ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

OPTIVENT® ULTRA-ULSA VAV damper, FläktGroup AB

EPD of a product with a scaling table for similar products and sizes.

Included products: OPTIVENT ULTRA ULSA size Ø100-630, EMSS size Ø100-630, EHSS size Ø100-630 and EMPA size Ø100-630

EPD HUB, HUB-4295

Published on 31.10.2025, last updated on 31.10.2030

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

GENERAL INFORMATION

MANUFACTURER

Manufacturer	FläktGroup AB
Address	Slovanská 781, 463 12 Liberec - Vesec, Czech Republic
Contact details	info-cz@flaktgroup.com
Website	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-B7, and modules C1-C4, D
EPD author	Doubravka Šimáňová
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	OPTIVENT® ULTRA-ULSA VAV damper
Product reference	ULSA-7-250-1; ULSA-8-250-1
Place(s) of raw material origin	Europe, Asia
Place of production	Liberec, Czech republic
Place(s) of installation and use	Europe
Period for data	calendar year 2024
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
GTIN (Global Trade Item Number)	8595736326187
NOBB (Norwegian Building Product Database)	-
A1-A3 Specific data (%)	15,15

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of ULTRA ULSA-7-250-1
Declared unit mass	4,2 kg
Mass of packaging	2,95 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	19,7
GWP-total, A1-A3 ($kgCO_2e$)	17
Secondary material, inputs (%)	21,4
Secondary material, outputs (%)	76,4
Total energy use, A1-A3 (kWh)	79,4
Net freshwater use, A1-A3 (m^3)	0,45

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

ABOUT FLÄKTGROUP

FläktGroup is a leader in air technology, delivering best-in-class, innovative, and energy-efficient solutions to ensure comfort, safety, and performance, whilst reducing customers' carbon footprint. FläktGroup 's premier brands have been setting technological standards for more than 100 years and can fulfil the most demanding customer requirements. Headquartered in Germany, FläktGroup operates all over the world with production sites across Europe, Asia, and the USA.

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. The challenge is to lower the energy consumption, and here FläktGroup is one of the key drivers providing superior quality products whilst protecting the environment.

OUR PURPOSE

Our purpose is simple: we care for your air whilst protecting the environment.

BEING AN EMPLOYER OF CHOICE

As we aim to be an employer of choice, this comes with a responsibility. We need to act and care as responsible Corporate Citizen for our people, our community, and our shared environment. We also must deliver sustainable solutions to help our customers to fulfil or exceed environmental demands and legislation. FläktGroup is committed to delivering smart energy-efficient ventilation solutions that make buildings sustainable, comfortable, healthy, and safe. FläktGroup delivers on this commitment while creating an environment of equality, respect, and fairness, and by adhering to the highest level of ethical and compliance standards. FläktGroup's roadmap is aligned with the UN sustainability goals and the European Green Deal objectives and is translated into annual investments that support our objectives.

PRODUCT DESCRIPTION

Dampers are used to regulate and control airflow for both supply and extract air. They are highly versatile and can be employed to manage room temperature, air quality, and more. This EPD includes a scaling table for the Optivent® series of air volume dampers: ULSA, EMSS, EHSS, and pressure control damper EMPA. All are available in sizes Ø100-630.

The declared product, OPTIVENT® ULTRA ULSA, offers all the benefits of VAV dampers, with the added advantage of ultrasound technology, enabling precise airflow measurement, and excellent resilience to dust while maintaining low sound levels. It can be connected to Modbus or BACnet, depending on the selected specification.

It is equipped with an UltraSound technology air flow measuring sensor, a damper blade, stable bearings made of nylon, and its shaft is mounted in maintenance free nylon headings. Control equipment is installed on the apparatus casing. Connection dimensions are 100 - 630 mm. Casing air leakage is according to EN 1751:2014 class B. All duct connections have spigot dimensions and are equipped with sealing rings made of rubber.

PRODUCTS INCLUDED IN THE SCALING TABLE:

EMSS and EHSS are variable air volume dampers for the OPTIVENT system. EHSS is intended for applications requiring higher duct velocities (e.g. renovation projects). Both dampers can be used for variable or constant airflow. EMPA is a compact pressure control damper for the OPTIVENT system, designed for use in duct systems where constant pressure is required. Unlike the ULSA model, which includes an ultrasonic

sensor, the EMSS, EHSS, and EMPA models use separate measurement nozzles connected to the regulator through PVC tubes.

Each damper can be equipped with either a non-insulated casing or an insulated casing (see separate EPD). All products are made from galvanized steel casting (corrosivity class C3), but EMSS and EHSS models can also be manufactured from acid-proof steel AISI 316 (corrosivity class C4). The difference in environmental impact can be seen in Annex II, where the EMSS-250 models made from different materials are compared.

Further information can be found at: *www.flaktgroup.com*

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	88	Europe, Asia
Minerals	0	-
Fossil materials	12	Europe
Bio-based materials	0	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0,0218
Biogenic carbon content in packaging, kg C	0,7827

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit of ULTRA ULSA-7-250-1
Mass per declared unit	4,2 kg
Functional unit	Air volume control from one ULSA 250 with 327VMZ-MB controller during 25 years of use in standby mode, assuming continuous operation.
Reference service life	25 years

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	X	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	Recovery	Recycling

Modules not declared = ND. Modules not relevant = MNR

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 VaV damper is made from galvanized steel sheets, which are cut and processed to form the body and damper blade. The body is then fitted with supplied components, including nylon bearings, a maintenance-free shaft system, ultrasound-based airflow measuring sensor and an electric actuator. The damper blade is equipped with EPDM rubber for tight sealing, meeting EN 1751:2014, Class 3 for air leakage. All materials in contact with ventilation air comply with C3 corrosivity standards (EN-ISO 12944-2).

Waste from the manufacturing process includes steel scrap and copper welding wire, both of which are sent for material recycling.
After production, the damper is carefully packaged in a cardboard box, cushioned with reused cardboard pieces, and placed on a custom-made wooden pallet for shipping.

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.

The transport distance is calculated based on a weighted average of sales, ensuring a representative distribution of transportation impacts.
The product is supplied ready for installation (A5), with no raw material waste generated during the installation process. Installation is performed manually, without the need for additional energy consumption. Packaging materials used for transport, such as cardboard and wooden pallets, are sent to waste treatment and managed according to the average end-of-life scenario in the EU.
Based on EUROSTAT data from 2021, 32% of wooden pallets are recycled, 30% are incinerated with energy recovery, and the remaining 38% are landfilled. For cardboard waste, 83% is recycled, 8% is incinerated, and the remaining 9% is landfilled.

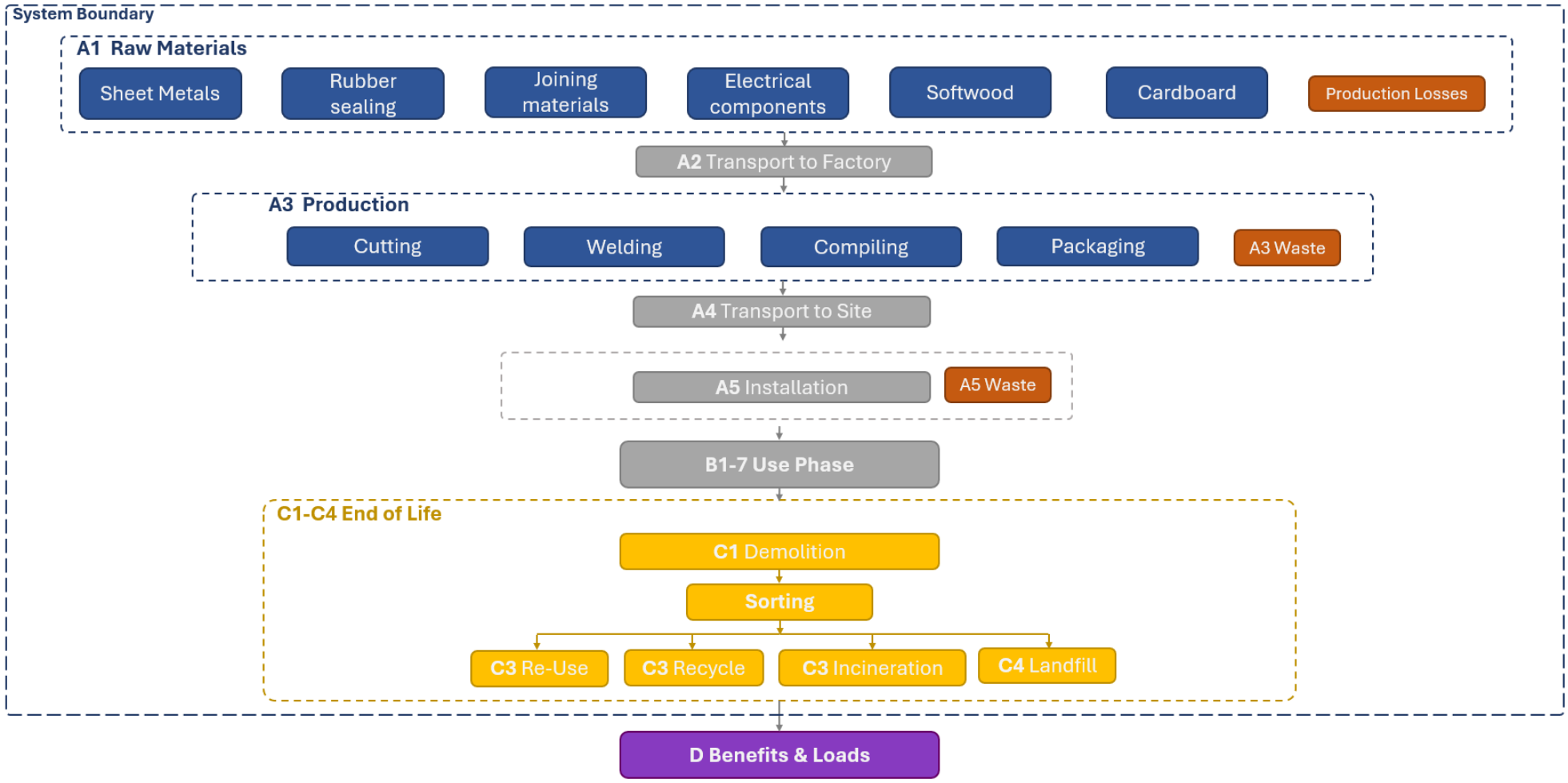
PRODUCT USE AND MAINTENANCE (B1-B7)

The product can be mechanically cleaned with a nylon brush during the ductwork cleaning. No further maintenance is required. Replacement of components or parts is not included.
Electricity consumption during the use phase is calculated over 25 years, based on measured data from the OPTIVENT ULTRA´s controller in stand-by mode. The electricity mix used in the scenario reflects a weighted average based on 2024 sales.
The use phase may vary based on individual usage habits. The module B6 results shown in this EPD represent only a specific scenario. Therefore, it is recommended to evaluate the environmental impact of the use phase separately for each project. Replacement of components or parts has not been included in this assessment.
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end of its life, the OPTIVENT ULTRA damper is assumed to be dismantled with electrical tool (deconstruction energy is negligible) and then transported 50 km to a local recycling facility. 50km is used because the real-life scenario is unknown and highly dependent on the location in which the unit is placed (C2). Waste processing (C3) and disposal (C4) are modelled with consideration of the markets where the VaV Damper was mostly sold in 2024, and pre-made groups for EOL by OneClick were used. The recycling rates for each material are based on the following sources: data for steel is from the World Steel Association (85% recycling rate), aluminium (76%) from the International Aluminium Institute (IAI), copper (40%) from the International Copper Association and electronic parts (39%) from European Environment Agency. Recycled materials are then credited in module D.

MANUFACTURING PROCESS



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.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 v3.2.3. 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 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

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	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	Not applicable

This EPD is product and factory specific and does not contain average calculations. The environmental impact data presented are specific for the product OPTIVENT ULTRA ULSA 250.
The calculated GWP-GHG for other included Circular dampers and all sizes for modules A1-A3 is shown in the Scaling table in Annex 1.

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. The results are based on the functional unit.

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_2e	1,64E+01	5,18E-01	6,54E-02	1,70E+01	1,13E+00	2,97E+00	ND	ND	ND	ND	ND	2,24E+01	ND	1,66E-01	4,48E-02	4,62E-01	1,39E-01	-6,43E+00
GWP – fossil	kg CO_2e	1,63E+01	5,18E-01	2,92E+00	1,97E+01	1,13E+00	1,02E-01	ND	ND	ND	ND	ND	2,18E+01	ND	1,66E-01	4,48E-02	4,62E-01	1,39E-01	-6,64E+00
GWP – biogenic	kg CO_2e	7,65E-02	9,64E-05	-2,86E+00	-2,79E+00	2,46E-04	2,87E+00	ND	ND	ND	ND	ND	1,05E-01	ND	-9,12E-06	9,79E-06	-2,33E-04	-1,75E-05	2,23E-01
GWP – LULUC	kg CO_2e	2,06E-02	2,03E-04	7,11E-03	2,79E-02	4,39E-04	1,23E-04	ND	ND	ND	ND	ND	5,41E-01	ND	1,60E-05	1,98E-05	1,03E-04	2,55E-06	-1,04E-02
Ozone depletion pot.	kg CFC-$_{11}$e	3,82E-05	1,01E-08	7,10E-08	3,83E-05	2,35E-08	1,46E-09	ND	ND	ND	ND	ND	4,40E-07	ND	1,76E-10	6,36E-10	1,32E-09	1,15E-10	-3,06E-08
Acidification potential	mol H^+e	3,55E-01	1,33E-03	1,09E-02	3,67E-01	2,82E-03	4,86E-04	ND	ND	ND	ND	ND	1,33E-01	ND	1,21E-04	1,48E-04	9,71E-04	4,31E-05	-4,28E-02
EP-freshwater[2)]	kg Pe	3,16E-02	3,89E-05	1,92E-03	3,35E-02	7,85E-05	2,58E-05	ND	ND	ND	ND	ND	1,27E-02	ND	4,01E-06	3,47E-06	4,96E-05	2,01E-06	-8,70E-03
EP-marine	kg Ne	2,75E-02	3,70E-04	2,85E-03	3,07E-02	7,37E-04	6,11E-04	ND	ND	ND	ND	ND	2,19E-02	ND	3,98E-05	4,79E-05	2,48E-04	1,45E-04	-8,41E-03
EP-terrestrial	mol Ne	1,28E+00	4,02E-03	2,72E-02	1,31E+00	7,98E-03	1,80E-03	ND	ND	ND	ND	ND	2,23E-01	ND	4,61E-04	5,21E-04	2,62E-03	1,68E-04	-9,95E-02
POCP ("smog")[3)]	kg NMVOCe	7,53E-02	2,15E-03	1,03E-02	8,78E-02	4,73E-03	6,31E-04	ND	ND	ND	ND	ND	6,66E-02	ND	1,02E-04	2,08E-04	7,73E-04	5,48E-05	-2,77E-02
ADP-minerals & metals[4)]	kg Sbe	3,91E-02	1,87E-06	3,78E-06	3,91E-02	3,21E-06	4,06E-07	ND	ND	ND	ND	ND	7,20E-04	ND	1,39E-07	1,45E-07	5,13E-06	1,47E-08	-4,03E-04
ADP-fossil resources	MJ	2,15E+02	7,45E+00	9,22E+03	9,44E+03	1,69E+01	1,28E+00	ND	ND	ND	ND	ND	1,05E+03	ND	1,69E-01	6,30E-01	1,18E+00	8,51E-02	-6,76E+01
Water use[5)]	m^3e depr.	1,19E+02	3,86E-02	7,79E-01	1,20E+02	8,64E-02	3,47E-02	ND	ND	ND	ND	ND	3,73E+01	ND	9,34E-03	2,95E-03	7,53E-02	6,86E-03	-1,72E+00

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	2,72E-06	4,26E-08	7,24E-08	2,84E-06	1,09E-07	8,40E-09	ND	ND	ND	ND	ND	8,24E-07	ND	1,35E-09	3,64E-09	1,30E-08	5,76E-10	-5,34E-07
Ionizing radiation[6)]	kBq U235e	9,22E-01	1,08E-02	5,80E-01	1,51E+00	2,03E-02	4,58E-03	ND	ND	ND	ND	ND	6,03E+01	ND	5,18E-04	5,21E-04	8,27E-03	1,27E-04	-1,62E-01
Ecotoxicity (freshwater)	CTUe	1,41E+04	1,01E+00	6,03E+00	1,41E+04	1,99E+00	1,43E+00	ND	ND	ND	ND	ND	1,27E+02	ND	1,87E+00	9,82E-02	2,87E+00	4,41E-01	-1,53E+02
Human toxicity, cancer	CTUh	8,98E-05	1,34E-10	3,27E-09	8,98E-05	1,88E-10	5,79E-11	ND	ND	ND	ND	ND	1,38E-08	ND	6,23E-11	7,59E-12	9,37E-11	4,22E-12	-2,90E-09
Human tox. non-cancer	CTUh	1,95E-05	4,62E-09	1,91E-08	1,95E-05	1,09E-08	3,14E-09	ND	ND	ND	ND	ND	7,10E-07	ND	4,15E-09	3,96E-10	5,16E-09	3,31E-10	-9,21E-08
SQP[7)]	-	1,22E+02	5,50E+00	2,33E+02	3,60E+02	1,69E+01	1,14E+00	ND	ND	ND	ND	ND	3,04E+02	ND	2,49E-01	4,03E-01	2,15E+00	1,60E-01	-2,92E+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	2,13E+01	1,42E-01	1,84E+01	3,98E+01	2,74E-01	-4,45E+01	ND	ND	ND	ND	ND	4,63E+02	ND	2,27E-02	8,70E-03	1,88E-01	2,00E-03	-3,96E+00
Renew. PER as material	MJ	1,48E-02	0,00E+00	2,51E+01	2,52E+01	0,00E+00	-2,51E+01	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-1,20E-02	-2,82E-03	1,78E+00
Total use of renew. PER	MJ	2,13E+01	1,42E-01	4,35E+01	6,49E+01	2,74E-01	-6,96E+01	ND	ND	ND	ND	ND	4,63E+02	ND	2,27E-02	8,70E-03	1,76E-01	-8,17E-04	-2,18E+00
Non-re. PER as energy	MJ	2,05E+02	7,46E+00	3,23E+01	2,45E+02	1,69E+01	1,28E+00	ND	ND	ND	ND	ND	1,05E+03	ND	1,69E-01	6,30E-01	-7,63E+00	-7,29E+00	-6,76E+01
Non-re. PER as material	MJ	1,17E+01	0,00E+00	1,66E+00	1,33E+01	0,00E+00	-1,66E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	-7,79E+00	-3,86E+00	5,40E-01
Total use of non-re. PER	MJ	2,17E+02	7,46E+00	3,40E+01	2,59E+02	1,69E+01	-3,80E-01	ND	ND	ND	ND	ND	1,05E+03	ND	1,69E-01	6,30E-01	-1,54E+01	-1,12E+01	-6,71E+01
Secondary materials	kg	8,99E-01	3,37E-03	1,01E-01	1,00E+00	7,31E-03	1,16E-03	ND	ND	ND	ND	ND	1,75E-01	ND	2,00E-04	2,82E-04	1,50E-03	4,26E-05	2,30E+00
Renew. secondary fuels	MJ	5,62E-02	3,76E-05	8,48E-01	9,05E-01	9,19E-05	9,45E-06	ND	ND	ND	ND	ND	8,03E-04	ND	9,95E-05	3,59E-06	6,26E-05	1,06E-06	-1,06E-03
Non-ren. secondary fuels	MJ	9,03E-03	0,00E+00	1,77E-05	9,04E-03	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	3,76E-01	1,10E-03	6,72E-02	4,45E-01	2,49E-03	-2,71E-03	ND	ND	ND	ND	ND	1,05E+00	ND	2,04E-04	8,45E-05	1,74E-03	-7,93E-04	-4,26E-02

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	3,40E+00	1,11E-02	7,03E-02	3,49E+00	2,44E-02	1,14E-02	ND	ND	ND	ND	ND	1,58E+00	ND	1,55E-02	1,09E-03	2,12E-02	3,67E-03	-1,51E+00
Non-hazardous waste	kg	4,87E+01	2,42E-01	1,24E+01	6,13E+01	4,89E-01	5,04E+00	ND	ND	ND	ND	ND	6,34E+01	ND	7,04E-02	2,05E-02	5,11E-01	1,28E+00	-1,31E+01
Radioactive waste	kg	6,49E-04	2,70E-06	1,42E-04	7,94E-04	5,02E-06	1,15E-06	ND	ND	ND	ND	ND	1,31E-02	ND	1,28E-07	1,28E-07	2,11E-06	3,22E-08	-3,93E-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	1,02E-03	0,00E+00	3,73E-06	1,02E-03	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,07E-02	0,00E+00	4,16E-05	1,07E-02	0,00E+00	1,43E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	3,21E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	1,02E-01	0,00E+00	3,29E-05	1,02E-01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	0,00E+00	2,76E-02	0,00E+00
Exported energy	MJ	9,74E-01	0,00E+00	2,22E-04	9,74E-01	0,00E+00	3,55E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	1,73E+00	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	1,49E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	7,28E-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	2,06E+00	ND	ND	ND	ND	ND	0,00E+00	ND	0,00E+00	0,00E+00	1,00E+00	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_2e	1,51E+01	5,15E-01	2,91E+00	1,86E+01	1,12E+00	2,41E-01	ND	ND	ND	ND	ND	2,23E+01	ND	1,66E-01	4,45E-02	4,62E-01	1,38E-01	-6,62E+00
Ozone depletion Pot.	kg CFC_{-11}e	3,35E-05	8,02E-09	6,49E-08	3,35E-05	1,87E-08	1,18E-09	ND	ND	ND	ND	ND	3,82E-07	ND	1,48E-10	5,08E-10	1,11E-09	9,39E-11	-2,90E-08
Acidification	kg SO_2e	1,96E-01	1,04E-03	8,74E-03	2,06E-01	2,24E-03	3,66E-04	ND	ND	ND	ND	ND	1,11E-01	ND	8,58E-05	1,14E-04	7,74E-04	3,23E-05	-3,44E-02
Eutrophication	kg PO_4^3e	4,98E-02	2,57E-04	8,07E-02	1,31E-01	5,39E-04	2,54E-04	ND	ND	ND	ND	ND	1,45E-02	ND	3,28E-05	2,77E-05	1,25E-04	1,59E-05	-5,91E-03
POCP (“smog”)	kg C_2H_4e	7,22E-03	1,11E-04	7,91E-04	8,12E-03	2,21E-04	6,16E-05	ND	ND	ND	ND	ND	6,38E-03	ND	6,59E-06	1,02E-05	4,83E-05	4,63E-06	-3,11E-03
ADP-elements	kg Sbe	3,85E-02	1,82E-06	3,44E-06	3,86E-02	3,14E-06	3,94E-07	ND	ND	ND	ND	ND	7,20E-04	ND	1,34E-07	1,41E-07	5,10E-06	1,14E-08	-4,03E-04
ADP-fossil	MJ	1,90E+02	7,27E+00	9,21E+03	9,40E+03	1,66E+01	1,20E+00	ND	ND	ND	ND	ND	2,02E+02	ND	1,60E-01	6,22E-01	1,04E+00	8,30E-02	-6,53E+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_2e	1,63E+01	5,18E-01	2,93E+00	1,98E+01	1,13E+00	1,02E-01	ND	ND	ND	ND	ND	2,23E+01	ND	1,66E-01	4,48E-02	4,62E-01	1,39E-01	-6,65E+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

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Market for electricity, high voltage, Czech republic
Electricity CO2e / kWh	0.62 kg
District heating data source and quality	Heat, from municipal waste incineration (71,84%), Heat production, natural gas, at industrial furnace (28,16%)
District heating CO2e / kWh	0,271

Transport scenario documentation A4

Scenario parameter	Value
Fuel and vehicle type. Eg, electric truck, diesel powered truck	Diesel powered Truck (1500km), Container Ship (80km)
Average transport distance, km	1580
Capacity utilization (including empty return) %	50
Bulk density of transported products	-
Volume capacity utilization factor	1

Installation scenario documentation A5

Scenario information	Value
Ancillary materials for installation (specified by material) / kg or other units as appropriate	-
Water use / m^3	-
Other resource use / kg	-
Quantitative description of energy type (regional mix) and consumption during the installation process / kWh or MJ	-
Waste materials on the building site before waste processing, generated by the product's installation (specified by type) / kg	Wooden pallet: 2kg Cardboard: 0,95kg
Output materials (specified by type) as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal (specified by route) / kg	% are for recycling, incineration with energy recovery, landfill respectively. Wood: 32%, 30%, 38% Cardboard: 83%, 8%, 9%
Direct emissions to ambient air, soil and water / kg	-

Use stages scenario documentation - B6-B7 Use of energy and use of water

Scenario information	Value
Ancillary materials specified by material / kg or units as appropriate	-
Net fresh water consumption / m^3	-
Type of energy carrier, e.g., electricity, natural gas, district heating / kWh	Market for electricity, low voltage (Reference product: electricity, low voltage) - mix based on sales 2024 (Finland, Sweden, Europe)
Power output of equipment / kW	-
Characteristic performance, e.g., energy efficiency, emissions, variation of performance with capacity utilization, etc.	-
Further assumptions for scenario development, e.g., frequency and period of use, number of occupants	The component operates continuously in standby mode.

End of life scenario documentation

Scenario information	Value
Collection process – kg collected separately	-
Collection process – kg collected with mixed construction waste	4,2
Recovery process – kg for re-use	-
Recovery process – kg for recycling	3,21
Recovery process – kg for energy recovery	0,03
Disposal (total) – kg for final deposition	0,96
Scenario assumptions e.g. transportation	50 km by lorry

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 15802+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.

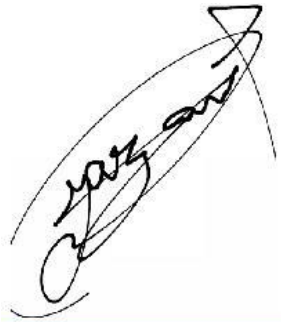
The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Yazan Badour as an authorized verifier for EPD Hub Limited

31.10.2025



ANNEX I:

This is a scaling table of multiple Circular Volume Control Dampers, based on the results of a product OPTIVENT ULTRA ULSA 250. The following table shows the calculated GWP-GHG results for the climate impact in modules A1-A3 (Cradle-to-gate) for all included products and sizes. It was modelled in OneClick LCA software for each product and size.

Product Name	Size	Code	Mass	A1-A3, EN 15804+A1	A1-A3, EN 15804+A2			Scaling coefficient A1-A3 GWP-total (kg CO2e)
				GWP (kg CO2e)	GWP$_{-total}$ (kg CO2e)	GWP$_{-fossil}$ (kg CO2e)	GWP$_{-biogenic}$ (kg CO2e)	
OPTIVENT ULTRA ULSA (size 250 reference product) 	100	ULSA-7-100-1 ULSA-8-100-1	1,9 kg	8,35	7,42	9,51	-2,11	**0,44**
	125	ULSA-7-125-1 ULSA-8-125-1	2,2 kg	9,42	8,50	10,58	-2,10	**0,50**
	160	ULSA-7-160-1 ULSA-8-160-1	2,7 kg	12,06	10,44	13,23	-2,81	**0,61**
	200	ULSA-7-200-1 ULSA-8-200-1	3,3 kg	15,09	13,49	16,27	-2,80	**0,79**
	250	**ULSA-7-250-1 ULSA-8-250-1**	**4,2 kg**	**18,56**	**16,99**	**19,75**	**-2,79**	**1,00**
	315	ULSA-7-315-1 ULSA-8-315-1	6,1 kg	26,64	23,69	27,84	-4,19	**1,39**
	400	ULSA-7-400-1 ULSA-8-400-1	12,3 kg	58,00	55,28	59,31	-4,11	**3,25**
	500	ULSA-7-500-1 ULSA-8-500-1	16,6 kg	79,77	72,90	81,14	-8,34	**4,29**
	630	ULSA-7-630-1 ULSA-8-630-1	24 kg	113,69	107,06	115,15	-8,24	**6,30**

Product Name	Size	Code	Mass	A1-A3, EN 15804+A1	A1-A3, EN 15804+A2			Scaling coefficient A1-A3 GWP-total (kg CO2e)
				GWP (kg CO2e)	GWP$_{-total}$ (kg CO2e)	GWP$_{-fossil}$ (kg CO2e)	GWP$_{-biogenic}$ (kg CO2e)	
EMSS 	100	EMSS-7-100-1-2	1,7 kg	6,99	6,01	8,11	-2,11	**0,35**
	125	EMSS-7-125-1-2	1,8 kg	8,08	7,11	9,21	-2,15	**0,42**
	160	EMSS-7-160-1-3	2,2 kg	9,73	8,05	10,86	-2,82	**0,47**
	200	EMSS-7-200-1-4	2,5 kg	10,75	9,09	11,89	-2,81	**0,54**
	250	EMSS-7-250-1-5	4,1 kg	18,58	16,95	19,71	-2,78	**1,00**
	315	EMSS-7-315-1-6	5,5 kg	25,07	22,05	26,21	-4,20	**1,30**
	400	EMSS-7-400-1-7	9 kg	43,67	40,77	44,88	-4,16	**2,40**
	500	EMSS-7-500-1-8	12 kg	60,23	53,12	61,47	-8,42	**3,13**
	630	EMSS-7-630-1-2	17 kg	82,40	75,44	83,70	-8,24	**4,44**
EHSS 	100	EHSS-7-100-1-2	1,7 kg	6,98	6,01	8,10	-2,11	**0,35**
	125	EHSS-7-125-1-2	1,8 kg	8,05	7,09	9,18	-2,10	**0,42**
	160	EHSS-7-160-1-3	2,2 kg	9,67	7,99	10,80	-2,82	**0,47**
	200	EHSS-7-200-1-4	2,5 kg	10,65	8,98	11,78	-2,82	**0,53**
	250	EHSS-7-250-1-5	4,1 kg	18,42	16,80	19,56	-2,79	**0,99**
	315	EHSS-7-315-1-6	5,4 kg	24,82	21,80	25,96	-2,79	**1,28**
	400	EHSS-7-400-1-7	8,9 kg	43,24	40,34	44,45	-4,16	**2,37**
	500	EHSS-7-500-1-8	11,8 kg	59,59	52,48	60,84	-8,43	**3,09**
	630	EHSS-7-630-1-2	16,7 kg	81,40	74,44	82,71	-8,37	**4,38**
EMPA 	100	EMPA-7-100	1,6 kg	6,91	5,94	8,03	-2,11	**0,35**
	125	EMPA-7-125	1,8 kg	7,98	7,01	9,18	-2,10	**0,41**
	160	EMPA-7-160	2,2 kg	9,57	7,90	10,71	-2,82	**0,46**
	200	EMPA-7-200	2,4 kg	10,50	8,83	11,63	-2,82	**0,52**
	250	EMPA-7-250	4 kg	18,20	16,57	19,33	-2,79	**0,98**
	315	EMPA-7-315	5,3 kg	24,57	21,55	25,71	-4,20	**1,27**
	400	EMPA-7-400	8,8 kg	42,93	40,03	44,14	-4,16	**2,36**
	500	EMPA-7-500	11,7 kg	59,17	52,07	60,42	-8,43	**3,06**
	630	EMPA-7-630	16,6 kg	80,91	73,95	82,22	-8,37	**4,35**

ANNEX II:

All products are originally manufactured from galvanized steel (corrosivity class C3). However, EMSS and EHSS models can also be produced from acid-proof steel AISI 316 (corrosivity class C4). The table below presents the values of key environmental impact indicators for modules A1–A3, comparing the representative product OPTIVENT ULTRA ULSA 250 with EMSS 250 variants made from different materials.

Product Name	Mass	A1-A3, EN 15804+A1	A1-A3, EN 15804+A2		
		GWP (kg CO2e)	GWP_{-total} (kg CO2e)	$GWP_{-fossil}$ (kg CO2e)	$GWP_{-biogenic}$ (kg CO2e)
EMSS-7-250-1-2 (Corrosivity class C3, galvanized sheet steel)	4,1 kg	18,58	16,95	19,71	-2,78
ULSA-7-250-1 - reference product (Corrosivity class C3, galvanized sheet steel)	4,2 kg	18,56	16,99	19,75	-2,79
EMSS-7-250-2-2 (Corrosivity class C4, acid-proof steel (AISI 316)	3,9 kg	7,18	16,74	19,22	-2,51