ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	**ASSA ABLOY Entrance Systems**
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ASA-20150114-IBA1-EN
Issue date	18.05.2015
Valid to	17.05.2020

Besam SL500 Slim Thermo sliding door system with Besam TightSeal

ASSA ABLOY Entrance Systems

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-20150114-IBA1-EN

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

Issue date
18.05.2015

Valid to
17.05.2020

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

Dr.-Ing. Burkhart Lehmann
(Managing Director IBU)

Besam SL500 Slim Thermo sliding door system with Besam TightSeal

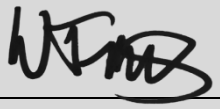
Owner of the Declaration
ASSA ABLOY Entrance Systems AB
Lodjursgatan 10
SE-261 44 Landskrona
Sweden

Declared product / Declared unit
This declaration represents 1 automatic sliding door system Besam SL500 Slim Thermo with Besam TightSeal consisting of 2 active door leaves with frame height 2.2 m, frame width 1.8 m and insulated glass.

Scope:
This declaration and its LCA study is relevant to the Besam SL500 Slim Thermo with Besam TightSeal - The final assembly and production stage occurs in Ostrov u Stribra, Czech Republic at D5 Logistic Park 34901 Ostrov u Stribra, Czech Republic. Components are sourced from international tier one suppliers. Besam SL500 Slim Thermo with Besam TightSeal sizes vary according to project requirements; a door system with 2 active door leaves with frame height 2.2 m and frame width 1.8 m and 22 mm insulated glass 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 verifier appointed by SVA)

2. Product

2.1 Product description

Product name: Besam SL500 Slim Thermo with Besam TightSeal

Product characteristics:
Sleek automatic sliding door system with additional sealing and insulated glass.
Besam SL500 Slim Thermo sliding door systems with Besam TightSeal are suitable for low to intense pedestrian traffic flow. It improves energy-savings while ensuring a high-level of entrance security. The sliding door systems are available in several configurations and designs, depending on application and facility requirements.
The door systems´ decorative, sleek profile blends beautifully into any facade, ensuring both convenience and appeal to pedestrians without compromising the architectural design.
The system consists of a support structure, door leaves with slim profiles, automatic door operator and safety units. Side screens and overlights are available upon request.
Automatic sliding door systems are made of aluminum, steel and glass.
The Besam SL500 Slim Thermo door system is fitted with 22 mm insulated glass, which improves energy savings even further. The Besam TightSeal solution minimizes air infiltration and energy losses. Directional activiation units contributes even further to eliminate unnecessary opening-cycles, keeping the integrity of the indoor climate intact.
The Besam SL500 Slim Thermo with Besam TightSeal has been designed to meet all operational and safety requirements in the European Directives and the standards issued by the European Standardization Committee (CEN).

2.2 Application

The Besam SL500 Slim Thermo with Besam TightSeal is an automatic sliding door system suitable for low to intense use. It combines optimal safety with maximum service life and appeal. The door system is designed to minimize unwanted air infiltration, blend into any

facade and ensure safe and convenient entry and exit for all- regardless of age and physical capabilities.
For outdoor and indoor applications in retail, private and public sector, etc. where design, pedestrian safety, security around-the-clock and variations in traffic intensity is a prerequisite.
The system handles changing weather conditions and environmental variations with ease.

2.3 Technical Data

The table presents the technical properties of the Besam SL500 Slim Thermo with Besam TightSeal automatic sliding door system:

Features

Name	Value	Unit
Size door leaf (bi-parting): (DW x DH)	1530 x 3010 (larger sizes available on request)	Mm
Clear opening: Bi-parting: SL500-2	900 – 3000	Mm
Clear opening: Single Slide: SL500-R/L	900 – 1500	Mm
Door leaf thickness	30	Mm
Door leaf material	glass and aluminum	-
Profile type	Slim Thermo	-
Profile finish	- anodized aluminum, colour on request - painted in colour according to RAL card	-
Glass type	22 (insulated)	mm

Performance

Name	Value
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: SL500	Variable up to approx. 1.4 m/s (SL500-2)
Hold open time	0-60 s
Recommended max.door weight: Bi-parting without break-out: SL500-2	200 kg/leaf
Recommended max.door weight: Single Slide without break-out: SL500-R/L	240 kg
For low energy movement	150 kg/leaf
Ambient temperature	-20 °C to +50 °C

2.4 Placing on the market / Application rules

For the placing on the market in the EEA, Switzerland and Turkey the following European directives apply to the Besam SL500 Slim Thermo with Besam TightSeal are:
2004/108/EC Electromagnetic Compatibility Directive (EMCD)
2006/42/EC Machinery Directive (MD)
These directives provides 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 61000-6-2 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-3 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 16005 Power operated pedestrian doorsets - Safety in use -Requirements and test methods.

Other standards or technical specifications, which have been applied:
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
EN 60335-2-103 Household and similar electrical appliances -Safety -Part 2: Particular requirements for drives for gates, doors and windows
IEC 600335-1 Household and similar electrical appliances -Safety -Part 1: General requirements
IEC 60335-2-103 Household and similar electrical appliances Safety Part 2-103: Particular requirements for drives for gates, doors and windows.
Disposal of the product is subject to the WEEE Directive within Europe, Directive 2012/19/EU

For the application and use the respective national provisions apply

2.5 Delivery status

The Besam SL500 Slim Thermo with Besam TightSeal is delivered ready for installation.

2.6 Base materials / Ancillary materials

The average composition for Besam SL500 Slim Thermo with Besam Thermo TightSeal is as following:

Component	Percentage in mass (%)
Glass	79.68
Aluminum	11.76
Steel	2.43
Stainless steel	0.19
Plastic	4.03
Electronic	0.19
Electro mechanics	1.60
Others	0.12
Total	**100**

2.7 Manufacture

Profiles are provided by tier one supplier SAPA and are delivered to the factory in Ostrov, Czech Republic. The profiles are machined. The products are surface treated; either anodized (externally) or powder coated (internally). Other parts as electronics, glass, etc. arrives from tier one suppliers or the factory in China then a basic assembly is done in Ostrov. The door system components are encased in pine crates and forwarded to on-site installation. The certified quality management system, EN ISO 9001:2008, 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 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

2.8 Environment and health during manufacturing

ASSA ABLOY Entrance Systems 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 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. The management of ASSA ABLOY Entrance Systems is aware of their roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
- Preparation and manufacturing conditions (including the process of powder 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.

2.9 Product processing/Installation

The Besam SL500 Slim Thermo with Besam TightSeal components are supplied ready for installation. The frame as well as the door leaves are assembled in factory and installed on-site by using simple tools including drills and hand tools. The installation is performed by certified installation technicians.

2.10 Packaging

Packaging exists for the purpose of protection during transportation. ASSA ABLOY Entrance Systems' sliding door systems are initially packaged in polystyrene film and corrugated cardboard. All packaging is recyclable.

Material	Value (%)
Cardboard/paper	97.3
Plastic	2.7
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

2.11 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 Besam SL500 Slim Thermo with Besam TightSeal is to use water and a soft cloth or a sponge. A gentle detergent may be used. To maintain the quality of the enamel layer, the surfaces should be three times/year (once/four month's period). The cleaning should be documented. To avoid damages to the profiles, the brushes/weather stripping must be vacuum-cleaned weekly.

- Do not expose windows, doors or profiles to alkalis. Both aluminum and glass are sensitive to alkalis.
- Do not clean with high pressure water. Operator, programme 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.

2.12 Environment and health during use

There is no harmful emissive potential. Minimal risk for personal injury if correctly configured and maintenance recommendations apply.

2.13 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.

2.14 Extraordinary effects

Fire

Not applicable.

Water

Contains no substances that have any 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.

2.15 Re-use phase

The product is possible to re-use during the reference service life and be moved from one entrance to another. The majority, by weight, of components is aluminum alloy, steel and glass which can be recycled. The plastic components can be used for energy recovery within a waste incineration process.
All materials are directed to a recycling unit. The components made of aluminum alloy, steel, and stainless steel can be recycled. The plastic components can be used for energy recovery within a waste incineration process.
Waste codes according to European Waste Catalogue and Hazardous Waste List - Valid from 1 January 2002.
EWC 16 02 13* discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12
EWC 17 02 03 plastic
EWC 17 04 01 copper, bronze, brass
EWC 17 04 02 aluminum
EWC 17 04 05 iron and steel
EWC 17 04 11 Cables with the exception of those outlined in 17 04 10

Disposal of the product is subject to the WEEE Directive within Europe, Directive 2012/19/EU.

2.16 Disposal

The requirements on waste disposal and recycling listed in the European Waste Catalogue (EWC) should be followed. The requirements on waste disposal and recycling listed in the European Waste Catalogue (EWC) should be followed. As the product contains no substances harmful to the environment or human health, the entire system can be safely placed in a landfill site in cases where no waste recycling technologies are available.

In this EPD, product parts made of glass were treated as a waste for landfill:
EWC 17 02 02 glass

2.17 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 automatic sliding door system Besam SL500 Slim Thermo with Besam TightSeal (frame height 2.2 m, frame width 1.8 m and insulated glass) as specified in Part B requirements on the EPD for PCR Automatic doors, automatic gates, and revolving door systems (door systems).

Declared unit

Name	Value	Unit
Declared unit for automatic doors and gates*	4.09	m²
Mass (without packaging)	255.14	kg
Mass (packaging)	7.05	kg
Conversion factor to 1 kg	0.004	-
Declared unit for revolving door systems (dimensions acc. to this PCR)	1	piece

*The areas for the Automatic doors are represented by the area of the two active door leafs.

3.2 System boundary

Type of the EPD: cradle to gate - with Options
The following life cycle phases 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 (Energy consumption for operation)

C1-C4 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 or recycling potential from EOL and A5.

3.3 Estimates and assumptions

Use phase:
For the use phase, it is assumed that the sliding door system is used in Europe, thus an EU electricity grid mix is considered within this stage.

EoL:
In the End-of-Life phase, for all the materials which can be recycled, a recycling scenario with 100% collection rate was assumed.

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), thermal energy consumption 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 products, the GaBi 6 Software System for Life Cycle Engineering, developed by PE INTERNATIONAL AG, is used /GaBi 6 2013/. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation /GaBi 6 2013D/.
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/.
PE INTERNATIONAL 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 6 software database. The last revision of the used background data has taken place not longer than 10 years ago.

3.7 Period under review
The period under review is 2013/14 (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:
• Waste incineration of plastic
• Waste incineration of paper
• Waste incineration of electronic scrap
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.

4. LCA: Scenarios and additional technical information

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (Paper packaging)	6.861	kg
Output substances following waste treatment on site (Plastic packaging)	0.192	kg

Reference service life

Name	Value	Unit
Reference service life	10	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	4068	kWh
Days per year in use	355	days
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 in on mode in W	71	W
Power consumption in idle mode in W	40	W
Power consumption in off mode in W	40	W

End of life (C1-C4)

Name	Value	Unit
Collected separately Aluminum, stainless steel, steel, zinc, electronic, copper, brass, electro mechanics, plastics	51.85	kg
Collected as mixed construction waste – glass	203.29	kg
Reuse plastic parts	10.29	kg
Recycling Aluminum, stainless steel, steel, zinc, copper, brass, electro mechanics, electronic	41.56	kg
Landfilling – glass	203.29	kg

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

Name	Value	Unit
Collected separately waste type Besam SL500 Slim Thermo sliding door system (including packaging)	262.20	kg
Recycling Aluminum	11.44	%
Recycling Stainless steel	0.19	%
Recycling Steel	2.37	%
Recycling Electronic and electro mechanics (PWBs, copper)	1.74	%
Recycling others (Zinc, Brass, Copper)	0.11	%
Reuse Plastic parts	3.93	%
Reuse Paper packaging (from A5)	2.62	%
Reuse Plastic packaging (from A5)	0.07	%
Loss Glass, constructions waste for landfilling (no recycling potential)	77.53	%

5. LCA: Results

Results shown below were calculated using CML 2001 – 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 Besam SL500 Slim Thermo with Besam TightSeal (frame height 2.2 m, frame width 1.8 m and insulated glass)

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	9.50E+02	2.08E+01	9.72E+00	1.93E+03	1.25E+00	6.81E-01	3.37E+01	-3.17E+02
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	4.98E-07	9.94E-11	4.45E-11	1.32E-06	5.97E-12	4.66E-10	2.24E-10	1.29E-07
AP	Acidification potential of land and water	[kg SO_2-Eq.]	5.69E+00	9.50E-02	2.22E-03	9.11E+00	5.71E-03	3.21E-03	3.85E-02	-1.82E+00
EP	Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	4.39E-01	2.17E-02	3.87E-04	5.13E-01	1.30E-03	1.81E-04	4.25E-03	-8.74E-02
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	3.62E-01	-3.06E-02	1.57E-04	5.41E-01	-1.84E-03	1.91E-04	3.42E-03	-1.03E-01
ADPE	Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	2.08E-02	7.83E-07	1.75E-07	2.67E-04	4.70E-08	9.42E-08	4.65E-06	-1.33E-02
ADPF	Abiotic depletion potential for fossil resources	[MJ]	1.13E+04	2.86E+02	2.72E+00	2.19E+04	1.72E+01	7.73E+00	1.18E+02	-3.12E+03

RESULTS OF THE LCA - RESOURCE USE: One piece of Besam SL500 Slim Thermo with Besam TightSeal (frame height 2.2 m, frame width 1.8 m and insulated glass)

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	2.44E+03	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	2.44E+03	1.13E+01	2.54E-01	6.28E+03	6.78E-01	2.21E+00	5.97E+00	-1.24E+03
PENRE	Non renewable primary energy as energy carrier	[MJ]	1.38E+04	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	1.38E+04	2.87E+02	3.19E+00	3.44E+04	1.73E+01	1.21E+01	1.23E+02	-3.91E+03
SM	Use of secondary material	[kg]	5.44E+01	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]	6.27E+00	7.97E-03	2.83E-02	1.55E+01	4.78E-04	5.47E-03	-2.70E-01	-3.36E+00

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of Besam SL500 Slim Thermo with Besam TightSeal (frame height 2.2 m, frame width 1.8 m and insulated glass)

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	9.40E-01	6.55E-04	2.19E-04	4.76E+00	3.93E-05	1.68E-03	3.71E-03	-5.15E-02
NHWD	Non hazardous waste disposed	[kg]	6.31E+01	3.61E-02	2.44E-01	1.11E+01	2.17E-03	3.91E-03	1.59E+02	-4.71E+01
RWD	Radioactive waste disposed	[kg]	9.96E-01	3.76E-04	1.87E-04	4.95E+00	2.26E-05	1.75E-03	1.89E-03	-3.16E-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	6.86E+00	0.00E+00	0.00E+00	2.40E+02	0.00E+00	-
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	1.23E+01	0.00E+00	0.00E+00	0.00E+00	4.89E+01	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	3.47E+01	0.00E+00	0.00E+00	0.00E+00	1.34E+02	-

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 phase (modules A1-A3) contributes between 27% and 45% 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 phase accounts for app. 99% - 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 phase, the main contribution for all the impact categories is the production of steel and aluminum mainly due to the energy consumption on this process. Glass, aluminum and steel accounts with app. 75% 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 phase (module B6), the energy consumption was included and it has a major contribution for all the impact assessment categories considered - between 52% and 72%, with the exception of ADPE (1%).

In the end-of-life phase, 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

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin (pub.): Generation of Environmental Product Declarations (EPDs);

General principles
for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013-04
www.bau-umwelt.de

IBU PCR Part A
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. April 2013
www.bau-umwelt.de

IBU PCR Part B
IBU PCR Part B: Automatic doors, automatic gates, and revolving door systems (door systems)
(PCR tested and approved by the independent expert committee)

2004/108/EC Electromagnetic Compatibility Directive (EMCD)
Relating to electromagnetic compatibility and repealing Directive 89/336/EEC

2006/42/EC Machinery Directive (MD)
Directive 2006/42/EC on machinery

DIN 18650-1
DIN 18650-1: 2005: Powered pedestrian doors - Part 1: Product requirements and test methods.

DIN 18650-2
DIN 18650-2: 2005: Powered pedestrian doors - Part 2: Safety at powered pedestrian doors.

ISO 14025
EN ISO 14025:2011: Environmental labels and declarations - Type III environmental declarations - Principles and procedures

EN 15804
EN 15804:2012+A1:2014: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

EN 16005
EN 16005:2012: Power operated pedestrian doorsets - Safety in use - Requirements and test methods.

EN 60335-1
EN 60335-1: 2012: Household and similar electrical appliances -Safety -Part 1: General requirements

EN 60335-2-103
EN 60335-2-103: 2003 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: Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

EN 61000-6-3
EN 61000-6-3: 2001: Quality management systems - Requirements (EN ISO 9001:2008)

EN ISO 13849-1
EN ISO 13849-1:2008: Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design.

GaBi 6
GaBi 6 2013: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, PE INTERNATIONAL AG, Leinfelden-Echterdingen, 1992-2013.

GaBi 6 2013D
GaBi 6 2013D: Documentation of GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, PE INTERNATIONAL AG, Leinfelden-Echterdingen, 1992-2013.
http://documentation.gabi-software.com/

WEEE
Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

EWC
European Waste Catalog

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 Besam SL500 Slim Thermo with Besam TightSeal (frame height 2.2 m, frame width 1.8 m and insulated glass)

Parameter	Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	9.50E+02	2.08E+01	9.72E+00	1.93E+03	1.25E+00	6.81E-01	3.37E+01	-3.17E+02
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	5.40E-07	1.06E-10	4.73E-11	1.41E-06	6.35E-12	4.96E-10	2.38E-10	1.37E-07
AP	Acidification potential of land and water	[kg SO_2-Eq.]	5.72E+00	1.24E-01	2.68E-03	8.62E+00	7.46E-03	3.04E-03	4.19E-02	-1.71E+00
EP	Eutrophication potential	[kg N-eq.]	2.76E-01	8.77E-03	1.55E-04	3.67E-01	5.27E-04	1.29E-04	4.94E-03	-4.28E-02
Smog	Ground-level smog formation potential	[kg O_3-eq.]	7.13E+01	2.56E+00	6.27E-02	7.81E+01	1.54E-01	2.75E-02	7.06E-01	-1.55E+01
Resources	Resources – fossil resources	[MJ]	1.10E+03	4.12E+01	3.19E-01	1.56E+03	2.47E+00	5.51E-01	1.50E+01	-2.67E+02

RESULTS OF THE LCA - RESOURCE USE: One piece of Besam SL500 Slim Thermo with Besam TightSeal (frame height 2.2 m, frame width 1.8 m and insulated glass)

Parameter	Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	2.44E+03	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	2.44E+03	1.13E+01	2.54E-01	6.28E+03	6.78E-01	2.21E+00	5.97E+00	-1.24E+03
PENRE	Non renewable primary energy as energy carrier	[MJ]	1.38E+04	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	1.38E+04	2.87E+02	3.19E+00	3.44E+04	1.73E+01	1.21E+01	1.23E+02	-3.91E+03
SM	Use of secondary material	[kg]	5.44E+01	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]	6.27E+00	7.97E-03	2.83E-02	1.55E+01	4.78E-04	5.47E-03	-2.70E-01	-3.36E+00

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of Besam SL500 Slim Thermo with Besam TightSeal (frame height 2.2 m, frame width 1.8 m and insulated glass)

Parameter	Parameter	Unit	A1-3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	9.40E-01	6.55E-04	2.19E-04	4.76E+00	3.93E-05	1.68E-03	3.71E-03	-5.15E-02
NHWD	Non hazardous waste disposed	[kg]	6.31E+01	3.61E-02	2.44E-01	1.11E+01	2.17E-03	3.91E-03	1.59E+02	-4.71E+01
RWD	Radioactive waste disposed	[kg]	9.96E-01	3.76E-04	1.87E-04	4.95E+00	2.26E-05	1.75E-03	1.89E-03	-3.16E-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	6.86E+00	0.00E+00	0.00E+00	2.40E+02	0.00E+00	-
MER	Materials for energy recovery	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
EEE	Exported electrical energy	[MJ]	0.00E+00	0.00E+00	1.23E+01	0.00E+00	0.00E+00	0.00E+00	4.89E+01	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	3.47E+01	0.00E+00	0.00E+00	0.00E+00	1.34E+02	-

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