Environmental Product Declaration

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

Flow switch

from

AB Industrietechnik S.R.L

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products from a company
EPD registration number:	EPD-IES-0029313
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	An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
PCR 2019:14 Construction products, version 2.0.1
PCR review was conducted by: *<name and organisation of the review chair, and information on how to contact the chair through the programme operator>*
Life Cycle Assessment (LCA)
LCA accountability: Festo C.T.E

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: Mr. Guido Croce Approved by: International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: AB Industrietechnik S.R.L. VAT nr: IT 02748450216
Address: Via Julius Durst 50 - 39042 - Bressanone (BZ)
Contact: Corbellini Paride, Paride.Corbellini@industrietechnik.it

Description of the organisation: Founded in 1981 and based in Bressanone (Bolzano), Italy, AB Industrietechnik is a specialist manufacturer of high-precision devices and components for HVAC/R (Heating, Ventilation, Air Conditioning and Refrigeration) and building automation systems.
The company develops and produces a wide range of products, including flow switches, valves and actuators, flow meters, sensors, transmitters, and controllers for fan coils and air-handling units. All products are designed in-house by a dedicated R&D team and manufactured in modern facilities that ensure high quality and performance. Operating internationally, AB Industrietechnik serves OEMs, system integrators, and distributors in more than 60 countries.

Product-related or management system-related certifications: UNI ISO 45001:2018, UNI EN ISO 9001:2015.

PRODUCT INFORMATION

Product name: Flow switch
Product identification: Flow switch

UN CPC code: The product group classification for the assessed product is UN CPC 48252
Product description: The product under study is a generic flow switch manufactured by AB Industrietechnik. A flow switch is a device designed to monitor the movement of liquids in a piping system and to activate a signal or control action when the flow reaches a certain threshold. The flow switches considered in this study feature a brass body and paddles, ensuring reliability and durability. This product commonly used in heating and cooling systems, refrigeration units, and heat pumps to ensure that fluid circulation occurs correctly and to protect equipment from damage due to insufficient flow.
The device features a threaded R1″ body, designed for easy installation in standard pipelines, and can withstand a maximum pressure of 1.1 MPa. It allows for adjustable flow detection, covering a wide range of flow rates, making it suitable for different system configurations. The switch is equipped with a reliable electrical contact system that operates at 24–250 V AC and can handle up to 15 A, ensuring

compatibility with most control circuits. The housing has an IP65 protection rating, meaning it is dust-tight and resistant to water jets, making it suitable for harsh environments.
The flow switch operates under ambient humidity between 10 % and 90 % (non-condensing) and can be stored at temperatures from –40 °C to +85 °C. The transparent polycarbonate cover, ABS base, and AISI 316L stainless-steel paddles ensure durability, corrosion resistance, and long service life. By continuously monitoring liquid flow, the product contributes to system efficiency and safety, preventing malfunctions and optimizing operational performance.
The following flow switch codes are represented by the declared unit: SF1E/EM, SF1E/HW, SF1E/N, SF1E/RE, SF1E, SF1K/DY, SF1K/HY, SF1K/ITH, SF1K/KO, SF1K/OR, SF1K/RE, SF1K/RL, SF1K/SIKA, SF1K/SY, SF1K/TCG, SF1K, SF1K/N, FLS304X, FLS304XT.

Name and location of production site(s): AB Industrietechnik S.R.L., Via Julius Durst 50 - 39042 - Bressanone (BZ).
References to any relevant websites for more information or explanatory materials:
https://www.industrietechnik.it

EPD shall not include rating, judgements, or direct comparisons with other products or companies.
“Other products” include previous or alternative versions of the studied product, i.e., the EPD shall not display changes in the environmental performance results of a product over time, or differences with regard to a hypothetical version of the product using, e.g., alternative production processes or input materials.
“Other companies” means that the EPD shall not in any way imply that the EPD owner is, for example, “a market leader” or “more sustainable” (or similar) compared to its competitors.

CONTENT DECLARATION

The mass (weight) of one unit of product per declared unit is 545,16 grams.
The flow switch contains two components made of brass (the body and the lever) and a microswitch with metallic parts, some of which include lead. According to the technical data sheet, the brass used in the body and in the lever contains approximately 2 % of lead, while the microswitch includes lead in metallic parts (>0.1 % by weight of the component) in accordance with exemptions 6(a) and 6(c) of the RoHS Directive (2011/65/EU). Considering the total mass of these parts, the overall lead content in the flow switch is about 1.1 % by weight.

The declared share of biogenic materials has shown below per declared unit:

Product content	Mass, g	Post-consumer recycled material, mass-% of product	Weight, %	Biogenic material, kg C/product or declared unit
Plastic	165	0%	30%	
Steel	70	0%	13%	
Brass	303	0%	56%	
Bronze	3	0%	1%	

Tin	3	0%	1%	
Copper	1	0%	0%	
TOTAL	**545**		**100%**	

Packaging materials	Mass, kg	Weight, %	Biogenic material, kg C/product or declared unit
Paper	11	8%	2,47E-01
Paperboard	121	91%	4,50E-01
Plastic	2	1%	
TOTAL	**134**	**100%**	**6,97E-01**

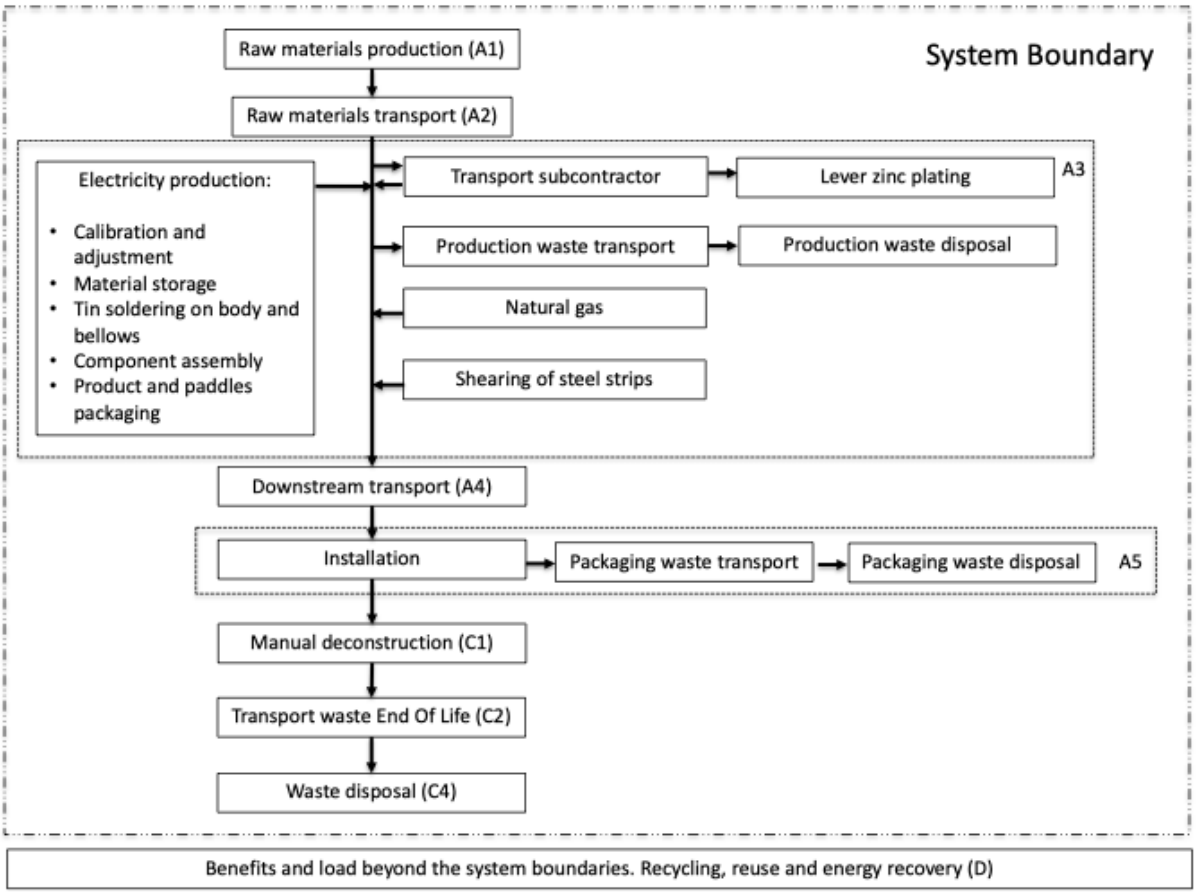
1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
Lead	1907/2006	7439-92-1	1,1%

LCA INFORMATION

Declared unit: 1 piece
Reference service life: 10 years
Time representativeness: 2024
Geographical scope: Global
Database(s) and LCA software used: The characterization factors were mainly found in the Ecoinvent v. 3.11 database of 2024 and software used is SimaPro 10.3.0.1.
Description of system boundaries: The LCA study, applying a cradle-to-gate with option methodology (A1-A3, A4, A5, C1-C4 and D), type b). B modules are excluded from the analyses since no use phase maintenance, repair or replacement and energy consumption is expected during the technical lifetime.

Process flow diagram:



- A1 – Raw Material Supply: Extraction and processing of raw materials used in the production phase.
- A2 – Transport of Raw Materials: Transportation of raw materials and semi-finished products from suppliers to the manufacturing site. Includes all transport-related inputs such as fuel consumption and emissions.
- A3 – Manufacturing: All processes at the production site, including electricity and natural gas production and consumption, auxiliary material consumption, packaging production, outsourced processing, as well as waste generation during manufacturing. In the manufacturing processes, there are produced metal scraps, they are sent to recycling.
- A4 – Transport: Transportation of final products from the production site to the resellers.
- A5 – Construction/installation: It includes all environmental impacts associated with the installation of the product to the construction site, site preparation, and installation activities such as energy use, auxiliary materials, and waste generation during construction.
- C1 – Deconstruction and Demolition: Activities involved in dismantling or demolition of the product at the end of its life, including energy use and emissions associated with these operations.
- C2 – Transport at End-of-Life: Transportation of the discarded product or its components to waste processing or disposal facilities.
- C4 – Disposal: Final disposal of materials that are not recycled or recovered, including landfilling or incineration, with associated emissions and environmental impacts.
- D – Benefits and Loads Beyond the System Boundary (out of system boundary): Potential environmental benefits or burdens related to reuse, recovery, or recycling of materials and

energy at the end of life, which occur outside the boundaries of the product system (e.g., substitution of primary materials or energy in other systems).

More information:
The calculations for the study were made on the unit of flow switch, which weighs 545,16 grams. The company provided the BoM for the product; therefore, all raw materials required for its manufacturing were considered in the analysis. Accordingly, the quantities of raw materials were directly provided by the company, along with information on the respective suppliers and the distances from them. Regarding energy consumption, the company's annual electricity and natural gas data were available and were therefore re-proportioned to the flow switch based on its mass share of total production. The same approach was applied to transportation to customers: the company supplied data on all customers as well as on those specifically related to the flow switch families. The tonne-kilometres for the declared unit were calculated by proportioning total transport activities by mass. Those assumptions are based on a hypothesis of linearity between production and inputs.
In this LCA study the repartition procedure for recycling used follows the "polluter pays principles" model, where impacts are assigned directly to the product that generates them. In this way the environmental loads from raw material production and the disposal impacts of the waste portion are totally allocated to the first life of the product, while to the recycled product (second life of the materials) the impacts of the recycling or recovery process are assigned instead.

Data quality: The quality of data used in this study has been assessed based on the criteria of completeness, temporal representativeness, geographical coverage, and technological relevance, as defined in EN 15804:2012+A2:2019, clause 6.3.7. In line with Table E.2 of the same standard, the overall data quality is considered fair. For some processes, generic and proxy data from Ecoinvent 3.11 were used to ensure methodological consistency. Proxy data refer to modified or combined datasets adjusted to better represent specific materials and manufacturing conditions.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Raw materials	Database	Ecoinvent 3.11	2024	Secondary data	0,00%
Raw material packaging	Database	Ecoinvent 3.11	2024	Secondary data	0,00%
Transport raw material	Database	Ecoinvent 3.11	2024	Primary data	0,56%
Transport packaging	Database	Ecoinvent 3.11	2024	Primary data	0,07%
Transports Subcontractor	Database	Ecoinvent 3.11	2024	Primary data	0,01%
Lever zinc coating	Database	Ecoinvent 3.11	2024	Primary data	0,08%
Energy (Electricity, Gas)	Database	Ecoinvent 3.11	2024	Primary data	6,93%
Transport waste	Database	Ecoinvent 3.11	2024	Primary data	0,00%
Total share of primary data, of GWP-GHG results for A1-A3					**7,65%**

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories. Emissions related to infrastructures and capital goods are included in the modelling.

Exclusions: activities that are not directly linked to the physical life cycle of the product have also been excluded. These comprise, for instance, business travel of personnel, commuting to and from the workplace, as well as research and development activities. Also, tools for mechanical processing and maintenance, such as oils and lubricants have been excluded from the system. These processes, although relevant to the broader organizational context, do not contribute significantly to the specific environmental profile of the product and are thus considered negligible in the scope of this study.

Climate impact of electricity: The company directly provided the electricity bills reporting their power consumption for 2024. These consumptions refer to the total production of AB Industrietechnik; therefore, a mass-based repartition was applied to derive the share attributable to the flow switch. The electricity use includes the execution of several steps along the production chain: calibration, material storage, component assembly, tin soldering on the body and bellows, and packaging of the paddles and the final product. The selected emission factor for electricity is *electricity, medium voltage, residual mix – IT*, with an impact of 0,68 kg CO_2/kWh (GWP-GHG indicator). The impact associated with the purchase of this electricity amounts to 0,43 kg CO_2/DU (GWP-GHG indicator).

End of life modelling: In the present study, the dismantling phase was considered negligible (C1), as the removal of the flow switch from the system in which it is installed does not require dedicated machinery or significant energy consumption. Consequently, no environmental impact was associated with this stage. This approach was confirmed by the manufacturer, which specified that the product can be manually removed during maintenance or replacement activities, without the use of diesel-powered or other mechanical equipment.
For the transport of waste (C2), according to Table 4 of the reference PCR Construction Products 2.0.1, 80 km distance from destination was estimated and multiplied by the weight of declared unit. The flow switch is assumed to be disposed of in a sanitary landfill (C4), as the separation of its constituent materials is highly complex. This represents a conservative end-of-life scenario. As consequence, no waste processing operations such as sorting or shredding are considered (C3).

For the end-of-life of the packaging, Module A5 was modelled, as the flow switch packaging contains biogenic carbon. This packaging consists of labels, a cardboard box, and a small plastic bag for the paddles. Since the majority of the company's flow switches are sold in Europe, the packaging end-of-life was modelled using Eurostat statistics and the values reported in Annex C – End-of-Life Recycling Processes of the European Platform on Life Cycle Assessment (EPLCA).

For Module D, the impacts related to the recycling of the packaging and the corresponding avoided virgin material production were accounted for. In addition, the avoided production of energy (electricity and heat) generated from the incineration of the remaining packaging fraction was considered. The transport to the recycling site was also included.

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	EU	EU	GLO	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Share of primary data	8%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	9,44E+00	1,12E-01	2,00E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,30E-03	0,00E+00	3,18E-01	7,69E-04
GWP-fossil	kg CO_2 eq.	9,33E+00	1,12E-01	1,02E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,30E-03	0,00E+00	6,49E-02	-2,76E-02
GWP-biogenic	kg CO_2 eq.	9,39E-02	6,14E-05	1,90E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,69E-06	0,00E+00	2,53E-01	2,89E-02
GWP-luluc	kg CO_2 eq.	1,64E-02	4,11E-05	3,03E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,75E-06	0,00E+00	6,08E-06	-5,14E-04
ODP	kg CFC 11 eq.	1,16E-07	2,23E-09	1,16E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,81E-10	0,00E+00	2,95E-10	-3,82E-10
AP	mol H^+ eq.	3,65E-01	6,99E-04	4,21E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,66E-05	0,00E+00	1,30E-04	1,46E-07
EP-freshwater	kg P eq.	1,81E-03	8,36E-07	1,08E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,08E-08	0,00E+00	4,64E-06	1,15E-06
EP-marine	kg N eq.	2,22E-02	2,00E-04	1,90E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,87E-06	0,00E+00	1,13E-03	-4,80E-05
EP-terrestrial	mol N eq.	2,96E-01	2,21E-03	1,70E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,76E-05	0,00E+00	4,00E-04	-1,78E-04
POCP	kg NMVOC eq.	5,20E-03	7,63E-04	6,56E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,04E-05	0,00E+00	1,74E-04	-1,45E-04
ADP-minerals&metals*	kg Sb eq.	5,20E-03	3,45E-07	3,60E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,80E-08	0,00E+00	2,17E-08	-1,05E-07
ADP-fossil*	MJ	1,27E+02	1,56E+00	9,85E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,18E-01	0,00E+00	1,98E-01	-2,72E-01
WDP*	m^3	7,06E+00	5,91E-03	-4,47E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,56E-04	0,00E+00	-2,97E-04	4,68E-02
Acronyms	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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*

The EPD shall include a statement, in connection to the results of the impact indicators:" The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks."

The following statement, if the EPD covers the end-of-life stage: "The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3)." For services, "A1-A3" shall be replaced by "A1-A5".

If results based on an old EF version is used to develop an EPD, the EPD shall include a statement that clarifies that an EPD based on an old EF version has been used as a data source, and that this was assessed to yield identical or conservative results compared to fully using the current EF version.

If biogenic carbon leaving the product system in module A5 (see Annex 2 of PCR) or recovered energy leaving the product system in modules A5 or C (see Annex 3 of PCR) have been balanced out already in modules A1-A3, a statement in this regard shall be included.

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[2]	kg CO_2 eq.	9,56E+00	1,12E-01	2,15E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,26E-04	0,00E+00	3,51E-03	-1,12E-02
PM	disease inc.	1,06E-06	8,22E-09	8,13E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,60E-10	0,00E+00	1,28E-09	-8,63E-10
IRP[1]	kBq U-235 eq	3,69E-01	6,11E-04	1,05E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,08E-05	0,00E+00	7,82E-04	2,85E-03
ETP-fw[2]	CTUe	5,85E+02	2,05E-01	3,47E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,56E-02	0,00E+00	1,04E+00	-2,98E-01
HTP-c[2]	CTUh	4,26E-08	1,95E-11	3,48E-12	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,41E-12	0,00E+00	1,43E-11	-1,18E-11
HTP-nc[2]	CTUh	3,73E-06	9,09E-10	1,48E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,33E-11	0,00E+00	1,88E-09	-1,83E-10
SQP[2]	dimensionless	1,44E+02	8,37E-01	3,92E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,95E-02	0,00E+00	3,34E-01	-2,27E+00
Acronyms	GWP-GHG[2]: This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero. 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 = Potential Soil Quality Index (dimensionless)															

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

The Global Warming Potential is largely driven by Module A1, which accounts for about 87% of the total impact due to raw material extraction and production. In particular, the brass body and lever are the main hotspots, together contributing roughly 56% of total GWP, with the body alone responsible for about 44% because of its higher mass. Machining operations, especially turning, play a key role in these impacts, particularly for the lever, where the energy intensity per unit mass is higher.
Module A3 contributes around 6% of total GWP, mainly due to electricity and natural gas consumption during manufacturing, while end-of-life stages remain marginal (about 5% combined between packaging disposal and product treatment). A similar dominance of Module A1 is observed across most other impact categories, although A3 shows a relatively higher contribution in Ozone Depletion Potential.

Resource use indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,07E+01	2,28E-02	1,64E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,85E-03	0,00E+00	1,16E-02	-1,40E-01
PERM	MJ	1,71E+00	0,00E+00	-1,60E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,25E+01	2,28E-02	3,54E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,85E-03	0,00E+00	1,16E-02	-1,40E-01
PENRE	MJ	1,21E+02	1,56E+00	3,79E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,18E-01	0,00E+00	1,98E-01	-2,74E-01
PENRM	MJ	5,36E+00	0,00E+00	-2,80E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,27E+02	1,56E+00	9,86E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,18E-01	0,00E+00	1,98E-01	-2,74E-01
SM	kg	9,20E-02	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,85E-01	1,88E-04	1,59E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,47E-05	0,00E+00	-1,64E-03	4,56E-04
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	4,07E-03	1,03E-05	6,72E-07	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,02E-07	0,00E+00	1,24E-06	-3,81E-06
Non-hazardous waste disposed	kg	1,48E+00	6,69E-02	1,04E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,64E-03	0,00E+00	5,47E-01	-1,10E-02
Radioactive waste disposed	kg	2,35E-04	4,12E-07	8,15E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,46E-08	0,00E+00	3,65E-07	2,38E-06

Output flow indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	1,34E-01	0,00E+00	9,96E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	2,00E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	4,00E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

ABBREVIATIONS

Abbreviation	**Definition**
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
SVHC	Substances of Very High Concern
ND	Not Declared
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO_2 eq.)
GWP-total	Total Global Warming Potential (kg CO_2 eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H^+ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)

WDP	Water Deprivation Potential (m³)
Resource Use Indicators	
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m³)
Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MR	Material for Recycling (kg)
MER	Materials for Energy Recovery (kg)
EEE	Exported Energy, Electricity (MJ)
EET	Exported Energy, Thermal (MJ)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
EC No.	European Community Number
CAS No.	Chemical Abstracts Service Number
MJ	Megajoule
kg	Kilogram
m³	Cubic Meter
NMVOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO_2 eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent

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VERSION HISTORY

Original Version of the EPD, 2026-03-13

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EPD
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