# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

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|---|---|
| Owner of the Declaration | ASSA ABLOY Entrance Systems AB |
| Programmer holder | Institut Bauen und Umwelt e.V. (IBU) |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number | EPD-ASA-20200106-IBC2-EN |
| Issue date | 15.05.2020 |
| Valid to | 14.05.2025 |

**Crawford Superior 42.2 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**

**Crawford Superior 42.2 overhead sectional door**

**Programme holder**
IBU - Institut Bauen und Umwelt e.V.
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Germany

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

**Declaration number**
EPD-ASA-20200106-IBC2-EN

**Declared product / Declared unit**
This declaration represents 1 residential garage door with electrical operation, 2500 mm width and 2125 mm height, consisting of panels filled with water blown CFC-free polyurethane foam, panel thickness 42.2 mm and panel height 513 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 overhead sectional door Crawford Superior 42.2 The production location is Ostrov, Czech Republic and components are sourced from international tier one suppliers. Crawford Superior 42.2 door size varies according to project requirements; a standard door 2500 mm width and 2125 mm height with insulated panels filled with CFC-free polyurethane, panel thickness 42 mm, panel height 513 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

**Verification**

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

Dipl.-Ing. Hans Peters
(Chairman of IBU e.V.)

Dr. Alexander Röder
(Managing Director IBU e.V.)

Dr. Wolfram Trinius
(Independent tester appointed by SVA)

# 2. Product

## 2.1 Product description

Product name: Crawford Superior 42.2 overhead sectional door

The Crawford Superior 42.2 overhead sectional door is suitable for all types of buildings, with regards 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-width completely free. The door is made of insulated panels. The panels are designed without thermal bridges to provide minimal thermal transmittance. The surface is made of painted galvanized steel. The panel has integrated finger pinch protection. There are 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 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 (Tension-spring system) supports door weight leaf. The balancing springs are connected to the door leaf with double wires. If one spring breaks the other will still take most of the weight. The maximum unbalance after spring is broken will be 20 kg. Electrical operation is included in this declaration.

The door has 4 primary parts:
1) Door leaf
2) Track set
3) Balancing system
4) Operating system (manually or electrically operated)

The Crawford Superior 42.2 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).
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 13241-1:2003+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 4)
- Thermal transmittance: EN12428 (1,21 W/(m².K))
- Water penetration: EN12425 (Class 2)
- Air permeability: EN12426 (Class 1)

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 Crawford Superior 42.2 overhead sectional door is suitable for all types of buildings, with regard to both function and appearance. Furthernore, it has a modern, clean design. 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 Crawford Superior 42.2 overhead sectional door:

| Name | Value | Unit |
|---|---|---|
| Max size: (W x H) | 6000 x 3000 | mm |
| Panel thickness: | 42 | mm |
| Panel material: | steel | - |
| Panel model | Classic, Flair, Linea, Style and Trend | |
| Panel surface | Brilliant, Smooth, Woodgrain | |
| Filling: | CFC-free polyurethane | - |
| Color outside: | 7 Standard colours | - |
| Color inside: | RAL 9002 | - |
| Track types: | Standard: Double roof track | - |
| Balancing system: | Tension and Torsion | |
| Window (optional) | Optional: Motif (cassette-window), framed section (elox. / painted | |
| Passdoor (optional) | Optional: In door leaf with Low threshold | |
| Electrical operation: | Optional: **Automated operation**, Safety functions | - |
| Opening/closing speed: | Magic 600 and Magic 1000: 0.21 m/s | |

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

### 2.4 Delivery status
The Crawford Superior 42.2 overhead sectional door unit with door size of 2500 mm and height 2125 mm, is delivered 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 Crawford Superior 42.2 is as following:

| Component | Percentage in mass (%) |
|---|---|
| Steel | 84.58 |
| Plastics | 13.40 |
| Electronics | 0.02 |
| Electro mechanics | 2.00 |
| **Total** | **100** |

### 2.6 Manufacture
The final manufacturing processes occur at the factory in Ostrov U Stříbra, Czech Republic. The electronics are produced in Suzhou, China.

Offcuts and scraps during the manufacturing process are directed to a recycling unit.
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
EWC 17 04 05 iron and steel
EWC 12 01 99 Wastes not otherwise specified (panels)

### 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.
• Any waste metals are separated and recycled.

### 2.8 Product processing/Installation

The Crawford Superior 42.2 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 may be performed by the customer with guidance from installation manual or performed by certified (or competent) installation technicians.

### 2.9 Packaging

Packaging exists for the purpose of protection during transportation. The Crawford Superior 42.2 overhead sectional door is packaged in polystyrene plastic, corrugated cardboard and wooden protection. All of these packaging components are standard industry types. The cardboard is recyclable.

| Material | Value (%) |
|---|---|
| Cardboard/paper | 54.25 |
| Packaging Plastics | 12.73 |
| Wood | 32.98 |
| Steel | 0.04 |
| Total | 100.00 |

All packaging materials incurred during installation are either sent to a recycling unit (steel) or a waste incineration plant (paper, plastic and wood) 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 15 01 04 metallic packaging

### 2.10 Condition of use

Regular inspection is recommended a minimum of:

- Every 6 months
1) Check the condition of the door cables and replace them if damaged.
2) Check the integrity of the fixtures to the wall, ceiling and floor. Re-secure if necessary.
3) To preserve the appearance of the door, clean the door sections using a soft sponge and normal car shampoo. Rinse thoroughly with clean, cold water. Do not use corrosive or solvent-based cleaners or materials that may scratch the door.

- Every 12 months
1) Clean the rubber seals, and lightly coat the top- and bottom sealing with Vaseline or similar product.
2) Lubricate the hinges with standard household lubricating oil.

### 2.11 Environment and health during use

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

### 2.12 Reference service life

The product has a reference service life of 20.000 cycles which complies for 10 years of standard daily use (with the recommended yearly service check). For this EPD the lifetime of 10 years was considered.

### 2.13 Extraordinary effects

**Fire**

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 re-use during the reference service life and be moved from one door to another. The components made of steel, plastic and aluminum alloy can be recycled. The plastic components can be used for energy recovery within a waste incineration process.
All recyclable materials are directed to a recycling unit. The components made of steel, electronics and electro-mechanics are recycled. Furthermore, the plastic components are 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 17 02 03 plastic
EWC 17 04 05 iron and steel
EWC 17 04 11 Cables with the exception of those outlined in 17 04 10

Note: Disposal of the motor is subject to the WEEE Directive within Europe, Directive 2012/19/EU

### 2.15 Disposal

No materials were landfilled.

### 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 the Crawford Superior 42.2 overhead sectional door (size of width 2500 mm and height 2125 mm) as specified in PCR Part B “Requirements on the EPD IBU: PCR Automatic doors, automatic gates, and revolving door systems (door systems)”.

**Declared unit**

| Name | Value | Unit |
|---|---|---|
| Mass (Total System) | 124.76 | kg |
| Packaging | 9.45 | kg |
| Conversion factor to 1 kg | 0.0080 | - |
| 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 (Energy consumption for sectional door 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

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

Use stage:
For the use stage, it is assumed that the sectional door is used in the European Union, thus a European electricity grid mix is considered within this stage.

EoL:
In the End-of-Life stage, for all the materials from the product which are recycled (steel, electronics and electro-mechanics), a recycling scenario with 100% collection rate was assumed. On the other hand, the plastic components are sent for energy recovery within a waste incineration process.

### 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 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 from which data comes 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 plastic
- Waste incineration of paper
- Waste incineration of wood

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

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) | 835 | km |
| Capacity utilization (incl. empty runs) of truck | 85 | % |
| Transport by ship | 0 | km |

**Installation into the building (A5)**

| Name | Value | Unit |
|---|---|---|
| Output substances following waste treatment on site (Paper packaging) | 5.72 | kg |
| Output substances following waste treatment on site (Plastic packaging) | 1.34 | kg |
| Output substances following waste treatment on site (wood packaging) | 3.43 | kg |
| Output substances following waste treatment on site (steel packaging) | 0.004 | kg |

**Reference service life**

| Name | Value | Unit |
|---|---|---|
| Reference service life (20.000 cycles) | 10 | a |

**Operational energy use (B6)**

| Name | Value | Unit |
|---|---|---|
| Electricity consumption per RSL (10 years, 365 days per year) | 235.6 | kWh |
| Days per year in use | 365 | d |
| Hours per day in on mode | 0.1 | h |
| Power consumption in on mode in W | 140 | W |
| Hours per day in stand-by mode | 23.35 | h |
| Power consumption in stand-by mode in W | 2 | W |
| Hours per day in idle mode | 0.55 | h |
| Power consumption in idle mode in W | 7 | W |

*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

**End of life (C1-C4)**

| Name | Value | Unit |
|---|---|---|
| Collected separately Steel, electronic, electromechanics plastic parts | 123.76 | kg |
| Recycling Steel,electronics and electromechanics | 107.10 | kg |
| Incineration of plastics | 16.58 | kg |

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

| Name | Value | Unit |
|---|---|---|
| Collected separately waste type (including packaging) | 134.21 | kg |
| Recycling Steel | 77.95 | % |
| Recycling Electronic/Electro mechanics | 1.85 | % |
| Incineration of plastic | 13.35 | % |
| Incineration of paper | 4.26 | % |
| Incineration of wood | 2.59 | % |
| Incineration of packaging material (paper, plastics, wood) (from module A5) | 7.85 | % |

## 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 Crawford Superior 42.2 overhead sectional door**

| Parameter | Unit | A1-3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP | [kg $CO_2$-eq.] | 3,72E+02 | 5,34E+00 | 3,60E+00 | 9,80E+01 | 6,00E-01 | 5,51E+01 | 1,78E-01 | -1,72E+02 |
| ODP | [kg CFC11-eq.] | 2,07E-08 | 8,91E-16 | 8,63E-16 | 2,75E-12 | 1,00E-16 | 2,02E-14 | 2,37E-16 | 4,61E-13 |
| AP | [kg $SO_2$-eq.] | 1,17E+00 | 2,19E-02 | 7,48E-04 | 2,78E-01 | 2,46E-03 | 1,23E-02 | 1,46E-04 | -4,62E-01 |
| EP | [kg $PO_4^{3-}$-eq.] | 1,21E-01 | 5,54E-03 | 1,41E-04 | 2,60E-02 | 6,23E-04 | 1,14E-03 | 1,87E-05 | -3,68E-02 |
| POCP | [kg ethene-eq.] | 1,15E-01 | -8,09E-03 | 4,95E-05 | 1,77E-02 | -9,08E-04 | 5,24E-04 | 9,91E-06 | -5,00E-02 |
| ADPE | [kg Sb-eq.] | 5,69E-03 | 4,16E-07 | 7,04E-08 | 3,12E-05 | 4,67E-08 | 3,26E-06 | 3,66E-08 | -4,81E-03 |
| ADPF | [MJ] | 4,57E+03 | 7,31E+01 | 9,94E-01 | 1,05E+03 | 8,21E+00 | 1,84E+01 | 3,05E-01 | -1,55E+03 |
| Caption | GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources | | | | | | | | |

**RESULTS OF THE LCA - RESOURCE USE: One piece of Crawford Superior 42.2 overhead sectional door**

| Parameter | Unit | A1-3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERE | [MJ] | 8,99E+02 | - | - | - | - | - | - | - |
| PERM | [MJ] | 0,00E+00 | - | - | - | - | - | - | - |
| PERT | [MJ] | 8,99E+02 | 4,25E+00 | 1,99E-01 | 7,14E+02 | 4,78E-01 | 4,01E+00 | 5,31E-02 | 7,01E+00 |
| PENRE | [MJ] | 5,05E+03 | - | - | - | - | - | - | - |
| PENRM | [MJ] | 0,00E+00 | - | - | - | - | - | - | - |
| PENRT | [MJ] | 5,05E+03 | 7,33E+01 | 1,16E+00 | 1,77E+03 | 8,24E+00 | 2,09E+01 | 3,23E-01 | -1,59E+03 |
| SM | [kg] | 4,87E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | [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 | [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 | [$m^3$] | 1,39E+00 | 7,19E-03 | 1,05E-02 | 8,41E-01 | 8,08E-04 | 1,39E-01 | 5,66E-04 | -2,91E-01 |
| Caption | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water | | | | | | | | |
| | | | | | | | | | |

**RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of Crawford Superior 42.2 overhead sectional door**

| Parameter | Unit | A1-3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| HWD | [kg] | 2,72E-05 | 4,10E-06 | 2,24E-09 | 8,47E-07 | 4,60E-07 | 8,87E-08 | 4,49E-09 | -1,20E-06 |
| NHWD | [kg] | 8,27E+00 | 5,96E-03 | 1,12E-01 | 1,29E+00 | 6,70E-04 | 4,60E+00 | 1,08E+00 | -3,75E+00 |
| RWD | [kg] | 1,96E-01 | 9,95E-05 | 6,75E-05 | 2,85E-01 | 1,12E-05 | 1,02E-03 | 7,24E-06 | -1,83E-02 |
| CRU | [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 | [kg] | 0,00E+00 | 0,00E+00 | 4,00E-03 | 0,00E+00 | 0,00E+00 | 1,07E+02 | 0,00E+00 | 0,00E+00 |
| MER | [kg] | 0,00E+00 | 0,00E+00 | 10,54E+00 | 0,00E+00 | 0,00E+00 | 16,58E+00 | 0,00E+00 | 0,00E+00 |
| EEE | [MJ] | 0,00E+00 | 0,00E+00 | 5,44E+00 | 0,00E+00 | 0,00E+00 | 1,14E+02 | 0,00E+00 | 0,00E+00 |
| EET | [MJ] | 0,00E+00 | 0,00E+00 | 9,87E+00 | 0,00E+00 | 0,00E+00 | 2,06E+02 | 0,00E+00 | 0,00E+00 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | | | |

## 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 69.6% and 99.4% to the overall results for all the environmental impact assessment categories hereby considered. Within the production stage, the main contribution for all the impact categories is the production of steel, with approx. 80%, mainly due to the energy consumption on this process. Steel accounts with approx. 85% 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, with exception of ADPE (0.54%) and ODP (0.01 %), it contributes between 14.24% and 18.71% for all the other impact categories considered. This is a result of 0.1 hours of operation per day in on mode per 365 days in a year with a power consumption of 140 W.

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

**General principles**
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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

**/2014/30/EU Electromagnetic Compatibility Directive (EMCD)**
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Directive 2006/42/EC on machinery
/2011/11/65 (RoHS)

**/GaBi 9 2019a/**
GaBi 9 2019a: 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/

**/ISO 14025/**
DIN EN ISO 14025:2011-10:
Environmental labels and declarations — Type III environmental declarations — Principles and procedures

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

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

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

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

**/EN 61000-6-3: 2007/**
EN 61000-6-3: 2007: Quality management systems - Requirements (ISO 9001:2008)

**/EWC: 2000/532/EC/**
European Waste Catalogue

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

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

**/DIN EN 12424/**

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

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

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

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

**/DIN 4102-4:2016-05/**
Fire behaviour of building materials and building components - Part 4: Synopsis and application of classified building materials, components and special components

# 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 Crawford Superior 42.2 overhead sectional door**

| Parameter | Unit | A1-3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP | [kg $CO_2$-eq.] | 3,72E+02 | 5,34E+00 | 3,60E+00 | 9,80E+01 | 6,00E-01 | 5,51E+01 | 1,78E-01 | -1,72E+02 |
| ODP | [kg CFC11-eq.] | 3,05E-09 | -1,67E-14 | -5,69E-15 | -1,48E-12 | -1,88E-15 | -7,04E-14 | -8,82E-16 | 1,65E-12 |
| AP | [kg $SO_2$-eq.] | 1,21E+00 | 2,95E-02 | 9,27E-04 | 2,82E-01 | 3,32E-03 | 1,47E-02 | 1,65E-04 | -4,62E-01 |
| EP | [kg N-eq.] | 6,54E-02 | 2,46E-03 | 5,58E-05 | 2,12E-02 | 2,76E-04 | 5,02E-04 | 8,21E-06 | -1,44E-02 |
| Smog | [kg $O_3$-eq.] | 1,93E+01 | 6,53E-01 | 2,26E-02 | 3,49E+00 | 7,34E-02 | 1,44E-01 | 3,01E-03 | -6,58E+00 |
| Resources | [MJ] | 3,54E+02 | 1,05E+01 | 1,14E-01 | 6,27E+01 | 1,18E+00 | 1,62E+00 | 3,47E-02 | -5,34E+01 |
| Caption | GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential; EP = Eutrophication potential; Smog = Smog, air; Resources = Resources, fossil fuels | | | | | | | | |

**RESULTS OF THE LCA - RESOURCE USE: One piece of Crawford Superior 42.2 overhead sectional door**

| Parameter | Unit | A1-3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERE | [MJ] | 8,99E+02 | - | - | - | - | - | - | - |
| PERM | [MJ] | 0,00E+00 | - | - | - | - | - | - | - |
| PERT | [MJ] | 8,99E+02 | 4,25E+00 | 1,99E-01 | 7,14E+02 | 4,78E-01 | 4,01E+00 | 5,31E-02 | 7,01E+00 |
| PENRE | [MJ] | 5,05E+03 | - | - | - | - | - | - | - |
| PENRM | [MJ] | 0,00E+00 | - | - | - | - | - | - | - |
| PENRT | [MJ] | 5,05E+03 | 7,33E+01 | 1,16E+00 | 1,77E+03 | 8,24E+00 | 2,09E+01 | 3E-01 | -1,59E+03 |
| SM | [kg] | 4,87E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | [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 | [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 | [$m^3$] | 1,39E+00 | 7,19E-03 | 1,05E-02 | 8,41E-01 | 8,08E-04 | 1,39E-01 | 5,66E-04 | -2,91E-01 |
| Caption | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water | | | | | | | | |

**RESULTS O F THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: One piece of Crawford Superior 42.2 overhead sectional door**

| Parameter | Unit | A1-3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| HWD | [kg] | 2,72E-05 | 4,10E-06 | 2,24E-09 | 8,47E-07 | 4,60E-07 | 8,87E-08 | 4,49E-09 | -1,20E-06 |
| NHWD | [kg] | 8,27E+00 | 5,96E-03 | 1,12E-01 | 1,29E+00 | 6,70E-04 | 4,60E+00 | 1,08E+00 | -3,75E+00 |
| RWD | [kg] | 1,96E-01 | 9,95E-05 | 6,75E-05 | 2,85E-01 | 1,12E-05 | 1,02E-03 | 7,24E-06 | -1,83E-02 |
| CRU | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | - |
| MFR | [kg] | 0,00E+00 | 0,00E+00 | 4,00E-03 | 0,00E+00 | 0,00E+00 | 1,07E+02 | 0,00E+00 | - |
| MER | [kg] | 0,00E+00 | 0,00E+00 | 10,54E+00 | 0,00E+00 | 0,00E+00 | 16,58E+00 | 0,00E+00 | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| EEE | [MJ] | 0,00E+00 | 0,00E+00 | 5,44E+00 | 0,00E+00 | 0,00E+00 | 1,14E+02 | 0,00E+00 | - |
| EET | [MJ] | 0,00E+00 | 0,00E+00 | 9,87E+00 | 0,00E+00 | 0,00E+00 | 2,06E+02 | 0,00E+00 | - |
| Caption | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | | | |

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