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-20200093-IBC1-EN
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Valid to	14.05.2025

ASSA ABLOY OH1042P overhead sectional door
ASSA ABLOY Entrance Systems

Institut Bauen und Umwelt e.V.

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

1. General Information

ASSA ABLOY	ASSA ABLOY OH1042P overhead sectional door
Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the Declaration** ASSA ABLOY Entrance Systems AB Lodjursgatan 10 SE-261 44 Landskrona Sweden
Declaration number EPD-ASA-20200093-IBC1-EN	**Declared product / Declared unit** This declaration represents 1 industrial overhead sectional door with electrical operation, 3600 mm width and 3600 mm height, consisting of panels filled with water blown CFC-free polyurethane foam, panel thickness 42 mm and panel height 545 mm.
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)	**Scope:** This declaration and its LCA study are relevant to the ASSA ABLOY OH1042P overhead sectional door. The production location is Heerhugowaard, Netherlands and components are sourced from international tier one suppliers. ASSA ABLOY OH1042P overhead sectional door size vary according to project requirements; a standard door 3600 mm width and 3600 mm height with insulated panels filled with CFC-free polyurethane, panel thickness 42 mm, panel height 545 mm 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.
Issue date 15.05.2020	
Valid to 14.05.2025	
 Dipl.-Ing. Hans Petersr (President of IBU e.V.)	**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. Alexander Röder (Managing Director of IBU e.V)	 Dr. Wolfram Trinius (Independent tester appointed by SVA)

2. Product

2.1 Product description

Product name: ASSA ABLOY OH1042P overhead sectional door

The ASSA ABLOY OH1042P overhead sectional door is suitable for all types of buildings, with regard to both function and appearance. High flexibility makes it possible to install this door in almost every type of building. The door slides up under the roof when opened, allowing free space around the door opening and leaving the door opening completely free. The door is made of insulated panels. The panels are designed without thermal bridge to provide minimal thermal transmittance, which reduces energy cost (in case the space is conditioned). The surface is made of waffled steel or aluminum. The panel has integrated finger pinch protection. There is top, bottom and side seals and seals between door sections. The standard track system is made of galvanized steel. The balancing system balances the door by applying a force nearly equal to the weight of the door leaf. This allows the door leaf to be moved up and down, and to stay open in any position. The balancing system (torsion spring system or weight balancing system to keep the door in balance) supports heavy forces. In case of a spring or cable break, its counterforce is lost. The door is therefore equipped with two safety devices that can block downward door movement; Spring Break Device (standard) and Cable Break Device (option, not declared in this EPD).

The door has 4 primary parts:
1) Door leaf
2) Track set
3) Balancing system
4) Operating system/chainhoist (optional).

The ASSA ABLOY OH1042P overhead sectional door has been designed to meet all operational and safety requirements in the European Directives and the standards issued by the European Standardization

Committee (CEN).
(standard) and Cable Break Device (option, not declared in this EPD).

For the placing on the market in the EEA, Switzerland and Turkey the Construction Products Regulation (EU) No 305/2011 applies. The products need a Declaration of Performance and CE marking under consideration of the Construction Products Regulation and the harmonized standard EN 13241:2003+A2:2016 Industrial, commercial and garage doors and gates — Product standard — Part 1: Products without fire resistance or smoke control characteristics.

Further standards that can be applied for sectional doors are:
 Wind load: EN12424
Class 3 (≤ 4250 mm DLW)
Class 2(> 4250 mm DLW) (Higher classes on request)
 Thermal transmittance: EN12428
1.0 W/(m².K) Steel door (Door surface 5000 x 5000 mm)
1.70 W/(m².K) Steel door with windows/passdoor (4000 x 3840 mm)
 Water penetration: EN12425
Class 3 (Door surface 4000 x 3310 mm)
 Air permeability: EN12426 Class 3 (Door surface 4000 x 3310 mm)
 Acoustic insulation: EN ISO 10140-2
R=25 dB (Door surface 2590 x 4210 mm)

The electrical unit as identified is in compliance with the following directives:
2006/42/EC Machinery Directive (MD)
2014/30/EU Electromagnetic Compatibility Directive (EMCD)
2011/65/EU RoHS

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

Other standards or technical specifications, which have been applied:
EN 60335-2-103 Household and similar electrical appliances -Safety -Part 2: Particular requirements for drives for gates, doors and windows.
For the application and use the respective national provisions apply.

2.2 Application
The ASSA ABLOY OH1042P overhead sectional door is suitable for all types of buildings, with regard to both function and appearance. It has a modern, clean design and meets high stability and insulation demands. High flexibility makes it possible to install this door in almost every type of building allowing free space around the door.

2.3 Technical Data
The table presents the technical properties of the ASSA ABLOY OH1042P overhead sectional door:

Technical data

Name	Value	Unit
Max size: (W x H)	8000 x 6000 mm (larger sizes available on request)	mm
Panel thickness:	42	mm
Panel material:	**Waffled steel** or aluminium	
Filling:	CFC-free polyurethane	
Weight	Steel: 13 kg/m2 Alu: 10 kg/m2	
Colour outside:	12 Standard RAL colours	
Colour inside:	RAL 9002	
Track types:	**Standard: SL** Optional: HL, LL, VL	
Windows (optional):	Optional: DARP, DAOP, Framed section	
Passdoor (optional):	Optional: In door leaf with Low threshold and Standard threshold	
Electrical operation:	Optional: **Automated operation**, Access control, Safety functions	
Opening/ closing speed:	CDM9: 0.25 m/s CDM9 HD: 0.18 m/s CDM9 2H: opening 0.5 m/s, closing 0.25 m/s	

**Bold text and values are relevant for the product in this EPD*

2.4 Delivery status
ASSA ABLOY OH1042P overhead sectional door unit with door size of width 3650 mm and height 3620 mm is delivered in parts ready for installation. All necessary installation material is included. For every track type, ASSA ABLOY offers specific installation kits to position the door in the building façade.

2.5 Base materials / Ancillary materials
The average composition for ASSA ABLOY OH1042P overhead sectional door is as following:

Component	Percentage in mass (%)
Aluminium	4.40
Brass	0.51
Plastics	4.29
Stainless steel	0.01
Steel	88.39
Electronic	0.34
Electro_mechanics	1.19
Others	0.86
Total	**100**

2.6 Manufacture
The final manufacturing processes occur at the factory in Heerhugowaard, The Netherlands. The electronics are produced in Ostrov, Czech Republic.

The factory in Heerhugowaard, The Netherlands has a certification of quality management system in accordance with ISO 9001 & ISO 14001.

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 17 02 03 plastic

2.7 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. Management of ASSA ABLOY Entrance Systems is aware of their roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
• The factory of Heerhugowaard, The Netherlands has certification of Environmental Management to ISO 14001.
• Any waste metals during machining are separated and recycled.

2.8 Product processing/Installation

The overhead sectional door components are supplied ready for installation. The panels, tracks, springs and hardware are assembled and installed on-site. The components are assembled using simple tools including drills and hand tools. The installation is performed by certified (or competent) installation technicians.

2.9 Packaging

Packaging exists for the purpose of protection during transportation. ASSA ABLOY OH1042P overhead sectional door components are packaged in polystyrene plastic and corrugated cardboard. All of these packaging components are standard industry types. The cardboard is recyclable.

Material	Value (%)
Cardboard/paper	71.82
Wood	18.17
Copper	0.08
Plastics	9.93
Total	**100.0**

All materials incurred during installation are sent to a recycling unit (copper) and waste incineration plant (wood paper and plastic) for its energy recovery.

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
EWC 15 01 03 wooden packaging.
EWC 17 04 01 copper, bronze, brass

2.10 Condition of use

Regular inspections by a trained and qualified person is recommended a minimum of one visit per year or more.
Monthly examination of the ASSA ABLOY OH1042P overhead sectional door
1) Use a soft brush and a mild detergent to clean the track set and the door seals.
2) Make sure there are no loose screws, bolts or nuts on the door leaf or the track set.
3) If necessary, tighten all loose screws, bolts and nuts.
4) Examine all door leaf hinges, door seals, rollers and roller holders for damage.
5) If damage is found, contact the local service centre for advice.
6) Examine the door cables for damage and corrosion.
7) If damage or corrosion is found, contact the local service centre for advice.
8) Lubricate the metal door-leaf hinges with oil (SAE 20).

2.11 Environment and health during use

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

2.12 Reference service life

The product has reference service life of more than 200.000 cycles standard daily use with the recommended maintenance and service program. For this EPD the lifetime of 35 years was considered.

2.13 Extraordinary effects

Fire
The panel fire test according to DIN 4102 part 1 class B2. No further tests have been conducted by Assa Abloy.

Water
Contain no substances that have any impact on water in case of flood. Electric operation of the device will be influenced negative.

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

2.14 Re-use stage

The product is possible to be re-used during the reference
service life and be moved from one door to another.

All recyclable materials are directed to a recycling unit where they are recycled (brass, electronics, electro-mechanics, stainless steel, steel, and aluminum).

On the other hand, the plastic components are sent to waste incineration plant for its energy recovery.

Waste codes according to European Waste Catalogue and Hazardous Waste List -Valid from 1 January 2002.
EWC 16 02 14 Used devices with the exception of those outlined in 16 02 09 to 16 02 13
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

2.15 Disposal

The product can be mechanically dissembled to separate the different materials. The majority, of components are steel and aluminiumwhich will be recycled. The plastic components are used for energy recovery in an incineration plant. No disposal is foreseen for the product nor for the corresponding packaging.

2.16 Further information

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3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of ASSA ABLOY OH1042P overhead sectional door (width of 3650 mm and height 3620 mm) as specified in Part B requirements on the EPD IBU: PCR Automatic doors, automatic gates, and revolving door systems (door systems).

Declared unit

Name	Value	Unit
Mass (without packaging)	197.16	kg
Mass packaging (paper wood, cooper and plastics)	7.13	kg
Conversion factor to 1 kg	0.0051	-
Declared unit for sectional 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 phase, it is assumed that the sectional door is used in the European Union, thus an European electricity grid mix is considered within this stage. According to the most representative scenario, the operating hours of the product are accounted for 11 hours in on mode and finally 5269 hours in standby mode per year (220 days per year in use); the power consumption throughout the whole life cycle is 2959 kWh.

EoL:
In the End-of-Life stage, for all the materials from the product which can be recycled (steel, aluminium, electronic parts, electro-mechanics, copper, stainless steel and brass), a recycling scenario with 100% collection rate was assumed. The plastic components are sent for energy recovery within a waste incineration process.

EoL is assumed to happen within EU-28. Furthermore, a transport distance by truck of 100 km has been assumed in the model.

3.4 Cut-off criteria

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

Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

3.5 Background data

For life cycle modeling of the considered product, the GaBi 9 Software System for Life Cycle Engineering, developed by thinkstep AG, is used /GaBi 9 2019a/. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation /GaBi 9 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 9 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 Plastic
- Waste incineration of Wood
- Recycling of Copper

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 9 2019b/ 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)	750	km
Capacity utilization (incl. empty runs) of truck	85	%
Transport by ship	21	km

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (paper/cardboard packaging)	5.46	kg
Output substances following waste treatment on site (copper packaging)	0.006	kg
Output substances following waste treatment on site (wood packaging)	1.38	kg
Output substances following waste treatment on site (plastic packaging)	0.75	kg

Reference service life

Name	Value	Unit
Reference service life	35	a

Operational energy use (B6)

Name	Value	Unit
Electricity consumption per RSL (35 years, 220 days per year)	2959	kWh
Hours per day in on mode	0,05	h
Hours per day in stand-by mode	23,95	h
Hours per day in idle mode	0	h
Power consumption – on mode	500	W
Power consumption – stand-by mode	15	W
Power consumption – idle mode	0	W

For the remaining days (145 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, stainless steel, copper, electronic, electro mechanics etc.	196.69	kg
Incineration of plastic parts	8.43	kg
Recycling aluminum, steel, electronic, electro-mechanics, stainless steel and brass	186.56	kg

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

Name	Value	Unit
Collected separately waste type (including packaging)	202.60	kg
Recycling aluminium	4.28	%
Recycling brass	0.49	%
Recycling copper	0.003	%
Recycling stainless steel	0.008	%
Recycling steel	85.81	%
Recycling electronic	0.33	%
Recyling electro mechanics	1.16	%
Incineration of plastic parts	4.54	%
Incineration of packaging (paper, wood and plastic) (from A5)	3.75	%

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 OH1042 Panel

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO_2-Eq.]	6,55E+02	7,36E+00	9,44E+00	1,23E+03	9,42E-01	2,52E+01	4,53E+00	-1,83E+02
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	4,76E-09	1,23E-15	2,19E-15	3,45E-11	1,57E-16	1,08E-14	3,28E-15	3,12E-11
AP	Acidification potential of land and water	[kg SO_2-Eq.]	2,19E+00	3,18E-02	1,79E-03	3,49E+00	3,86E-03	6,03E-03	1,22E-03	-7,26E-01
EP	Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	1,97E-01	7,77E-03	3,29E-04	3,27E-01	9,77E-04	4,92E-04	1,31E-04	-4,61E-02
POCP	Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	2,04E-01	-1,10E-02	1,20E-04	2,22E-01	-1,43E-03	2,38E-04	5,26E-05	-5,40E-02
ADPE	Abiotic depletion potential for non-fossil resources	[kg Sb Eq.]	1,80E-02	5,70E-07	1,80E-07	3,92E-04	7,32E-08	1,71E-06	6,98E-07	-8,88E-03
ADPF	Abiotic depletion potential for fossil resources	[MJ]	7,07E+03	1,01E+02	2,50E+00	1,32E+04	1,29E+01	9,16E+00	1,99E+00	-1,78E+03

RESULTS OF THE LCA - RESOURCE USE: One piece of OH1042 Panel

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	1,86E+03	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0,00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	1,86E+03	5,82E+00	5,05E-01	8,96E+03	7,50E-01	2,17E+00	5,53E-01	-4,00E+02
PENRE	Non-renewable primary energy as energy carrier	[MJ]	7,95E+03	-	-	-	-	-	-	-
PENRM	Non-renewable primary energy as material utilization	[MJ]	0,00E+00	-	-	-	-	-	-	-
PENRT	Total use of non-renewable primary energy resources	[MJ]	7,95E+03	1,01E+02	2,93E+00	2,23E+04	1,29E+01	1,06E+01	2,23E+00	-1,96E+03
SM	Use of secondary material	[kg]	1,73E+02	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]	2,78E-23	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]	3,27E-22	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]	3,91E+00	9,84E-03	2,68E-02	1,06E+01	1,27E-03	6,30E-02	1,16E-02	-1,28E+00

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of OH1042 Panel

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	3,77E-05	5,60E-06	5,57E-09	1,06E-05	7,22E-07	4,63E-08	1,29E-08	-1,43E-06
NHWD	Non-hazardous waste disposed	[kg]	3,83E+01	8,16E-03	2,78E-01	1,62E+01	1,05E-03	2,39E+00	6,33E-01	-2,15E+01
RWD	Radioactive waste disposed	[kg]	3,47E-01	1,37E-04	1,71E-04	3,58E+00	1,75E-05	5,62E-04	9,45E-05	-6,96E-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	0,00E+00
MFR	Materials for recycling	[kg]	0,00E+00	0,00E+00	6,00E-03	0,00E+00	0,00E+00	1,86E+02	0,00E+00	0,00E+00
MER	Materials for energy recovery	[kg]	0,00E+00	0,00E+00	7,59E+00	0,00E+00	0,00E+00	8,43E+00	0,00E+00	0,00E+00
EEE	Exported electrical energy	[MJ]	0,00E+00	0,00E+00	1,41E+01	0,00E+00	0,00E+00	5,54E+01	0,00E+00	0,00E+00
EET	Exported thermal energy	[MJ]	0,00E+00	0,00E+00	2,55E+01	0,00E+00	0,00E+00	9,98E+01	0,00E+00	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 33.9 % and 49.3 % 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. 97.9 % - 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). Also, ODP shows a higher contribution of 99.3%

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. 93°% 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 53.6 % and 64.7 %, with the exception of ADPE (2.1°%) and ODP (0.7°%). This is a result of 0,05 hours of operation in on mode and 23.95 hours in stand-by mode per day and per 220 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.

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

/GaBi 9 2019a/
GaBi 9 2019: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Echterdingen, 1992-2018.

/GaBi 9 2019b/
GaBi 9 2019b: Documentation of GaBi 8: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Echterdingen, 1992-2018. http://documentation.gabi-software.com/

/EN 15804:2014-07/
EN 15804:2014-07: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

/2014/30/EU Electromagnetic Compatibility Directive (EMCD)

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

/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: 2007: Electromagnetic compatibility (EMC) - Part 6-3: Generic Standards - Emission standard for residential, commercial and light-industrial environments

/ EN 12425:2000/
Industrial, commercial and garage doors and gates - Resistance to water penetration - Classification; German version EN 12425:2000

/EN ISO 10140-2:2010/
Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010); German version EN ISO 10140-2:2010

/DIN 4102/
DIN 4102- Part 1, B2 (1998), Reaction to fire tests - Ignitability of building products subjected to direct impingement of flame.

/DIN EN 12424/
Industrial, commercial and garage doors and gates - Resistance to wind load - Classification; German version EN 12424:2000

/DIN EN 12428/
Industrial, commercial and garage doors - Thermal transmittance - Requirements for the calculation; German version EN 12428:2013

/DIN EN ISO 10140-2:2010-12/
Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010); German version EN ISO 10140-2:2010

/DIN EN 60335 1:2012+A11:2011+A12:2017+AC1:2014
Household and similar electrical appliances - Safety - Part 1: General requirements

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

/DIN EN ISO 13849-1:2016-06/
Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design

/EN 13241-1/
EN 13241:2003+A2:2016 Industrial, commercial, garage doors and gates - Product standard, performance characteristics

/EWC/
European Waste Catalogue

/IBU PCR Part A:2019/
Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. Version 1.8 April 2019
www.ibu-epd.de

/IBU PCR Part B: 2017/
IBU PCR Part B: PCR Guidance-Texts for Building-Related Products and Services. From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part B: Requirements on the EPD for Automatic doors, automatic gates and
revolving door systems Version 1.6 (11. 2017) www.ibu-epd.com

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

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

/2014/30/EU/
Electromagnetic Compatibility Directive (EMCD)

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

/2012/19/EU/
Waste Electrical and Electronic Equipment Directive (WEEE Directive)

/DIN EN 12426:2000
Industrial, commercial and garage doors and gates - Air permeability - Classification; German version EN 12426:2000

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 OH1042 Panel

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
GWP	Global warming potential	[kg CO2-Äq.]	6,55E+02	7,36E+00	9,44E+00	1,23E+03	9,42E-01	2,52E+01	4,53E+00	-1,83E+02
ODP	Depletion potential of the stratospheric ozone layer	[kg CFC11-Äq.]	4,74E-09	-2,31E-14	-1,40E-14	-1,86E-11	-2,95E-15	-3,24E-14	-4,75E-15	3,76E-11
AP	Acidification potential of land and water	[kg SO2-Äq.]	2,20E+00	4,23E-02	2,20E-03	3,54E+00	5,21E-03	7,17E-03	1,47E-03	-7,02E-01
EP	Eutrophication potential	[kg PO43--Äq.]	1,07E-01	3,43E-03	1,31E-04	2,67E-01	4,33E-04	2,25E-04	6,16E-05	-1,89E-02
Smog	Ground-level smog formation potential	[kg Ethen Äq.]	2,97E+01	9,30E-01	5,19E-02	4,38E+01	1,15E-01	5,89E-02	1,36E-02	-8,13E+00
Resources	Resources – resources fossil	[kg Sb Äq.]	4,91E+02	1,45E+01	2,84E-01	7,87E+02	1,85E+00	7,69E-01	1,48E-01	-1,13E+02

RESULTS OF THE LCA - RESOURCE USE: One piece of OH1042 Panel

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
PERE	Renewable primary energy as energy carrier	[MJ]	1,86E+03	-	-	-	-	-	-	-
PERM	Renewable primary energy resources as material utilization	[MJ]	0,00E+00	-	-	-	-	-	-	-
PERT	Total use of renewable primary energy resources	[MJ]	1,86E+03	5,82E+00	5,05E-01	8,96E+03	7,50E-01	2,17E+00	5,53E-01	-4,00E+02
PENRE	Non-renewable primary energy as energy carrier	[MJ]	7,95E+03	-	-	-	-	-	-	-
PENRM	Non-renewable primary energy as material utilization	[MJ]	0,00E+00	-	-	-	-	-	-	-
PENRT	Total use of non-renewable primary energy resources	[MJ]	7,95E+03	1,01E+02	2,93E+00	2,23E+04	1,29E+01	1,06E+01	2E+00	-1,96E+03
SM	Use of secondary material	[kg]	1,73E+02	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]	2,78E-23	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]	3,27E-22	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	[m³]	3,91E+00	9,84E-03	2,68E-02	1,06E+01	1,27E-03	6,30E-02	1,16E-02	-1,28E+00

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of OH1042 Panel

Parameter	Parameter	Unit	A1 - A3	A4	A5	B6	C2	C3	C4	D
HWD	Hazardous waste disposed	[kg]	3,77E-05	5,60E-06	5,57E-09	1,06E-05	7,22E-07	4,63E-08	1,29E-08	-1,43E-06
NHWD	Non-hazardous waste disposed	[kg]	3,83E+01	8,16E-03	2,78E-01	1,62E+01	1,05E-03	2,39E+00	6,33E-01	-2,15E+01
RWD	Radioactive waste disposed	[kg]	3,47E-01	1,37E-04	1,71E-04	3,58E+00	1,75E-05	5,62E-04	9,45E-05	-6,96E-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	6,00E-03	0,00E+00	0,00E+00	1,86E+02	0,00E+00	-

MER	Materials for energy recovery	[kg]	0,00E+00	0,00E+00	7,59E+00	0,00E+00	0,00E+00	8,43E+00	0,00E+00	-
EEE	Exported electrical energy	[MJ]	0,00E+00	0,00E+00	1,41E+01	0,00E+00	0,00E+00	5,54E+01	0,00E+00	-
EET	Exported thermal energy	[MJ]	0,00E+00	0,00E+00	2,55E+01	0,00E+00	0,00E+00	9,98E+01	0,00E+00	-

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