ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	ASSA ABLOY Entrance Systems AB
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20250462-IBA1-EN
Issue date	23.01.2026
Valid to	22.01.2031

ASSA ABLOY SL510 Sliding Door Operator

ASSA ABLOY Entrance Systems

Institut Bauen und Umwelt e.V.

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ASSA ABLOY

1. General Information

ASSA ABLOY Entrance Systems

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-ASA-20250462-IBA1-EN

This declaration is based on the product category rules:

Automatic doors, automatic gates, and revolving door systems, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

23.01.2026

Valid to

22.01.2031

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

ASSA ABLOY SL510 Sliding Door Operator

Owner of the declaration

ASSA ABLOY Entrance Systems AB
Lodjursgatan 10
SE-261 44 Landskrona
Sweden

Declared product / declared unit

This declaration represents 1 automatic ASSA ABLOY SL510 sliding door operator for escape route requirements according to EN16005.

Scope:

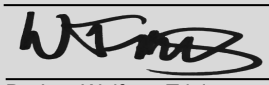
This declaration and its LCA study are relevant to the ASSA ABLOY SL510 sliding door operator. The final assembly and production stage occur in Ostrov and Stribra, Czech Republic at D5 Logistic Park 34901 Ostrov u Stribra, Czech Republic. Components are sourced from international tier one suppliers. The ASSA ABLOY SL510 sliding door operator length varies according to project requirements; an operator for escape route maneuvering 2 door leaves (bi-parting) with a beam length of 4.1 m is used in this declaration.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally



Dr.-Ing. Wolfram Trinius,
(Independent verifier)

2. Product

2.1 Product description/Product definition

Product name: ASSA ABLOY SL510 sliding door operator.

Product characteristics: Automatic sliding door operator.

The modular ASSA ABLOY SL510 sliding door operator is an automatic sliding door operator developed to suit building entrances. It is easy to install for both new construction and retrofit application, and it can be adapted to a wide range of entrance requirements. The ASSA ABLOY SL510 sliding door operator can be used for both internal and external entrance solutions. It can be mounted on the building surface structure or on a supporting beam.

The ASSA ABLOY SL510 sliding door operator works electromechanically. The operator is designed in a modular way and consists of different variants of support beams, covers, drive units, control units and power supplies. As an option the operator can be equipped with an emergency unit, electromechanical locking devices, additional functionality board and sensors. The drive unit transmits movement to the door leaves by means of a tooth belt. The door leaf is fitted to a carriage wheel that rolls on a sliding track. The operator is self-adjusting to changing weather conditions, making it suitable for different environments.

The SL510 sliding door operator is comprised mostly of aluminium and steel.

The sliding door operator has 3 primary parts:
1) Housing including side plates
2) Track system with carriages
3) Drive system containing electrical components

The ASSA ABLOY SL510 sliding door operator has been designed to meet operational and safety requirements and is certified by a third party to fulfill the European Directives and the standards issued by the European Standardization Committee (CEN).

For the placing on the market in the European Union/European Free Trade Association (EU/EFTA) (excl. Switzerland), Switzerland and Turkey the following European directives apply to the ASSA ABLOY SL510 sliding door operator:

- *2014/30/EU* Electromagnetic Compatibility Directive (EMCD)
- *2006/42/EC* Machinery Directive (MD)
- *2011/65/EU* on the restriction of the use of certain hazardous substances in electrical and electronic equipment with the applicable amendments (RoHS).

These directives provide for CE marking of the product and issuing a Declaration of Conformity.

Harmonized European standards, which have been applied:

- *EN 60335-1* Household and similar electrical appliances -Safety -Part 1: General requirements
- *EN 60335-2-103* Household and similar electrical appliances -Safety -Part 2: Particular requirements for drives for gates, doors and windows
- *EN 61000-6-2* Electromagnetic compatibility (EMC) - Part 6-2 Generic standards - Immunity for industrial environments
- *EN 61000-6-3+A1* Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments
- *EN ISO 13849-1* Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design
- *EN IEC 63000* Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Other standards or technical specifications, which have been applied:

- *IEC 600335-1 ed. 5* Household and similar electrical appliances -Safety -Part 1: General requirements
- *IEC 60335-2-103 ed. 2.1* Household and similar electrical appliances Safety Part 2-103: Particular requirements for drives for gates, doors and windows.
- *DIN 18650-1* Powered pedestrian doors - Part 1: Product requirements and test methods.
- *DIN 18650-2* Powered pedestrian doors - Part 2: Safety at powered pedestrian doors

Disposal of the product is subject to the Waste from Electrical and Electronic Equipment (WEEE) Directive within Europe, Directive *2012/19/EU* together with the RoHS Directive *2011/65/EU* and its amending Directive *2015/863*.

For the application and use the respective national provisions apply.

2.2 Application

The ASSA ABLOY SL510 sliding door operator is an automatic door operator suitable for low to very intense pedestrian traffic flow. From hospital entrances to retail and transportation applications, the smooth, quiet operation and flexible platform make the ASSA ABLOY SL510 sliding door operator ideal for any segment. The operator offers a number of sustainable features to help minimize power usage, reduce environmental footprints and air infiltration to meet the increased demands of energy efficiency.

The ASSA ABLOY SL510 sliding door operator offers a number of highly intelligent features as standard, specially designed for optimal pedestrian safety at all times around-the-clock. The operator is convenient as it is built upon a modular platform to ensure optimal user flexibility. Serviceability is taken into account in order to ensure minimal hassle, optimal product life cycle and smooth maintenance.

The ASSA ABLOY SL510 sliding door operator can be tailored to any requirements. It can be easy upgraded and modernized to meet new requirements without time-consuming and complex entrance re-modelling.

The ASSA ABLOY SL510 sliding door operator incorporates entrance security into its design and operation from start. Not only does it come with a number of clever features as standard - it is also ready for add-on locking configurations.

2.3 Technical Data

The list presents the technical properties of the ASSA ABLOY SL510 sliding door operator;
Operator dimensions: 100 x 198 mm (height x depth)
Clear opening: Bi-parting (SL510-2): 1000 – 3000 mm
Clear opening: Single slide (SL510-R/L): 800 – 3000 mm
Recommended max. door weight (Bi-parting without break-out): 200 kg/leaf

Recommended max. door weight (Single Slide without break-out): 240 kg
Profile finish: anodized aluminum (Colour on request -painted in colour according to RAL card)

Constructional data

Name	Value	Unit
Power "Standby"	-	W
Power "On"	48.1	W
Power "Idle"	18	W
Power "Off"	21	W
Power supply	100-240 ±10%, 50/60	VAC, Hz
Power consumption max.	250	W
Auxiliary voltage	24 V DC, 1 A	
Opening/closing speed	SL510: Variable up to approx. 1.7 m/s (2 leaves)	
Hold open time	0-60	sec
Recommended max. door weight (Bi-parting without break-out)	SL510-2: 200 kg/leaf	
Recommended max. door weight (Single Slide without break-out)	SL510-R/L 240 kg	
Ambient temperature	-20 to +50	°C

Performance data of the product according to the harmonised standards, based on provisions for harmonization.

- *EN 60335-1* Household and similar electrical appliances -Safety -Part 1: General requirements
- *EN 60335-2-103* Household and similar electrical appliances -Safety -Part 2: Particular requirements for drives for gates, doors and windows
- *EN 61000-6-2* Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- *EN 61000-6-3+A1* Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments
- *EN ISO 13849-1* Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design

2.4 Delivery status

The ASSA ABLOY SL510 sliding door operator with beam length 4.1 m is delivered ready for installation.

2.5 Base materials/Ancillary materials

The average composition for ASSA ABLOY SL510 sliding door operator is as following:

Name	Value	Unit
Aluminium	46.89	%
Brass	0.01	%
Copper	0.01	%
Plastics	10.92	%
Stainless steel	0.80	%
Steel	26.60	%
Zinc	0.79	%
Electronic	1.98	%
Electro-mechanics	11.86	%
Paper	0.15	%

2.6 Manufacture

The primary manufacturing processes are made by tier one suppliers and the final manufacturing processes for operator units occur in the factory in Ostrov, Czech Republic. The profiles are machined and surface treated; either anodized (externally) or powder coated (internally). Other parts as electronics etc. arrive from tier one suppliers or the factory in China and a final assembly is done in Ostrov. The operators are packed in cardboard boxes and forwarded to on-site installation. The certified Quality Management system, *EN ISO 9001*, ensures high standards.

Offcuts and scraps during the manufacturing process are directed to a recycling unit. Waste is sent for disposal.

Waste codes according to the European Waste Catalogue and Hazardous Waste List -Valid from 1
July 2015.
EWC 12 01 03 Non-ferrous metal filings and turnings
EWC 08 02 01 Waste coating powders

2.7 Environment and health during manufacturing

ASSA ABLOY Entrance Systems AB is committed to producing and distributing door opening solutions with minimal environmental impact, where health & safety are the primary focus for all employees and associates.
• Environmental operations, Greenhouse gases, energy, water, waste, VOC, surface treatment and Health & Safety are being routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and environment management program effectiveness is evaluated.
• Code of Conduct covers human rights, labor practices and decent work. ASSA ABLOY Entrance Systems AB´s management is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
• Preparation conditions (including the process of power coating) in the factory of Ostrov do not require special health and safety measures. Standard health and safety measures (work gloves, hearing protection, safety shoes, dust mask when sanding and milling, dust extraction, etc.) are observed where appropriate.
• Water and soil contamination does not occur, and all production related waste is processed internally in the appropriate manner.

2.8 Product processing/Installation

The ASSA ABLOY SL510 sliding door operator is supplied ready for installation. The components are assembled using simple tools including drills and hand tools. The installation is performed by trained and qualified installation technicians.

2.9 Packaging

Packaging exists for the purpose of protection during transportation. ASSA ABLOY SL510 sliding door operator components are packed in cardboard packaging together with interior fittings made of styrofoam. The cardboard is recyclable.

Cardboard/paper 91.87%
Plastics 8,13%
Total 100.0%

All materials incurred during installation are directed to a recycling unit.

Waste codes according to the European Waste Catalogue and Hazardous Waste List -Valid from 1 July 2015:
EWC 15 01 01 Paper and cardboard packaging
EWC 15 01 02 Plastic packaging.

2.10 Condition of use

Regular inspections shall be made according to national regulations and product documentation by an ASSA ABLOY Entrance Systems trained and qualified technician. The number of service occasions should be in accordance with national requirements and product documentation. Service is recommended according to "Service Log Book". Regular inspections and cleaning should be performed by the owner of the product, according to "Users Manual".

The best way to remove dust and dirt from the ASSA ABLOY SL510 sliding door operator is to use a soft cloth or a sponge. A gentle detergent may be used. To maintain the quality of the enamel layer, the surfaces should be cleaned three times/year (once/four month's period). The cleaning should be documented.

- Do not expose profiles to alkalis. Aluminum is sensitive to alkalis.
- Do not clean with high pressure water; Operator, program selector and sensor may be damaged, and water may enter the profiles.
- Do not use polishing detergent.
- Do not scrub with materials that will cause mechanical damage.

During the 10 year long life time of the product, the battery pack will be replaced 4 times for safety/regulatory requirement to maintain an escape route.

2.11 Environment and health during use

There is no harmful emissive potential. No damage to health or impairment is expected under normal use corresponding to the intended use of the product.

2.12 Reference service life

The product has reference service life of 1.000.000 cycles or 10 years of average daily use with the recommended maintenance and service program. For this EPD the lifetime of 10 years was considered.

2.13 Extraordinary effects

Fire

Not applicable. The SL510 sliding door operator has not been tested for fire and smoke protection. The door is tested together with the operator to get a final approval. These tests are done considering specifications in each country. Sliding door operators, however, consist largely of metal which does not add to the spread of fire.

Water

Contains no substances that impact water. In case of a flood electric operation of the device will be influenced negatively.

Mechanical destruction

No danger to the environment can be anticipated during mechanical destruction.

2.14 Re-use phase

The product is possible to be re-used during the reference service life and be moved from one door to another. All recyclable materials are directed to a recycling unit where they are recycled (electronics, steel, and aluminium). On the other hand, the plastic components are sent to the waste incineration plant for its energy recovery.

2.15 Disposal

The product can be mechanically disassembled to separate the different materials. The majority, by weight, of components are steel and aluminium which will be recycled. The plastic components are used for energy recovery in an incineration plant.
Waste codes according to the European Waste Catalogue and Hazardous Waste List -Valid from 1 July 2015:

EWC 17 02 03 Plastic
EWC 17 04 01 Copper, bronze, brass
EWC 17 04 02 Aluminium
EWC 17 04 04 Zinc
EWC 17 04 05 Iron and steel
EWC 17 04 11 Cables with the exception of those outlined in 17 04 10
EWC 20 01 36 Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35

Disposal of the motor and electronics is subject to the WEEE Directive within Europe, Directive */2012/19/EU/*

2.16 Further information

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3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of ASSA ABLOY SL510 sliding door operator as specified in Part B requirements on the EPD IBU: PCR Automatic doors, automatic gates, and revolving door systems (door systems).

Functional unit for module

- B2: Use of 1 piece of the back up battery every two years
- B6: Use of 1 piece of ASSA ABLOY SL510 sliding door operator for 10 years.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	pce
Dimensions (LxWxH)	4100x198X100	mm
Mass (without packaging)	37.37	kg
Mass Packaging (paper wood, steel and plastics)	7.82	kg
Mass reference	37.37	kg/pce

3.2 System boundary

Type of the EPD: cradle to gate - with options. The following life cycle stages were considered:

Production stage:

- A1 – Raw material extraction and processing
- A2 – Transport to the manufacturer
- A3 – Manufacturing

Construction stage:

- A4 – Transport from the gate to the site
- A5 – Packaging waste processing

Use stage related to the operation of the building includes:

- B2 – Maintenance (replacement of batteries)
- B6 – Operational energy use

End-of-life stage:

- C1 – Manual deconstruction and demolition
- C2 – Transport to waste processing,
- C3 – Waste processing for recycling and
- C4 – Disposal (landfill, waste for incineration).

This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of-waste state or disposal of final residues.

Benefits and loads beyond the system boundaries:

- D – Declaration of all benefits and loads.

3.3 Estimates and assumptions

Transportation: Data on the mode of transport and distances, as reported by suppliers were used for those materials and parts contributing more than 2 % of the total product mass.

Use stage: For the use phase, it is assumed that one piece of sliding door operator SL510 is used in the European Union, thus a European electricity grid mix is considered within this stage. According to the most representative scenario, the operating hours of the product are accounted for 0.8 hours in on mode, 11.2 hours in idle mode and 12 hours in off mode per day (365 days per year in use, 10 years lifetime); the power consumption throughout the whole life cycle is 6.911 MWh. Furthermore, the during the 10 year long life time of the product, the battery pack will be replaced every 2 year for safety/regulatory requirement to maintain an escape route (i.e. 4 times in 10 years).

EoL: In the End-of-Life stage, for all the materials from the product which can be recycled (steel, aluminum, electronic parts, electro-mechanics, copper, stainless steel and brass),a recycling scenario with 100 % collection rate was assumed. The plastic components are sent for energy recovery within a waste incineration process. EoL is assumed to happen within EU-28. Furthermore, a transport distance by truck of 100 km has been assumed in the model.

3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), and electric power consumption - including material and energy flows contributing less than 1 % of mass or energy (if available). In case a specific flow contributing less than 1 % in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts. Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

3.5 Background data

For life cycle modelling of the considered product, Sphera's Life Cycle for Expert (LCA FE) software is used. Sphera Managed Lifecycle Content (MLC) modelling database is used as the background database of the study.

3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the IBU PCR Part A. Sphera performed a variety of tests and checks during the entire project to ensure a high quality of the completed project. This obviously includes an extensive review of project-specific LCA models as well as the background data used. The technological background of the collected data reflects the physical reality of the declared products. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs. All relevant background datasets are taken from the Sphera MLC database.

3.7 Period under review

The period under review is 2024 (12-month average).

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

3.9 Allocation

Regarding incineration, the software model for the waste incineration plant (WIP) is adapted according to the material composition and heating value of the combusted material. In this EPD, the following specific life cycle inventories for the WIP are considered for:

- Waste incineration of paper
- Waste incineration of plastic
- Waste incineration of wood

Regarding the recycling material of metals, the metal parts in the EoL are declared as end-of-waste status. Thus, these materials are considered in module D. Specific information on allocation within the background data is given in the MLC dataset documentation.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. Sphera's Managed LCA Content CUP 2024.2 serves as background database for the calculation

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.02	kg C
Biogenic carbon content in accompanying packaging	3.09	kg C

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

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	27.5	l/100km
Transport distance	1166	km
Capacity utilisation (including empty runs)	61	%

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (paper/cardboard packaging)	7.19	kg
Output substances following waste treatment on site (plastic packaging)	0.64	

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	years

Operational energy use (B6)

Name	Value	Unit
Electricity consumption per RSL (365 days per year during 10 years)	1796.30	kWh
Hours per day in on mode	0.8	h
Hours per day in idle mode	11.2	h
Hours per day in off mode	12	h
Power consumption – on mode	48.17	W
Power consumption – idle mode	18	W
Power consumption - off mode	21	W

*Total energy consumed during the whole product life was calculated using following formula:
((W_on mode*h_on mode + W_idle mode*h_idle mode + W_off model*h_off mode) *Days_years operational*Lifespan)+(W_idle mode*h_idle mode* Days_years idle*Lifespan)+ (W_standby mode*h_idle mode* Days_years idle*Lifespan)*0.001

Where:
- W_on mode - Energy consumption in on mode in W
- h_on mode - Operation time in on mode in hours
- W_idle mode - Energy consumption in idle mode in W
- h_idle mode - Operation time in idle mode in hours
- W_off mode – Energy consumption in off mode in W
- h_off mode – Operation time in off mode in hours
- Lifespan - Reference service life of product
- Days_year operation - Operation days per year
- Days_year idle – Only Idle days per year
- Days_year off – Only off by days per year
- 0.001 - Conversion factor from Wh to kWh

Maintenance (B2)

Name	Value	Unit
Battery pack	1	units
Battery pack	0.83	kg/unit
Replacement cycle	4	Number/RSL

End of life (C1-C4)

Name	Value	Unit
Transport to EoL (C2)	100	km
Collected separately waste type (aluminium, steel, brass, zinc, plastics, stainless steel, copper, electronic, electromechanics etc.)	37.32	kg
Incineration of plastic parts	4.08	kg
Incineration of paper	0.05	kg
Recycling (aluminium, steel, copper, electronic, electro-mechanics, stainless steel, zinc and brass)	33.23	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Collected separately waste type (including packaging)	45.19	kg
Recycling aluminium	38.77	%
Recycling copper	0.01	%
Recycling stainless steel	0.66	%
Recycling steel	22	%
Recycling zinc	0.65	%
Recycling electronic	1.64	%
Recycling electro mechanics	9.80	%
Incineration of plastic parts	9.03	%
Incineration of paper	0.12	%
Incineration of packaging (paper and plastic) (from A5)	17.31	%

5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	X	MNR	MNR	MNR	X	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 piece SL510 sliding door operator

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2.68E+02	4.05E+00	1.02E+01	3.1E+01	5.42E+02	0	2.88E-01	1.24E+01	8.95E-01	-1.6E+02
GWP-fossil	kg CO_2 eq	2.95E+02	3.97E+00	2.37E-01	2.78E+01	5.37E+02	0	2.82E-01	1.23E+01	1.02E-01	-1.59E+02
GWP-biogenic	kg CO_2 eq	-1.14E+01	9.49E-03	9.93E+00	3.21E+00	4.83E+00	0	6.74E-04	7.59E-02	7.93E-01	-3.81E-01
GWP-luluc	kg CO_2 eq	2.3E-01	6.68E-02	1.58E-04	1.89E-02	8.15E-02	0	4.75E-03	9.65E-04	8.07E-05	-3.85E-02
ODP	kg CFC11 eq	1.26E-09	5.85E-13	1.39E-12	7.58E-11	1.22E-08	0	4.16E-14	6.8E-12	8.56E-14	-9.92E-11
AP	mol H^+ eq	1.46E+00	5.44E-03	2.84E-03	5.71E-01	1.04E+00	0	3.87E-04	3.43E-03	2.41E-04	-8.58E-01
EP-freshwater	kg P eq	8.73E-04	1.7E-05	3.96E-07	1.72E-04	2.23E-03	0	1.21E-06	1.72E-06	1.87E-05	-5.55E-05
EP-marine	kg N eq	2.67E-01	1.98E-03	1.04E-03	3.4E-02	2.59E-01	0	1.4E-04	1.3E-03	2.23E-04	-1.53E-01
EP-terrestrial	mol N eq	2.87E+00	2.35E-02	1.3E-02	3E-01	2.71E+00	0	1.67E-03	1.69E-02	9.07E-04	-1.67E+00
POCP	kg NMVOC eq	8.3E-01	5.42E-03	2.76E-03	1E-01	6.85E-01	0	3.85E-04	3.49E-03	5.36E-04	-4.57E-01
ADPE	kg Sb eq	9.91E-03	3.46E-07	1.47E-08	5.1E-04	1E-04	0	2.46E-08	5.63E-08	1.83E-09	-4.23E-03
ADPF	MJ	4.05E+03	5.23E+01	3.14E+00	3.6E+02	1.13E+04	0	3.72E+00	1.01E+01	6.33E-01	-1.82E+03
WDP	m^3 world eq deprived	7.31E+01	6.15E-02	1.26E+00	8.21E+00	1.48E+02	0	4.37E-03	1.52E+00	3.75E-03	-6.3E+01

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 piece SL510 sliding door operator

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
PERE	MJ	1.67E+03	4.51E+00	1.36E+02	5.64E+01	8.14E+03	0	3.2E-01	3.87E+00	6.72E-02	-9.96E+02
PERM	MJ	1.35E+02	0	-1.35E+02	0	0	0	0	0	0	0
PERT	MJ	1.81E+03	4.51E+00	8.55E-01	5.64E+01	8.14E+03	0	3.2E-01	3.87E+00	6.72E-02	-9.96E+02
PENRE	MJ	3.77E+03	5.23E+01	1.51E+01	3.6E+02	1.13E+04	0	3.72E+00	2.78E+02	6.33E-01	-1.82E+03
PENRM	MJ	2.8E+02	0	-1.2E+01	0	0	0	0	-2.68E+02	0	0
PENRT	MJ	4.05E+03	5.23E+01	3.14E+00	3.6E+02	1.13E+04	0	3.72E+00	1.01E+01	6.33E-01	-1.82E+03
SM	kg	1.09E+01	0	0	0	0	0	0	0	0	1.84E+01
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m^3	2.66E+00	5.02E-03	2.97E-02	2.28E-01	6.23E+00	0	3.57E-04	3.67E-02	1.1E-04	-2.32E+00

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 = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 piece SL510 sliding door operator

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
HWD	kg	1.24E-02	2E-09	1.79E-09	1.29E-05	1.63E-05	0	1.42E-10	8.27E-09	1.14E-10	-6.81E-06
NHWD	kg	6.07E+01	8.55E-03	3.2E-01	9.36E+00	9.29E+00	0	6.07E-04	1.57E+00	6.43E-01	-6.51E+01
RWD	kg	1.87E-01	9.54E-05	1.58E-04	5.99E-03	1.8E+00	0	6.78E-06	6.04E-04	7.99E-06	-8.33E-02
CRU	kg	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	2.93E+01	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0
EEE	MJ	1.95E-01	0	1.54E+01	0	0	0	0	2.19E+01	0	0

EET	MJ	4.53E-01	0	2.8E+01	0	0	0	0	4.15E+01	0	0

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

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 piece SL510 sliding door operator

Parameter	Unit	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
PM	Disease incidence	2.07E-05	5.45E-08	1.56E-08	9.71E-06	8.67E-06	0	3.87E-09	4.02E-08	2.42E-09	-1.52E-05
IR	kBq U235 eq	2.24E+01	1.38E-02	2.48E-02	6.22E+01	2.97E+02	0	9.83E-04	9.01E-02	1.19E-03	-8.52E+00
ETP-fw	CTUe	1.34E+03	3.89E+01	1.37E+00	7.87E+03	3.26E+03	0	2.76E+00	4.76E+00	8.85E-01	-5.32E+02
HTP-c	CTUh	8.06E-05	7.85E-10	8.14E-11	3.5E-08	1.83E-07	0	5.58E-11	3.56E-10	1.62E-11	-2.16E-07
HTP-nc	CTUh	2.76E-06	3.52E-08	1.61E-09	2.81E-06	2.81E-06	0	2.5E-09	2.7E-08	1.38E-09	-1.5E-06
SQP	SQP	3.52E+03	2.57E+01	9.55E-01	4.74E+03	4.74E+03	0	1.83E+00	3.13E+00	6.89E-02	-8.98E+01

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. Stated percentages in the whole interpretation are related to the overall life cycle, excluding credits (module D).

The production stage (modules A1-A3) contributes between 9% and 50% to the overall results for all core environmental impact assessment categories except ADPF with 90% impact.

Within the production stage, the main contribution to all the impact categories is the production of steel and aluminium mainly due to the energy consumption of these processes. These two materials account for approx. 72% to the overall mass of the product, therefore, the impacts are in line with the mass composition of the product. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use stage (module B6) in 10 years of service life, the energy consumption was included, and it has a relevant contribution for all core impact assessment categories considered - between 30% and 70%,with the exception of ODP (90%). This is a result of 0.8 hours of operation in on mode and 11.2 hours in idle mode per day and per 365 days in a year. During the time span of 10 years, the battery pack used in the product (0.834 kg) is exchanged after every 2 years. The production and EOL of this additional batteries require are modeled in module B2, making it the second hot spot in all core categories from a life cycle perspective.

In the end-of-life stage, there are loads and benefits (module D, negative values) considered. The benefits are considered beyond the system boundaries and are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution).

7. Requisite evidence

Not applicable in this EPD.

8. References

CPR
Regulation (EU) No. 305/2011, Construction Product Regulation (CPR)- laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

DIN EN ISO 14025
DIN EN ISO 14025:2010, Environmental labels and declarations - Type III environmental declarations - Principles and procedures

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

2014/30/EU
European directive on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)

2006/42/EC
European directive on machinery, and amending Directive 95/16/EC (recast)

2012/19/EU
European directive on waste electrical and electronic equipment (WEEE)

2011/65/EC
European directive on the restriction of the use of certain

hazardous substances in electrical and electronical equipment, and its amendment directives including 2015/863/EC (RoHS directive)

2015/863/EU
European directive amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances (RoHS directive)

EN 60335-1
EN 60335-1: 2012 AC:2014 +A1:2019 + A2:2019 +A11:2014 +A13:2017 +A14:2019 Household and similar electrical appliances - Safety - Part 1: General requirements

EN 60335-2-103
EN 60335-2-103:2015 Household and similar electrical appliances - Safety - Part 2-103: Particular requirements for drives for gates, doors and windows

EN 61000-6-2
EN 61000-6-2: 2005 + AC:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

EN 61000-6-3
EN 61000-6-3: 2007 + A1:2011/AC:2012 + A1:2011 Electromagnetic compatibility (EMC) - Part 6-3: Generic Standards - Emission standard for residential, commercial and light-industrial environments

EN ISO 13849-1
EN ISO 13849-1:2015 Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design

EWC
European Waste Catalogue established by Commission Decision 2000/532/EC

ISO 9001
ISO 9001:2015, Quality management systems - Requirements with guidance for us

FCC Part 15B
FCC Part 15B Unintentional Radiators

IEC 60335-1 ed
IEC 60335-1 ed 5 Household and similar electrical appliances - Safety - Part 1: General requirements

UL 325
UL 325 Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems

IEC 60335-2-103
IEC 60335-2-103: ed. 2.1:2011 Household and similar electrical appliances -Safety - Part 2: Particular requirements for drives for gates, doors and windows

EN 300 328 V 2.1.1
EN 300 328 V 2.1.Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz band; Harmonised Standard for access to radio spectrum"

EN IEC 63000
EN IEC 63000 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Further References

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Sphera Solutions, 'Life Cycle Assessment for Expert software', Sphera Solutions, Chicago, US, 2023. Retrieved from https://sphera.com/

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General Instructions for the EPD programme of Institut Bauenund Umwelt e.V. Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021.www.ibu-epd.com

IBU PCR Part A
Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report Version 1.4 04.2024 www.ibu-epd.de

IBU PCR Part B
IBU PCR Part B: PCR Guidance-Texts for Building-Related Products and Services. From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part B: Part B: PCR for Automatic doors, automatic gates, and revolving door systems, Version v8 (08. 2024) www.ibu-epd.com

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Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI), EPA/600/R-12/554 2012

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