

2023-09-21 No. C(90/T8)-2023

Environmental Product Declaration

Organization making the declaration:

FabricAir A/S
Sandvadsvej 2, 4600 Koege, Denmark

Product:

Textile air distribution system, described as textile (virgin PES fabric, thermofixated, dyed, with FR and antimicrobial finishing, coated with PU, weighing 300 g/m²) air distribution system with a diameter of duct 500 mm and typical section of 9 meters and using Type 8 suspension.

Functional unit:

1 m² of the textile air distribution system.

Product Category Rule:

UN CPC 36950, 42190, 42999: Air ducts, substantial materials, Version 2.01 (2019). International EPD® System.

Life cycle assessment (LCA) data:

LCA, performed by a third party – technical university – accounts for the potential environmental impacts of a system over its entire life cycle, i.e.:

- Manufacturing of the PES air distribution system
- Packaging
- Use
- Transportation
- End of life of the air distribution system



Fig. 1. System boundaries “from cradle to grave”

The LCA was made and structured according to ISO 14040 and ISO 14044 standards, using company-specific data (year 2022), Ecoinvent database, and scientific literature.

Table 1. Life Cycle Impact Assessment results for 1 m² of separate materials for PES fabric air duct system

PARAMETER	UNIT	MANUFACTURING OF AIR DUCT SYSTEM MATERIALS									
		Fabric (PES)	Straps (PVC+PES)	Sliders (POM)	H-rail (Al)	Connectors (Steel)	Adjustable cable lock ^a	Adjustable cable lock ^b	End lock (ABS)	Sewing yarns (PES)	Zipper
EPD (2018) V1.00 METHOD											
Acidification (fate not incl.)	kg SO ₂ eq.	"-"	7.10E-04	2.74E-05	6.66E-03	1.10E-04	2.98E-04	4.07E-05	1.39E-05	1.82E-06	"-"
Eutrophication	kg PO ₄ ³⁻ eq.	"-"	8.14E-05	5.95E-06	7.24E-04	-6.30E-05	2.85E-05	3.06E-06	1.32E-06	1.97E-07	"-"
Global warming (GWP100a)	kg CO₂ eq.	2.47E+00	2.17E-01	1.66E-02	1.33E+00	5.42E-02	5.47E-02	1.37E-02	4.68E-03	4.72E-04	4.35E-02
Photochemical oxidation	kg NMVOC	"-"	8.86E-04	2.24E-05	3.83E-03	1.37E-04	1.64E-04	2.84E-05	1.35E-05	1.63E-06	"-"
Abiotic depletion, elements	kg Sb eq.	"-"	3.17E-07	8.03E-09	3.59E-06	2.11E-11	2.70E-07	3.24E-10	1.93E-09	5.78E-11	"-"
Abiotic depletion, fossil fuels	MJ	"-"	4.44E+00	3.36E-01	1.43E+01	5.53E-01	5.71E-01	1.47E-01	8.83E-02	1.08E-02	"-"
Water scarcity	m ³ eq.	"-"	5.59E-01	1.16E-01	3.46E+00	0.00E+00	6.14E-03	1.81E-02	2.42E-03	4.21E-04	"-"
Ozone layer depletion (ODP) (optional)	kg CFC-11 eq.	"-"	4.64E-09	7.78E-10	8.45E-08	1.50E-10	2.80E-09	-5.71E-11	6.12E-11	1.68E-09	"-"

a Made from ferronickel

b Made from steel

"-" The data for all impact categories was not available in the literature.

Table 1.1. Inventory data.

No.	MANUFACTURING:	UNIT	VALUE (1 m ²)
1.	Fabric (PES) ^{***}	kg	0.3
2. a	Straps (PVC)*	kg	0.054
2. b	Straps (PES)*	kg	0.024
3.	Sliders (POM)*	kg	0.005
4.	Anodized aluminium H-rail*	kg	0.253
5.	Connectors (Steel)*	kg	0.020
6.	Steel wire*	kg	0.007
7. a	Adjustable cable lock (stainless steel)*	kg	0.006

7. b	Adjustable cable lock (ferronickel)*	kg	0.006
8.	Plastic End lock with 2 flaps (made from ABS polymer)*	kg	0.001
9.	Sewing yarns (PES)***	meters	4.954
10. a	Zipper (Polyester)***	kg	0.007
10. b	Zipper (Zinc alloy without nickel)*	kg	0.003
PACKAGING:			
11.	Carton boxes*	kg	0.184
12.	PE bags*	kg	0.007
WASTESTREAMS:			
13.	Polyester incineration*	kg	0.300
14.	Aluminium reused*	kg	0.253
15.	Steel reuse*	kg	0.033
TRANSPORTATION:			
16.	Ships**		tkm
	Airplane**		
	Lorry**		
MAINTENANCE (1 WASHING):			
17.	Washing detergent for 1 washing***	kg	0.001
	Water consumption for 1 washing***	kg	0.451
	Electricity consumption for 1 washing***	kWh	0.007

Table 2. Life Cycle Impact Assessment results for 1 m² of fabric air duct system packaging

PARAMETER	UNIT	PACKAGING	
		Carton boxes	PE bags
EPD (2018) V1.00 METHOD			
Acidification (fate not incl.)	kg SO₂ eq.	4.92E-04	5.83E-05
Eutrophication	kg PO₄³⁻ eq.	1.35E-04	4.09E-06
Global warming (GWP100a)	kg CO₂ eq.	1.20E-01	1.58E-02
Photochemical oxidation	kg NMVOC	4.58E-04	6.95E-05
Abiotic depletion, elements	kg Sb eq.	2.49E-07	2.99E-09
Abiotic depletion, fossil fuels	MJ	1.48E+00	4.66E-01
Water scarcity	m³ eq.	2.67E-02	5.18E-03
Ozone layer depletion (ODP) (optional)	kg CFC-11 eq.	1.05E-08	1.02E-10

Table 3. Life Cycle Impact Assessment results for transportation of 1 ton of goods per 1 kilometer

PARAMETER	UNIT	TRANSPORTATION			
		Ships	Aircrafts	Lorry	Train
EPD (2018) V1.00 METHOD					
Acidification (fate not incl.)	kg SO ₂ eq.	2.40E-04	4.82E-03	6.69E-04	4.00E-04
Eutrophication	kg PO ₄ ³⁻ eq.	2.07E-05	7.10E-04	1.05E-04	1.03E-04
Global warming (GWP100a)	kg CO ₂ eq.	1.13E-02	1.11E+00	1.31E-01	4.87E-02
Photochemical oxidation	kg NMVOC	1.68E-04	5.51E-03	8.32E-04	4.99E-04
Abiotic depletion, elements	kg Sb eq.	2.53E-09	1.13E-07	3.72E-07	7.84E-8
Abiotic depletion, fossil fuels	MJ	1.55E-01	1.60E+01	2.01E+00	5.82E-01
Water scarcity	m ³ eq.	1.02E-03	6.64E-02	1.47E-02	6.37E-03
Ozone layer depletion (ODP) (optional)	kg CFC-11 eq.	1.80E-09	2.04E-07	2.44E-08	5.47E-9

Table 4. Life Cycle Impact Assessment results for 1 m² of fabric air duct system end of life stage

PARAMETER	UNIT	END OF LIFE		
		PES fabric incineration	Aluminum reuse	Steel reuse
EPD (2018) V1.00 METHOD				
Acidification (fate not incl.)	kg SO ₂ eq.	2.21E-03	7.94E-05	2.09E-06
Eutrophication	kg PO ₄ ³⁻ eq.	9.02E-05	7.90E-06	3.18E-07
Global warming (GWP100a)	kg CO ₂ eq.	-3.14E-01	1.07E-02	2.77E-04
Photochemical oxidation	kg NMVOC	8.44E-04	5.77E-05	2.55E-06
Abiotic depletion, elements	kg Sb eq.	1.28E-08	8.27E-09	4.66E-10
Abiotic depletion, fossil fuels	MJ	4.30E+00	1.51E-01	6.79E-03
Water scarcity	m ³ eq.	-4.36E-02	4.27E-03	2.47E-04
Ozone layer depletion (ODP) (optional)	kg CFC-11 eq.	3.68E-08	1.18E-09	8.04E-11

Table 5. Life Cycle Impact Assessment results for 1 m² of fabric air duct system maintenance per 1 washing cycle

PARAMETER	UNIT	USE		
EPD (2018) V1.00 METHOD		Detergent	Water	Energy
Global warming (GWP100a)	kg CO ₂ eq.	6.33E-03		

Additional environmental information:

FabricAir A/S is an ISO 9001 certified organization.

References:

1. ISO 14040: 2006 Environmental Management – Life cycle assessment – Principles and framework.
2. ISO 14044: 2006 Environmental Management – Life cycle assessment – Requirements and Guidelines.
3. Product Category: UN CPC 36950, 42190, 42999: Air ducts, substantial materials , Version 2.01 (2019). International EPD® System.
4. ROOS, Sandra, et al. Environmental assessment of Swedish fashion consumption. Five garments–sustainable futures. Mistra Future Fashion, 2015.
5. WU, Zequan. Haode evaluating the life-cycle environmental impacts of polyester sports Tshirts. In: IOP Conference Series: Earth and Environmental Science. IOP Publishing, 2020. p. 022017.
6. JEWELL, J.; KOFFLER, C.; MURPHY, S. LCA update of cotton fiber and fabric life cycle inventory. Cotton Incorporated, 2016, 162.

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