Environmental Product Declaration

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

Ministry of the Environment
of the Czech Republic

Programme: National Environmental Labelling Program
Programme operator: Ministry of the Environment of the Czech republic
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Atrea®
Leader in ventilation and heat recovery

Ventilation units

DUPLEX 650 / 1100 / 1700 / 2300 / 3500 / 4500 / 6000 Flexi 3

EPD of multiple products, based on results for specific product **DUPLEX 650 Flexi 3**.

GENERAL INFORMATION

Programme information

ACCOUNTABILITIES FOR PCR, LCA AND INDEPENDENT, THIRD-PARTY VERIFICATION	
Product Category Rules (PCR)	CEN standard EN 15804 serves as the core Product Category Rules (PCR) EN 15804:2012+A2:2019/AC:2021 EN 50693:2020 Product category rules for life cycle assessment of electronic and electrical products and systems Independent verification of the declaration and data according to EN ISO 14025:2010: ☑ External ☐ Internal
Life Cycle Assessment (LCA)	TÜV SÜD Czech s.r.o. Novodvorská 994/138, 142 21 Praha 4 Person Responsible for LCA: Luboš Nobilis ✉ nobilis.lubos@gmail.com
Third-party verification	Independent verification of the declaration and data by a third party in accordance with ISO 14025:2006 through: ☑ EPD verification by individual verifier Third-party verifier: doc. Ing. Jan Weinzettel, Ph.D. http://www.fernconsulting.cz, weinzettel@seznam.cz
	Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☑ No

Programme	National Environmental Labelling Programme
Address	Ministry of the Environment of the Czech Republic Vršovická 1442/65 Prague 10, 100 10, Czech Republic
Website	www.cenia.cz www.ekoznacka.cz

EPDs within the same product category but registered in different EPD programmes or not complying with ČSN EN 15804 may not be comparable.
For two EPDs to be comparable, EPDs must be based on the same PCR (including the same version number) or on fully aligned PCRs or PCR versions; cover products with the same functions, technical performance and use (e.g. identical declared/functional units); have equivalent system boundaries and data descriptions; apply equivalent data quality requirements, data collection methods and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); include equivalent content declarations; and be valid at the time of comparison. For more information on comparability, see ČSN EN 15804

The manufacturer is the sole owner and has liability and responsibility for this EPD.

Company information

EPD owner	ATREA, s. r. o.
Manufacturing company (headquarters and production site)	Československé armády 32, 466 05 Jablonec nad Nisou, Czech Republic Registration N°: 63144476 VAT N°: CZ63144476
Contacts	Bohumil Cimbál, Head of R & D +420 608 644 686 bohumil.cimbal@atrea.com www.atrea.com

We are a family business with more than thirty years of tradition.

We are a socially responsible company that respects the environment, and our foundation supports selected social projects and activities.

We emphasise quality, technology and a human approach.

ATREA is a leading European manufacturer of ventilation and indoor climate control systems in buildings. We specialise in air handling units with heat recovery for buildings of all sizes – from family homes and apartment buildings, through civic amenities such as theatres, restaurants and shopping centres, to industrial complexes, commercial kitchens and other special projects. Customers appreciate our system solutions, which combine expert knowledge of the subject matter, technical precision of products and user-friendly control systems and interfaces.

ATREA currently employs approximately 400 people in ten European countries. The company's production facility is located in Jablonec nad Nisou, Czech Republic. The production plant covers an area of approximately 20,000 m^2 with further expansion planned. Ensuring consistent quality and the manufacture of top-of-the-range products.

ATREA is also a member of major international associations such as EVIA and Eurovent. This membership enables the company to actively contribute to the development of European legislation and to the advancement of the building services sector.

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PRODUCT INFORMATION

The third generation of series-produced compact units, **DUPLEX Flexi 3,** builds on the highly successful DUPLEX Flexi range and offers airflow rates from 650 to 6,000 m^3/h nominal airflow rates with an available pressure of 250 Pa.

The units are supplied in a universal design suitable for both floor-mounted (parapet) and ceiling-suspended installation.
The parapet version can be used indoors as well as outdoors. Another unique feature is the reversible airflow direction, meaning the supply and extract air paths can be swapped, which ensures high installation flexibility on site.

Optional accessories (e.g. hot-water heating coil, direct-expansion (DX) coil, shut-off dampers, flexible connectors, etc.) are intended primarily for installation outside the unit. Depending on requirements for functionality, comfort, and operation, the units can be equipped with various control systems and operated manually, via time schedules, or based on sensor inputs (e.g. humidity, CO_2). The units are supplied in compliance with the hygiene standard VDI 6022.

- DUPLEX Flexi 3 range: 650, 1100, 1700, 2300, 3500, 4500, 6000
- Counterflow heat exchanger with efficiency up to 93%
- 100% heat exchanger bypass
- Indoor and outdoor installation in one design
- Floor-mounted (parapet) or ceiling-suspended installation in one design
- Control system with built-in web server as standard
- EC fans — high efficiency, German quality
- Left/right airflow configuration easily adjustable via a control system parameter
- Constant airflow control
- Constant static-pressure control
- External heating and cooling coils
- Integrated electric preheater (optional)
- Wide range of additional accessories
- Units comply with the requirements of Commission Regulation (EU) No 1253/2014 (Ecodesign)

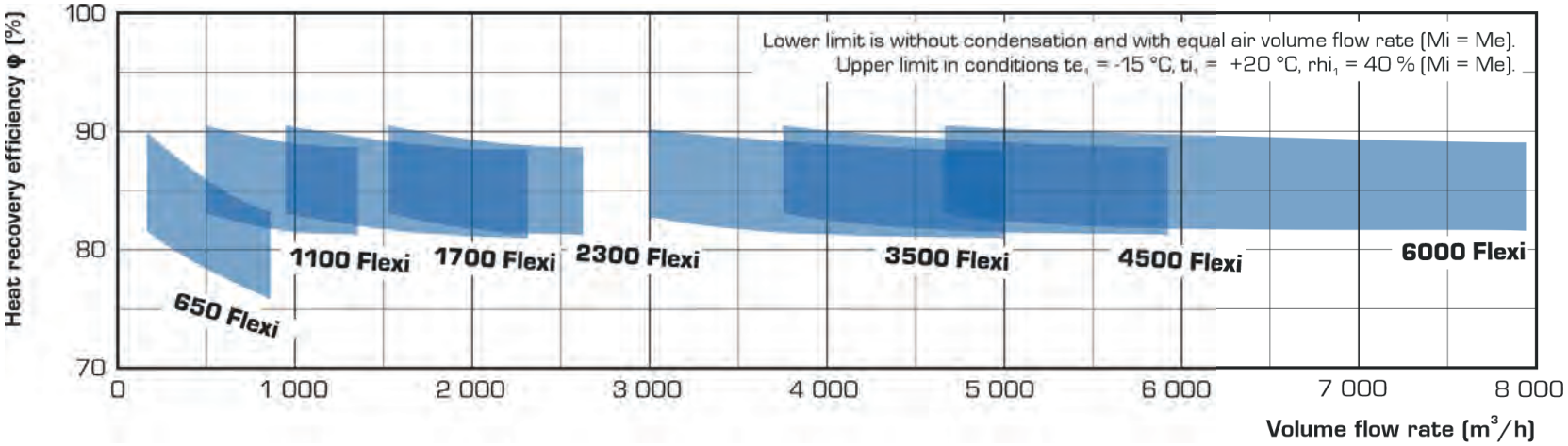
VDI 6022 READY Atrea

Technical data

Unit DUPLEX		650 Flexi 3	1100 Flexi 3	1700 Flexi 3	2300 Flexi 3	3500 Flexi 3	4500 Flexi 3	6000 Flexi 3
Nominal airflow	m^3h^{-1}	650	1 100	1 700	2 300	3 500	4 500	6 000
Nominal external static pressure	Pa	170	200	200	200	300	300	300
Power input at nominal operating point	W	320	670	1 200	1 600	2 100	2 300	3 000
Recovery efficiency*	%	viz graf						
Weight**	kg	105	150	235	280	325	390	510
Power supply	V	230	230	230	230	400	400	400
Frequency	Hz	50	50	50	50	50	50	50
Max. power input	W	340	780	1 600	1 700	5 200	5 200	6 400
Fan speed	min^{-1}	4 300	3 400	2 360	2 470	2 970	2 970	2 700
Preheater heating capacity	kW	2,2	3,3	4,4	7,7	11	13,2	16,5
Filtration class	–	ePM1 55 % (F7) / ePM10 50 % (M5)						

* depending on air volume – see graph
** depending on the selected equipment

Note:
The units comply with the requirements of Commission Regulation (EU) No 1253/2014 (Ecodesign).



Ministry of the Environment of the Czech Republic

Product composition

Composition of DUPLEX 650 Flexi 3

Composition	(kg)	Post-consumer recycled material (%)	Biogenic material, weight %, and kg C/DU*
Steel	69.79	0	0
Aluminium	12.25	0	0
HIPS	6.49	0	0
Electronics (wires, etc.)	6.16	0	0
PIR	4.33	0	0
Fan	2.70	0	0
Stainless steel	1.86	0	0
Plastics and rubber	1.34	0	0
Copper and brass	0.07	0	0
TOTAL	**105.00**	**0**	**0**
Packaging	**(kg)**	**Weight % of product**	**Biogenic carbon weight, kg C/DU***
Wood	10.44	9.94 %	4.70
TOTAL	**10.44**	**9.94 %**	**4.70**

Note:
The material composition listed refers to the DUPLEX 650 Flexi 3 reference model. The actual weight proportions of individual materials may vary slightly depending on the size of the unit, its configuration and the components used (e.g. type of exchanger, fans, insulation and accessories).
The basic material composition of the product remains unchanged.

The substances listed as substances of very high concern subject to authorisation by the European Chemicals Agency are not present in the product in declarable quantities.

Biogenic carbon content per DU*

	DUPELX 650 Flexi3 (kg)
Biogenic carbon content in the product	0
Biogenic carbon content in packaging	4.70

UN CPC: 43912 Air conditioning units

* Declared Unit

LCA information

Declared unit:	1 pc of ventilation unit maintained for 25 years defined below:	
Type DUPLEX	**weight (kg)**	**airflow (m^3h^{-1})**
650 Flexi 3	105	650
1100 Flexi 3	150	1 100
1700 Flexi 3	235	1 700
2300 Flexi 3	280	2 300
3500 Flexi 3	325	3 500
4500 Flexi 3	390	4 500
6000 Flexi 3	510	6 000
The results in the EPD refer to the specific product **DUPLEX 650 Flexi 3**. The results can be converted for other types based on the weight coefficient in the table on page 18.		
Reference service life:	25 years	
Data time frame:	2023	
Database and software used:	Ecoinvent 3.11 (EN 15804 proc./cut-off allocation model), Simapro v. 10.2 EN 15804 reference package based on EF 3.1 (https://eplca.jrc.ec.europa.eu/LCDN/developerEF.html).	
Processes not included:	These do not exceed 1% of the energy flows throughout the entire life cycle.	
Allocation:	Economic allocation (total turnover in 2023 vs. turnover of the Flexi 3 product line) was used to assign inputs and outputs to module A3 (energy and fuel consumption, waste and emissions production). For materials processed in production, production waste (steel, aluminium, PIR/HIPS) was allocated by weight to the materials contained in the product. This production waste is sold, and the economic ratio of purchase and resale prices was used for its allocation. Production takes place in a single plant, in separate sections.	
System boundaries:	EPD type: cradle to gate with options, modules C1-C4 and module D (A1-A3, C, D and supplementary modules A4 and A5)	
Infrastructure/capital assets:	Infrastructure is part of database processes in previous and subsequent phases, but is not taken into account in module A3.	

Life cycle phases

Production phase (A1-A3)

Module **A1** mainly covers the production of components for the assembly of complete ventilation units. These are profiles and components made of surface-treated steel, aluminium alloys and stainless steel (parts of the casings), HIPS and PIR insulation, and various small parts made of plastic, electronics, and brass.

Phase **A2** involves specific transport of the above-mentioned materials and components to production in phase A3 and internal transport (fuel consumption).

In production **A3,** components are processed, in particular the production of recuperative heat exchangers, sandwich cladding and the assembly of units based on standard production schemes. This involves the consumption of electricity, natural gas and fuels and the production of emissions from their use.

Only wooden pallets are used for product packaging. Production generates production waste and packaging waste (plastics, paper and cardboard, mixed). GWP-GHG from electricity production: 0.66 kg CO_2 eq/kWh (the Czech residual mix contains: 50.8% fossil fuels, 42.8% nuclear energy, 6.4% renewable sources).

Transport to the construction phase (A4)

Module **A4** represents the average (weight-assigned) requirements for road transport (HGV) based on specific data for the reference year 2023.

Construction-Installation (A5)

The installation of units in a building can be carried out in various ways and using various tools, building materials and fasteners. Module **A5** only takes into account the production of packaging waste from the product.

Use phase (B1-B7)

This phase is not declared, as the impacts of the use phase of ventilation units depend on a wide range of conditions of use, including physical location, outdoor climatic conditions, air flow, pressure losses, operating hours, etc.
The impacts of the use phase should only be calculated at the building level, taking into account its specific conditions of use.

End-of-life phase (C1-C4)

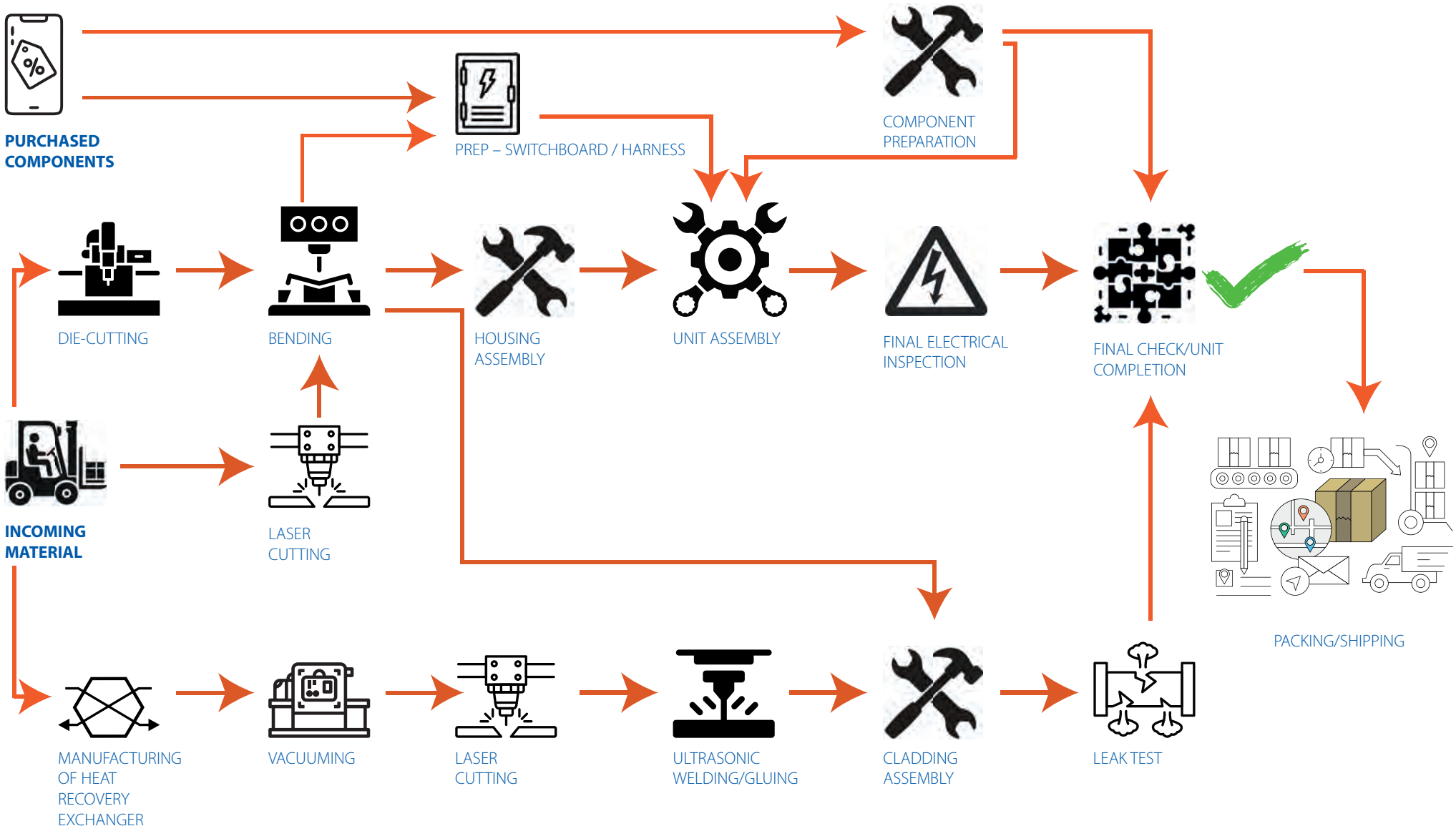
Module **C1** considers manual dismantling and transport for processing at a distance of 50 km.

The rate of recovery and disposal is determined in accordance with Annex G of EN 50693:2020: 80% material recovery for steel, 70% material recovery for aluminium, 20% material recovery for PIR/HIPS, 50% energy recovery for rubber and PVC, and 100% landfilling of remaining materials.

Benefits and costs beyond the system boundaries (D) – potential for reuse, recovery and recycling

Beyond the system boundaries, recyclates and energy from utilisation in module C3 is declared as substitutes for primary inputs: steel, pig iron, aluminium, PIR/HIPS, electricity, high voltage (EU), district or industrial heat. The quantities of exported products are listed in the output flow tables.

System diagram



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Results information

	Production phase			Construction phase		Use phase	End-of-life phase				Benefits and costs beyond the system boundaries
	Supply of raw materials	Transport	Production	Transport to the construction site	Construction process – installation	Use, maintenance, repair, replacement, reconstruction, operational energy consumption, operational water consumption	Deconstruction, demolition	Transport	Waste processing	Disposal	Potential for reuse, recovery and recycling
Module	A1	A2	A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Declared modules	x	x	x	x	x	module not declared	x	x	x	x	x
Geography	EU	CZ			EU	–	EU				
Specific data	> 15 %			–	–	–	–	–	–	–	–
Variability – products	-20 % to 10 %*			–	–	–	–	–	–	–	–
Variability – production plants	not applicable			–	–	–	–	–	–	–	–

* Variability refers to specific types of DUPLEX Flexi 3 units compared to the reference product on a weight basis. In most impact categories, the results for the reference product are conservative (less favourable). In the Climate change, fossil impact category, the variability is less than 3%.

Note:
It is not recommended to use the results of modules A1-A3 without taking into account the results of module C.

In accordance with EN 15804+A2:2019/AC:2021, environmental impacts are declared using the EC-JRC basic characterisation factors (reference package based on EF 3.1). Specific data is based on operation and general data comes from the Ecoinvent database.

The estimated impact results are only relative data that do not indicate the end points of impact categories, threshold exceedances, safety margins or risks. All emissions to air, water and soil and all materials and energy used were included in the calculation.

The LCA data results are detailed in the following tables and refer to the declared unit of 1 DUPLEX 650 Flexi 3 ventilation unit.

BASIC ENVIRONMENTAL IMPACT INDICATORS per DU

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Climate change – total	kg CO_2 ekv.	6,20E+02	1,00E+01	1,09E+00	0	9,49E-01	1,56E+01	1,97E-01	-1,95E+02
Climate change – fossil fuels		6,16E+02	1,00E+01	0,00E+00	0	9,48E-01	1,56E+01	1,96E-01	-1,94E+02
Climate change – biogenic		6,52E-01	6,69E-03	1,09E+00	0	6,33E-04	8,74E-03	9,44E-05	-1,69E-02
Climate change – land use and land use change		3,48E+00	3,38E-03	0,00E+00	0	3,20E-04	1,35E-03	1,13E-04	-1,52E+00
Ozone depletion	kg CFC11 ekv.	6,45E-06	2,18E-07	0,00E+00	0	2,07E-08	7,20E-08	5,47E-09	-1,65E-06
Acidification	mol H+ ekv.	6,07E+00	2,15E-02	3,51E-06	0	2,04E-03	3,99E-02	1,38E-03	-1,01E+00
Eutrophication, fresh water	kg P ekv.	3,61E-01	6,95E-04	7,83E-05	0	6,58E-05	6,39E-04	1,72E-05	-8,53E-02
Eutrophication, seawater	kg N ekv.	8,99E-01	5,18E-03	3,43E-03	0	4,90E-04	1,67E-02	5,28E-04	-1,78E-01
Eutrophication, terrestrial soil	mol N ekv.	1,48E+01	5,59E-02	9,02E-07	0	5,29E-03	1,79E-01	5,77E-03	-1,84E+00
Photochemical ozone creation	kg NMVOC ekv.	2,61E+00	3,41E-02	3,25E-04	0	3,23E-03	5,34E-02	2,08E-03	-6,61E-01
Depletion of raw material resources – minerals and metals*	kg Sb ekv.	2,51E-02	3,44E-05	0,00E+00	0	3,25E-06	4,71E-05	2,86E-07	-3,70E-04
Depletion of raw material resources – fossil fuels*	MJ	8,42E+03	1,42E+02	0,00E+00	0	1,35E+01	5,88E+01	4,81E+00	-2,26E+03
Water consumption*	m^3 global equivalent shortage	3,44E+02	7,30E-01	0,00E+00	0	6,90E-02	8,98E-01	2,14E-01	-9,00E+01

***** The results of this environmental impact indicator must be used with caution because they are highly uncertain or because there is limited experience with this indicator.

Note:
The estimated impact results are only relative data that do not indicate the end points of impact categories, threshold exceedances, safety margins or risks.

SUPPLEMENTARY ENVIRONMENTAL IMPACT INDICATORS on DU

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Particulate emissions	Incidence of disease	6,59E-05	7,51E-07	2,58E-12	0	7,11E-08	1,01E-06	3,16E-08	-1,45E-05
Human toxicity, non-carcinogenic*	CTUh	2,11E-05	8,98E-08	1,73E-09	0	8,49E-09	7,75E-08	8,01E-10	-1,23E-06
Human toxicity, carcinogenic*		CTUe	1,69E-09	2,16E-12	0	1,60E-10	1,85E-09	3,56E-11	-2,68E-07
Ecotoxicity (freshwater)	Pt	7,31E+03	1,91E+01	4,69E-01	0	1,81E+00	3,00E+01	3,48E-01	-5,25E+02
Impacts related to land use / soil quality*	kBq U-235 equiv.	2,08E+03	8,55E+01	9,78E+00	0	8,09E+00	1,42E+01	9,45E+00	-3,46E+02
Ionising radiation, human health**	kBq U-235 ekv.	6,59E+01	1,72E-01	0,00E+00	0	1,63E-02	1,36E-01	2,88E-03	-1,31E+01

* The results of this environmental impact indicator must be used with caution because of their high uncertainty or because of limited experience with this indicator.

** This impact category deals mainly with the potential impact of low doses of ionising radiation on human health from the nuclear fuel cycle. It does not take into account the effects of possible nuclear accidents, occupational exposure or the storage of radioactive waste in underground facilities. This indicator also does not measure potential ionising radiation from soil, radon and certain building materials.

Note:
The estimated impact results are only relative data that do not indicate the end points of impact categories, threshold exceedances, safety margins or risks.

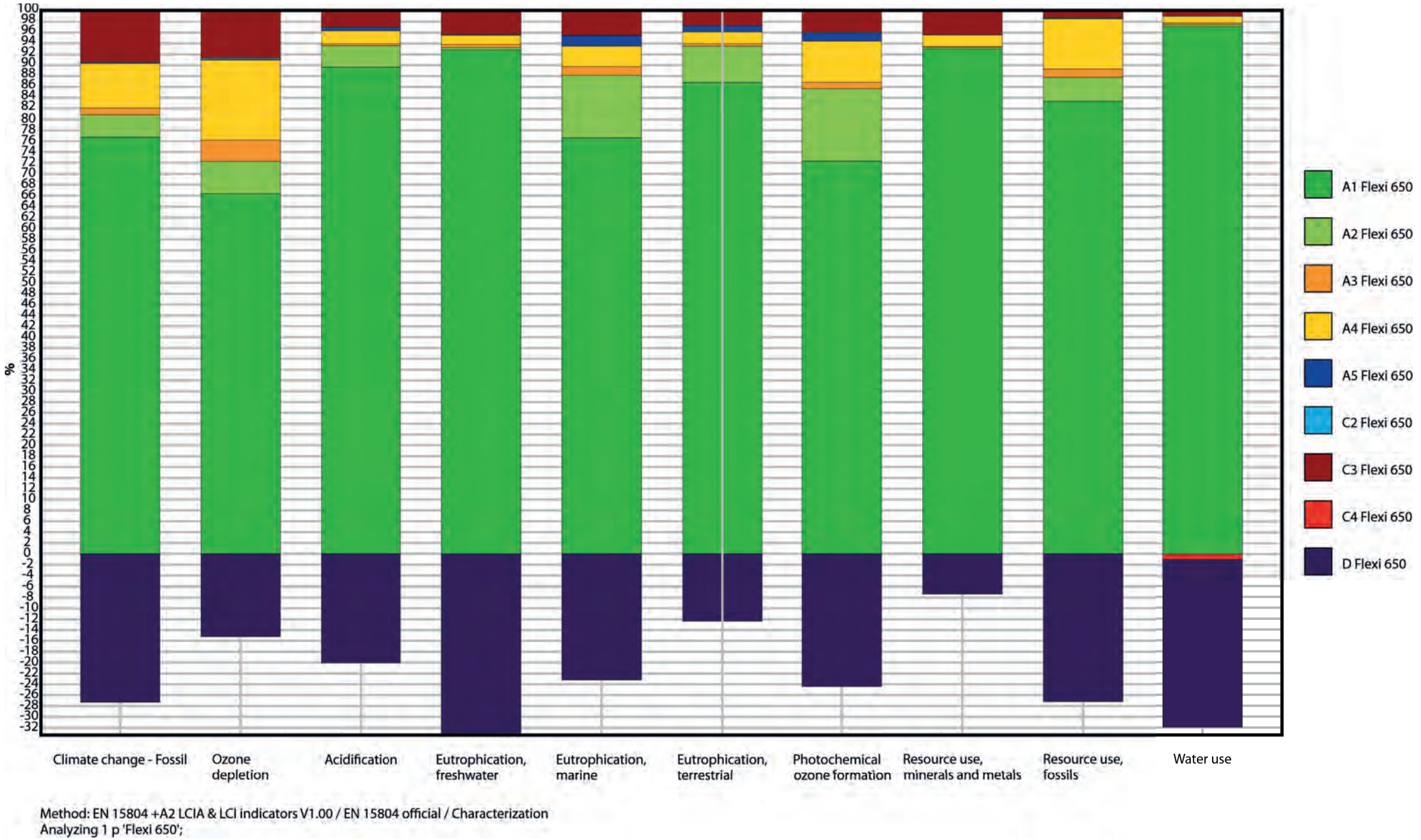
PARAMETERS DESCRIBING RESOURCE CONSUMPTION at DU

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Primary energy consumption excluding energy sources used as raw materials (PERE)	MJ, calorific value	1,21E+03	2,35E+00	0,00E+00	0	2,22E-01	2,16E+00	4,50E-02	-4,18E+02
Consumption of renewable primary energy sources used as raw materials (PERM)		0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total consumption of renewable primary energy sources (primary energy and primary energy sources used as raw materials) (PERT)		1,21E+03	2,35E+00	0,00E+00	0	2,22E-01	2,16E+00	4,50E-02	-4,18E+02
Non-renewable primary energy consumption excluding energy sources used as raw materials (PENRE)		8,42E+03	1,42E+02	0,00E+00	0	1,35E+01	5,88E+01	4,81E+00	-2,26E+03
Consumption of non-renewable primary energy resources used as raw materials (PENRM)		0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total consumption of non-renewable primary energy sources (primary energy and primary energy sources used as raw materials) (PENRT)		8,42E+03	1,42E+02	0,00E+00	0	1,35E+01	5,88E+01	4,81E+00	-2,26E+03
Consumption of secondary raw materials (SM)	kg	3,97E+01	6,45E-02	0,00E+00	0	6,10E-03	2,88E-02	1,20E-03	-1,15E+00
Renewable secondary fuel consumption (RSF)	MJ, calorific value	5,59E-02	8,48E-04	0,00E+00	0	8,02E-05	3,85E-04	2,50E-05	-6,29E-03
Consumption of non-renewable secondary fuels (NRSF)		0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net consumption of drinking water (FW)	m^3	8,61E+00	1,81E-02	0,00E+00	0	1,71E-03	2,16E-02	4,99E-03	-2,30E+00

WASTE CATEGORY and OUTPUT FLOWS at DU

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1,62E+02	2,07E-01	0,00E+00	0	1,96E-02	3,91E-01	5,48E-03	-3,85E+01
Other waste removed		2,19E+03	4,44E+00	1,04E+01	0	4,20E-01	1,04E+01	1,27E-01	-4,17E+02
Removed radioactive waste		2,00E-02	4,24E-05	0,00E+00	0	4,01E-06	3,45E-05	7,02E-07	-3,34E-03
Reusable construction elements (CRU)		0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (MFR)		1,01E+00	1,73E-03	0,00E+00	0	1,63E-04	7,49E+00	5,21E-05	0,00E+00
Materials for energy recovery (MER)		3,86E-03	9,18E-06	0,00E+00	0	8,68E-07	1,97E-06	9,26E-08	0,00E+00
Exported electrical energy (EEE)	MJ by energy type	2,68E+00	2,83E-02	0,00E+00	0	2,68E-03	2,66E-01	3,12E-04	0,00E+00
Exported thermal energy (EET)		4,89E+00	3,47E-02	0,00E+00	0	3,28E-03	9,21E-02	1,66E-04	0,00E+00

Chart of LCA results in life cycle phases



Method: EN 15804 +A2 LCIA & LCI indicators V1.00 / EN 15804 official / Characterization
Analyzing 1 p 'Flexi 650';

Additional information

Example of environmental impacts in the climate change category – total (corresponds to the carbon footprint) in the use phase

This chapter provides an illustrative example of environmental impacts in the category overall climate change during the use phase of the building related to ensuring hygienic air exchange. The information provided is not part of the declared environmental impacts of the product due to the high variability of possible usage scenarios and alternative ventilation methods, and is not intended for comparing different ventilation systems, ventilation methods or heat sources. The data is provided solely for the purpose of technical explanation of operational contexts during the building's use phase.

Description of the usage scenario

To illustrate the operational impacts during the use phase, a reference scenario of an office for 25 people was selected. The functional service of the system is to ensure hygienic air exchange in the building.

Description of the operational scenario

- Type of building: office building in Prague
- Number of persons: 25
- Ventilation volume: fresh air supply corresponding to the hygienic air exchange requirements for the given number of persons
- Air exchange volume per day: Based on the considered operating schedule (unit operation 6:00–16:00 at a flow rate of 650 m^3/h), the total air exchange volume is approximately 6,500 m^3per day
- Ventilation method: mechanical ventilation with heat recovery
- Ventilation unit: DUPLEX Flexi 650
- Typical heat recovery efficiency: 85% (approximate design assumption)
- When the outside temperature drops below –5 °C, electric preheating is used
- Fans: EC fans
- Estimated operating life: 25 years (an approximate design assumption)

The daily ventilation schedule is based on typical office operation:

- ventilation is in operation throughout the year during working hours
- outside working hours, ventilation is limited or switched off
- the internal design temperature is assumed to be constant
- specific fan power (SFP) corresponds to typical values for office uildings

The values used are based on the manufacturer's design software and serve solely as a technical reference scenario.

Impacts of the selected scenario during the building's use phase (informative)

Based on the selected scenario, the annual electricity consumption for preheating the supply air and operating the fans is first determined. From this consumption, the greenhouse gas (GHG) emissions associated with the production of the consumed electricity were then determined according to the assumed composition. The calculation took into account the residual electricity mix in the Czech Republic in 2024 with an emission factor of 0.712 kg CO2 e/kWh. The calculated environmental impacts are listed in the table below (they do not include the impacts associated with reheating the supply air to the internal temperature due to the variability of the possible methods of reheating).

Ventilation system component	Annual electricity consumption (kWh)	GHG emissions per year ($kgCO_2e$)	Climate change – total over 25 years – GHG emissions ($kgCO_2e$)
Fan operation (EC)	1 043,9	743	18 581
Electric preheating of supply air	31,9	23	568
Total – ventilation system (electricity)	**1 075,8**	**766**	**19 149**

Potential benefits beyond the product system (informative – Module D according to EN 15804)

If the hygienic air exchange were not ensured by mechanical ventilation with heat recovery, this service would be provided by an alternative method, typically natural ventilation through windows. In such a case, it would be necessary to heat the supplied outdoor air to the indoor temperature using common heat sources in the Czech Republic (e.g. a gas boiler or a heat pump).

The use of a ventilation unit with heat recovery. The environmental impacts that would arise if the same service were provided by alternative ventilation and air heating methods are thus avoided. These impacts are reported outside the boundaries of the ventilation unit product system and correspond to the logic of Module D according to the EN 15804. These are therefore not direct environmental impacts of the product, but potential savings according to the considered scenario of an alternative ventilation method and source of supply air heating.

The following table shows the environmental impacts. Since these impacts are influenced by the heat source, the results are shown for a gas boiler and a heat pump.

The gas boiler is considered a standard condensing gas heat source, with environmental impacts determined based on the emission factor for natural gas (0.20 kg CO_2e/kWh). The heat pump is considered an air-to-water electric heat pump with an approximate heating factor of COP ≈ 2.5. The source of electrical energy for the heat pump is considered to be identical to the power source for the ventilation system in the previous section, i.e. the residual electricity mix in the Czech Republic for 2024 (emission factor 0.712 kg CO_2e/kWh).

In accordance with the logic of Module D of EN 15804, environmental impacts are indicated with a negative sign, as they represent potential impacts that have been avoided by using a ventilation system with heat recovery. The total heat savings amount to 697.5 GJ over the 25-year lifetime of the ventilation system (we assume air heating to a temperature equal to the outlet temperature of the ventilation system).

	Gas boiler	Heat pump (COP 2.5)
GWP total – avoided impacts (B6, ref. scenario) ($kgCO_2$-eq.)	- 38 418	- 55 135

Although the impact of energy consumption during the use phase is relatively significant, the emissions avoided by the alternative method of heating the supplied fresh air significantly exceed the emissions associated with natural gas and heat pumps (see previous table).

The same fresh air supply is assumed for all ventilation methods considered in order to ensure the same level of service is provided. An example comparison of a ventilation system with heat recovery is available at https://atrea.eu/en/documents/?id=825.

Other environmental performance indicators
Not applied

Other environmental information
The following table shows the weighting coefficients of individual Flexi 3 unit types compared to the reference product. When converting, it is necessary to take into account the variability of results in the range of -20 to +10% compared to the reference product. In most impact categories, the results of the reference product are conservative (less favourable). In the Climate change, fossil impact category, the variability is less than 3%.

Weighting coefficients for converting results to other types of DUPLEX Flexi 3 ventilation units

Type	Weight (kg)	Coefficient
DUPLEX 650 Flexi 3	105	**1.00**
DUPLEX 1100 Flexi 3	150	**1.43**
DUPLEX 1700 Flexi 3	235	**2.24**
DUPLEX 2300 Flexi 3	280	**2.67**
DUPLEX 3500 Flexi 3	325	**3.10**
DUPLEX 4500 Flexi 3	390	**3.71**
DUPLEX 6000 Flexi 3	510	**4.86**

Ecodesign (ErP) – the company publishes instructions for dismantling unit components on its website (https://atrea.eu/en/documents/).

Information on sectoral EPD
Not relevant

Other economic and social information
In 2020, the company established its own ATREA Foundation, which focuses on supporting local health, social and educational projects, as well as its own employees in difficult life situations (https://atrea.eu/en/foundation/).

References

ISO 14040/44/ DIN EN ISO 14040:2006-10, Environmental

management – Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)

ISO 14044:2006-10, Environmental Management — Life Cycle Assessment — Requirements and Instructions (ISO 14044:2006); EN ISO 14044:2006

ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the construction products product category

EN 50693:2020 Product category rules for assessing the life cycle of electronic and electrical products and systems

Eurovent Recommendation on complementary Product Category Rules for ventilation units, 2025

/Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

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