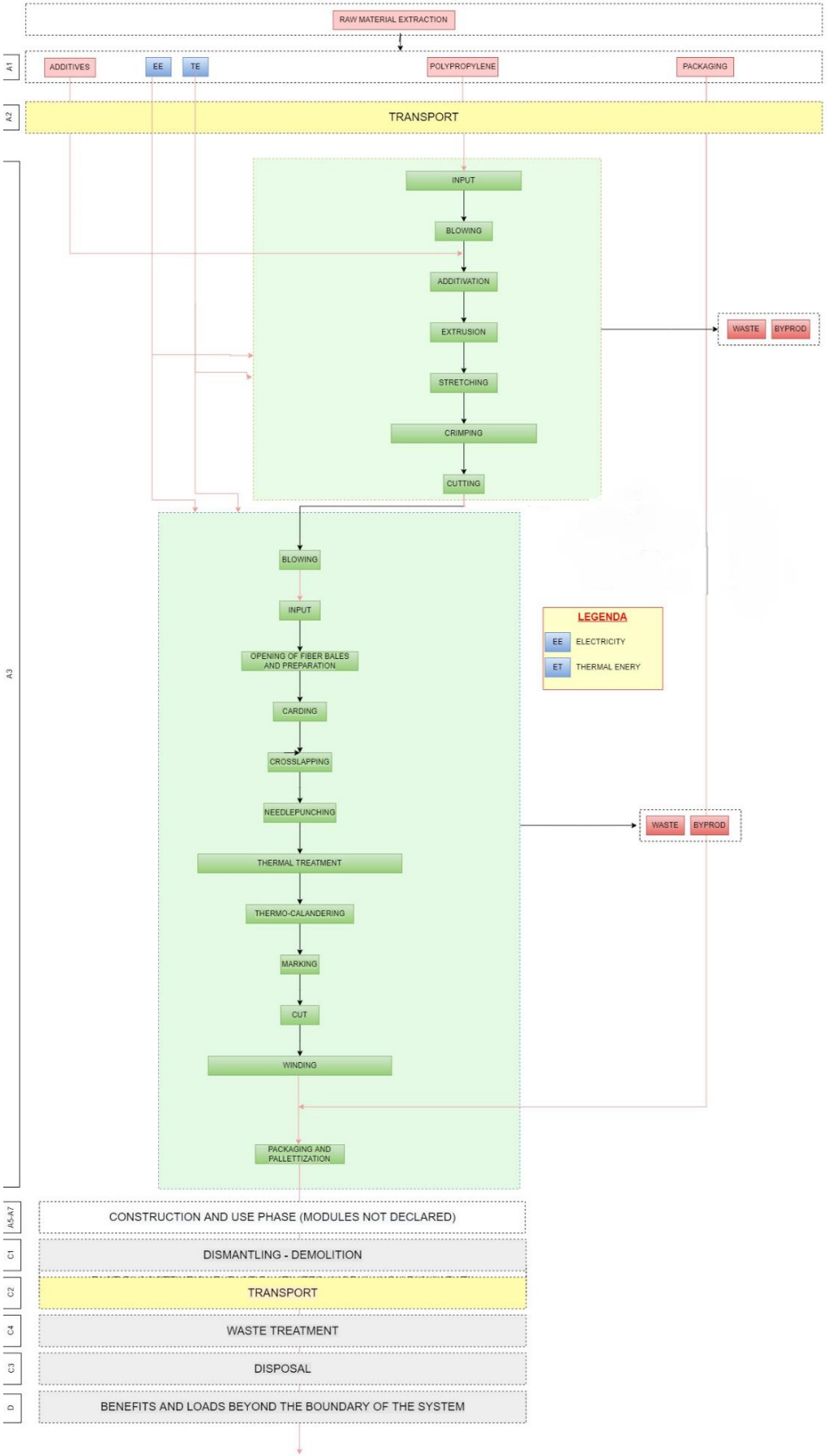
The criterion chosen for the initial inclusion of the input and output elements is based on the definition of a 1% cut-off level, in terms of mass, energy and environmental relevance. This means that a process has been neglected if it is responsible for less than 1% of the total mass, primary energy, and total impact. It can be assumed that the neglected processes would have contributed less than 5% to the impact categories considered.

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 (CEN, 2019).

Electricity modeling (Module A1): The modeling of electricity consumption in module A1 was carried out using the residual Italian national mix, using the AIB 2020 report as a data source. The breakdown of the energy sources used is shown here below.

Source	Residual Mix 2020
Renewables Unspecified	0,00%
Solar	5,02%
Wind	1,75%
Hydro&Marine	1,72%
Geothermal	0,00%
Biomass	1,73%
Nuclear	11,42%
Fossil Unspecified	2,11%
Lignite	0,54%
Hard Coal	17,40%
Gas	54,44%
Oil	3,87%
TOTAL	100,00%

System diagram:



Content statement

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Polypropylene	1,00E0	0,00%	0,00%
TOTAL	1,00E0	0,00%	0,00%
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Pipe (mix, 31% cardboard, 69% recycled PE)	3,91E-02	3,71%	
Roll PE film	7,00E-02	0,67%	
Wood pallet	2,14E-03	0,01%	
External PE film	7,00E-04	0,00%	
Wood packaging	4,90E-03	0,45%	
PET straps	7,00E-04	0,06%	
TOTAL	1,06E+00	4,89%	

Product components

The nonwoven geotextile is 100% composed by virgin polypropylene, not renewable.

Packaging materials

The finished product packaging is represented by an average of pipes in core board and pipes in recycled PE, polyethylene film, wood packaging with PET protective straps and wood pallets with PE protective film.

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%.

Environmental performance

Potential environmental impact

The values relating to the **Drefon® ST** average product are shown below.

The variation of the GWP-GHG indicator among the different products of the Drefon® ST family is lower than ±10% compared to the impact of the average product.

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	Total	D
GWP-total	kg CO_2 eq	3,04E+00	1,16E-01	4,98E-02	2,79E-01	1,65E-02	0,00E+00	1,40E-01	3,65E+00	0,00E+00
GWP-fossil	kg CO_2 eq	3,04E+00	1,16E-01	6,96E-02	2,79E-01	1,65E-02	0,00E+00	1,24E-01	3,65E+00	0,00E+00
GWP-biogenic	kg CO_2 eq	4,33E-03	6,25E-05	-2,02E-02	1,07E-04	8,89E-06	0,00E+00	1,57E-02	0,00E+00	0,00E+00
GWP-luluc	kg CO_2 eq	7,60E-04	4,09E-05	3,26E-04	2,91E-05	5,83E-06	0,00E+00	2,08E-06	1,16E-03	0,00E+00
ODP	kg CFC_{11} eq	1,56E-07	2,66E-08	5,90E-09	5,85E-08	3,78E-09	0,00E+00	3,11E-09	2,54E-07	0,00E+00
AP	mol H^+ eq	1,05E-02	5,92E-04	3,75E-04	2,85E-03	8,41E-05	0,00E+00	7,40E-05	1,45E-02	0,00E+00
EP-freshwater	kg P eq	4,78E-04	8,58E-06	3,66E-05	1,56E-05	1,22E-06	0,00E+00	9,24E-07	5,41E-04	0,00E+00
EP-freshwater	kg PO_4^{3-} eq	1,47E-03	2,63E-05	1,12E-04	4,79E-05	3,75E-06	0,00E+00	2,84E-06	1,66E-03	0,00E+00
EP-marine	kg N eq	1,85E-03	2,03E-04	1,04E-04	1,25E-03	2,89E-05	0,00E+00	4,05E-04	3,83E-03	0,00E+00
EP-terrestrial	mol N eq	1,94E-02	2,22E-03	8,85E-04	1,37E-02	3,16E-04	0,00E+00	3,01E-04	3,68E-02	0,00E+00
POCP	kg NMVOC eq	8,15E-03	6,33E-04	2,81E-04	3,77E-03	9,01E-05	0,00E+00	1,13E-04	1,30E-02	0,00E+00
ADP – mineral&metals*	kg Sb eq	2,11E-05	3,17E-06	9,37E-07	4,83E-07	4,51E-07	0,00E+00	7,44E-08	2,62E-05	0,00E+00
ADP – fossil*	MJ	9,00E+01	1,77E+00	1,07E+00	3,82E+00	2,51E-01	0,00E+00	2,27E-01	9,71E+01	0,00E+00
WDP*	m^3 world eq. depriv.	1,81E+00	4,92E-03	5,03E-02	6,71E-03	7,00E-04	0,00E+00	1,04E-03	1,87E+00	0,00E+00
GWP-GHG	kg CO2 eq	2,94E+00	1,16E-01	7,03E-02	2,78E-01	1,65E-02	0,00E+00	1,06E-01	3,52E+00	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*. **The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*

Potential incidence of disease due to PM emissions (PM), Potential Human exposure efficiency relative to U235 (IRP), Potential Comparative Toxic Unit for ecosystems (ETP-fw), Potential Comparative Toxic Unit for humans (HTP-c), Potential Comparative Toxic Unit for humans (HTP-nc) and Potential soil quality index (SQP) are not declared (ND) in this document.

Use of resources

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,14E+00	1,71E-02	8,06E-02	2,34E-02	2,43E-03	0,00E+00	7,11E-03	1,27E+00	0,00E+00
PERM	MJ	7,75E-01	7,87E-03	3,75E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,16E+00	0,00E+00
PERT	MJ	1,91E+00	2,49E-02	4,55E-01	3,05E-02	3,55E-03	0,00E+00	8,85E-03	2,44E+00	0,00E+00
PENRE	MJ	4,54E+01	1,77E+00	1,07E+00	3,82E+00	2,51E-01	0,00E+00	2,27E-01	5,25E+01	0,00E+00
PENRM	MJ	4,46E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,46E+01	0,00E+00
PENRT	MJ	9,00E+01	1,77E+00	1,07E+00	3,82E+00	2,51E-01	0,00E+00	2,27E-01	9,71E+01	0,00E+00
SM	kg	0,00E+00	0,00E+00	7,59E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,59E-03	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	3,06E-02	1,86E-04	1,66E-03	2,36E-04	2,65E-05	0,00E+00	2,80E-04	3,30E-02	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.

Production of waste and outflows

Waste production

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	Total	D
HWD	kg	2,23E-05	4,63E-06	1,41E-06	1,05E-05	6,58E-07	0,00E+00	2,73E-07	3,97E-05	0,00E+00
NHWD	kg	9,22E-02	8,45E-02	1,78E-02	7,08E-03	1,20E-02	0,00E+00	1,00E+00	1,21E+00	0,00E+00
RWD	kg	7,12E-05	1,20E-05	5,02E-06	2,59E-05	1,71E-06	0,00E+00	1,48E-06	1,17E-04	0,00E+00

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

Outgoing flows

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	Total	D
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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

Information on biogenic carbon content

The DREFON ST average product contains 0 kgC per kg of geotextile, while the content in the packaging is equal to 8,44E-03 kgC per kg of geotextile.

Potential environmental impact

The values relating to the **Drefon® S** average product are shown below.

The variation of the GWP-GHG indicator among the different products of the Drefon® S family is lower than ±10% compared to the impact of the average product.

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	Total	D
GWP-total	kg CO_2 eq	2,78E+00	1,16E-01	4,98E-02	9,59E-02	1,65E-02	0,00E+00	1,42E-01	3,20E+00	0,00E+00
GWP-fossil	kg CO_2 eq	2,78E+00	1,16E-01	6,96E-02	9,59E-02	1,65E-02	0,00E+00	1,24E-01	3,20E+00	0,00E+00
GWP-biogenic	kg CO_2 eq	1,93E-03	6,25E-05	-2,02E-02	3,68E-05	8,89E-06	0,00E+00	1,82E-02	0,00E+00	0,00E+00
GWP-luluc	kg CO_2 eq	7,39E-04	4,09E-05	3,26E-04	1,00E-05	5,83E-06	0,00E+00	2,08E-06	1,12E-03	0,00E+00
ODP	kg CFC_{11} eq	1,24E-07	2,66E-08	5,90E-09	2,01E-08	3,78E-09	0,00E+00	3,11E-09	1,83E-07	0,00E+00
AP	mol H^+ eq	9,84E-03	5,92E-04	3,75E-04	9,79E-04	8,41E-05	0,00E+00	7,40E-05	1,19E-02	0,00E+00
EP-freshwater	kg P eq	4,47E-04	8,58E-06	3,66E-05	5,36E-06	1,22E-06	0,00E+00	9,24E-07	5,00E-04	0,00E+00
EP-freshwater	kg PO_4^{3-} eq	1,37E-03	2,63E-05	1,12E-04	1,65E-05	3,75E-06	0,00E+00	2,84E-06	1,53E-03	0,00E+00
EP-marine	kg N eq	1,73E-03	2,03E-04	1,04E-04	4,29E-04	2,89E-05	0,00E+00	4,05E-04	2,90E-03	0,00E+00
EP-terrestrial	mol N eq	1,81E-02	2,22E-03	8,85E-04	4,70E-03	3,16E-04	0,00E+00	3,01E-04	2,65E-02	0,00E+00
POCP	kg NMVOC eq	7,75E-03	6,33E-04	2,81E-04	1,30E-03	9,01E-05	0,00E+00	1,13E-04	1,02E-02	0,00E+00
ADP – mineral&metals*	kg Sb eq	2,05E-05	3,17E-06	9,37E-07	1,66E-07	4,51E-07	0,00E+00	7,44E-08	2,53E-05	0,00E+00
ADP – fossil*	MJ	8,60E+01	1,77E+00	1,07E+00	1,31E+00	2,51E-01	0,00E+00	2,27E-01	9,06E+01	0,00E+00
WDP*	m^3 world eq. depriv.	1,77E+00	4,92E-03	5,03E-02	2,30E-03	7,00E-04	0,00E+00	1,04E-03	1,83E+00	0,00E+00
GWP-GHG	kg CO2 eq	2,68E+00	1,16E-01	7,03E-02	9,54E-02	1,65E-02	0,00E+00	1,06E-01	3,08E+00	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*. **The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*

Potential incidence of disease due to PM emissions (PM), Potential Human exposure efficiency relative to U235 (IRP), Potential Comparative Toxic Unit for ecosystems (ETP-fw), Potential Comparative Toxic Unit for humans (HTP-c), Potential Comparative Toxic Unit for humans (HTP-nc) and Potential soil quality index (SQP) are not declared (ND) in this document.

Use of resources

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	Total	D
PERE	MJ	1,07E+00	1,71E-02	8,06E-02	8,03E-03	2,43E-03	0,00E+00	7,11E-03	1,18E+00	0,00E+00
PERM	MJ	7,52E-01	7,87E-03	3,75E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E+00	0,00E+00
PERT	MJ	1,82E+00	2,49E-02	4,55E-01	8,03E-03	2,43E-03	0,00E+00	7,11E-03	2,31E+00	0,00E+00
PENRE	MJ	4,14E+01	1,77E+00	1,07E+00	1,31E+00	2,51E-01	0,00E+00	2,27E-01	4,60E+01	0,00E+00
PENRM	MJ	4,46E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,46E+01	0,00E+00
PENRT	MJ	8,60E+01	1,77E+00	1,07E+00	1,31E+00	2,51E-01	0,00E+00	2,27E-01	9,06E+01	0,00E+00
SM	kg	0,00E+00	0,00E+00	7,59E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,59E-03	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,98E-02	1,86E-04	1,66E-03	8,11E-05	2,65E-05	0,00E+00	2,80E-04	3,20E-02	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.

Production of waste and outflows

Waste production

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	Total	D
HWD	kg	1,81E-05	4,63E-06	1,41E-06	3,62E-06	6,58E-07	0,00E+00	2,73E-07	2,87E-05	0,00E+00
NHWD	kg	8,76E-02	8,45E-02	1,78E-02	2,43E-03	1,20E-02	0,00E+00	1,00E+00	1,21E+00	0,00E+00
RWD	kg	6,45E-05	1,20E-05	5,02E-06	8,91E-06	1,71E-06	0,00E+00	1,48E-06	9,36E-05	0,00E+00

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

Outgoing flows

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	Total	D
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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

Information on biogenic carbon content

The DREFON S average product contains 0 kgC per kg of geotextile, while the content in the packaging is equal to 8,44E-03 kgC per kg of geotextile.

Type and source of data

In choosing the data to be used for the LCA study, primary data collected at Manifattura Fontana through a campaign of measurements were privileged. The primary data cover a period of 12 months, from January 2020 to December 2020 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);
- raw materials used (quantity and type);
- the production process of geotextiles at Manifattura Fontana (mass balance and energy consumption);
- waste produced at Manifattura Fontana (quantity and destination);
- electricity consumption for both technological and office uses.

In the event that 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 3.01
- PCR construction Products and construction services 2019:14 version 1.11 valid until 2024-12-20
- European Residual Mixes. Results of the calculation of Residual Mixes for the calendar year 2020. AIB, 2020
- LCA Report “Studio di Life Cycle Assessment dei prodotti Drefon®, geotessili nontessuti in polipropilene di varie dimensioni di Manifattura Fontana S.p.A.”, rev. 3 del 27/04/2022

Standard

- ISO 14040:2006/Amd 1:2020 Environmental management - Life cycle assessment - Principles and framework – Amendment 1
- ISO 14044:2006/Amd 2:2020 Environmental management — Life cycle assessment — Requirements and guidelines — Amendment 2
- ISO 14025:20010 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

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