OWNER OF THE EPD: Camfil AB, Sveavägen 56E, 111 34 Stockholm, Sweden

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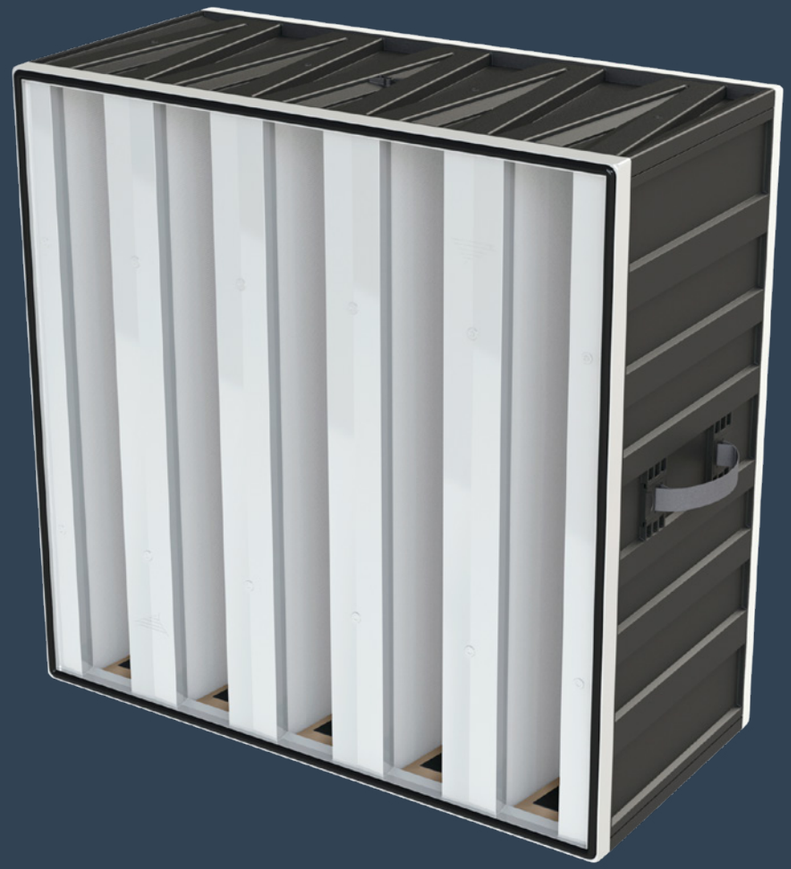
ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

ABSOLUTE VGXL H13

MADE IN FRANCE



Product variants declared in the EPD:
Absolute VGXL H13

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-10971
Publication date:	2023-10-26
Valid until:	2028-10-26
Revision date:	N/A

**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.*

Programme information

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)

PRODUCT CATEGORY RULES (PCR): PCR 2019:14 Construction products, version 1.2.5 of 2022-11-01, valid until 2024-12-20 and c-PCR-018 (to PCR 2019:14) Ventilation components, version 1.1 of 2021-05-18, valid until 2026-05-18

PCR REVIEW WAS CONDUCTED BY: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, ADDERE Research & Technology. The review panel may be contacted via the Secretariat www.environdec.com/contact.

INDEPENDENT THIRD-PARTY VERIFICATION OF THE DECLARATION AND DATA, ACCORDING TO ISO 14025:2006:

☐ Internal ☑ External | ☐ EPD process certification ☑ EPD verification

LCA STUDY CONDUCTED BY: Axel Cullberg, VästLCA AB

THIRD PARTY VERIFIER: Martyna Mikusinska, Sweco

IN CASE OF RECOGNISED INDIVIDUAL VERIFIERS:
APPROVED BY: The International EPD® System

PROCEDURE FOR FOLLOW-UP OF DATA DURING EPD VALIDITY INVOLVES THIRD PARTY VERIFIER: ☐ Yes ☑ No

PROGRAMME
The International EPD® System

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The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

Company information

As a leading manufacturer of premium clean air solutions, Camfil provides commercial and industrial solutions for air filtration and air pollution control that improves worker and equipment productivity, minimises energy use, benefits human health and the environment. More information about the organisation can be found on the website in the section About Camfil.

ISO 9001
ISO 14001

Absolute VGXL13 Prosafe

Absolute VGXL13 Prosafe are high airflow H13 filters produced by Camfil SAS (Saint-Martin-Longueau, France) also available within other EPA and HEPA filtration classes acc. EN1822 and ISO29463. They consist out of several pleated glass fibre media packs, sealed in V-shape orientation inside aerodynamic box-type plastic frames.

These high airflow HEPA filters are used for supply, recirculation or exhaust air filtration in industrial applications such as Life Science, Healthcare or Food and Beverage. For supply air they are mounted in final stages of air handling units or in-line Hepa housings to provide clean air to the sensitive areas or to ensure long lifetime of terminal ULPA filters.

With their low weight they are especially suitable for mounting in bag-in-bag-out safe-change exhaust air housings protecting people and the environment from hazardous particulate contamination. Absolute VG Prosafe filters have significantly lower pressure drop or higher rated air flows than traditional HEPA filters. For this Prosafe version, special chemically and biologically inert materials are tested and selected to provide extra safety for the mentioned applications and in terms of hygienics, purity and safety.

UN CPC CODE

CPC 2.1: 43914 – Filtering or purifying machinery and apparatus, for liquids or gases, except oil filters, petrol filters and air intake filters for internal combustion engines.
HS 2017: 842139 – Machinery; for filtering or purifying gases, other than intake air filters for internal combustion engines.

ABSOLUTE VGXL13 PROSAFE ATTRIBUTES

- Full module standard size 610x610x292mm (WxHxD)
- Available in more and different sizes, for information see product information. Only the standard size is covered by this EPD.
- Filter media: micro glass fibre
- Media separators: EVA hotmelt
- Sealant: 2-component polyurethane
- Frame material: virgin ABS plastic
- Gasket: seamless polyurethane foam

Life Cycle Assessment

The life cycle stages included in the assessment are A1-A5, B1, B6, C1-C4, and D. The scope of the EPD generated corresponds to the so-called cradle-to-gate with options, modules C1-C4, module D and with optional modules, as described in the c-PCR for ventilation components (v 1.1) used. This means that additional life cycle stages except the mandatory stages A1-A3, C1-C4 and D are also included, which is A4 (Transport), A5 (Installation), B1 (Use), and B6 (Operational energy use). This EPD is for a specific product. No allocation was applied in this study.

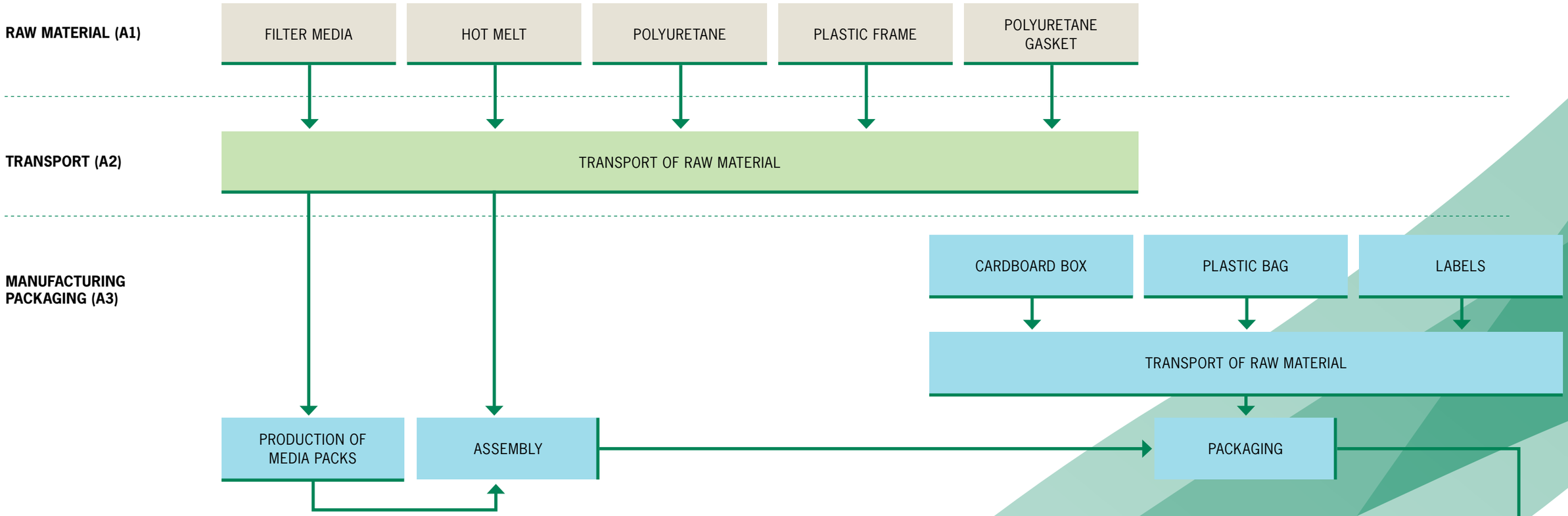
DECLARED UNIT: 1 Absolute VGXL filter.
REFERENCE SERVICE LIFE: One year - derived from HVAC filters approach for comparability.
TIME REPRESENTATIVENESS: Data collection was performed during 2022 and 2023. Data for the processes in A3 represent values for the years 2022 and 2023. Age of background data range between year 2006 and 2022.
LCA SOFTWARE USED: Sphera LCA for Experts version 10.7.1.28.
DATABASE USED: Sphera Managed LCA Content version 2023.2 and ecoinvent version 3.9.1.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USAGE STAGE							END OF LIFE STAGE				RESOURCE RECOVERY STAGE
Raw materials	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	ND	ND	ND	ND	X	ND	X	X	X	X	X

GEOGRAPHICAL SCOPE: Europe

SPECIFIC DATA USED: 28% for module A1-A3

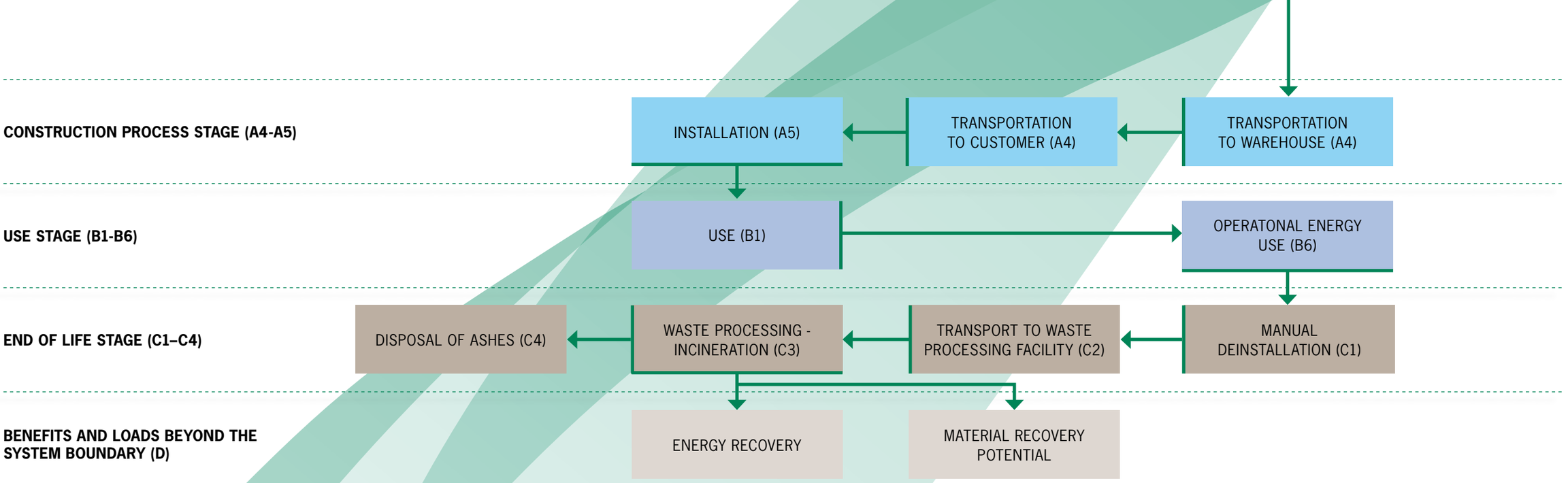
Description of system boundaries:



MODULE A1 covers extraction and processing of raw materials, as well as production of the materials and components used for production of Absolute filters: filter media, plastic frame, hot melt polyurethane for casting and gasket.

MODULE A2 covers transportation of the materials and components to the production site in SML France.

MODULE A3 covers production of the Absolute VGXL filters at the production site in SML. This stage includes electricity consumption for Absolute media packs production and filter assembly, as well as the electricity consumption for general processes, such as heating and lighting. Media pack production include trimming and pleating the rolled media into pleated packs including hot melt. Filter assembly includes assembly of frames and insertion of media packs and application of PU for casting and gasket. Both processes are conducted in specially designed machines - respective pleating and semi automatic assembly station. Average energy consumption per filter was determined through measurement by producing a representative number of units and dividing the energy on unit output. Module A3 also includes production and transport of packaging materials as including a cardboard box, plastic bag and labels.



MODULE A4 covers transportation of the Absolute filter to the customer, including the distance between the production unit and the warehouse. An average transport distance is assumed to be 856 km by truck and 167 km by sea freight and it it is representative for year 2022.

MODULE A5 covers only transport of cardboard box to waste management and its incineration.

MODULE B1 covers accumulation of dust in the filter and hence the reduction or particulate matter in the air. Which this case considering the pre filtration the amount of particulate matter in kg is close to zero and thus regarded to have zero impact.

MODULE B6 covers electricity consumption during use phase of the Absolute filter during one year. Calculation of electricity consumption was estimated for normal running conditions.

MODULE C1 covers manual operation of filter removal from the installation.

MODULE C2 covers transport from the user site to the waste processing facility. An average transport distance has been estimated to 100 km.

MODULE C3 covers incineration of the filter, its packaging. The incineration process is conducted with recovery of energy.

MODULE C4 as the incineration process used to model waste disposal includes ash deposition, C4 impact is included in C3.

MODULE D includes energy recovery potential from incineration process and burdens occurring outside of the system boundary, associated with incineration of secondary materials in module A5.

CUT-OFF CRITERIA:

Close to 100% of all raw material used in the production has been included in the model calculations. In other words, the study applies a cut-off criterion of maximum 5% energy and mass, which complies with the maximum cut-off criteria established by the standard.

Recycled material enters the system boundaries without any burden from previous life cycles. Recycling processes and transports of the material to the production site are included.

EXCLUDED LIFECYCLE STAGES AND ACTIVITES:

Impact from production and maintenance of infrastructure and equipment used for the manufacturing of the products was excluded from the study (since it was assumed to have a minor share per one product). However, the electricity used by that equipment was included.

Content declaration

PRODUCT COMPONENTS	SUBSTANCES	WEIGHT, KG	POST-CONSUMER MATERIAL, WEIGHT-%	RENEWABLE MATERIAL, WEIGHT-%
Absolute VG frame		**3,53**	0%	0%
	Acrylonitrile-Butadiene-Styrene Copolymer	(≤95%)		
	Additives	(≤5%)		
HEPA filter media		**3,080**	0%	0%
	Glass fibre	(60-95%)		
	Acrylic resin	(5-40%)		
Hot melt		**1,25**	0%	0%
	Wax	(<30%)		
	Polymer	(<40%)		
	Ethylene vinyl acetate copolymer	(<30%)		
Polyurethane	Casting	**2,50**	0%	0%
	Gasket	**0,125**	0%	0%
Total		**10,5**		

PACKAGING MATERIALS	SUBSTANCES	WEIGHT, KG	WEIGHT-% (VERSUS THE PRODUCT)
Frame label		**0,0018**	0,02%
	PET	(100%)	
Plastic bag		**0,136**	1,3%
	PET	(100%)	
Cardboard box		**1,208**	11,5%
	Cardboard	(100%)	
Box label		**0,0024**	0,02%
	PET	(100%)	
Total		**1,346**	

**No substances included in the product or in the packaging have been listed as Substance of Very High Concern (SVHC)*

RECYCLED MATERIAL

The box contains 100% of recycled cardboard.

BIOGENIC CARBON CONTENT	KG C PER ONE FILTER
In product	0
In accompanying packaging	0,556

NOTE: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2


Environmental performance

Potential environmental impact

ABSOLUTE VGXL H13

Absolute VGXL H13	A1-A3	A4	A5	B1	B6	C1	C2	C3	C4	D
Global Warming Potential fossil fuels (GWP-fossil) [kg CO_2 eq.]	4.18E+01	7.55E-01	2.21E-01	0.00E+00	1.02E+03	0.00E+00	7.51E-02	1.73E+01	0.00E+00	-7.59E+00
Global Warming Potential biogenic (GWP-biogenic) [kg CO_2 eq.]	-1.97E+00	1.70E-03	1.98E+00	0.00E+00	8.74E+00	0.00E+00	1.73E-04	3.32E-02	0.00E+00	3.89E-01
Global Warming Potential land use and land use change (GWP-luluc) [kg CO_2 eq.]	7.58E-02	6.83E-03	1.03E-04	0.00E+00	1.16E-01	0.00E+00	7.07E-04	5.36E-05	0.00E+00	4.52E-03
Global Warming Potential total (GWP-total) [kg CO_2 eq.]	3.99E+01	7.64E-01	2.21E+00	0.00E+00	1.03E+03	0.00E+00	7.60E-02	1.74E+01	0.00E+00	-7.20E+00
Ozone Depletion Potential (ODP) [kg CFC 11 eq.]	8.66E-09	9.82E-14	2.19E-13	0.00E+00	2.14E-08	0.00E+00	9.94E-15	6.63E-09	0.00E+00	2.18E-08
Acidification Potential (AP) [mol H^+ eq.]	1.22E-01	1.63E-03	5.25E-04	0.00E+00	3.28E+00	0.00E+00	1.12E-04	1.03E-02	0.00E+00	-1.48E-02
Eutrophication Potential reaching freshwater end compartment (EP-freshwater) [kg P eq.]	2.65E-04	2.70E-06	1.12E-07	0.00E+00	4.39E-03	0.00E+00	2.79E-07	4.58E-07	0.00E+00	1.81E-03
Eutrophication Potential reaching marine end compartment (EP-marine) [kg N eq.]	3.14E-02	6.77E-04	1.94E-04	0.00E+00	5.65E-01	0.00E+00	4.08E-05	4.93E-03	0.00E+00	-2.04E-03
Eutrophication Potential terrestrial (EP-terrestrial) [mol N eq.]	3.31E-01	7.76E-03	2.37E-03	0.00E+00	5.92E+00	0.00E+00	4.82E-04	5.69E-02	0.00E+00	-2.94E-02
Photochemical Ozone Formation Potential (POCP) [kg NMVOC eq.]	9.34E-02	1.71E-03	5.09E-04	0.00E+00	1.55E+00	0.00E+00	9.86E-05	1.27E-02	0.00E+00	-6.75E-03
Abiotic Depletion for non-fossil resources (ADP-minerals&metals) [kg Sb eq.]*	8.39E-06	4.92E-08	2.62E-09	0.00E+00	2.10E-04	0.00E+00	5.06E-09	-1.13E-06	0.00E+00	1.63E-06
Abiotic Depletion for fossil resources (ADP-fossil) [MJ, net calorific value]*	9.57E+02	1.05E+01	6.97E-01	0.00E+00	2.18E+04	0.00E+00	1.04E+00	6.38E+00	0.00E+00	-1.16E+02
Water Use Deprivation Potential (WDP) [m^3 world eq. deprived]*	5.11E+00	8.97E-03	2.10E-01	0.00E+00	2.00E+02	0.00E+00	9.23E-04	2.25E+00	0.00E+00	-5.53E-01

**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.*

Additional mandatory environmental impact indicators

ABSOLUTE VGXL H13

Absolute VGXL H13	A1-A3	A4	A5	B1	B6	C1	C2	C3	C4	D
Global Warming Potential excl. biogenic carbon (GWP-GHG) [kg CO_2 eq.]	4.20E+01	7.64E-01	2.22E-01	0.00E+00	1.03E+03	0.00E+00	7.60E-02	1.73E+01	0.00E+00	-7.60E+00

Additional optional environmental impact indicators

Absolute VGXL H13	A1-A3	A4	A5	B1	B6	C1	C2	C3	C4	D
Particulate Matter emissions potential (PM) [Disease incidence]	1.07E-06	1.75E-08	3.03E-09	0.00E+00	2.87E-05	0.00E+00	9.08E-10	3.89E-08	0.00E+00	-1.12E-07
Ionizing radiation exposure potential (IRP) [kBq U235 eq.]	1.85E+00	2.88E-03	4.64E-03	0.00E+00	3.19E+02	0.00E+00	2.91E-04	3.06E-02	0.00E+00	-9.48E-01
Eco-toxicity Potential freshwater (ETP-fw) [CTUe]	3.17E+02	7.49E+00	3.39E-01	0.00E+00	5.42E+03	0.00E+00	7.45E-01	2.35E+00	0.00E+00	-2.74E+01
Human Toxicity Potential – cancer effects (HTP-c) [CTUh]	1.93E-08	1.51E-10	1.78E-11	0.00E+00	3.85E-07	0.00E+00	1.51E-11	1.27E-10	0.00E+00	-1.30E-09
Human Toxicity Potential – non-cancer effects (HTP-nc) [CTUh]	4.76E-07	6.66E-09	6.69E-10	0.00E+00	5.42E-06	0.00E+00	6.73E-10	7.70E-09	0.00E+00	-4.03E-08
Land use related impacts (SQP) [-]	9.66E+01	4.20E+00	2.18E-01	0.00E+00	9.85E+03	0.00E+00	4.35E-01	1.02E+00	0.00E+00	6.15E+01

Use of resources

ABSOLUTE VGXL H13

Absolute VGXL H13	A1-A3	A4	A5	B1	B6	C1	C2	C3	C4	D
Use of renewable primary energy (PERE) [MJ]	8.92E+01	7.33E-01	1.46E+01	0.00E+00	1.49E+04	0.00E+00	7.57E-02	8.20E-01	0.00E+00	-5.36E+01
Primary energy resources used as raw materials (PERM) [MJ]	1.45E+01	0.00E+00	-1.45E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT) [MJ]	1.04E+02	7.33E-01	1.45E-01	0.00E+00	1.49E+04	0.00E+00	7.57E-02	8.20E-01	0.00E+00	-5.36E+01
Use of non-renewable primary energy (PENRE) [MJ]	9.58E+02	1.05E+01	6.98E-01	0.00E+00	2.18E+04	0.00E+00	1.04E+00	2.69E+02	0.00E+00	-1.16E+02
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2.62E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.62E+02	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	1.22E+03	1.05E+01	6.98E-01	0.00E+00	2.18E+04	0.00E+00	1.04E+00	6.38E+00	0.00E+00	-1.16E+02
Input of secondary material (SM) [kg]	1.21E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels (NRSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW) [m^3]	3.38E-01	8.03E-04	4.96E-03	0.00E+00	6.59E+00	0.00E+00	8.29E-05	5.29E-02	0.00E+00	-2.00E-02

Waste production and output flows

ABSOLUTE VGXL H13

Absolute VGXL H13	A1-A3	A4	A5	B1	B6	C1	C2	C3	C4	D
Hazardous waste disposed (HWD) [kg]	7.79E-05	3.22E-11	1.86E-11	0.00E+00	-2.05E-06	0.00E+00	3.23E-12	3.65E-10	0.00E+00	3.87E-09
Non-hazardous waste disposed (NHWD) [kg]	1.09E+00	1.57E-03	7.19E-02	0.00E+00	1.96E+01	0.00E+00	1.59E-04	2.79E-01	0.00E+00	-2.66E-01
Radioactive waste disposed (RWD) [kg]	1.56E-02	1.93E-05	2.94E-05	0.00E+00	3.42E+00	0.00E+00	1.95E-06	2.93E-04	0.00E+00	-1.19E-02
Components for reuse [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity [MJ]	3.75E-01	0.00E+00	2.49E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.03E+01	0.00E+00	0.00E+00
Exported energy, thermal [MJ]	7.93E-01	0.00E+00	4.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.36E+01	0.00E+00	0.00E+00

USE OF THE PRODUCT

To ensure the efficient and sustainable performance of the filter, the end user is obliged to guarantee specific operational conditions. Detailed information about the use of Absolute VGXL H13 is included in product data sheet for Absolute VGXL H13.

INSTRUCTIONS FOR STORAGE, HANDLING AND MAINTENANCE

Construction of the filter requires a certain method for storing, handling and maintaining the product. Our recommendations are described in Handling and maintenance instruction for HEPA filter.

FILTER LIFETIME

The service life of compact HEPA filters is dependent on the end user preferences. It may vary also for the different types of installation, the quality of pre-filtration and the geographical location of the installation site. However, 3 to 5 years is an average lifetime of the filter, based on particle loading and related to its pressure drop increase which results in higher energy consumption.

END OF LIFE

Construction of the Absolute VGXL makes the filter suitable for one-time use only. Moreover, filter fixed assembly is a limiting factor to dismount specific parts of the product. The recommended method of disposal of the filter with a plastic frame is incineration, which takes place in certified facilities.

SUSTAINABILITY

The mission of Camfil is to protect the health of people, processes & the environment, hence the organization has strived for sustainability from day one of its inception. Camfil is committed to sustainability from design to delivery and across the complete product life cycle. Complex information about how Camfil addresses environmental concerns are described on the website and can be found in the section Sustainability.

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CAMFIL – A GLOBAL LEADER IN AIR FILTERS AND CLEAN AIR SOLUTIONS.

For more than half a century, Camfil has been helping people breathe cleaner air. As a leading manufacturer of premium clean air solutions, we provide commercial and industrial systems for air filtration and air pollution control that improve worker and equipment productivity, minimize energy use, and benefit human health and the environment.

We firmly believe that the best solutions for our customers are the best solutions for our planet, too. That's why every step of the way – from design to delivery and across the product life cycle – we consider the impact of what we do on people and on the world around us. Through a fresh approach to problem-solving, innovative design, precise process control and a strong customer focus we aim to conserve more, use less and find better ways – so we can all breathe easier.

The Camfil Group is headquartered in Stockholm, Sweden, and has manufacturing sites, R&D centres and local sales offices worldwide, and are growing. We proudly serve and support customers in a wide variety of industries and in communities across the world. To discover how Camfil can help you to protect people, processes and the environment, visit us at ↴

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