

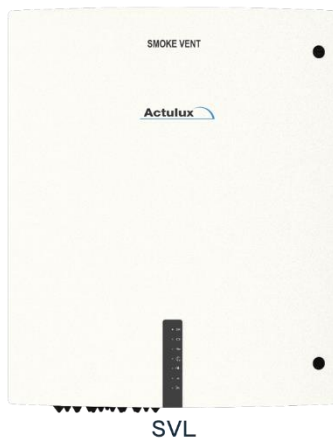
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Valid to: 12-02-2030

3rd PARTY VERIFIED

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804

Control panels



Accessories



Owner of declaration

Actulux A/S
 Porsborgparken 35, 9530
 Stoevring, Denmark
 www.actulux.dk
 VAT no. 28892195



Issued:
12-02-2025

Valid to:
12-02-2030

Programme

EPD Danmark
www.epddanmark.dk



- Industry EPD
- Product EPD

This is a product group EPD for worst case scenario and single product EPD

Declared product(s)

SVM EI (216100/227417)
 SV (218600/ 218100)
 SVL (22890602/22800220)
 Flexbox (121360/121431)
 Fire Switch (511881/511940/511781/511729)
 Wind and Rain sensor (111961)
 Smoke detector (111740)
 Comfort Switch (111944)

Number of declared datasets/product variations:
 [8 datasets /15 product variants]

Production site

Porsborgparken 35, 9530 Stoevring, Denmark

Use of Guarantees of Origin

- No certificates used
- Electricity covered by GoO
- Biogas covered by GoO

Declared/ functional unit

1 piece

Year of production site data (A3)

2023

EPD version

Version nr. 1

Basis of calculation

This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity

This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use

The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type

- Cradle-to-gate with modules C1-C4 and D
- Cradle-to-gate with options, modules C1-C4 and D
- Cradle-to-grave and module D
- Cradle-to-gate
- Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR
Independent verification of the declaration and data, according to EN ISO 14025
<input type="checkbox"/> internal <input checked="" type="checkbox"/> external
Third party verifier: [Mirko Miseljic]

Martha Katrine Sørensen
 EPD Danmark

Life cycle stages and modules (MND = module not declared)

Product			Construction process		Use								End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	MND	MND	X	X	X	X	X	X	X	X	X	X	X	X	

Table 1: Life cycle stages in this LCA

Product information

Product description

Following EPD Denmark, all EEE (electrical and electronic equipment) have all B modules mandatory, therefore this EPD will include modules A1-A3, B1-B7, C1-C4 and D.

The ranges of the main material groups weight in kg are shown in the table below for all declared datasets. The main materials found in these products are plastic, steel, cardboard, electric components and batteries. Other smaller materials that are not mentioned in this table have a weight amount smaller than 0.001kg but are included in the LCA calculation.

Materials	SVM EI	SV	SVL
Plastic	0.61 - 0.83	0.21 - 0.54	0.81 - 1.10
Steel	0.42 - 1.16	7.78 - 7.79	11.51 - 12.98
Paper	0.25	0.84	0.05
Electric components	0.79 - 1.21	1.39 - 3.50	1.28 - 4.51
Battery	4.48 - 4.50	5.20 - 13.00	7.80 - 20.80

Materials	Flexbox	Fire and priority switch	Wind and Rain sensor	Smoke detector	Comfort Switch
Plastic	0.26 - 0.38	0.20	0.34	0.07	0.07
Steel	0.01	0	0.25	0.04	0.002
Paper	0.01	0.01	0.01	0.01	0.01
Electric components	0.28 - 0.30	0.05 - 0.10	0.37	0.02	-

Table 2: Main components range in kg

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below. The study includes both the packaging used for the raw materials and the packaging for product delivery. The amounts presented in the table below will be the biggest amounts of packaging for each data set declared.

Materials	SVM EI	SV	SVL
	Weight (kg)	Weight (kg)	Weight (kg)
Cardboard	0.85	4.55	31.63

Materials	Flexbox	Fire Switch	Wind and Rain sensor	Smoke detector	Comfort Switch
	Weight (kg)	Weight (kg)	Weight (kg)	Weight (kg)	Weight (kg)
Cardboard	0,03	0,04	0,04	0,0004	0,01

Table 3: Packaging amounts per dataset

Representativity

This declaration represents the production of 15 products, from which 8 are displayed as a reference worst-case product (or in case of single variants – the reference product), manufactured at Actulux A/S production site in Stoevring, Denmark. Product specific data are based on average values collected within the entire 2023 year. Background data are based on the Ecoinvent 3.10 database and are less than 10 years old. End of life scenarios are based on international documents and reports referred to in this study.

Hazardous substances

Declared products have been investigated for hazardous substances separately.

SV Control panels:

Control panels contain lead-acid batteries that contain Lead and Lead alloys (CAS 7439-92-1) and Active mass (battery lead paste) (CAS 7439-92-1) at levels above 0.1% that is on the "Candidate List of Substances of Very High Concern for authorization".

The weight % of the declared product concerning substances of very high concern is calculated to represent 26.48% of the total product.

A REACH declaration from the supplier can be found in the Appendix.

(<http://echa.europa.eu/candidate-list-table>)

Substance in declared product	CAS no.	Weight % of declared product
Lead and Lead alloys	7439-92-1	26.48%
Active mass (battery lead paste)	7439-92-1	

Table 4: Dangerous substances

Flexbox/Fire and priority switch/Wind and rain sensor/Smoke and heat detector/Comfort switch:

These declared products do not contain substances listed on the "Candidate List of Substances of Very High Concern for authorization".

(<http://echa.europa.eu/candidate-list-table>)

Product(s) use

SV Control panels:

Actulux control panels provide reliable solutions for smoke and comfort ventilation in buildings:

More information can be found on the manufacturers page ([Actulux](#)).

Flexbox:

The Flex1 ACDC is a reliable Flexbox designed to support 24VDC or 48VDC systems in ventilation and automation applications.

More information can be found on the manufacturers page ([Actulux](#)).

The fire and priority switch:

The Fire and Priority Switch is used in smoke ventilation systems to trigger ventilation or other safety functions during fire emergencies.

More information can be found on the manufacturers page ([Actulux](#)).

The wind and rain sensor:

The Wind and Rain Sensor by Actulux automatically controls ventilation systems based on weather conditions.

More information can be found on the manufacturers page ([Actulux](#)).

Smoke detector:

The Smoke Detector by Actulux detects smoke and triggers ventilation systems to improve fire safety.

More information can be found on the manufacturers page ([Actulux](#)).

Comfort switch:

The Comfort Switch is a manual control switch used to operate comfort ventilation systems, including 24V fire and smoke ventilation systems.

More information can be found on the manufacturers page ([Actulux](#)).

Essential characteristics

SV Control panels:

Each of these panels comes with battery backup, supports various monitoring functions, and is EN12101-10 certified for fire safety.

1. SVM EI:

- Basic, simplified configuration for small systems.
- Integrated 230VAC power supply with required fuses.

2. SV:

- Supports 2-wire CAN bus communication for multiple panel integration.
- Modular design, expandable up to 2 motor groups.
- Line detection for fault monitoring.
- Compact design suitable for space-constrained installations..

3. SVL:

- Multi-zone capability with up to 6 motor groups.
- Fault-tolerant "ring" communication ensures reliability.
- Smartphone app integration for easy setup and monitoring.
- High load capacity (up to 50A) and advanced input/output options for sensors and alarms.

Flexbox:

Accepts 110VAC or 230VAC input and provides 24VDC/48VDC output. Includes optional RF control module for wireless operation and is IP66 rated for outdoor use.

The fire and priority switch:

Features 2-wire Powerline communication, built-in buzzer for alerts, and a thermostat function for temperature monitoring. Rated for IP43, IP54, and IP65 protection, ensuring durability in various environments.

The wind and rain sensor:

Detects wind and rain, triggering the operation of windows, skylights, or ventilation hatches.

Ideal for use with Actulux's ventilation systems. Weatherproof design ensures reliable performance outdoors.

Smoke detector:

Integrated into smoke and comfort ventilation systems to trigger automatic ventilation openings upon smoke detection.

Comfort switch:

Compact up/down switch for easy control of ventilation systems, especially in 24V fire and smoke ventilation setups. Wall-mountable housing.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website: www.actulux.dk.

Reference Service Life (RSL)

SV Control panels:

The EN 12101-10 standard outlines that control panels and related fire safety equipment should have an expected service life of around 10 to 15 years. This is based on general industry norms for fire safety systems.

Flexbox:

EN 12101-10 provides a guideline for fire safety equipment so the power supply would likely have an estimated reference service life of around 10 years.

For more details, please consult the product page on Actulux's website: [Flex1 ACDC](http://Flex1.ACDC).

The fire and priority switch:

Following the EN 12101-10 standard, the expected service life of such fire safety devices is usually estimated at around 10 to 15 years.

Wind and Rain Sensor:

Similar outdoor monitoring systems follow EN 60730-1 (for automatic electrical controls) and other relevant standards that suggest a typical service life of 10 years for such systems under standard operational conditions.

Smoke detector:

Typically, the reference service life of smoke detectors is around 10 years. This is based on general guidelines from standards like EN 14604 (for smoke alarms) and NFPA 72 (National Fire Alarm and Signaling Code), which recommend that smoke detectors be replaced after 10 years of operation to ensure reliability and accuracy.

Comfort switch:

For electrical switches like this one, the typical lifespan is based on the number of operations (e.g., the number of times the switch is flipped). This electrical switch is rated for at least 10,000 operations. Considering this, the expected reference service life for the switch is 10 years when used in standard conditions.

See additional information for manufacturers guidance and technical description:
(<https://actulux.dk/control-panels/?lang=en>)

Picture of product(s)



Figure 1: SVM EI

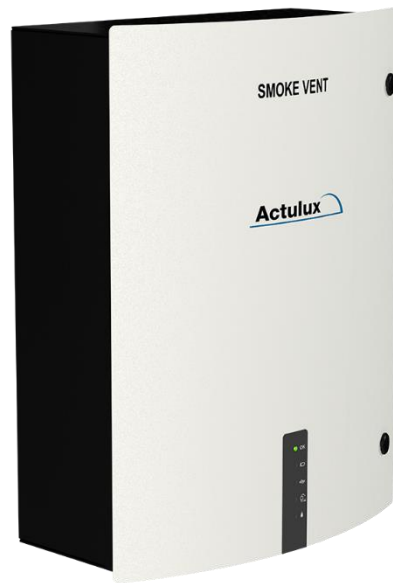


Figure 2: SV

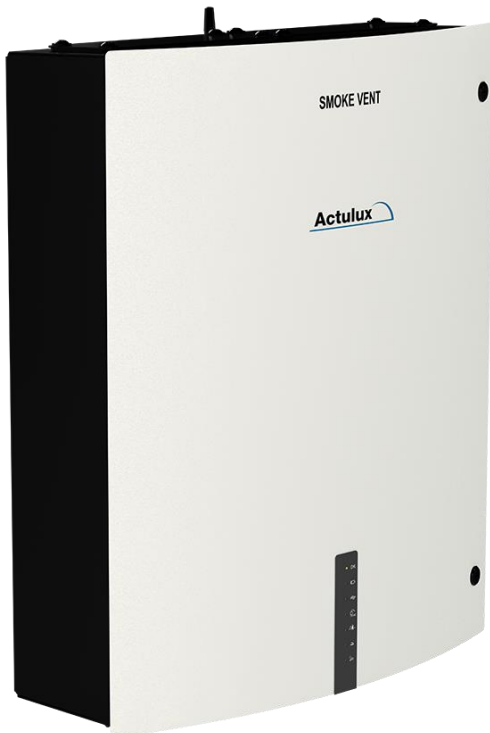


Figure 3: SVL

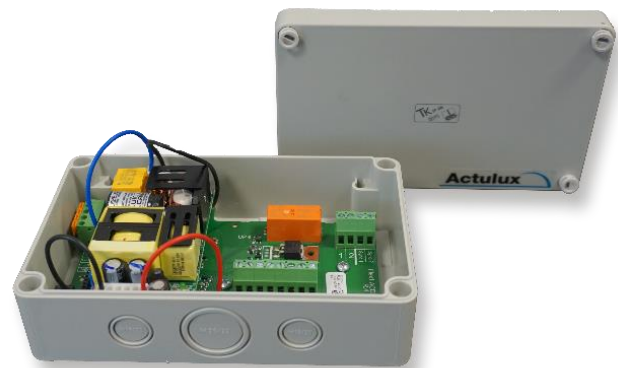


Figure 4: Flex Box



Figure 5: Fire and Priority Switch



Figure 6: Comfort Switch



Figure 7: Smoke Detector



Figure 8: Rain and Wind Sensor

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 piece of SVM EI/SV/SVL/Flexbox/Fire and Priority Switch/Wind and Rain sensor/Smoke detector/Comfort switch from Actulux.

The declared unit is chosen as 1 piece.

Name	Value	Unit
Declared unit	1	piece

Table 5: Declared unit

RSL

As a conservative estimate, 10 years is the reference service life for all declared products. More information related to that can be seen on page 6 – Essential characteristics.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN DS/EN 15804 + A2:2019. Furthermore, the waste scenario for electronic components is based on the c-PCR for life cycle assessment of electronic and electrical products and systems in EN 50693:2019.

The method for choosing between different variations of the same model follows EPD Denmark’s worst case grouping rules. The description can be found in EPD Denmark’s consultant kit – document “Grouping rules”.

This EPD is made of grouped products (SVM EI (216100/227417), SV (218600/ 218100), SVL (22890602/22800220), Flexbox (121360/121431), Fire Switch (511881/511940/511781/511729)) where a reference worst case product is identified and declared for each group, and single products (Wind and Rain sensor (111961), Smoke detector (111740), Comfort Switch (111944) where a reference product is declared. A worst-case product is a product for which all environmental impact results are worst, within a group of products.

Energy modelling principles

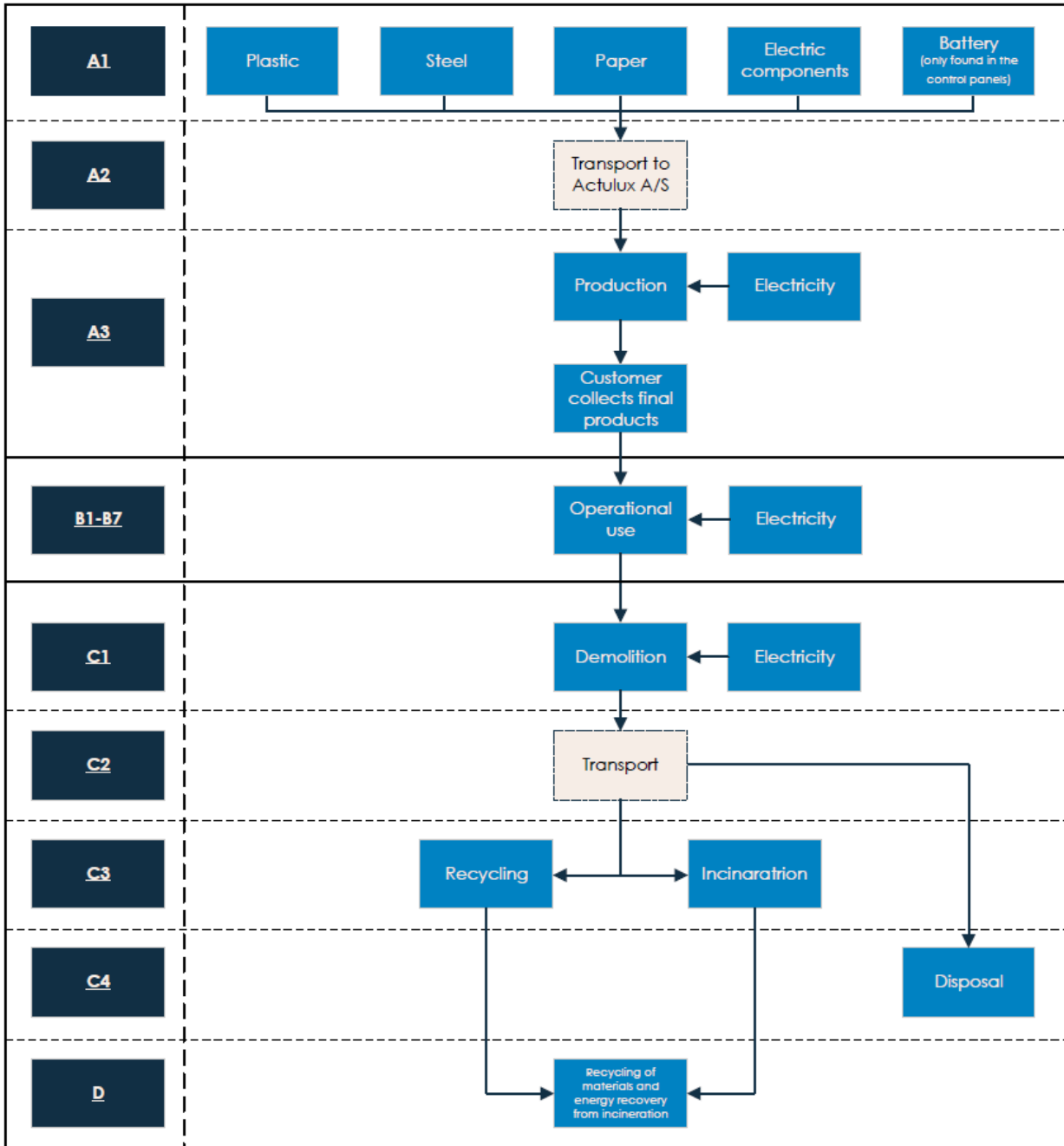
Foreground system:

The product is produced using both grid mix energy as well as solar power produced on site and modelled according to the requirement of residual mix for the grid electricity. Following EPD Denmark’s rules about modelling of energy consumption, the residual electricity mix production in Denmark from Ecoinvent 3.10 is used. This dataset describes the residual mix on the medium voltage level in Denmark.

Background system:

Upstream and downstream processes in the background system are modelled using average grid mix electricity, where electricity is used in the aggregated secondary datasets.

Flowdiagram



System boundary

This EPD is based on a cradle-to-gate with module A1-A3, B1-B7, C1-C4 and D, in which 100 weight-% of the product has been accounted for.

The general rules for the exclusion of inputs and outputs (cut-off) follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Economic allocation is applied in this project for the energy use calculation in A3 module.

No other allocation is performed in this project.

This EPD is of grouped products with declaring the reference worst case product as the result.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the “end-of-life” state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

The raw materials: Materials used for the assembly of the declared products are bought from Vietnam, China, Germany and Denmark and afterwards transported and assembled in the factory at Actulux. Most of the packaging from the raw materials is disposed of in A3. Some packaging is however being reused for the delivery of the product afterwards.

Transportation: Due to the lack of information about the specific transport type used for delivering raw materials/component to the production site, all transportation was assumed to be done with one vehicle type. The distance was calculated on land and on water specifically from the supplier to the storing facility in Denmark at Actulux.

Manufacturing: The assembly of the final product is done at the production facility in Denmark. The production facility and the storage facility are under the same roof. The materials are sorted when arriving at the warehouse. When an order is placed, due to the high organisational methods, each component is found based on their number and collected in a pallet box to limit the time used by the workers for searching of each individual component. Different assembly stations move the pallet box from the first to the last person that is responsible for assembling specific components. The products are then assembled on different tables depending on the part of the product. Different professionals are responsible for different parts of the assembly process.

When the product is finalised, it is then sent to the delivery area where it is organised either on a wooden pallet with plastic strips or in cardboard boxes, and afterwards delivered to the customer. The product packaging is then disposed of in A5.

Construction process stage (A4-A5) includes:

These modules are not included in the project.

Use stage (B1-B7) includes:

B1: No activity occurs in module B1.

B2:

Control panels: The system requires annual inspection and testing by authorized personnel. This is indicated by the product's built-in service reminder LEDs. The inspection involves testing of batteries to ensure adequate capacity, verifying all connections, sensors and input/output functionality and confirming there are no cable or line errors. Consumables can be batteries and resistors for line monitoring if the system has an error.

Other products: Require annual verification of functionality

B3:

Control panels: Repairs typically involve addressing failures identified during regular maintenance or system operation. The activities in relation to repair can be addressing line errors

caused by short circuits, grounding issues, or breaks in cable connections. Repairing issues with the central control unit, such as LED indicators or DIP switch malfunctions. And lastly circuit board-level repairs in case of electrical failures. Consumables can be spare parts like replacement circuit boards or LEDs and potentially rewiring affected areas

Other products: No activity occurs in module B3. If components are worn out, they are replaced and allocated in B4.

B4:

Control panels: Components subjected to replacement are the batteries. They need replacing every 3 year or when testing indicated reduced performance.

Flexbox/Fire switch/Comfort switch: If components are worn out, they will be replaced.

Wind and rain sensor/smoke and heat detector: Wind and rain sensors may need periodic replacement depending on environmental exposure.

B5: No activity occurs in module B5.

B6: Electricity – Grid Mix (EU market average) is included for the operation of the declared products. The electricity consumption is calculated based on the number of times the products will activate, the working time, voltage consumption and current consumption (and number of batteries in an opening system). B6 is modelled for a year of product use.

Name	Value	Unit
SVM EI	342	kWh/year
SV	673	kWh/year
SVL	2102	kWh/year
Flexbox	57	kWh/year
Fire and priority switch	0.490	kWh/year
Wind and rain sensor	18	kWh/year
Smoke detector	0.021	kWh/year
Comfort switch	0.0013	kWh/year

Table 6: Energy use per year

B7: No activity occurs in module B7.

The products do not consume water and have no direct environmental emissions during the use phase. Furthermore, there is no mandatory need for repair, replacement, or renovation during the product's lifetime, if installation and maintenance

are carried out in accordance with Actulux’s installation guidelines. The only exception from this rule are batteries in all control panels that need to be replaced minimum every 3 years. All the information is available in the guidance installation manual provided by Actulux.

End of Life (C1-C4) includes:

It is considered that the products are dismantled by using electrical drills and then transported to the waste processing facilities, where the parts are disposed, recycled, or incinerated depending on the type of material, as well as handled as hazardous waste.

The End-of-Life scenario includes electrical equipment and cables, plastics, and metals being recycled, incinerated, or landfilled.

Re-use, recovery and recycling potential (D) includes:

Module D includes reuse, recovery and/or recycling potential, expressed as net impact and benefits, due to reuse, recycling and incineration of materials with energy recovery in module C3.

The energy recovery is credited in module D and the energy recovered is based on the calorific values of materials from the incineration of plastic.

OneClickLCA

This EPD is generated with the EPD software from OneClickLCA. The EN & ISO-compliant EPD generation streamlines LCA analysis and sustainability reporting. The modelling process was done using Ecoinvent 3.10 data and the results of the EPD are checked for plausibility.

Identification name and version number of the EPD-software: OneClickCA EPD software - Ecoinvent 3.10.

Estimates and assumptions

All transport in A2 and C2 is with EURO 5 trucks due to the lack of specific data.

In the C module the end-of-life scenario considered is that the opening system is demounted during the deconstruction process

and a small amount of energy for power tools is required for this process. The used system is transported to a municipal waste collection and sorting station, the average transport distance from the demolition place to the station is set to 50km for all waste facilities in Europe.

The scenarios attributed to the modules where data was unavailable are considered representative to the generic European data and are also descriptive to the geography of the project.

LCA results

1.1.1 Results following EN15804:2012+A2:2019

1.1.1.1 SVM EI 227417

ENVIRONMENTAL IMPACTS PER 1 piece										
Indicator	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	7.09E+01	0.00E+00	3.91E+00	1.11E+02	7.10E-04	8.98E-02	1.99E+00	4.20E+00	-2.69E+00
GWP-fossil	kg CO ₂ eq.	7.11E+01	0.00E+00	3.90E+00	1.11E+02	7.09E-04	8.98E-02	1.99E+00	4.20E+00	-2.69E+00
GWP-biogenic	kg CO ₂ eq.	-3.38E-01*	0.00E+00	-8.67E-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO ₂ eq.	1.17E-01	0.00E+00	5.50E-03	3.43E-01	1.39E-06	3.00E-05	1.54E-04	1.73E-06	-7.65E-04
ODP	kg CFC 11 eq.	1.45E-06	0.00E+00	6.37E-08	1.92E-06	4.57E-12	1.79E-09	1.55E-09	7.53E-11	-2.94E-08
AP	mol H ⁺ eq.	6.85E-01	0.00E+00	4.86E-02	5.64E-01	3.45E-06	2.68E-04	8.62E-04	5.44E-03	-1.07E-02
EP-freshwater	kg P eq.	6.46E-02	0.00E+00	2.73E-03	9.87E-02	3.05E-07	5.83E-06	3.43E-05	2.69E-07	-1.08E-03
EP-marine	kg N eq.	9.53E-02	0.00E+00	4.84E-03	9.78E-02	6.90E-07	8.99E-05	3.95E-04	2.45E-03	-2.24E-03
EP-terrestrial	mol N eq.	1.06E+00	0.00E+00	5.40E-02	8.50E-01	6.95E-06	9.78E-04	3.26E-03	2.65E-02	-2.43E-02
POCP	kg NMVOC eq.	3.84E-01	0.00E+00	1.79E-02	2.82E-01	2.06E-06	4.23E-04	9.45E-04	2.49E-02	-9.74E-03
ADPm ¹	kg Sb eq.	1.79E-02	0.00E+00	1.60E-03	2.47E-04	6.68E-10	2.93E-07	8.70E-07	5.58E-09	-2.36E-05
ADPf ¹	MJ	9.70E+02	0.00E+00	5.40E+01	2.62E+03	9.15E-03	1.25E+00	1.41E+00	6.44E-02	-3.58E+01
WDP ¹	m ³ world eq. deprived	2.60E+01	0.00E+00	1.73E+00	6.78E+01	1.71E-04	6.08E-03	1.09E-01	4.62E-02	-5.15E-01
Caption	<p>GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification;</p> <p>EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use</p>									
Disclaimer	<p>¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.</p> <p>*The results of this calculation is negative because of the exclusion of the A5 module from the scope of this project</p>									

Table 7 - Core environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
PM	[Disease incidence]	5.38E-06	0.00E+00	3.01E-07	1.97E-06	3.11E-11	6.07E-09	1.97E-08	7.60E-05	-1.56E-07
IRP ²	[kBq U235 eq.]	5.59E+00	0.00E+00	3.20E-01	7.32E+01	9.63E-05	1.91E-03	5.49E-03	5.45E-05	-1.39E-02

ETP-fw ¹	[CTUe]	1.81E+03	0.00E+00	2.05E+02	2.76E+02	1.58E-03	1.79E-01	1.27E+01	4.02E+01	-6.35E+00
HTP-c ¹	[CTUh]	8.80E-08	0.00E+00	9.91E-09	2.30E-08	8.56E-14	1.44E-11	5.69E-10	1.28E-06	-4.53E-10
HTP-nc ¹	[CTUh]	5.89E-06	0.00E+00	7.40E-07	9.89E-07	4.21E-12	7.36E-10	2.66E-08	1.22E-07	-2.12E-08
SQP ¹	-	6.15E+02	0.00E+00	2.87E+01	4.45E+02	1.38E-03	6.44E-01	1.58E+00	1.41E-01	-8.16E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. ² 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.									

Table 8 – Additional environmental impact indicators

RESOURCE USE PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
PERE	[MJ]	9.39E+01	0.00E+00	5.31E+00	6.12E+02	1.20E-03	2.44E-02	1.02E-01	8.52E-04	-2.27E+00
PERM	[MJ]	3.13E+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
PERT	[MJ]	9.71E+01	0.00E+00	5.31E+00	6.12E+02	1.20E-03	2.44E-02	1.02E-01	8.52E-04	-2.27E+00
PENRE	[MJ]	9.49E+02	0.00E+00	5.40E+01	2.62E+03	9.15E-03	1.25E+00	-1.72E+01	-5.50E+01	-3.58E+01
PENRM	[MJ]	2.10E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.53E+01	-5.52E+00	8.21E+00
PENRT	[MJ]	9.70E+02	0.00E+00	5.40E+01	2.62E+03	9.15E-03	1.25E+00	-3.26E+01	-6.05E+01	-2.76E+01
SM	[kg]	3.92E+00	0.00E+00	8.30E-01	2.81E-01	9.40E-07	5.48E-04	1.47E-03	2.05E-05	1.32E+00
RSF	[MJ]	7.84E-02	0.00E+00	1.93E-03	1.16E-03	4.49E-09	5.56E-06	6.38E-05	3.96E-07	-1.86E-04
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
FW	[m ³]	6.98E-01	0.00E+00	4.45E-02	2.18E+00	4.80E-06	1.71E-04	2.15E-03	-5.48E-04	-9.94E-03
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water									

Table 9 - Parameters describing resource use

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
HWD	[kg]	8.62E+00	0.00E+00	4.72E-01	5.97E+00	6.12E-05	1.63E-03	1.27E-01	9.64E-05	-7.06E-01
NHWD	[kg]	3.16E+02	0.00E+00	1.48E+01	4.85E+02	1.48E-03	3.83E-02	8.80E-01	7.73E-01	-9.84E+00
RWD	[kg]	1.41E-03	0.00E+00	8.08E-05	1.88E-02	2.41E-08	4.79E-07	1.38E-06	1.35E-08	-3.39E-06

CRU	[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
MFR	[kg]	6.80E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.20E+00	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	4.20E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.35E+00	0.00E+00	0.00E+00
EET	[MJ]	3.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.74E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy									

Table 10 – End-of-life (waste categories and output flows)

BIOGENIC CARBON CONTENT PER 1 piece		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0.0375

Table 11 – Biogenic carbon content at factory gate

1.1.1.2 SV 218600

ENVIRONMENTAL IMPACTS PER 1 piece										
Indicator	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2.17E+02	0.00E+00	4.52E+00	2.18E+02	7.10E-04	2.95E-01	3.72E+00	1.21E+01	-1.17E+01
GWP-fossil	kg CO ₂ eq.	2.18E+02	0.00E+00	4.51E+00	2.18E+02	7.09E-04	2.94E-01	3.72E+00	1.21E+01	-1.17E+01
GWP-biogenic	kg CO ₂ eq.	-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
GWP-luluc	kg CO ₂ eq.	3.49E-01	0.00E+00	6.35E-03	6.76E-01	1.39E-06	9.84E-05	4.81E-04	4.42E-06	-2.21E-03
ODP	kg CFC 11 eq.	4.63E-06	0.00E+00	7.36E-08	3.77E-06	4.57E-12	5.88E-09	4.43E-09	2.20E-10	-7.72E-08
AP	mol H ⁺ eq.	1.73E+00	0.00E+00	5.62E-02	1.11E+00	3.45E-06	8.79E-04	2.61E-03	1.58E-02	-4.63E-02
EP-freshwater	kg P eq.	1.44E-01	0.00E+00	3.16E-03	1.94E-01	3.05E-07	1.91E-05	1.22E-04	6.42E-07	-4.85E-03
EP-marine	kg N eq.	2.71E-01	0.00E+00	5.59E-03	1.92E-01	6.90E-07	2.95E-04	1.17E-03	7.02E-03	-1.00E-02
EP-terrestrial	mol N eq.	2.92E+00	0.00E+00	6.23E-02	1.67E+00	6.95E-06	3.21E-03	9.15E-03	7.68E-02	-1.09E-01
POCP	kg NMVOC eq.	1.11E+00	0.00E+00	2.07E-02	5.54E-01	2.06E-06	1.39E-03	2.76E-03	7.21E-02	-4.00E-02
ADPm ¹	kg Sb eq.	3.73E-02	0.00E+00	1.85E-03	4.86E-04	6.68E-10	9.62E-07	3.64E-06	1.25E-08	-1.08E-04
ADPf ¹	MJ	2.90E+03	0.00E+00	6.24E+01	5.15E+03	9.15E-03	4.10E+00	4.28E+00	1.86E-01	-1.27E+02
WDP ¹	m ³ world eq. deprived	7.25E+01	0.00E+00	2.00E+00	1.33E+02	1.71E-04	1.99E-02	2.71E-01	1.34E-01	-2.07E+00
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP =									

	Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. *The results of this calculation is negative because of the exclusion of the A5 module from the scope of this project

Table 12 - Core environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
PM	[Disease incidence]	1.68E-05	0.00E+00	3.48E-07	3.88E-06	3.11E-11	1.99E-08	1.06E-07	2.20E-04	-7.30E-07
IRP ²	[kBq U235 eq.]	1.60E+01	0.00E+00	3.70E-01	1.44E+02	9.63E-05	6.26E-03	1.69E-02	1.22E-04	2.23E-01
ETP-fw ¹	[CTUe]	4.17E+03	0.00E+00	2.37E+02	5.43E+02	1.58E-03	5.88E-01	3.85E+01	1.17E+02	-2.81E+01
HTP-c ¹	[CTUh]	2.38E-07	0.00E+00	1.15E-08	4.52E-08	8.56E-14	4.72E-11	2.01E-09	3.72E-06	-1.91E-09
HTP-nc ¹	[CTUh]	1.41E-05	0.00E+00	8.55E-07	1.95E-06	4.21E-12	2.41E-09	7.77E-08	3.55E-07	-9.18E-08
SQP ¹	-	1.90E+03	0.00E+00	3.32E+01	8.76E+02	1.38E-03	2.11E+00	7.30E+00	3.72E-01	-3.44E+01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality									
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. ² 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.									

Table 13 – Additional environmental impact indicators

RESOURCE USE PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
PERE	[MJ]	2.55E+02	0.00E+00	6.14E+00	1.20E+03	1.20E-03	8.02E-02	3.47E-01	1.88E-03	-8.40E+00
PERM	[MJ]	1.07E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.66E+02	0.00E+00	6.14E+00	1.20E+03	1.20E-03	8.02E-02	3.47E-01	1.88E-03	-8.40E+00
PENRE	[MJ]	2.90E+03	0.00E+00	6.24E+01	5.15E+03	9.15E-03	4.10E+00	-2.24E+00	-1.44E+02	-1.27E+02
PENRM	[MJ]	3.16E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.21E+00	-7.96E-01	1.52E+01
PENRT	[MJ]	2.90E+03	0.00E+00	6.24E+01	5.15E+03	9.15E-03	4.10E+00	-4.44E+00	-1.45E+02	-1.12E+02
SM	[kg]	1.43E+01	0.00E+00	9.60E-01	5.53E-01	9.40E-07	1.80E-03	3.40E-03	4.83E-05	6.13E+00
RSF	[MJ]	3.08E-01	0.00E+00	2.23E-03	2.27E-03	4.49E-09	1.82E-05	2.61E-04	9.90E-07	-8.94E-04
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

FW	[m ³]	1.86E+00	0.00E+00	5.14E-02	4.28E+00	4.80E-06	5.62E-04	6.01E-03	-1.79E-05	-3.32E-02
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water									

Table 14 - Parameters describing resource use

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
HWD	[kg]	2.89E+01	0.00E+00	5.46E-01	1.17E+01	6.12E-05	5.34E-03	3.52E-01	2.14E-04	-3.51E+00
NHWD	[kg]	9.28E+02	0.00E+00	1.71E+01	9.55E+02	1.48E-03	1.26E-01	1.94E+00	2.70E-01	-3.55E+01
RWD	[kg]	4.03E-03	0.00E+00	9.34E-05	3.70E-02	2.41E-08	1.57E-06	4.23E-06	3.02E-08	5.79E-05

CRU	[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
MFR	[kg]	8.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.61E+00	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	2.22E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-01	0.00E+00
EET	[MJ]	3.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.27E-01	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy									

Table 15 – End-of-life (waste categories and output flows)

BIOGENIC CARBON CONTENT PER 1 piece		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0.43

Table 16 – Biogenic carbon content at factory gate

1.1.1.3 SVL 22890602

ENVIRONMENTAL IMPACTS PER 1 piece										
Indicator	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	3.17E+02	0.00E+00	1.81E+01	6.82E+02	7.10E-04	4.18E-01	6.36E+00	1.61E+01	-1.77E+01
GWP-fossil	kg CO ₂ eq.	3.17E+02	0.00E+00	1.80E+01	6.80E+02	7.09E-04	4.18E-01	6.36E+00	1.61E+01	-1.77E+01
GWP-biogenic	kg CO ₂ eq.	-4.71E-02*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO ₂	4.68E-01	0.00E+00	2.54E-02	2.11E+00	1.39E-06	1.40E-04	7.46E-04	7.44E-06	-3.51E-03

	eq.									
ODP	kg CFC 11 eq.	6.65E-06	0.00E+00	2.94E-07	1.18E-05	4.57E-12	8.34E-09	6.91E-09	3.61E-10	-1.24E-07
AP	mol H ⁺ eq.	2.52E+00	0.00E+00	2.25E-01	3.47E+00	3.45E-06	1.25E-03	4.07E-03	2.09E-02	-7.02E-02
EP-freshwater	kg P eq.	1.96E-01	0.00E+00	1.26E-02	6.07E-01	3.05E-07	2.72E-05	1.87E-04	1.10E-06	-7.33E-03
EP-marine	kg N eq.	3.88E-01	0.00E+00	2.24E-02	6.01E-01	6.90E-07	4.19E-04	1.84E-03	9.33E-03	-1.51E-02
EP-terrestrial	mol N eq.	4.15E+00	0.00E+00	2.49E-01	5.22E+00	6.95E-06	4.56E-03	1.45E-02	1.02E-01	-1.65E-01
POCP	kg NMVOC eq.	1.61E+00	0.00E+00	8.26E-02	1.73E+00	2.06E-06	1.97E-03	4.34E-03	9.54E-02	-6.09E-02
ADPm ¹	kg Sb eq.	5.13E-02	0.00E+00	7.38E-03	1.52E-03	6.68E-10	1.37E-06	5.56E-06	2.17E-08	-1.63E-04
ADPf ¹	MJ	4.21E+03	0.00E+00	2.50E+02	1.61E+04	9.15E-03	5.82E+00	6.65E+00	3.06E-01	-1.97E+02
WDP ¹	m ³ world eq. deprived	1.10E+02	0.00E+00	8.00E+00	4.17E+02	1.71E-04	2.83E-02	4.33E-01	1.77E-01	-3.16E+00
Caption	<p>GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification;</p> <p>EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use</p>									
Disclaimer	<p>¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.</p> <p>*The results of this calculation is negative because of the exclusion of the A5 module from the scope of this project</p>									

Table 17 - Core environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
PM	[Disease incidence]	2.40E-05	0.00E+00	1.39E-06	1.21E-05	3.11E-11	2.82E-08	1.59E-07	2.92E-04	-1.10E-06
IRP ²	[kBq U235 eq.]	2.32E+01	0.00E+00	1.48E+00	4.50E+02	9.63E-05	8.88E-03	2.64E-02	2.11E-04	2.97E-01
ETP-fw ¹	[CTUe]	5.93E+03	0.00E+00	9.47E+02	1.70E+03	1.58E-03	8.34E-01	5.91E+01	1.54E+02	-4.25E+01
HTP-c ¹	[CTUh]	3.49E-07	0.00E+00	4.58E-08	1.41E-07	8.56E-14	6.70E-11	3.07E-09	4.92E-06	-2.90E-09
HTP-nc ¹	[CTUh]	2.05E-05	0.00E+00	3.42E-06	6.08E-06	4.21E-12	3.43E-09	1.20E-07	4.69E-07	-1.39E-07
SQP ¹	-	2.79E+03	0.00E+00	1.33E+02	2.74E+03	1.38E-03	3.00E+00	1.11E+01	6.21E-01	-5.23E+01
Caption	<p>PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality</p>									

Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.
	² 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.

Table 18 – Additional environmental impact indicators

RESOURCE USE PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
PERE	[MJ]	3.69E+02	0.00E+00	2.46E+01	3.76E+03	1.20E-03	1.14E-01	5.36E-01	3.26E-03	-1.29E+01
PERM	[MJ]	5.92E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	3.69E+02	0.00E+00	2.46E+01	3.76E+03	1.20E-03	1.14E-01	5.36E-01	3.26E-03	-1.29E+01
PENRE	[MJ]	4.19E+03	0.00E+00	2.50E+02	1.61E+04	9.15E-03	5.82E+00	-1.80E+01	-1.96E+02	-1.97E+02
PENRM	[MJ]	2.19E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.60E+01	-5.77E+00	2.60E+01
PENRT	[MJ]	4.21E+03	0.00E+00	2.50E+02	1.61E+04	9.15E-03	5.82E+00	-3.40E+01	-2.02E+02	-1.71E+02
SM	[kg]	2.09E+01	0.00E+00	3.84E+00	1.73E+00	9.40E-07	2.55E-03	5.73E-03	8.26E-05	9.24E+00
RSF	[MJ]	7.08E-01	0.00E+00	8.90E-03	7.10E-03	4.49E-09	2.59E-05	3.97E-04	1.67E-06	-1.34E-03
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
FW	[m ³]	2.79E+00	0.00E+00	2.06E-01	1.34E+01	4.80E-06	7.97E-04	9.36E-03	-4.81E-04	-5.17E-02
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water									

Table 19 - Parameters describing resource use

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 piece										
Parameter	Unit	A1-A3	B1, B3-B5, B7	B2	B6	C1	C2	C3	C4	D
HWD	[kg]	4.20E+01	0.00E+00	2.18E+00	3.67E+01	6.12E-05	7.57E-03	5.47E-01	3.71E-04	-5.26E+00
NHWD	[kg]	1.37E+03	0.00E+00	6.83E+01	2.98E+03	1.48E-03	1.78E-01	3.22E+00	1.01E+00	-5.48E+01
RWD	[kg]	5.85E-03	0.00E+00	3.74E-04	1.16E-01	2.41E-08	2.23E-06	6.61E-06	5.23E-08	7.74E-05

CRU	[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
MFR	[kg]	1.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E+01	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	1.35E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.41E+00	0.00E+00	0.00E+00
EET	[MJ]	1.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E+01	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical									

energy; EET = Exported thermal energy

Table 20 – End-of-life (waste categories and output flows)

BIOGENIC CARBON CONTENT PER 1 piece		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0.07

Table 21 – Biogenic carbon content at factory gate

1.1.1.4 Fleksboks 121431

ENVIRONMENTAL IMPACTS PER 1 piece									
Indicator	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1.16E+01	0.00E+00	1.85E+01	7.10E-04	8.15E-03	5.83E-01	2.21E-01	-2.46E-01
GWP-fossil	kg CO ₂ eq.	1.17E+01	0.00E+00	1.84E+01	7.09E-04	8.15E-03	5.83E-01	2.21E-01	-2.46E-01
GWP-biogenic	kg CO ₂ eq.	-1.22E-01*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO ₂ eq.	1.76E-02	0.00E+00	5.72E-02	1.39E-06	2.72E-06	1.85E-05	7.05E-07	-7.83E-05
ODP	kg CFC 11 eq.	5.40E-06	0.00E+00	3.20E-07	4.57E-12	1.63E-10	1.87E-10	2.80E-11	-3.06E-09
AP	mol H ⁺ eq.	6.92E-02	0.00E+00	9.40E-02	3.45E-06	2.43E-05	1.27E-04	2.79E-04	-9.84E-04
EP-freshwater	kg P eq.	6.06E-03	0.00E+00	1.65E-02	3.05E-07	5.30E-07	3.90E-06	1.14E-07	-9.73E-05
EP-marine	kg N eq.	1.10E-02	0.00E+00	1.63E-02	6.90E-07	8.16E-06	6.50E-05	1.46E-04	-2.03E-04
EP-terrestrial	mol N eq.	1.17E-01	0.00E+00	1.42E-01	6.95E-06	8.88E-05	5.45E-04	1.35E-03	-2.19E-03
POCP	kg NMVOC eq.	4.89E-02	0.00E+00	4.70E-02	2.06E-06	3.84E-05	1.46E-04	1.26E-03	-9.09E-04
ADPm ¹	kg Sb eq.	1.06E-03	0.00E+00	4.12E-05	6.68E-10	2.66E-08	1.08E-07	2.43E-09	-2.12E-06
ADPf ¹	MJ	1.38E+02	0.00E+00	4.36E+02	9.15E-03	1.14E-01	1.66E-01	2.40E-02	-3.49E+00
WDP ¹	m ³ world eq. deprived	4.54E+00	0.00E+00	1.13E+01	1.71E-04	5.52E-04	1.87E-02	2.42E-03	-4.85E-02
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use								
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. *The results of this calculation is negative because of the exclusion of the A5 module from the scope of this project								

Table 22 - Core environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PM	[Disease incidence]	5.78E-07	0.00E+00	3.28E-07	3.11E-11	5.51E-10	1.16E-09	3.81E-06	-1.39E-08
IRP ²	[kBq U235 eq.]	8.30E-01	0.00E+00	1.22E+01	9.63E-05	1.73E-04	7.85E-04	2.38E-05	-3.36E-03
ETP-fw ¹	[CTUe]	1.11E+02	0.00E+00	4.60E+01	1.58E-03	1.63E-02	7.60E-01	2.05E+00	-5.79E-01
HTP-c ¹	[CTUh]	6.87E-09	0.00E+00	3.83E-09	8.56E-14	1.31E-12	4.59E-11	6.42E-08	-4.28E-11
HTP-nc ¹	[CTUh]	3.41E-07	0.00E+00	1.65E-07	4.21E-12	6.68E-11	2.10E-09	6.24E-09	-1.94E-09
SQP ¹	-	7.04E+01	0.00E+00	7.42E+01	1.38E-03	5.85E-02	1.65E-01	5.60E-02	-7.55E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality								
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. ² 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.								

Table 23 – Additional environmental impact indicators

RESOURCE USE PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PERE	[MJ]	1.58E+01	0.00E+00	1.02E+02	1.20E-03	2.22E-03	1.29E-02	3.75E-04	-2.19E-01
PERM	[MJ]	1.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.74E+01	0.00E+00	1.02E+02	1.20E-03	2.22E-03	1.29E-02	3.75E-04	-2.19E-01
PENRE	[MJ]	1.23E+02	0.00E+00	4.36E+02	9.15E-03	1.14E-01	-1.15E+01	-6.19E+00	-3.45E+00
PENRM	[MJ]	1.50E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.08E+01	-3.90E+00	8.85E-01
PENRT	[MJ]	1.38E+02	0.00E+00	4.36E+02	9.15E-03	1.14E-01	-2.24E+01	-1.01E+01	-2.57E+00
SM	[kg]	1.23E-01	0.00E+00	4.69E-02	9.40E-07	4.97E-05	5.13E-04	8.67E-06	1.17E-01
RSF	[MJ]	1.71E-02	0.00E+00	1.93E-04	4.49E-09	5.05E-07	5.61E-06	1.63E-07	-1.64E-05
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
FW	[m ³]	1.24E-01	0.00E+00	3.63E-01	4.80E-06	1.56E-05	2.29E-04	-3.54E-04	-9.85E-04
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water								

Table 24 - Parameters describing resource use

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 piece									
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Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
HWD	[kg]	1.11E+00	0.00E+00	9.94E-01	6.12E-05	1.48E-04	1.13E-02	4.21E-05	-6.15E-02
NHWD	[kg]	4.34E+01	0.00E+00	8.09E+01	1.48E-03	3.48E-03	2.38E-01	4.76E-01	-9.54E-01
RWD	[kg]	2.09E-04	0.00E+00	3.13E-03	2.41E-08	4.35E-08	2.00E-07	5.93E-09	-8.46E-07

CRU	[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
MFR	[kg]	2.78E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.83E-01	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	6.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.99E+00	0.00E+00	0.00E+00
EET	[MJ]	8.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.48E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								

Table 25 – End-of-life (waste categories and output flows)

BIOGENIC CARBON CONTENT PER 1 piece		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0.016

Table 26 – Biogenic carbon content at factory gate

1.1.1.5 Fire Switch 511940

ENVIRONMENTAL IMPACTS PER 1 piece									
Indicator	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	6.14E+00	0.00E+00	1.59E-01	7.10E-04	3.56E-03	2.90E-01	7.87E-02	-1.08E-01
GWP-fossil	kg CO ₂ eq.	6.13E+00	0.00E+00	1.59E-01	7.09E-04	3.56E-03	2.90E-01	7.87E-02	-1.08E-01
GWP-biogenic	kg CO ₂ eq.	-1.88E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO ₂ eq.	1.30E-02	0.00E+00	4.92E-04	1.39E-06	1.19E-06	8.49E-06	3.60E-07	-7.60E-05
ODP	kg CFC 11 eq.	1.59E-07	0.00E+00	2.75E-09	4.57E-12	7.11E-11	8.51E-11	1.43E-11	-3.33E-09
AP	mol H ⁺ eq.	4.29E-02	0.00E+00	8.08E-04	3.45E-06	1.06E-05	5.98E-05	9.84E-05	-4.40E-04
EP-freshwater	kg P eq.	3.94E-03	0.00E+00	1.41E-04	3.05E-07	2.32E-07	1.79E-06	5.81E-08	-3.51E-05
EP-marine	kg N eq.	7.21E-03	0.00E+00	1.40E-04	6.90E-07	3.57E-06	3.11E-05	5.50E-05	-7.69E-05
EP-	mol N	7.56E-02	0.00E+00	1.22E-03	6.95E-06	3.88E-05	2.60E-04	4.76E-04	-8.06E-04

terrestrial	eq.								
POCP	kg NMVOC eq.	3.31E-02	0.00E+00	4.04E-04	2.06E-06	1.68E-05	6.89E-05	4.40E-04	-4.91E-04
ADPm ¹	kg Sb eq.	7.59E-04	0.00E+00	3.54E-07	6.68E-10	1.16E-08	5.09E-08	1.24E-09	-6.94E-07
ADPf ¹	MJ	8.72E+01	0.00E+00	3.75E+00	9.15E-03	4.97E-02	7.58E-02	1.23E-02	-2.63E+00
WDP ¹	m ³ world eq. deprive d	2.44E+00	0.00E+00	9.71E-02	1.71E-04	2.41E-04	8.92E-03	8.60E-04	-2.75E-02
Caption	<p>GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification;</p> <p>EP-freshwater = Eutrophication - aquatic freshwater; EP-marine = Eutrophication - aquatic marine; EP-terrestrial = Eutrophication - terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential - minerals and metals; ADPf = Abiotic Depletion Potential - fossil fuels; WDP = water use</p>								
Disclaimer	<p>¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.</p> <p>*The results of this calculation is negative because of the exclusion of the A5 module from the scope of this project</p>								

Table 27 - Core environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PM	[Disease incidence]	3.67E-07	0.00E+00	2.82E-09	3.11E-11	2.41E-10	5.02E-10	1.32E-06	-3.99E-09
IRP ²	[kBq U235 eq.]	5.54E-01	0.00E+00	1.05E-01	9.63E-05	7.58E-05	3.69E-04	1.22E-05	-1.22E-02
ETP-fw ¹	[CTUe]	7.15E+01	0.00E+00	3.95E-01	1.58E-03	7.11E-03	2.89E-01	7.18E-01	-2.31E-01
HTP-c ¹	[CTUh]	3.91E-09	0.00E+00	3.29E-11	8.56E-14	5.71E-13	1.97E-11	2.23E-08	-2.05E-11
HTP-nc ¹	[CTUh]	1.87E-07	0.00E+00	1.42E-09	4.21E-12	2.92E-11	8.75E-10	2.19E-09	-8.45E-10
SQP ¹	-	3.66E+01	0.00E+00	6.38E-01	1.38E-03	2.56E-02	7.69E-02	2.86E-02	-3.67E-01
Caption	<p>PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Eco toxicity - freshwater; HTP-c = Human toxicity - cancer effects; HTP-nc = Human toxicity - non cancer effects; SQP = Soil Quality</p>								
Disclaimers	<p>¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.</p> <p>² 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.</p>								

Table 28 - Additional environmental impact indicators

RESOURCE USE PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D

PERE	[MJ]	8.34E+00	0.00E+00	8.77E-01	1.20E-03	9.70E-04	5.99E-03	1.92E-04	-1.50E-01
PERM	[MJ]	2.37E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	8.36E+00	0.00E+00	8.77E-01	1.20E-03	9.70E-04	5.99E-03	1.92E-04	-1.50E-01
PENRE	[MJ]	8.03E+01	0.00E+00	3.75E+00	9.15E-03	4.97E-02	-5.92E+00	-2.77E+00	-2.74E+00
PENRM	[MJ]	6.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.07E+00	-1.83E+00	1.17E+00
PENRT	[MJ]	8.72E+01	0.00E+00	3.75E+00	9.15E-03	4.97E-02	-1.10E+01	-4.60E+00	-1.56E+00
SM	[kg]	5.78E-02	0.00E+00	4.03E-04	9.40E-07	2.18E-05	2.59E-04	4.43E-06	3.97E-02
RSF	[MJ]	1.07E-02	0.00E+00	1.66E-06	4.49E-09	2.21E-07	2.50E-06	8.31E-08	-3.69E-06
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
FW	[m ³]	6.83E-02	0.00E+00	3.12E-03	4.80E-06	6.80E-06	1.02E-04	-1.82E-04	-8.12E-04
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water								

Table 29 - Parameters describing resource use

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
HWD	[kg]	6.99E-01	0.00E+00	8.55E-03	6.12E-05	6.46E-05	4.82E-03	2.15E-05	-9.47E-03
NHWD	[kg]	3.01E+01	0.00E+00	6.95E-01	1.48E-03	1.52E-03	1.18E-01	2.45E-01	-7.01E-01
RWD	[kg]	1.39E-04	0.00E+00	2.69E-05	2.41E-08	1.90E-08	9.41E-08	3.03E-09	-3.11E-06

CRU	[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
MFR	[kg]	3.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.16E-02	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	5.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.06E+00	0.00E+00	0.00E+00
EET	[MJ]	8.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								

Table 30 – End-of-life (waste categories and output flows)

BIOGENIC CARBON CONTENT PER 1 piece		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0.002

Table 31 – Biogenic carbon content at factory gate

1.1.1.6 Comfort switch

ENVIRONMENTAL IMPACTS PER 1 piece									
Indicator	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	3.41E+00	0.00E+00	4.22E-04	7.10E-04	4.38E-03	4.68E-01	1.03E-02	-1.73E-01
GWP-fossil	kg CO ₂ eq.	3.41E+00	0.00E+00	4.21E-04	7.09E-04	4.38E-03	4.68E-01	1.03E-02	-1.73E-01
GWP-biogenic	kg CO ₂ eq.	-6.59E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO ₂ eq.	1.40E-03	0.00E+00	1.31E-06	1.39E-06	1.46E-06	1.18E-05	6.36E-07	-1.24E-04
ODP	kg CFC 11 eq.	9.60E-09	0.00E+00	7.29E-12	4.57E-12	8.74E-11	1.13E-10	2.53E-11	-5.33E-09
AP	mol H ⁺ eq.	1.50E-02	0.00E+00	2.14E-06	3.45E-06	1.31E-05	8.87E-05	6.95E-06	-7.05E-04
EP-freshwater	kg P eq.	3.77E-04	0.00E+00	3.75E-07	3.05E-07	2.85E-07	2.64E-06	1.02E-07	-5.66E-05
EP-marine	kg N eq.	5.24E-03	0.00E+00	3.72E-07	6.90E-07	4.39E-06	4.75E-05	2.27E-05	-1.23E-04
EP-terrestrial	mol N eq.	2.90E-02	0.00E+00	3.23E-06	6.95E-06	4.78E-05	3.92E-04	2.84E-05	-1.29E-03
POCP	kg NMVOC eq.	9.36E-03	0.00E+00	1.07E-06	2.06E-06	2.07E-05	1.03E-04	1.23E-05	-7.83E-04
ADPm ¹	kg Sb eq.	8.46E-06	0.00E+00	9.39E-10	6.68E-10	1.43E-08	8.55E-08	2.19E-09	-1.11E-06
ADPF ¹	MJ	5.36E+01	0.00E+00	9.95E-03	9.15E-03	6.11E-02	1.03E-01	2.18E-02	-4.22E+00
WDP ¹	m ³ world eq. deprived	3.76E+00	0.00E+00	2.58E-04	1.71E-04	2.97E-04	1.30E-02	1.06E-04	-4.44E-02
Caption	<p>GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification;</p> <p>EP-freshwater = Eutrophication - aquatic freshwater; EP-marine = Eutrophication - aquatic marine; EP-terrestrial = Eutrophication - terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential - minerals and metals; ADPF = Abiotic Depletion Potential - fossil fuels; WDP = water use</p>								
Disclaimer	<p>¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.</p> <p>*The results of this calculation is negative because of the exclusion of the A5 module from the scope of this project</p>								

Table 32 - Core environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PM	[Disease incidence]	1.53E-07	0.00E+00	7.49E-12	3.11E-11	2.96E-10	9.92E-10	1.57E-10	-6.35E-09
IRP ²	[kBq U235 eq.]	6.11E-02	0.00E+00	2.78E-04	9.63E-05	9.31E-05	5.47E-04	2.14E-05	-2.00E-02
ETP-fw ¹	[CTUe]	5.83E+00	0.00E+00	1.05E-03	1.58E-03	8.75E-03	1.59E-01	3.17E-02	-3.72E-01
HTP-c ¹	[CTUh]	3.95E-10	0.00E+00	8.74E-14	8.56E-14	7.02E-13	2.41E-11	5.04E-13	-3.29E-11
HTP-nc ¹	[CTUh]	1.10E-08	0.00E+00	3.76E-12	4.21E-12	3.59E-11	8.09E-10	9.87E-11	-1.36E-09
SQP ¹	-	5.99E+00	0.00E+00	1.69E-03	1.38E-03	3.14E-02	1.34E-01	5.06E-02	-5.90E-01

Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality
Disclaimers	<p>¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.</p> <p>² 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.</p>

Table 33 – Additional environmental impact indicators

RESOURCE USE PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PERE	[MJ]	1.39E+00	0.00E+00	2.33E-03	1.20E-03	1.19E-03	8.93E-03	3.37E-04	-2.44E-01
PERM	[MJ]	8.29E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.47E+00	0.00E+00	2.33E-03	1.20E-03	1.19E-03	8.93E-03	3.37E-04	-2.44E-01
PENRE	[MJ]	4.14E+01	0.00E+00	9.95E-03	9.15E-03	6.11E-02	-1.03E+01	-3.33E+00	-4.22E+00
PENRM	[MJ]	1.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.75E+00	-2.79E+00	1.89E+00
PENRT	[MJ]	5.19E+01	0.00E+00	9.95E-03	9.15E-03	6.11E-02	-1.80E+01	-6.12E+00	-2.33E+00
SM	[kg]	1.60E-02	0.00E+00	1.07E-06	9.40E-07	2.67E-05	4.43E-04	7.82E-06	5.90E-02
RSF	[MJ]	1.21E-02	0.00E+00	4.39E-09	4.49E-09	2.72E-07	3.78E-06	1.47E-07	-5.95E-06
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
FW	[m ³]	8.97E-02	0.00E+00	8.27E-06	4.80E-06	8.36E-06	1.22E-04	-3.16E-04	-1.31E-03
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water								

Table 34 - Parameters describing resource use

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
HWD	[kg]	9.28E-02	0.00E+00	2.27E-05	6.12E-05	7.94E-05	4.88E-03	3.79E-05	-1.49E-02
NHWD	[kg]	2.24E+00	0.00E+00	1.84E-03	1.48E-03	1.87E-03	1.91E-01	4.25E-01	-1.12E+00
RWD	[kg]	1.54E-05	0.00E+00	7.14E-08	2.41E-08	2.34E-08	1.40E-07	5.33E-09	-5.13E-06

CRU	[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
MFR	[kg]	3.32E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-01	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	8.60E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.56E+00	0.00E+00	0.00E+00
EET	[MJ]	1.10E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.89E+00	0.00E+00	0.00E+00

Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy
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Table 35 – End-of-life (waste categories and output flows)

BIOGENIC CARBON CONTENT PER 1 piece		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0.002

Table 36 – Biogenic carbon content at factory gate

1.1.1.7 Wind and rain sensor

ENVIRONMENTAL IMPACTS PER 1 piece									
Indicator	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1.54E+01	0.00E+00	5.84E+00	7.10E-04	1.17E-02	7.66E-01	1.60E-01	-5.31E-01
GWP-fossil	kg CO ₂ eq.	1.53E+01	0.00E+00	5.82E+00	7.09E-04	1.17E-02	7.66E-01	1.60E-01	-5.30E-01
GWP-biogenic	kg CO ₂ eq.	-6.59E-03*	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO ₂ eq.	7.66E-02	0.00E+00	1.81E-02	1.39E-06	3.91E-06	2.63E-05	1.09E-06	-2.30E-04
ODP	kg CFC 11 eq.	3.45E-07	0.00E+00	1.01E-07	4.57E-12	2.34E-10	2.38E-10	4.48E-11	-9.53E-09
AP	mol H ⁺ eq.	1.03E-01	0.00E+00	2.97E-02	3.45E-06	3.49E-05	1.81E-04	1.98E-04	-2.14E-03
EP-freshwater	kg P eq.	8.78E-03	0.00E+00	5.20E-03	3.05E-07	7.61E-07	6.44E-06	1.74E-07	-1.98E-04
EP-marine	kg N eq.	2.00E-02	0.00E+00	5.15E-03	6.90E-07	1.17E-05	9.34E-05	1.18E-04	-4.19E-04
EP-terrestrial	mol N eq.	1.83E-01	0.00E+00	4.47E-02	6.95E-06	1.28E-04	7.52E-04	9.55E-04	-4.50E-03
POCP	kg NMVOC eq.	8.07E-02	0.00E+00	1.48E-02	2.06E-06	5.52E-05	2.04E-04	8.74E-04	-2.09E-03
ADPm ¹	kg Sb eq.	1.56E-03	0.00E+00	1.30E-05	6.68E-10	3.82E-08	2.16E-07	3.69E-09	-4.22E-06
ADPF ¹	MJ	2.11E+02	0.00E+00	1.38E+02	9.15E-03	1.63E-01	2.26E-01	3.84E-02	-9.14E+00
WDP ¹	m ³ world eq. deprived	8.04E+00	0.00E+00	3.57E+00	1.71E-04	7.92E-04	2.36E-02	1.75E-03	-1.14E-01
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication - aquatic freshwater; EP-marine = Eutrophication - aquatic marine; EP-terrestrial = Eutrophication - terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential - minerals and metals; ADPF = Abiotic Depletion Potential - fossil fuels; WDP = water use								
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. *The results of this calculation is negative because of the exclusion of the A5 module from the scope of this project								

Table 37 - Core environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PM	[Disease incidence]	8.97E-07	0.00E+00	1.04E-07	3.11E-11	7.91E-10	4.24E-09	2.61E-06	-2.68E-08
IRP ²	[kBq U235 eq.]	1.21E+00	0.00E+00	3.85E+00	9.63E-05	2.49E-04	1.14E-03	3.61E-05	-2.30E-02
ETP-fw ¹	[CTUe]	1.71E+02	0.00E+00	1.45E+01	1.58E-03	2.34E-02	7.66E-01	1.43E+00	-1.21E+00
HTP-c ¹	[CTUh]	9.92E-09	0.00E+00	1.21E-09	8.56E-14	1.88E-12	7.35E-11	4.40E-08	-9.35E-11
HTP-nc ¹	[CTUh]	4.34E-07	0.00E+00	5.21E-08	4.21E-12	9.59E-11	2.28E-09	4.35E-09	-4.18E-09
SQP ¹	-	8.27E+01	0.00E+00	2.34E+01	1.38E-03	8.40E-02	3.83E-01	8.75E-02	-1.68E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Eco toxicity - freshwater; HTP-c = Human toxicity - cancer effects; HTP-nc = Human toxicity - non cancer effects; SQP = Soil Quality								
Disclaimers	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. ² 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.								

Table 38 – Additional environmental impact indicators

RESOURCE USE PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PERE	[MJ]	2.09E+01	0.00E+00	3.22E+01	1.20E-03	3.19E-03	2.03E-02	5.67E-04	-5.52E-01
PERM	[MJ]	8.29E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.10E+01	0.00E+00	3.22E+01	1.20E-03	3.19E-03	2.03E-02	5.67E-04	-5.52E-01
PENRE	[MJ]	1.97E+02	0.00E+00	1.38E+02	9.15E-03	1.63E-01	-1.58E+01	-6.82E+00	-9.14E+00
PENRM	[MJ]	1.38E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.02E+01	-3.66E+00	3.08E+00
PENRT	[MJ]	2.11E+02	0.00E+00	1.38E+02	9.15E-03	1.63E-01	-2.60E+01	-1.05E+01	-6.07E+00
SM	[kg]	2.09E-01	0.00E+00	1.48E-02	9.40E-07	7.14E-05	7.52E-04	1.33E-05	2.33E-01
RSF	[MJ]	2.17E-02	0.00E+00	6.08E-05	4.49E-09	7.25E-07	1.14E-05	2.52E-07	-3.02E-05
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
FW	[m ³]	2.09E-01	0.00E+00	1.15E-01	4.80E-06	2.23E-05	2.68E-04	-4.82E-04	-2.68E-03
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water								

Table 39 - Parameters describing resource use

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 piece

Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
HWD	[kg]	1.74E+00	0.00E+00	3.14E-01	6.12E-05	2.12E-04	1.18E-02	6.38E-05	-1.06E-01
NHWD	[kg]	6.72E+01	0.00E+00	2.55E+01	1.48E-03	4.99E-03	3.24E-01	6.56E-01	-2.47E+00
RWD	[kg]	3.05E-04	0.00E+00	9.89E-04	2.41E-08	6.25E-08	2.89E-07	8.98E-09	-5.86E-06

CRU	[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
MFR	[kg]	3.27E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.20E-01	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	7.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.47E+00	0.00E+00	0.00E+00
EET	[MJ]	9.90E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.23E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								

Table 40 – End-of-life (waste categories and output flows)

BIOGENIC CARBON CONTENT PER 1 piece		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0.001

Table 41 – Biogenic carbon content at factory gate

1.1.1.8 Smoke detector

ENVIRONMENTAL IMPACTS PER 1 piece									
Indicator	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1.69E+00	0.00E+00	6.82E-03	7.10E-04	1.50E-03	5.64E-02	1.30E-02	-9.38E-02
GWP-fossil	kg CO ₂ eq.	1.69E+00	0.00E+00	6.79E-03	7.09E-04	1.50E-03	5.64E-02	1.30E-02	-9.38E-02
GWP-biogenic	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	0.00E+00
GWP-luluc	kg CO ₂ eq.	2.39E-03	0.00E+00	2.11E-05	1.39E-06	5.02E-07	2.99E-06	1.06E-07	-2.34E-05
ODP	kg CFC 11 eq.	3.71E-08	0.00E+00	1.18E-10	4.57E-12	3.00E-11	2.29E-11	4.61E-12	-8.81E-10
AP	mol H ⁺ eq.	1.13E-02	0.00E+00	3.46E-05	3.45E-06	4.49E-06	1.92E-05	1.65E-05	-3.74E-04
EP-freshwater	kg P eq.	9.80E-04	0.00E+00	6.06E-06	3.05E-07	9.77E-08	8.76E-07	1.65E-08	-3.81E-05
EP-marine	kg N eq.	1.84E-03	0.00E+00	6.01E-06	6.90E-07	1.51E-06	9.66E-06	9.47E-06	-7.90E-05
EP-terrestrial	mol N eq.	1.95E-02	0.00E+00	5.22E-05	6.95E-06	1.64E-05	7.24E-05	7.93E-05	-8.59E-04
POCP	kg NMVOC eq.	7.92E-03	0.00E+00	1.73E-05	2.06E-06	7.09E-06	2.07E-05	7.19E-05	-3.34E-04

ADPm ¹	kg Sb eq.	1.49E-04	0.00E+00	1.52E-08	6.68E-10	4.91E-09	3.34E-08	3.42E-10	-8.42E-07
ADPf ¹	MJ	2.30E+01	0.00E+00	1.61E-01	9.15E-03	2.09E-02	2.43E-02	3.94E-03	-1.17E+00
WDP ¹	m ³ world eq. deprived	5.60E-01	0.00E+00	4.16E-03	1.71E-04	1.02E-04	1.89E-03	1.45E-04	-1.75E-02
Caption	<p>GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification;</p> <p>EP-freshwater = Eutrophication - aquatic freshwater; EP-marine = Eutrophication - aquatic marine; EP-terrestrial = Eutrophication - terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential - minerals and metals; ADPf = Abiotic Depletion Potential - fossil fuels; WDP = water use</p>								
Disclaimer	¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								

Table 42 - Core environmental impact indicators

ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PM	[Disease incidence]	1.05E-07	0.00E+00	1.21E-10	3.11E-11	1.02E-10	9.31E-10	2.14E-07	-5.60E-09
IRP ²	[kBq U235 eq.]	1.54E-01	0.00E+00	4.49E-03	9.63E-05	3.19E-05	1.25E-04	3.34E-06	3.69E-04
ETP-fw ¹	[CTUe]	2.44E+01	0.00E+00	1.69E-02	1.58E-03	3.00E-03	8.80E-02	1.17E-01	-2.23E-01
HTP-c ¹	[CTUh]	1.58E-09	0.00E+00	1.41E-12	8.56E-14	2.41E-13	1.09E-11	3.61E-09	-1.56E-11
HTP-nc ¹	[CTUh]	5.35E-08	0.00E+00	6.07E-11	4.21E-12	1.23E-11	2.21E-10	3.55E-10	-7.39E-10
SQP ¹	-	9.22E+00	0.00E+00	2.73E-02	1.38E-03	1.08E-02	6.67E-02	8.61E-03	-2.82E-01
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation - human health; ETP-fw = Eco toxicity - freshwater; HTP-c = Human toxicity - cancer effects; HTP-nc = Human toxicity - non cancer effects; SQP = Soil Quality								
Disclaimers	<p>¹ The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.</p> <p>² 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.</p>								

Table 43 - Additional environmental impact indicators

RESOURCE USE PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
PERE	[MJ]	3.05E+00	0.00E+00	3.76E-02	1.20E-03	4.09E-04	2.57E-03	5.22E-05	-7.48E-02
PERM	[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
PERT	[MJ]	3.05E+00	0.00E+00	3.76E-02	1.20E-03	4.09E-04	2.57E-03	5.22E-05	-7.48E-02
PENRE	[MJ]	2.19E+01	0.00E+00	1.61E-01	9.15E-03	2.09E-02	-1.13E+00	-5.06E-01	-1.17E+00
PENRM	[MJ]	1.12E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.26E-01	-2.98E-01	2.20E-01
PENRT	[MJ]	2.30E+01	0.00E+00	1.61E-01	9.15E-03	2.09E-02	-1.96E+00	-8.04E-01	-9.50E-01
SM	[kg]	5.34E-02	0.00E+00	1.73E-05	9.40E-07	9.17E-06	6.83E-05	1.25E-06	4.74E-02

RSF	[MJ]	1.47E-03	0.00E+00	7.09E-08	4.49E-09	9.31E-08	1.93E-06	2.42E-08	-6.74E-06
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
FW	[m ³]	1.74E-02	0.00E+00	1.34E-04	4.80E-06	2.87E-06	2.39E-05	-3.35E-05	-3.17E-04
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water								

Table 44 - Parameters describing resource use

WASTE CATEGORIES AND OUTPUT FLOWS PER 1 piece									
Parameter	Unit	A1-A3	B1-B5, B7	B6	C1	C2	C3	C4	D
HWD	[kg]	5.17E-01	0.00E+00	3.66E-04	6.12E-05	2.72E-05	9.71E-04	5.89E-06	-2.60E-02
NHWD	[kg]	7.48E+00	0.00E+00	2.98E-02	1.48E-03	6.41E-04	2.66E-02	4.72E-02	-3.23E-01
RWD	[kg]	3.90E-05	0.00E+00	1.15E-06	2.41E-08	8.02E-09	3.15E-08	8.29E-10	1.01E-07
CRU	[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
MFR	[kg]	3.32E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.59E-02	0.00E+00	0.00E+00
MER	[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
EEE	[MJ]	1.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.96E-01	0.00E+00	0.00E+00
EET	[MJ]	7.20E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.44E-01	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								

Table 45 – End-of-life (waste categories and output flows)

BIOGENIC CARBON CONTENT PER 1 piece		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	0.001

Table 46 – Biogenic carbon content at factory gate

Additional information

LCA interpretation

1. SVM EI (216100/227417)

SVM EI products use a combination of plastics, electronic components (e.g., printed circuit boards), and metals, which are major contributors to the high impacts in A1 (Raw Material Extraction). These materials are energy-intensive to extract and process, leading to substantial CO₂e emissions.

- SVM EI 227417 exhibits the highest CO₂e emissions among the SVM EI products, primarily driven by:

- Raw Material Extraction and Processing (A1): This is the largest contributor, indicating resource-intensive material inputs.
- Manufacturing (A3): A significant impact, likely due to energy-intensive production techniques.
- Transportation (A2 and A4): These stages contribute moderately but could be improved by localizing raw material sourcing or using lower-emission transport methods.

A good recommendation will be to Focus on sustainable material selection and optimizing manufacturing processes to reduce A1 and A3 impacts.

2. SV (218600/ 218100)

SV products use a combination of plastics, electronic components (e.g., printed circuit boards), and metals. Electronics are significant due to their complex, high-impact manufacturing.

- SV 218600 has the highest emissions in this group. Key contributors include:
 - A1 (Raw Material Extraction): Similar to SVM EI products, this phase dominates the emissions.
 - A3 (Manufacturing): Production processes contribute significantly, suggesting a need for energy optimization.

A good recommendation will be to emphasize sustainable raw materials and explore renewable energy options for manufacturing.

3. SVL (22890602/22800220)

SVL products incorporate advanced materials like coated metals and durable polymers to ensure longevity in harsh environments.

- SVL 22890602 records the highest CO₂e emissions, particularly from:
 - A1 (Raw Material Extraction): High emissions indicate reliance on materials with significant embedded carbon.
 - A3 (Manufacturing): A secondary but still substantial contributor.

A good recommendation will be to investigate opportunities to replace high-emission materials with recycled or low-impact alternatives and streamline production processes.

4. Flexbox (121360/121431)

Flexbox products use polymers extensively, making raw material sourcing (A1) and manufacturing (A3) the dominant impact contributors.

- Flexbox 121360 has higher emissions, driven by:
 - A1 (Raw Material Extraction): The dominant phase, reflecting the material composition's environmental impact.
 - A3 (Manufacturing): Contributes significantly but less than A1.

A good recommendation is to enhance material efficiency and consider modular design options to reduce material use.

5. Fire Switch (511881/511940/511781/511729)

Fire Switches combine electronic circuits with polymer housings and metal contacts. Electronics are particularly impactful in A1 and A3.

- Fire Switch 511881 shows the highest emissions among the Fire Switches. Key sources are:

- A1 (Raw Material Extraction): Reflects the embedded carbon of components like plastics or metals.
- A3 (Manufacturing): Significant due to the complexity of manufacturing electronic components.

A good recommendation is to optimize raw material sourcing and enhance energy efficiency during manufacturing.

6. Wind and Rain sensor (111961)

Sensors rely on durable polymers, electronics, and precision components. Their environmental impact is largely concentrated in the extraction of rare-earth metals and manufacturing processes.

- This product's emissions are predominantly from:
 - A1 (Raw Material Extraction): Likely due to the specific materials required for weatherproofing and sensors.
 - A3 (Manufacturing): A smaller yet notable contributor.

A good recommendation is to explore lightweight and low-carbon materials to reduce the A1 phase impact.

7. Smoke detector (111740)

Smoke detectors utilize plastic housings, electronic circuits, and small sensors, leading to impacts from A1 and A3.

- The smoke detector's emissions are heavily influenced by:
 - A1 (Raw Material Extraction): Reflecting the use of sensitive and durable materials required for functionality.
 - A3 (Manufacturing): Contributing significantly due to precision manufacturing processes.

A good recommendation is to investigate alternative sensor materials with lower carbon footprints and improve production energy efficiency.

8. Comfort Switch (111944)

Comfort Switches use polymers, metals, and electronic circuits, similar to Fire Switches, making A1 and A3 significant contributors.

- The Comfort Switch's emissions primarily stem from:
 - A1 (Raw Material Extraction): Embedded carbon in the materials used.
 - A3 (Manufacturing): Contributes to the overall impact, though to a lesser extent than A1.

A good recommendation is to focus on material efficiency and investigate ways to streamline manufacturing.

Technical information on scenarios

Reference service life

RSL information	Description	Unit
Reference service Life	10	Years
Declared product properties	The declared unit is a ready to use product	
Design application parameters	The products are applied for control monitorisation of window opening systems	
Assumed quality of work	Technical specifications and guidance can be obtained at https://actulux.dk/?lang=en or by directly contacting Actulux	
Maintenance	The products are inspected once a year and for the SV products, the batteries get changed every 3-5 years	

Use (B1-B7)

Scenario information	Description	Unit
B2 - Maintenance		
Maintenance process	Yearly inspection is necessary as well as battery change each 3-5 years for SV products	
Maintenance cycle	1	/year
B6 – Use of energy		
Type of energy carrier	Market for EU average electricity	

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

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General programme instructions

General Programme Instructions, version 2.0, spring 2020
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EN 15804

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