Environmental Product Declaration

In accordance with ISO 14025:2006 for:

FINON®

from

KOLON INDUSTRIES

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-09474
Publication date:	2023-06-16
Valid until:	2028-06-16

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

Publisher: The Norwegian EPD Foundation
Registration number: NEPD-4830-4102-EN

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
Product Category Rules (PCR): Nonwovens for clothing, protective clothing and upholstery / PCR 2011: 06, Version 3.0.2
PCR review was conducted by: The International EPD® System Technical Committee Visit www.environdec.com for full list of members. Chair of the PCR review: *Claudia A. Peña, University of Concepción, Chile.* The review panel may be contacted via info@environdec.com
Life Cycle Assessment (LCA)
LCA accountability: *Sung Mo Yeon, H.I.Pathway Co.,Ltd.*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by accredited certification body Third-party verification: *Noh-hyun Lim, Institute of Global Sustainability Certification(IGSC)*
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. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: KOLON INDUSTRY

Contact: Woo Seok Choi, e-mail: wooseok_choi@kolon.com, tel: +82 054 469 3879

Description of the organisation:
Since the first nylon production in Korea in 1957, KOLON Industries have grown with customers, transforming lifestyles through innovative products during history. As leader in the industrial field, we focus on four business divisions; Industrial Materials, Chemicals, Films/electronic Materials, and Fashion.

We manufacture and sell tire cords, airbags, industrial yarn, aramids, spunbond, synthetic leather, membrane humidifier, and PEM/MEA.

- Tire Cord It is a fiber reinforcement that forms the frame of a tire, and the majority of our clients are tire manufacturers.
- Air Bags We produce cushions for automobile airbags and supply them to manufacturers of automobile parts modules.
- Industrial Yarn We produce industrial materials for such items as seat belts, as well as PE materials for gloves and cold blankets.
- Aramids These are sold as filament, pulp, staple, etc. for a variety of applications, including bullet-proofing, optical cables, and hoses.
- Spunbond Industrial non-woven fabrics are used for filters, carpets, civil engineering, etc.
- Artificial Leather It is used for automobile interiors, furniture, and luxury goods.
- Membrane Humidifier As a moisture control device for fuel cells, it has been mass-produced for vehicles, power plants, and buildings, and is also utilized in fuel cell systems.
- PEM/MEA As a separator with selective permeability, it contributes to the production of electricity in a hydrogen fuel cell.

[Overview]

Name : KOLON INDUSTRIES Co., Ltd. Establishment April 12, 1957
CEO : President Yeong-bom Kim
Website : https://www.kolonindustries.com/
Head office : 110, Magokdong-ro, Gangseo-gu, Seoul 07793, Republic of Korea
Business : Manufacturing and sale of Industrial Materials, Chemicals, Films/electronic Materials, and Fashion
Products : tire cords, airbags, industrial yarn, aramids, spunbond, synthetic leather, membrane humidifier, PEM/MEA etc.

Product-related or management system-related certifications: IATF 16949, 14001 and 50001-certificates
Name and location of production site(s): Gumi plant of KOLON INDUSTRIES, 48, Suchul-daero, Gumi-si, Gyeongsangbuk-do

Product information

Product name: FINON®

Product description:
FINON is a brand name for 100% spunbond non-woven fabric products manufactured by KOLON Industries for the first time in Republic of Korea. With its excellent mechanical properties and fiber distribution, FINON can be applied to various industrial materials (e.g. filter media, carpet tile, automotive, shoe and landscape).

The FINON is made of PET 100% by KOLON INDUSTRIES and it is supplying excellent quality products that can be applied as well as various uses. The main applications are carpets, filters, automobiles, wallcoverings and civil engineering/architecture.
Having been the first in Korea to produce non-woven fabric product, KOLON INDUSTRIES, will ensure to supply the products not only with various of utility but also with excellent quality of fabric to apply.

UN CPC code: 27922
Geographical scope: Global

Product identification:

TYPE of TEST		UNIT	VALUE
Physical state		-	solid
Melting point / melting range		℃	approx. 253-267
Decomposition temperature		℃	greater 300
Solubility	water solubility	-	Insoluble
	soluble	-	chloral hydrate, phenol, phenol/tetrachloroethane (1:1), nitrobenzenes, hot dimethyl sulfoxide, trifluoroacetic acid hot m-cresol, o-chlorophenol

Regulated Hazardous Substance

- The base material of the FINON is plastic. No substances required to be reported as hazardous are associated with the production of this product.

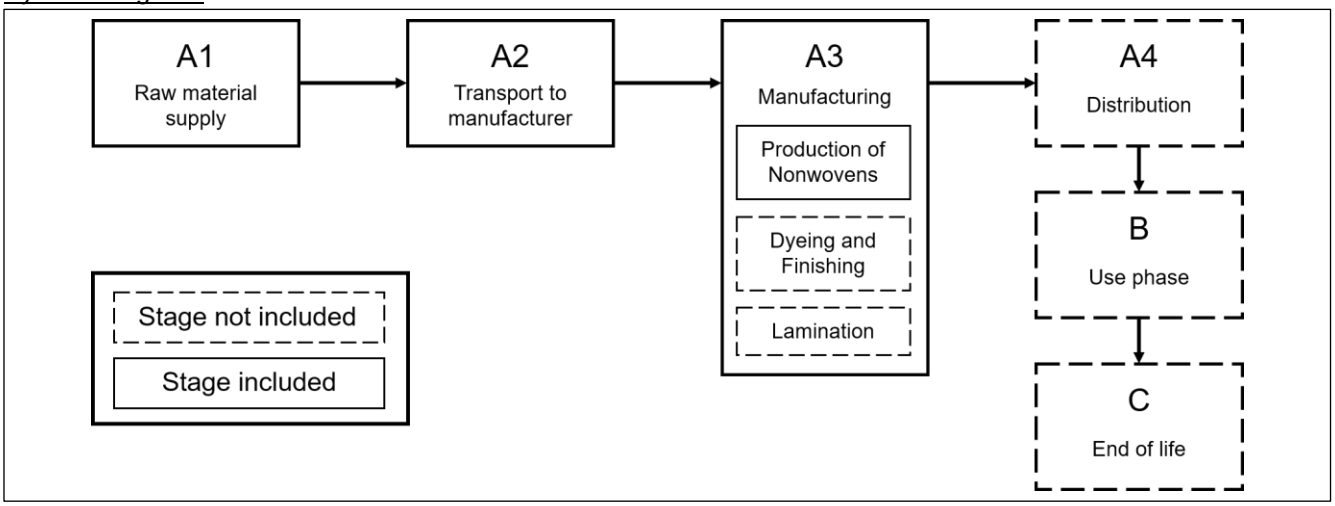
Dangerous Substance

- All chemicals used in the Busan factory are managed in accordance with the Korean Toxic Chemicals Control Act. Substances listed on the Candidate List of Substances of Very High Concern (SVHC) for authorization published by European Chemicals Agency (ECHA) are not contained in the steel in declarable quantities.

LCA information

Functional unit / declared unit: 1 kilogram
Reference service life: Not applicable
Time representativeness: The production data are from 2022, and the database data are from 2018 – 2021 i.e., no data is older than 10 years.
Database(s) and LCA software used: Database used is mainly Ecoinvent 3.8. The LCA software used is SimaPro 9.3.
Description of system boundaries:
LCA is made in "Cradle to gate with module Upstream Process (A1, A2) and Core Process (A3). All major materials, production energy use and waste are included for product stages A1, A2 and A3. After the customer purchases the product, it is manufactured as a non-woven product and then applied to the clothing site, so, KOLON INDUSTIRES does not have control over subsequent processes. Therefore, the Downstream Process are not the responsibility of KOLON INDUSTRIES. All life cycle impacts are included, see flowchart below. The following information describes the scenarios in the different modules of the EPD. All elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts shall be included. This cut-off rule does not apply to hazardous materials and substances.

System diagram:



More information: Electricity, waste and ancillary materials in production are calculated as an average weight per produced tonne of all products using yearly production data and the rate for 2022. For manufacturing processes, the specific country mix of electricity is considered. For secondary data on materials' flow information has been gathered from the Ecoinvent 3.8. database. In addition, the allocation is made following the provisions of PCR 2019:14 Construction products (EN 15804:A2) (1.11). The transportation of the material is considered in this analysis. The polluter pays and modularity principles are followed. The processes excluded from analysis are environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process and personnel-related impacts.

	Upstream process		Core process	Downstream process	
	Raw material supply (extraction, processing, recycled material)	Transport	Manufacturing (Core process 1)	Use phase	End of life
Module	A1	A2	A3	B1~B7	C1~C4
Modules declared	X	X	X	ND	ND
Geography	RoW	RoW	KR	-	-
Specific data used	> 99%	-	-	-	-
Variation-products	Not relevant	-	-	-	-
Variation sites	Not relevant	-	-	-	-

X = declared stage, ND = Not Declared

- Raw material supply (A1) : The material that is needed to produce ’ FNINON’ products is mostly RE-PET and Co-polyester. According to the cut-off rules, the environmental impact from the RE-PET which has significant environmental impact is reported in the EPD report.

- Transport (A2) : All raw materials and packaging materials have supplied from Republic of Korea or foreign contries. Therefore, all raw materials and packaging materials were classified into foreign country transportation, shipping transportation, and Republic of Korea transportation distance, and each transportation distance data was collected.

- Manufacturing (A3) : The processes that are included in the manufacturing phase are the drying, spinning, forming bonding and winding, of which energy consumption, auxiliary material consumption, waste and gaseous emissions have been modeled..

Content information

Product components	Weight, %	Post-consumer material, weight-%	Renewable material, weight-%
RE-PET	83.33%	0%	0%
Co-polyester B	8.24%	0%	0%
Cp-polyester A	4.48%	0%	0%
Others	3.95%	0%	0%
TOTAL	100.0%	0%	0%

Packaging materials	Weight, ton	Weight-% (versus the product)
Paper tube	3.23E-03	2.43%
Carton case	5.97E-06	0.45%
PE-FILM	2.24E-06	0.17%
POLYTEX	1.19E-06	0.09%
Cardboard	6.58E-07	0.05%
TAPE	5.87E-07	0.04%
VINYL Bag	3.56E-07	0.03%
Others	9.91E-07	0.07%
TOTAL	4.43E-05	3.33%

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
NON			

Environmental Information

For construction services, the total value of A1-A3 shall be replaced with the total value of A1-A5.

Potential environmental impact – mandatory indicators according to EN 15804

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**TOTAL**
GWP-fossil	kg CO_2 eq.	4.09E+00	1.05E-03	2.59E+00	6.68E+00
GWP-biogenic	kg CO_2 eq.	-1.37E-02	6.17E-07	5.95E-03	-7.72E-03
GWP-luluc	kg CO_2 eq.	2.89E-03	4.47E-07	1.23E-03	4.13E-03
GWP-total	kg CO_2 eq.	4.08E+00	1.06E-03	2.60E+00	6.68E+00
ODP	kg CFC 11 eq.	1.94E-05	2.27E-10	6.66E-08	1.95E-05
AP	mol H^+ eq.	1.77E-02	3.61E-06	8.23E-03	2.60E-02
EP-freshwater	kg PO_4^{3-} eq.	8.33E-04	7.90E-08	1.93E-03	2.76E-03
EP-marine	kg N eq.	3.26E-03	7.59E-07	2.93E-03	6.20E-03
EP-terrestrial	mol N eq.	3.34E-02	8.29E-06	2.84E-02	6.18E-02
POCP	kg NMVOC eq.	1.23E-02	2.94E-06	7.12E-03	1.95E-02
ADP-minerals&metals*	kg Sb eq.	4.66E-05	3.62E-09	1.26E-06	4.78E-05
ADP-fossil*	MJ	9.03E+01	1.55E-02	3.56E+01	1.26E+02
WDP	m^3	1.95E+00	5.40E-05	3.29E-01	2.28E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; 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 Exceedance; 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 Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption				

** 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.*

Use of resources

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**TOTAL**
PERE	MJ	1.86E+00	1.28E-04	1.83E-01	2.05E+00
PERM	MJ	1.91E+00	5.27E-05	5.47E-01	2.45E+00
PERT	MJ	3.77E+00	1.80E-04	7.30E-01	4.50E+00
PENRE	MJ	9.80E+01	1.65E-02	3.67E+01	1.35E+02
PENRM	MJ.	6.06E-03	7.05E-07	1.83E-04	6.25E-03
PENRT	MJ	9.80E+01	1.65E-02	3.67E+01	1.35E+02
SM	kg	NA	NA	NA	NA
RSF	MJ	NA	NA	NA	NA
NRSF	MJ	NA	NA	NA	NA
FW	m^3	4.98E-02	1.79E-06	9.54E-03	5.94E-02
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water				

Waste production and output flows

Waste production

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**TOTAL**
Hazardous waste disposed	kg	7.00E-03	0.00E+00	5.73E+00	5.74E+00
Non-hazardous waste disposed	kg	1.62E-01	0.00E+00	1.37E-01	2.99E-01
Radioactive waste disposed	kg	8.86E-05	1.02E-07	1.56E-04	2.45E-04

Output flows

Results per functional or declared unit					
Indicator	**Unit**	**A1**	**A2**	**A3**	**TOTAL**
Components for re-use	kg	NA	NA	NA	NA
Material for recycling	kg	NA	NA	3.36E-03	3.36E-03
Materials for energy recovery	kg	NA	NA	NA	NA
Exported energy, electricity	MJ	NA	NA	NA	NA
Exported energy, thermal	MJ	NA	NA	NA	NA

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in packaging	kg C	0.00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

References

- EN 15804:2012+A2:2019. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- General Programme Instructions of the International EPD® System. Version 3.01
- 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
- LCA software SimaPro 9.3
- Nonwovens for clothing, protective clothing and upholstery / 2011: 06, Version 3.0.2

SOUTH KOREA EPD

THE INTERNATIONAL EPD SYSTEM

www.epd-southkorea.com

EPD®

www.environdec.com

ANNEX 1

ANNEX 1: Self declaration from EPD owner

Specific requirements

1 Applied electricity data set used in the manufacturing phase

Not relevant

2 Transport from the place of manufacture to a central warehouse

Not relevant

3 Impact on the indoor environment

☐ Not relevant; specify _____It is not B2C Product_____