ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

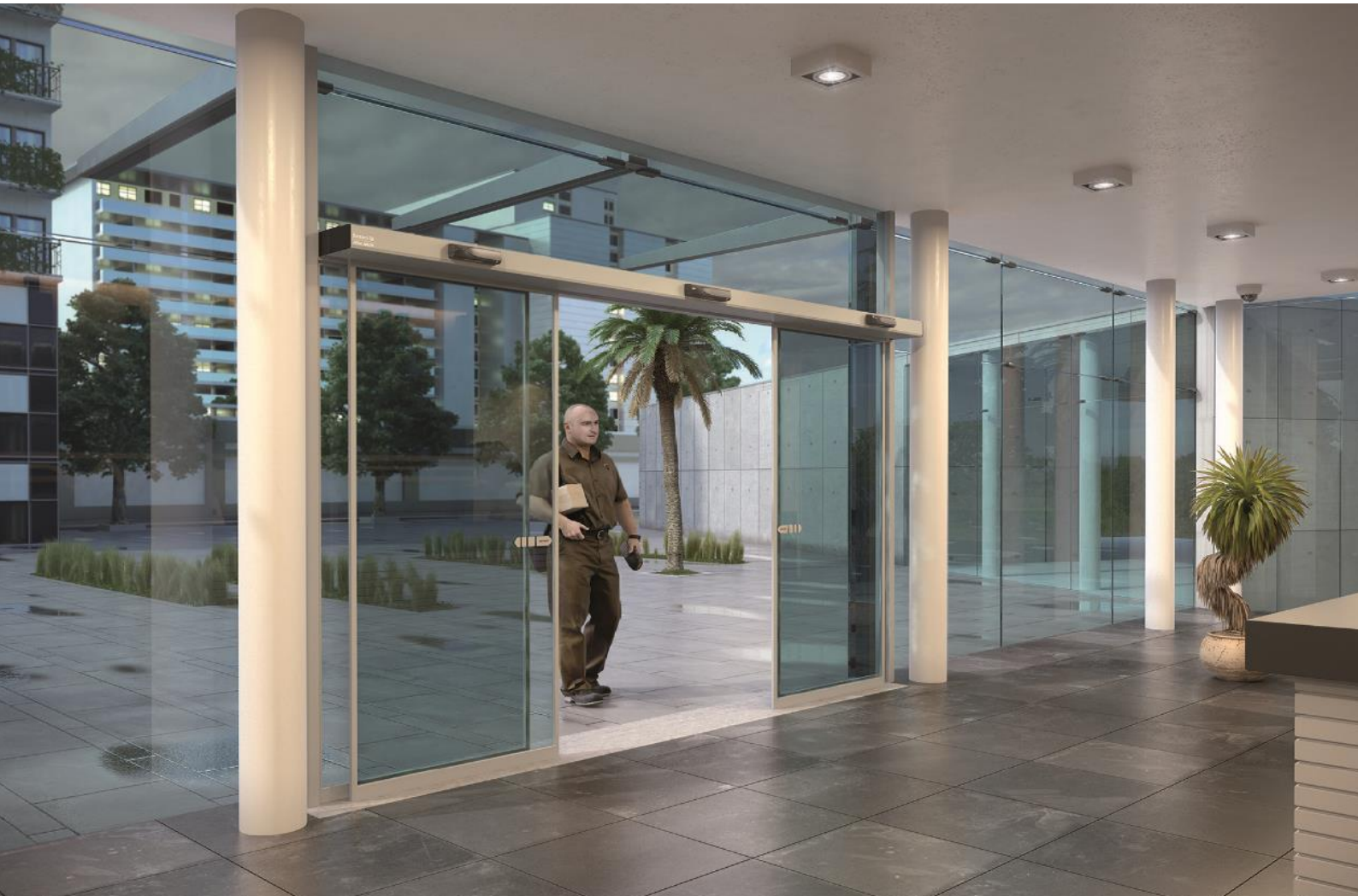
Owner of the Declaration	**ASSA ABLOY Entrance Systems AB**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20190136-IBB1-EN
Issue date	04.09.2019
Valid to	03.09.2024

ASSA ABLOY SL510 sliding door operator

ASSA ABLOY Entrance Systems AB

Institut Bauen und Umwelt e.V.

www.bau-umwelt.com / https://epd-online.com



ASSA ABLOY

1. General Information

ASSA ABLOY Entrance Systems AB

Programme holder
IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number
EPD-ASA-20190136-IBB1-EN

This Declaration is based on the Product Category Rules:
IBU: PCR Automatic doors, automatic gates and revolving door systems (door systems) Version 1.6 (11. 2017).
(PCR tested and approved by the independent expert committee)

Issue date
04.09.2019

Valid to
03.09.2024

Hans Peters
(President of IBU)

Dr. Alexander Röder
(managing director of IBU))

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
The declaration represents 1 automatic ASSA ABLOY SL510 sliding door operator.

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 maneuvering 2 door leaves (bi-parting) with beam length 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.

Verification

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

Dr. Wolfram Trinius
(Independent tester appointed by SVA)

2. Product

2.1 Product description

Product name: ASSA ABLOY SL510 sliding door operator.
Product characteristic: 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 automatic sliding door operator is generally made of aluminum and steel.

The door operator has three primary parts:
1) Cover
2) Support beam with transmission
3) Electrical components

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

For the placing of the product on the market in the EU/EFTA the Directive (EU) 2006/42/EC Machinery Directive (MD) and the following other harmonization

provisions apply: the Directive (EU) 2014/30/EU Electromagnetic Compatibility Directive (EMCD) and 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), the Directive 2012/19/EU Waste Electrical and Electronic Equipment (WEEE Directive) respectively.

The CE-marking for the product takes into account the proof of conformity with the following harmonized norms:

/EN 16005:2012/AC:2015: Power operated pedestrian doorsets-Safety in use-Requirements and test methods
/EN 61000-6-2:2005: Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
/EN 61000-6-3:2007+A1:2011: Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial
/EN 60335-1: 2012: Household and similar electrical appliances -Safety - Part 1: General requirements
/EN 60335-2-103:2015: Household and similar electrical appliances -Safety - Part 2: Particular requirements for drives for gates, doors and windows
/EN ISO 13849-1:2015: Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design

Other standards or technical specifications, which have been applied:
DIN 18650-1:2010: Powered pedestrian doors - Part 1: Product requirements and test methods.
DIN 18650-2:2010: Powered pedestrian doors - Part 2: Safety at powered pedestrian doors
IEC 60335-1:2010: ed. 5: Household and similar electrical appliances -Safety - Part 1: General requirements
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
Richtlinie über automatische Schiebetüren in Rettungswegen - AutSchR - (1997-12)

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 offer 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 table presents the technical properties of the SL510 sliding door operator:

Technical Data

Features	Value
Clear opening: Bi-parting	SL510-2: 900 – 3000mm
Clear opening: Single Slide	SL510-R/L: 900 – 3000mm
Suitable for doors up to 65 mm thickness	
Profile finish	- anodized aluminum, colour on request - painted in colour according to RAL card

Name	Value	Unit
Mains power supply	100 V AC -10% to 240 V AC +10%, 50/60 Hz, fuse 10 AT (building installation)	
Power consumption	Max 250 W	
Auxiliary voltage	24 V DC, 1 A	
Opening/closing speed	SL510: Variable up to approx. 1.4 m/s (SL510-2)	
Hold open time	0-60 s	
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 °C to +50 °C	
Resistance to wind load acc.to EN12424	NA	
Thermal transmittance acc.to EN 12428	NA	$W/m^2.k$
Resistance to water penetration acc. to EN 12426	NA	
Air permeability acc. to EN 12426	NA	
Power input "Idle"	40	W
Power input "Operation"	71	W

2.4 Delivery status

The ASSA ABLOY SL510 sliding door operator is delivered ready for installation.

2.5 Base materials / Ancillary materials

The average composition of ASSA ABLOY SL510 sliding door operator is as follows:

Component	Percentage in mass (%)
Aluminium	46.13
Brass	0.42
Copper	0.01
Plastics	10.47
Stainless steel	0.63
Steel	27.88
Zinc	0.75
Electronic	1.87
Electro_mechanics	11.31
Others	0.02
Total	**100**

2.6 Manufacture

The primary manufacturing processes are made by tier one suppliers and the final manufacturing processes for operator units occur in factory in Ostrov, Czech Republic. The profiles are machined and surface treated; either anodized (externally) or powder coated (internally). Other parts as electronics etc. arrives 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 9001:2015, ensures high standards.
Offcuts and scraps during the manufacturing process are directed to a recycling unit. Wastewater are cleared on-site and waste is sent for disposal.
Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002.
EWC 12 01 01 Ferrous metal filings and turnings
EWC 12 01 03 Non-ferrous metal filings and turnings
EWC 08 02 01 Waste coating powders
EWC 12 01 05 Plastics

2.7 Environment and health during manufacturing

ASSA ABLOY is committed to producing and distributing door opening solutions with minimal environmental impact, where health & safety is the primary focus for all employees and associates.

- Environmental operations, GHG, energy, water, waste, VOC, surface treatment and H&S are routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and to evaluate the effectiveness of the environmental management program.
- Code of Conduct covers human rights, labor practices and decent work. Management of ASSA ABLOY is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
- Any waste metals during machining are separated and recycled. Waste water from water-based painting processes is delivered to waste treatment plant.

2.8 Product processing/Installation

The ASSA ABLOY SL510 sliding door operator is supplied ready for installation. The installation is performed by certified installation technicians.

2.9 Packaging

The ASSA ABLOY SL510 sliding door operator components are packed in cardboard packaging together with interior fittings made of styrofoam. The cardboard is recyclable.
80% of carton is made from recycled material. 100% of packaging paper is made from recycled material.

Material	Value (%)
Cardboard/paper	83.4
Plastics	16.6
Total	**100.0**

All materials incurred during installation are directed to a recycling unit. Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002.
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 like Scotch-brite, as this will cause mechanical damage.

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 a reference service life of more than 1.000.000 cycles and 10 years of standard daily use (with the recommended maintenance and service program). For this EPD a lifetime of 10 years was considered.

2.13 Extraordinary effects

Fire

Not applicable. Sliders do not have any fire approvals for the operators. The door is then tested together with the operator to get a final approval. These tests are done considering specifications in each country.

Water

The product does not contain any substances that could be released and have an adverse environmental impact on water in case of flood. Product operation can be influenced.

Mechanical destruction

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

2.14 Re-use stage

The product is possible to re-use during the reference service life and be moved from one door to another. The majority, by weight, of components is aluminum and steel which can be recycled. Paper and plastic components can be used for energy recovery within a waste incineration process.
The rest components can all be recycled and are directed to a recycling unit..

2.15 Disposal

The product can be mechanically dissembled to separate the different materials. The majority of the material can be recycled. The requirements on waste disposal and recycling listed in the European Waste Catalogue (EWC) should be followed.

Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002:
EWC/ 17 04 05 iron and steel
EWC/ 17 04 04 zinc
EWC/ 17 04 01 copper, bronze, brass
EWC/ 17 04 02 aluminium
EWC/ 17 02 03 plastic
EWC/ 16 02 wastes from electrical and electronic equipment
EWC/ 15 01 01 paper and cardboard packaging
EWC/ 15 01 02 plastic packaging

2.16 Further information

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3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to one automatic ASSA ABLOY SL510 sliding door operator as specified in Part B requirements on the EPD for PCR Automatic doors, automatic gates, and revolving door systems (door systems).
An operator maneuvering 2 door leaves (bi-parting) with beam length 4.1 m is used in this declaration has been considered in this declaration.

Declared unit

Name	Value	Unit
Mass (without packaging)	39,44	kg
Mass packaging (paper and plastics)	5,83	kg
Conversion factor to 1 kg	0,025355319	-
Declared unit for SL510 sliding door systems (dimensions acc. to this PCR)	1	piece

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 and
- 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:

- B6 – Operational energy use

End-of-life stage:

- 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.

Module D:

- Declaration of all benefits and loads

3.3 Estimates and assumptions

Transportation: Data on 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. In case of unknown transport distances for parts and materials, contributing less than 2 % to the total product mass, transport by road over an average distance of 500 km was assumed.

Use stage:
For the use stage, it is assumed that the sliding door 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 2130 hours in on mode and 4260 hours (355 days per year in use) in idle mode per year; the power consumption throughout the whole life-cycle is 4068,3 kWh.

EoL:
In the End-of-Life stage, for all the materials which can be recycled, a recycling scenario with 100% collection rate was assumed. 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 modeling of the considered product, the GaBi 8 Software System for Life Cycle Engineering, developed by thinkstep AG, is used /GaBi 8 2019a/. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation /GaBi 8 2019b/. To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials.

3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR Part A/.
Thinkstep performed a variety of tests and checks during the entire project to ensure 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 / GaBi 8 software database.

3.7 Period under review

The period under review is 2018 (12-month average).

3.8 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 plastics

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 GaBi dataset documentation.

3.9 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. /GaBi 8 2016b/ serves as background database for the calculation.

4. LCA: Scenarios and additional technical information

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).

Transport to the building site (A4)

Name	Value	Unit
Truck transport		
Litres of fuel diesel with maximum load (27t payload)	39,4	l/100km
Transport distance truck (primary target market is EU 28)	1236	km
Capacity utilization (incl. empty runs) of truck	85	%

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (paper/cardboard packaging)	4,86	kg
Output substances following waste treatment on site (plastic packaging)	0,97	kg

Reference service life

Name	Value	Unit
Reference service life	10	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption per RSL (10 years, 355 days per year)	4068,3	kWh
Hours per day in on mode	6	h
Hours per day in stand-by mode	6	h
Hours per day in idle mode	12	h
Power consumption – on mode	71	W
Power consumption – stand-by mode	40	W
Power consumption – idle mode	40	W

For the remaining days (10 days) the power is being switched off.

*Total energy consumed during the whole product life was calculated using following formula:

*(W_active_mode*h_active_mode+W_idle_mode*h_idle_mode+W_stand_by_mode*h_stand_by_mode)*Life_span*days_year*0.001*

Where:

- W_active_mode - Energy consumption in active mode in W
- h_active_mode - Operation time in active mode in hours
- W_idle_mode - Energy consumption in idle mode in W
- h_idle_mode - Operation time in idle mode in hours
- W_stand_by_mode - Energy consumption in stand-by mode in W
- h_stand_by_mode - Operation time in stand-by mode in hours
- Life_span - Reference service life of product
- days_year - Operation days per year
- 0.001 - Conversion factor from Wh to kWh.

End of life (C1-C4)

Name	Value	Unit
Collected separately aluminum, steel, brass, plastics, electronic, electro mechanics etc.	39,43	kg
Incineration of plastic parts	4,13	kg
Incineration of paper/cardboard	0,21	kg
Recycling aluminum, steel, electronic, electro-mechanics	35,10	kg

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

Name	Value	Unit
Collected separately waste type (including packaging)	45,27	kg
Recycling aluminium	40,20	%
Recycling brass	0,37	%
Recycling copper	0,01	%
Recycling stainless steel	0,55	%
Recycling steel	24,29	%
Recycling Zinc	0,65	%
Recycling electronic	1,63	%
Recyling electro mechanics	9,86	%
Incineration of plastic parts	11,26	%
Incineration of paper parts	11,19	%
Incineration of packaging (paper and plastic) (from A5)	12,8	%

5. LCA: Results

Results shown below were calculated using CML 2000 – Apr. 2013 Methodology.

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

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement[1)]	Refurbishment[1)]	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	MND	MND	MND	MND	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of ASSA ABLOY SL510 sliding door operator

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	4,61E+02	2,67E+00	9,58E+00	1,93E+03	1,88E-01	0,00E+00	9,86E+00	-2,18E+02
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	5,98E-07	1,28E-11	4,01E-11	1,32E-06	8,98E-13	0,00E+00	2,97E-11	8,16E-08
AP	Acidification potential of land and water	[kg SO_2-Eq.]	2,59E+00	1,24E-02	2,25E-03	9,11E+00	8,58E-04	0,00E+00	2,51E-03	-1,36E+00
EP	Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	1,79E-01	2,80E-03	3,32E-04	5,13E-01	1,96E-04	0,00E+00	1,90E-04	-6,55E-02
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	1,92E-01	-3,92E-03	1,46E-04	5,41E-01	-2,77E-04	0,00E+00	1,22E-04	-7,81E-02
ADPE	Abiotic depletion potential for non-fossil resources	[kg Sb Eq.]	2,48E-02	1,00E-07	2,89E-07	2,67E-04	7,07E-09	0,00E+00	6,52E-07	-2,06E-02
ADPF	Abiotic depletion potential for fossil resources	[MJ]	5,40E+03	3,68E+01	3,03E+00	2,19E+04	2,59E+00	0,00E+00	4,17E+00	-2,16E+03

RESULTS OF THE LCA - RESOURCE USE: One piece of ASSA ABLOY SL510 sliding door operator

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	1,21E+03	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0,00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	1,21E+03	1,45E+00	2,62E-01	6,28E+03	1,02E-01	0,00E+00	3,06E-01	-7,84E+02
PENRE	Non-renewable primary energy as energy carrier	[MJ]	6,38E+03	-	-	-	-	-	-	-
PENRM	Non-renewable primary energy as material utilization	[MJ]	0,00E+00	-	-	-	-	-	-	-
PENRT	Total use of non-renewable primary energy resources	[MJ]	6,38E+03	3,69E+01	3,49E+00	3,44E+04	2,60E+00	0,00E+00	4,64E+00	-2,66E+03
SM	Use of secondary material	[kg]	8,63E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	Use of renewable secondary fuels	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	Use of non-renewable secondary fuels	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	Use of net fresh water	[m^3]	3,74E+00	1,02E-03	2,68E-02	1,55E+01	7,20E-05	0,00E+00	2,41E-02	-2,23E+00

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of ASSA ABLOY SL510 SLIDING DOOR OPERATOR

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	2,38E-01	8,40E-05	2,41E-04	4,76E+00	5,91E-06	0,00E+00	3,24E-04	-3,42E-02
NHWD	Non-hazardous waste disposed	[kg]	4,33E+01	4,63E-03	4,05E-01	1,11E+01	3,27E-04	0,00E+00	9,19E-01	-3,03E+01
RWD	Radioactive waste disposed	[kg]	3,87E-01	4,83E-05	1,83E-04	4,95E+00	3,40E-06	0,00E+00	1,85E-04	-1,96E-01
CRU	Components for re-use	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	Materials for recycling	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,51E+01	0,00E+00	0,00E+00
MER	Materials for energy recovery	[kg]	0,00E+00	0,00E+00	5,82E+00	0,00E+00	0,00E+00	4,34E+00	0,00E+00	0,00E+00
EEE	Exported electrical energy	[MJ]	0,00E+00	0,00E+00	1,37E+01	0,00E+00	0,00E+00	0,00E+00	1,89E+01	0,00E+00
EET	Exported thermal energy	[MJ]	0,00E+00	0,00E+00	3,83E+01	0,00E+00	0,00E+00	0,00E+00	5,18E+01	0,00E+00

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 19.1 % and 31.2% to the overall results for all the environmental impact assessment categories hereby considered, except for the abiotic depletion potential (ADPE), for which the contribution from the production stage accounts for approx. 98.9 % - this impact category describes the reduction of the global amount of non-renewable raw materials, therefore, as expected, it is mainly related with the extraction of raw materials (A1).

Within the production stage, the main contribution for all the impact categories is the production of steel and aluminum mainly due to the energy consumption on these processes. These two materials accounts with approx. 74 % 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), the energy consumption was included, and it has a major contribution for all the impact assessment categories considered - between 68.8 % and 80.1 %, with the exception of ADPE (1.1 %). This is a result of 6 hours of operation in stand-by mode, 12 hours in idle-mode and 6 hours in on mode per day and per 355 days in a year.

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.

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9. Annex

Results shown below were calculated using TRACI Methodology.

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

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement[1)]	Refurbishment[1)]	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	MND	MND	MND	MND	X	MND	MND	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One **piece of ASSA ABLOY SL510 SLIDING DOOR OPERATOR**

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	4,61E+02	2,67E+00	9,58E+00	1,93E+03	1,88E-01	0,00E+00	9,86E+00	-2,18E+02
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	6,50E-07	1,36E-11	4,26E-11	1,41E-06	9,55E-13	0,00E+00	3,16E-11	8,64E-08
AP	Acidification potential of land and water	[kg SO_2-Eq.]	2,53E+00	1,61E-02	2,70E-03	8,62E+00	1,12E-03	0,00E+00	2,95E-03	-1,28E+00
EP	Eutrophication potential	[kg N-eq.]	1,39E-01	1,13E-03	1,36E-04	3,67E-01	7,93E-05	0,00E+00	8,98E-05	-3,27E-02
Smog	Ground-level smog formation potential	[kg O_3-eq.]	2,91E+01	3,31E-01	5,19E-02	7,81E+01	2,31E-02	0,00E+00	2,31E-02	-1,16E+01
Resources	Resources – resources fossil	[MJ]	4,79E+02	5,29E+00	3,41E-01	1,56E+03	3,72E-01	0,00E+00	4,29E-01	-1,73E+02

RESULTS OF THE LCA - RESOURCE USE: One piece of ASSA ABLOY SL510 sliding door operator

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	1,21E+03	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0,00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	1,21E+03	1,45E+00	2,62E-01	6,28E+03	1,02E-01	0,00E+00	3,06E-01	-7,84E+02
PENRE	Non-renewable primary energy as energy carrier	[MJ]	6,38E+03	-	-	-	-	-	-	-
PENRM	Non-renewable primary energy as material utilization	[MJ]	0,00E+00	-	-	-	-	-	-	-
PENRT	Total use of non-renewable primary energy resources	[MJ]	6,38E+03	3,69E+01	3,49E+00	3,44E+04	2,60E+00	0,00E+00	5E+00	-2,66E+03
SM	Use of secondary material	[kg]	8,63E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	Use of renewable secondary fuels	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	Use of non-renewable secondary fuels	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	Use of net fresh water	[m^3]	3,74E+00	1,02E-03	2,68E-02	1,55E+01	7,20E-05	0,00E+00	2,41E-02	-2,23E+00

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of ASSA ABLOY SL510 sliding door operator

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	2,38E-01	8,40E-05	2,41E-04	4,76E+00	5,91E-06	0,00E+00	3,24E-04	-3,42E-02
NHWD	Non-hazardous waste disposed	[kg]	4,33E+01	4,63E-03	4,05E-01	1,11E+01	3,27E-04	0,00E+00	9,19E-01	-3,03E+01
RWD	Radioactive waste disposed	[kg]	3,87E-01	4,83E-05	1,83E-04	4,95E+00	3,40E-06	0,00E+00	1,85E-04	-1,96E-01
CRU	Components for re-use	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-
MFR	Materials for recycling	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,51E+01	0,00E+00	0,00E+00
MER	Materials for energy recovery	[kg]	0,00E+00	0,00E+00	5,82E+00	0,00E+00	0,00E+00	4,34E+00	0,00E+00	0,00E+00
EEE	Exported electrical energy	[MJ]	0,00E+00	0,00E+00	1,37E+01	0,00E+00	0,00E+00	0,00E+00	1,89E+01	-
EET	Exported thermal energy	[MJ]	0,00E+00	0,00E+00	3,83E+01	0,00E+00	0,00E+00	0,00E+00	5,18E+01	-

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