



ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Ceiling Air Diffuser, FläktGroup AB

EPD of multiple products, based on the result of a representative product.

Included products: DYKH (ARIES-1), DYCH (ARIES-2), RHOH (ATLAS-1), RHKH (ATLAS-2), HPKH (ATLAS-7), DYBH (ARIES-3), DYRH (ARIES-4), ROPH (ATLAS-3), RPPH (ATLAS-4), VSKH (INDUS-1) and VFKH (INDUS-2).



EPD HUB, HUB-5774

Published on 19.03.2026, last updated on 19.03.2026, valid until 18.03.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.



Created with One Click LCA

FläktGroup

GENERAL INFORMATION

MANUFACTURER

Manufacturer	FläktGroup AB
Address	Hämeentie 23, 37800 AKAA, FINLAND
Contact details	info.fi@flaktgroup.com
Website	https://www.flaktgroup.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Heini Sjöholm FläktGroup AB
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
EPD verifier	Yazan Badour as an authorized verifier for EPD Hub

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Ceiling Air Diffuser
Additional labels	DYKH (ARIES-1), DYCH (ARIES-2), RHOH (ATLAS-1), RHKH (ATLAS-2), HPKH (ATLAS-7), DYBH (ARIES-3), DYRH (ARIES-4), ROPH (ATLAS-3), RPPH (ATLAS-4), VSKH (INDUS-1) and VFKH (INDUS-2).
Product reference	-
Place(s) of raw material origin	Europa, Asia, Australia and South America
Place of production	Finland, Akaa
Place(s) of installation and use	-
Period for data	Calendar year 2024
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	-
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	49,9

ENVIRONMENTAL DATA SUMMARY

Declared unit	One kilogram of diffuser
Declared unit mass	1 kg
Mass of packaging	0,209 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	4,41
GWP-total, A1-A3 (kgCO ₂ e)	4,13
Secondary material, inputs (%)	10,8
Secondary material, outputs (%)	75,6
Total energy use, A1-A3 (kWh)	16,1
Net freshwater use, A1-A3 (m ³)	2,69

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

ABOUT FLÄKTGROUP

FläktGroup designs and manufactures ventilation and air treatment products for use in commercial and industrial buildings. The company is headquartered in Germany and operates production facilities in Europe, Asia and the United States.

FOR WELLBEING, SAFETY, AND ENVIRONMENT

Today, we spend more than 90% of our time indoors, and the air we breathe has a big impact on our performance, well-being, and comfort. Our buildings need mechanical ventilation and air treatment to deliver safe and comfortable building spaces. At the same time, buildings account for up to 40% the energy consumption, where ventilation systems play a big part. With this in mind, FläktGroup aims to approach ventilation and air treatment with consideration for indoor environments, energy use, and environmental aspects throughout the building lifecycle.

PRODUCT DESCRIPTION

FläktGroup ceiling diffusers are quiet, ceiling-mounted supply and exhaust air diffusers. They feature adjustable nozzles that allow the diffusion pattern to be customised, or alternatively an unperforated diffuser plate can be used.

The slot height can be set to 0, 12, 20, or 35 mm. The diffuser plate is magnetically attached to the diffuser body, making it easy to open for inspection and maintenance. The diffusers are manufactured from sheet steel and powder-coated for a high-quality surface finish. The standard colour is RAL 9003. The nozzles are made of white plastic with an antistatic treatment.

Diffusers with dimensions 595 × 595 mm can be installed directly into A-edge ceiling tiles (600 × 600 mm). Diffusers with dimensions 425 × 425 mm can be installed into A-edge ceiling tiles using the UTKZ-395 ceiling plate. Diffusers with dimensions 535 × 535 mm can be installed in various suspended ceiling systems using the ADAP false ceiling adapter.

Installation, adjustment, and maintenance instructions are available at www.flaktgroup.com

Further information can be found at:
<https://www.flaktgroup.com>

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	86,5	Europa, Asia, Australia and South America
Minerals	-	-
Fossil materials	13,5	Asia, Europa
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	One kilogram of diffuser
Mass per declared unit	1 kg
Functional unit	
Reference service life	

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recycling

Not declared = ND.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission. Metal coils are purchased and received from the steel manufacturer via truck. The coils are then cut, formed, spot-welded, pressed, turned, and painted. Once this is completed, the parts that need to be painted goes through a paint machine. The treated parts are then transferred to the assembly station, where all components are put together. Finally, the finished product is packed in a plastic bag and placed into a cardboard box.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. The transportation covers the delivery for the final product to the construction site and spills of packaging material. The average transport distance for the transported mass is defined based on the distance from the manufacturing plant to the wholesaler representing the largest share of sales.

Transportation covers the material loss of the diffusers during the installation phase and it's estimated to be zero. The recycling percentages come from different sources where for paper packaging is 83% recycled, 8% is incinerated and 9% goes to landfill. The source used for this is https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_85

19259/default/table?lang=en. Plastic packaging is 40% recycled, 37% is incinerated and 23% goes to landfill. The source used for this is https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_85 19242/default/table?lang=en.

PRODUCT USE AND MAINTENANCE (B1-B7)

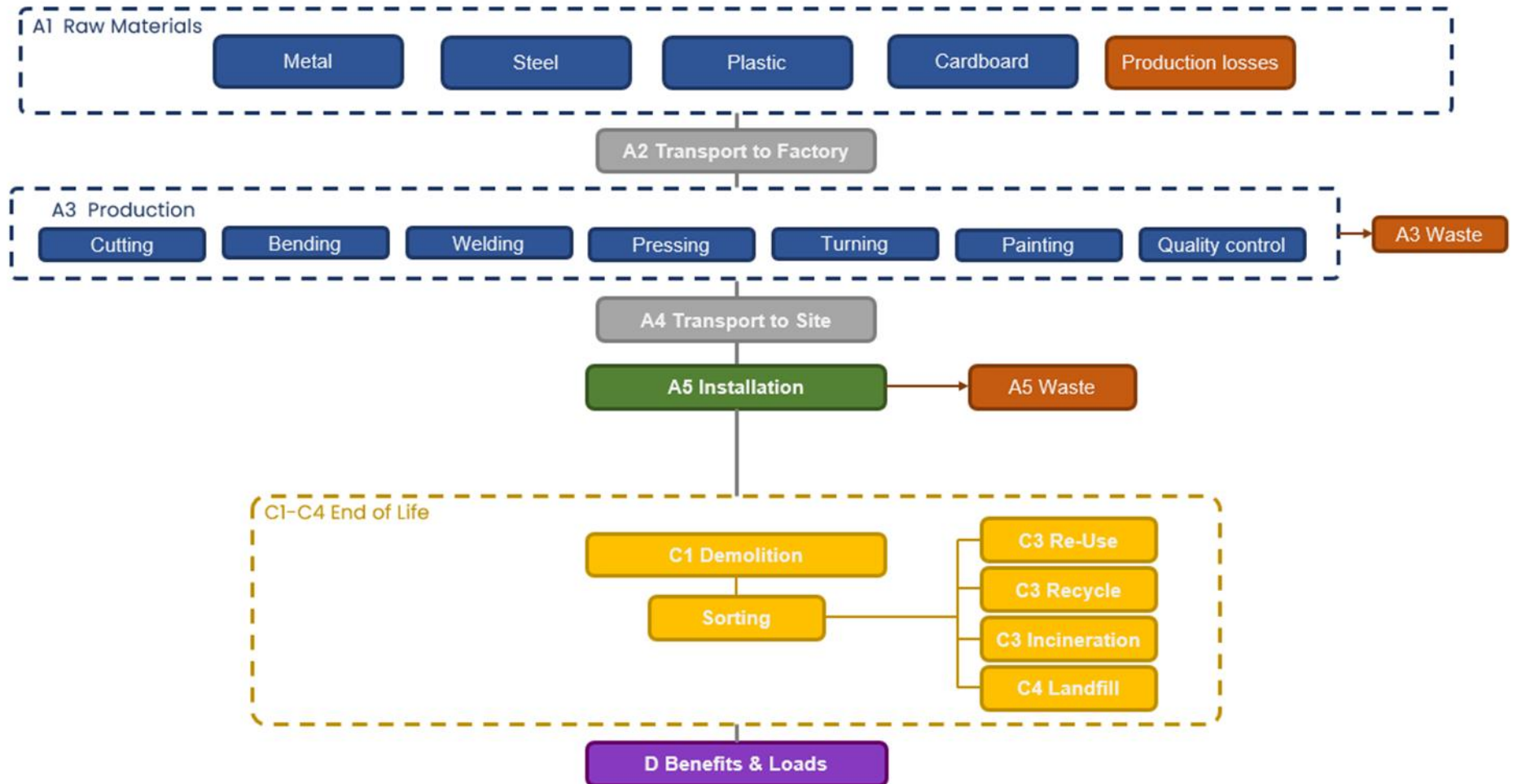
This EPD excludes the products use phase. The impacts during this phase vary depending on usage patterns and should be addressed separately within a comprehensive evaluation of specific construction projects. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

The diffusers are assumed to be dismantled using hand tools (C1) and these are then transported 50km to the local recycling site by truck (C2). 50km is used because the real-life scenario is unknown and very dependent on which city that the unit is placed in. At the recycling site the product is dismantled into different categories where each raw-material is divided into each category such as different kinds of metals and plastics, depending on material the average recovery of material differs. (C3). The remaining that is not recycled is then taken to landfill for disposal (C4).

The recycling percentages come from different sources where for steel 85% goes to recycling and 15% goes to landfill. The source used for this is <https://worldsteel.org/wp-content/uploads/Life-cycle-inventory-LCI-study-2020-data-release.pdf>. For the paint and coating used in the product, 0% goes to recycling, 99% goes to incineration and 1% goes to landfills. For plastic for instance PP 23% goes to recycling, 50% incineration and 27% goes to landfill. Other plastics waste is 50% incinerated with energy recovery, 25% of other is incinerated without energy recovery and 25% is landfilled. The recycled materials are then credited in module D. This is the most likely scenario for the handling of the product at its end of life.

SYSTEM DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	No allocation
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on worst-case results
Variation in GWP-fossil for A1-A3, %	<10%

FläktGroup ceiling diffusers are available in various shapes and sizes to suit different application needs. This EPD covers the FläktGroup DYKH and RHKH Size 200-4 diffusers, presenting an average environmental performance based on a weighted average of the products sold in 2024. To assess potential variations, two extreme product cases were modelled and analyzed: one without plastic components and one with a high proportion of

plastic components. The results showed that the difference between these two extremes was less than <10%. All products are manufactured at the same site in Akaa, Finland. The weights of the diffusers, including all sizes are presented for modules A1–A3 in Annex 1.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.4. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11/3.12 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11/3.12 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	4,02E+00	1,87E-01	-7,21E-02	4,13E+00	2,01E-01	3,17E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E-02	1,31E-01	1,90E-01	-1,68E+00
GWP – fossil	kg CO ₂ e	4,01E+00	1,87E-01	2,14E-01	4,41E+00	2,00E-01	2,32E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E-02	1,31E-01	1,90E-01	-1,54E+00
GWP – biogenic	kg CO ₂ e	8,27E-05	3,43E-05	-2,94E-01	-2,94E-01	3,84E-05	2,94E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,34E-06	-3,84E-05	-9,28E-06	-1,40E-01
GWP – LULUC	kg CO ₂ e	2,41E-03	7,34E-05	8,21E-03	1,07E-02	7,61E-05	4,43E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,05E-06	2,25E-05	8,14E-06	4,92E-04
Ozone depletion pot.	kg CFC ₁₁ e	1,81E-07	3,44E-09	5,32E-09	1,89E-07	3,81E-09	7,87E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,40E-10	2,52E-10	8,88E-10	-6,90E-09
Acidification potential	mol H ⁺ e	5,00E-02	1,71E-03	1,01E-03	5,28E-02	1,30E-03	3,24E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,37E-05	2,19E-04	1,34E-04	-6,20E-03
EP-freshwater ²⁾	kg Pe	7,46E-02	1,08E-05	1,10E-04	7,47E-02	1,23E-05	1,69E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,86E-07	1,12E-05	1,87E-06	-7,31E-04
EP-marine	kg Ne	4,11E-03	4,28E-04	4,72E-04	5,01E-03	3,24E-04	4,95E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,61E-06	5,50E-05	3,87E-05	-1,43E-03
EP-terrestrial	mol Ne	1,88E-01	4,73E-03	3,17E-03	1,96E-01	3,57E-03	1,07E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,06E-05	5,93E-04	2,76E-04	-1,55E-02
POCP (“smog”) ³⁾	kg NMVOCe	1,19E-02	1,55E-03	8,51E-04	1,43E-02	1,30E-03	3,93E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,00E-05	1,72E-04	1,52E-04	-5,37E-03
ADP-minerals & metals ⁴⁾	kg Sbe	5,51E-03	5,06E-07	1,34E-06	5,52E-03	5,89E-07	4,91E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,95E-08	1,20E-06	6,55E-08	-1,45E-05
ADP-fossil resources	MJ	5,01E+01	2,54E+00	3,41E+00	5,60E+01	2,76E+00	7,07E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,68E-01	2,45E-01	7,81E-01	-1,50E+01
Water use ⁵⁾	m ³ e depr.	4,71E+00	1,12E-02	1,13E-01	4,83E+00	1,28E-02	2,25E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,17E-04	8,09E-03	4,10E-03	-1,88E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. 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 experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,08E-07	1,17E-08	1,27E-08	4,32E-07	1,33E-08	4,27E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,49E-10	2,85E-09	1,56E-09	-1,01E-07
Ionizing radiation ⁶⁾	kBq 11235e	4,93E+01	2,75E-03	2,10E-02	4,94E+01	3,21E-03	4,45E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,56E-04	1,99E-03	3,20E-04	5,64E-02
Ecotoxicity (freshwater)	CTUe	7,30E+01	3,03E-01	1,78E+00	7,51E+01	3,43E-01	2,41E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,41E-02	1,97E-01	2,70E-01	-3,79E+00
Human toxicity, cancer	CTUh	8,82E-09	3,33E-11	6,39E-11	8,91E-09	3,49E-11	6,00E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,87E-12	2,06E-11	3,17E-10	-2,65E-10
Human tox. non-cancer	CTUh	1,40E-07	1,38E-09	1,88E-09	1,44E-07	1,59E-09	3,07E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,83E-11	1,23E-09	5,74E-10	-1,18E-08
SQP ⁷⁾	-	6,10E+00	1,24E+00	7,82E+00	1,52E+01	1,46E+00	5,56E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,68E-02	4,56E-01	1,09E-01	-1,63E+01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	3,23E+00	3,82E-02	-9,76E-01	2,29E+00	4,42E-02	-2,79E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,28E-03	4,33E-02	5,20E-03	-3,13E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	2,51E+00	2,51E+00	0,00E+00	-2,51E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E+00
Total use of renew. PER	MJ	3,23E+00	3,82E-02	1,54E+00	4,80E+00	4,42E-02	-5,30E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,28E-03	4,33E-02	5,20E-03	-1,79E+00
Non-re. PER as energy	MJ	4,98E+01	2,54E+00	3,20E+00	5,55E+01	2,76E+00	-4,56E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,68E-01	-2,10E+00	-1,27E+00	-1,52E+01
Non-re. PER as material	MJ	3,80E+00	0,00E+00	6,30E-01	4,43E+00	0,00E+00	-6,30E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-2,78E+00	-1,01E+00	7,46E-01
Total use of non-re. PER	MJ	5,36E+01	2,54E+00	3,83E+00	6,00E+01	2,76E+00	-1,09E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,68E-01	-4,88E+00	-2,28E+00	-1,44E+01
Secondary materials	kg	1,08E-01	1,16E-03	1,93E-01	3,03E-01	1,27E-03	1,26E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,37E-05	3,46E-04	3,10E-04	8,91E-01
Renew. secondary fuels	MJ	3,79E-03	1,20E-05	1,82E-02	2,20E-02	1,43E-05	7,61E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,50E-07	1,33E-05	6,96E-07	-1,27E-04
Non-ren. secondary fuels	MJ	2,30E-03	0,00E+00	0,00E+00	2,30E-03	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m ³	1,97E+00	3,04E-04	7,20E-01	2,69E+00	3,48E-04	-4,42E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,30E-05	1,64E-04	3,37E-05	-1,95E-03

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	3,59E-01	3,57E-03	1,14E-02	3,74E-01	3,92E-03	1,28E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,19E-04	2,74E-03	2,42E-03	-4,90E-01
Non-hazardous waste	kg	5,74E+00	6,97E-02	3,05E-01	6,11E+00	7,91E-02	1,47E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,15E-03	1,04E-01	1,37E-01	-4,32E+00
Radioactive waste	kg	9,61E-04	6,81E-07	5,39E-06	9,67E-04	7,98E-07	1,13E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,40E-08	5,10E-07	7,83E-08	1,47E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	5,95E-04	0,00E+00	3,60E-01	3,61E-01	0,00E+00	1,65E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	7,56E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	1,37E-04	0,00E+00	0,00E+00	1,37E-04	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	3,24E-03	0,00E+00	0,00E+00	3,24E-03	0,00E+00	1,62E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	5,30E-01	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,80E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	2,22E-01	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,40E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	3,08E-01	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	3,64E+00	1,86E-01	2,25E-01	4,05E+00	1,99E-01	4,33E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E-02	1,31E-01	1,90E-01	-1,53E+00
Ozone depletion Pot.	kg CFC ₁₁ e	1,10E-07	2,74E-09	4,35E-09	1,17E-07	3,03E-09	6,44E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,91E-10	2,08E-10	7,07E-10	-7,02E-09
Acidification	kg SO ₂ e	2,95E-02	1,36E-03	7,46E-04	3,16E-02	1,04E-03	2,46E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,91E-05	1,75E-04	1,10E-04	-4,96E-03
Eutrophication	kg PO ₄ ³ e	7,01E-03	1,85E-04	3,90E-04	7,58E-03	1,55E-04	3,41E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,56E-06	2,79E-05	1,39E-05	-9,25E-04
POCP (“smog”)	kg C ₂ H ₄ e	1,18E-03	8,06E-05	8,00E-05	1,34E-03	6,73E-05	6,79E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,01E-06	1,06E-05	9,15E-06	-7,72E-04
ADP-elements	kg Sbe	5,51E-03	4,95E-07	1,34E-06	5,52E-03	5,76E-07	4,80E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,83E-08	1,19E-06	5,88E-08	-1,45E-05
ADP-fossil	MJ	4,69E+01	2,50E+00	3,47E+00	5,29E+01	2,71E+00	6,30E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,64E-01	2,11E-01	7,76E-01	-1,61E+01

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁹⁾	kg CO ₂ e	4,02E+00	1,87E-01	2,22E-01	4,43E+00	2,01E-01	2,32E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,20E-02	1,31E-01	1,90E-01	-1,54E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO₂ is set to zero.

SCENARIO DOCUMENTATION

DATA SOURCES

Manufacturing energy scenario documentation

1. Heat production, natural gas, at industrial furnace >100kW, Albania, Ecoinvent, 0.0773 kgCO₂e/MJ
2. Electricity voltage transformation, residual mix, from high to medium voltage, Finland, Ecoinvent, 0.68 kgCO₂e/kWh

Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry 16-32 metric ton, EURO6, 734 km
2. Market for transport, freight, sea, ferry, 222 km

Transport scenario documentation A4

Scenario parameter	Value
Capacity utilization (including empty return) %	50
Bulk density of transported products	6,05E+01
Volume capacity utilization factor	1

Installation scenario documentation - A5 (Installation waste)

1. Treatment of waste paper, unsorted, sorting, Ecoinvent, Materials for recycling, 0.16 kg
2. Treatment of waste packaging paper, municipal incineration, Ecoinvent, 0.016 kg
3. Exported Energy: Thermal, Ecoinvent, 0.049 MJ
4. Exported Energy: Thermal, Ecoinvent, 0.045 MJ
5. Exported Energy: Electricity, Ecoinvent, 0.035 MJ
6. Exported Energy: Electricity, Ecoinvent, 0.033 MJ
7. Treatment of waste packaging paper, sanitary landfill, Ecoinvent, 0.018 kg
8. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.0052 kg

9. Treatment of waste polyethylene, municipal incineration, Ecoinvent, 0.0048 kg
10. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.003 kg

End-of-life scenario documentation - C1-C4 (Data source)

1. Sorting and pressing of iron scrap, Ecoinvent, Materials for recycling, 0.74 kg
2. Treatment of scrap steel, inert material landfill, Ecoinvent, 0.13 kg
3. Treatment of waste paint, hazardous waste incineration, Ecoinvent, 0.046 kg
4. Treatment of waste paint, sanitary landfill, Ecoinvent, 4.6E-4 kg
5. Treatment of waste polyethylene, for recycling, unsorted, sorting, Ecoinvent, Materials for recycling, 0.016 kg
6. Treatment of waste polypropylene, municipal incineration, Ecoinvent, 0.035 kg
7. Exported Energy: Electricity, Ecoinvent, 0.18 MJ
8. Exported Energy: Electricity, Ecoinvent, 0.042 MJ
9. Exported Energy: Thermal, Ecoinvent, 0.25 MJ
10. Exported Energy: Thermal, Ecoinvent, 0.058 MJ
11. Treatment of waste polyethylene, sanitary landfill, Ecoinvent, 0.019 kg
12. Treatment of waste rubber, unspecified, municipal incineration, Ecoinvent, 0.003 kg
13. Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, 0.0085 kg
14. Treatment of waste plastic, mixture, municipal incineration, Ecoinvent, 0.0043 kg
15. Treatment of waste plastic, mixture, sanitary landfill, Ecoinvent, 0.0043 kg

Scenario information	Value
Scenario assumptions e.g. transportation	Transported 50 km by truck to local recycling station

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

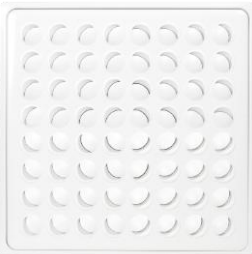
Tool verifier: Magaly Gonzalez Vazquez

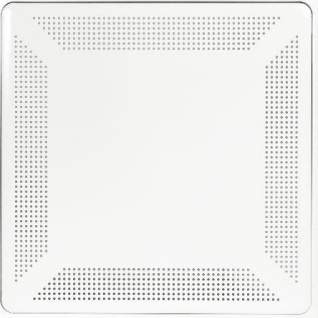
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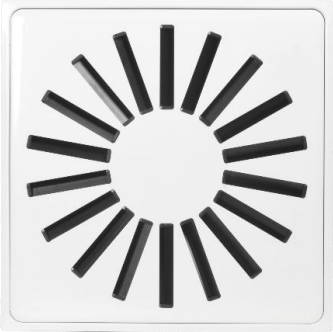
Yazan Badour as an authorized verifier for EPD Hub Limited 19.03.2026

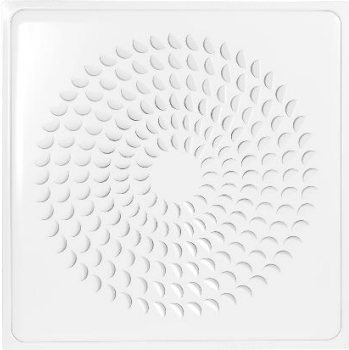
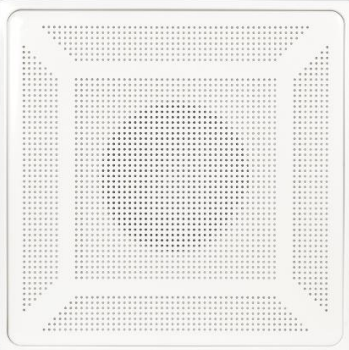


ANNEX 1: PRODUCTS INCLUDED IN THE EPD:

Product Name	Size	Total weight
DYKH (ARIES-1) (Size 200-4 reference product) 	125-4	2.2
	125-5	3.2
	125-6	4.1
	160-4	2.2
	160-5	3.2
	160-6	4.1
	200-4	2.1
	200-5	3.2
	200-6	4.1
	250-5	3.1
	250-6	4.0
	315-5	3.0
	315-6	3.9
	400-6	3.9
DYCH (ARIES-2) 	125-4	2.2
	125-5	3.2
	125-6	4.1
	160-4	2.2
	160-5	3.2
	160-6	4.1
	200-4	2.1
	200-5	3.2
	200-6	4.1
	250-5	3.1
	250-6	4.0
	315-5	3.0
	315-6	3.9
	400-6	3.9

RHOH (ATLAS-1)		Size	Weight (kg)
		125-4	2,3
		125-5	3,5
		125-6	4,5
		160-4	2,3
		160-5	3,5
		160-6	4,5
		200-4	2,1
		200-5	3,5
		200-6	4,5
		250-5	3,4
		250-6	4,4
		315-5	3,3
		315-6	4,3
		400-6	4,3
RHKH (ATLAS-2)		Size	Weight (kg)
		125-4	2,3
		125-5	3,5
		125-6	4,5
		160-4	2,3
		160-5	3,5
		160-6	4,5
		200-4	2,1
		200-5	3,5
		200-6	4,5
		250-5	3,4
		250-6	4,4
		315-5	3,3
		315-6	4,3
		400-6	4,3

VSKH (INDUS-1)		Size	Weight (kg)
		125-5	3.6
		125-6	4.5
		160-5	3.6
		160-6	4.5
		200-5	3.6
		200-6	4.5
		250-5	3.6
		250-6	4.4
		315-5	3.3
		315-6	4.3
		400-6	4.3
VFKH (INDUS-2)		Size	Weight (kg)
		125	4.5
		160	4.5
		200	4.5
		250	4.4
		315	4.3
		400	4.3

DYBH (ARIES-3) 	Size	Weight (kg)
	125	4.5
	160	4.5
	200	4.5
	250	4.4
	315	4.3
	400	4.3
HPKH (ATLAS-7) 	160-5	3.3
	160-6	4.1
	200-5	3.3
	250-5	4.1
	250-6	3.2
	250-6	4.0
	315-5	3.1
	315-6	3.9
	400-6	3.9

DYRH (ARIES-4) 	Size	Weight (kg)
	125	1.4
	160	1.4
	200	1.4
	250	3.0
	315	2.9
	400	3.0
ROPH (ATLAS-3) 	125	1.4
	160	1.4
	200	1.4
	250	3.1
	315	3.0
	400	2.8
RPPH (ATLAS-4) 	125	1.4
	160	1.4
	200	1.4
	250	3.1
	315	3.0
	400	2.8