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THRACE NG
MEMBER OF THRACE GROUP

ENVIRONMENTAL PRODUCT DECLARATION

PP Multifilament Yarns and **Fibers for Concrete** of Thrace Nonwovens & Geosynthetics S.A.

In accordance with ISO 14025 and EN 15804+A1

Programme	The International EPD® System, www.environdec.com
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- COMPANY INFORMATION -

Thrace Nonwovens & Geosynthetics S.A. was established in 2010, assuming all the Technical Fabrics` activities of Thrace Plastics, which was originally founded in 1979. Today Thrace NG is producing PP technical fabrics and yarns/fibers. The plant of Thrace Nonwovens & Geosynthetics S.A. is located at Magiko Xanthi, 67100, Greece, in an Industrial Zone, nearby urban areas. The exact geographical coordinates of the plant are 41.05794666622788, 24.896821261376395.

EXPERTISE

At Thrace NG we strive for excellence and that shapes every aspect of our procedures, our processes and our people. Thrace NG`s strategy is to sustain growth through long term client relations, by the implementation of the latest manufacturing technologies and innovation.

PRODUCTS

Polypropylene woven flat and circular fabrics, needle-punched and spunbond nonwoven fabrics, staple fibers, multifilament yarns and tapes, HDPE tape and monofilament nets, polypropylene ropes, webbings, monofilament yarns, vapor control layers, roofing membranes and specialty textile materials.

AREAS OF APPLICATION

Geosynthetics, agri & horticulture, building construction, industrial fabrics, packaging, furniture & bedding, filtration, disposables, medical, workwear.

MARKETS

Thrace NG exports all over the world, in more than 80 countries.

WHAT MAKES US DIFFERENT

At Thrace NG we recognise that personalised customer service can make the difference between success and failure when it comes down to selecting the proper product for the corresponding application. Thrace NG`s dedicated staff follows a one to one relationship approach with our clients in order to understand their needs and provide them with effective solutions.

-PRODUCT DESCRIPTION-

The composition of the products is presented in Table below.

Material	By weight (%)
Polypropylene	60-100
Additives	0-20
UV Stabilizer	0-10
Color	0-10

No substance in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" exceeds 0.1% by weight in the final products.

Picture 1: Multifilament yarns

Multifilament Yarns are the ideal starting material for weaving, braiding and twisting. Their technical characteristics offer excellent resistance to acids and alkalis. They all offer superior technical parameters, with high tenacity, chemical resistance and flexibility. The multifilament yarns fulfil the requirements of the EU Construction Products Regulation **305/2011** and are regularly used for the production of geotextiles and related products. Other applications include production of filtration fabrics, slings, braided ropes, webbings, sewing, nets, belts, etc.

Picture 2: Fibers for concrete

Fibers for concrete are high-performance high-tenacity polypropylene **Class 1a microfibers** used for crack control of concrete, which fulfil the requirements of the EU Construction Products Regulation **305/2011** and amendments, and the specifications of the European Standard **EN 14889-2**. They are highly resistant to chemicals, especially in highly alkaline environments, such as concrete, mortar and grout, and have a round cross section. They are specially engineered and manufactured for use in concrete, mortar or grout, at a minimum recommended dosage rate of 0.9kg per cubic meter of concrete. The main applications of the fibers is in floor slabs, driveways, precast units, building restoration, pools etc.

-TECHNICAL CHARACTERISTICS-

PP MULTIFILAMENT NATURAL YARNS

Property	Standard	Unit	Nominal Value									Tolerance
Linear Density	ISO 2060	Denier	300	400	600	840	1000	1200	1500	2000	3000-5000	±5%
Elongation	ASTM D2256	%	24	30	22	22	22	22	22	22	22	±25%
Tenacity	ASTM D2256	gr/den	4.3	6	7	7	7	7	7	7	6.5	minimum
Shrinkage	Testrite 3min @ 120°C	%	1-3	1-3	4-6	3-5	3-5	2-4	2-4	2-4	2-4	
UV resistance[5]	ASTM G154	%	30	30	30	30	30	30	30	30	30	minimum
Bobbin dimensions		Intermingled or Parallel - Bobbin length 300mm (300Den-150mm), internal diameter 75mm - weight up to 8 kg										
		Twisted (400den and up) - Bobbin length 282mm, internal diameter 73mm - weight up to 5 kg										
Twisting		Intermingled, Parallel or Twisted 40-250 tpm, S or Z are available upon request.										

PP MULTIFILAMENT COLORED YARNS

Property	Standard	Unit	Nominal Value									Tolerance
Linear Density	ISO 2060	Denier	300	400	600	840	1000	1200	1500	2000	3000	±5%
Tensile elongation @peak	ASTM D2256	%	25	25	22	22	22	22	22	22	22	±25%
Tenacity @peak	ASTM D2256	gr/den	4	5	5	6	6	6	6	6	6	minimum
Shrinkage	Testrite 3min @ 120°C	%	1-3	1-3	4-6	3-5	3-5	2-4	2-4	2-4	2-4	
UV resistance[5]	ISO 21898	%	50	50	50	50	50	50	50	50	50	minimum
Bobbin dimensions		Intermingled or Parallel - Bobbin length 300mm (300Den-150mm), internal diameter 75mm - weight up to 8 kg										
		Twisted (400den and up) - Bobbin length 282mm, internal diameter 73mm - weight up to 5 kg										
Twisting		Intermingled, Parallel or Twisted 40-250 tpm, S or Z are available upon request.										

-TECHNICAL CHARACTERISTICS-

PP FIBERS FOR CONCRETE

Properties	Method	Units	Nominal Value
PHYSICAL PROPERTIES			
Length*	Optically	mm	3-54mm (±10%) upon request
Diameter	Optically	µm	~32 (±10%)
Specific Gravity	Bibliography	g/cm^3	0.905
Melting point	ISO 11357-3	°C	~165
MECHANICAL PROPERTIES			
Linear Density	EN 13392	dtex	7.5 (±10%)
Tenacity	EN ISO 2062	cN/dtex	6.2 (-13%)
		MPa	560 (-13%)
Tensile elongation	EN 14899-2	%	22 (±4)
Young's modulus**	EN 14899-2	GPa	6.2
Effect on consistence of concrete (900gr fibers/m^3 of concrete)***	EN 12350-3, EN 12350-4	VEBE time 10s	1.26-1.28s
Consistency of the reference concrete***	EN 12350-3, EN 12350-4	VEBE time 7s	1.25s
FIBER CHARACTERISTICS			
Composition type	100% PP		
Cross section area	round		
UV stabilization	~150kLy		
Chemical resistance	Excellent resistance to acids and alkali		

* Available lengths: in multiples of 3, up to 54mm
**Calculated at 1% strain
***values validated for fiber lengths of 6 and 12 mm

Fiber Length	mm	3	6	12	18	21	30	51	54
Estimated Number of fibers per kg	millions	444	222	111	74	63	44	26	25

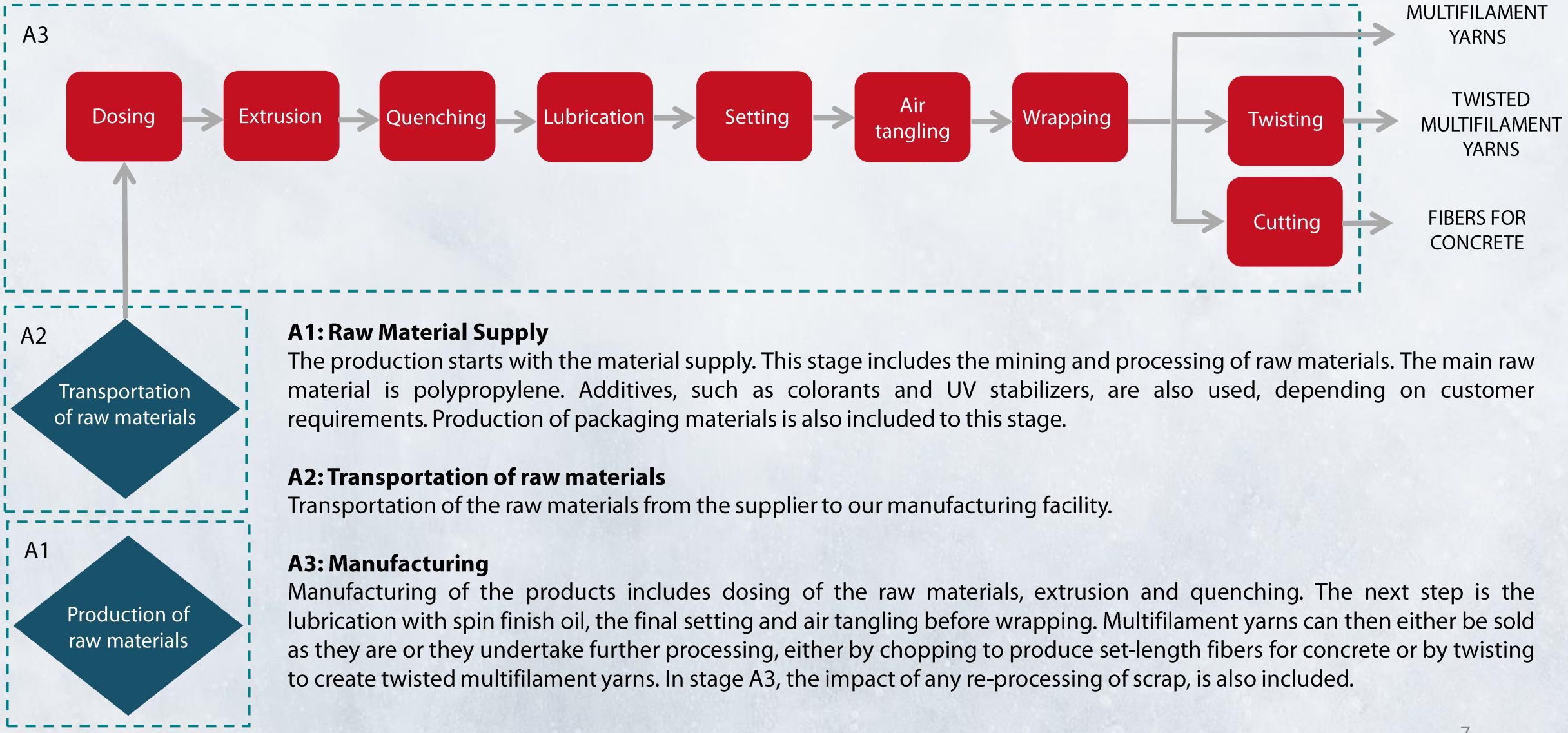
- SYSTEM BOUNDARIES -

The scope of the study is set to be ***Cradle-to-gate***. The system's boundaries are described in more detail below:

Product stage			**Construction stage**		**Use stage**							**End-of-life stage**				**Resource recovery stage**
Raw Materials Supply	**Transport**	**Manufacturing**	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction and demolition	Transport	Waste processing for reuse, recovery and/or recycling	Disposal	Reuse-Recovery-Recycling-potential
A1	**A2**	**A3**	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	**X**	**X**	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Modules of EPD, X=Included and MND=Module not Declared

- SYSTEM BOUNDARIES -



A1: Raw Material Supply
The production starts with the material supply. This stage includes the mining and processing of raw materials. The main raw material is polypropylene. Additives, such as colorants and UV stabilizers, are also used, depending on customer requirements. Production of packaging materials is also included to this stage.

A2: Transportation of raw materials
Transportation of the raw materials from the supplier to our manufacturing facility.

A3: Manufacturing
Manufacturing of the products includes dosing of the raw materials, extrusion and quenching. The next step is the lubrication with spin finish oil, the final setting and air tangling before wrapping. Multifilament yarns can then either be sold as they are or they undertake further processing, either by chopping to produce set-length fibers for concrete or by twisting to create twisted multifilament yarns. In stage A3, the impact of any re-processing of scrap, is also included.

- LCA INFORMATION -

DECLARED UNIT
The declared unit is 1 kg of product.

GOAL AND SCOPE
This EPD evaluates the impacts of 1 kg of polypropylene multifilament yarns and fiber for concrete from Cradle-to-Gate, produce by Thrace NG, at Magiko Plant.

GEOGRAPHICAL SCOPE
Worldwide

SOFTWARE AND DATABASE
Microsoft Excel is used to perform the LCA. Background data is sourced from Ecoinvent 3.7.1 Cut-off lci via software OpenLCA 1.10.3.

DATA QUALITY
ISO 14044 was applied in terms of data collection and quality requirements. The impact of the production of raw materials recovered from Ecoinvent database v.3.7.1. The data concerning the modules A2 (Transportation) and A3 (Product manufacturing) were provided by Thrace NG and concerns 1/9/2019-29/2/2020. These data were the quantities of all input and output materials extracted from the company's ERP system, the energy consumed, the waste management and the distances and means of transport for each input stream. Regarding electricity mix, the latest (2020) national residual electricity mix as published in DAPEEP SA was utilized.

ASSUMPTIONS
- For A2 the road and sea transportation a lorry 7,5-16 metric ton, EURO5 and bulk carrier for dry goods were used respectively.
- The color masterbatch is assumed to be 40% carbon black and 60% polypropylene.
- The UV Stabilizer is assumed to be 100% of polypropylene.

CUT-OFF RULES
The cut-off rule for insufficient data that are less than 1% of the total input mass and less than 5% of energy usage and mass per module was applied.

TIME REPRESENTIVENESS
All primary data used in this study is from 1/9/2019-29/2/2020 due to absence of measurement system for an entire year because of relocation of the plant. However, the production is not seasonal and as a result, this absence of data does not affect the results.

ALLOCATIONS
Wherever possible allocation was avoided by dividing the unit process to be allocated into two or more sub-processes and collecting the input and output data related to these sub-processes. When needed allocation based on physical properties and specifically on mass were used. The electricity of each machine for manufacturing and for other utilities, such as lighting, was allocated by mass of the produced products. Packaging materials and scrap were allocated by mass of the final products.

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP MULTIFILAMENT NATURAL (UNCOLORED) YARN

ENVIRONMENTAL IMPACTS	Unit	A1	A2	A3	A1-A3
Global Warming Potential	kg CO_2 eq	2,02E+00	5,54E-02	7,92E-01	2,87E+00
Ozone Depletion Potential	kg CFC-11 eq	4,59E-08	9,78E-09	4,43E-08	1,00E-07
Acidification Potential	Kg SO_2 eq	6,26E-03	1,91E-04	3,73E-03	1,02E-02
Eutrophication Potential	kg $PO4^{-3}$ eq	1,68E-03	4,05E-05	3,57E-03	5,29E-03
Photochemical Ozone Creation Potential	kg C_2H_4 eq	4,19E-04	7,07E-06	1,56E-04	5,81E-04
Depletion of abiotic resources potential (Elements)*	kg Sb eq	1,49E-05	2,65E-07	1,57E-06	1,67E-05
Depletion of abiotic resources potential (Fossil)*	MJ	7,02E+01	8,13E-01	9,47E+00	8,05E+01

WASTE CATEGORIES	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	1,25E-05	2,23E-06	6,04E-06	2,08E-05
Non-hazardous waste disposed	kg	1,80E-01	3,30E-02	4,59E-02	2,58E-01
Radioactive waste disposed	kg	4,90E-05	5,66E-06	8,49E-05	1,40E-04

*The results of these environmental impact indicators shall be used with care as the uncertainties of these results are high or as there is limited experienced with the indicator.

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP MULTIFILAMENT NATURAL (UNCOLORED) YARN

RESOURCE USE	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	2,97E+00	1,35E-02	2,03E+00	5,01E+00
Use of renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources	MJ	2,97E+00	1,35E-02	2,03E+00	5,01E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	7,43E+01	8,35E-01	1,48E+01	9,00E+01
Use of non-renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources	MJ	7,43E+01	8,35E-01	1,48E+01	9,00E+01
Use of secondary materials	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,36E-02	1,02E-04	1,05E-02	3,42E-02

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP MULTIFILAMENT COLORED YARN

ENVIRONMENTAL IMPACTS	Unit	A1	A2	A3	A1-A3
Global Warming Potential	kg CO_2 eq	2,02E+00	5,72E-02	7,92E-01	2,87E+00
Ozone Depletion Potential	kg CFC-11 eq	5,42E-08	1,01E-08	4,43E-08	1,09E-07
Acidification Potential	Kg SO_2 eq	6,29E-03	1,98E-04	3,73E-03	1,02E-02
Eutrophication Potential	kg $PO4^{-3}$ eq	1,68E-03	4,20E-05	3,57E-03	5,29E-03
Photochemical Ozone Creation Potential	kg C_2H_4 eq	4,19E-04	7,33E-06	1,56E-04	5,82E-04
Depletion of abiotic resources potential (Elements)*	kg Sb eq	1,49E-05	2,74E-07	1,57E-06	1,67E-05
Depletion of abiotic resources potential (Fossil)*	MJ	7,03E+01	8,40E-01	9,47E+00	8,06E+01

WASTE CATEGORIES	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	1,26E-05	2,30E-06	6,04E-06	2,10E-05
Non-hazardous waste disposed	kg	1,80E-01	3,41E-02	4,59E-02	2,59E-01
Radioactive waste disposed	kg	5,34E-05	5,85E-06	8,49E-05	1,44E-04

*The results of these environmental impact indicators shall be used with care as the uncertainties of these results are high or as there is limited experienced with the indicator.

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP MULTIFILAMENT COLORED YARN

RESOURCE USE	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	2,96E+00	1,39E-02	2,03E+00	5,00E+00
Use of renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources	MJ	2,96E+00	1,39E-02	2,03E+00	5,00E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	7,44E+01	8,63E-01	1,48E+01	9,00E+01
Use of non-renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources	MJ	7,44E+01	8,63E-01	1,48E+01	9,00E+01
Use of secondary materials	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,35E-02	1,06E-04	1,05E-02	3,40E-02

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP TWISTED MULTIFILAMENT NATURAL (UNCOLORED) YARN

ENVIRONMENTAL IMPACTS	Unit	A1	A2	A3	A1-A3
Global Warming Potential	kg CO_2 eq	2,02E+00	5,54E-02	8,75E-01	2,95E+00
Ozone Depletion Potential	kg CFC-11 eq	4,59E-08	9,78E-09	4,89E-08	1,05E-07
Acidification Potential	Kg SO_2 eq	6,26E-03	1,91E-04	4,11E-03	1,06E-02
Eutrophication Potential	kg $PO4^{-3}$ eq	1,68E-03	4,05E-05	3,94E-03	5,66E-03
Photochemical Ozone Creation Potential	kg C_2H_4 eq	4,19E-04	7,07E-06	1,72E-04	5,98E-04
Depletion of abiotic resources potential (Elements)*	kg Sb eq	1,49E-05	2,65E-07	1,73E-06	1,69E-05
Depletion of abiotic resources potential (Fossil)*	MJ	7,02E+01	8,13E-01	1,05E+01	8,15E+01

WASTE CATEGORIES	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	1,25E-05	2,23E-06	6,67E-06	2,14E-05
Non-hazardous waste disposed	kg	1,80E-01	3,30E-02	5,06E-02	2,63E-01
Radioactive waste disposed	kg	4,90E-05	5,66E-06	9,38E-05	1,48E-04

*The results of these environmental impact indicators shall be used with care as the uncertainties of these results are high or as there is limited experienced with the indicator.

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP TWISTED MULTIFILAMENT NATURAL (UNCOLORED) YARN

RESOURCE USE	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	2,97E+00	1,35E-02	2,24E+00	5,22E+00
Use of renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources	MJ	2,97E+00	1,35E-02	2,24E+00	5,22E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	7,43E+01	8,35E-01	1,64E+01	9,15E+01
Use of non-renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources	MJ	7,43E+01	8,35E-01	1,64E+01	9,15E+01
Use of secondary materials	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,36E-02	1,02E-04	1,16E-02	3,53E-02

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP TWISTED MULTIFILAMENT COLORED YARN

ENVIRONMENTAL IMPACTS	Unit	A1	A2	A3	A1-A3
Global Warming Potential	kg CO_2 eq	2,02E+00	5,72E-02	8,75E-01	2,96E+00
Ozone Depletion Potential	kg CFC-11 eq	5,42E-08	1,01E-08	4,89E-08	1,13E-07
Acidification Potential	Kg SO_2 eq	6,29E-03	1,98E-04	4,11E-03	1,06E-02
Eutrophication Potential	kg $PO4^{-3}$ eq	1,68E-03	4,20E-05	3,94E-03	5,66E-03
Photochemical Ozone Creation Potential	kg C_2H_4 eq	4,19E-04	7,33E-06	1,72E-04	5,98E-04
Depletion of abiotic resources potential (Elements)*	kg Sb eq	1,49E-05	2,74E-07	1,73E-06	1,69E-05
Depletion of abiotic resources potential (Fossil)*	MJ	7,03E+01	8,40E-01	1,05E+01	8,16E+01

WASTE CATEGORIES	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	1,26E-05	2,30E-06	6,67E-06	2,16E-05
Non-hazardous waste disposed	kg	1,80E-01	3,41E-02	5,06E-02	2,64E-01
Radioactive waste disposed	kg	5,34E-05	5,85E-06	9,38E-05	1,53E-04

*The results of these environmental impact indicators shall be used with care as the uncertainties of these results are high or as there is limited experienced with the indicator.

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP TWISTED MULTIFILAMENT COLORED YARN

RESOURCE USE	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	2,96E+00	1,39E-02	2,24E+00	5,21E+00
Use of renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources	MJ	2,96E+00	1,39E-02	2,24E+00	5,21E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	7,44E+01	8,63E-01	1,64E+01	9,16E+01
Use of non-renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources	MJ	7,44E+01	8,63E-01	1,64E+01	9,16E+01
Use of secondary materials	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,35E-02	1,06E-04	1,16E-02	3,51E-02

- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP FIBERS FOR CONCRETE

ENVIRONMENTAL IMPACTS	Unit	A1	A2	A3	A1-A3
Global Warming Potential	kg CO_2 eq	2,02E+00	5,54E-02	8,04E-01	2,88E+00
Ozone Depletion Potential	kg CFC-11 eq	4,59E-08	9,78E-09	4,50E-08	1,01E-07
Acidification Potential	Kg SO_2 eq	6,26E-03	1,91E-04	3,78E-03	1,02E-02
Eutrophication Potential	kg $PO4^{-3}$ eq	1,68E-03	4,05E-05	3,62E-03	5,34E-03
Photochemical Ozone Creation Potential	kg C_2H_4 eq	4,19E-04	7,07E-06	1,58E-04	5,84E-04
Depletion of abiotic resources potential (Elements)*	kg Sb eq	1,49E-05	2,65E-07	1,59E-06	1,67E-05
Depletion of abiotic resources potential (Fossil)*	MJ	7,02E+01	8,13E-01	9,62E+00	8,07E+01

WASTE CATEGORIES	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	1,25E-05	2,23E-06	6,14E-06	2,09E-05
Non-hazardous waste disposed	kg	1,80E-01	3,30E-02	4,66E-02	2,59E-01
Radioactive waste disposed	kg	4,90E-05	5,66E-06	8,62E-05	1,41E-04

*The results of these environmental impact indicators shall be used with care as the uncertainties of these results are high or as there is limited experienced with the indicator.

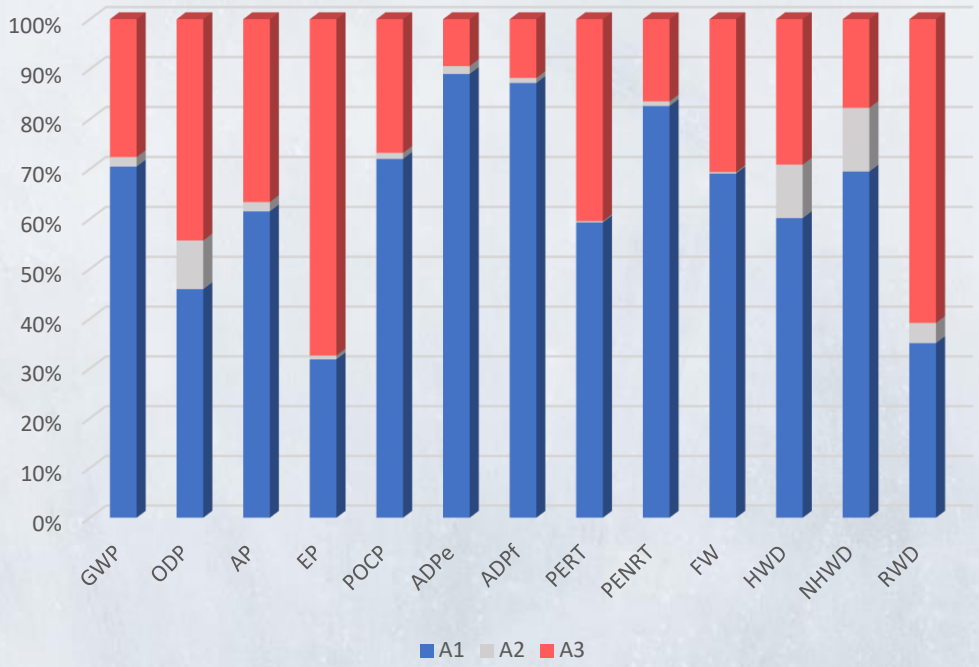
- ENVIRONMENTAL PERFORMANCE INDICATORS -

PP FIBERS FOR CONCRETE

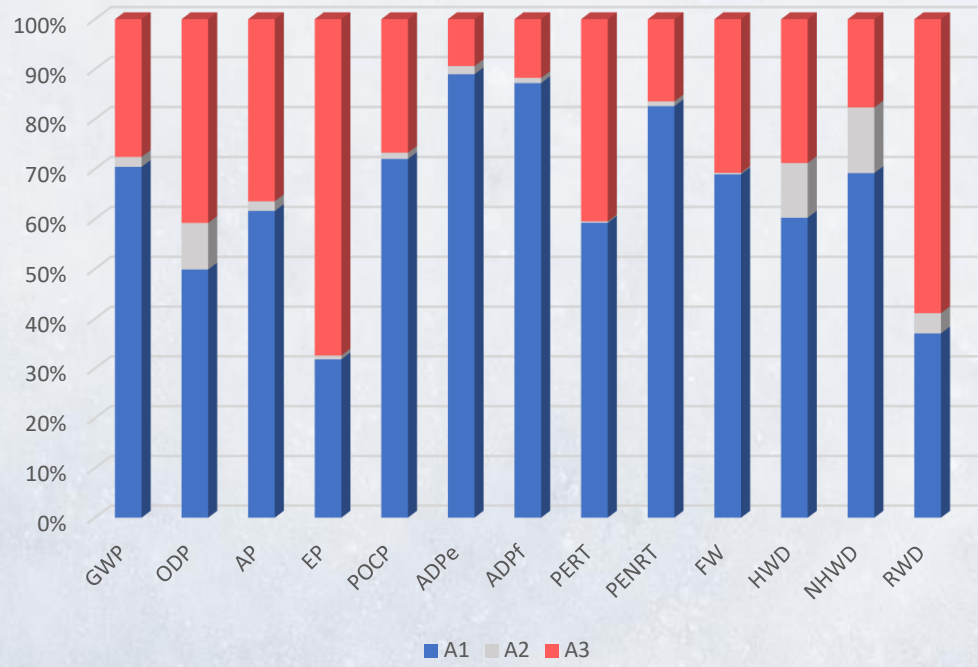
RESOURCE USE	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	2,97E+00	1,35E-02	2,06E+00	5,04E+00
Use of renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources	MJ	2,97E+00	1,35E-02	2,06E+00	5,04E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	7,43E+01	8,35E-01	1,50E+01	9,02E+01
Use of non-renewable primary energy resources used as raw materials	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources	MJ	7,43E+01	8,35E-01	1,50E+01	9,02E+01
Use of secondary materials	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	2,36E-02	1,02E-04	1,06E-02	3,44E-02

- INTERPRETATION -

PP MULTIFILAMENT TRANSPARENT YARN

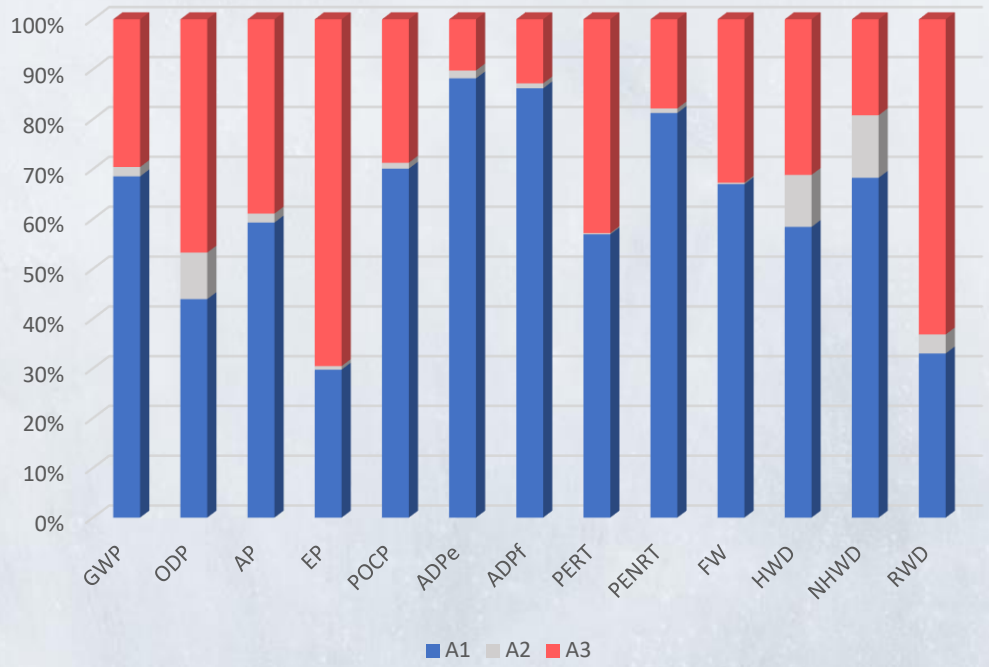


PP MULTIFILAMENT COLORED YARN



- INTERPRETATION -

PP TWISTED MULTIFILAMENT TRANSPARENT YARN



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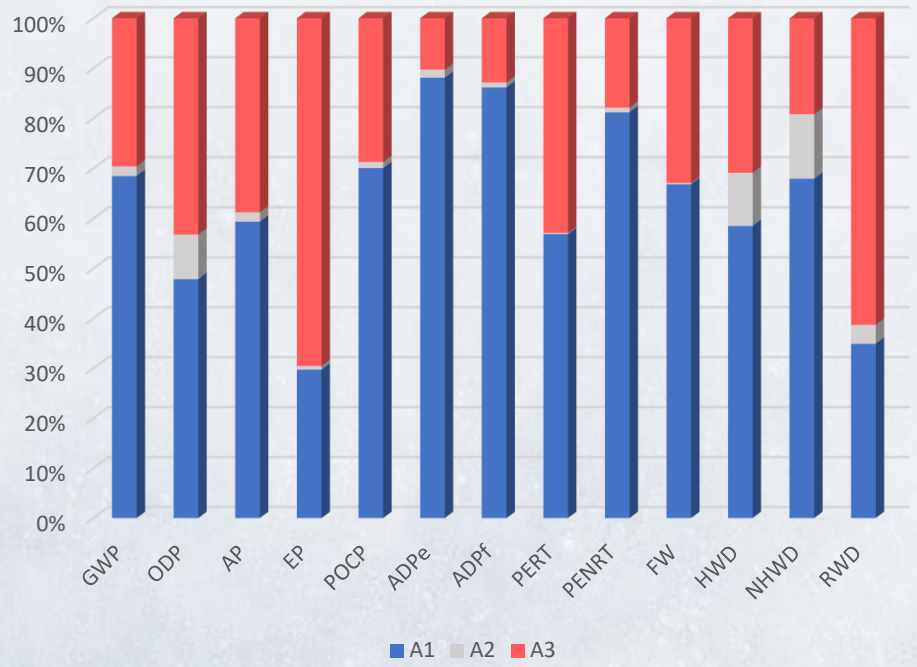
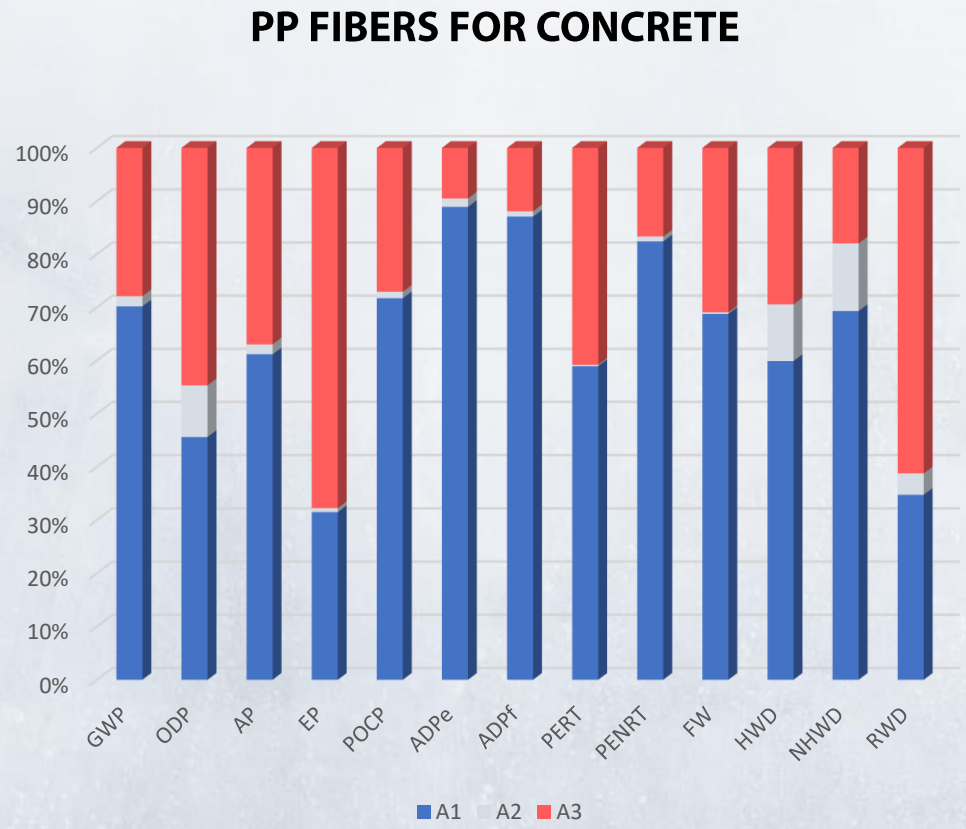


- INTERPRETATION -



- PROGRAMME RELATED INFORMATION -

Product group classification: UN CPC 355 Man-made fibers

The CEN standard EN 15804 serves as the core Product Category Rules

PCR 2012 Construction products and services (EN 15804:A1); Version 2.34; dated 2021-11-08, valid until 2022-02-28

PCR review was conducted by: The Technical Committee of the International EPD® System.

Independent third-party verification of the declaration and data in accordance with ISO 14025:2006

☐ EPD process certification ☒ EPD verification

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

☒ Yes ☐ No

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

- REFERENCES -

- ***General Programme Instructions*** *of the International EPD® System. Version 3.01, 2019-09-18*
- ***PCR 2012:01*** v.2.34 Construction products and services. *International EPD® System.* Date 2021-11-08, Valid until 2022-02-28
- ***EN 15804:2012+A1:2013,*** *Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products*
- ***ISO 14020:2000*** *Environmental labels and declarations — General principles*
- ***ISO 14025:2006*** *Environmental labels and declarations - Type III environmental declarations — Principles and procedures*
- ***ISO 14040:2006*** *Environmental management - Life cycle assessment - Principles and framework*
- ***ISO 14044:2006*** *Environmental management - Life cycle assessment - Requirements and guidelines*
- ***Ecoinvent / Ecoinvent Centre***, *www.Eco-invent.org*
- ***Residual Energy Mix 2020*** *from Renewable Energy Sources Operator & Guarantees of Origin (DAPEEP SA)*

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