



Environmental Product Declaration

In accordance with ISO 14025 for:

TAÇ Reborn Yarn (from %100 Re-PES) (Post-industrial) from KORTEKS



Programma	TURKEY EPD® ENVIRONMENTAL PRODUCT DECLARATIONS THE INTERNATIONAL EPD® SYSTEM		Programme Info		
Programme	EPD Turkey, a fully aligned regional programme. www.epdturkey.org	The International EPD® System www.environdec.com			
Programme Operator	EPD Turkey: SÜRATAM – Turkish Centre for Sustainable Production	The International EPD® System EPD International AB	Programme		
	Nef 09 B Blok No:7/15 34415 Kagıthane/Istanbul Turkey	Box 210 60 SE-100 31 Stockholm Sweden	Product Category Rules (PCR)	PCR : fibr	
Geographical Scope	G	obal	Independent third-party verification of the declaration and data, according to ISO 14025:2006		

UN CPC Code

264

(Textile yarn and thread of man-made filaments or staple fibres.)



The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs for textile products are primarily intended for use in B2B communication, but their use in B2C communication under certain conditions is not precluded. For EPDs intended for B2C communication, refer to ISO 14025.

Third party verifier

Procedure for follow-up of data

during EPD validity involves third

Approved by

party verifier

ormation

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2013:12 Textile yarn and thread of natural ores, man-made filaments or staple fibres, version 2.11

EPD process certification ()

EPD verification (${\boldsymbol{\mathsf{X}}}$)

Professor Vladimír Kocí

The International EPD® System

Yes () No (**X**)

About Company

Established in 1989 to meet the high-quality polyester yarn needs of the Turkish textile industry, Korteks is one of the world's most important, largest, integrated, and innovative polyester yarn production centers. In addition to the domestic market, it exports its products to more than 50 countries including Germany, Italy, England, the USA, Canada, Mexico, China.

Having an annual production capacity of 170,000 tons, Korteks produces thousands of different types of polyester filament yarns and can differentiate itself from the competition with its product variety. Korteks is one of the leading production facilities in Turkey, especially in the field of technical textiles, thanks to its competent and experienced human resources. The factory has been designed to allow for the production of high quality filament yarns and features such as "high count & micro count". These highly competitive products are used in different fields including automotive, health, outdoor, industrial textiles, carpets, fleece, top and sportswear. Korteks offers super-bright, semi-dull polyester textile chips and super-bright/ dull/semi-dull/full dull ecru and polymer-dyed polyester POY, FDY, textured, elasthan, air-textured, plain, bobbin-dyed and twisted, monofilament yarns under the brand name TAC.

Having an R&D team that researches and offers new solutions, Korteks has also been a pioneer in many polyester yarn technologies worldwide. As a company that aims to grow through customer-oriented, innovative, and value-added products, Korteks also has intensively invested in R&D. The most prominent products that have been developed are: TAÇ Antistatic, preventing all kinds of static electricity, dust collection and adhesion to the human body; TAÇ UV Resistant, developed for outdoor fabrics such as awnings, tarpaulins, garden furniture; TAÇ Flame Retardant yarns, offering flame retardancy, DRY TOUCH®; a certified performance fabric brand that facilitates moisture management.

Developing many products for the automotive industry, Korteks offers fast, flexible, and reliable service by working in continuous cooperation with customers from the design stage to mass production of automotive fabric projects. Today, the yarns produced in this respect are used in the projects of the world's largest automobile brands by domestic and foreign fabric manufacturers.

Being the technology base in polyester yarn production, Korteks will continue to penetrate into new markets with the yarns it has developed.



CERTIFICATION







KORTEKS





SUSTAINABLE







Product Information

LCA Information



As Korteks, the largest integrated polyester yarn production center in Europe, we dream for a sustainable world and make all endeavors to deliver better tomorrows that rely on innovative and technological advancements in line with Zorlu Holding's vision of "Smart Life 2030". And, accordingly, we take our pride in achieving another breakthrough moment in Turkey with the Polymer Recycling Plant which would allow us to produce Taç Reborn from plastic bottles.

At the Polymer Recycling Plant, we are producing RPET Chips, the raw material of the TAÇ Reborn, extracted from the waste plastic bottles, a non-biodegradable product capable of inducing negative environmental impact by uncontrollably remaining in the nature for prolonged periods, and other yarns discarded as production wastes to obtain a recyclable product, the filament polyester yarn.



Thanks to this innovative recycling process, we not only save energy as the process requires less energy when compared to the traditional production practices, but also endorse reduction of greenhouse gas emissions. Therefore, we support recycling processes through circular economy while also contributing to build a sustainable future in the long run.



Functional Unit	1 kg c indus
Time Representativeness	2021
Database(s) and LCA Software Used	Ecoin Datab
System Boundaries	Crado - Pr - Tr - Pr - Tr
Allocation	No al
Cut-Off Rules	No cu under



of TAÇ Reborn Yarn (from %100 Re-PES) (Poststrial)/ Texturized

nvent 3.6, TLCID (Turkish Lifecycle Inventory base) and SimaPro 9.1

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ut-off rule was applied within the LCA study rlying this EPD.

System Boundary

System Description



For the production of TAÇ Reborn Yarn from %100 Re-PES, polyester wastes are used which are occurred Korteks production line.

Spinning oil and titanium dioxide are used as a raw material of yarn spinning. Transportation mix (spinning oils are supplied from several countries) of spinning oil is assumed as following:

- 1300 km by truck
- 16000 km by ship

Titanium dioxide transport:

- 10600 km by ship
- 40 km by truck

Chips are prepared for the POY spinning plant, after that spinning of the POY and then it is textured.

Chips preparation process consist of two drying step (last one is for the crystallization) and, chips production step.

Yarn form is obtained at POY spinning process. Finally, POY is texturized to get natural look. While POY spinning and texturizing process, spin finish oil and cone oil are used.

At the end of the production, TAÇ Reborn yarns are packaged.

Taç Reborn yarns are transported to numerous customers in Turkey and Europe. Transportation mix is calculated as 500 km in average by truck according to last one year deliveries.

UPSTREAM

CORE

DOWNSTREAM

POTENTIAL ENVIRONMENTAL IMPACT

Param	neter	Unit	Upstream	Core	Downstream	Total
	Fossil	kg CO2 eq.	52.8 x10 ⁻³	3.08	0.83 x10 ⁻³	3.22
Clabel	Biogenic	kg CO2 eq.	62 x10 ⁻⁶	6.48 x10 ⁻³	20 x10 ⁻⁶	6.56 x10 ⁻³
potential (GWP)	Land use and transformation	kg CO2 eq.	40.1 x10 ⁻⁶	17.1 x10 ⁻³	24.3 x10 ⁻⁶	17.1 x10 ⁻³
	Total	kg CO2 eq.	52.9 x10 ⁻³	3.1	82.8 x10 ⁻³	3.24
Depletion potent tospheric ozone	ial of the stra- ayer (ODP)	kg CFC-11 eq	20.6 x10 ⁻⁹	0.11 x10 ⁻⁶	15.2 x10 ⁻⁹	14.5 x10 ⁻⁶
Acidification pote	ential (AP)	kg SO2 eq.	34.8 x10 ⁻³	0.15 x10 ⁻³	29.8 x10 ⁻³	16.1 x10 ⁻³
Eutrophication p	otential (EP)	kg PO ₄ ³⁻ eq	84 x10 ⁻⁶	9.34 x10 ⁻³	61.8 x10 ⁻⁶	9.49 x10 ⁻³
Photochemical or on potential (POI	kidant formati- FP)	kg NMVOC	0.87 x10 ⁻³	7.61 x10 ⁻³	0.33 x10 ⁻³	8.81 x10 ⁻³
Abiotic depletion Elements	n potential –	kg Sb eq	0.38 x10 ⁻⁶	0.1 x10 ⁻⁶	0.25 x10 ⁻⁶	1.62 x10 ⁻⁶
Abiotic depletion Fossil resources	n potential –	MJ, net calorific value	2.03	35.2	1.25	38.5
Water scarcity po	otential	m ³ eq	21.4 x10 ⁻³	2.31	8.71 x10 ⁻³	2.34

Global Warming Potential was calculated using IPCC 2013 method with a timeframe of 100 years. Eutrophication, Abiotic Depletion Fossil Fuels and Abiotic Depletion Elements were calculated with CML 2001 baseline method. Acidification was calculated using fate not included version in CML 2001 non-baseline method. Photochemical Oxidant Formation potential was calculated with POFP, LOTOS-EUROS as applied in ReCiPe 2008. Water Scarcity was calculated with AWARE method.

Global Warming Potential
1.6% of GWP comes from upstream (raw material production and transport)
95.8% of GWP comes from core processes (core production processes)
2.6% of GWP comes from downstream (transport of end product)



ENVIRONMENTAL PERFORMANCE

Upstream (1.6%) Core (95.8%) Downstream (2.6%)

USE OF RESOURCE

Parameter		Unit	Upstream	Core	Downstream	Total
	Use as energy carrier	MJ, net calorific value	16.8 x10 ⁻³	2.6	5.22 x10 ⁻³	2.62
Primary energy resources – Renewable	Used as raw materials	MJ, net calorific value	0	0	0	0
	Total	MJ, net calorific value	16.8 x10 ⁻³	2.6	5.22 x10 ⁻³	2.62
Primary energy resources – Non- renewable	Use as energy carrier	MJ, net calorific value	2.09	36.1	1.27	39.4
	Used as raw materials	MJ, net calorific value	0	0	0	0
	Total	MJ, net calorific value	2.09	36.1	1.27	39.4
Secondary materia	al	kg	1.03	0	0	1.03
Renewable second	ary fuels	MJ, net calorific value	0	0	0	0
Non-renewable se	condary fuels	MJ, net calorific value	0	0	0	0
Net use of fresh water		m³	0.33 x10 ⁻³	40.3 x10 ⁻³	0.22 x10 ⁻³	0.41 x10 ⁻³

Energy calculations were obtained using Cumulative Energy Demand (LHV) v 1.00, which is present in SimaPro's latest version. Net freshwater used was calculated from the life cycle inventory results.

Primary Energy Resources

- 5.0% of primary energy used at upstream (raw material production and transport)

- 92.0% of primary energy used at core processes (core production processes)

- 3.0% of primary energy used at downstream (trnasport of end product)



■ Upstream (5.0%) ■ Core (92.0%) ■ Downstream (3.0%)

Net Use of Fresh Water

-0.8% of water used at upstream (raw material production and transport) - 98.7% of water used at core processes (core production processes) 0.5% of water used at downstream (trnasport of end product)



■ Upstream (0.8%) ■ Core (98.7%) ■ Downstream (0.5%)

WASTE PRODUCTION

Parameter	Unit	Upstream	Core	Downstream	Total
Hazardous waste disposed	kg	0	0.1	0	0.1
Non-hazardous waste disposed	kg	0	27.6 x10 ⁻⁹	0	27.6 x10 ⁻⁹
Radioactive waste disposed	kg	0	0	0	0

Hazardous and Non-Hazardous waste amounts are allocated from yearly total waste amounts.

OUTPUT FLOWS

Parameter	Unit	Upstream	Core	Downstream	Total
Components for reuse	kg	0	0	0	0
Material for recycling	kg	0	0	0	0
Materials for energy recovery	kg	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0

Output flow amounts are allocated from yearly total waste amounts.

TOXICITY IMPACTS

Parameter	Unit	Upstream	Core	Downstream	Total
Human toxicity, cancer	cases	2.46 x10 ⁻⁹	0.22 x10 ⁻⁶	2.30 x10 ⁻⁹	0.23 x10 ⁻⁶
Human toxicity, non-cancer	cases	10.8 x10 ⁻⁹	0.56 x10 ⁻⁶	11.5 x10 ⁻⁹	0.58 x10 ⁻⁶
Freshwater ecotoxicity	PAF.m3.day	303	25 289.3	134	25 726

Toxicity impacts were calculated using USEtox v 2.02 recommended + interim.

References

Contact Information

Ecoinvent		
Ecoinvent Centre, www.ecoinvent.org		
ELCD Database		
European Platform on Life Cycle Assessment, https://eplca.jrc.ec.europa.eu/ELCD3/	Programma	
EN ISO 9001	Programme	FPD registered th
Quality Management Systems - Requirements		aligned regional pr
EN ISO 14001		EPD Turke
Environmental Management Systems - Requirements		
GPI		EPD Turke SÜRATAM – Turkisk
General Programme Instructions of the International EPD® System. Version 3.0.		Sustainable Productio
ISO 45001	Programme Operator	Design Nef 09 B Blok N
Occupational Health & Safety Management System - Requirements		34415 Kagıthane / Ist
ISO 14020:2000		www.epdturke
Environmental Labels and Declarations — General principles		Info@epdturk(
EN 15804:2012+A2:2019		
Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products	Owner of the Declaration	KORT
ISO 14025 DIN EN ISO 14025:2009-11		
Environmental labels and declarations - Type III environmental declarations — Principles and procedures		
ISO 14040/44/ DIN EN ISO 14040:2006-10		
Environmental management - Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)		
SimaPro		0.0
SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com	LCA Practitioner &	MELL
The International EPD® System	LI D DESIGIICI	Sustainability Consulting
The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com		





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