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-20150116-IBA1-EN
Issue date	18.05.2015
Valid to	17.05.2020

Besam PowerSwing swing door operator

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-20150116-IBA1-EN

This Declaration is based on the Product Category Rules:
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 PowerSwing swing 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 swing door operator Besam PowerSwing.

Scope:
This declaration and its LCA study is relevant to the Besam PowerSwing swing door operator. 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. The Besam PowerSwing operator cover length vary according to project requirements; an operator with cover standard length 716 mm and push arm system 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 PowerSwin
Product characteristics: Automatic, electro-hydraulic swing door operator
The operator works electro-hydraulically, opening with motor and closing with spring. The opening and closing speeds can be varied individually.
The motor, oil pump and hydraulic unit are combined into a compact unit mounted next to the control within the cover. The operator is connected to the door leaf with either a pushing or a pulling arm system.
The Besam PowerSwing offers fire rating and is approved for fire door installations using a concealed coordinator for double door applications.
Automatic swing door operators are generally made of aluminum and steel.
The Besam PowerSwing 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 PowerSwing operator is suitable for most types of external and internal swing doors.
The Besam PowerSwing is just as suitable for disabled access, nursing homes and hospital corridors – with tough requirements on safety and reliability – as it is for department stores, banks, hotels etc. in demanding environments. The door can be held continuously open using a programme selector. The electronics and the motor are discreetly housed in an attractive cover.

2.3 Technical Data

The table presents the technical properties of the Besam PowerSwing:

Features

Length (standard cover)	716 mm (optional lengths available)
Height	110 mm
Depth	110 mm
Inertia	Max. 80 kg/m²
Profile finish	Anodized aluminium, RAL colors available on request

Performance

Mains power supply	230 V AC ±10%, 50 Hz, mains fuse max 10A
Power consumption	Max. 230W (Max 460W Double door set)
Auxiliary voltage	24 V DC, 700 mA (stabilized)
Opening time (0° - 80°)	variable between 2 - 8 seconds
Closing time (90° - 10°)	variable between 2 - 8 seconds
HOLD open time	1.5-30 seconds
Ambient temperature	-15°C to +30°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 PowerSwing 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 PowerSwing is delivered ready for installation.

2.6 Base materials / Ancillary materials

The average composition of Besam PowerSwing is as follows:

Component	Percentage in in mass (%)
Electronic	37.53
Aluminium	33.36
Brass	0.02
Copper	0.06
Lubricants	2.86
Plastics	2.11
Stainless steel	8.50
Steel	13.18
Zinc	1.09
others	1.29
Total	**100.0**

2.7 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 9001:2008, 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

2.8 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 PowerSwing is supplied ready for installation. The installation is performed by certified installation technicians.

2.10 Packaging

The Besam PowerSwing components are packed in cardboard packaging together with interior fittings made of Styrofoam. The cardboard is recyclable.

Material	Value (%)
Cardboard/paper	86.96
Plastics	13.04
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 "User's Manual".
The best way to remove dust and dirt from the Besam PowerSwing 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 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, 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

The Besam PowerSWing is tested for usage in fire and smoke protection doors according to EN1634-1.

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 door to another. The components made of aluminium alloy and steel 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 aluminium
EWC 17 04 05 iron and steel
EWC 17 04 11 Cables with the exception of those outlined in 17 04 10
EWC 17 09 03* Construction and Demolition Waste - other construction and demolition wastes (including mixed wastes) containing dangerous substances.
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, small parts of product were treated as a waste for landfill:
17 09 04 mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03

2.17 Further information

ASSA ABLOY Entrance Systems AB
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SE-261 44 Landskrona
Sweden
www.assaabloyentrance.com

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of the Besam PowerSwing operator as specified in Part B requirements on the EPD for Doors, windows, shutters, and related products/IBU PCR Part B/. PCR Automatic doors, automatic gates, and revolving door systems (door systems).

Declared unit

Name	Value	Unit
Declared unit	1	piece of operator
Mass of product (without packaging)	13.22	kg
Mass packaging	0.81	kg
Conversion factor to 1 kg	0.076	-

3.2 System boundary

Type of the EPD: cradle to gate - with options
The following life cycle phases were considered for Door Closer:

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 BESAM-RD operation)

End-of-life stage:

- C2 – Transport to waste processing
- C3 – Waste processing for recycling and
- C4 – Disposal (landfill)

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.

- 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 swing door operator 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

I 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 (PWBs)
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 Packaging (paper)	0.70	kg
Output substances following waste treatment on site Packaging (plastics)	0.11	kg

Reference service life

Name	Value	Unit
Reference service life	10	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption	2336	kWh
Days per year in use	365	days
Hours per day in on mode	10	h
Hours per day in stand-by mode	6	h
Hours per day in idle mode	8	h
Power consumption in on mode in W	50	W
Power consumption in idle mode in W	10	W
Power consumption in off mode in W	10	W

End of life (C1-C4)

Name	Value	Unit
Collected separately Aluminium, brass, copper, zinc, stainless steel, steel, electronic, plastics	13.05	kg
Collected as mixed construction waste construction waste for landfilling	0.17	kg
Reuse plastic parts	0.28	kg
Recycling Aluminium, brass, copper, zinc, steel, stainless steel, electronics	12.77	kg
Landfilling construction waste for landfilling	0.17	kg

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

Name	Value	Unit
Collected separately waste type Besam PowerSwing (including packaging)	14.02	kg
Recycling Secondary aluminium	31.45	%
Recycling Brass and copper	0.07	%
Recycling Steel	12.42	%
Recycling Stainless steel	8.02	%
Recycling Electronic and electro-mechanics	35.38	%
Recycling Zinc	1.03	%
Reuse Plastic parts	1.98	%
Reuse Paper packaging (from A5)	4.99	%
Reuse Plastic packaging (from A5)	0.75	%
Loss Construction waste for landfilling (no recycling potential)	3.91	%

5. LCA: Results

Results shown below were calculated using 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 PowerSwing

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	9.97E+01	7.00E-01	1.17E+00	1.11E+03	3.33E-01	7.77E-01	1.84E+00	-5.05E+01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.94E-08	3.35E-12	5.08E-12	7.59E-07	1.60E-12	5.32E-10	6.15E-12	1.90E-08
AP	Acidification potential of land and water	[kg SO_2-Eq.]	7.72E-01	3.21E-03	2.72E-04	5.23E+00	1.53E-03	3.67E-03	8.41E-04	-3.24E-01
EP	Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	3.68E-02	7.32E-04	4.29E-05	2.95E-01	3.49E-04	2.06E-04	9.12E-05	-1.50E-02
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	4.72E-02	-1.03E-03	1.83E-05	3.11E-01	-4.92E-04	2.18E-04	5.86E-05	-1.78E-02
ADPE	Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	7.85E-03	2.64E-08	2.98E-08	1.54E-04	1.26E-08	1.08E-07	1.54E-07	-5.69E-03
ADPF	Abiotic depletion potential for fossil resources	[MJ]	1.12E+03	9.66E+00	3.54E-01	1.26E+04	4.60E+00	8.83E+00	1.55E+00	-4.95E+02

RESULTS OF THE LCA - RESOURCE USE: One piece of Besam PowerSwing

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	2.64E+02	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	2.64E+02	3.81E-01	3.15E-02	3.61E+03	1.81E-01	2.53E+00	1.26E-01	-1.86E+02
PENRE	Non renewable primary energy as energy carrier	[MJ]	1.35E+03	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	1.35E+03	9.69E+00	4.10E-01	1.97E+04	4.62E+00	1.38E+01	1.67E+00	-6.13E+02
SM	Use of secondary material	[kg]	2.81E+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]	9.34E-01	2.69E-04	3.33E-03	8.91E+00	1.28E-04	6.24E-03	2.05E-03	-5.38E-01

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of Besam PowerSwing

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	4.07E-02	2.21E-05	2.83E-05	2.74E+00	1.05E-05	1.92E-03	1.03E-04	-7.25E-03
NHWD	Non hazardous waste disposed	[kg]	1.32E+01	1.22E-03	4.17E-02	6.37E+00	5.81E-04	4.47E-03	4.53E+00	-7.99E+00
RWD	Radioactive waste disposed	[kg]	9.23E-02	1.27E-05	2.24E-05	2.84E+00	6.04E-06	1.99E-03	5.00E-05	-4.66E-02
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	6.30E-01	0.00E+00	0.00E+00	7.50E+00	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	1.60E+00	0.00E+00	0.00E+00	0.00E+00	3.29E+00	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	4.49E+00	0.00E+00	0.00E+00	0.00E+00	9.03E+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).

Production phase (module A1-A3) contributes between 8% and 13% to total impact assessment, with exception for ADPE (98%). Upstream emissions associated with steel- aluminum making processes as well as electronic and electro mechanic parts dominate this stage. 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, with exception of ADPE (2%), it contributes between 89% and 97% for all the other impact categories considered.

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 PowerSwing

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	9.97E+01	7.00E-01	1.17E+00	1.11E+03	3.33E-01	7.77E-01	1.84E+00	-5.05E+01
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.07E-08	3.57E-12	5.40E-12	8.08E-07	1.70E-12	5.66E-10	6.54E-12	2.02E-08
AP	Acidification potential of land and water	[kg SO_2-Eq.]	7.19E-01	4.19E-03	3.28E-04	4.95E+00	1.99E-03	3.47E-03	9.61E-04	-3.03E-01
EP	Eutrophication potential	[kg N-eq.]	2.28E-02	2.96E-04	1.74E-05	2.11E-01	1.41E-04	1.48E-04	5.45E-05	-7.27E-03
Smog	Ground-level smog formation potential	[kg O_3-eq.]	6.27E+00	8.62E-02	6.82E-03	4.48E+01	4.11E-02	3.14E-02	1.34E-02	-2.66E+00
Resources		[MJ]	9.20E+01	1.39E+00	4.04E-02	8.97E+02	6.62E-01	6.29E-01	1.78E-01	-4.10E+01

RESULTS OF THE LCA - RESOURCE USE: One piece of Besam PowerSwing

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	2.64E+02	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	2.64E+02	3.81E-01	3.15E-02	3.61E+03	1.81E-01	2.53E+00	1.26E-01	-1.86E+02
PENRE	Non renewable primary energy as energy carrier	[MJ]	1.35E+03	-	-	-	-	-	-	-
PENRM	Non renewable primary energy as material utilization	[MJ]	0.00E+00	-	-	-	-	-	-	-
PENRT	Total use of non renewable primary energy resources	[MJ]	1.35E+03	9.69E+00	4.10E-01	1.97E+04	4.62E+00	1.38E+01	1.67E+00	-6.13E+02
SM	Use of secondary material	[kg]	2.81E+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]	9.34E-01	2.69E-04	3.33E-03	8.91E+00	1.28E-04	6.24E-03	2.05E-03	-5.38E-01

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of Besam PowerSwing

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	4.07E-02	2.21E-05	2.83E-05	2.74E+00	1.05E-05	1.92E-03	1.03E-04	-7.25E-03
NHWD	Non hazardous waste disposed	[kg]	1.32E+01	1.22E-03	4.17E-02	6.37E+00	5.81E-04	4.47E-03	4.53E+00	-7.99E+00
RWD	Radioactive waste disposed	[kg]	9.23E-02	1.27E-05	2.24E-05	2.84E+00	6.04E-06	1.99E-03	5.00E-05	-4.66E-02
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	6.30E-01	0.00E+00	0.00E+00	7.50E+00	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	1.60E+00	0.00E+00	0.00E+00	0.00E+00	3.29E+00	-
EET	Exported thermal energy	[MJ]	0.00E+00	0.00E+00	4.49E+00	0.00E+00	0.00E+00	0.00E+00	9.03E+00	-

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