PRODUCT ENVIRONMENTAL PROFILE

Majorline

Nominal cooling capacity : 0.7 - 8.7 kW
Nominal heating capacity : 1.0 - 9.15 kW

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1 – ECODESIGN MANUAL

1.1 – Commercial reference of the reference product

Reference product :	Majorline 304P HEE CV
Nominal capacity of the device :	1.844 kW
Product family :	Fan Coil Unit
Product category :	Cabinet Fan Coil Unit

1.2 – Functional Unit

"Emit 1 kW of sensitive cooling or heating (if only heating is required) via a fan coil unit, by providing the ventilation, filtration, heating and/or cooling functions for 16 years".

1.3 – Additional environmental information

The environmental impacts are calculated using a Life Cycle Analysis of the product in accordance with ISO standards 14040 and 14044. All the stages of the manufacture, distribution, installation (packaging end of life), maintenance and end of life of the product are included in this study.

1.4 - Manufacturing

- Production

The product is manufactured in France at a production plant, which implements an ISO 14001-certified environmental management system. The manufacturing site has also obtained ISO 9001 and OHSAS 18001 certification.

The ranges of products from the Carrier Group's comply with the requirements of the "RoHS" Directive (EU) 2015/863 of 31 March 2015 and 2011/65/EU of 8 June 2011 and the "REACH" regulation 1907/2006 of 18 December 2006. The Carrier Group's suppliers are obliged to inform them of any change in the composition of the components.

During the manufacturing phase, a procurement scenario is taken in to account ; information on the provenance of the components and the mode of transport has been gathered from the purchasing department.

- Energy model

Electricity Mix; Production mix; Low voltage; FR (reference year : 2018)

1.5 - Distribution

- Production

The distribution scenario has been defined using data recommended by the PEP Ecopassport® program, adjusted to the average sales distance for our customers. The environmental impact is then calculated pro rata using the total weight of the products transported, to ensure trucks carry an optimised load when outbound and are 25% full on their return.

- Energy model

ELCD - Lorry Transport; articulated lorry, 27t capacity; RER

ELCD - Transoceanic transport, Container ship, 27 500 t capacity; RER

1.6 - Installation

- Production

When the product is supplied packed, the impact of the end of life for this packaging is taken into account in this phase. We therefore take into consideration an average journey of 200 km in a van, and the water and/or oil consumption linked to the connection to the hydraulic network.

- Energy model

ELCD - Lorry transport; Small lorry, 3,3 t capacity; RER

1.7 - Use

- Production

The CARRIER Group is continuously striving to improve the acoustic and energy performance of its products in the usage phase. Energy efficient motors play a crucial role in this.
The power consumed depends on the conditions of use and operation of the building concerned.
Our hypothesis is based on default usage of the unit as per the PSR :
- 1500 hours in winter 70%(LS) 25%(MS) 5%(HS)
- 1100 hours in summer 65%(LS) 30%(MS) 5%(HS)

Unit in standby: 12.32 kWh

Eurovent conditions :
Indoor :
- Heating mode conditions: 20 °C; 50% humidity.
- Cooling mode conditions: 27 °C; 47% humidity

Refrigerant temperature:
- heating mode: 65/55 °C
- cooling mode: 7/12 °C

Consumption of the device :
Consumption = 556 kWh
Consumption in France = 556 kWh
Consumption in Europe = 0 kWh
Consumption in rest of world = 0 kWh

Filters twice a year (according to the PSR)
FMA once during the life cycle (according to the PSR)
End of life of the FMA follows a WEEE disposal process.

- Energy model

For France, the chosen module is : "Electricity Mix; Production mix; Low voltage; FR" (reference year : 2018)

For Europe, the chosen module is : "Electricity Mix; Production mix; Low voltage; UE-27" (reference year : 2018)

1.8 – End of life

- Production

The product end of life follows a WEEE disposal process :
- stage 1 : the equipment is collected with a 200 km van journey.
- stage 2 : decontamination, crushing then sorting of the various materials.
- stage 3 : specific processing of the electronic components, electrical heaters, cables, bulbs and screens.
- stage 4 : recycling of other materials (this flow is outside of the system and its benefit is not recorded), with a 100 km van journey.
- stage 5 : incineration without energy recovery of components with no re-use value, with a 100 km journey.
- stage 6 : offloading of the rest of the material, with a 100 km journey.

- Energy model

Waste pretreatment of electrical and electronic equipment (WEEE) ; including dismantling and material separation ;
- technology mix, at waste pretreatment plant ; GLO ;
- Waste recycling ; in compliance with stock method ; World, GLO ;
- Waste incineration of WEEE ; after dismantling ; GLO ;
- Landfill of WEEE ; after dismantling ; GLO

1.9 - PEP ecopassport program hypothesis

The life cycle analysis was carried out according to the hypothesis and scenarios provided by the PEP ecopassport program.

Activity area :	Tertiary
Expected lifetime :	16 years
Annual operating time in heating mode :	1500 hours
Eurovent operating time in heating mode :	70% LS ; 25% MS ; 5% HS
Annual operating time in cooling mode :	1100 hours
Annual operating time in cooling mode :	65% LS ; 30% MS ; 5% HS
Annual operating time :	2600 hours
Average extracted air flow :	- m^3/h
Pressure loss Δp :	-
Momentary refrigerant leaks :	0%
Refill threshold :	0%
Number of engine changes during the life cycle :	Once
Number of filter changes during the life cycle :	Twice a year

1.10 – Technical description of the device

Designed for heating and cooling, Majorline is available in 4 models (with or without body, horizontal or vertical).

The versatility of Majorline, thanks to its different assemblies and numerous accessories, allows it to adapt to all types of installations. In Europe, it has become a reference solution for the renovation of large office buildings or for chain hotels and building rehabilitation, etc.

Modern aesthetic lines, excellent sound levels and optimised thermal performance With Majorline, CIAT offers a comfort solution that is both economical and quick to configure.

TEWI (Total Equivalent Warming Impact) :	Direct effect :	Indirect effect :
- tCO_2 eq	- tCO_2 eq	- tCO_2 eq
Calorific value of the device :	15.5 MJ/kg	
Electrical power absorbed by the fan :	0.030 kW	
Cooling capacity :	1.783 kW	SEER : -
Heating capacity :	1.890 kW	SCOP : -
Sensitive capacity :	1.495 kW	
Refrigerant :	-	GWP = - tCO_2 eq
Liquid waste (condensates) :	0.466 m^3	
Water consumption of the device :	0 m^3	

1.11 – Sales scenarios

Sales of the device are distributed as follows :

Country name	Share in sales (%)	
France	100	%
Europe	0	%
World	0	%

This distribution affects the distance travelled during the phase and the electric mix used during the usage phase.

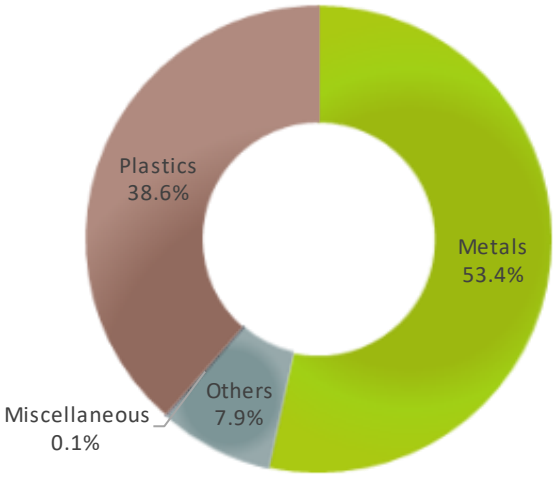
2 – COMPONENT MATERIALS

2.1 – Reference product

Modelled total weight :

PEP material category	Materials	Weight (kg)	Pourcentage
Metals	Galvanised steel	10.78	39.9%
Plastics	Acrylonitrile butadiene styrene (ABS)	7.20	26.7%
Plastics	Polycarbonate (PC)	2.59	9.6%
Metals	Copper	2.08	7.7%
Metals	Aluminium	1.57	5.8%
Others	Cardboard	1.20	4.4%
Others	Glass fiber	0.52	1.9%
Others	Paper ; virgin fiber	0.41	1.5%
Plastics	Polypropylene (PP)	0.20	0.8%
Plastics	Expandable polystyrene (EPS)	0.19	0.7%
Plastics	Polyvinylchloride (PVC)	0.12	0.5%
Plastics	Melamine	0.06	0.2%
Plastics	Polyethylene high density (PE-HD)	0.03	0.1%
Plastics	Polybutyene Terephthalate (PBT)	0.02	< 0.1%
Metals	Brass	0.01	< 0.1%
Miscellaneous	Miscellaneous	0.03	< 0.1%
Total		27.01	100.0%

2.2 – Component materials



Recyclability rate : 76%

3 – ENVIRONMENTAL IMPACTS

Per kW corresponding to the functional unit

Environmental indicators		Total	Manu facturing	Distribution	Installation	Use ∑ B1 à B7	End of life	Potential benefits Module D
Ozone depletion	kg.CFC-11 eq	1.17E-05	6.57E-06	2.82E-09	6.99E-08	2.91E-06	2.13E-06	-1.45E-06
Acidification (AP)	mole H^+ eq	1.47E+00	7.18E-01	1.16E-02	4.08E-03	5.72E-01	1.67E-01	-8.19E-01
Freshwater eutrophication	kg P eq	2.32E-03	5.16E-04	6.89E-07	7.62E-06	1.30E-03	4.96E-04	-6.15E-02
Marine aquatic eutrophication	kg N eq	2.45E-01	9.18E-02	5.45E-03	1.08E-03	8.82E-02	5.83E-02	-5.84E-02
Terrestrial eutrophication	mole N eq	2.20E+00	9.61E-01	5.98E-02	7.81E-03	9.46E-01	2.23E-01	-6.96E-01
Photochemical Ozone formation	kg NMVOC eq	7.03E-01	3.22E-01	1.51E-02	2.10E-03	2.97E-01	6.69E-02	-2.13E-01
Depletion of abiotic resources - elements	kg Sb eq	3.94E-03	2.51E-03	0*	0*	1.28E-03	1.44E-04	-2.43E-03
Depletion of abiotic resources - fossil fuels	MJ	1.51E+04	4.84E+03	2.56E+01	1.07E+01	9.89E+03	3.12E+02	-5.55E+02
Climate change - total	kg CO_2 eq.	3.15E+02	1.39E+02	1.84E+00	1.05E+00	1.50E+02	2.31E+01	-4.66E+01
Climate change - fossil fuels	kg CO_2 eq.	3.10E+02	1.36E+02	1.84E+00	1.01E+00	1.50E+02	2.19E+01	-4.52E+01
Climate change - biogenics	kg CO_2 eq.	4.10E+00	2.15E+00	0*	4.68E-02	7.18E-01	1.19E+00	-1.36E+00
Climate change - land use and land use transformation	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water requirement	m^3	1.31E+04	4.61E+01	0*	0*	4.23E+02	1.26E+04	-3.17E+04
Total use of primary energy during the life cycle	MJ	1.56E+04	4.92E+03	2.57E+01	1.15E+01	1.03E+04	3.52E+02	-7.07E+02
Emission of fine particles	incidence of diseases	1.33E-05	4.77E-06	9.46E-08	2.69E-08	7.10E-06	1.34E-06	-3.67E-06
Ionizing radiation, human health	kBq U235 eq	1.12E+03	4.87E+02	0*	0*	6.32E+02	1.59E+00	-9.57E+00
Ecotoxicity (fresh water)	CTUe	1.32E+04	5.96E+03	1.24E+00	7.65E+00	5.42E+03	1.79E+03	-5.04E+03
Human toxicity, carcinogenic effects	CTUh	4.19E-05	3.46E-05	0*	3.77E-07	6.83E-06	1.23E-07	-4.26E-07
Human toxicity, non-carcinogenic effects	CTUh	9.80E-06	5.39E-06	3.49E-09	5.62E-09	3.54E-06	8.57E-07	-7.77E-06
Impacts related to land use/soil quality	-	6.09E+01	2.58E-01	0*	0*	4.62E+00	5.60E+01	-4.20E+02
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	4.67E+02	4.87E+01	0*	7.87E-01	3.78E+02	4.00E+01	-1.51E+02
Use of renewable primary energy resources used as raw materials	MJ	3.78E+01	3.78E+01	0*	0*	0.00E+00	0*	0.00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	5.05E+02	8.65E+01	0*	7.87E-01	3.78E+02	4.00E+01	-1.51E+02
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	1.44E+04	4.30E+03	2.56E+01	1.07E+01	9.79E+03	3.12E+02	-5.55E+02
Use of non-renewable primary energy resources used as raw materials	MJ	6.30E+02	5.31E+02	0*	0*	9.91E+01	0*	0.00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	1.51E+04	4.84E+03	2.56E+01	1.07E+01	9.89E+03	3.12E+02	-5.55E+02
Use of secondary materials	kg	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	MJ	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	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m^3	3.24E+02	1.07E+00	0*	0*	1.16E+01	3.11E+02	-7.53E+02
Hazardous waste disposed of	kg	2.82E+02	1.98E+02	0*	0*	7.03E+01	1.41E+01	-6.96E-03
Non-hazardous waste disposed of	kg	1.49E+02	1.18E+02	6.45E-02	3.50E+00	2.71E+01	4.49E-02	-2.49E+00
Radioactive waste disposed of	kg	1.58E-01	1.14E-01	4.59E-05	4.60E-04	4.33E-02	8.28E-05	-1.65E-03
Components for re-use	kg	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	7.48E-01	0*	0*	5.79E-01	1.69E-01	0*	0.00E+00
Materials for energy recovery	kg	5.35E+00	0*	0*	5.21E-02	5.30E+00	0*	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content of the product	kg of C.	6.08E-01	6.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	kg of C.	1.80E+00	1.80E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

The Life Cycle Analysis was conducted using EIME software : EIME© v5.9.4. Whit its database version : CODDE-2022-01 * The results of this PEP represent the use of the product in countries with energy mixes of varying pollution levels, which significantly affects the product's environmental impact. To obtain the results that correspond to your product, please contact your Carrier representative.
The PEP was drawn up under the assumption of 1 kW of heating or cooling power being supplied. The real impact of the stages of the life cycle of a product installed in an actual situation is to be calculated by the user of the PEP by multiplying the impact concerned by the total heating or cooling capacity in kW.
* represents less than 0.01% of the total life cycle of the reference flow

3 – ENVIRONMENTAL IMPACTS

Environmental indicators		Use B1	Maintenance B2	Repair B3	Replacement B4	Refurbishment B5	Operational energy use B6	Operational water use B7
Ozone depletion	kg.CFC-11 eq	3.43E-08	2.58E-06	0.00E+00	0.00E+00	0.00E+00	2.96E-07	0.00E+00
Acidification (AP)	mole H^+ eq	1.99E-02	4.35E-01	0.00E+00	0.00E+00	0.00E+00	1.17E-01	0.00E+00
Freshwater eutrophication	kg P eq	5.37E-07	3.43E-04	0.00E+00	0.00E+00	0.00E+00	9.58E-04	0.00E+00
Marine aquatic eutrophication	kg N eq	6.10E-03	6.61E-02	0.00E+00	0.00E+00	0.00E+00	1.60E-02	0.00E+00
Terrestrial eutrophication	mole N eq	6.19E-02	6.53E-01	0.00E+00	0.00E+00	0.00E+00	2.31E-01	0.00E+00
Photochemical Ozone formation	kg NMVOC eq	1.54E-02	2.34E-01	0.00E+00	0.00E+00	0.00E+00	4.75E-02	0.00E+00
Depletion of abiotic resources - elements	kg Sb eq	9.22E-08	1.27E-03	0.00E+00	0.00E+00	0.00E+00	9.53E-06	0.00E+00
Depletion of abiotic resources - fossil fuels	MJ	2.16E+01	6.00E+03	0.00E+00	0.00E+00	0.00E+00	3.87E+03	0.00E+00
Climate change - total	kg CO_2 eq.	7.27E+00	1.23E+02	0.00E+00	0.00E+00	0.00E+00	2.01E+01	0.00E+00
Climate change - fossil fuels	kg CO_2 eq.	7.27E+00	1.22E+02	0.00E+00	0.00E+00	0.00E+00	2.01E+01	0.00E+00
Climate change - biogenics	kg CO_2 eq.	0.00E+00	6.66E-01	0.00E+00	0.00E+00	0.00E+00	5.19E-02	0.00E+00
Climate change - land use and land use transformation	kg CO_2 eq.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water requirement	m^3	-9.74E+00	4.32E+02	0.00E+00	0.00E+00	0.00E+00	1.46E+00	0.00E+00
Total use of primary energy during the life cycle	MJ	2.18E+01	6.02E+03	0.00E+00	0.00E+00	0.00E+00	4.23E+03	0.00E+00
Emission of fine particles	incidence of diseases	8.57E-08	2.50E-06	0.00E+00	0.00E+00	0.00E+00	4.52E-06	0.00E+00
Ionizing radiation, human health	kBq U235 eq	2.78E-02	1.10E+02	0.00E+00	0.00E+00	0.00E+00	5.22E+02	0.00E+00
Ecotoxicity (fresh water)	CTUe	3.21E+00	5.27E+03	0.00E+00	0.00E+00	0.00E+00	1.42E+02	0.00E+00
Human toxicity, carcinogenic effects	CTUh	1.60E-10	6.82E-06	0.00E+00	0.00E+00	0.00E+00	3.37E-09	0.00E+00
Human toxicity, non-carcinogenic effects	CTUh	1.32E-08	3.38E-06	0.00E+00	0.00E+00	0.00E+00	1.46E-07	0.00E+00
Impacts related to land use/soil quality	-	0.00E+00	3.98E+00	0.00E+00	0.00E+00	0.00E+00	6.42E-01	0.00E+00
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	2.21E-01	1.95E+01	0.00E+00	0.00E+00	0.00E+00	3.58E+02	0.00E+00
Use of renewable primary energy resources used as raw materials	MJ	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 (primary energy and primary energy resources used as raw materials)	MJ	2.21E-01	1.95E+01	0.00E+00	0.00E+00	0.00E+00	3.58E+02	0.00E+00
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	2.16E+01	5.90E+03	0.00E+00	0.00E+00	0.00E+00	3.87E+03	0.00E+00
Use of non-renewable primary energy resources used as raw materials	MJ	0.00E+00	9.91E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.16E+01	6.00E+03	0.00E+00	0.00E+00	0.00E+00	3.87E+03	0.00E+00
Use of secondary materials	kg	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	MJ	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	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m^3	-2.27E-01	1.18E+01	0.00E+00	0.00E+00	0.00E+00	3.40E-02	0.00E+00
Hazardous waste disposed of	kg	1.54E-04	7.00E+01	0.00E+00	0.00E+00	0.00E+00	3.00E-01	0.00E+00
Non-hazardous waste disposed of	kg	1.74E+00	2.34E+01	0.00E+00	0.00E+00	0.00E+00	1.94E+00	0.00E+00
Radioactive waste disposed of	kg	5.28E-04	4.20E-02	0.00E+00	0.00E+00	0.00E+00	8.14E-04	0.00E+00
Components for re-use	kg	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	1.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	5.30E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content of the product	kg of C.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	kg of C.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

The Life Cycle Analysis was conducted using EIME software : EIME© v5.9.4. Whit its database version : CODDE-2022-01 * The results of this PEP represent the use of the product in countries with energy mixes of varying pollution levels, which significantly affects the product's environmental impact. To obtain the results that correspond to your product, please contact your Carrier representative.
As part of the life cycle analysis of buildings, the environmental impacts of the use stage must be declared according to modules B1 to B7 (B1: use; B2: maintenance; B3: repair; B4: replacement; B5: rehabilitation; B6: energy use; B7: water use).

4 – EXTRAPOLATION TO THE OTHER SIZES IN THE RANGE

		Capacity [kW]	Manufacturing	Distribution	Installation	Use	End of life
	102J AC CV	0.985	1.232	1.235	0.702	2.695	1.261
	102J HEE CV	0.985	1.232	1.235	0.702	1.475	1.261
	102M AC CV	1.169	1.039	1.041	0.592	2.197	1.063
	102M HEE CV	1.169	1.039	1.041	0.592	1.281	1.063
	202J AC CV	1.593	0.911	0.912	0.714	3.472	0.921
	202J HEE CV	1.593	0.911	0.912	0.714	1.051	0.921
	202M AC CV	1.753	0.828	0.828	0.649	3.155	0.837
	202M HEE CV	1.753	0.828	0.828	0.649	0.955	0.837
	202N AC CV	1.906	0.761	0.762	0.597	2.902	0.770
	202N HEE CV	1.906	0.761	0.762	0.597	0.879	0.770
	302J AC CV	1.940	0.951	0.951	0.951	3.170	0.951
	302J HEE CV	1.940	0.951	0.951	0.951	0.951	0.951
	302K AC CV	2.023	0.912	0.912	0.912	3.041	0.912
	302K HEE CV	2.023	0.912	0.912	0.912	0.912	0.912
	302M AC CV	2.162	0.853	0.853	0.853	2.845	0.853
	302M HEE CV	2.162	0.853	0.853	0.853	0.853	0.853
	402M AC CV	3.729	0.621	0.621	0.725	2.946	0.616
	402M HEE CV	3.729	0.621	0.621	0.725	0.847	0.616
	502M AC CV	4.262	0.639	0.639	0.876	2.415	0.627
	502M HEE CV	4.262	0.639	0.639	0.876	0.800	0.627
	602N AC CV	6.000	0.523	0.523	0.817	2.625	0.508
	602N HEE CV	6.000	0.523	0.523	0.817	0.895	0.508
	104P AC CV	0.940	1.292	1.294	0.736	2.732	1.321
	104P HEE CV	0.940	1.292	1.294	0.736	1.593	1.321
	204P AC CV	1.523	0.953	0.954	0.747	3.632	0.964
	204P HEE CV	1.523	0.953	0.954	0.747	1.100	0.964
	204R AC CV	2.154	0.674	0.674	0.528	2.569	0.682
	204R HEE CV	2.154	0.674	0.674	0.528	0.778	0.682
	304P AC CV	1.844	1.000	1.000	1.000	3.335	1.000
REF	**304P HEE CV**	**1.844**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
	304R AC CV	2.305	0.800	0.800	0.800	2.668	0.800
	304R HEE CV	2.305	0.800	0.800	0.800	0.800	0.800
	404P AC CV	3.206	0.723	0.722	0.844	3.426	0.716
	404P HEE CV	3.206	0.723	0.722	0.844	0.985	0.716
	404R AC CV	3.698	0.627	0.626	0.731	2.970	0.621
	404R HEE CV	3.698	0.627	0.626	0.731	0.854	0.621
	504P AC CV	4.103	0.664	0.663	0.910	2.600	0.651
	504P HEE CV	4.103	0.664	0.663	0.910	0.831	0.651
	604P AC CV	6.521	0.482	0.481	0.752	2.407	0.467
	604P HEE CV	6.521	0.482	0.481	0.752	0.810	0.467

4 – EXTRAPOLATION TO THE OTHER SIZES IN THE RANGE

	Capacity [kW]	Manufacturing	Distribution	Installation	Use	End of life
102J AC NCV	0.985	0.980	0.983	1.014	2.695	0.982
102J HEE NCV	0.985	0.980	0.983	1.014	1.475	0.982
102M AC NCV	1.169	0.826	0.829	0.855	2.197	0.827
102M HEE NCV	1.169	0.826	0.829	0.855	1.281	0.827
202J AC NCV	1.593	0.723	0.725	0.772	3.472	0.723
202J HEE NCV	1.593	0.723	0.725	0.772	1.051	0.723
202M AC NCV	1.753	0.657	0.659	0.701	3.155	0.657
202M HEE NCV	1.753	0.657	0.659	0.701	0.955	0.657
202N AC NCV	1.906	0.605	0.606	0.645	2.902	0.604
202N HEE NCV	1.906	0.605	0.606	0.645	0.879	0.604
302J AC NCV	1.940	0.728	0.729	0.792	3.170	0.726
302J HEE NCV	1.940	0.728	0.729	0.792	0.951	0.726
302K AC NCV	2.023	0.698	0.699	0.760	3.041	0.696
302K HEE NCV	2.023	0.698	0.699	0.760	0.912	0.696
302M AC NCV	2.162	0.653	0.654	0.711	2.845	0.651
302M HEE NCV	2.162	0.653	0.654	0.711	0.853	0.651
402M AC NCV	3.729	0.489	0.489	0.495	2.946	0.489
402M HEE NCV	3.729	0.489	0.489	0.495	0.847	0.489
502M AC NCV	4.262	0.492	0.492	0.505	2.415	0.491
502M HEE NCV	4.262	0.492	0.492	0.505	0.800	0.491
602N AC NCV	6.000	0.396	0.396	0.410	2.625	0.395
602N HEE NCV	6.000	0.396	0.396	0.410	0.895	0.395
104P AC NCV	0.940	1.027	1.031	1.063	2.732	1.029
104P HEE NCV	0.940	1.027	1.031	1.063	1.593	1.029
204P AC NCV	1.523	0.757	0.759	0.807	3.632	0.756
204P HEE NCV	1.523	0.757	0.759	0.807	1.100	0.756
204R AC NCV	2.154	0.535	0.536	0.571	2.569	0.535
204R HEE NCV	2.154	0.535	0.536	0.571	0.778	0.535
304P AC NCV	1.844	0.766	0.767	0.833	3.335	0.763
304P HEE NCV	1.844	0.766	0.767	0.833	1.000	0.763
304R AC NCV	2.305	0.612	0.613	0.667	2.668	0.611
304R HEE NCV	2.305	0.612	0.613	0.667	0.800	0.611
404P AC NCV	3.206	0.568	0.568	0.575	3.426	0.568
404P HEE NCV	3.206	0.568	0.568	0.575	0.985	0.568
404R AC NCV	3.698	0.493	0.493	0.499	2.970	0.493
404R HEE NCV	3.698	0.493	0.493	0.499	0.854	0.493
504P AC NCV	4.103	0.511	0.511	0.524	2.600	0.510
504P HEE NCV	4.103	0.511	0.511	0.524	0.831	0.510
604P AC NCV	6.521	0.365	0.364	0.377	2.407	0.364
604P HEE NCV	6.521	0.365	0.364	0.377	0.810	0.364

Extrapolation coefficients are given for the environmental impact of the functional unit, i.e. the emission of 1 kW of heating or cooling power. For each stage of the life cycle, the environmental impacts of the product concerned are calculated by multiplying the impacts of the declaration corresponding to the reference product by the extrapolation coefficient. The "Total" column should be calculated by adding the environmental impacts of each stage of the life cycle.

5 - GLOSSARY

The set of indicators used in this study is : Indicators for PEF EF 3.0 (Compliance : PEP ed.4, EN15804+A2) v2.0

5.1 – The mandatory indicators are :

- **GWP (Global Warming Potential) :** This indicator is used to calculate the global warming potential caused by emissions in the air contributing to the greenhouse effect. It is expressed in kg CO_2 eq. The calculation methodology comes from the IPCC (International Panel of Climate Change, US, 2007), and we used a 100-year horizon. (IPCC 2007 method via CML, GWP 100).
- **ODP (Ozone Depletion) :** This indicator is used to calculate the contribution of atmospheric emissions to the depletion of the stratospheric ozone layer. It is expressed in kg CFC-11 eq. The calculation methodology comes from the WMO (World Meteorological Organization, CML 2012).
- **A (Acidification for soil and water) :** This indicator is used to calculate the acidification of the soil and water. It is expressed in kg SO_2-eq. The calculation methodology was developed by Huijbregts (CML, 2012).
- **EP (Eutrophication) :** This indicator is used to calculate the eutrophication (enrichment with nutrients) of oceans and lakes by effluent. It is expressed in kg PO_4^{3-}eq. Eutrophication of water courses results from excessive enrichment with nutrient molecules (organic molecules) in the environment. Phosphorus, nitrogen, carbon and potassium allow the development of algae and aquatic species that can lead to a reduction in the oxygen level and an unbalanced biocoenosis. The calculation methodology was developed by Heijungs et al. 1992 (CML, 2012).
- **POCP (Photochemical Oxidation) :** This indicator, expressed in kg C_2H_4-eq, is used to calculate the amount of ozone produced in the troposphere due to the action of solar radiation on oxidising gas emissions (known as summer smog; see summer peak ozone levels). The calculation methodology was developed by Jenkin & Hayman - Derwent et al. (CML, 2012).
- **ADPe (Depletion of Abiotic Resources - Elements) :** This indicator is used to calculate the depletion of non-renewable mineral resources by taking into account the extent of natural reserves. It is expressed in equivalents of kilograms of antimony (kg Sb-eq). The calculation methodology was developed by Oers et al. (CML, 2012).
- **EP (Total use of primary energy) :** This indicator is used to calculate the primary energy consumption during the life cycle of the product. It is expressed in MJ.
- **NUFW (Net use of fresh water) :** This indicator represents the net consumption of fresh water used for the system. It is expressed in m^3. In EIME, fresh water is broken down into river, lake, underground and surface water, as well as water of unspecified origin. Water extracted and discharged into these environments with the same quality level is not covered by this indicator.
- **ADPf (Depletion of Abiotic Resources - Fossil Fuels) :** This indicator is used to calculate the consumption of non-renewable fossil fuel resources. It is expressed in equivalents of kilograms of antimony (kg eq Sb). The calculation methodology was developed by Oers et al. (CML, 2012).
- **WP (Water Pollution) :** this indicator, expressed as a critical volume (m^3), is used to calculate water pollution by taking into account the authorised effluent concentration limits. The methodology comes from the DHUP (French directorate of housing, urbanism and landscape) based on the recommendations of the AIMCC (French construction industry trade association).
- **AP (Air Pollution) :** this indicator, expressed as a critical volume (m^3), is used to calculate ambient air pollution (troposphere) by taking into account the authorised concentration limits for atmospheric emissions. The methodology comes from the DHUP (French directorate of housing, urbanism and landscape) based on the recommendations of the AIMCC (French construction industry trade association).
- **Module B1 - Border for products installed during use :** it corresponds to the impacts and aspects of normal (i.e. expected) conditions of use of building construction products, materials and components, excluding those related to water and energy consumption, which are processed in modules B6 and B7. Module B1 also includes the impacts and aspects related to fugitive refrigerant emissions.
- **Module B2 – Border for maintenance :** it must include the production and transportation of construction products and materials, components and ancillary products used for maintenance; all cleaning processes for the interior and exterior of the building; all maintenance processes for the functional and technical performance of the building structure and the building-integrated technical systems, as well as the aesthetic qualities of the components inside and outside the building.
- **Module B3 – Border for repair :** it must include any repair process for building components carried out during the use phase of the building.
- **Module B4 – Border for replacement :** it must include the following as part of the planned replacement of building components based on their expected lifespan.
- **Module B5 – Border for refurbishment :** it corresponds to any major planned modification of the structure, layout and / or technical systems of the building, generally following a change / adjustment of its intended use / function.
- **Module B6 – Border for operational energy use :** it includes the impacts and aspects of the energy requirement during the operation phase according to the « service categories » described in the standard relating to the energy performance of buildings (EPB), EN ISO 52000-1.
- **Module B7 – Border for operational water use :** it must include all the water consumed and its treatment (before and after consumption) during the normal operation of the building (are excluded from module B7 maintenance, repair, replacement and rehabilitation of water supply systems and equipment. water).
- **Module D - Border for the benefits and charges outside the system border :** it quantifies the environmental benefits or charges resulting from the following re-use, recycling and energy recovery from the net flows of materials leaving the system boundary; and services exported outside the border of the system.

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